INNOVATION AT TRANSIT SYSTEMS

AUGUST 2004

Importance of Issues when Considering Innovations

- Operating Cost: 4.63
- Initial Cost of Innovation: 4.59
- Internal Leadership: 4.27
- Lack of Personnel: 3.94
- Time to Implement Change: 3.82
- Political Climate: 3.78
- Risk of Failure: 3.69
- Ability to Explain Innovation: 3.61
- Possible Negative Media Reaction: 3.35
- Labor Contract: 3.02

Weighted Importance (5=very important)
INNOVATION AT TRANSIT SYSTEMS

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Prepared by
Lynda K. Hikichi
with Edward Beimborn

Center for Urban Transportation Studies
University of Wisconsin – Milwaukee
Milwaukee, WI 53201

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ABSTRACT

In order for transit agencies to regularly improve their levels of services, control costs, and to operate more efficiently, transit agencies need to be innovative. The process to bring about change varies depending on the need, type of innovations, nature of the organization, funding, political support, and having a champion for the change.

The hypothesis of this research is that there are many factors to bring about an innovation or change to a transit agency, but a key factor that discourages change is lack of funding and the main reason for innovation is having a champion to lead the way for the improvement. The research question is: What are the conditions that lead to innovation in transit agencies? What barriers exist to innovation and how can they be overcome? The objective of the work is to highlight innovations at transit agencies in Wisconsin through face-to-face interviews and identify barriers to innovation from transit agencies across the country via an on-line survey.

This study had two major components. First, a series of case studies were conducted of innovation adopted by transit agencies in Wisconsin. Secondly, transit agencies across the country were contacted to get a general sense of the issue of innovation and change via an on-line survey. An analysis of the case studies showed that many of the case studies had common themes and barriers to the various innovations highlighted. These were funding, nature of the organization, persistence, regional planning commission, user involvement, problem center approach, and an idea of a champion. All of the innovations discussed in the case studies came about because there was a need and a desire for making improvements to the transit systems. Analysis of the survey results revealed that the primary institutional barrier to innovation or change was money, and the main reason for change was having an internal leader/champion.

For an innovation to occur, a combination of the following is necessary: a need for better level of service or to make improvements, a champion to lead and coordinate to bring about change, and money to fund the planning and implementation of the innovation.
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LIST OF ABBREVIATIONS

ADA – Americans with Disabilities Act
APTA – American Public Transportation Association
AVL – Automatic Vehicle Locator
BRT – Bus Rapid Transit
BTS – Bureau of Transportation Statistics
BUS – Belle Urban System
CMAQ – Congestion Mitigation Air Quality
CTED – UWM Center for Transportation Education
CUTS – UWM Center for Transportation Studies
DOT – Department of Transportation
EU – European Union
FHWA – Federal Highway Administration
FTA – Federal Transit Administration
GAO – General Accounting Office
GIS - Geographical Information System
HOV – High Occupancy Vehicle
ISTEA - Intermodal Surface Transportation Efficiency Act
JARC - Job Access Reverse Commute
NCHRP – National Cooperative Highway Research Program
NHTS – National Household Transportation Survey
NPTS - Nationwide Personal Transportation Survey
OCEDC – Ozaukee County Economic Development Corporation
OCTMA – Ozaukee County Transportation Management Association
R&D – Research and Development
RTCC - Research and Technology Coordinating Committee
SEWRPC – Southeast Wisconsin Regional Planning Commission
TANF - Temporary Assistance for Needy Family
TCRP – Transit Cooperative Research Program
TDM – Transportation Demand Management
TMA – Transportation Management Association
TMI – Transit Mutual Insurance Corporation
TRB – Transportation Research Board
TSAR - Transportation Statistics Annual Report
TTI – Texas Transportation Institute
UBUS – University Bus
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Chapter 1: Introduction

“…while the total number of workers increased in the 1990s, transit usage stayed about the same.”

INTRODUCTION

According to the U.S. Department of Transportation’s Journey-to-work trends report, demographic and worker characteristics, the availability of alternative modes of commuting, and perceived travel time all affect how people in the U.S. travel to work.¹ The most recent Journey-to-work trends report discloses, between 1990 and 2000 population increased 13.2% from 248,709,873 to 281,421,906 representing the largest numerical population increase in any decade in American history.² The report reveals, “Between 1960 and 2000, the U.S. added 102 million households, 124 million vehicles and 64 million workers...almost two vehicles were added to the U.S. household-vehicle fleet for every added worker.”³

According to the report, “In 1960, 41 million commuters used private vehicles; by 2000, 113 million workers commuted by private vehicles.”⁴ While workers commuting by car have been increasing, the use of public transit has decreased from 7.807 million (12.6%) in 1960 to 6.81 million (8.5%) in 1970 to 6.175 million (6.2%) in 1980 and then leveled off to 6.07 million (5.1%) in 1990 to 6.068 (4.7%) in 2000. Thus, while the total number of workers increased in the 1990s, transit usage stayed about the same.

The mean travel time to work increased from 21.7 minutes in 1980 to 22.4 minutes in 1990 to 25.5 minutes in 2000. The report reveals, “the average travel time by workers who drove alone was 24.1 minutes, while transit travel time was 47.7 minutes...carpool travel times are close to drove alone at 18.5 minutes, on average.”⁵ According to the 2000 census,⁶ 75.7% (97,102,050) drove alone to work, 12.2% (15,634,051) carpooled, 4.7% (6,067,703) commuted to work using public transportation (including taxicab), 3.3% (4,184,223) worked at home, and 2.9% (3,758,982) walked.

³ Ibid.
⁴ Ibid.
⁵ Ibid.
"In order for transit agencies to regularly improve their levels of service, transit agencies need to be innovative."

INTRODUCTION

With the increase of automobile ownership, more single occupancy vehicles on the road, little change in use of transit, and capacity not able to keep up with demand, road congestion has worsened over the past years. The reliance on autos has contributed to increase in urban roadway congestion.

Transit is a viable alternative travel mode choice for some drivers but is not a feasible option for many drivers. For drivers that transit is a viable option, the problem is that not enough people are taking advantage of what is available in the community. For drivers where transit is not a feasible alternative, something needs to be done to make transit more accessible. Transit increases the travel time to work due to making stops along the routes to pick up and drop off passengers. However, if those drivers with access to transit realized the many benefits of transit compared to the automobile, perhaps, more people will opt to take transit. If transit were to become more competitive by continuously making improvements with their service offerings, perhaps, people will consider transit more when making their travel choice. At the same time, for those drivers where transit is not a viable option, transit agencies need to make service improvements to make transit a feasible alternative.

In order for transit agencies to regularly improve their levels of service, transit agencies need to be innovative. Innovative in the sense that something new and different is introduced to the current service levels. In this regard, innovative does not necessarily mean new technology. If transit could attract more riders with innovation, perhaps road congestion can be lessened and improve the overall travel experience for all travelers. If transit became more feasible by making innovative changes to routes and service offerings, perhaps more people will have the option to use transit.

In order for transit agencies to introduce innovations and changes, many factors are involved. A need for an innovation or change has to be realized. Public agencies are not known to be risk takers and thus, the reason for an innovation or change has to be substantiated by a need. Just because there is a need for innovation does not guarantee the transit agency will take action to bring about that change. In many cases, political battles or community opposition can prevent an innovation from introduction. In addition, while transit agencies may recognize the need for change, if they lack the necessary funding they will have a difficult time initiating for the improvement. On the other hand, transit agencies could have all the money for a change but if there is no one,
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a leader/champion of the cause to take charge in bringing about the change, it will not happen. The process to bring about change varies depending on the need, type of innovations, nature of the organization, funding, political support, and having a champion for the change.

The hypothesis of this research is that there are many factors to bring about an innovation or change to a transit agency, but a key factor that discourages change is lack of funding while having a champion leading the way is the main reason for innovation.

Statement of the Problem

The research questions of this project are: What are the conditions that lead to innovation in transit agencies, and what barriers exist to innovation and how can they be overcome? The key term here is “innovations.” As Schweppe\(^7\) asserts, “introducing innovative technologies into day-to-day practice can save time, money, and even lives.” Then the question is what type of innovations? What may be innovative for one agency may not be considered an innovation for another agency because that particular innovation may have been in place for many years.

The issue of innovation at transit agencies is important for various reasons: transit has the potential to help ease congestion by capturing additional riders, and various innovations could make transit agencies more efficient in their everyday operations, reduce costs, enhance safety for passengers and bus operators, and help make transit more feasible for everyone. The key to making transit more attractive is to continuously bring about change and introduce innovations to the organization.

Average commute travel time has been steadily increasing over the years. The 2003 Urban Mobility Report reports, “congestion extends to more time of the day, more roads, affects more of the travel and creates more extra travel time than in the past.”\(^8\)

\(^7\) Schweppe, E., Technologies for Champions, TR News, #226, May-June 2003 (p. 25)
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Second, with the increase of automobiles on the road, congestion has worsened. The Transportation Statistics Annual Report in 2000 reports “it took 30 percent longer, on average, to make a peak period trip in urban areas compared with the time it would take if traffic were flowing freely.” The 2003 Urban Mobility Report accounts the following:

- Congestion (based on wasted time and fuel) cost about $69.5 billion in the 75 urban areas studied for the report in 2001; an average cost per person of $520.
- 5.7 billion gallons of fuel (equivalent of 114 super-tankers or 570,000 gasoline tank trucks) were wasted; 570,000 gasoline tank trucks could stretch from New York to Las Vegas and back.

Third, transit can be a viable alternate travel mode choice for some drivers where transit is not feasible by bringing innovative changes to the transit agency’s operations. Fourth, transit can become more attractive for those drivers who already have access to transit if people took advantage of the transit benefits available in their community. According to the 2003 Urban Mobility Report (Volume 2), “peak period public transportation service during congested hours can improve the transportation capacity, provide travel options and allow those without a vehicle to gain access to jobs, school, medical facilities or other destinations.” Fifth, the U.S. Census Bureau projects total resident population to reach over 300 million by year 2011 (middle series, according to the highest series, population can reach over 300 million as early as year 2008 and according to the lowest series, reach over 300 million as late as year 2017). With the potential for more people on the roads, transit can play a vital role in helping to ease congestion by attracting and carrying more passengers on their vehicles. Lastly, about 70 percent of the U.S. population is served by 580 of the 7,500 transit agencies in 2001.

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10 Schrank and Lomax, p. 23.
11 Ibid, p. 20.
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changes for improvements at transit agencies are necessary so that transit agencies can better serve the population with good levels of service.

Objectives of the Work

The objective of the work is to examine innovations at transit agencies in Wisconsin through face-to-face interviews and identify barriers to innovation from transit agencies across the country via an on-line survey. The first objective is to identify the innovations the transit agencies have introduced in past years. The goal of this effort is to analyze these innovations to understand the process that led to their adoption. Also, by analyzing these innovations, other transit agencies could look to these transit agencies for guidance when attempting to bring about similar changes to their organizations. Essentially, looking to other transit agencies and learning from their experiences is equivalent to the benchmarking process. Benchmarking is described as a process to “determine who else does a particular activity the best and emulate what they do to improve performance.”

Through the benchmarking process, transit agencies could ascertain the benefits, advantages, and disadvantages of certain innovation from agencies that have already implemented that change and not make the same mistakes. The second objective is to develop a general picture of the attitudes towards innovation and barriers to change for transit agencies across the country. This was done with a survey of 250 transit agencies across the United States, from small to large organizations, to distinguish key factors that led to an innovation.

Transit plays a vital role in the transportation industry. By sharing information about innovation and change, transit agencies could learn from other agencies rather than try to “reinvent the wheel” or make the same mistakes. It is through sharing of information and experiences that transit agencies will prosper and be more competitive. Innovations at various transit agencies should be assessed so that common barriers and necessities could be articulated. By gauging the performance of others, one could learn and make improvements to their current operations. Hyman asserts, “At the root of

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benchmarking is measurement.” Big corporations “routinely benchmark their performance against other firms in order to gain competitive and strategic advantage.”16 Hyman discusses about customer-driven benchmarking which involves “assessing, adopting, and improving upon ‘best’ practices that have been shown through measurement to lead to higher levels of performance—better products and services to customers...these better performances are achieved with the same or fewer resources and are applicable to a particular environmental setting.”17 Transit agencies like corporations could assess, adopt, and improve upon the innovations and changes that other transit agencies have implemented through benchmarking so that they could better serve their current and potential customers. The objective of this research is to identify elements of transit agencies that foster innovation, create a climate conducive to change and overcome barriers to innovation.

Scope and Limits of the Work

The case studies were limited to transit agencies located in the Milwaukee and Madison metropolitan areas. Due to their location near the university, transit agencies in Milwaukee, Racine, Waukesha, and Ozaukee counties, and the City of Madison were used as case studies. In addition to transit agencies, individuals not part of the transit agency but who took part in the innovation were also interviewed. Depending on the innovation, it took from one meeting to several meetings to get all the required information. In addition to the face-to-face interviews, communication with the transit agencies was conducted through email and telephone conversations.

For the survey portion of the research, 250 transit agencies across the country were contacted through email. Two emails were sent: an initial email with the explanation of the study and a web address for the on-line survey, and a reminder email with the web address again. Due to the number of transit agencies and people being weary of SPAM emails, communication to the transit agencies was limited to just two email letters. The survey results were limited to only those who responded to the survey. Out of the 250 transit agencies contacted, 18 transit agencies had undeliverable

16 Hyman, p.8.
17 Ibid.
email addresses that didn’t recognize the person’s name in the email addresses. Responses were received from 49 agencies.
Chapter 2: 
Background and Literature Review

"Transit provides mobility for those without access to automobiles and provides an alternative to driving."

BACKGROUND AND LITERATURE REVIEW

Transit includes public bus, commuter bus and train, subway/elevated train, and streetcar/trolley. Overall, household transportation expenditures came in second to housing (33%) with 19% of average annual household spending. The 19% of annual household spending totaled $7,759, of which $7,371 was used for private vehicle and $389 was used for public transportation. Of $389 expended for public transportation $50 was used for mass transit fares.\(^{18}\) Needless to say, many people will choose the automobile over public transit because of its convenience. Transit service often does not connect the travelers' origins and destinations at required time and many people find that they have to travel by automobile despite the benefits (gas conservation, reduced traffic, less pollution, environmental and societal gains) of using public transportation. In addition to the convenience factor, the benefits of using a car (comfort and privacy) and disadvantages (longer travel times and exposure to poor weather) of public transportation are immediate, whereas the reduction in pollution, congestion, and costs from using public transportation and disadvantages (maintenance costs and pollution) of using a car are delayed.\(^{19}\) Huey and Everett contends, “the disadvantages of public transportation seem to be experienced more immediately (i.e., waiting at a bus stop, uncomfortable seats, and a crowded environment), and these immediate factors are what most consumers consider when choosing a transportation mode.”\(^{20}\) In addition, the authors claim, “not only are the benefits of using a car immediate but most of them also are received directly by the individual (i.e., independence, status, and fast trips). Conversely, most benefits of using public transportation are not received by the individual but rather are received by society in general (i.e., less congestion and reduced pollution levels).”\(^{21}\)

Needless to say, transit has an important role. Transit provides mobility for those without access to automobiles and provides an alternative to driving. The Texas Public Policy Foundation suggests the expansion of roads as inappropriate to combat

\(^{20}\) Ibid.
\(^{21}\) Ibid, p. 65.
“Depending on the innovation, nature of the organization, and existence or lack of presence of a champion, potential adopters of the innovation will invariably face barriers.”

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congestion in recent years for two reasons: “it is claimed that building of roadways in itself creates more traffic and alternatives to roadways are a more effective way to provide for additional demand.”\(^{22}\) Texas has doubled in population since 1960. Population growth has contributed to growth in travel in the urbanized areas, thus contributing to the increase in road congestion. Rather than expanding roadways to combat congestion, making public transit into a viable alternative for travel is an option. The Texas Public Policy Foundation states, “the theory is that people will use public transit if it is a reasonable alternative in time and convenience to the automobile.”\(^{23}\) Advocates of the bus rapid transit (buses on busways separate from regular roadways, sharing HOV lanes, using arterial ways in communities) claim bus rapid transit is one of many transit options available to communities to help deal with traffic congestion.\(^{24}\)

Compared to private companies, public agencies tend to be more risk-averse. Thus, introducing innovations pose challenges. Depending on the innovation, nature of the organization, and existence or lack of presence of a champion, potential adopters of the innovation will invariably face barriers. In addition to the characteristics of the innovation and the organization, “public procurement practices, which often depend on producing detailed specifications and awarding contracts to the lowest bidder, inhibit the introduction of new concepts, technologies, and practices...entrepreneurs have little incentive to take risks when they face high barriers to market entry and relatively low assurance that they can derive profit from the introduction of new products.”\(^{25}\) Hence, innovation in the “public sector is a particular challenge.”\(^{26}\)

\(^{23}\)Ibid.
\(^{26}\)Ibid.
BACKGROUND AND LITERATURE REVIEW

Benchmarking

Benchmarking is defined as “simply the systematic process of searching for best practices, innovative ideas and highly effective operating procedures that lead to superior performance.” Hyman asserts benchmarking can transform the organization by focusing on the customer and applying the resources where necessary. Some of the ideas surrounding customer-driven benchmarking include: continuous quality improvement, continuous improvement will exceed current levels of performance and customer expectations, and measuring customer satisfaction and conditions important to the customers. Some of the benchmarking benefits include:

- “It is the most expedient way to discover and implement better practices that lead to better performance.”
- “Can learn from the observed successes and experiences you want to emulate or improve upon.”
- “Can minimize trial and error and avoid making the mistakes of others.”
- “Leads to continuous improvement.”
- “Stimulates Creativity.”
- “Will better understand how various-labor, equipment, materials, and external factors-affect performance and, therefore, you will be better able to allocate scarce resources.”

Innovations

When one thinks of an innovation, one usually conjures up the idea of new technology. Actually, an innovation is a technology process or policy that is

28 Hyman, p.12.
new to an organization. An innovation is synonymous with a change or improvement. The National Science Foundation defines innovation as "a technology new to a given organization." An innovation is synonymous with a change or improvement. Essentially, "what is transferred in technology transfer" is an innovation. The Webster’s Encyclopedic Unabridged Dictionary of the English Language defines innovation as the following: (1) something new or different introduced, (2) the act of innovating; introduction of new things or methods. Robbins and Decenzo define innovation as the “process of taking a creative idea and turning it into a useful product, service, or method of operation.” Robbins and Decenzo describe an innovative culture to have seven characteristics: acceptance of ambiguity, tolerance of the impractical, low external controls, tolerance of risk, tolerance of conflict, focus on ends rather than on means, and open systems focus. Schmitt et al. explains two types of information transfer: vertically and horizontally. Information transfer from top to bottom (federal to state to local agencies) is known as a vertical transfer; and between agencies similar in size and function is known as a horizontal transfer.

Many factors affect the implementation of an innovation. The innovation needs to be simple (making it easy to understand from the potential users point of view), easy to introduce, have benefits that are easy to measure, inexpensive, and provide significant improvements over current methods. The characteristics of the innovation are not the only factors that are important in the implementation process, organizational characteristics are also important. These include: “risk taking climate (willing to take risks, younger firms vs. complicated structure of larger firms), attitude towards failure (if efforts are made to learn from the failure and to make it work a more open process of

References:
35 Robbins and Decenzo, p. 248.
36 Schmitt, et al., p. 16.
Technology Transfer

Technology transfer refers to “all activities leading to adoption of a new product or procedure by any group of users.”\(^\text{38}\) The Research and Technology Coordinating Committee (RTCC), a special committee of the Transportation Research Board defines technology transfer as: “a range of activities that involve researchers, technology users, and technology transfer specialists...the movement of technological and technology-related organizational know-how among partners.”\(^\text{40}\) These activities include identifying, selecting, modifying, and developing technologies as well as transfer methods. In Special Report 256, the committee identifies key characteristics of successful technology transfer\(^\text{41}\):

- Potential users of the technology transfer should be involved in the research planning phase
- Before implementation, field tests and demonstrations should be conducted as part of R&D activities to decipher whether to refine the technology or to implement at all
- Financial and technical assistance should be available for early adopters of the technology as incentives. The committee asserts, “Since early adopters of new technology are often closely watched by other, sufficient funds are needed to complete initial or pilot installations.”

\(^\text{41}\) Ibid, pp. 5-6.
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- Senior management support and establishing a champion among the decision makers. Having a champion for a new technology has shown to be valuable within the user agency.
- Technical training
- “Careful monitoring of acceptance, adoption, refinement, and satisfaction among users of the technologies being promoted.”

Irwin defines technology transfer as “a proactive form of advocacy for change through adoption of technology…practitioners of technology transfer are variously referred to as change agents, communicators, teachers, trainers, technology marketers, and by many other terms.”42 Identification of user needs, information exchange, implementation, and feedback are all components of a technology transfer. Identifying user needs can be accomplished through questionnaires, market research, and focus groups. Information about the technology can be exchanged through newsletters, demonstrations, and manuals. Training and marketing will assist in the implementation. During the feedback process, problems and suggestions can be addressed for further improvement.

There are many forms of technology transfer and can occur through the following ways: “informal interactions between individuals; formal consulting agreements; publications; workshops, personnel exchanges, and joint projects involving groups of experts from different organizations; and more readily measured activities such as patenting, copyright licensing, and contract research.”43 Furthermore, Schmitt et al. describes the technology transfer process involving “adaptation (the altering of innovation and the new setting to enhance the ‘fit’ of the new innovation), adoption (the testing of the innovation which leads to the implementation, modification or abandonment of the innovation), implementation (the long-term incorporation of the innovation) and diffusion (both internal and external) of the research results.”44 Early adopters of the technology transfer can have a profound effect in spreading the word

44 Schmitt, et al., p. 5.
BACKGROUND AND LITERATURE REVIEW

about the new technology. Schmitt et al. asserts, "adopters of an innovation are often the best promoters of the new idea, product, or method because they can relate to a have greater credibility among potential adopters...thus adopters influence other potential adopters and innovations spread." In all, there are many components and players in a technology transfer process. Moreover, the technology has to be "perceived as beneficial from the point of view of the potential user" for adoption.

Barriers

One of the 14 Critical Issues in Transportation 2002 identified by the Executive Committee of the Transportation Research Board (TRB) is "barriers to innovation." Irwin contends, "barriers restrict or constrain...the principal barrier is resistance to change." According to Irwin, some of the institutional barriers include:

- Lack of resources - funding and people;
- Lack of management support to implement new ideas;
- Lack of an organizational infrastructure;
- Inflexible regulations, incentives, and rewards; and
- Resistance to risk-taking and change

Some of the human behavioral barriers include culture, language, lack of interest or perceived need, and poor attitudes from provider and recipient toward one another. It's not just the organization that needs to be open to change but the employees also have to be receptive to change as well for the innovation to be a success. Whether it's the decision-makers or the rank-and-file employees, people naturally resist change. The Resistance to Change article on the UWM Benchmarking website states, "The adoption

45 Schmitt, et al., p. 16.
46 Ibid.
48 Irwin, p. 3.
49 Ibid, pp. 3-4.
50 Ibid.
of innovations involves altering human behavior, and the acceptance of change. 

People resist change for the following reasons:

- “When the reason for the change is unclear (ambiguity).”
- “When the proposed users have not been consulted about the change, and it is offered to them as an accomplished fact.”
- “When the change threatens to modify established patterns of working relationships between people.”
- “When communication about the change—timetables, personnel, monies, etc.—has not been sufficient.”
- “When the benefits and rewards for making the change are not seen as adequate for the trouble involved.”
- “When the change threatens jobs, power or status in an organization.”

Some of the barriers to innovation and change occur when the innovation is not disseminated or is disseminated to the wrong people. When the potential user does not understand the innovation or the innovation is irrelevant to addressing the problem on hand, barriers will transpire. In all, innovation may not be implemented because of “constraints associated with the organizational structures of implementation agencies.”

Transportation Innovations

One may not realize the magnitude of how transportation plays many key roles in our lives. Every aspect of our lives entails some aspect of transportation, whether it deals with eating, shopping, working, running errands, etc. Transportation makes up 11.2% of the gross domestic product, third to health care (14.5%) and food (11.6%). After housing, transportation ranks second (19%) for family expenditures. Together with more automobiles on the road, population growth, and people making more trips, whether it’s for commuting to work, shopping, going to school, running errands, etc.,

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52 Ibid.
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congestion has worsened. Demand for transportation facilities has not kept up with these demands. In addition to the everyday demands, there are other issues of cost and environmental concerns. One would think transportation innovations could alleviate some of these concerns. However, according to TRB’s Critical Issues in Transportation 2002, “transportation faces formidable barriers to innovation, which are compounded by growing constraints on research investments.”55

The Transportation Research Board’s Special Report #256 discusses innovation in the highway industry and Federal Highway Administration’s (FHWA) technology transfer efforts. For the FHWA, innovation is a “continuous learning process that involves many feedback loops.”56 In the highway industry, “a number of factors serve as impediments to innovation because they limit or prevent innovation and its potential benefits.” These factors include57:

- “While innovation involves risk, public-sector decision makers work in an environment that does not reward risk taking.”
- “Fragmentation within the highway industry…public ownership of the highway system is spread over more than 40,000 agencies with an assortment of political, regulatory, and administrative characteristics, as well as differences in size, budget, and staff capabilities.”
- “Public-sector innovation is not subject to the profit motive that stimulates commercial innovation.”

The Special Report also discusses few of the linear models used to describe innovations in the highway industry. According to Special Report 25658, the innovation process in the highway industry is based on the traditional linear model. One of the linear models described in the report consists of seven stages. In a linear model innovation occurs in a series of sequential vertical, from the top down steps rather than

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56 Special Report 256, pp. 8-9.
57 Ibid, pp. 34-35.
58 Ibid, p. 16.
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horizontal or parallel steps. Stages 1 through 4 involve research and development; stages 5 through 7 entail the technology transfer. The seven stages are as follows:

- Idea (research)
- Experiment (research)
- Prototype (development)
- Finished product (development)
- Marketing (implementation)
- Application (implementation)
- Benefits of use (effectiveness)

The report further describes a revised model that considers the highway industry characteristics. The revised model entails the following:

- Idea generator
- Technology generation and adaptation
- State and local agencies involvement
- Specifications and contracts
- Contractors
- Project applications
- Benefits

The revised model includes “stages in both the vertical and horizontal dimensions to represent an innovation process that moves forward (horizontally) in time, as well as upward (vertically) to overcome resistance or barriers with feedback loops and input channels that can affect highway industry innovation.”

There are other modified models to describe the different variations in time and loops. For this project, only two models were discussed just to give a background on innovations in transportation.

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60 Special Report 256, pp. 17-18.
“Innovation is an important aspect of the European Union’s transportation improvement efforts.”

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European Union Example

Innovation is an important aspect of the European Union’s (EU) transportation improvement efforts. The EU utilizes a combination of three types of innovation: technological, administrative, and marketing. Some of the innovative activities in Europe include:

- Management importation: A director from the airline industry was brought in to “develop new orientations in the privatizing transit industry.” (Netherlands)
- Technological: One debit card will be used for rural and urban transit services for all modes. (Netherlands)
- Administration innovation: In efforts to increase workforce efficiency and allow for more flexibility, drivers have been trained to operate both buses and trains, which has “eliminated a feeling of superiority on the part of rail operators, a feeling that had had a divisive effect, and is said to have significantly increased morale.” (Netherlands)
- Marketing innovation: “Buildings, from bus shelters to corporate headquarters, play an important part in defining the place of transit in the consciousness of the community...German and Dutch agencies “believe that if a transit system can incorporate its distinctive designs into the community’s identity, it has a greater chance of being seen as an essential part of the community.” (Germany and Netherlands)

Innovations come in many forms. Whether the innovation affects the administration, marketing, or technological aspect of the transportation industry, innovation can have a profound effect on improving the service levels for the users of the facilities. TRB’s Critical Issues in Transportation 2002 seems to sum up best with the following quotation, “despite challenges, innovation offers promise in almost all disciplines of transportation.”

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Transit Innovations

According to Rubin, “the mission of transit is to maximize the mobility of people, with specific emphasis on the provision of transportation for residents who do not have other transportation options.” Transit users are categorized into two groups: transit-dependent and choice riders. Transit-dependent riders cannot drive due to health, age or licensing reasons or do not have access to an automobile. Choice riders prefer to use transit even though they are capable of driving and have access to an automobile. Rubin asserts in order to attract a choice rider, “he/she must be presented with a transit option that goes from where he/she wants to go, at a high speed of travel, with high trip frequency, in a comfortable environment, with very high reliability, with a minimum of transfers-preferably none, with high actual and perceived safety, with the ‘proper’ level of status commensurate with the choice riders view of his/her position in the world, and, at low cost.” Rubin contends, “since transit-dependent riders use transit for non-work trips during non-peak hours, many of these trips are relatively inexpensive to provide, while choice riders utilize transit almost exclusively for home-to-work trips, the most expensive trips for transit operators.” Thus, it costs more to carry a choice rider than a transit-dependent rider. So, then the question arises, should innovation discriminate between a choice rider and a transit-dependent rider? One would hope that transit innovations would encourage all types of riders to take advantage of transit options.

There are many literature reviews on the topic of innovations, but not many on the topic of transit innovations specifically. One study specific to transit innovations was in the Transit Cooperative Research Program Report #70 that discussed transit systems in rural and small urban areas. Transit systems in rural and small urban areas serve very large geographic areas usually with low density. Like many other transit systems, rural and small urban area transit operators meet the diverse needs of their riders with limited funding. According to the report, “some rural and small urban transit systems

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Ibid. p. 19.

Ibid.

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have found they must change—try new things—to remain responsive to riders and their communities, sometimes just to stay in business.66

Defining innovation as "change for a useful purpose," the research project in the report presented three components of innovation: "new, different, and unique techniques, practices or approaches (change that improve a part of the organization)."67 The focus of the research project was to identify elements that fostered innovation at transit systems in rural and small urban areas. The research identified eight elements related to the culture of change at rural and small urban area transit systems: “quality of service, focus on the mission, dynamic leadership, organizational support, community involvement and communication, staff development and motivation, build resources, and seize opportunity/serendipity.”68 Barriers and constraints were also identified69:

- Attitudes and perceptions
- Limited funding
- Regulatory complexities
- Operational issues
- Isolation
- Older Americans Act prohibition on charging fares
- Prohibition of charter services
- Problems using vehicles and resources for other than clients of funding program

Although the research identified barriers to change at rural and small urban area transit systems, the study found that the barriers were “more a perception than a reality" and many of the transit managers considered these barriers to be “issues or constraints that they resolve, not barriers that defeat them.”70 The study recognized that having a strong manager was key in bringing about change to many of the transit systems.

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Having a manager at these transit systems willing to view the barriers as issues to resolve than hurdles to bringing about change showed strong leadership and facilitated the perception. Essentially, having a manager with a “can do” attitude is helpful when pursuing an innovation or change.

Summary

Change in any environment, whether the transit system is located in a rural and small urban setting or in a large metropolitan area, is hard. Except for those few risk takers of organizations, the rank-and-file and administration officials alike tend to be weary of change. For any transit system, it is much easier to maintain the status quo than to bring about change. However, change is important to make improvements in any industry.

Whether one drives, walks, ride the bicycle, or uses transit, transportation plays an immense part in our daily lives. Every aspect of our lives entails some facet of transportation, whether it deals with running an errand, commuting to work, or shopping, etc. Most of the transportation expenditures involve private vehicles and not much is spent on public transit. For some people, the convenience of a private automobile seems to outweigh the general benefits (gas conservation, reduced traffic, less pollution, environmental and societal gains) of using public transportation. On the other hand, some people do not have access to enjoy the benefits of using public transit. Transit service often does not connect the travelers’ origins and destinations at required time and many people find that they have to travel by automobile despite the benefits of using public transportation. Nonetheless, transit has an important role because it provides mobility for those without access to automobiles and provides an alternative to driving.

An innovation is synonymous with technology transfer, change, or improvement, and can be new technology or just something new to an organization. Innovations are necessary for continuous improvement but introducing innovations pose challenges. Depending on the innovation, nature of the organization, and presence of a champion, potential adopters of the innovation will invariably face barriers. Transit agencies could use the benchmarking process to gauge the success of innovations at other transit agencies and learn for continuous quality improvement.
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The implementation of an innovation involves many factors: it should be easy to try and introduce, have benefits that are easy to measure, inexpensive, and provides significant improvements. Technology transfer refers to all activities leading to adoption of a new product. A technology transfer can be informal through individual interactions, formal by means of publications and workshops, and joint projects by involving groups of experts. One of the principal barriers to innovation is resistance to change. Decision-makers and the rank-and-file employees may be resistant to change because of the organization’s culture, lack of interest and perceived need, lack of a champion or a leader, and money.

In the literature regarding transit innovations in small and urban areas, the study recognized that having a strong manager was key in bringing about change to many of the transit systems. Essentially, having a manager serving as the champion of the cause with a “can do” attitude is helpful when pursuing an innovation or change, especially when a manager is willing to view the barriers as issues to resolve than hurdles. Since people are naturally resistant to change, transit systems will have an easier time maintaining the status quo than to bring about change. However, change is important to make continuous quality improvements and to better serve current and potential transit customers. The common themes found throughout the literature review are: transportation is an important element in our daily lives, transit can be a viable travel option if available, benchmarking can help assess an innovation for continuous improvement, and the implementation of an innovation depends largely on the presence of a champion or a manager willing to lead the change.
Chapter 3: Procedure and Methods

PROCEDURE AND METHODS

This study had two major components. First, a series of case studies were conducted of innovation adopted by transit agencies in Wisconsin. These were done to document and disseminate information on the innovation and to identify key factors, which led to its adoption. The second component was to gather information from transit agencies throughout the country about how they implement changes and innovations and identify barriers to innovation. The second component was done with a survey of transit agencies across the country to get a general sense on the issue of innovation and change.

The first part of the study gathered information on transit innovations throughout the Milwaukee metropolitan area through face-to-face meetings. Various transit agencies throughout the Milwaukee metropolitan area and Madison was initially contacted either via telephone or email. Upon making contact, appointments were set up to meet with the officials at various transit agencies. All appointments were scheduled at the transit agency office. Depending on the innovation, it took one or several meetings to acquire the information. Meetings usually lasted from 45 minutes to 1.5 hour with an average of about one hour.

Upon returning from the interview, a report was written. The draft reports were sent to respective transit officials for their edits. This was done to ensure the facts in the report were correct (in terms of dates, numbers, order of events, etc.) and that the report did not misrepresent the process that occurred. After changes were made, if the transit official requested to approve the revised version, a final draft was sent to the transit official for their approval. If not, the revised version was posted onto the University of Wisconsin-Milwaukee, Center for Urban Transportation Studies website on benchmarking.71

The second part of the study was an on-line survey about innovations from transit agencies across the country. First, survey questions were developed which went through several revisions. Second, email addresses of transit agencies across the country were gathered. Once the survey questions were finalized, the survey was coded and posted onto a website on the university server. Then, an email was sent to 250 transit agencies across the country asking for their input and to fill out the survey. Of the

71 http://www.uwm.edu/Dept/CUTS/bench/
PROCEDURE AND METHODS

250 transit agencies emailed, 18 emails were undeliverable due to unknown recipients. Thus, 232 transit agencies received an email about the on-line survey. Of the 232 transit agencies, 49 transit agencies submitted a completed survey, resulting in a response rate of 21% as of July 28, 2004.

Part I: Case Studies - Interviewing Process

For the interviewing process, a set of general questions and another set of questions specifically tailoring to the innovation were developed. Questions ranged from background information about the transit agency to how and why the innovation came about. The majority of the questions focused on the innovation itself: who was the champion of the change, main reasons for the innovation, obstacles and barriers faced during the planning process, any resistance to change during the implementation process, any suggestions or advice for other transit agencies wanting to follow in their footsteps, etc. A sample of the questions used is given in Appendix A.

Cast study reports included a User Assessment explaining about the customers and the agency, a Technology Assessment detailing about benefits, trial process, observability and complexity, Cost, Consequences of Failure, and Implementation Issues of the innovation (see Appendix B). The report format was derived from the “Steps for the Technology Transfer Plan.” The User Assessment addressed the organization’s functions, size and goals, and the potential users of the innovation. The Technology Assessment section focused on the characteristics of the technology in terms of advantages/benefits, trialability (how easy to try the innovation/change), observability (how observe the success of the program), and complexity (obstacles/hurdles faced during the planning and implementation stages) of the innovation. The Cost section gave the dollar amount of the implementation and operation costs. The Cost of Failure discussed the consequences of the innovation not working out as planned. The Implementation Issues identified the methods used to get the word out about the new innovation or change to the public. The finalized report was then posted on the benchmarking website.

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Part II: Survey Process

The main purpose for the survey was to gather information about the reasons for change and barriers to innovation at transit agencies in general. The initial set of questions consisted of more than 30 questions. The questions were whittled down to be more specific and focused on the barriers/resistance to change aspect of the innovation. The intention of conducting the survey was to get a general sense of the status of different innovations at various transit agencies across the country (see Appendix C).

In order to receive instantaneous results from the survey, the survey was posted onto the web on a university server. The email sent out to the transit agencies included a direct link to the web address. Two weeks after the email was sent out, the survey data were retrieved into an Access database for further analysis. This process enabled a very rapid turn around on the survey with answers posted within hours of when it was first sent out.

Like any other on-line surveys, there were limitations to this on-line survey as well. Since the on-line survey specifically addressed the issue of innovations, it is possible that only those transit officials interested in innovations filled out and submitted the survey presenting potential bias into the survey results. The responses to the questions may reflect the feelings and thoughts of the person filling out the survey and not necessarily that of the organization he/she represents. Using the email and an on-line survey to ask for input was inexpensive and an ideal way to reach a broad set of audiences.
"The first portion of this study was face-to-face interviews with various transit agencies from the Milwaukee metropolitan area and City of Madison to gather case studies of innovation."

CASE STUDIES AND SURVEY RESULTS

Case Studies

The first portion of this study was face-to-face interviews with various transit agencies from the Milwaukee metropolitan area and City of Madison to gather case studies of innovation. The case studies were used to gather and disseminate information about bringing an innovation to fruition and identifying key factors in its adoption. Nine case studies were conducted: Caledonia Shared-Ride, Madison Metro Transit: Transfer Point Centers, Milwaukee County Transit System: Semi-Annual Quality Measurement Survey, Milwaukee County Transit System: Special Events Service, Ozaukee County Express, Ozaukee County Shared-Ride Taxi, Transit Mutual Insurance Corporation of Wisconsin, University of Wisconsin-Milwaukee: UPASS, and Waukesha Internet Trip Planner. These nine case studies are categorized into three groups: Service, Management, and Technological.

Service Innovations

Caledonia Shared-Ride Transit

Description:

The Town of Caledonia, a town located north of the City of Racine, west of the Village of Wind Point, south of the Cliffside Park, and east of the State Highway 31, does not have its own transit services, and uses the City of Racine Department of Transportation transit services. The BUS (Belle Urban System) route #10 was based on a fixed 45-minute route, running 10-12 times a day in service for 20 years. Since the BUS route #10 made one big loop around town, those living in the middle part of town had difficulty having access to transit. Due to the big loop and low density of the service area, transit ridership on BUS Route #10 was low. In efforts to provide better transit service to the residents of Caledonia, a Shared-Ride Transit program, a door-to-door transportation service for the residents of Caledonia, was implemented in July 2000.

The Caledonia Shared-Ride Transit program consists of a wheelchair accessible mini-bus and a large 4-door sedan (Ford Crown Victoria). There are two ways to ride the Shared-Ride Transit: 1) call for a pick-up, which has a 45-minute response time; or
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2) make a reservation. The Shared-Ride Transit runs Monday through Friday from 5:30 a.m. to 7 p.m., and on Saturdays from 7 a.m. to 5:30 p.m., with no service on Sundays and holidays. The fares for the shared-ride transit are as follows: $1.50 per person per ride, $0.75 for senior citizens and disabled persons, $0.50 for transfer from BUS to the Shared-Ride Transit, or free transfer to BUS Route 1 (Greentree) and BUS Routes 2 & 4 (Shorecrest).

The Town of Caledonia does not have its own transit office, and the City of Racine oversees the transit operations in the town. When the Town of Caledonia approved the shared-ride transit program, the City of Racine asked for bids and selected Laidlaw as its contractor. The City of Racine serves as negotiator, mediator and coordinator of the Shared-Ride Transit program, and has a contract with Caledonia (service receiver) and Laidlaw (service provider). The program was implemented after the three parties, the City of Racine, Laidlaw, and Town of Caledonia, agreed on the terms of the three-year contract, which included a set of fixed prices for the operation.

Implementation Process:

Because the Town of Caledonia was not very receptive to the idea of changing transit services at first, the program took a long time to implement. The Southeast Wisconsin Regional Planning Commission (SEWRPC) was involved with various planning/transportation studies eight or nine years ago. The commission felt that there could be a better way to service the residents of Caledonia. The idea of a shared-ride transit was raised during a brainstorming session of a SEWRPC meeting. It was suggested as an option for the Town of Caledonia. The town twice rejected the idea of a shared-ride transit and when asked the third time several years later; the town came back with an answer of a "maybe". Once the Caledonia Town Board agreed on the Shared-Ride Transit, and with the help of SEWRPC, the City of Racine transit office sent out (to service providers) for bids. After selecting the contractor with the best hourly prices for the service and a three-year contract, the implementation process began. The project started in July 1999 when the City of Racine received approval to issue a proposal to the groups. In July 2000, the program was implemented after it took some time to iron out the contract.
To advertise the new service, posters and magnets were distributed, information was featured in the town newsletter, and postcards were mailed out. There was a lot of publicity, which consisted of the press and a newspaper story. Marketing the Shared-Ride transit is a continual process, where publicity is used at various times during the year to remind residents about the service since new people are moving in and residents’ circumstances change that driving becomes no longer an option (e.g., losing driver license privileges, illness, aging population).

From the start of the program, the ridership and revenues were monitored. Initially, as expected, the ridership decreased after the transit service changed from the BUS #10 to the Shared-Ride Transit. Over the three-year period, after the initial dip the ridership increased and then later stabilized. The shared-ride transit averages a couple of trips an hour. Ridership for the year 2000 before the change from bus to a shared-ride transit averaged 1100 riders a day. For the last 6 months of year 2002, shared-ride transit ridership averaged 1260 riders a day. For January 2003, shared-ride transit had 1316 riders a day.

The Town of Caledonia was able to take advantage of the “Congestion, Mitigation Air Quality” (CMAQ) program to fund the initial program because Racine/Caledonia is located in an ozone non-containment area. Federal and state subsidies, and fare revenue supplant the shared-ride transit program in Caledonia. Due to the federal assistance, Caledonia’s share of the costs was reduced. Federal money provided $20,000 a year for three years. Federal assistance was expected to end on July 12, 2003, which coincides with the end of the contractual period between Racine, Caledonia, and Laidlaw.

There was a concern for failure. The City of Racine had a contract for three years, and Laidlaw had a cancellation clause. It was agreed upon that a cancellation of the program would provide Laidlaw with a lump sump after the first year, smaller lump sum after the second year, and a lesser lump sum after the third year. All parties involved recognized that the program may not be well received, but everyone was also committed to the three-year plan to make it work. The longer-term commitment provides
Persistence by SEWRPC and the City of Racine was key to bring about the innovation. Because of its location in an ozone non-containment area, the Town of Caledonia was able to take advantage of the CMAQ program and receive $20,000 a year of federal funding for three years to reduce Caledonia’s share of the costs. In addition, having the City of Racine transit office to handle the logistics of the program was helpful as well. The City of Racine transit office was responsible for sending out bids to service providers, selecting the contractor with the best hourly prices for the service, and negotiating a three-year contract for the program.

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For the implementation of this innovation, persistence and money seem to have been critical. It was persistence that brought about the change but it was lack of money that led to the termination of the program. Innovation was introduced but due to budgetary cuts, the program had to be terminated. Money did not pose a problem with the implementation of the innovation, but became a barrier with the continuation of the innovation.

Ozaukee County Shared-Ride Taxi

Description:

In the 1970s, Ozaukee County (located just north of Milwaukee County) had a paratransit program for only the elderly and disabled. This program was funded with both state and local dollars. The services were initially contracted out to two agencies: one agency was responsible for volunteer drivers, and another agency was responsible for providing the wheelchair accessible vans. The county took over the program in 1983.
The program initially consisted of 6 vehicles: 3 sedans and 3 wheelchair accessible vans. The program “enhanced both the elderly and disabled persons’ ability to stay independent.” However, rides were not provided to residents of nursing homes. The program allowed 3 roundtrips per week, or 6 one-way trips Mondays through Fridays, from 7:45 a.m. to 5 p.m. Due to the limited number of trips allowed and operating hours, riders mainly used the services for attending medical appointments. Rides were provided within a mile of the county line for work purposes and farther outside the county for medical services that were not available in the county.

The program provided senior citizens and the disabled the ability to live without a vehicle and stay independent. Due to the high demand and cost of the transportation services, in November 1993, Ozaukee County requested that the Southeastern Wisconsin Regional Planning Commission (SEWRPC) study the possible effects of the program’s expansion and prepare a plan. The demand for services was higher than the county was able to provide. The SEWRPC’s recommendation was to convert the current elderly and disabled transportation program into a shared ride program. The county agreed to convert the program in 1997, and thus, the Ozaukee County Shared-Ride Taxi program was implemented on January 1, 1998. The Planning Transit Committee, the Department of Transportation, and the County Board were involved in the project. The program originated in the Ozaukee County Aging Services Department but moved to the Ozaukee County Transit Services in January 2003. With the Shared-Ride Taxi program providing in-county transportation services, the Elderly and Disabled Transportation program changed to providing only services for the elderly and disabled who need medical treatments outside of the county.

In 1998, there were nine vehicles in operation. In addition to the funding provided by State statute 85.21 (for the elderly and disabled), and other state and federal dollars, money provided by federal Section 5311 was also used to purchase vehicles. Funding from State statute 85.20, which provides state funding for mass transit, was also used for the program. Through federal Section 5311, 80% of the vehicle costs were paid for by federal funds. As of January 1, 2003, the contractor provides drivers and dispatch, and county fuels the vehicles and maintains them. Some of the vehicles are spares, and 13 vehicles with 4 ADA accessible are used to operate the program. The state/federal funding is possible through the Congestion Mitigation Air Quality (CMAQ) Improvement Program and Federal Transit Administration (FTA), and
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the state’s 85.20 statute for mass transit and state statute 85.21 providing services for
the elderly and the disabled.

The Ozaukee County Shared-Ride Taxi serves the whole county, curb-to-curb. The county is divided into 6 zones, and depending on the zone, the ride costs vary from $2.75 to $6.50 per trip for adults, from $2.50 to $5.75 for students, and from $2.25 to $5.25 for seniors/disabled (children ages 5 and under, accompanied by an adult are free). Frequent riders could purchase prepaid punch cards for $20 per card, which has a value of $22. One could use the services, as many times as necessary, and the only limitation posed is the number of bags a rider could bring into the vehicle. For those who need special assistance, the Shared-Ride Taxi provides door-to-door service at no extra charge. This service is also available for those who are handicapped and wheelchair bound, with the caveat that the person has to be ready at their door side. Because of insurance issues, this extra service is not available to all riders.

The county notified all elderly citizens, who used the Elderly and Disabled Transportation services, of the implementation of the Shared-Ride Taxi program. In addition to notifying previous users of the Elderly and Disabled Transportation, the general public learned of the new program via extra advertisements and posters around the county. With the implementation of the Shared-Ride Taxi program, services improved and fares decreased for the elderly and disabled. The Shared-Ride Taxi program was open to the general public, which allowed those who were not elderly or disabled to use the services.

Implementation Process:

The Ozaukee County Shared-Ride Taxi program came about because there was a need. The program provided more services to disabled adults and added services to the general population. The biggest jump in ridership came from the disabled adults group who could use the service for transportation to and from work.

Implementation was difficult because some county board members were not receptive to the idea. Initially, there were complaints about the high cost of the program; the program was averaging $13-15 per trip. Some concerns were raised because of the belief that everyone in Ozaukee County has a car and in the beginning of the shared-ride taxi program, there was minimal marketing done. It was through word of mouth that
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many riders heard about the shared-ride taxi. However, within the past three years, the focus has changed with more emphasis on marketing.

The community was supportive of the program. There were some concerns expressed by other groups who provided free transportation services. They complained that because their services were free, they were overwhelmed with additional riders. Services provided by groups who do not charge are contingent upon the availability of volunteer drivers. The county’s main goal is to provide better and more services. The demand was high, and the program’s success was observed through the increase in usage.

Ozaukee County’s attitude toward change and innovation was skepticism, because they were taking a small program and opening up to everyone. There were concerns about costs and who was going to pay, and whether if it was really needed. Even though Ozaukee County was “slow to embrace change,” the expansion of the shared-ride program has proved to be very beneficial and valuable to the county.

What has started out as a transportation program for the elderly and disabled persons has expanded into the Ozaukee County Shared-Ride Taxi program. The Ozaukee County Shared-Ride Taxi serves riders of all ages throughout the county. Since the inception of the program in 1998, ridership has increased especially among the employed. Due to the popularity of the program, the county was in the process of expanding its operation hours.

Assessment:

For the Ozaukee County Shared-Ride Taxi program, SEWRPC input and CMAQ funding played a big part in bringing about the innovation. Because the demand for transportation services was higher than the county was able to provide, Ozaukee County requested SEWRPC to study the effects of expanding the paratransit program for the elderly and disabled to the general public. The SEWRPC’s recommendation to expand the elderly and disabled transportation program into a shared ride program brought about the implementation of the Ozaukee County Shared-Ride Taxi program. Opposition to the program was mainly due to some county board members concern about taking a small program and expanding it to everyone, and concerns about costs and who was going to pay. SEWRPC’s recommendation and state/federal funding
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through CMAQ were both critical to the implementation of the innovation. Although opposition to the program expansion posed a challenge initially, the opposition was overcome by the potential benefits provided for those in need and cost issue alleviated by CMAQ funding. Once again, money is a key factor in the implementation and continuation of an innovation.

**Milwaukee County Transit System: Special Events Service**

**Description:**

Milwaukee is a city of special events and sometimes calls itself the “city of festivals.” These events include Summerfest (a major music festival), ethnic festivals nearly every weekend of the summer, the State Fair, and numerous major sporting events. Summerfest is Milwaukee’s oldest festival and is held on the lakefront near downtown and attracts over 900,000 people in its 10 day run. The location of the grounds is off the usual Milwaukee County Transit System’s regular routes. Because of the large attendance at Summerfest, parking and traffic demands are very high and a transit alternative is very attractive. Milwaukee County Transit System (MCTS) saw a demand for transit due to high parking and traffic demands on Summerfest grounds. The Milwaukee County Transit System started to service Summerfest in 1977 with a modest shuttle service on Wisconsin Avenue to the main gate. At one time, MCTS only had the shuttle service on Wisconsin Avenue. In 1979 MCTS provided flyer express service to Summerfest from the park-and-ride lots. During the late 1970s, Festa Italiana was the first ethnic festival to request the service. With more and more ethnic festivals, MCTS started to provide more service because of the number of festivals and attendance. Demand for shuttle services increased. For 2003 Summerfest, MCTS provided 421,000 rides.

**Implementation Process:**

The idea to provide shuttle services for special events originated within the management staff at MCTS. The planning stages were evolutionary based on customer demand and the number of events. In the planning stages, there was no opposition to MCTS providing shuttle service during festivals or special events. Many of the decision
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makers were pleased with the expansion of transit services. The process of providing transit service to special events like the festivals took six to eight years to perfect. Providing shuttle services for other festivals besides Summerfest works off the basic operating scheme of Summerfest. For some festivals, the operating scheme is similar to Summerfest since they are held on the same Summerfest grounds. For other festivals not held on the same grounds, the basic operating scheme for Summerfest is used as a basis for operations. Ethnic festivals do not need that much planning since they are very similar from year to year, and from festival to festival.

Early on the operations costs for Summerfest was budgeted into the MCTS annual budget. At first, ethnic festivals had to pay for shuttle services, but the costs were eventually budgeted into MCTS's annual budget. Special events busing does not have its own budget, but rather the budget is rolled into the regular MCTS budget based on historic costs. Through the budget process, MCTS integrated the special events of the service hours into the regular operating budget. The MCTS also provides shuttle services for the Milwaukee Brewers home games. The MCTS had provided services to the Bucks games since the mid-1980s but the services were cancelled last year in 2002 because of low usage. For the Brewers games, shuttles run from Wisconsin Avenue to Bluemound Avenue to the gate while making certain stops on Wisconsin Avenue.

Initially, State Fair paid for a portion of the operating costs for providing shuttle services to the State Fair. Eventually, the operating costs for the State Fair shuttle services were folded into the MCTS budget. For the State Fair, the MCTS’s responsibility to provide shuttle services increased with the increase in the number of riders. In the beginning, MCTS involved providing shuttle services for 3000-4000 riders. Now, there are more than 4000+ riders in one day just from the Watertown Plank drop-off/pick-up point. For 2003 State Fair, MCTS provided 127,000 rides compared to 170,000 rides in 2002.

The benefits for MCTS in providing the special events shuttle services have to do with MCTS’s role in the community. Providing the special events shuttle services allows MCTS to introduce transit service to the public (especially to those who are not regular transit users) and build a positive reputation in the community. Having a reliable service is an important aspect of the operations because people will complain if services are not reliable. MCTS benefits from having service for customers who may not use transit for any other purpose and that also helps MCTS to get support for transit in general.
“The presence of a champion was the key factor in the implementation of this innovation.”

Case Studies and Survey Results

Generate ridership. The complexity of providing shuttle services for special events is a matter of an equity issue as well. The question is how to choose which special events to service and where to provide service.

Assessment:

The idea of Special Events transit services originated within the management staff at the Milwaukee County Transit System to address the parking and traffic demand problem on Summerfest grounds. Through the budget process, MCTS integrated the service hours of the special events into the regular operating budget. Since attendance is subject to weather, special events busing may give people an idea to try regular service if they think highly of the special event services provided by MCTS.

Initially, MCTS invested in marketing in efforts to reach a group that did not use transit regularly. Since operating shuttle services can be expensive, marketing is very important to protect investment. More marketing means more return on revenues. Basically, the key to success is “planning, planning, planning!” The success of the special events shuttle services was observed through the increase of festival/special events riders.

Traffic and access issues sometimes pose as obstacles. From time to time but more recently, budget issues have created hurdles. If there are too many events at the same time, operating expenses could run up because some drivers are on time-and-a-half. Since attendance is subject to weather and economy, there is no guarantee that MCTS will generate ridership. MCTS is not able to provide special events busing to any festival that requests the service. However, providing the special events shuttle services allows MCTS to introduce transit service to the public (especially to those who are not regular transit users) and helps to build a positive reputation in the community. By building a positive reputation in the community, MCTS may increase support for transit in general.
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Special events busing allow MCTS to play a role in the community by providing additional services when they are most needed.

The presence of a champion was the key factor in the implementation of this innovation. However, money issues prevent MCTS from providing special events busing to whoever requests the service. Because the idea originated internally and a champion was present to take charge of the planning and implementation process, and the benefits associated with the innovation, there was not much resistance to bringing about the change.

Ozaukee County Express

Description:

Ozaukee County was considered a severe ozone non-attainment area, and in 1994 employers in Ozaukee County faced Employee Commute Option (ECO)/Clean Air mandates. In addition, due to a low unemployment rate and the high cost of housing in Ozaukee County, many employers were short of employees to fill vacant positions. Realizing these needs, the Ozaukee County Economic Development Corporation (OCEDC, non-profit 501(c)(6) organization) applied to the Wisconsin Department of Transportation for a Transportation Demand Management (TDM) grant to form a countywide Transportation Management Association (TMA). The purpose of the Ozaukee County TMA (OCTMA) was to plan and implement new commuter transit in Ozaukee County. On July 1, 1998, OCTMA transferred responsibility for operations of the Ozaukee Express to the county government.

A bus system made good business sense for many communities in Ozaukee County. Homegrown industries needed workers. Without workers, such industries would be forced to move out of the county, which would negatively impact the community’s and the county’s tax base. Responding to the parallel efforts of the county and the OCEDC, the Southeastern Wisconsin Regional Planning Commission (SEWRPC) conducted a transit study. Ozaukee County examined other transit and employee shuttle systems in the region, notably New Berlin’s. The impetus to design and start a transit system in Ozaukee County resulted from the ideas of many people. Ozaukee County used SEWRPC’s transit service report 96-00 as a reference.
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The Intermodal Surface Transportation Efficiency Act (ISTEA) had passed in 1991, and embraced the public participation model. A federal mandate of employee commute options (ECO) required that companies with 15 employees or more should have 1.4 persons per vehicle, and not have everyone drive to work alone. That requirement brought employers also strapped for workers to the table for discussion on the possibility of starting a transit system in the county. OCTMA was a project of the OCEDC, and the OCEDC became the manager of the program and convener of the meetings.

In 1995 96% of Ozaukee county residents had access to vehicles. According to the 1990 census, 700 households were without access to transportation. Because the employers in Ozaukee County agreed to pay for the full local share during the first 17 months of the project, the Ozaukee County Board of Supervisors readily agreed to be the public sponsor that would apply for the public funding. On behalf of the county, OCTMA prepared all funding applications. The CMAQ grant provided for three years of funding. In effect, the county board received a very attractive offer because CMAQ paid for the majority of project costs during the pilot years.

Implementation Process:

Because the county was trying to create something so different, it took a while to get the program going. A few people opposed the idea initially but over time even they became supporters. By January 25, 1996, Mequon was the only community not to endorse a resolution for the 2-year pilot transportation project, projected to cost $425,000 annually. In February 1996, the state DOT approved a $360,000 grant to Ozaukee County under the CMAQ program. The program began on August 5, 1996.

Originally called the Ozaukee Express Bus Service, the Ozaukee County Express is currently run by the Milwaukee County Transit System (MCTS) and continues to serve more than 6000 passengers annually. When the first contract expired after five years of operation, the Milwaukee County Transit System successfully obtained the bid to operate the Ozaukee County Express. In the beginning, the Ozaukee Express served Milwaukee to County V to Hwy 32, and then to feeder communities. Shuttle buses met express buses at the lots to take passengers to employment sites in six communities in Ozaukee County. Transit service was available on all three work shifts in Ozaukee.
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County.  The park and ride lots along I-43 in southern part of the county became stops along the rapid transit bus route between Ozaukee and Milwaukee counties.  The transit system grew from six to twelve round trips per day between Milwaukee’s near south side and park-and-ride lots in Ozaukee County.  Currently, the Ozaukee County Express provides services to Mitchell Street, Downtown Milwaukee, Cedarburg, Fredonia, Grafton, Mequon, Port Washington, and Saukville.

The Ozaukee County Express was successful because it had a public-private partnership, a flexible and customer-comes-first approach, and energetic support by business owners in a politically and fiscally conservative county.  Supporters of the program believed public transportation would bring to the county needed workers as well as new freedom for those who didn’t drive or who preferred not to drive to employment in downtown Milwaukee.  The success of the program was observed by looking at the ridership.  In addition, a customer service survey was conducted.  The ridership has been consistently above 6000 passengers since 1997.  The advantages with an express bus are that it serves out of park-and-ride lots and has the high speed service to downtown.

Initially, a majority of the 32-member county board showed support for some sort of public transportation in the county.  Conflicts with the Mequon mayor kept the issue in the news.  Because of the outside funding and the local share paid by the employers, Ozaukee County had few expenses.  Opponents of the program eventually became supporters of the program.  During the planning process, OCTMA faced the following obstacles/hurdles: 1) red tape and time (from a business perspective, red tape is frustrating to the business community), and 2) did not have a strong flexible transit model.

The county had an obligation to provide transportation services.  The county’s attitude toward change was open but skeptical.  All parties involved had to communicate effectively, and OCTMA had to bring an offer the county could not refuse.  Too often, County government is an unknown governmental body except for its human services delivery.  The Wisconsin DOT required the county to establish a transit committee, which the Administrative Committee did.  Initially, three out of five members including the chairperson were not supportive of the program, but eventually became supporters.  The political obstacle of Mequon was turned into an advantage.  Because of Mequon’s non-
support of the program, the issue was kept in the news. County residents knew about the program through articles in the papers, from individual employers, and via word of mouth. County board members were kept apprised through the use of monthly, one-page reports with key numbers highlighted in the margin for clarity and easy reference.

**Assessment:**

The Ozaukee County Express used a problem driven approach: to find a solution for the problem of a labor shortage in the county and to provide transit services to those in and outside of Ozaukee County to fill these vacant positions. Due to a low unemployment rate and the high cost of housing in Ozaukee County, many employers were short of employees to fill vacant positions. The solution was to establish transit services from outlying areas to Ozaukee County and vice versa. The initial 2-year pilot transportation project was projected to cost $425,000 annually but because Ozaukee County was considered a severe ozone non-attainment area, it received a $360,000 CMAQ grant funding. The Ozaukee County Express not only brought workers to fill vacant positions but also provided a travel option for those who didn’t drive or who preferred not to drive. Because of the outside funding and the local share paid by the employers, Ozaukee County had few expenses. The key to the implementation of this innovation was outside money and a public-private partnership that served as the champion of the change. Resistance to this innovation was limited because the county was able to avoid most of the costs. The lesson learned is that implementation of an innovation is highly possible with sufficient outside funding and the support of public and private entities who serve as champions of the cause.

**Service Innovations: Madison Metro Transit – Transfer Point Centers**

**Description:**

The late 1970s and early 1980s brought about the start of the job/retail exodus from downtown Madison. In the 1980s, many businesses and retail establishments were locating outside downtown and into the Madison suburbs. With retail and jobs moving out of the city, Madison Metro needed to find a way to serve those no longer needing to come into the city for shopping and employment. In addition, a consultant study in 1985 identified the need to provide transit services in the suburbs. Thus, Madison Metro
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embarked on a planning process to modify the current system to include services in the suburbs.

In 1990 some of the Madison Transit staff members went out to Pierce, Washington to look at the transfer centers operations already in place for two years. In June 1993 Madison Metro conducted a public input session with regard to what type of improvements were necessary; conducted surveys of drivers and riders, met with public officials in Madison and all surrounding areas about the type of needed improvements. Madison Metro staff members started to put lines on the map and developed the routing scheme in late November/December of 1994, and unveiled its first new plan in 1995 as the Metro concept.

In October 1996, Madison Metro held public meetings for locations of transfer points. A series of public meetings were also held on route systems. Madison Metro was hoping to implement the final plan in the summer of 1997. Madison Metro had already attained neighborhood approval for the final plan. Due to a funding shortfall, the implementation was not possible in 1997. Additional state funding in 1998 enable Madison Metro to implement the Madison Metro Transfer Point Project in the summer of 1998.

Originally, the transfer centers were designed to not only provide access for transferring, but also retail for shopping and other conveniences. The original plan consisted of two centers to be located in a commercial location but Madison Metro was unable to obtain neighborhood approval. In the following planning stages, a modified plan consisted of seven to eight transfer centers. This plan also did not work because Madison Metro was unable to get 2/3 majority of the City Council to agree on the plan. In the second plan, the transfer centers were to be located away from the neighborhood. Thus, Madison Metro had to look for a different neighborhood/sites. Finally, the plan that was eventually adopted had the transfer centers separate from the neighborhoods near

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Implementation Process:

There were several stages of the planning process. The original plan had enclosed transfer centers, but the neighborhood did not like the enclosed idea. The neighborhood feared that the enclosed transfer center would attract kids and the homeless. The original plan even had seating available. To prevent possible loitering around the transfer centers, the plans changed to the current design of open air and no seating available.

With any new building construction, an Environmental Impact Statement (EIS) is necessary. After the EIS, Madison Metro held public hearings and meetings but did not get people’s attention. Madison Metro then hired architects to come up with the designs. Once the design process began, Madison Metro took the designs to the public. During the preliminary design process, neighborhoods started to organize for resistance. In a commercial manufacturing district. The transfer centers were located as remotely as possible and simple in design, used primarily for transferring. It took two years of meetings to come to a consensus: what they should look like, where it should be located, and how to design routes with the least impact.

It took nine years of planning, but on July 19, 1998, the Madison Metro Transit changed overnight into the timed transfer departure system. The Madison Metro Transfer Point Project began its planning process in 1989 and culminated into a system of four transfer points. The four transfer centers provide a timed transfer system departure where the buses leave on the ½ hour and on the hour, like an airport. The operating concept was driven by the responses to the design. It is very unique that the whole transit system is timed around four transfer points: N, E, S, and W. These four transfer points provide travel access to both downtown Madison and the suburbs of Madison.

With the current system, Madison Metro is able to accommodate new growth more easily. As the city expands outwards, the new system is set up to accommodate the new growth without affecting the whole system. In the old system, because of cross-town routes, new growth affected the whole system. Now, new growth only affects the nearby area. Madison Metro can easily adjust the service levels better with the new system since the routes are shorter. Madison Metro can also easily change the
In addition to having a champion for the project, it is also necessary to have key local staff and policymakers behind you.

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frequency of the routes based on ridership. Efficiency savings are also included in the system, which means shorter travel time for passengers.

Some of the advantages are that now people who are traveling to areas outside of downtown in the periphery have shorter trips and non-transfer routes to downtown are also available. Eighty percent of the passengers go to the downtown area for work during peak times, and the rest travel during non-peak times. However, the timed transfer system has inefficiencies already built into it. Passengers have either $\frac{1}{2}$ hour or 1 hour to get to their destinations. From the North transfer point, travel time is scheduled for 1-hour, but it really does not take 1 hour. Delays are
also built into the wait time. For some people, delays increased. The City of Madison was very supportive of Madison Metro’s change from the start. It took a long time to implement the project due to neighborhood opposition during the first planning process. During the second planning process, Madison Metro interacted more with their customers and implementation went smoothly.

Ridership decreased initially but increased in the second year of implementation. Madison Metro took risks in implementing the new timed transfer system. The potential loss of ridership is risk. The success of the program was observed from the number of complaints received, and monitoring ridership at the route and system levels. A survey is conducted every five years to monitor the success of the program. There were
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current system standards already established for timed transfers system. Edmonton Canada, Pierce (Tacoma) Washington, and Dayton Ohio already had timed transfer systems in place. Madison Metro learned from their experiences. However, Madison Metro's is catered to the needs of Madison residents.

Assessment:

Madison Metro advises that a champion is needed to carry out the proposed new project. In addition to having a champion for the project, it is also necessary to have key local staff and policymakers behind you. Without a champion, local staff and policymakers, one could possibly face heavy resistance to change.

With retail and jobs moving out of the city, Madison Metro needed to find a way to serve those no longer needing to come into the city for retail and employment. Although it took nine years to implement the innovation, through benchmarking the transfer center operations in Washington, public input session, and persistence, the City of Madison was able to implement the timed transfer departure system. Originally, the transfer centers were designed to not only provide access for transferring, but also retail for shopping and other conveniences. Due to neighborhood opposition, the plan that was eventually adopted had the transfer centers separate from the neighborhoods near a commercial manufacturing district. The transfer centers were located as remotely as possible and simple in design, used primarily for transferring. For the implementation of the transfer centers, having a champion at the transit agency helped to bring about the change. Being able to carry out the change after nine years of planning showed persistence. When the neighborhoods showed resistance to the transfer center plans, the transit agency interacted more with their customers for their input. Although a funding shortfall delayed the implementation by another year, the transit system was still persistent in ensuring the fruition of the innovation. The lessons learned: emphasis of a champion to lead the innovation to implementation, and importance of persistence even with funding delays, opposition, and many changes to the plan to satisfy customers.
One of the elements of the university’s master plan in 1972 dealt with parking. The question was whether the campus would be able to accommodate growth in enrollment. The campus had enough land space to accommodate growth for classes, but not enough for parking. Some of the alternatives included having satellite parking (which would require large subsidies) and improving bus services. In addition to satellite parking, there were talks about improvements to the parking situation on campus. The concept of UBUS (University Bus) came from a consultant and from the University of Minnesota. A comprehensive survey of students was conducted in 1973 to determine the locations of their residences.

To accommodate growth on campus, and to help mitigate the parking congestion on campus, the university worked with the transit system and provided exclusive bus services for students and staff as part of a regular route. By 1973, the first UBUS operated along North Avenue (92nd and North) making a loop to UWM. The university contracted with the Milwaukee County Transit System to provide bus service specifically to the campus. The North Avenue UBUS became so popular that in the following semester, service was expanded to include Oklahoma Avenue/Capitol and Silver Spring routes. In order to attract students and staff to the UBUS, bus fare was subsidized with reduced fare tickets. Even with the bus charge, the UBUS was very popular. However, due to later state budget cuts, the state funding of the program stopped. Bus tickets were no longer subsidized, and consequently, ridership decreased.

In 1996 the program was changed so that the subsidy came in the form of a student pass that allowed the students with unlimited use of any Milwaukee County transit bus. The student pass operated like a regular monthly bus pass, except that the student’s pass was good for the entire semester. The university and the transit agreed on a fixed price for the student pass, which was coined “UPASS” – university pass. The agreed fixed price was initially $29 per student for the whole semester to be charged as part of the student tuition. In addition, transit agreed to extend more routes to UWM.
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The idea about a UW-Milwaukee’s UPASS (University Transit Pass Program) program was discussed back in 1991/1992 and implemented in 1994. When the concept of a UPASS program was raised, the idea had to be sold to students and to the administration. The university student government was used as a conduit to introduce the idea of a UPASS program to the students. Due to the turnover of student leaders in student government, selling the idea of a UPASS program to students and the university administration took about 2-3 years.

The idea of the university transit pass program had to be sold to the whole student body and not just to the student decision makers. As for the university administration’s position, there was some skepticism. The administration was uncertain whether the program would have any impact on the parking problem on campus. However, they were supportive of the program as long as the students supported it through a referendum.

The hope was that there would be more ridership with the UPASS implementation. About 3000 students were coming to UWM on transit, and one out of 5 trips to UWM was by transit, in addition, another 3000 students used satellite parking. Students, particularly those who regularly commute to campus, felt there are many advantages of a UPASS program. It can save them substantial amounts of money, especially if the purchase of a car can be avoided. Non-transit users may oppose the idea of having their tuition raised for a service that they don’t use. Opposition may lessen if they know of other students that do use the pass and benefit from it. Generally similar student fees are used for a variety of purposes such as athletics, student government, health care, etc. all of which have different rates of participation by students. At the same time, non-transit users also benefit from the UPASS. When more students use transit to get to campus, this alleviates some parking congestion, enabling more parking opportunities for those who drive to campus. The UPASS turned out to be a win-win situation for both transit and non-transit users.

Implementation Process:

Three groups were involved in the adoption of the UPASS: transit agency management, UWM students, and university administration. Of the three groups, resistance to change appears to have been primarily among university administration.
“The two key factors with this innovation were the presence of a champion and a plan to provide money for the service.”

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This stems from the unfamiliarity with public transit and a concern about raising student tuition to pay for the program. Some university administrators were unfamiliar with how students got to campus. This resistance was overcome by emphasizing that a pass program could relieve neighborhood parking pressure and increase potential enrollments by reducing the transportation costs of attending the university.

Both the students and the transit agency were optimistic about the program. They were hopeful that the program was going to work, due to the short supply of parking on and around campus and Milwaukee’s good transit system. The university’s main concern for the UPASS program was the impact on tuition. Students do not have the option to purchase the UPASS; the cost of the UPASS is automatically added to the semester’s tuition costs. However, the resistance based on tuition concerns was overcome by holding a student referendum.

Since the implementation of the program, ridership on transit has increased. Students tend to commute to school at off-peak times using buses that would have seats available. The UWM campus is the second largest trip generator in Southeast Wisconsin. The UPASS decreases the parking congestion on and around campus. The UPASS is another avenue for students to get to UWM and provides an alternative for students and staff with a number of direct routes to campus. These routes require no transferring. It is a viable alternative for many reasons: 1) parking on campus can be expensive, 2) encourages people to use transit, 3) helps to decrease parking congestion, and 4) UPASS provides options for everybody. Before the UPASS program, transit ridership of students commuting to UWM was 6-7%. Now the transit ridership is 15-20% of students coming to UWM and reaches up to 60% for those who live near routes that directly serve the university.

The program was marketed through advertisements in the student paper, and direct mailings to every house (about three times). The price charged to the university was based on: 1) revenue transit will lose from students who rode before program and paid full fare and 2) adding two new routes meant additional costs associated with covering expenses. To determine the base price, the university and transit assessed the current ridership (both had similar ridership estimates), calculated what the new routes will cost transit, took a percentage off the regular fare, and agreed on a fixed low price.
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The UPASS was significantly discounted for the students, and the costs of implementing the program consisted of students just having to pay for the pass as part of their segregated fees. The payment for the UPASS is made directly to the transit office by the university, after collecting from the students. A regular pass for the Milwaukee Metro costs about $12 weekly. The UPASS can be used for the duration of the semester and for few weeks after the semester ends. If a student were to purchase a regular pass for one semester, it would cost more than $200. The university also had an agreement with the transit that the fare increase for the cost of the pass will not be any different from regular fare increases. Both fares for the regular passes and the UPASS would increase at the same time by similar percentage.

Assessment:

The UPASS resulted from a need to address the growing parking demand around the university. With projected student growth and subsequent increase in parking congestion around campus, an innovation to address this problem was necessary. The concept of a UPASS program had to be sold to students and to the administration. The champion came from the university transit office, serving as the liaison between the MCTS, student government, and the university administration. The main contention with the implementation of this innovation was that the administration was uncertain whether the program would have any impact on the parking problem on campus and did not want to raise tuition any more than necessary. However, the administration was supportive of the program as long as the students were for the program. This resistance was overcome by emphasizing that a pass program could relieve neighborhood parking pressure and increase potential enrollments by reducing the transportation costs of attending the university. The two key factors with this innovation were the presence of a champion and a plan to provide money for the service. The champion served as the link amongst the students, transit agency, and the administration. Because the administration was concerned about the additional cost to the students, money almost became a barrier to the implementation. However, because students voted in favor of the program the implementation of the innovation was possible.
Management Innovations

MCTS: Semi-Annual Quality Measurement Survey

Description:

The Milwaukee County Transit System (MCTS) started to conduct surveys to identify ridership concerns and areas of improvement in 1995. The questions related to the Job Access Reverse Commute (JARC) were added to the “Semi-Annual Quality Measurement Survey” in 1997. The idea of conducting surveys of the ridership was introduced internally, by a marketing director for the transit agency. The Quality Measurement Survey is used to measure over thirty different characteristics of the MCTS service by riders, with emphasis on two issues: 1) identify specific areas of responsibility and areas of quality measurement (e.g., bus cleanliness, timely maintenance, addressing survey responses) and 2) on-going profiling of ridership for monitoring basic demographic as well as use characteristics such as trip purpose, form of fare payment, frequency of use, etc.

Surveys are conducted twice a year, in October and April, using a random dial telephone survey. A sample of 400 households is used for the survey. The survey is conducted in April and October to avoid biases of special event riders in the summer and weather biases in the winter. Usually, regular riders are used for the survey. However, in April 2003, a comparable 400 households of non-riders were also surveyed to get information on potential new riders. The data (feelings, opinions and experiences) are collected amongst a representative sample of adults 18 years old or older. Only adults who have used the transit system within the 30 days prior to the survey are questioned. The survey usually takes about 5 minutes for non-riders and about 5-10 minutes for riders. A 15% rate of return requires that 100 people be called to get 15 completed rider surveys. Calls are made until 400 completed surveys have been obtained. The MCTS works with a professional market research firm, who compiles, interviews, reports and handles all of the arrangements for the survey.

Implementation Process:

Originally, the survey was conducted on a quarterly basis, but was eventually reduced to twice a year. Typically the two surveys cost between $8000 and $9000 each.
The benefits of doing the quality measurement survey are numerous. MCTS gets leading edge information on quality problems and can work quickly to correct them. MCTS can observe long-term trends by comparing data from past surveys. Characteristics of new or proposed features of service can be measured. For example, MCTS asked a question about rider familiarity and use of credit and debit card for daily purchases. Also, issue related questions could be asked on a limited basis if the timing of the survey is favorable (e.g., Did you vote in the last election).

The main goals of the MCTS are rider retention and to increase ridership. MCTS instituted the survey to gauge the riders and non-riders’ feelings and experiences, and to identify improvement areas. The Semi-Annual Quality Measurement Survey is just one of many innovations at the MCTS used to identify areas for improvements and meet travel demands in the county.
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Assessment:

The Quality Measurement Survey is focused on identifying areas of quality measurement and profiling ridership for monitoring basic demographics. Because the idea was generated internally, the champion was already present to lead the innovation. The survey was instituted to gauge riders and non-riders' feelings and experiences, and to identify improvement areas. Since the idea was originated internally to find ways to better serve the customers and there were numerous benefits associated with doing a quality measurement survey, there was no resistance. With this innovation, the lesson learned again emphasizes the importance of a champion to bring about change to an organization.

Transit Mutual Insurance Corporation of Wisconsin

Description:

Transit agencies in Wisconsin were concerned about insurance costs and in the late 1970s; the state hired a consultant for insurance related issues. The various transit agencies in the state were paying different deductibles and rates. A study was conducted to look into the possibility of combining coverages for some savings. As a result, the buying group, the Wisconsin Municipal Transit Insurance Commission, was formed. Transit agencies used a decision tree as a basis to decipher whether to become a member of the buying group or not. The insurance coverages for the members of the buying group were combined into one umbrella policy. Because of the combined insurance coverage, transit agencies were able to take advantage of the savings provided for by the umbrella policy.

In 1985, six months before the policy renewal, the buying group was told by the insurance company that its premiums would increase substantially. The buying group had six months to decide whether to continue its coverage with the current company or seek coverage elsewhere. During board meetings, discussions about forming their own mutual insurance company surfaced. When the buying group was told of its substantial premium increase for the following year, the group saw it as an opportunity to expand the group into its own mutual insurance company. The Wisconsin Department of Transportation (WISDOT) provided funding to study the possibility of starting a transit...
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mutual company. The study found that the buying group had enough resources to form its own mutual company.

First, the buying group had to go to the commissioner of insurance to get the approval to start an insurance company. The buying group had to get a charter to form its own mutual company. On January 1, 1986, bylaws were adopted and the Transit Mutual Insurance Corporation of Wisconsin (TMI) was officially established. The Transit Mutual Insurance Corporation, consisting of 19 transit agencies with fixed routes, was the first one in the nation. The head office is located in Appleton, Wisconsin.

The directors of the Wisconsin Municipal Transit Insurance Commission became Board of Directors for the Transit Mutual Insurance Corporation. The board members consisted primarily of people from the transit agencies, but some members were non-transit. The board membership is a 3-year term, and it is up to the community to select a member to be on the board of directors. An executive director runs the day-to-day operations with the help of three full-time and three part-time employees. The company now has three officers: president, vice president, and secretary/treasurer.

Because the company writes its own coverage, premiums have become cheaper. Annual premiums amount to about $1.5 million and the company cedes out $5 million for reinsurance. Transit agencies needing excessive coverage have to go outside of the company for coverage. Communities pay their premiums annually with the understanding that additional assessments could be made.

Implementation Process:

Communities used the decision tree process to decide whether to join. From the decision tree process, if communities stood to save money, they had to join the group. If it turned out to be a “wash,” then it was up to the community to decide whether to join. If it cost more money, then the community could opt out and stay with the local carrier. When the insurance rates were determined, it turned out to be a 30-50% savings for everybody. Fifteen out of twenty transit systems joined immediately. Watertown eventually dropped out of the Transit Mutual Insurance Corporation because it had changed its fixed route to a shared ride, and Milwaukee was never part of it.
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One of the main advantages of the buying group was that due to the low insurance rates, it was cheap. For 17 years the Transit Mutual Insurance Corporation has had stable insurance rates, and more effort has taken place to control risk by agencies in the pool. Other advantages of the TMI are that if all of the premiums are not spent (for claims, etc.), the money goes back into the bank account, and if premiums do go up TMI offers premium deductions.

The implementation cost for the Transit Mutual Insurance Corporation was about $1 million to $1.25 million. Since 1986, TMI has saved about $7 million dollars. Each year, the Board of Directors votes on a premium reduction dividend from top of the premium amount. This amount has been stable at a 30% discount for the past several years. This premium reduction comes from savings in claims.

Even before getting the approval to form the mutual insurance company, the buying group had all of the necessary information before January 1, 1986. If a state does not already have a buying group, the formation of their own mutual insurance company will depend on the will of the communities, champion of the idea to lead, support of the community, and a personal will.

Assessment:

The TMI corporation came about because the buying group was faced with a steep increase in insurance rates and had six months to decide whether to continue its coverage with the current company or seek coverage elsewhere. TMI has enjoyed low and stable insurance rates for 17 years. Because the company writes its own coverage, premiums have become cheaper. If all of the premiums are not spent, the money goes back into the bank account, and if premiums do go up TMI offers premium deductions. The corporation came about because there was a need to make a decision about continuing coverage or seeking coverage elsewhere. The buying group acted as its own champion to bring about change to the organization. Forming the first corporation of its kind in the country was an innovation itself. The issue of a champion was critical with the implementation of this innovation. Because the buying group acted as its own champion, there was no resistance.
Technological Innovation: Waukesha Internet Trip Planner

Description:

The internet trip planner is an easy and efficient transit routing system that can be accessed via the web 24 hours a day. It provides the user with specific instructions of which routes to take and where and when they may need to transfer. Suggested routes are time sensitive and are changed based on the requested time of day of the trip. Anyone wanting information on how to get from point A to point B can use the internet trip planner to obtain detailed directions within the City of Waukesha. Metro’s Internet Trip Planner project began in July 2000 and culminated in a media event where stakeholders, local officials, social service and employment agencies, and press were invited to the kickoff celebration of the implementation at the Workforce Development Center in Pewaukee, Wisconsin in December 2001. Since its implementation in December 2001, various issues and problems pertaining to the usage of the internet trip planner have been sorted out and the system has been running smoothly since mid 2002. Promotion of the Metro Internet Trip Planner has included word of mouth, advertisement on bus schedules, mention of its existence in print advertisements, and news coverage by local television news.

Implementation Process:

Waukesha Metro Transit (Metro) implemented the first internet trip planner in the state of Wisconsin. It was developed through a collaborative effort involving the University of Wisconsin-Milwaukee, UWM-Center for Transportation Education (CTED), Waukesha Metro Transit (Metro), and the City of Waukesha. Metro bus riders can obtain information about trip directions, bus stop locations, transfer points, schedule information, length of travel time, and a map of the trip. There are similar internet trip planners in other cities in the U.S., but the Metro’s Internet Trip Planner is the first one to be based on the Internet Geographical Information System (GIS) technology.

A prototype of an internet trip planner existed on the northwest side of Milwaukee, for the usage by persons on Temporary Assistance for Needy Family
CASE STUDIES AND SURVEY RESULTS

(TANF) program. This prototype was based on a grant and consisted of 3-4 routes. After this prototype, in collaboration between the University of Wisconsin-Milwaukee planning faculty and the UWM-CTED, an application for a WETAP grant was made to the state to further the prototype into a larger transit area.

The City of Waukesha was selected for this project because of its receptiveness to change and openness to opportunity for improvements. The city was approached for its transit size, 10 routes. This was an ideal size to serve as an incubator for the first implementation of an internet trip planner. The idea was to implement the trip planner on a smaller system, and then proceed to a larger transit system. In addition, the Waukesha area was a high growth area at the time, and many people were commuting into the city for work. If a person seeking a position in the Waukesha area was concerned about transportation access, the Human Resources person of a company could provide that information by using the internet trip planner. During the interview, the Human Resources person could access the website to get the best routing option for the potential hire. The W2 (Welfare to Work) agencies could use the tool as well to provide information to those who need transportation to a job.

The intent of the project was to create a system that anyone in the four-county perimeter could have access to transportation for jobs, education, child care, and as a consequence, assist with welfare reform. With access to transportation, people who are unemployed will have an easier time to get to the jobs. With any transit system, information is needed to connect people to transit in addition to providing a comfortable atmosphere and convenient routes. It was envisioned that a regional system would be developed with each transit system having its own server and data.

The internet trip planner was added to the transit system website to provide better information to the transit riders. Before the internet trip planner, users of the Metro website only had route schedules for trip planning. It provides easy access to information, and has been designed to be simple to use. If there were disadvantages, it would have to be that the human element is avoided when riders access the internet to get directions. The riders are interacting with a computer versus speaking to a live
Innovation at Transit Systems

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person to obtain trip information. A positive consequence to the internet trip planner, the
volume of phone calls requesting directions has been reduced at the transit office. The
usage of the internet trip planner has been monitored by the number of trips planned per
day. On an average weekday, 2800-3000 trips are made on Metro. Metro is able to
gauge the usage of the internet trip planner by the number of trips planned on the
internet. The usage has significantly increased. Since July 2002 the number of trips
planned per day has increased from 1.3 to 18.2 in January 2003.

The most time consuming portion of the project was data collection, cleaning up
and processing. Bus route and schedule data needed to be collected and prepared in a
GIS format. Data (bus stops, transfer points, and route locations at different time of day)
needs to be consistent, accurate, and in order to be linked with a schedule. There are
route variations for each transit route. A route could have 20 variations for one day, and
could change for the weekend. There are over 800 stops, and some route variations
(e.g., express buses) do not make all the stops. The main obstacle from Metro’s point of
view was getting the server set up and having it set to work with the existing web.
Metro’s perspective is that everyone working on a project of this magnitude needs to be
committed, with one person coordinating and leading to keep everyone involved on task.

Assessment:

The Metro’s Internet Trip Planner is the first one to be based on the Internet GIS
technology. One of the reasons why the City of Waukesha was selected for the
innovation was because of its receptiveness to change and openness to opportunity for
improvements. The internet trip planner was added to the transit system website to
provide better information to the transit riders. Before the internet trip planner, users of
the Metro website only had route schedules for trip planning. The collaboration between
the University of Wisconsin-Milwaukee faculty and the UWM-CTED, and a WETAP grant
made the implementation of the innovation possible. Because of the WETAP grant,
money did not pose as a barrier. The lesson learned is that a champion is critical to
implementing a change. In this case, various collaborators served as champions of the
innovation. By working together and acting as the leaders of the project, the first internet
trip planner based on GIS technology was possible.

“The lesson learned is that a champion is critical to implementing a change.”
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Case Studies Findings

There are many factors and issues to consider when transit agencies bring about an innovation. In analyzing the nine case studies, ten factors were identified beforehand to examine whether any of these factors were involved in the implementation of the highlighted innovation. These factors were: cost, risk of failure, lack of personnel, negative media attention, political climate, champion, labor contract, ability to explain innovation, time to implement, and persistence. Upon analysis of the case studies, it was found that seven of the ten factors were utilized in the implementation of the innovations. Two factors were prevalent in the majority of the case studies: cost and champion. In fact, the idea of a champion played a major role in bringing about the innovation for all nine case studies. Some of the factors, lack of personnel, labor contract, and ability to explain the innovation were not prominent in any of the case studies. These factors were either not important or not considered in the implementation of the innovation. An analysis of the case studies showed that there are many common themes and barriers to the various innovations highlighted. (See Table 1)

One common theme that was prevalent in all of the case studies but was not identified, as a factor in the innovation implementation was “need.” All of the innovations discussed in the case studies came about in response to problems and a desire to make improvements to the transit systems. The Caledonia Shared-Ride came about to better serve the residents located in the middle of the fixed-route loop. The Madison Transfer Centers came about to serve the needs of those in the suburban areas commuting into the city. The Milwaukee County Transit System’s Semi-Annual Measurement Survey started out to gauge the experiences of riders for finding improvement areas. The MCTS’s Special Events busing started out serving the Summerfest patrons to help alleviate traffic and parking demands around the Summerfest grounds but has expanded to include the State Fair and many of the ethnic festivals. The Ozaukee County Express came into being to provide transit access to those inside and outside of the county for employment in the county, thus helping to ease the labor shortage and contribute to the overall economy. The Ozaukee County Shared-Ride Taxi started out serving the elderly and the disabled but has expanded to serve everyone without access to automobiles or with difficulty getting to transit stops, and hence increasing the mobility options for all.
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The Transit Mutual Insurance Corporation came about because there was a need to find cheaper ways to insure the members of the buying group. The UWM’s UPASS came into being to solve the parking demand problem associated with the growth of the university. The Waukesha Internet Trip Planner began as a way to better serve those who may be transit dependent in finding the best and shortest routes possible to get to a destination. All of these innovations, changes, and improvements came about because there was a need for service level enhancement. The common theme amongst the transit agencies is that ideas and innovations were generated from a need to better serve residents, students, employment seekers, riders, and communities. Whether the need arose from increasing parking and traffic demands or to accommodate growth and labor shortage, the commonality among the innovations discussed in the case studies is that they were done in response to problems rather than solution in search of a problem.

Table 1 is a checklist of case studies and factors for innovation implementation. This table illustrates which factors were utilized in the innovation implementation for the respective transit agency. Cost was an important factor for Caledonia Shared-Ride, Madison Transfer Centers, MCTS: Special Events, Ozaukee Shared-Ride, Ozaukee County Express, Transit Mutual Insurance Corporation, and UWM-UPASS. For Caledonia Shared-Ride and Ozaukee County Express, CMAQ money was very crucial to bring about the change. Because of the CMAQ money, Caledonia was able to reduce their costs and change transit services. As for Ozaukee County Express, despite the political opposition faced, together with CMAQ and funding by local businesses, the county had an offer that they could not refuse. Initially, the main barrier to the Ozaukee County Shared-Ride Taxi program was money because the expansion of the program would have increased operational costs. For the UWM’s UPASS, the initial resistance came from the administration not wanting to increase student tuition fees any more than necessary. The program was able to overcome this resistance once the students voted in favor of such a program. Cost was an important factor for many of the transit agencies examined because it served either as the impetus or an initial barrier to change. Having enough funding allowed the transit agencies to implement the innovation.

The risk of failure is a factor that affected half of the transit agencies studied. Caledonia Shared-Ride, Madison Transfer Center, Ozaukee Shared-Ride, Ozaukee County Express, and UWM-UPASS were concerned about risk of failure. Whether the
CASE STUDIES AND SURVEY RESULTS

innovation dealt with changing transit services, changing transit operations overnight, expanding the current paratransit program to the general public, starting a new transit service, and creating a UPASS for students, the risk of failure factor was important. In all of these cases, had the innovation not worked, it would have meant going back to the status quo and not being able to make service enhancements for the public.

After the analysis of the case studies, it seemed that negative media attention would have affected Madison Transfer Center and MCTS: Special Events the most. For Madison, since the whole transit operations were being converted to the timed transfer system over night, had the innovation not worked the negative media attention could have been very unpleasant. Since one of the benefits of providing special events busing to festivals in Milwaukee was to introduce transit to those who normally do not utilize transit, negative media attention would have had the opposite effects.

Political climate was an important factor for Caledonia, Ozaukee Shared-Ride, and Ozaukee County Express. For the Caledonia Shared Ride program, the town board was at first resistant to the idea of changing transit services. In fact, the town had twice rejected the idea of a shared ride program. When asked the third time, the town finally said, "maybe." The political climate in Caledonia delayed the initiation of the innovation. For both the Ozaukee County Shared-Ride and Express, one of the key barriers to the implementation was political opposition. Although the political concerns kept the innovation in the news, the political climate of the county played an important role with initial skepticism of the innovation.

It should be noted that with regard to the Madison Transfer Centers, the transit agency had the support of the political leaders but had the neighborhood opposition to the project. Neighborhoods selected for the transfer centers resisted to the idea of having transit centers with retail and commercial establishments in their "backyard." Residents of the selected neighborhoods seemed to have the "NIMBY" (not in my backyard) attitude to the innovation. The opposition was overcome when the transfer center was redesigned to only accommodate riders making transfers and making it impossible for anyone to loiter around the centers due to the presence of retail establishments and seating areas. Since it took nine years to implement the change, the time factor was very important for Madison as well. Of all the case studies, the Madison innovation took the longest to implement.
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For Madison, persistence was also a key factor to the implementation of the innovation. The nine years of planning to implement the transfer centers only goes to show that persistence played a very important role. For Madison, it was the persistence of the transit agency officials that brought about change. For Caledonia, it was the persistence of the regional planning commission repeatedly suggesting the idea of a shared ride program to the town that was the impetus for transit service change. For Ozaukee County Express and UWM-UPASS, it was the persistence of the champions involved in the project that eventually brought about the innovation.

As for the general agreement amongst the case studies as to how to get an innovation to fruition, the common theme is having a champion to coordinate and lead the effort. The effort for the Ozaukee County Express, a champion and a visionary behind the project was critical. Madison Metro advised that a champion is needed to carry out the proposed new project. For the UWM’s UPASS, the Director of Physical Planning, Parking & Transit was instrumental in negotiating with the student leaders, administration officials, and MCTS. For the Waukesha Internet Trip Planner, commitment of the project staff and with one person coordinating and leading to keep everyone involved on task was necessary. In all nine case studies, the idea of a champion was very important. All nine transit agencies agreed that having a champion was crucial to ensure the project got started and implemented. Of all the factors identified, only the champion factor was important to all nine case studies highlighted. Thus, the role of a champion is very important and vital to bringing about the innovation to fruition.

A transit agency could have all of the right ingredients to bringing about change, but lack of proper funding could prevent the innovation from implementation. For some agencies, outside funding such as CMAQ money was critical to the innovation implementation. On the contrary, an agency could have all the money that’s available, but without a champion to spearhead and galvanize support for the innovation, change may not be possible. Basically, to address how to get an innovation to fruition, the answer is a combination of the following: a need for better level of service or to make improvements, a champion to lead and coordinate to bring about change, and money to fund the planning and implementation of the innovation. The factors identified are not exhaustive and depending on the innovation and the transit agency, factors involved will
CASE STUDIES AND SURVEY RESULTS

vary from one transit agency to the next. However, common themes are prominent: cost and the idea of a champion.

Table 1: Table of Innovations and Factors

<table>
<thead>
<tr>
<th>Factors</th>
<th>Caledonia Shared-Ride</th>
<th>Madison Transfer Centers</th>
<th>MCTS: Special Events</th>
<th>MCTS: Survey</th>
<th>Ozaukee Shared-Ride</th>
<th>Ozaukee County Express</th>
<th>TMIC</th>
<th>U-PASS</th>
<th>Waukesha Internet</th>
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<tr>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>Risk of failure</td>
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<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Lack of personnel</td>
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<tr>
<td>Negative media attention</td>
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<td></td>
<td>X</td>
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<tr>
<td>Political climate</td>
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<td>X</td>
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<tr>
<td>Champion</td>
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<td>X</td>
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<tr>
<td>Time to implement</td>
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<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Persistence</td>
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<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
CASE STUDIES AND SURVEY RESULTS

Survey Results

The second component of this study gathered information from transit agencies around the country about how they implement changes and innovations and identify barriers to innovation. This was done by email and an on-line survey. Out of 250 transit agencies emailed, 18 were undeliverable due to unknown recipients. Of 232 possible respondents, 49 transit agencies responded to the on-line survey. One agency submitted three responses; the latest one submitted was used for the analysis. The response rate for the on-line survey totaled 21%. A copy of the survey is given in Table 2.

Like any other on-line surveys, there were limitations as well. Since the on-line survey specifically addressed the issue of innovations, it is possible that only those transit officials interested in innovations filled out and submitted the survey presenting potential bias into the survey results. Although efforts were made to contact every transit agency in the country, not all transit agencies were contacted due to various reasons (e.g., known email addresses but unknown recipients, unknown email addresses, no contact information, etc.). Though more than 200 transit agencies were contacted about the survey, there was no control over who eventually filled out and submitted the survey. The responses to the questions may reflect the feelings and thoughts of the person filling out the survey and not necessarily that of the organization he/she represents.
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Table 2: On-line Survey

Innovations at Transit Agencies Survey

The purpose of this survey is to gather information about how transit agencies implement changes and innovations. The survey will take a few minutes to complete. No individual agency will be identified in the reporting of the results. Final results will be posted at http://www.uwm.edu/Dept/cuts/inno.pdf sometime in the Fall of 2004. Your input will be greatly appreciated. Thank you for your time and input.

1. What is the name of your transit agency?

2. How important are each of the following to your agency?

   1--Very important     2--Somewhat important     3--Neutral
   4--Somewhat unimportant     5--Not very important

   1  2  3  4  5

   Funding  ----------------------------
   Ridership ---------------------------
   Cleanliness of buses  ---------------
   Security on buses  ------------------
   High turnover of bus operators ------

On-Line Survey: Innovations at Transit Agencies
### Table 2: On-Line Survey continued…

3. Which of these is the primary concern at your transit agency?
   - Funding
   - Ridership
   - Cleanliness of buses
   - Security on buses
   - High turnover of bus operators
   - Other

   If other, please specify

4. What is the transit agency’s main local funding source?
   - Property tax
   - Sales tax
   - Income tax
   - Other local tax
   - No local funds

5. Who has the final decision making authority at your transit agency?
   - Board of Directors
   - City Council
   - County Board
   - Internal group
   - Director of agency
   - Other

   If other, please specify

6. What is your agency’s status with each of the following?
   - 1--In operation
   - 2--Being installed
   - 3--Considering for next year
   - 4--Considering in 3 years
   - 5--Not considering

<table>
<thead>
<tr>
<th>Ridership surveys</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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### Table 2: On-Line Survey continued…

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<tr>
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<td>X</td>
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<td>Changed maintenance practices</td>
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<td>Automatic passenger counters</td>
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</tr>
<tr>
<td>Security cameras</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>Alternate fuel buses</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Bus rapid transit</td>
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</tr>
<tr>
<td><strong>Other, please specify</strong></td>
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</tbody>
</table>

**Other, please specify**

**Other, please specify**

**Other, please specify**
CASE STUDIES AND SURVEY RESULTS

Table 2: On-Line Survey continued…

(The National Science Foundation defines innovation as “a technology new to a given organization.” We are interested in how your agency reacts to innovation. For the purpose of this research, “innovation” is used not only as new technology but something new to the organization.)

7. What is the average time (planning and implementation) that it takes to implement an innovation or change at your transit agency?
   - Less than 6 months
   - 6 months - 1 year
   - 1 - 2 years
   - 2 - 3 years
   - 3 - 4 years
   - 4 - 5 years
   - 5+ years

8. What is the agency’s attitude towards innovation?
   - Very high
   - Moderately high
   - Neutral
   - Some resistance
   - Very resistant

9. What is the primary reason for change or implementing an innovation in your agency?
   - Internal champion/leader pursued the innovation
   - Board suggestion
   - Ridership suggestion
   - Other

   If other, please specify
Table 2: On-Line Survey continued…

10. How important are each of the following to your agency when you consider an innovation?
   1--Very important    2--Somewhat important    3--Neutral
   4--Somewhat unimportant    5--Not very important

<table>
<thead>
<tr>
<th></th>
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<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>Initial cost of innovation</td>
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<td>☐</td>
<td>☐</td>
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<tr>
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<tr>
<td>Risk of failure</td>
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<td>☐</td>
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<tr>
<td>Lack of personnel</td>
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<td>☐</td>
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<td>☐</td>
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<tr>
<td>Internal leadership</td>
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</tr>
<tr>
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<tr>
<td>Ability to explain innovation</td>
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<td>☐</td>
<td>☐</td>
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</tr>
</tbody>
</table>

11. What primary institutional barrier does your agency face when implementing a change/innovation?

☐ Money    ☐ Internal leadership    ☐ External government bureaucracy
☐ Organization's nature    ☐ Time    ☐ Lack of personnel    ☐ Other
### CASE STUDIES AND SURVEY RESULTS

**Table 2: On-Line Survey continued…**

If other, please specify ____________________________

12. How many years have you worked in the transit industry (both private and public)?

- [ ] 1 - 5 years
- [ ] 6 - 10 years
- [ ] 11 - 15 years
- [ ] 16 - 20 years
- [ ] 21 - 25 years
- [ ] 26 - 30 years
- [ ] 31+ years

13. What is your current position at the transit agency?

- [ ] Director
- [ ] Consultant
- [ ] Staff
- [ ] Other

If other, please specify ____________________________

14. How many vehicles do you operate during peak hours? ____________________________

15. What is the zip code of the transit agency? ____________________________
CASE STUDIES AND SURVEY RESULTS

Table 2: On-Line Survey continued…

16. Any other thoughts/comments/suggestions on the issue of innovations at transit agencies.

“The purpose of the on-line survey was to gather information about how transit agencies implement change and innovations.”

The purpose of the on-line survey was to gather information about how transit agencies implement change and innovations. Questions addressed the importance of certain issues, the agency’s primary concern, the status of certain innovations, the agency’s attitude towards innovations, the importance of various issues when considering an innovation, and the institutional barrier to innovation. Analysis was done using responses of all 49 transit agencies and then the transit agencies were divided into two groups: small and large size transit agencies. Transit agencies with less than 100 vehicles in the fleet were categorized into small size transit agencies (29 respondents).
CASE STUDIES AND SURVEY RESULTS

Transit agencies with more than 100 vehicles in the fleet were categorized into large size transit agencies (20 agencies).  

For three questions with ordinal degree of importance, weighted averages were calculated. Two questions: how important are each of the following to your agency and how important are each of the following to your agency when you consider an innovation had responses: very important, somewhat important, neutral, somewhat unimportant, and very important. The responses to these two questions were weighted from a score of 1 being the least important to 5 being the most important. The third question relating to the agency’s status with each of the various innovations had responses: in operation, being installed, considering for next year, considering in 3 years, and not considering. The responses for this question were weighted from a score of 1 being not in consideration or least completed to 5 being the most completed or implemented. The weighted averages measured the degree of implementation.

The figures for the weighted averages represent three averages: one average for responses by all transit agencies, one average for responses made by large transit agencies (agencies with greater than 100 vehicles), and one average for responses made by small transit agencies (agencies with less than 100 vehicles).

Importance of Various Issues

The first question asked the respondents how important various issues are at their agency. These were: funding, ridership, cleanliness of buses, security on buses, and high turnover of bus operators. More than 90% of the respondents said funding and ridership were “very important.” For cleanliness of buses and security on buses, more than 70% of the respondents said these two issues were very important and 18%-20% of the respondents said the two issues were “somewhat important.” As for high turnover of bus operators, only 35% of the respondents said this issue was “very important,” whereas 27% said it was “somewhat important,” 18% were neutral, and 20% of the

73 Any graph with notation “large” indicates large size transit agencies with more than 100 vehicles and “small” indicates small size transit agencies with less than 100 vehicles. Any graph without the “large” or “small” designation signify “all” transit agencies, meaning responses from all 49 agencies were used in the analysis.
respondents said the issue was either “somewhat unimportant” or “not very important.” (See Tables 3 and 4)

<table>
<thead>
<tr>
<th></th>
<th>Funding</th>
<th>Ridership</th>
<th>Cleanliness</th>
<th>Security</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very important</td>
<td>45</td>
<td>45</td>
<td>37</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Somewhat unimportant</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Not very important</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3: Importance of Various Issues at Transit Agencies Frequency

<table>
<thead>
<tr>
<th></th>
<th>Funding</th>
<th>Ridership</th>
<th>Cleanliness</th>
<th>Security</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very important</td>
<td>92%</td>
<td>92%</td>
<td>76%</td>
<td>71%</td>
<td>35%</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>4%</td>
<td>2%</td>
<td>20%</td>
<td>18%</td>
<td>27%</td>
</tr>
<tr>
<td>Neutral</td>
<td>0%</td>
<td>2%</td>
<td>0%</td>
<td>8%</td>
<td>18%</td>
</tr>
<tr>
<td>Somewhat unimportant</td>
<td>0%</td>
<td>0%</td>
<td>4%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Not very important</td>
<td>4%</td>
<td>4%</td>
<td>0%</td>
<td>2%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Table 4: Importance of Various Issues at Transit Agencies Percentages

Figure 1 illustrates the weighted average for the question: How important are each of the following to your agency? Just as expected, funding was found to be the most important of the issues measured amongst all transit agencies. Small size transit agencies also found funding to be the most important issue. For large size transit agencies, ridership was found to be the most important issue.
Figure 1: Weighted Average-Importance of Various Issues
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Both small and large agencies rated the issues nearly the same. In comparing the averages between large and small agencies for funding, ridership surveys, cleanliness of buses, security on buses, and high turnover of bus operators using the t-test showed that there was no significant difference in the rating of these issues by large or small agencies. Only driver turnover showed a difference in that small agencies rated it more important than large agencies. Table 5 shows the t-test results for the weighted averages between large and small agencies regarding Importance of Issues. Raw data and percentages for large and small agencies are shown in Appendix D.

<table>
<thead>
<tr>
<th>Importance of Issues</th>
<th>Funding</th>
<th>Ridership Surveys</th>
<th>Cleanliness of Buses</th>
<th>Security on Buses</th>
<th>Turnover of Bus Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>df</td>
<td>36</td>
<td>39</td>
<td>38</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>t-test</td>
<td>0.3133</td>
<td>-0.1638</td>
<td>0.1917</td>
<td>0.4705</td>
<td>1.4975</td>
</tr>
</tbody>
</table>

Table 5: Importance of Issues t-test

Primary Concern

Tables 6 and 7, and Figure 2 show the data for the question: Which of these is the primary concern at your transit agency? Not surprisingly, 67% of the respondents said funding was the primary concern at their transit agency while almost one-third (27%) of the respondents said ridership was the primary concern at their transit agency. Only one transit agency responded that security on buses was the primary concern. Two transit agencies listed other concerns, such as overcrowding on buses, providing good transit service, and unrestricted operating funding as their primary concerns. (See Table 6 and Figure 2)
CASE STUDIES AND SURVEY RESULTS

<table>
<thead>
<tr>
<th>Primary Concern</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>33</td>
<td>67%</td>
</tr>
<tr>
<td>Ridership</td>
<td>13</td>
<td>27%</td>
</tr>
<tr>
<td>Cleanliness of buses</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Security on buses</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>High turnover of bus operators</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 6: Primary Concern at Transit Agency

Figure 2: Primary Concern at Transit Agency Pie Chart
CASE STUDIES AND SURVEY RESULTS

For both large and small size transit agencies, funding was the primary concern followed by ridership. (See Table 7)

<table>
<thead>
<tr>
<th>Primary Concern</th>
<th>Large Agencies</th>
<th>Percent</th>
<th>Small Agencies</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>12</td>
<td>60%</td>
<td>21</td>
<td>72%</td>
</tr>
<tr>
<td>Ridership</td>
<td>8</td>
<td>40%</td>
<td>5</td>
<td>17%</td>
</tr>
<tr>
<td>Cleanliness of buses</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Security on buses</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>High turnover of bus operators</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>7%</td>
</tr>
</tbody>
</table>

Table 7: Primary Concern at Large and Small Transit Agencies

Local Funding Sources

Tables 8 and 9, and Figure 3 show the data for the question: What is the transit agency’s main local funding source? Responses for main local funding source varied. A third of the respondents said their main local funding source derived from sales tax and another third said it derived from other local taxes. Twenty-five percent of the respondents said their main local funding source came from property tax. One respondent said their main local funding source came from income tax and two respondents said there were no local funding sources. (See Table 8 and Figure 3)

<table>
<thead>
<tr>
<th>Main Local Funding Source</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property tax</td>
<td>12</td>
<td>25%</td>
</tr>
<tr>
<td>Sales tax</td>
<td>17</td>
<td>35%</td>
</tr>
<tr>
<td>Income tax</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Other local tax</td>
<td>16</td>
<td>33%</td>
</tr>
<tr>
<td>No local funds</td>
<td>2</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 8: Transit Agency’s Main Local Funding Source

“A third of the respondents said their main local funding source derived from sales tax and another third said it derived from other local taxes.”
CASE STUDIES AND SURVEY RESULTS

Figure 3: Transit Agency’s Main Local Funding Source Pie Chart

When transit agencies are categorized into small and large size agencies, the sources for main local funding are different. For large transit agencies, 45% of the respondents said sales tax was their main local funding source, followed by property tax (25%) and other local tax (20%). For small size transit agencies, 43% of the respondents said other local tax was their main local funding source, followed by sales tax (29%) and property tax (25%). For large size transit agencies, sales tax is an important funding source whereas for small size agencies, other local taxes play a big part as the funding source. (See Table 9)
CASE STUDIES AND SURVEY RESULTS

<table>
<thead>
<tr>
<th>Main Local Funding Source</th>
<th>Large Agencies</th>
<th>Small Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Property tax</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>Sales tax</td>
<td>9</td>
<td>45%</td>
</tr>
<tr>
<td>Income tax</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Other local tax</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>No local funds</td>
<td>1</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table 9: Main Local Funding Source for Large and Small Transit Agencies

Decision Making Authority

With regard to decision making authority, the following question was asked: Who has the final decision making authority at your transit agency? A little more than half of the respondents said the board of directors had the final decision making authority at the transit agencies. Sixteen percent of the respondents said a City Council had the final decision making authority, whereas another 14% said the County Board. None of the respondents said an internal group at the transit agency had the final decision making authority but 4% of the respondents said the director of the transit agency did have final authority. For the rest of the respondents, person or group having the final decision making authority included student government, the Secretary of Transportation, the general manager/local transit authority board, a regional Council of Governments, the mayor, and a transportation committee of a regional government. (See Table 10 and Figure 4)
**CASE STUDIES AND SURVEY RESULTS**

<table>
<thead>
<tr>
<th>Decision Making Authority</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Directors</td>
<td>28</td>
<td>57%</td>
</tr>
<tr>
<td>City Council</td>
<td>8</td>
<td>16%</td>
</tr>
<tr>
<td>County Board</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td>Internal Group</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Director of agency</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>8%</td>
</tr>
</tbody>
</table>

Table 10: Final Decision Making Authority at Transit Agencies

**Figure 4: Decision Making Authority at Transit Agencies Pie Chart**
CASE STUDIES AND SURVEY RESULTS

For large size transit agencies, an overwhelming majority (75%) of the respondents said the Board of Directors had the final decision making authority, whereas for small size transit agencies, only 45% of the respondents said the Board of Directors had the authority. For small size transit agencies, 28% of the respondents said the City Council had the final decision making authority, followed by 17% responding with the County Board. It seems that the decision making authority varied depending on the size of the transit agency. None of the respondents said an internal group had the final decision making authority. (See Table 11)

<table>
<thead>
<tr>
<th>Decision Making Authority</th>
<th>Large Agencies</th>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Small Agencies</th>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Directors</td>
<td>15</td>
<td></td>
<td>75%</td>
<td></td>
<td>13</td>
<td></td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>City Council</td>
<td>0</td>
<td></td>
<td>0%</td>
<td></td>
<td>8</td>
<td></td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>County Board</td>
<td>2</td>
<td></td>
<td>10%</td>
<td></td>
<td>5</td>
<td></td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>Internal Group</td>
<td>0</td>
<td></td>
<td>0%</td>
<td></td>
<td>0</td>
<td></td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Director of agency</td>
<td>1</td>
<td></td>
<td>5%</td>
<td></td>
<td>1</td>
<td></td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td></td>
<td>10%</td>
<td></td>
<td>2</td>
<td></td>
<td>7%</td>
<td></td>
</tr>
</tbody>
</table>

Table 11: Final Decision Making Authority at Large and Small Agencies

Agency’s Status With Various Innovative Activities

Raw data as well as weighted averages are illustrated in Tables 12 and 13, and Figure 5 for the following question: What is your agency’s status with each of the following? Only two of the listed activities had been implemented in most agencies with more than 80% of the respondents saying that ridership surveys and special events busing were in operation. More than 50% of the respondents said security cameras were in operation. Almost half or close to half of the respondents said transit centers, shared ride programs, and changed maintenance practices were in operation. However, 37% of the respondents also said that shared ride programs were not in consideration at
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all. It seems for shared ride programs, either the programs are already in place and operating or are not being considered for implementation. Also, a quarter of the respondents said changed maintenance practices were not being considered as well. Furthermore, close to 40% of the respondents responded that signal priority programs were not being considered.

More than 50% said that bus rapid transit was not being considered. However, about 34% of the respondents said that bus rapid transit was being considered either for next year or the next three years. Only 8% and 4% of the respondents said the bus rapid transit was already in operation or being installed, respectively. As for the automatic vehicle locator (AVL) and automatic passenger counters, the distribution of the responses seems even. One eighth (13%) of the respondents indicated that AVLs were not being considered, and a little over 20% said that AVLs were in operation, being installed, or being considered from 1 to 3 years. As for the automatic passenger counters, aside for 12% of the respondents responding that the program was being installed, about 20% of the respondents said the automatic passenger counters were already in operation, or being considered from 1 to 3 years. One-third of the respondents said the alternate fuel buses were in operation and another third indicated they were not being considered.

Some of the respondents also said that the following other activities were already in operation, being installed, or in consideration: values statement, on line trip planning, talking bus, new streetcar line, wireless communication ability, surveillance cameras, enhanced marketing, real time passenger info, voice announcements, community based transit, Smart Card fare box technology, and enhanced paratransit service. (See Tables 12 and 13)
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<table>
<thead>
<tr>
<th>Activity</th>
<th>In operation</th>
<th>Being installed</th>
<th>Considering for next year</th>
<th>Considering in 3 yrs.</th>
<th>Not considering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveys</td>
<td>41</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AVL</td>
<td>13</td>
<td>8</td>
<td>9</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Signal</td>
<td>5</td>
<td>2</td>
<td>11</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>Transit Ctr.</td>
<td>22</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Shared Ride</td>
<td>24</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Special Events</td>
<td>41</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Maintenance Auto.</td>
<td>23</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Counters</td>
<td>11</td>
<td>6</td>
<td>11</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Cameras</td>
<td>28</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Alt. Fuel Buses</td>
<td>16</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Bus Rapid</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>9</td>
<td>26</td>
</tr>
</tbody>
</table>

Table 12: Agency’s Status with Various Innovative Activities Frequency
CASE STUDIES AND SURVEY RESULTS

<table>
<thead>
<tr>
<th>Activity</th>
<th>In operation</th>
<th>Being installed</th>
<th>Considering for next year</th>
<th>Considering in 3 yrs.</th>
<th>Not considering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveys</td>
<td>84%</td>
<td>6%</td>
<td>8%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>AVL</td>
<td>27%</td>
<td>17%</td>
<td>19%</td>
<td>25%</td>
<td>13%</td>
</tr>
<tr>
<td>Signal</td>
<td>10%</td>
<td>4%</td>
<td>22%</td>
<td>24%</td>
<td>39%</td>
</tr>
<tr>
<td>Transit Ctr.</td>
<td>45%</td>
<td>10%</td>
<td>14%</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Shared Ride</td>
<td>49%</td>
<td>4%</td>
<td>4%</td>
<td>6%</td>
<td>37%</td>
</tr>
<tr>
<td>Special Events</td>
<td>84%</td>
<td>2%</td>
<td>0%</td>
<td>2%</td>
<td>12%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>48%</td>
<td>21%</td>
<td>4%</td>
<td>0%</td>
<td>27%</td>
</tr>
<tr>
<td>Auto. Counters</td>
<td>22%</td>
<td>12%</td>
<td>22%</td>
<td>20%</td>
<td>22%</td>
</tr>
<tr>
<td>Cameras</td>
<td>58%</td>
<td>6%</td>
<td>15%</td>
<td>8%</td>
<td>13%</td>
</tr>
<tr>
<td>Alt. Fuel Buses</td>
<td>33%</td>
<td>6%</td>
<td>6%</td>
<td>21%</td>
<td>33%</td>
</tr>
<tr>
<td>Bus Rapid</td>
<td>8%</td>
<td>4%</td>
<td>15%</td>
<td>19%</td>
<td>54%</td>
</tr>
</tbody>
</table>

Table 13: Agency’s Status with Various Innovative Activities Percentages

Figure 5 illustrates the weighted average by size of transit agency for the question: What is your agency’s status with each of the following? For large transit agencies, ridership surveys and special events busing were the most implemented. Among the small size transit agencies, ridership survey was also the most widely implemented.
CASE STUDIES AND SURVEY RESULTS

Figure 5: Weighted Average-Agency's Status with Various Innovations

Weighted Average: Agency's Status with Various Innovative Activities

- Ridership Surveys
- Security Cameras
- Transit Centers
- AVL
- Alternate Fuel Buses
- Bus Rapid Transit

Values represent the status of agency's adoption of various innovations, with higher values indicating more advanced implementation. The chart shows a weighted average across different categories, including all, large, and small agencies.
Evaluating the averages for status with various innovations between large and small agencies using the t-test showed that there were significant differences for some of the innovations. Depending on the innovation, it did make a difference whether the agency was large or small. Table 14 shows the t-test results for the weighted averages between large and small agencies regarding status with various innovations. The t-tests indicated that there was no difference between the averages of large and small agencies for the following innovations: ridership surveys, shared ride programs, special events busing, changed maintenance practices, and automatic passenger counters. On the other hand, there were significant differences for the following: AVL, signal priority, transit centers, security cameras, alternate fuel buses, and bus rapid transit. These innovations tend to be more capital intensive and more appropriate for congested areas. Thus, there may be more likelihood these innovations were applicable at larger agencies. Raw data and percentages for large and small agencies are shown in Appendix E.

<table>
<thead>
<tr>
<th>Innovation Status</th>
<th>df</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ridership Surveys</td>
<td>46</td>
<td>-0.7303</td>
</tr>
<tr>
<td>AVL*</td>
<td>45</td>
<td>-3.5003</td>
</tr>
<tr>
<td>Signal Priority*</td>
<td>28</td>
<td>-4.6748</td>
</tr>
<tr>
<td>Transit Centers*</td>
<td>47</td>
<td>-3.3342</td>
</tr>
<tr>
<td>Shared Ride Programs</td>
<td>42</td>
<td>-1.3286</td>
</tr>
<tr>
<td>Special Events Busing</td>
<td>46</td>
<td>-1.7654</td>
</tr>
<tr>
<td>Changed Maintenance Practices</td>
<td>42</td>
<td>-0.5535</td>
</tr>
<tr>
<td>Automatic Passenger Counters</td>
<td>39</td>
<td>-1.9292</td>
</tr>
<tr>
<td>Security Cameras*</td>
<td>45</td>
<td>-3.4970</td>
</tr>
<tr>
<td>Alternate Fuel Buses*</td>
<td>38</td>
<td>-2.2438</td>
</tr>
<tr>
<td>Bus Rapid Transit*</td>
<td>36</td>
<td>-2.1593</td>
</tr>
</tbody>
</table>

*Significant at 95% level

Table 14: Innovation Status t-test
CASE STUDIES AND SURVEY RESULTS

Average Time of Innovation Implementation

With regard to the question: What is the average time (planning and implementation) that it takes to implement an innovation or change at your transit agency, more than 50% of the respondents said it took about 6 months to 1 year. Only 6% of the respondents said that the average time for implementation was less than 6 months. A third of the respondents said the average time took 1 to 2 years for an innovation to be implemented. One tenth of the respondents said that it took more than 2 years to implement an innovation. (See Table 15 and Figure 6)

<table>
<thead>
<tr>
<th>Average Time</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 6 months</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>6 months - 1 year</td>
<td>25</td>
<td>51%</td>
</tr>
<tr>
<td>1 - 2 years</td>
<td>16</td>
<td>33%</td>
</tr>
<tr>
<td>2 - 3 years</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>3 - 4 years</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>4 - 5 years</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>5+ years</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 15: Average Time for Innovation Implementation
With regard to average implementation time, smaller transit agencies felt it took less time than large transit agencies. For large transit agencies, 45% of the respondents said the average time to implement an innovation was 1 - 2 years. For small transit agencies, 62% of the respondents said the average time for innovation implementation were 6 months to 1 year. (See Table 16)
CASE STUDIES AND SURVEY RESULTS

<table>
<thead>
<tr>
<th>Average Time</th>
<th>Large Agencies</th>
<th>Small Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Less than 6 months</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>6 months - 1 year</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td>1 - 2 years</td>
<td>9</td>
<td>45%</td>
</tr>
<tr>
<td>2 - 3 years</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>3 - 4 years</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>4 - 5 years</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>5+ years</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 16: Average Time for Innovation Implementation – Large and Small

Attitude Towards Innovation

Most of the responding transit agency’s attitude towards innovations was described as either very high or moderately high. Only 8% of the respondents said the agency was neutral and only 4% of the respondents said the agency was somewhat resistant to innovations. None of the respondents said that their agency was very resistant towards innovations. These results indicate that a majority of the respondents have a positive attitude towards innovations or change. (See Table 17 and Figure 7)

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high</td>
<td>18</td>
<td>37%</td>
</tr>
<tr>
<td>Moderately high</td>
<td>25</td>
<td>51%</td>
</tr>
<tr>
<td>Neutral</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>Some resistance</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Very resistant</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 17: Agency’s Attitude Towards Innovation

“Most of the responding transit agency’s attitude towards innovations was described as either very high or moderately high.”
CASE STUDIES AND SURVEY RESULTS

An agency's attitude towards innovation does seem dependent on the transit agency size. Ninety-five percent of the respondents at large transit agencies said their agency had a very or moderately high attitude towards innovation. At small transit agencies, 83% of the respondents said their agency attitude towards innovation was very or moderately high. (See Table 18)
CASE STUDIES AND SURVEY RESULTS

Table 18: Agency’s Attitude Towards Innovation for Large and Small

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Large Agencies</th>
<th>Frequency</th>
<th>Percent</th>
<th>Small Agencies</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high</td>
<td></td>
<td>10</td>
<td>50%</td>
<td></td>
<td>8</td>
<td>28%</td>
</tr>
<tr>
<td>Moderately high</td>
<td></td>
<td>9</td>
<td>45%</td>
<td></td>
<td>16</td>
<td>55%</td>
</tr>
<tr>
<td>Neutral</td>
<td></td>
<td>0</td>
<td>0%</td>
<td></td>
<td>4</td>
<td>14%</td>
</tr>
<tr>
<td>Some resistance</td>
<td></td>
<td>1</td>
<td>5%</td>
<td></td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Very resistant</td>
<td></td>
<td>0</td>
<td>0%</td>
<td></td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 19: Primary Reason for Change or Implementing an Innovation

<table>
<thead>
<tr>
<th>Primary Reason for Change</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal champion/leader pursued the innovation</td>
<td>37</td>
<td>76%</td>
</tr>
<tr>
<td>Board suggestion</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Ridership suggestion</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>14%</td>
</tr>
</tbody>
</table>

"76% of the respondents said that the primary reason for change or implementing an innovation at their agency was due to an internal champion or a leader pursuing the innovation."

Primary Reason for Change

Not surprisingly, 76% of the respondents said that the primary reason for change or implementing an innovation at their agency was due to an internal champion or a leader pursuing the innovation. Only 10% of the respondents said that the primary reason for change was due to suggestions from the board or ridership. Some of the responses in the “other” category were: changes in technology, affordability, perceived challenge, opportunity for increase ridership or revenue, improvement in operations/service/reduce operating costs, and planning decision based on operational needs. (See Table 19 and Figure 8)
CASE STUDIES AND SURVEY RESULTS

Figure 8: Primary Reason for Change Pie Chart

Size of the transit agency did not matter in that an internal champion was key to bringing about change to an organization for both size categories. (See Table 20)
When considering an innovation, an overwhelming majority of the respondents said initial cost of the innovation and operating costs were either very or somewhat important. For the initial cost of the innovation, 98% of the respondents said this issue was either very or somewhat important as opposed to only one respondent said that it was not very important. For operating costs, 95% of the respondents said either very or somewhat important, as opposed to only one respondent saying neutral and one not very important. More than 50% of the respondents said risk of failure and lack of personnel issues were somewhat important. A little more than 40% of the respondents said either negative media attention or the political climate were somewhat important when considering an innovation. However, 88% of the respondents said internal leadership was either very or somewhat important. With regard to the labor contract issue, close to 30% of the respondents were neutral on the topic. In fact 24% of the respondents said the labor contract was not very important when considering an innovation. On the other hand, 43% of the respondents also said labor contract issue was either very or somewhat important. Surprisingly, 66% of the respondents said the ability to explain an innovation was either very or somewhat important. The remaining
CASE STUDIES AND SURVEY RESULTS

34% of the respondents were neutral or considering this issue was not important. As expected, time to implement change was an important issue when considering an innovation. Seventy-one percent of the respondents said the issue of time was either very or somewhat important when considering an innovation. (See Tables 21 and 22)

<table>
<thead>
<tr>
<th></th>
<th>Very important</th>
<th>Somewhat important</th>
<th>Neutral</th>
<th>Somewhat unimportant</th>
<th>Not very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Cost</td>
<td>32</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>35</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Risk of Failure</td>
<td>8</td>
<td>25</td>
<td>10</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Lack Personnel</td>
<td>13</td>
<td>25</td>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Neg. Media Attn.</td>
<td>5</td>
<td>20</td>
<td>14</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Political Climate</td>
<td>11</td>
<td>21</td>
<td>12</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Internal Leadership</td>
<td>23</td>
<td>20</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Labor Contract</td>
<td>6</td>
<td>15</td>
<td>14</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Ability to Explain</td>
<td>14</td>
<td>18</td>
<td>7</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Time to Implement</td>
<td>12</td>
<td>23</td>
<td>9</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 21: Importance of Issues When Considering Innovations Frequency

<table>
<thead>
<tr>
<th></th>
<th>Very important</th>
<th>Somewhat important</th>
<th>Neutral</th>
<th>Somewhat unimportant</th>
<th>Not very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Cost</td>
<td>65%</td>
<td>33%</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>71%</td>
<td>24%</td>
<td>2%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Risk of Failure</td>
<td>16%</td>
<td>51%</td>
<td>20%</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td>Lack Personnel</td>
<td>27%</td>
<td>51%</td>
<td>16%</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>Neg. Media Attn.</td>
<td>10%</td>
<td>41%</td>
<td>29%</td>
<td>14%</td>
<td>6%</td>
</tr>
<tr>
<td>Political Climate</td>
<td>22%</td>
<td>43%</td>
<td>24%</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>Internal Leadership</td>
<td>47%</td>
<td>41%</td>
<td>6%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Labor Contract</td>
<td>12%</td>
<td>31%</td>
<td>29%</td>
<td>4%</td>
<td>24%</td>
</tr>
<tr>
<td>Ability to Explain</td>
<td>29%</td>
<td>37%</td>
<td>14%</td>
<td>8%</td>
<td>12%</td>
</tr>
<tr>
<td>Time to Implement</td>
<td>24%</td>
<td>47%</td>
<td>18%</td>
<td>6%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 22: Importance of Issues When Considering Innovations Percentages
CASE STUDIES AND SURVEY RESULTS

Figure 9 illustrates the weighted average by size of agency for the question: How important are each of the following to your agency when you consider an innovation? When considering the weighted average for all transit agencies, operating cost was found to be most important when considering an innovation. Large size transit agencies also found operating cost to be the most important consideration. However, rather than operating cost, the initial cost of the innovation was found to be the most important when considering an innovation for small size transit agencies, followed closely by operating cost. Regardless of the transit agency size, cost in general was found to be the most important when considering an innovation.

When considering innovations, the size of the agency did matter when it came to certain issues. Table 23 shows the t-test results for the weighted averages between large and small agencies when considering innovations. The t-tests indicated that there was no difference between the averages of large and small agencies for the following issues: operating cost, risk of failure, lack of personnel, possible negative media attention, political climate, internal leadership, and labor contract. On the other hand, there were significant differences for the following issues: initial cost, ability to explain, and time to implement change. Thus, it did make a difference whether the agency was large or small when it came to getting the program initially started. Raw data and percentages for large and small agencies are shown in Appendix F.

<table>
<thead>
<tr>
<th>Issues</th>
<th>df</th>
<th>t Stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Cost*</td>
<td>24</td>
<td>2.2393</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>27</td>
<td>0.9616</td>
</tr>
<tr>
<td>Risk of Failure</td>
<td>34</td>
<td>-0.0358</td>
</tr>
<tr>
<td>Lack of Personnel</td>
<td>39</td>
<td>1.4650</td>
</tr>
<tr>
<td>Possible Negative Media Attention</td>
<td>33</td>
<td>1.3078</td>
</tr>
<tr>
<td>Political Climate</td>
<td>42</td>
<td>1.4534</td>
</tr>
<tr>
<td>Internal Leadership</td>
<td>32</td>
<td>0.6900</td>
</tr>
<tr>
<td>Labor Contract</td>
<td>46</td>
<td>-1.7990</td>
</tr>
<tr>
<td>Ability to Explain Innovation*</td>
<td>32</td>
<td>2.9983</td>
</tr>
<tr>
<td>Time to Implement Change*</td>
<td>26</td>
<td>2.2624</td>
</tr>
</tbody>
</table>

*Significant at 95% level

Table 23: When Considering an Innovation t-test
Figure 9: Weighted Average-Issues When Considering an Innovation

Weighted Average: Importance of Issues When Considering Innovations

- Operating Cost
- Initial Cost
- Internal Leadership
- Lack of Personnel
- Time to Implement
- Political Climate
- Risk of Failure
- Ability to Explain
- Negative Media Attention
- Labor Contract

Legend:
- all
- large
- small
CASE STUDIES AND SURVEY RESULTS

Primary Institutional Barrier

As for the question: what primary institutional barrier does your agency face when implementing a change/innovation, 57% of the respondents said money. Fourteen percent of the respondents said lack of personnel was the primary barrier and another 12% of the respondents said external government bureaucracy was the main barrier to innovation. Only 12% of the respondents said internal leadership, organization’s nature, and time were their primary institutional barrier. Other primary barriers included: public input/resistance to any change and training on new equipment/software/etc. (See Table 24 and Figure 10)

<table>
<thead>
<tr>
<th>Primary Institutional Barrier</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money</td>
<td>28</td>
<td>58%</td>
</tr>
<tr>
<td>Internal leadership</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>External government bureaucracy</td>
<td>6</td>
<td>12%</td>
</tr>
<tr>
<td>Organization's nature</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Time</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Lack of personnel</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 24: Primary Institutional Barrier
With the issue of money, it seems the size of the transit agency really does not matter. For both large and small transit agencies, the primary institutional barrier to implementing an innovation was money. However, lack of personnel is also a concern for small agencies. (See Table 25)
CASE STUDIES AND SURVEY RESULTS

<table>
<thead>
<tr>
<th>Primary Institutional Barrier</th>
<th>Large Agencies</th>
<th></th>
<th>Small Agencies</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Money</td>
<td>14</td>
<td>70%</td>
<td>14</td>
<td>48%</td>
</tr>
<tr>
<td>Internal leadership</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>External government bureaucracy</td>
<td>3</td>
<td>15%</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>Organization's nature</td>
<td>1</td>
<td>5%</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>5%</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Lack of personnel</td>
<td>1</td>
<td>5%</td>
<td>6</td>
<td>21%</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>7%</td>
</tr>
</tbody>
</table>

Table 25: Primary Institutional Barrier for Large and Small

Respondent's Years in Transit Industry

The respondent’s number of years in the transit industry (both private and public) seemed to be evenly distributed when categorizing the years into every five years. Only 10% of the respondents had more than 31 years of experience in the transit industry and only 18% had less than 5 years of experience. It seems the experiences of the respondents were varied and diverse. (See Table 26 and Figure 11)

<table>
<thead>
<tr>
<th>Years in Industry</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5 years</td>
<td>9</td>
<td>18%</td>
</tr>
<tr>
<td>6 - 10 years</td>
<td>8</td>
<td>16%</td>
</tr>
<tr>
<td>11 - 15 years</td>
<td>6</td>
<td>12%</td>
</tr>
<tr>
<td>16 - 20 years</td>
<td>8</td>
<td>16%</td>
</tr>
<tr>
<td>21 - 25 years</td>
<td>5</td>
<td>10%</td>
</tr>
<tr>
<td>26 - 30 years</td>
<td>8</td>
<td>16%</td>
</tr>
<tr>
<td>31+ years</td>
<td>5</td>
<td>10%</td>
</tr>
</tbody>
</table>

Table 26: Respondent’s Years in the Transit Industry

“The respondent’s number of years in the transit industry (both private and public) seemed to be evenly distributed when categorizing the years into every five years.”
The respondent’s years in the transit industry for large transit agencies were not evenly distributed. Ten percent of the respondents had less than 5 years of experience and only 15% had more than 31+ years of experience. Twenty percent of the respondents had 6-10 years in the industry, another 20% had 16-20 years, and 25% of the respondents had 26-30 years of transit industry experience. The years in the transit industry for small transit agencies is slightly more evenly distributed. Aside for 24% of the respondents with less than 5 years of experience and 7% with 31+ years in the transit industry, the percentage ranged from 10% to 17% for each of the other categories. (See Table 27)
**CASE STUDIES AND SURVEY RESULTS**

<table>
<thead>
<tr>
<th>Years in Industry</th>
<th>Large Agencies</th>
<th>Small Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>1 - 5 years</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>6 - 10 years</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>11 - 15 years</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>16 - 20 years</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>21 - 25 years</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>26 - 30 years</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>31+ years</td>
<td>3</td>
<td>15%</td>
</tr>
</tbody>
</table>

**Table 27: Respondent’s Years in the Transit Industry for Large and Small**

**Respondent’s Current Position**

Although the respondent’s years in the transit industry seemed diverse, more than 50% of the respondent held a director position and 29% had a staff position. There were no consultants among the respondents. The remaining 20% of the respondents held other positions at the agency that ranged from CEO to president to general manager to transit administration manager to program supervisor to administrator to operations manager. (See Table 28 and Figure 12)

<table>
<thead>
<tr>
<th>Current Position</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director</td>
<td>25</td>
<td>51%</td>
</tr>
<tr>
<td>Consultant</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Staff</td>
<td>14</td>
<td>29%</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Table 28: Respondent’s Current Position at the Transit Agency**
The percentage of respondents whose position was director for small and large transit agencies was similar. The difference was that the percentage of respondents who were staff members was higher at the large transit agencies. (See Table 29)

<table>
<thead>
<tr>
<th>Current Position</th>
<th>Large Agencies</th>
<th>Small Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
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<tr>
<td>Director</td>
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<td>Consultant</td>
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<tr>
<td>Staff</td>
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<td>35%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>15%</td>
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</table>

Table 29: Respondent’s Current Position at Large and Small Agencies
CASE STUDIES AND SURVEY RESULTS

Summary

Using an on-line survey to acquire general information about how transit agencies implement changes and innovations seems to have been an effective approach, especially if quick results are possible. Also, using the email and an on-line survey to ask for input was inexpensive and ideal for reaching a broad set of audiences (in terms of small and large size agencies). However, since the email was used to initially communicate with the transit agencies, those agencies without known email addresses were not contacted. Thus, the limitation was that not all transit agencies were contacted.

Comparing the case studies findings and survey results, it is not surprising that the primary reason for change was due to a champion or an internal leader pursuing the innovation with a source of funds to carry out the project. The survey results further substantiate the findings from the case studies. The two key elements to bringing about change or an innovation to an agency are having a champion or leader to pursue the innovation and availability of money/funding.
CONCLUSION AND RECOMMENDATIONS

Chapter 5: Conclusion and Recommendations

Conclusion

Innovation, change, and technology transfer can occur in many ways and different forms. Innovation is not necessarily new technology but is something new and different to an organization. According to Jelinek, “Innovation is a locally driven process that succeeds where organizational conditions foster the transformation of knowledge into products, processes, systems, and services.” Technology transfer is “aimed at using the benefits of someone else’s successful research, development or experience to their benefit locally—often at a fraction of the original development cost...in the transportation sector, as in any field, can be a catalyst for long-term change and improvements.”

There are many factors that affect the implementation of an innovation. The innovation needs to be simple, easy to try and introduce, have easily measured benefits, inexpensive, and provide significant improvements. Rubin identified eight elements related to the culture of change at rural and small urban area transit systems: “quality of service, focus on the mission, dynamic leadership, organizational support, community involvement and communication, staff development and motivation, build resources, and seize opportunity/serendipity.” In addition to these elements, Rubin also recognized the importance of having a strong manager.

The objective of this research is to identify the innovations the transit agencies have introduced and to analyze these innovations to understand the process that led to their adoption. Innovations are analyzed so that other transit agencies could have guidance when attempting to bring about similar changes to their organizations. Through this process, transit agencies could ascertain the benefits, advantages, and disadvantages of innovation from agencies that have already implemented that change and not make the same mistakes.

74 Jelinek, Mariann (Sam) Program Director, Innovation and Organizational Change Program, National Science Foundation, quoted from the Draft Report of the results of the National Science Foundation’s workshop, Partnerships: Building a New Foundation for Innovation, held June 18-19, 2001 in Arlington, Virginia, p. 11.

CONCLUSION AND RECOMMENDATIONS

In order to gauge how transit agencies implement innovations and identify barriers to change, this work consisted of two components: case studies and a survey. The case studies were conducted at transit agencies in the Milwaukee and Madison metropolitan areas to gather information through face-to-face meetings with transit officials about innovations that had already been implemented. The objective of the survey was to get a general sense of innovations from transit agencies across the country.

The literature reviews, case studies findings, and the survey agreed on the key issues important to bringing about change, primary institutional barriers to innovation, and primary reason for change. All of the innovations discussed in the case studies came about because there was a need and a desire for making improvements to the transit systems. The literature review revealed that there are many benefits to innovation and factors involved to bring about change. The on-line survey further substantiated the case studies findings.

One of the key factors to innovation implementation for the case studies was the presence of a champion. This idea is substantiated by the literature review that suggests having a strong manager was the key to change. The importance of having a champion to lead the effort is also corroborated by the survey, where 76% of the respondents said the primary reason for change was internal champion/leader pursuing the innovation. The champion factor was important for all nine case studies.

Persistence was an important factor in several of the case studies. Often the initial reaction to change was rejection or skepticism. This was the case with the Madison Transfer Centers project, UPASS, Caledonia Shared Ride, and Ozaukee Express bus. It was the persistence of SEWRPC suggesting the option of a Shared-Ride program to better serve the residents of Caledonia that brought about the change in transit services. For Madison, being able to carry out the change after nine years of planning showed persistence. These changes were originally rejected and took several attempts before they were adopted. About half of the respondents to the survey indicated that it takes 6 months to a year to implement a change and another third said one to two years. Case studies and the literature review revealed that implementation time is highly dependent on the innovation. Changes that are internal only can be done
CONCLUSION AND RECOMMENDATIONS

in a shorter time while those needing approval of outside organizations can take much longer.

Not surprisingly, 67% of the respondents said funding was the primary concern at their transit agency. When considering an innovation, an overwhelming majority of the respondents said initial costs of the innovation and operating costs were either very or somewhat important. Funding was found to be the most important of the issues measured amongst all transit agencies with operating cost to be most important when considering an innovation, regardless of the transit agency size. However, there was a difference of weighted averages between large and small transit agencies when it came to initial cost to implementation and operating costs. For operating costs, the size of the transit agency did not make a difference. Although costs in general is an important factor for all types of agencies, the initial cost to implementation plays more of an importance for smaller agencies when considering an innovation.

For many of the case studies, CMAQ funding played an important role in getting the innovation implemented. This was true for Caledonia Shared-Ride Transit, Ozaukee County Shared-Ride Taxi, and Ozaukee County Express. Because of their location in an ozone non-containment area, both the Town of Caledonia and Ozaukee County were able to take advantage of the CMAQ program and receive federal assistance. For these innovations, CMAQ money was critical to the implementation of the innovations.

Both the regional planning commission input and user involvement played an important role for Caledonia, Ozaukee Shared-Ride Taxi, and Madison Transfer Centers. SEWRPC’s suggestions to start a shared-ride program in Caledonia and convert the paratransit services in Ozaukee County into a shared-ride taxi program for the general public served as the impetus for implementing the transit changes. Because of neighborhood opposition to the transfer center plans, Madison Metro interacted more with their customers for additional input with the transfer centers. Although the regional planning commission input and user involvement factors were not measured in the survey, some of the case studies revealed their importance to bring about change.

Most of the responding transit agency’s attitude towards innovations was either very high or moderately high. Transit agencies may pursue an innovation to solve a problem or a transit agency may get selected for change due to its nature of the
organization. The City of Waukesha was selected for the internet trip planner innovation because of its receptiveness to change, openness to opportunity for improvements, and size. Some agencies like the Transit Mutual Insurance Corporation, City of Madison, and Ozaukee County used the “problem centered approach” to find the innovation that would best solve a specific problem.

Using a combination of case studies and survey was a good way to find out about innovation at transit agencies. Case studies provided first hand examples and the survey gave a general sense about innovations from transit agencies across the country. Although transit agencies face similar challenges and have analogous concerns, using both methods helped to substantiate findings. Not one method was better than the other, but the combination proved to be helpful. Because one cannot control who responds in a survey and the limited number of case studies, a combination of case studies and survey was a good and effective way to find out about innovation.

In summary, the case studies findings, survey results, and the literature review show that the two key elements to bringing about change or an innovation to an agency are having a champion to pursue the innovation and have funding available for the project. Literature reviews, case studies, and the survey results also reveal that it takes more than a champion and money to implement an innovation. Agencies should create conditions necessary where champions can emerge and are encouraged. This means a willingness to take risks, a tolerance for failure, an ability to clearly explain the innovation, and ways to measure its success. Having enough funding is not enough; the lack of a champion could delay or never have the innovation come to fruition. Transit agencies need to adopt a positive attitude towards change, identify a need, benchmark it, carefully select innovations, and implement them for continuous quality improvement.

Recommendations

What catalyzes institutional changes at transit agencies? Is it mere road congestion? Is it just a matter of getting more riders on the buses or reducing costs? Is it the desire of the transit agency wanting to emulate success for continuous quality improvement? Transit agencies need to demonstrate that transit is a viable travel mode.
CONCLUSION AND RECOMMENDATIONS

choice for those with and without access to transit, and explain to the public the many benefits of riding transit. For those who do not have easy access to transit, transit agencies need to be more innovative to make transit more accessible. One of the best approaches to emulate innovations is through benchmarking as evidenced by Madison’s benchmarking of transit centers in Washington State. By assessing, adopting, measuring, and studying the success/failures of other transit agencies, an organization could improve the current operations of one’s own agency. An innovation involves necessity, having a champion, overcoming barriers, and marketing the change.

In order for transit to stay competitive with other forms of travel modes, transit agencies need to be innovative. The case studies of innovation and survey give a sense of how an innovation is implemented and identify barriers to implementation. This work shows the importance of having a champion and funding to experiment. There is a need for transit agencies to share their experiences and expertise through various technology transfer outlets. Innovation and technology transfer should happen by information sharing (papers, workshops, publications, reports, etc.), partnerships, coalitions, technical assistance and training, and personnel exchange.\(^\text{76}\)

So the question is what can be done to increase innovation? The key is information gathering and sharing, and the recognition that innovation will help with continuous quality improvement. First, a need has to be recognized and realized. Transit agencies should identify a need within their organization for improvement. Then, transit agencies should identify an innovation that will address the need, followed by benchmarking innovations and changes of other transit agencies. Through benchmarking, transit agencies could learn from the other transit agencies about how and why the innovation came about, identify any barriers faced and how they overcame those barriers. If a champion is not already present, identifying and encouraging champions to lead the change is key. Creating a plan for the planning and implementation process is also critical. Transit agencies also need to seek funding for the innovation. Innovation is not easy and persistence is the key to making sure that the innovation does eventually occur.

\(^\text{76}\) A Guide to Transportation Technology and Innovation, U.S. Dept. of Transportation, Research and Special Programs Administration, January 2004, p. iii.
CONCLUSION AND RECOMMENDATIONS

Transit agencies, state and federal agencies should establish a separate innovation function or set it up within an innovation office. Personnel should be dedicated to finding out the various transit innovations occurring throughout the country for information gathering and dissemination. By analyzing transit innovations elsewhere, agencies could find guidance to bring about similar changes to their organizations. When an innovation office is established, office should examine innovations at transit agencies in other locations, understand the process that led to their adoption, identify barriers to innovation, and develop a general sense of attitudes towards innovation so that they could better assist in bringing about change to their organization.

The main goal of the innovation office needs to be gathering and disseminating information for better understanding of innovation implementation. In addition, the innovation office needs to identify potential champions at various transit agencies so they could encourage them and make it easier to overcome resistance to change, help transit officials understand that change requires persistence, seek out funding to cover experimental programs, and create an atmosphere conducive to change.
REFERENCES


REFERENCES


Jelinek, Mariann (Sam) Program Director, Innovation and Organizational Change Program, National Science Foundation, quoted from the Draft Report of the results of the National Science Foundation’s workshop, Partnerships: Building a New Foundation for Innovation, held June 18-19, 2001 in Arlington, Virginia.


REFERENCES


Appendix

Appendix A: Sample Interview Questions

(from Ozaukee County Shared Ride Taxi program interview)

1) How did the Shared Ride Taxi program come about?

2) Who does the Shared-Ride Taxi program service: areas

3) What is the official name of the program?

4) How riders/residents know about the taxi program?

5) When did the program start? How long did it take from initial to implementation stages?

6) Advantages of the shared taxi?

7) Disadvantages of the program?

8) What do you see as the benefits?

9) Costs of implementation?

10) Was there a concern about failure?

11) Ozaukee County’s attitude toward change/innovation?

12) How long did it take to approve and supplement the project?

13) Who was involved in the project?
    Other organizations?
    Private groups?
    Officials?
APPENDIX

14) How long will it take to implement the same program in another city?
15) Whose idea to start a share taxi program?
16) Who did you have to go to get approval? County Board of Supervisors?
17) What changes were made during the planning stage?
    Implementation stage?
    Any obstacles/hurdles?
18) Any dos and don’ts?
19) How observe the success of the program?
20) Anyone oppose the idea initially? Who? Why?
21) What’s next for County of Ozaukee?
22) OK to list contact information in report or webpage?
23) How easy was it to try the project?
24) How easy was it to see the results from the project?
25) Has the transit ridership increase of decline due to the shared taxi?
26) Has a survey been done to evaluate the success of the program?
27) Know of any other innovations in the state?
Appendix B: Sample Interview Report Format

Title
Summary
Description
User Assessment
Customers
Agency
Technology Assessment
Relative Benefits
Trial process
Observability
Complexity
Cost
Consequences of Failure
Implementation Issues
Contact Information
APPENDIX

Appendix C: Survey Questions

1. What is the name of your transit agency?
2. How important are each of the following to your agency?
   (Very important, Somewhat important, Neutral, Somewhat unimportant, Not very important)
   a. Funding
   b. Ridership
   c. Cleanliness of buses
   d. Security on buses
   e. High turnover of bus operators

3. Which of these is the primary concern at your transit agency?
   a. Funding
   b. Ridership
   c. Cleanliness of buses
   d. Security on buses
   e. High turnover of bus operators
   f. Other, specify

4. What is the transit agency’s main local funding source?
   a. Property tax
   b. Sales tax
   c. Income tax
   d. Other local tax
   e. No local funds

5. Who has the final decision making authority at your transit agency?
   a. Board of Directors
   b. City Council
   c. County Board
   d. Internal group
   e. Director of agency
   f. Other, specify
APPENDIX

6. What is your agency's status with each of the following?
   (In operation, Being installed, Considering for next year, Considering in 3 years, Not considering)
   - Ridership surveys
   - AVL
   - Signal priority
   - Transit centers
   - Shared ride programs
   - Special events busing
   - Changed maintenance practices
   - Automatic passenger counters
   - Security cameras
   - Alternate fuel buses
   - Bus rapid transit
   - Other
   - If other, specify _______

7. What is the average time (planning and implementation) that it takes to implement an innovation or change at your transit agency?
   - Less than 6 months
   - 6 months – 1 year
   - 1 year – 2 years
   - 2 – 3 years
   - 3 – 4 years
   - 4 – 5 years
   - 5+ years

8. What is the agency's attitude towards innovation?
   a. Very high
   b. Moderately high
   c. Neutral
   d. Some resistance
   e. Very resistant
9. What is the primary reason for change or implementing an innovation in your agency?
   - Internal champion/leader pursued the innovation
   - Board suggestion
   - Ridership suggestion
   - Other
   - If other, specify

10. How important are each of the following to your agency when you consider an innovation? (Very important, somewhat important, neutral, somewhat unimportant, very unimportant)
    - Cost of project
    - Operating cost of the implementation
    - Risk of failure
    - Lack of personnel
    - Media attention
    - Political Climate
    - Internal leadership
    - Labor contract
    - Ability to explain innovation
    - Time to implement change
    - Other
    - If other, specify

11. What primary institutional barrier does your agency face when implementing a change/innovation?
    a. money
    b. internal leadership
    c. external: government bureaucracy, City Council, County government
    d. Organization’s nature
    e. Time
    f. Lack of personnel
    g. Other
    h. If other, specify
APPENDIX

12. How many years have you worked in the transit industry (both private and public)?
   - 1 – 5 years
   - 6 – 10 years
   - 11 – 15 years
   - 16 – 20 years
   - 21 – 25 years
   - 26 – 30 years
   - 31+ years

13. What is your current position at the transit agency? Director
   a. Consultant
   b. Staff
   c. Other
   d. If other, specify _______

14. How many vehicles do you operate during peak hours?

15. What is the zip code of the transit agency?

16. Any other thoughts/comments/suggestions on the issue of innovations at transit agencies.
Appendix D: Importance of Various Issues - Large and Small Raw Data

<table>
<thead>
<tr>
<th></th>
<th>Funding</th>
<th>Ridership</th>
<th>Cleanliness</th>
<th>Security</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
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<tr>
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<tr>
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Table 30: Importance of Various Issues at Large Agencies Frequency

<table>
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<th>Ridership</th>
<th>Cleanliness</th>
<th>Security</th>
<th>Turnover</th>
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<td>5%</td>
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Table 31: Importance of Various Issues at Large Agencies Percentages
APPENDIX

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<th>Security</th>
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Table 32: Importance of Various Issues at Small Agencies Frequency

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</table>

Table 33: Importance of Various Issues at Small Agencies Percentages
Appendix E: Status with Various Innovations - Large and Small Raw Data

<table>
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<tr>
<th>Activity</th>
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<th>Considering in 3 yrs.</th>
<th>Not considering</th>
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Table 34: Large Agency’s Status with Various Innovative Activities Frequency
### APPENDIX

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<td>Bus Rapid</td>
<td>11%</td>
<td>5%</td>
<td>32%</td>
<td>21%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Table 35: Large Agency’s Status with Various Innovative Activities Percentages
### APPENDIX

Table 36: Small Agency’s Status with Various Innovative Activities Frequency

<table>
<thead>
<tr>
<th>Activity</th>
<th>In operation</th>
<th>Being installed</th>
<th>Considering for next year</th>
<th>Considering in 3 yrs.</th>
<th>Not considering</th>
</tr>
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<tbody>
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<td>Surveys</td>
<td>23</td>
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<td>2</td>
<td>1</td>
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</tr>
<tr>
<td>AVL</td>
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<td>4</td>
<td>5</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Signal</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Transit Ctr.</td>
<td>9</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Shared Ride</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Special Events</td>
<td>22</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Maintenance</td>
<td>14</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Auto. Counters</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Cameras</td>
<td>11</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Alt. Fuel Buses</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Bus Rapid</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>20</td>
</tr>
</tbody>
</table>

*Innovation at Transit Systems*
### APPENDIX

<table>
<thead>
<tr>
<th>Activity</th>
<th>In operation</th>
<th>Being installed</th>
<th>Considering for next year</th>
<th>Considering in 3 yrs.</th>
<th>Not considering</th>
</tr>
</thead>
<tbody>
<tr>
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<td>7%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>AVL</td>
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<td>14%</td>
<td>18%</td>
<td>32%</td>
<td>21%</td>
</tr>
<tr>
<td>Signal</td>
<td>0%</td>
<td>3%</td>
<td>7%</td>
<td>34%</td>
<td>55%</td>
</tr>
<tr>
<td>Transit Ctr.</td>
<td>31%</td>
<td>10%</td>
<td>14%</td>
<td>17%</td>
<td>28%</td>
</tr>
<tr>
<td>Shared Ride</td>
<td>41%</td>
<td>3%</td>
<td>3%</td>
<td>10%</td>
<td>41%</td>
</tr>
<tr>
<td>Special Events</td>
<td>76%</td>
<td>3%</td>
<td>0%</td>
<td>3%</td>
<td>17%</td>
</tr>
<tr>
<td>Maintenance</td>
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<td>17%</td>
<td>3%</td>
<td>0%</td>
<td>31%</td>
</tr>
<tr>
<td>Auto. Counters</td>
<td>14%</td>
<td>10%</td>
<td>24%</td>
<td>24%</td>
<td>28%</td>
</tr>
<tr>
<td>Cameras</td>
<td>39%</td>
<td>7%</td>
<td>21%</td>
<td>14%</td>
<td>18%</td>
</tr>
<tr>
<td>Alt. Fuel Buses</td>
<td>21%</td>
<td>4%</td>
<td>7%</td>
<td>29%</td>
<td>39%</td>
</tr>
<tr>
<td>Bus Rapid</td>
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<td>3%</td>
<td>3%</td>
<td>17%</td>
<td>69%</td>
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</tbody>
</table>

**Table 37: Small Agency’s Status with Various Innovative Activities Percentages**
APPENDIX

Appendix F: When Considering Innovations - Large and Small Raw Data

<table>
<thead>
<tr>
<th></th>
<th>Very important</th>
<th>Somewhat important</th>
<th>Neutral</th>
<th>Somewhat unimportant</th>
<th>Not very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Cost</td>
<td>9</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>13</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Risk of Failure</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Lack Personnel</td>
<td>3</td>
<td>11</td>
<td>4</td>
<td>1</td>
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<tr>
<td>Neg. Media Attn.</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>4</td>
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</tr>
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<td>Political Climate</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Internal Leadership</td>
<td>9</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Labor Contract</td>
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<td>7</td>
<td>9</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
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<td>2</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Time to Implement</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>2</td>
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</table>

Table 38: When Considering Innovations Frequency (Large)

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<th>Neutral</th>
<th>Somewhat unimportant</th>
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</thead>
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</tr>
<tr>
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<td>0%</td>
<td>5%</td>
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<tr>
<td>Operating Cost</td>
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<td>30%</td>
<td>0%</td>
<td>0%</td>
<td>5%</td>
</tr>
<tr>
<td>Risk of Failure</td>
<td>25%</td>
<td>40%</td>
<td>15%</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>Lack Personnel</td>
<td>15%</td>
<td>55%</td>
<td>20%</td>
<td>5%</td>
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<tr>
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<td>15%</td>
<td>20%</td>
<td>35%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Political Climate</td>
<td>15%</td>
<td>35%</td>
<td>40%</td>
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<td>0%</td>
</tr>
<tr>
<td>Internal Leadership</td>
<td>45%</td>
<td>40%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
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<td>Labor Contract</td>
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<td>35%</td>
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<tr>
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Table 39: When Considering Innovations Percentages (Large)
APPENDIX

<table>
<thead>
<tr>
<th></th>
<th>Very important</th>
<th>Somewhat important</th>
<th>Neutral</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Initial Cost</td>
<td>23</td>
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<td>0</td>
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<td>Operating Cost</td>
<td>22</td>
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<td>17</td>
<td>7</td>
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<td>1</td>
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<td>14</td>
<td>4</td>
<td>0</td>
<td>1</td>
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<td>16</td>
<td>7</td>
<td>3</td>
<td>1</td>
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<td>8</td>
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<td>1</td>
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<tr>
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<td>10</td>
<td>5</td>
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<td>1</td>
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<td>8</td>
<td>16</td>
<td>5</td>
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</table>

Table 40: When Considering Innovations Frequency (Small)

<table>
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<th>Very important</th>
<th>Somewhat important</th>
<th>Neutral</th>
<th>Somewhat unimportant</th>
<th>Not very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N=49)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Cost</td>
<td>79%</td>
<td>21%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>76%</td>
<td>21%</td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Risk of Failure</td>
<td>10%</td>
<td>59%</td>
<td>24%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Lack Personnel</td>
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<td>48%</td>
<td>14%</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Neg. Media Attn.</td>
<td>7%</td>
<td>55%</td>
<td>24%</td>
<td>10%</td>
<td>3%</td>
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<tr>
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<tr>
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<td>7%</td>
<td>3%</td>
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<td>0%</td>
</tr>
</tbody>
</table>

Table 41: When Considering Innovations Percentages (Small)