

## **Addison County Transit Resources: Who is not riding?**

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## **Executive Summary**

The main purpose of this study was to explore public transportation ridership in Addison County, Vermont. More specifically, we investigated the reasons why citizens are and are not utilizing Addison County Transit Resources (ACTR), in order to help the agency improve services and increase its ridership. Using surveys, we queried citizens at the Middlebury, Vergennes, and Bristol town meetings in order to gain information regarding ridership patterns. We also surveyed at Shaw's grocery stores in Bristol, Vergennes, and Middlebury; at the Middlebury Hannaford's Supermarket and Natural Foods Co-op; both the Middlebury middle and elementary schools; and two assisted living centers. Several key trends were evident. A large majority of the population does not utilize ACTR despite awareness of the service. Top reasons cited for not using the system—or using it only infrequently—include inconvenient routes, frequency, and stops, and a preference for other forms of transportation, such as personal cars. In order to attract more riders, ACTR might have to expand its services to make riding more convenient and accessible for those who do not want to dramatically change their lifestyle. Ultimately, this will result in environmental, social, and economic sustainability for the region.

## **Introduction**

In light of rising oil prices, concerns about air pollution, the daunting issues associated with global warming, and declining health in Americans, this timely study focused on public transportation in Addison County, Vermont. Specifically, we sought to determine why some Addison County citizens are not making use of Addison County Transit Resources (ACTR) and what might persuade them to do so. Along with politicians, scientists, and consumers, we believe that some sort of change is needed in the American utilization of private transportation towards a wider use of public transportation in order to live more sustainably. This study provides a launching point for exploring how to improve ridership in Addison County, and perhaps eventually, throughout the country.

### *Transportation in the United States*

Now more than ever before, increasing both the availability and utilization of public transportation needs attention in the United States. In 1900, there were 8,000 cars in the United States compared to over 160 million today, which go hand in hand with over 6 million kilometers of paved roads (Burkhardt et al., 1998). Today, society has become car-dependent whereby utilizing single-occupancy vehicles is considered the norm and has become an engrained right of the average American citizen. DeKa states, “we have developed an ardent love affair with cars...Americans are so enamored of their cars that the average household spends more on cars and gasoline than on groceries or income tax” (2004). Public transportation can ease our “addiction” to oil, allowing us to

achieve significant energy savings and live in a sustainable fashion. Each year, public transportation in the United States saves 1.4 billion gallons of gasoline (APTA, 2007).

Not only can public transportation lessen our usage of oil, but it also points our nation towards increased environmental stewardship, better health, and a higher quality of life. A shift in use and funding toward public transportation over private automobile use would promote a significantly less polluted environment, especially in terms of air quality through reduced fuel use. Public transportation has the potential to produce 95% less carbon monoxide, 90% less volatile organic compounds, and half as much carbon dioxide and noxious gases per passenger mile than private vehicles (APTA, 2007).

Public transportation also plays a crucial role in creating a healthier nation, especially in respect to lowering the rates of respiratory disease and heart disease (Burkhardt et al., 1998). Mobile-source pollution, which causes carbon monoxide, noxious gases, and particulate matter to accumulate in our breathing air, can be hazardous and potentially life-threatening in older adults, those with respiratory illnesses, and other sensitive populations. The automobile's carbon dioxide emissions also accumulate in the atmosphere, contributing to the climatic change that we are witnessing today. By reducing our over-use of the private car, we can begin to rid the air of these dangerous pollutants. Furthermore, public transportation use is highly correlated with an increase in daily exercise, a necessary component of a healthy lifestyle which Americans do not practice enough. Insufficient physical exercise, partially due to little walking due to personal automobile use, led to a 31% rate of obesity in U.S. adults in 2000, and can lead to chronic conditions such as diabetes, hypertension, hypercholesterolemia, stroke, heart disease, some cancers, and arthritis (Burkhardt et al., 1998). In fact, in countries such as

the Netherlands and Denmark where public transportation use is widespread, average healthy life expectancies are 2.5 to 4.4 years longer than in the U.S. (Burkhardt et al., 1998).

Finally, increasing the usage of public transportation can influence the U.S. economy in terms of allowing families to save money and apply it to more practical, necessary purposes. In 2006, gas cost an average of \$2.59 per gallon (Wang et al., 2007), and as of May 2008 it had surpassed \$4.00 per gallon in some U.S. cities. Private cars are extremely costly: for every \$1 earned, an average household spends 18 cents on transportation, 94% of which is spent on buying, maintaining, and operating cars (APTA, 2007). Transit riders can save a significant \$1,400 just in gasoline per year (APTA, 2007). Transportation constraints stand as a significant barrier for low-income families in making their way out of poverty. The need to own one or more cars in order to access jobs and provide for a family is placing homeownership out of reach for many low-income families, restricting access to the single most effective tool for increasing family wealth (Canby, 2003). The unequal distribution of transportation spending for the rich and poor of the U.S. is an inequity that public transportation has the prospect of alleviating. The poorest fifth of Americans, earning less than \$14,000 per year, spend 39% of their income on transportation, compared with the average American household spending 20% on transportation.

Still, while transit services have improved, it is hard to compete with the level of comfort, privacy, convenience, and door-to-door time savings offered by even the cheapest of cars (Pucher, 2004). A closer look at the role and importance of public

transportation in rural areas perhaps can lend insight into how a transition to wider usage is applicable in non-city environments.

### *Public Transportation in Rural Areas*

Rural America is characterized by settlements outside of towns and cities, distinct from more intensively settled urban and suburban areas, yet also different from unsettled lands such as outback or wilderness. Public transportation in rural America presents a new perspective and raises several issues and hardships that are not inherent to transit in more urban areas. The most obvious difference lies in the fact that people are more spread out and destinations are not clumped. Therefore, a small network of public transportation routes through a central, more populated rural town do not necessarily cater to the needs or offer viable service for all rural residents.

Since the 1990s, rural and small town areas have been growing, especially those with recreation and retirement economies (Burkhardt, 1998). Over the past several decades, rural economies have shifted away from a strong dependence on farming, forestry, and mining to a more diverse array of economic activities (Burkhardt, 1998). Rural transit systems are important targets for improvement as they are likely to have a hefty economic impact in rapidly-growing service and retirement communities where transit can complement expansion trends. In these places, public transit can take people to jobs, job training, stores, and education programs, providing for an overall increase in economic activity (Burkhardt, 1998). One must bear in mind, however, the difficulty in accessing people in remote places and in having enough ridership from small towns to make public transportation systems environmentally and economically viable. The big disadvantage of most flexible rural and suburban services (e.g., allowing ½-mi.

deviations off the route) is that they are much less productive than fixed-route services within the city, generating fewer riders per vehicle and requiring larger subsidies per passenger trip (Pucher, 2004).

Nonetheless, it is vital to address these challenges and attempt to overcome them because of the potential transit has to increase rural quality of life. While the most prevalent mode for transporting people in rural areas is the car, one in every 14 households in rural America does not have a car (Burkhardt, 1998). Several demographic groups in rural populations have limited or no access to a car: the 45% of rural elderly without cars, the 57% of rural poor who lack cars, and the 52% of all rural households that share a single car. Therefore, public transit services are vital when considering the significant portion of the population who do not have access to a car, cannot drive, or cannot afford its maintenance (Burkhardt, 1998). Bearing in mind this lack of private transportation to potentially sprawling destinations for a large segment of the population, it is unacceptable that 28% of the nation's rural residents live in areas without any public transit, and an additional 28% live in areas where the service level is negligible.

Thus, rural transportation is especially appealing and even essential when considering the need to even out the playing field and address issues of social equity and environmental justice. Rural transportation has the potential to alleviate the negative consequences of the affluence gap in the United States, as it can target those people with the least access to transportation, lowest incomes, greatest physical/mental disabilities, or those with other transportation impediments (Burkhardt, 1998).

Rural transit programs can create collective demand markets for rural public transit systems where it would usually be nonexistent, especially through effects such as

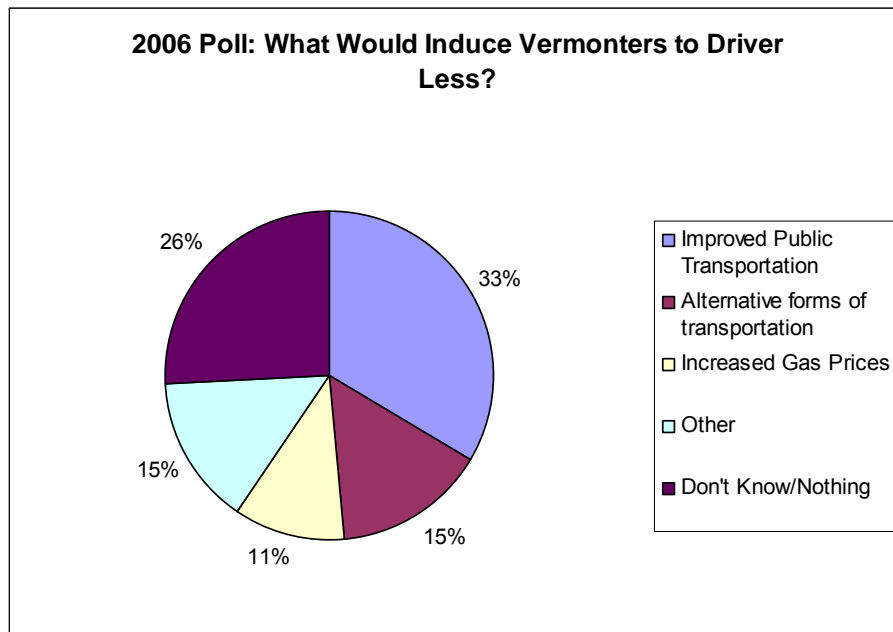
regional economies of scale, community multipliers, and reductions in air pollution or traffic congestion (Burkhardt, 1998). Direct economic benefits can be viewed as those economic and social services that transit can make accessible for people, such as jobs, health/social services, shopping, entertainment/community, and visits to friends/relatives. Indirect economic benefits fall under the category of the increased stability and reliability of employees' work hours, made possible by the assurance of transportation every day. Induced economic benefits also may be attained through the creation of an environment that is more likely to attract businesses that value services that transport customers/employees easily. Public transportation can allow people to lead independent lives when older, increase opportunities for employment, attract tourists, provide access to medical facilities, enable parents to work or have more leisure time when they would normally be chauffeuring their children, and even increase real estate values (Deka, 2004). It is through this lens that we turn to assessing ways to improve rural transit options in Vermont.

### *Public Transit Ridership in Vermont*

Vermont, a largely rural state, is a prime target for consideration of increased public transportation coverage. In 2006, Vermont spent a total of \$1.1 billion on transportation, with state spending allocating only 4% of the total transportation budget towards public transport (Wang et al., 2007). Transportation accounts for 44% of Vermont emissions of carbon dioxide, compared to a national average of 22% (APTA, 2007). With gas prices in 2006 rising to \$2.59 (June 2, 2008 average of \$3.96 in

Vermont), Vermont saw a 9.3% increase in public transit ridership between FY05 and FY06.

In 2000 and again in 2006, a Vermont survey was circulated in order to assess what factors would induce residents to drive less. In 2000, two-thirds of respondents said that nothing would cause them to drive less, a response rate that dropped considerably in 2006. The 2006 poll went a step further and attempted to determine what would induce rural America to drive less, and improved public transportation was cited by 33% of respondents (see Figure 1).



**Figure 1.** Results of a 2006 poll asking what factors would push people to drive less (Wang et al., 2007).

The key to improving the impact of public transportation in rural areas, such as Vermont, is determining the reasons why citizens are and are not utilizing the resource, and which demographics are utilizing it more. The Surface Transportation Policy Project (Bailey, 2004) found that when public transportation is more available it is highly utilized

by older non-drivers; they complete an estimated 310 million trips per year throughout the U.S. Rural riders in Florida, Kansas, Washington, and Montana have expressed their heavy reliance on public transit for transport to and from health services, for its aid to local economies through providing transport to jobs, and to open up a world of independence for senior citizens (Wilson, 2007). At the same time, however, rural transportation systems do not see nearly as much use as they possibly could. Because of the nature of rural areas, with low population density and a spread-out town structure, public transit stops are not always convenient enough for many people to leave the car in the driveway and utilize the public transit system. With insufficient state funding in many rural areas combined with low ridership numbers, rural public transit systems do not have the financial means to provide frequent service. This creates a negative feedback loop in that the less frequent service the system has, the less people will utilize it because of increased waiting time at stops for the next transit unit to arrive, which creates even less of a demand for the transit to increase its service. Many transit systems have attempted to solve this rural obstacle of spread-out towns through creating demand-response systems where people can call and request a public transit pick-up and drop-off at specific locations. However, this demand-response system along with deviated-route systems, whereby buses deviate up to one-half mile from established routes to accommodate riders—and the fact that all this transportation is often occurring via a large vehicle such as a bus—brings up questions of whether the public transportation system is actually creating *more* air pollution. ACTR offers both demand-response and deviated-route systems, though their demand-response services are typically provided by personal automobiles driven by volunteer drivers. Long-term environmental sustainability, then,

could, in part, be reached through an increase in public transportation ridership in Addison County to the extent that the air pollution from the buses and volunteer drivers is outweighed by the massive decrease in air pollution from lowered personal car use.

### *Case Studies of Rural Public Transportation*

In order to place ACTR in the context of other efforts to promote public transportation, it is useful to briefly focus on several specific case studies of transit efforts. The challenging aspect of these transit efforts by coordinators of rural public transportation is promoting and developing sustainable and successful transit options in light of the geographical characteristics.

Over the last decade there have been several rural transit systems developed across North America and the examination of such programs will allow us to better understand the obstacles and successes associated with public transportation in rural communities. For example, in 1998 the government of Ontario, Canada launched the Community Transit Access Program, which assessed the problems of rural transportation in Ontario, the effectiveness of government transit programs and local-based systems, and described a model system for community transit organizations. More importantly, the study focused on three transit models: urban centralized, rural centralized and rural dispersed. The analyses of the rural centralized and rural dispersed system are most pertinent to our study. The county of Perth provides an example of a rural centralized transit system that is mainly rural but encompasses five urban areas and serves ca. 70,000 people. The study found that developing a unified vision, a developed network for all stakeholders, open lines of communication, shared decision making, and maintenance of

the program were instrumental in ensuring the success of the program. Additionally, before the program was launched there was a strong foundation for transportation because of existing independent systems in towns throughout the county. Therefore, the unification of existing services provided a fundamental base for the transit services in Perth (Fuller and Herold, 2002).

An example of a less successful transit system was the rural dispersed system in West Elgin County. This system experienced several failures because there was a lack of commitment from the communities, stakeholders, and potential riders (Fuller and Herold, 2002), emphasizing the importance of involving surrounding communities and developing a concrete network in order to encourage widespread use.

Another well developed and successful rural public transit system was in the town of Rimoski in Northern Quebec. This town established an effective public transportation system within the constraints of a limited financial budget by creating a partnership with private taxi owners. The Rimoski transit board utilized a demand-response system that dispatched and sought to achieve maximum capacity during each run. The program was awarded subsidies and lowered the price of the average trip to \$2.64. A fourth case study that demonstrates success occurred in three counties in Indiana— Delaware, Jay, and Randolph. These three counties developed the Interurban Rural Public transit system and provided service via a small fixed-route service and a demand-response service. The service focused on assisting seniors and those individuals with disabilities (Lifestream, 2002). These latter two case studies highlight demand-response systems, and while they mainly catered to a distinctive group, the success experienced by the two effectively shows successful rural transit systems do exist.

*Addison County Transit Resources / Goal of Study*

The goal of ACTR is to “enhance the economic, social, and environmental health of the region by providing public transportation services that are safe, reliable, accessible, and affordable for everyone” (ACTR, 2007). The services they provide include the following:

- **Middlebury Shuttle Bus (MSB)** with 4 loops that start in the center of town and radiate outward between one and five miles
- **Tri-Town Shuttle Bus (TTSB)** running between Middlebury, Bristol, and Vergennes
- **Snow Bowl Shuttle Bus (SBSB)** with seasonal access to hiking trails, the Middlebury College Snow Bowl, Middlebury’s Breadloaf Campus, Ripton, and East Middlebury
- **Burlington Link**, a commuter and weekend service run in partnership with Chittenden County Transportation Authority
- **Rutland Connector**, a weekday commuter service run in partnership with Marble Valley Regional Transit District
- **Demand-Response System** throughout all of Addison County, which uses volunteer and professional drivers to provide people with disabilities, elderly, and Medicaid recipients service to medical and health facilities

ACTR services provide a link that makes it possible for those who cannot afford to drive, or cannot drive, to be employed: 67% of ACTR riders report having little or no access to cars, and 45% of ACTR riders report using ACTR to get to work (ACTR, 2007). ACTR also helps people stay healthy, providing more than 30,000 rides in 2007 to healthcare providers. Although ACTR has been successful in providing transportation to those who otherwise would not have access to it, there are lessons to learn from other rural transit providers that could enhance ACTR’s performance and help it to avoid pitfalls. The goal of our research was to assess these ridership issues that are common to rural areas for our local public transit provider, Addison County Transit Resources, in order to determine reasons why many citizens of Addison County are not utilizing the service.

## Methods

There are two focal populations for this work: citizens of Middlebury, Vergennes, and Bristol and tourists in Middlebury. For both groups, we looked at the “wish routes” for future riders, the present most popular destinations, and most importantly, the reasons behind why people are and are not using current service. We focused on who *isn't* riding in order to ultimately improve the efficacy of ACTR service. In order to gain a representative sample of populations from a variety of areas that go beyond ACTR's easy targets of large employers or businesses in the area, we surveyed parents of students at local Middlebury schools, patrons of the tri-town grocery stores, and residents of assisted living centers. We also surveyed visitors lodging in Middlebury hotels during the duration of our study to assess the opportunity for public transportation for a tourist population (Table 1). The hotel surveys were not analyzed because of the very low response rate.

**Table 1.** Total number of surveys collected based on location.

<b>Location</b>	<b>Number of Surveys Collected</b>
Grocery Stores	179
Schools	33
Assisted Living Centers	49
Middlebury Inn	5
<i>Election and Town Meeting Day</i>	
Middlebury	307
Bristol	45
Vergennes	13

For all groups, we not only examined the reasons people are or are not riding ACTR shuttles, but also the factors that would make them more likely to use public transportation. Our primary tools for this study were surveys (see Appendix A), which we created and distributed at the target areas. Each survey had several of the same questions along with a few that catered more to the specific group being surveyed. With many of the surveys, we also asked respondents for verbal suggestions.

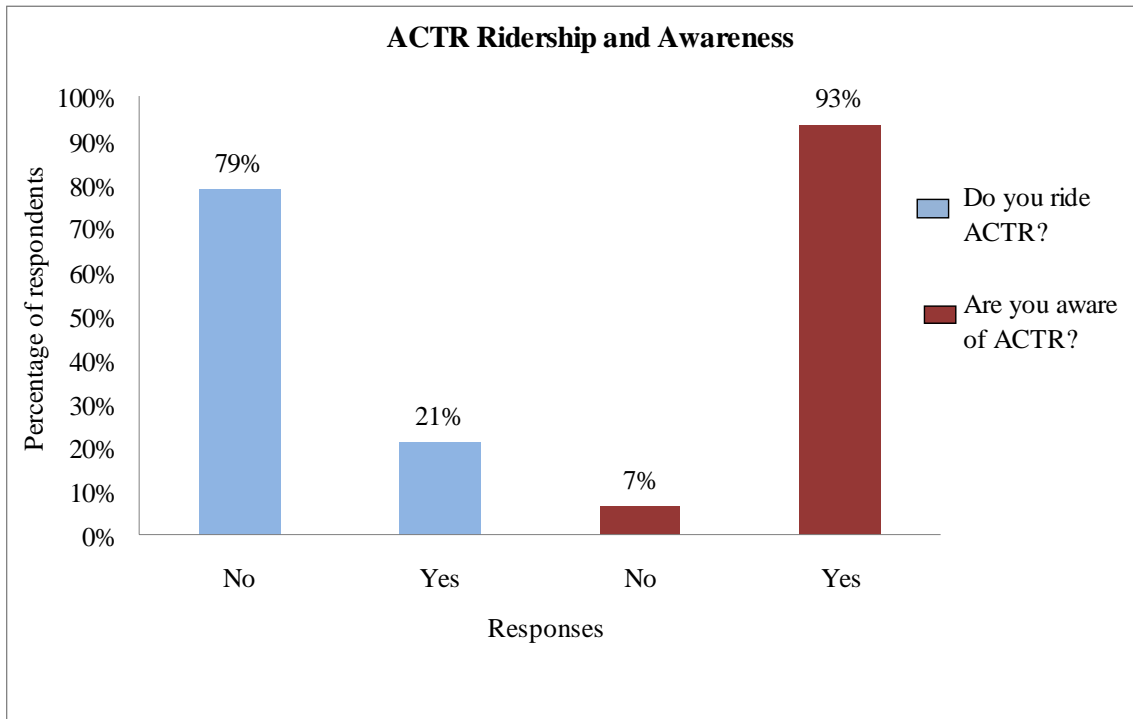
Surveys made available on Town Meeting Day (March 4<sup>th</sup>, 2008) to all three towns were the most extensive; they examined several aspects of the respondents' transportation habits, familiarity with ACTR, and either reasons for using, or not using, public transportation in Addison County.

The surveys administered at the tri-town grocery stores and Middlebury public schools were less comprehensive than the Town Meeting Day surveys in order to accommodate respondents' expected lack of time. Grocery stores where surveying was conducted include the Shaw's supermarkets in Middlebury, Bristol, and Vergennes; the Hannaford Supermarket in Middlebury; and the Middlebury Natural Foods Co-op. Surveys distributed at schools had additional questions targeting parents' reasons for picking their child up in a single-occupancy vehicle (SOV) as opposed to having them utilize public transportation.

In order to evaluate and analyze the data from all completed surveys, responses were tabulated electronically in Excel. We considered numerous parameters (e.g. age, income) and how these influenced survey responses to identify trends in the survey results. Graphical representations of survey responses and key trends are shared in the Results section.

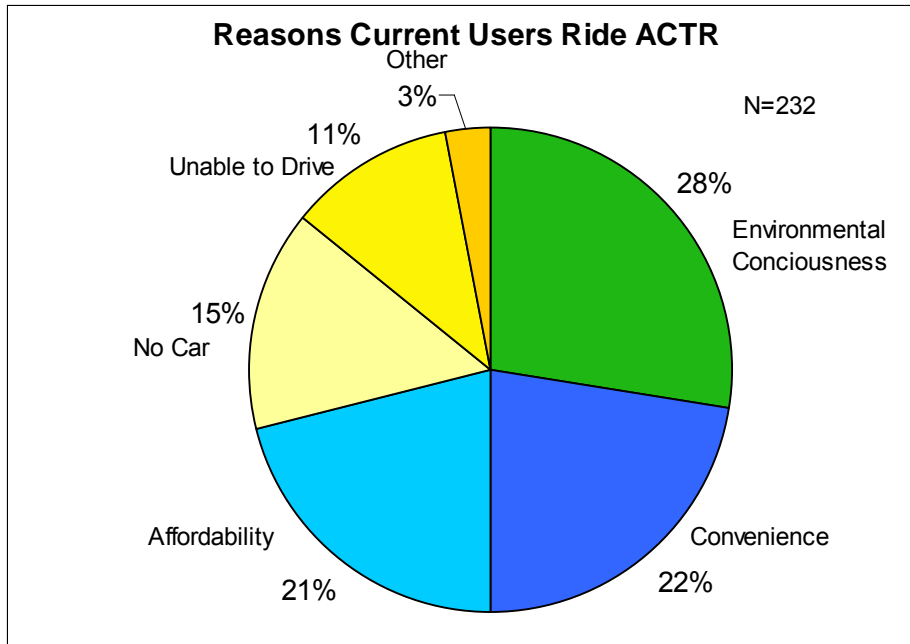
## Results

Overall it was found that 79% of all survey respondents had not utilized ACTR, while 21% had (Figure 2). Ninety-three percent of all respondents were at least somewhat aware of the service.



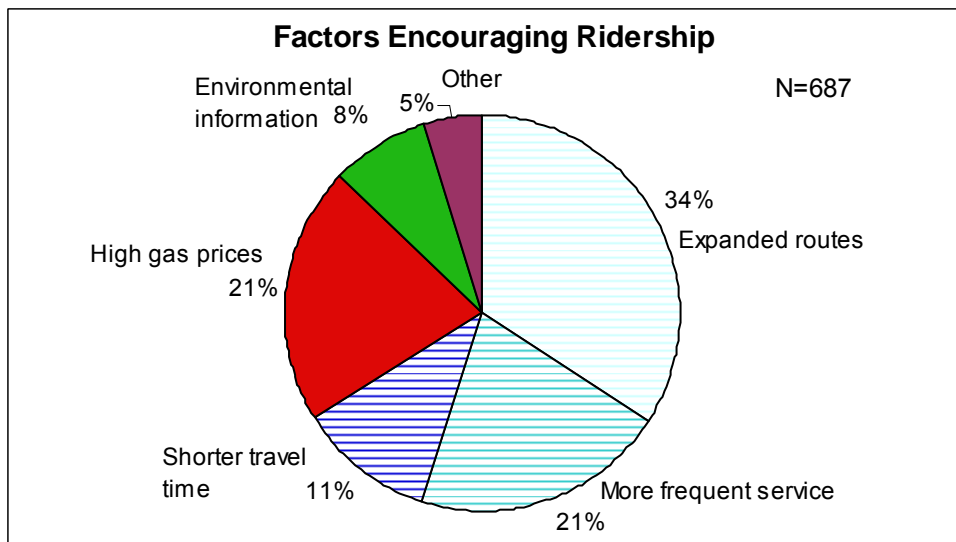
**Figure 2.** Percent of survey respondents answering “yes” and “no” to the questions of whether or not one rides ACTR and whether or not one is aware of it.

The most commonly-cited reason of current riders of ACTR for their use of the service was environmental consciousness (28%), followed by convenience (21%) and affordability (21%) (Figure 3). The combined responses of inability to drive and lack of a car was chosen by 26% of respondents.



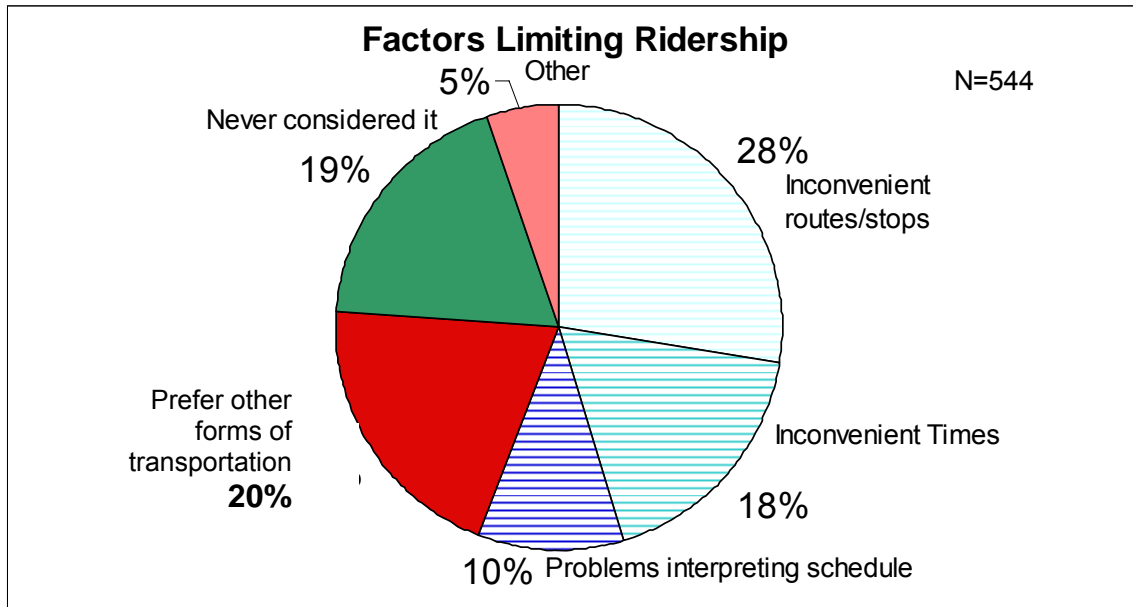
**Figure 3.** Response to question of “Why do you ride ACTR?”

Both riders and current non-riders indicated that expanding routes (34% of respondents) is the main way in which they would be encouraged to ride ACTR or ride it more often (Figure 4). More frequent service and high gas prices were also important factors (21% each).



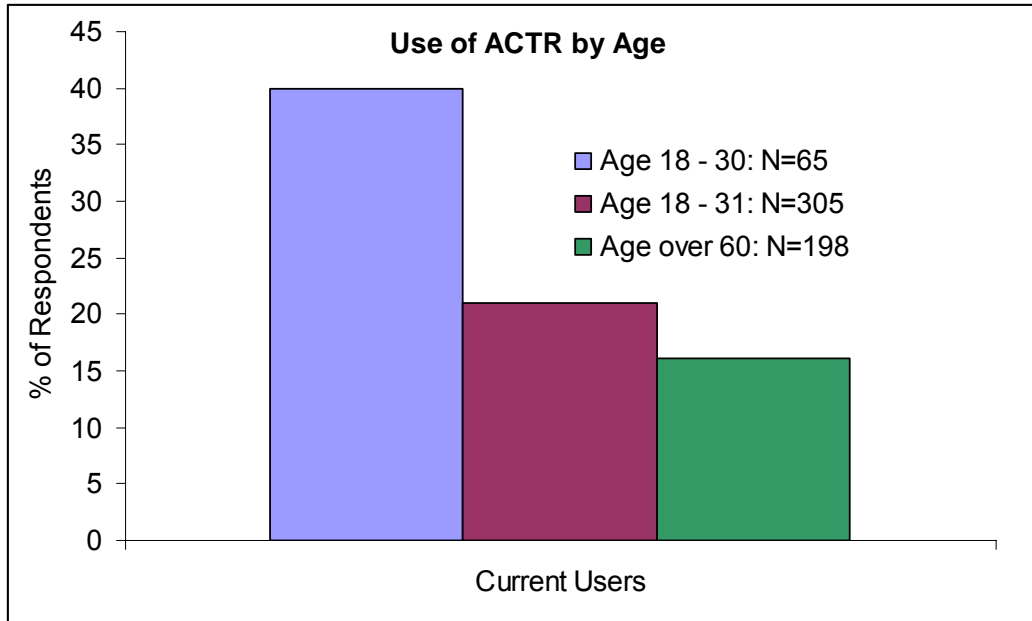
**Figure 4.** Response to question “What factors would cause you to utilize ACTR/utilize it more often?”

Inconvenient routes and stops were the primary reason why non-riders do not use ACTR (28%) (Figure 5). A preference for other forms of transportation (20%), never considering it an option (19%), and inconvenient times (18%) were also common factors indicated by respondents.



**Figure 5.** Response to question “Why don’t you use public transportation?”

Respondents in the age bracket 18-30 were the most likely to use ACTR, with 39% of respondents utilizing the service (Figure 6). Those respondents ages 18-30 were also more likely to cite inconvenient routes, times, and stops as the reasons for not utilizing ACTR services (65%), followed by age brackets 31-60, and then 60+ (Table 2). Respondents over age 60 were most likely to cite a preference for other forms of transportation or never considering public transportation an option as their reasons for not utilizing it (47%), followed by those in age bracket 31-60 and 18-30, respectively.



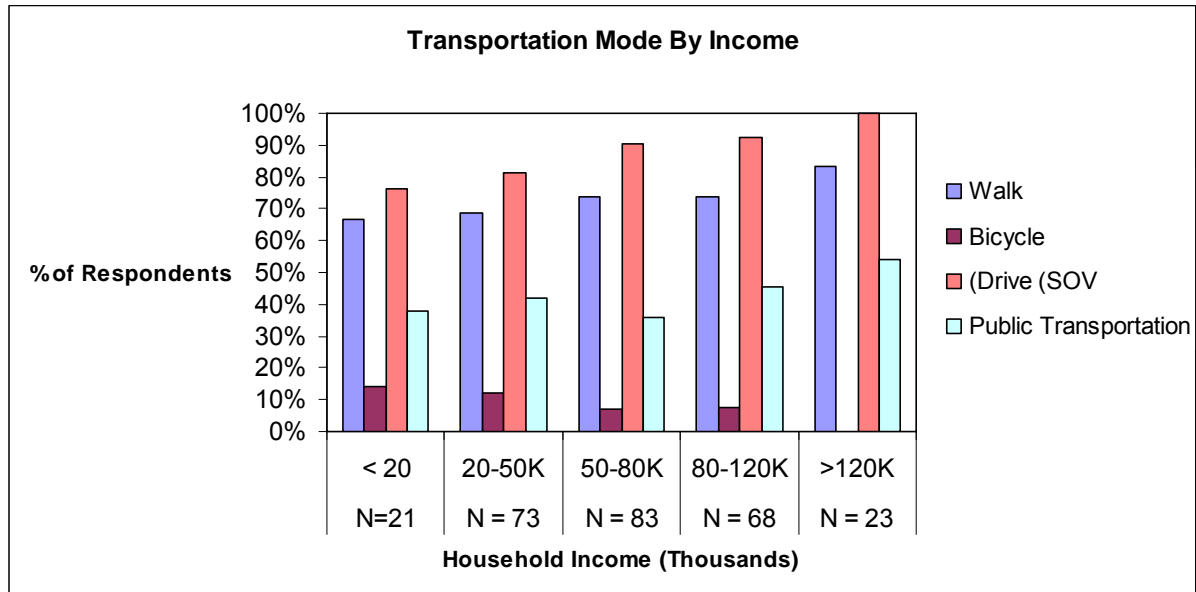
**Figure 6.** Response to question “Do you currently use ACTR” by age category.

Age Group	Inconvenient Routes, Times, and Stops	Prefer other transportation or never considered it
<b>18-30</b>	65%	34%
<b>31-60</b>	41%	39%
<b>Over 60</b>	37%	47%

**Table 2.** Response to question, “Why don’t you use public transportation?”

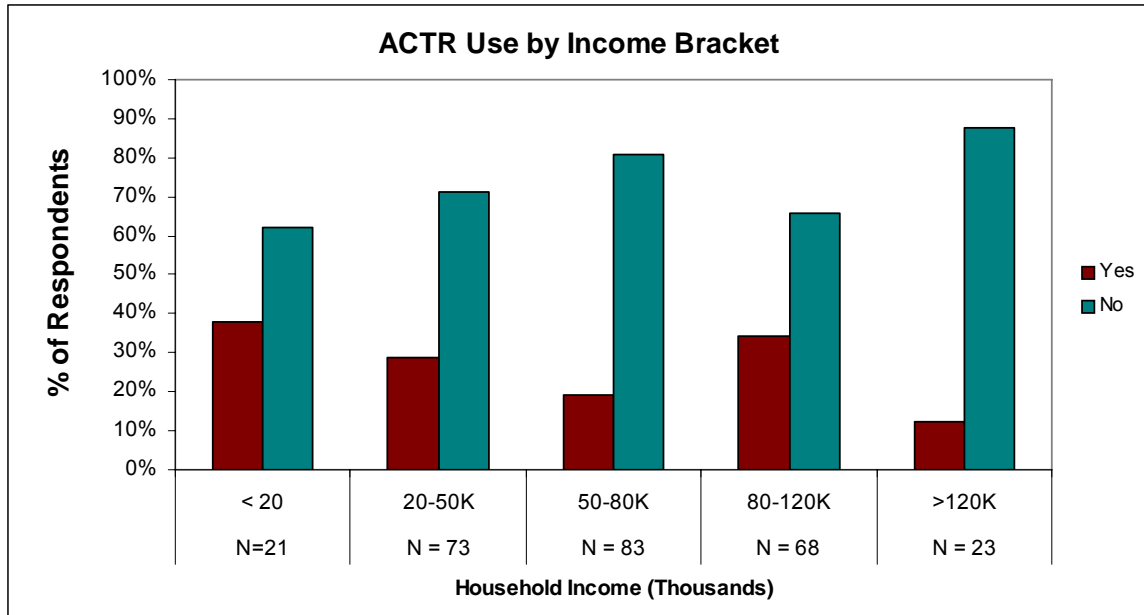
In addition to age, another variable that was assessed in comparison with transit use was income levels. In terms of the various modes of transportation utilized, it was found that those in the income bracket of \$120,000/year or greater both drove and walked the most, with decreased rates of both modes as income decreased (Figure 7). Public transportation was also utilized by those with a household income of \$120,000/year or greater, with 54% of respondents answering that they used it, followed by 46% in the income bracket

of \$80-120,000/year (Figure 7). Only 38% of those respondents making less than \$20,000/year used public transportation.



**Figure 7.** Response to question “What types of transportation do you use in an average week?” categorized by income.

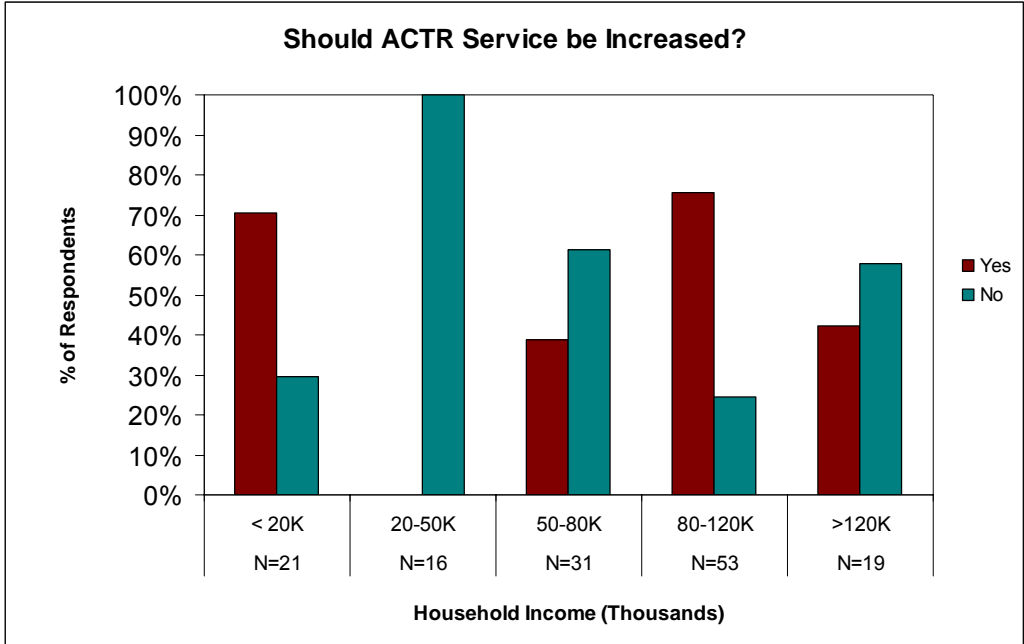
Focusing solely on public transportation usage, it was found that the largest percentage of respondents with an annual household income of less than \$20,000 per year used ACTR (38%) (Figure 8). Those with an income of greater than \$120,000 per year utilized it least.



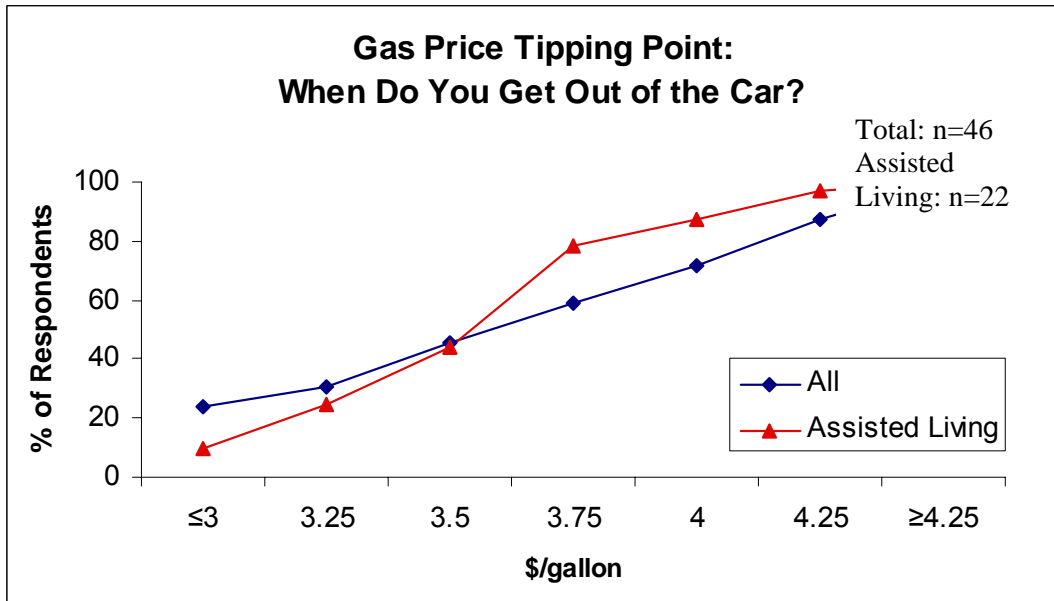
**Figure 8.** Percent respondents answering the question “Do you use ACTR?” based on income bracket.

An increase in ACTR service was most often supported by those in the \$80,000-120,000 income bracket at a 75% support rate, followed by those in the less than \$20,000/year income bracket with a 71% support rate (Figure 9). None of the sixteen respondents in the income bracket from \$20,000-50,000 supported a service increase.

Respondents were asked about what gas price would be the “tipping point” of pushing them to start seeking out other forms of transportation besides their personal car. At \$4.00 / gallon, 60% of all respondents stated that they would get out of their car (Figure 10). Eighty percent of respondents living in assisted living facilities said they would get out of their car at \$3.75 / gallon.

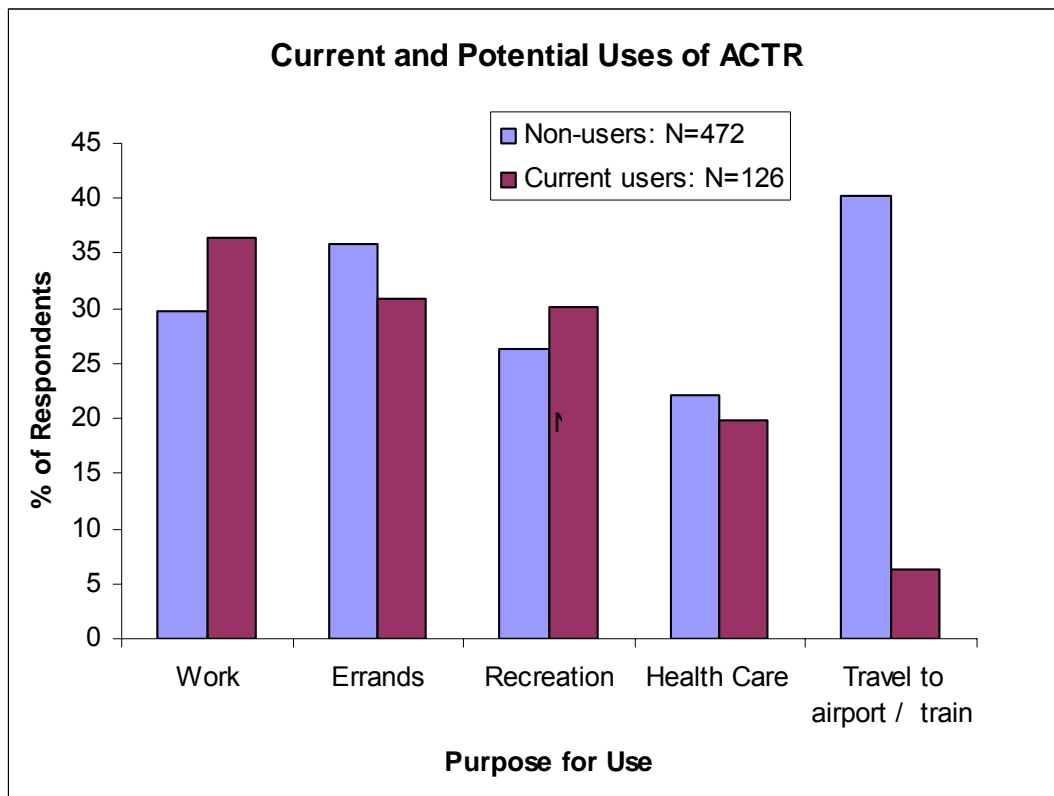


**Figure 9.** Percent of respondents by income bracket who supported/did not support the option of an increase in ACTR service.



**Figure 10.** Response to question “At what price would you begin to consider utilizing other forms of transportation besides a personal car?”

When current users were asked what they use public transportation for, and their answers were compared to non-users' responses about what they would consider using public transportation for, the largest new ridership potential existed for transit utilization for travel to airports and train stations (Figure 11). Currently, the principal reason for current users' use of public transportation is for travel to work (37% of respondents), followed by transit to errands (31% of respondents). The largest percentage of non-users claim that they would like to use public transportation for travel to airports or train stations (40% of respondents), followed by errands (36%) (Figure 11).



**Figure 11.** Percent of current users who chose either work, errands, recreation, health care, or travel to airport/train when asked “What do you use public transportation for,” and non-users response to question of “What would you consider using public transportation for.”

Lastly, here is a snapshot of some of the most commonly cited comments on surveys:

- “I don’t know why we need more buses if the ones that are out there are basically empty. It seems like a waste.”
- “I don’t understand the schedule.”
- “I would use it if it could take me to work at the time I need to go.”
- “This is a great system!”

## **Discussion**

The prominent reasons why *current* riders use ACTR’s services mirror the major themes identified in ACTR’s mission—environmental, social, and economic sustainability. For example, the primary reason Middlebury respondents choose to use ACTR is environmental consciousness. If ACTR expanded their fleet to include more sustainable fuel vehicles, perhaps more citizens would use public transportation in order to further align their actions with their values. Additionally, thirty percent of current ACTR patrons rely on the services provided for transportation because they have no other means to travel, highlighting ACTR as an invaluable social resource in Addison County. Moreover, they provide the citizens with access to their jobs, which is an economic boost for the county.

While a majority of our respondents do not ride ACTR buses, there is a high potential to increase ridership because of the large amount of people who are aware of the service, the relatively easy fixes to reasons why people do not currently ride (i.e., route and stop convenience), the younger generation’s increased likelihood to ride, and the rising gas prices which may encourage utilization. However, there are entrenched views

and behaviors in the county that likely account for the clear discrepancy between awareness and actual ridership. Many respondents indicated both never having considered public transportation an option and a preference for other transportation forms. They are accustomed to their current ways of life and its comforts, and seem to find switching to a new lifestyle difficult and burdensome.

Those factors that survey respondents claimed would encourage their ridership demonstrate that ACTR has the opportunity to expand routes, and that providing more frequent service and environmental information could be ways to increase current ridership. Factors beyond ACTR's control, including rising gas prices, will also likely encourage increased ridership.

Across all age groups, there is potential for increased ridership. In analyzing the age demographic of 18 to 30 year-olds, it was found that most people were not riding because of the following factors: inconvenient routes, times, and stops. In contrast, the age demographic of 60+ year-olds was more likely to indicate a preference for other forms of transportation and not considering public transportation an option. Perhaps this is a sign of hope, and we are turning a corner that begins with a younger generation. The relatively recent development of public transportation in the United States and its importance in environmental health is a much more salient issue among today's young people. As for the elderly, it seems their everyday behavior is more engrained, and they may be more resistant to change. It is possible that they can still learn something from the younger generations.

It is also interesting to note the connection between income and public transportation usage, especially in light of the rising costs of using and maintaining

single-occupancy vehicles (SOVs). Those in the highest income bracket (greater than \$120,000/year) tended to walk and drive SOVs the most of all income brackets. The high amount of walking may be a result of living in close proximity to town centers, where more expensive housing is often located. Because this survey question did not distinguish between ACTR use and any other type of public transportation use, the higher rate of transit ridership by this income bracket could be a function of increased travel to urban cities with public transportation systems, which people with higher incomes can afford to visit more often. Supporting this hypothesis is the significantly lower percentage of the most affluent respondents who have used ACTR. Those making under \$20,000/year probably use public transportation the most because they do not have as much disposable income for gas and car maintenance. This income bracket may also include persons with physical or mental disabilities who cannot drive and must use the service. Respondents in the higher income brackets might include individuals with a higher degree of education and awareness of the environmental and social benefits beyond their personal benefits, utilizing the service with environmental consciousness.

The responses by income bracket to whether ACTR service should be increased reinforce the ridership pattern. The lowest income bracket supports an increase in ACTR service, likely because they rely on the bus for their transportation needs. On the other hand, those making \$20,000 - \$50,000/year may have enough money to afford a car but less disposal income to devote to expansion efforts. As income increases people seem generally supportive; although they might not use the service, they may think it is important for social equity concerns.

A gas price tipping point refers to those high prices that will drive people to use their car less, or turn to some other form of transportation. Twenty percent of respondents claimed they would get out of their car at prices of \$3.00/gallon or less; in Middlebury this amount has already been surpassed with regular gas prices averaging at around \$3.69/gallon (May 2008). This brings up the issue of whether people's future actions of utilizing their cars less will actually remain true to their survey response choices. Gas prices are predicted to pass \$4.00/gallon in the summer of 2008; therefore, according to survey respondents, around 72% of people—33 respondents—would get out of their car this summer. At \$3.75/gallon, 60% of all respondents said they would get out of their car, while 80% of assisted living respondents chose this price as their tipping point. This difference might be due to the fixed income that some people who require assisted living may have.

In using survey responses, there arises the problem of determining whether what people say on their surveys is an accurate representation of what they will actually do. Another problem with our surveying had to do with some people not answering all the questions—many people left numerous questions or the entire backside of the survey blank. We also did not cover as wide of a demographic variety as was hoped: we had very few respondents in the under-18 age group and not a wide enough variety of stakeholders. Furthermore, the majority of our surveys came from town meetings, where people in attendance likely are civically engaged and may support or ride the bus more, having preconceived notions about the need for such services to a greater extent than other Addison County residents.

In retrospect, we should have made our surveys shorter and attempted to make the surveys for different locations more uniform in order to simplify the analysis. We should have focused our efforts on the town of Middlebury in order to represent the viewpoints of the town which ACTR services the most often, especially because the “Towns” group of our seminar was focusing more on Vergennes and Bristol residents. The age bracket 31-60 should have been broken up into two smaller brackets in order to more accurately capture relationships between age and ideals/behavior. The characteristics and tendencies of a 31 year-old can be drastically different from those of a 60 year-old, causing our correlations between age and ridership to be less useful. It would also be interesting to go into the community and have more conversations with respondents to have more anecdotal evidence as opposed to making assumptions based on quick survey responses.

## **Conclusions and Recommendations**

Increasing ridership would be an important step in furthering ACTR's goal of enhancing the environmental, social, and economic health of Addison County. A large proportion of the public does not utilize ACTR's services, but from survey results it seems that there is room for improvement in ridership. At the same time, one of the largest challenges ACTR will face is how to change people's everyday behavior and instill a constant awareness of environmental concern in citizens' actions.

One of the quick actions ACTR could take in order to increase their ridership is to provide a service to more central transportation hubs such as an airport, train station, or ferry port. While all destinations or uses of ACTR have untapped potential for increased ridership, more people would consider using public transportation for uses other than daily activities for which they would need to change their daily routines. ACTR might also consider concentrating their efforts towards attracting and providing services for people in lower income brackets, or those on fixed incomes, for whom increasing gas prices are more likely to change behavior and mode of transportation. Another demographic which ACTR should focus on servicing more in the future is the younger age group. The majority of those respondents ages 18-30 did not ride because of convenience issues. However, they may be more inclined to change behavioral patterns than the older demographics who are more set in their routines and may hold preconceived notions about public transportation. It would be interesting to conduct a more focused study targeting these two demographic groups, highlighting their specific needs and motivations to ride.

In order to achieve the environmental, social, and economic sustainability of ACTR, short term losses must be expected in order to achieve long term gains. By this, we mean it may be necessary to increase services (routes, stops, frequency) before we see an increase in ridership. For a short period of time there may be several buses driving around with few occupants; however, the increase in buses will likely go hand-in-hand with increased awareness of ACTR, and increased ridership will follow. A change in behavior is also required, which is essentially the biggest challenge to public transportation. At the same time as debate rises on how to overcome this challenge, transit managers have predicted an increase of 5% or more this coming year in transit ridership, the largest increase in the past decade (Krauss, 2008), indicating that motorists are beginning to alter their driving habits. As Joseph Giuletti, director of the South Florida Regional Transportation Authority said, “Nobody believed that people would actually give up their cars to ride public transportation, but in the last year, and last several months in particular, we have seen exactly that” (as quoted in Krauss, 2008).

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**Appendix A: Surveys**

**Public Transportation Survey (for town meeting)  
Spring 2008**

*Thank you for your time and participation. As part of our senior seminar at Middlebury College, we are working with Addison Count Transit Resources (ACTR) to evaluate their services in your community and to investigate the possibility of expanding these current services. ACTR aims to enhance the economic, social and environmental health of the region by providing public transportation services that are safe, reliable, accessible and affordable for everyone. If you have any further comments or suggestions, please contact ACTR at info@actr-vt.org.*

**How old are you?**

Under 18 \_\_\_ 18-30 \_\_\_ 31-60 \_\_\_ over 60 \_\_\_

**Do you have access to a car?**

Always \_\_\_ Most of the time \_\_\_ Some of the time \_\_\_ Never \_\_\_

**Where do you live?**

Middlebury \_\_\_ Vergennes \_\_\_ Bristol \_\_\_ Other(specify)\_\_\_\_\_

**How many people are in your household? \_\_\_\_\_**

**What is your annual household income?**

<\$20,000 \_\_\_ \$20,000-50,000 \_\_\_ \$50,000-80,000 \_\_\_ \$80,000-120,000 \_\_\_ >\$120,000 \_\_\_

**How much time do you spend in transit on an average day? (Circle time for each mode)**

Walking:	<15 min.	15 min.	30 min.	45min.	1-2 hours	>2 hours
Biking:	<15 min.	15 min.	30 min.	45min.	1-2 hours	>2 hours
Driving:	<15 min.	15 min.	30 min.	45min.	1-2 hours	>2 hours
Public Transport:	<15 min.	15 min.	30 min.	45min.	1-2 hours	>2 hours
Other:	<15 min.	15 min.	30 min.	45min.	1-2 hours	>2 hours

**How aware are you of ACTR services?**

Not at all \_\_\_ Somewhat \_\_\_ Aware \_\_\_ Very aware \_\_\_

**How have you heard about ACTR services?**

Bus stop signs \_\_\_ Radio \_\_\_ Newspaper ad \_\_\_ Word of mouth \_\_\_ ACTR website \_\_\_  
Pamphlet at local business \_\_\_ On-road ACTR buses/drivers \_\_\_  
Other (specify) \_\_\_\_\_

**How far do you live from an ACTR stop?**

5 minute walk or less (~1/4 mile) \_\_\_\_\_  
5-10 minute walk (~1/2 mile) \_\_\_\_\_  
15 minute walk or more (~1 mile or more) \_\_\_\_\_  
Unaware of closest stop location \_\_\_\_\_

**How long are you willing to wait for public transportation?**

0-5 min \_\_\_ 5-10 min. \_\_\_ 10-20 min. \_\_\_ > 20 min. \_\_\_

**(Over)**

**Do you currently use ACTR?**

Yes \_\_\_ No \_\_\_ (If yes, answer **Section 1**; if no answer **Section 2** below)

**Do you think there is a need for increased ACTR service in your town?**

Yes \_\_\_ No \_\_\_ Comment: \_\_\_\_\_

**Would you support additional town funding for expanded ACTR service?**

Yes \_\_\_ No \_\_\_ Comment: \_\_\_\_\_

**What, if any, new ACTR bus stop locations would you propose for your town?**

\_\_\_\_\_

**Section 1: Current Users**

**How often do you ride ACTR?**

1-2 times a day \_\_\_ 1-2 times a week \_\_\_ 1-2 times a month \_\_\_

**What would make you use ACTR services more frequently? (Check all that apply)**

Expanded routes/more stops \_\_\_ Information about environmental benefits \_\_\_  
Increased comfort on vehicles \_\_\_ Increase in gas prices \_\_\_  
Shorter travel time \_\_\_ More frequent shuttles \_\_\_  
Other (please specify) \_\_\_\_\_

**Why do you use ACTR? (Check all that apply)**

Environmental Consciousness \_\_\_ Convenience \_\_\_ Physical Disability \_\_\_  
Unable to Drive \_\_\_ No Car \_\_\_ Affordability \_\_\_  
Other (specify) \_\_\_\_\_

**What do you use ACTR for? (Check all that apply)**

Work \_\_\_ Errands \_\_\_ Recreation \_\_\_ Health Care \_\_\_ Travel to airport/train \_\_\_  
Other (specify) \_\_\_\_\_

**Which services have you used? (Check all that apply)**

Snow Bowl Shuttle \_\_\_ Rutland Connector \_\_\_ Middlebury Shuttle \_\_\_  
Burlington Link \_\_\_ Tri-Town Shuttle Bus \_\_\_ Demand Response \_\_\_

**Section 2: Potential Users**

**Why don't you use ACTR? (Check all that apply)**

Inconvenient times \_\_\_ Inconvenient routes \_\_\_ Inconvenient stops \_\_\_  
Schedule is difficult to decipher \_\_\_ Prefer other forms of transportation \_\_\_  
Other (specify) \_\_\_\_\_

**What would make you more likely to ride the ACTR shuttle?**

Expanded routes/more stops \_\_\_ Information about environmental benefits \_\_\_  
Increased comfort on vehicles \_\_\_ Increase in gas prices \_\_\_  
Shorter travel time \_\_\_ More frequent service \_\_\_  
Other (specify) \_\_\_\_\_

**Which of your transportation needs would you consider satisfying with ACTR services? (Check all that apply)**

Work \_\_\_ Errands \_\_\_ Recreation \_\_\_ Health Care \_\_\_ Travel to airport/train \_\_\_  
Other (specify) \_\_\_\_\_

**Public Transportation Survey (for Shaw's and Middlebury Commons)  
Spring 2008**

*Thank you for your time and participation. As part of our senior seminar at Middlebury College, we are exploring public transportation issues in Addison County regarding why people are and are not using it. All answers are confidential.*

***Thank you for your time. Your input is important to us!***

**Where do you live?**

Middlebury \_\_\_ Vergennes \_\_\_ Bristol \_\_\_ Other (please specify) \_\_\_\_\_

**How old are you?**

Under 18 \_\_\_ 18-30 \_\_\_ 31-60 \_\_\_ over 60 \_\_\_

**Do you have access to a car?**

Always \_\_\_ Most of the time \_\_\_ Some of the time \_\_\_ Never \_\_\_

**What types of transportation do you use in an average week? (Check all that apply)**

Personal Car \_\_\_ Walk \_\_\_ Bike \_\_\_ Public Transportation \_\_\_  
Carpool \_\_\_ Other (please specify) \_\_\_\_\_

**How do you usually run errands? (Please check all that apply)**

Personal car \_\_\_ Walk \_\_\_ Ride from family/friend \_\_\_ Public  
Transportation \_\_\_ Bike \_\_\_ Other (please specify) \_\_\_\_\_

**How long are you willing to wait for public transportation?**

0-5 min. \_\_\_ 5-10 min. \_\_\_ 10-20 min. \_\_\_ 20+ min. \_\_\_

**At what price per gallon of gas will you choose (or have you already chosen) to seek alternative transportation at least some of the time?**

\$3/gallon or less \_\_\_ \$3.25-\$3.50/gallon \_\_\_ \$3.50-\$3.75/gallon \_\_\_  
\$3.75-\$4.00/gallon \_\_\_ \$4-4.25/gallon \_\_\_ \$4.25 and up \_\_\_

**How aware are you of public transportation services in Addison County?**

Not at all \_\_\_ Somewhat \_\_\_ Aware \_\_\_ Very aware \_\_\_

**Do you currently use public transportation in Addison County?**

No \_\_\_ (Please answer SECTION 1 OVER only—Non Users)

Yes \_\_\_ (Please answer SECTION 2 OVER only—Current Users)

**Section 1: Non-users**

**Why don't you use public transportation? (Check all that apply)**

Inconvenient times \_\_\_ Inconvenient routes \_\_\_ Inconvenient stops \_\_\_  
Schedule is difficult to decipher \_\_\_ Prefer other forms of transportation \_\_\_  
I have never considered it as an option \_\_\_ Do not have enough information \_\_\_  
Transfer between buses is required \_\_\_ Other (specify) \_\_\_\_\_

**What would make you more likely to ride public transportation? (Check all that apply)**

Expanded routes/more stops \_\_\_ Information about environmental benefits \_\_\_  
Increased comfort on vehicles \_\_\_ Increase in gas prices \_\_\_  
Shorter travel time \_\_\_ More frequent service \_\_\_  
Other (specify) \_\_\_\_\_

**Which of your transportation needs would you consider satisfying with public transportation? (Check all that apply)**

Work \_\_\_ Errands \_\_\_ Recreation \_\_\_ Health Care \_\_\_ Travel to airport/train \_\_\_  
Other (specify) \_\_\_\_\_

**Section 2: Current Users**

**How often do you ride public transportation?**

1-2 times a day \_\_\_ 1-2 times a week \_\_\_ 1-2 times a month \_\_\_

**Why do you use public transportation? (Check all that apply)**

Convenience \_\_\_ Physical Disability \_\_\_ Environmental Consciousness \_\_\_  
Unable to Drive \_\_\_ No Car \_\_\_ Affordability \_\_\_  
Other (specify) \_\_\_\_\_

**What do you use public transportation for? (Check all that apply)**

Work \_\_\_ Errands \_\_\_ Recreation \_\_\_ Health Care \_\_\_ Travel to airport/train \_\_\_  
Other (specify) \_\_\_\_\_

**What would make you use ACTR services more frequently? (Check all that apply)**

Expanded routes/more stops \_\_\_ Information about environmental benefits \_\_\_  
Increased comfort on vehicles \_\_\_ Increase in gas prices \_\_\_  
Shorter travel time \_\_\_ More frequent shuttles \_\_\_  
Other (please specify) \_\_\_\_\_

**Public Transportation Survey (for parents of schoolchildren)  
Spring 2008**

*Thank you for your time and participation. As part of our senior seminar at Middlebury College, we are exploring public transportation issues in Addison County regarding why people are and are not using it. All answers are confidential.*

***Thank you for your time. Your input is important to us!***

**Where do you live?**

Middlebury\_\_\_\_ E. Middlebury\_\_\_\_ Weybridge\_\_\_\_ Cornwall\_\_\_\_  
Shoreham\_\_\_\_ Bridport\_\_\_\_ Ripton\_\_\_\_ Salisbury\_\_\_\_  
Other (please specify)\_\_\_\_\_

**How old are you?**

Under 18 \_\_\_\_ 18-30 \_\_\_\_ 31-60\_\_\_\_ over 60 \_\_\_\_

**Do you have access to a car?**

Always \_\_\_\_ Most of the time \_\_\_\_ Some of the time \_\_\_\_ Never \_\_\_\_

**How aware are you of public transportation services in Addison County?**

Not at all \_\_\_\_ Somewhat \_\_\_\_ Aware \_\_\_\_ Very aware \_\_\_\_

**What types of transportation do you use in an average week? (Check all that apply)**

Personal Car\_\_\_\_ Walk\_\_\_\_ Bike\_\_\_\_ Public Transportation\_\_\_\_  
Carpool\_\_\_\_ Other (please specify)\_\_\_\_\_

**How does your child generally get to and from school? (Please check all that apply)**

Their personal car\_\_\_\_ Walk\_\_\_\_ Ride from family/friend\_\_\_\_  
Public Transportation\_\_\_\_ Bike\_\_\_\_ Other (please specify): \_\_\_\_\_

**How long are you willing to wait for public transportation?**

0-5 min.\_\_\_\_ 5-10 min.\_\_\_\_ 10-20 min. \_\_\_\_ 20+ min.\_\_\_\_

**At what price per gallon of gas will you choose (or have already chosen) to seek alternative transportation at least some of the time?**

\$3/gallon or less\_\_\_\_ \$3.25-\$3.50/gallon\_\_\_\_ \$3.50-\$3.75/gallon\_\_\_\_  
\$3.75-\$4.00/gallon\_\_\_\_ \$4-4.25/gallon\_\_\_\_ \$4.25 and up\_\_\_\_

**Why do you pick your child up from school as opposed to having them use other forms of transportation? (Check all the apply)**

To spend time with them\_\_\_\_ It is more convenient for them\_\_\_\_  
I believe it is safer\_\_\_\_ Never considered other options\_\_\_\_  
To get them to afterschool activity\_\_\_\_ Child prefers that I drive them\_\_\_\_ Other (specify)\_\_\_\_

**What factors might cause you to have your child use public transportation for school commutes? (Check all that apply)**

Expanded routes/more stops\_\_\_\_ Information about environmental benefits\_\_\_\_  
Increased comfort on vehicles\_\_\_\_ Increase in gas prices\_\_\_\_  
Shorter travel time\_\_\_\_ More frequent service\_\_\_\_ Other (specify)\_\_\_\_\_

**\*\*\*\*\*OVER PLEASE\*\*\*\*\***

**Do you currently use public transportation in Addison County?**

No \_\_\_ (Please answer SECTION 1 BELOW only—Non Users)

Yes \_\_\_ (Please answer SECTION 2 BELOW only—Current Users)

**Section 1: Non-users**

**Why don't you use public transportation? (Check all that apply)**

Inconvenient times \_\_\_ Inconvenient routes \_\_\_ Inconvenient stops \_\_\_

Schedule is difficult to decipher \_\_\_ Prefer other forms of transportation \_\_\_

I have never considered it as an option \_\_\_ Do not have enough information \_\_\_

Transfer between buses is required \_\_\_ Other (specify) \_\_\_\_\_

**What would make you more likely to ride public transportation? (Check all that apply)**

Expanded routes/more stops \_\_\_ Information about environmental benefits \_\_\_

Increased comfort on vehicles \_\_\_ Increase in gas prices \_\_\_

Shorter travel time \_\_\_ More frequent service \_\_\_

Other (specify) \_\_\_\_\_

**Which of your transportation needs would you consider satisfying with public transportation? (Check all that apply)**

Work \_\_\_ Errands \_\_\_ Recreation \_\_\_ Health Care \_\_\_ Travel to airport/train \_\_\_

Other (specify) \_\_\_\_\_

**Section 2: Current Users**

**How often do you ride public transportation?**

1-2 times a day \_\_\_ 1-2 times a week \_\_\_ 1-2 times a month \_\_\_

**Why do you use public transportation? (Check all that apply)**

Convenience \_\_\_ Physical Disability \_\_\_ Environmental Consciousness \_\_\_

Unable to Drive \_\_\_ No Car \_\_\_ Affordability \_\_\_

Other (specify) \_\_\_\_\_

**What do you use public transportation for? (Check all that apply)**

Work \_\_\_ Errands \_\_\_ Recreation \_\_\_ Health Care \_\_\_ Travel to airport/train \_\_\_

Other (specify) \_\_\_\_\_

**What would make you use ACTR services more frequently? (Check all that apply)**

Expanded routes/more stops \_\_\_ Information about environmental benefits \_\_\_

Increased comfort on vehicles \_\_\_ Increase in gas prices \_\_\_

Shorter travel time \_\_\_ More frequent shuttles \_\_\_

Other (please specify) \_\_\_\_\_

**Public Transportation Survey (for hotel guests)**  
*Spring 2008*

*Thank you for your time and participation. As part of our senior seminar at Middlebury College, we are working with Addison County Transit Resources (ACTR) to explore public transportation issues in Addison County. ACTR aims to enhance the economic, social and environmental health of the region by providing public transportation services that are safe, reliable, accessible and affordable for everyone. If you have any further comments or suggestions, please contact ACTR at [info@actr-vt.org](mailto:info@actr-vt.org) or call 388-1946. Thank you for your time. Your input is important to us!*

**How do you plan on getting around Middlebury during your stay?**

Personal car \_\_\_\_\_ Walking \_\_\_\_\_ ACTR buses \_\_\_\_\_

**What is the purpose for your visit to Middlebury?**

Business \_\_\_\_\_ Leisure \_\_\_\_\_

**Would you consider using ACTR public transportation during your stay at Middlebury?**

Yes \_\_\_\_\_

No \_\_\_\_\_

**If you are not using ACTR during your stay here, why not? (Check all that apply)**

Inconvenient times \_\_\_\_\_ Inconvenient routes \_\_\_\_\_ Inconvenient stops \_\_\_\_\_

Prefer other transportation forms \_\_\_\_\_ Do not know enough about the service \_\_\_\_\_

Schedule is difficult to decipher \_\_\_\_\_

**What would make you more likely to use ACTR? (Check all that apply)**

Information about environmental benefits \_\_\_\_\_ Increase in gas prices \_\_\_\_\_ Shorter travel time \_\_\_\_\_

More available information about routes/stops \_\_\_\_\_ Expanded routes/stops \_\_\_\_\_ Frequent service \_\_\_\_\_

**How long are you willing to wait for public transportation?**

0-5 min. \_\_\_\_\_ 5-10 min. \_\_\_\_\_ 10-20 min. \_\_\_\_\_ >20 min. \_\_\_\_\_

**How old are you?**

Under 18 \_\_\_\_\_

18-30 \_\_\_\_\_

31-60 \_\_\_\_\_

over 60 \_\_\_\_\_