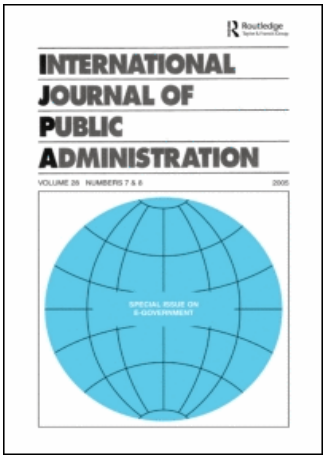

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Public–Private Partnerships in Transportation Policy: The Case of Advanced Traveler Information Systems

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Abstract: Increasing roadway usage has made achieving public transportation goals more challenging. Federal legislation has recognized that advanced technology, creating systems deployed by public-private partnerships (PPPs), can help meet these goals. Advanced Traveler Information Systems (ATIS) represent efforts to provide travelers with information about real-time traffic conditions so that they can make informed decisions about travel plans. Five model ATIS PPPs found in varying US metropolitan areas are proposed, each reflecting different roles and responsibilities of public and private partners. Actual experience is assessed, noting that ATIS PPPs often must evolve from one model to another to maximize effectiveness.

Keywords: advanced traveler information systems, public private partnerships

INTRODUCTION

Recent federal transportation policy, as reflected in both the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and the Transportation Equity Act for the 21st Century (TEA-21) of 1998, has recognized the need for partnerships that include state and local transportation agencies and stakeholders such as private sector contractors. Partnerships are viewed as potentially effective means of achieving national transportation goals. As stated by Francis Francois, these goals include:

- achieve and maintain an acceptable mobility level to satisfy local,
- regional, and national needs for the movement of people and things to their desired destinations;

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- minimize the time delays caused by congestion;
- maximize the safety of surface transportation by reducing the opportunities and propensities for crashes to a minimum.[1]

The challenge of reaching these goals is made more difficult by increasing roadway usage. From 1978 to 1998, for example, total vehicle registrations in the United States increased by more than 42 percent and vehicle miles of travel increased by 70 percent. Although 23.8 percent of all travel is on the Interstate Highway System, over 77 percent of the 3.9 million miles of roadways is under the jurisdiction of over 30,000 local governments. The need for coordination among all levels of government is essential.[2]

To meet national transportation goals, federal legislation recognizes that technology and partnerships can play a major role. The introduction and use of Intelligent Transportation Systems (ITS) has been stimulated by ISTEA and TEA-21. ITS reflects an understanding that national surface transportation goals may not be most effectively and efficiency met by building more roads or expanding existing roadways. Advanced Traveler Information Systems (ATIS), a component of ITS, are built upon the understanding that communicating information about traffic congestion to the traveling public in a timely manner may significantly help to lessen traffic congestion and thereby decrease travel times and lessen traffic fatalities. If travelers are informed of existing traffic conditions, especially those conditions caused by nonrecurring accidents or incidents, they will seek alternate routes or change travel plans, thus lessening congestion and reducing secondary accidents.[3]

The effective deployment of ATIS infrastructure components or subsystems requires cooperation and coordination among public sector agencies, from whom data regarding transportation conditions are collected, and among private contractors who often provide needed expertise and deployment capabilities. These have resulted in public–private partnerships (PPPs).

Collecting accurate and reliable information about congestion on freeways and arterial roadways and effectively disseminating this information has become the major challenge of ATIS. More than two dozen metropolitan areas nationwide offer information to travelers via websites. Stimulated by the decision of the Federal Communications Commission to designate 511 as a telephone number for traveler information, more than twenty states now offer traveler information via telephone.[4]

Metropolitan Model Deployment Initiatives, begun in 1996 with substantial USDOT support, stimulated the creation of ATIS PPPs.[5] Since then, these partnerships have undergone several evolutions. The ability of private partners to sell advertising and individualized subscriptions has not materialized in many metropolitan areas.[6] As a result, the initial expectations that public partners would be able to share in generated revenue have not been met. With more limited resources available, the nature of essential partnership activities such as marketing have changed as well. Public partner

involvement has become more crucial in determining the success of individual ATIS.

Also, fast-evolving technology has changed expectations and standards of what travel related data can be collected and how this data should be presented to the traveling public. Although most of existing infrastructure has been deployed on freeways, the ability to collect data on arterial roadways is now more possible. The deployment of cameras, allowing traffic management centers to view accidents in a more timely manner as well as providing website viewers real-time looks at traffic, have become more possible and essential to ATIS. These technology advancements have changed the nature of public–private partnerships, involving a greater number of local transportation and law enforcement agencies and providing greater amounts of data to be processed.

After first discussing the nature of ATIS services, this article next identifies characteristics of PPPs. The ATIS deployment experiences in several American metropolitan areas are reviewed, proposing models that represent different types of experiences. Throughout, analysis of success or failure is made. The conclusion focuses on ways in which future partnerships can be more successful.

ADVANCED TRAVELER INFORMATION SYSTEMS

ATIS contains information systems that encompass a variety of means providing up to date information to the traveling public regarding traffic congestion. There are essentially four components to an ATIS:

1. the content of the information collected and passed along to the public;
2. the information collection processes and devices;
3. the data collection or fusion hardware/software; and
4. the information dissemination means.

Data regarding traffic congestion can be collected from several sources, including police accident reports, inductive loops embedded in the highways, traffic camera feeding visible images to traffic management centers, 911 centers, travelers using cellular telephones, and traffic helicopters and airplanes. This information is typically sent to one data fusion operations center, created using a variety of hardware/software.

Typically, messages communicated or disseminated to the traveling public contain information about accidents, road construction, bad weather conditions, and other reasons for delay. These messages can be sent out via several means, including highway advisory radio, variable message signs posted along the highways, website information, telephone advisories and even e-mail alerts.[7]

PUBLIC–PRIVATE PARTNERSHIPS: DEFINITION AND CHARACTERISTICS

Increasingly, Public-Private Partnerships (PPPs) are found in a vast range of government-related products and services. It is a term that is politically popular, as it connotes greater efficiencies and higher quality services/products than if the public sector were the sole provider. It is also a term, though, that is often applied inappropriately.

In the most general sense, PPPs can be defined as:

> An arrangement of roles and relationships in which two or more public and private entities coordinate/combine complementary resources to achieve their separate objectives through joint pursuit of one or more common objectives.[8]

This generic definition does not provide a full understanding of the "separate objectives" and the "common objective" as it relates to transportation projects and ITS deployment. In simple terms, the objective of the public partners is to provide a public service by saving time and lives for the traveling public. The objective of the private partner is to make a profit. An example of a common objective is to relieve traffic congestion.

The private firm involvement may also lead to an improved reputation if the project is successful, as well as helping to meet a social or public policy need. Rather than a private firm, a nonprofit firm may become part of a PPP. The partnership will not be successful, however, if the separate objectives of public and private partners are not met.

Public-Private Partnerships

PPPs consist of partners from public and private sectors. They differ from traditional contractual relationships in several ways:[9]

- They involve providing a service (or product) that potentially can involve a great deal of uncertainty regarding how best to deliver that service
- The service may be highly complex
- Changing technology may determine varying ways to deliver the service; and/or require knowledge from service deliverers that is not present or difficult to obtain by one or more partners
- All partners have discretion to identify ways/means of achieving goals, resulting in is greater opportunity for innovation and creativity
- Risk occurs for each partner in a number of ways: for public agencies: private partners may not be able to achieve partnership goals; and for private agencies, there can be loss of profit, jobs, and reputation;

- Genuine cost-sharing is part of the partnership commitment, as all partners will contribute money and in-kind services
- Partnerships are characterized by expected long-term commitments and relationships

Overall, there is the expectation that the PPP is based on trust and shared commitment to solving a problem or resolving conflict. There is the recognition that flexibility is necessary and it is understood that the relationship will evolve and change over time. If deadlines are not met, or public agency goals change with changes in political leadership, then the partners need to discuss the basis of the partnership and construct a different relationship.

Benefits and Risks of ATIS Public–Private Partnerships

Throughout recent federal transportation policy, there is a strong recurring theme of encouraging private sector involvement. The basis for this encouragement recognizes the potential benefit that the private sector offers, both in terms of overcoming the weaknesses of the public sector and in terms of adding new expertise leading to better, more successful results.

There has also been a long-standing tradition within public DOT's to hire private-sector vendors to build roads, and so forth, rather than to have such expertise on staff. This tradition coincides with the underlying assumptions of the increasing privatization efforts of governments worldwide that assume private vendors can provide a more efficient service, or less costly product—while maintaining high levels of quality—than their public-sector counterparts.[10] In addition, it may be that a line item in a DOT budget that identifies payments to a private vendor to operate an ATIS for example, is more politically acceptable than having the function performed by public employees.[11]

In a PPP, the private sector also offers expertise—through tested software-based systems—and an additional source of funding. Public partners recognize that their staffs are not as knowledgeable about fast-evolving technologies that comprise ATIS as are their private-sector counterparts. Plus, investment in data collection devices such as cameras made by private partners foregoes the need for such capital investments by public partners and provides needed information much in a more timely fashion.

With some PPPs, especially those found in ATIS dissemination, there is the recognition that some end products are likely to be sold to individuals rather than seen as a public good and provided for free to the public. Customized traveler information would not be sought by all members of the public and therefore should be provided by private vendors.

These benefits have been offset by risks that still exist. Similar to potential problems that exist in traditional contracting relationships, the public management capacity to act as an effective partner may not exist. Public partners

may be required to monitor several contracts with private vendors as well as play a viable role while participating in a PPP.[12] If there are several public partners, some may become apathetic, not clearly understanding the role they can play to help achieve partnership objectives.[13] As a result, the cooperation and coordination among all partners required to most effectively achieve both public and private partner goals may be absent. Ultimately the PPP may fail as a result.

For the private partners, there are risks as well. Markets in many metropolitan areas have not been exploited, defined, or dimensioned. A reasonable return on investment cannot be promised, as many partnerships in which public partners provide financial support are only short term, often no more than five years.[14] Given the embryonic nature of markets for subscriber ATIS services, for example, a short-term agreement may not be sufficient for a reasonable return on investment.

Even though there have been few PPP successes in providing ATIS, the potential benefits outweigh the potential risks. The future vision of ATIS includes both data collected from arterial roadways[15] as well as freeways, and a prevalence of customized subscriber services providing needed travel information.[16] Public officials in many cases have neither the capital nor the will to invest sufficient funds in instrumenting all arterial roadways.[17] An effective PPP is a viable goal for both public and private sectors.

PUBLIC-PRIVATE PARTNERSHIPS: ADVANCED TRAVELER INFORMATION SYSTEM MODELS

The choice of ATIS partnerships depends on several factors that provide a context for a specific urban transportation system. These include: the amount of congestion on the freeways and on the arterial roads, both real and perceived; the viability of arterial roads as alternatives to congestion on the freeways; and the resulting political pressure on local policy makers.

Several issues must be resolved before a metropolitan area decides to adopt an ATIS. These are relevant to the roles of public and private partners. They include:

1. Who pays to construct the data collection system
2. Who pays to construct the data fusion system
3. Who pays for and disseminates the data
4. The choice of data dissemination modes
5. Who provides marketing/outreach information concerning
6. ITS/publicly provided ATIS services and/or privately provided ATIS services;
7. Should the public sector receive revenue as part of any partnership;
8. Who pays for the operations and maintenance of ATIS.

Partnerships occur, then, when one or more of the functions of data collection, data fusion, data dissemination, marketing/outreach, and operations/maintenance are shared between public agencies and private vendors. Sharing must entail contributions of funds and/or in-kind services on the part of public and private partners, and not simply the contracting of a private vendor to perform one of the functions. Where functions are provided separately by both, sharing also means the exchange of information or data, and the coordination—or even integration—of efforts.

Public-Private Partnership Models and Strategies: A Literature Review

Various authors, including Hallenbeck[18] and McQueen, et al.,[19] have identified PPP models and strategies. These earlier efforts provide broad overviews of public–private relationships and interactions. They suffer from: 1) not providing sufficient assessment of all of the functions that comprise the ATIS PPP; 2) not indicating how or why a metropolitan area ATIS may evolve from one model to another; 3) not providing models that reflect a wider range of actual experiences; and 4) not sufficiently indicating under what conditions one model is more successful or effective than another.

Hallenbeck identifies four business plans or PPP models, primarily describing public and private control of and responsibility for the functions of data collection, fusion, and dissemination. The Public Centered Operation Model indicates that the public provides most of the collection and fusion, with data given away to the general public. Private partners may or may not perform separate data collection and fusion, but all would disseminate information/sell data to individual members of the traveling public. The Contracted Operations Model differs only in that data fusion is largely handled by the private sector. The Franchise Operations Model indicates that the private sector fuses data may collect and disseminate data in addition and agrees to give the public partners fused data free of charge. The Private Competitive Operations Model indicates that the public-sector partners with more than one private partner fuse to data. Those private partners that fuse data may also disseminate data or contract with other private vendors for data dissemination.

A major strength of Hallenbeck's analysis is that it recognizes that different models provide different degrees of public and private control of ATIS. There is the implication that with greater public control, more data will be given away for free and revenue opportunities for the private partners will be lessened. His analysis of each model, though, omits other relevant aspects that are crucial to the issue of the public achieving its goal of better transportation management and the private achieving a goal of a reasonable return on its investment. More important is 1) the content of data that is collected; and 2) the percentage of relevant freeway and arterial roadway coverage. If public

collection is focused on transit information and on travel speeds and incidents for a limited portion of freeways only, then a private vendor could generate revenue by collecting data for the remaining freeways and incident data (if not speed data) for the arterials. This may be accurate no matter which model is adopted in terms of data fusion.

The marketing and public outreach functions are given limited analysis in any of the four models. There is no indication that vendors disseminating ATIS information have sufficient expertise or will invest sufficient funds to market successfully. Funds for public outreach may be limited as well. Without these functions, it may not matter how much data is given away for free if very few members of the traveling public know it is available.

McQueen et. al. add to the model development process by first developing theoretical models and then providing examples of Hallenbeck's original analysis. Eight theoretical models are developed by suggesting that the public and private sectors could each control or share one or more of the ATIS functions. These models recognize a wider possible range of PPPs. There is little recognition, however, of which of these models may be the most viable and effective in metropolitan areas in the United States.

Overall, both Hallenbeck's and McQueen's models are presented as if metropolitan areas have the ability to choose one or the other, not recognizing to what extent state laws, infrastructure, and legacy agreements may be in place prior to any interest in creating a PPP. If a given metropolitan area has already invested in some data collection and created a regional traffic management center but has yet to interact with private vendors, it should adopt a different model than if virtually no data collection and nor a traffic management center exists.

EFFECTIVE ATIS PARTNERSHIP MODELS

The following sections identify five ATIS partnership models that build upon previous classifications discussed above. These models reflect evolving partnerships, suggesting that over time a given metropolitan area may progress from one model to another.

These models can be grouped into **public controlled** (A: Public Controlled; B: Public Stimulated/Funded; and C: Public Stimulated/Non-Funded) and **private controlled** (D: Private Partnered; and E: Private Controlled) (see Table 1). In the first group, the public sector has paid for and still controls much of the data collection and data fusion functions. There is likely to be an extensive public–public partnership, especially with Model B, that supports ATIS through data collection efforts. There is also significant data dissemination performed by the public sector, even though there may be the expectation that the private sector will increasingly provide ATIS services that will reach greater numbers of users over time.

Table 1. ATIS PPPs

PPP Models	Data Collection	Fusion	Dissemination	Marketing/Public Outreach	Who Pays
			PUBLIC CONTROLLED		
A	public and private are separate; minimal exchange	public and private are separate	public and private are separate	no coordination	public and private are separate
B	public	public	public through website; private other means	minimal coordination	public pays; gives data to private with start-up funds
C	public	public	public through website; private other means	minimal coordination	public pays; gives data to private without start-up funds
			PRIVATE CONTROLLED		
D	public and private	private; limited public	private; limited public	moderate coordination	public pays private to provide all functions
E	public and private	private	private	moderate coordination	public pays private to provide all functions, expecting revenue return

In metropolitan areas that reflect private controlled models, a much greater amount of data collection and fusion is performed by the private sector. Data dissemination is also largely privately provided. For these functions, the public partners pay the private partners. Daily operations and maintenance as well as dissemination are all controlled by the private sector, even though the partnership agreement provides public partners with some degree of oversight and/or approval roles.

It is best to view each model along a continuum, as some metropolitan areas whose experiences would place them in Model A, for example, are closer to Model B than others. Some areas in Model A offer ATIS services on a limited basis, for example, disseminating information via highway advisory radio only. As they add ATIS services, for example, a website reflecting construction activity and travel speeds, they may decide to move closer to another model if they find that congestion relief is not as great as hoped.

Model A: Public Controlled

Under Model A, ATIS services are more directed to the general traveling public and are not specialized or personalized. These services are also less likely to provide significant information concerning incidents and traffic speeds on arterial roads. For some metropolitan areas this information may be sufficient to relieve congestion in the short term. Model A partnerships that work effectively may reflect strong public–public partnerships with relatively few private partners and limited ATIS dissemination means.

This model does not really reflect a significant public private partnership, as data exchange is limited or nonexistent. It is significant, however, as many of the 78 nationwide metropolitan areas deploying ATIS can be placed in this model.[20]

There are several dimensions that are appropriate for this model. These include:

1. severity of traffic congestion—both real and perceived;
2. tradition of privatizing government services;
3. interest in developing PPPs; and
4. strength of public-public partnerships/regional focus.

The traffic congestion problem is viewed in several ways. At one end of the dimension, congestion may not be viewed as severe by the traveling public and therefore not a highly prioritized public policy issue. For some cities, congestion is viewed as a growing problem but not yet severe. Predicted strong population growth leads to this conclusion. At the other end of the spectrum, congestion is severe and is a very evident public policy issue.

The response to traffic congestion varies, as well. The lack or absence of response is due to several factors: 1) low levels of congestion; 2) lack of

regionally based public–public partnerships; 3) low interest in developing PPPs; and 4) a lack of funds to invest in ATIS. Where there is a response that includes ATIS, it may be the result of efforts of a small group of state DOT officials, for example, that collect a small amount of data from cameras and loop detectors found on a limited amount of freeway miles. They may also disseminate information via highway advisory radio and variable message signs but do not have the support from other local government public agencies to provide a wider range of ATIS services.

At the other end of the response dimension, some metropolitan areas reflecting this model may have strong regional support and choose to focus efforts on advanced public transportation and other publicly supported ITS modes rather than forming PPPs. Accompanying this strong public response is the perception that there would not be a sufficient market to support personalized, subscriber-based services.

Both TransPort (Portland, OR) and Navigator (Atlanta, GA) represent ATIS models with a strong historical commitment to public cooperation among state and local transportation agencies. TransPort represents a collaboration among Oregon DOT, City of Portland, The Tri-County Metropolitan District of Oregon (Tri-Met—the Transit agency), and METRO (the Portland area Metropolitan Planning Organization).[21] There is a commitment among all agencies to staff limited ATIS services and to share the cost of providing basic infrastructure needs such as a fiber optic network.[22] Congestion is viewed as a growing concern, but with a commitment to light rail in the downtown area and to developing other means of mass transit, it is not yet a significant public policy issue.

Navigator is based on an extensive ATIS that was initially built and deployed in time for the 1996 Summer Olympic Games in Atlanta. It consists of a regional transportation management center connected via a fiber optic network with seven other transportation control centers in the five Georgia counties that surround Atlanta, the City of Atlanta, and the Metropolitan Atlanta Rapid Transit Authority (MARTA).[23] Congestion is viewed as a major issue, as the Atlanta region is ranked the eighth most congested urban area by the 1999 TTI Urban Mobility report.[24]

The Cleveland, OH and Buffalo, NY/Toronto (Canada) areas represent the opposite ends of the Public Controlled model. In both areas, limited congestion has perhaps lead to the lack of a commitment to provide more than minimal public ATIS services through highway advisory radio. Metro One Network provides some ATIS services, with the public sector dependent upon this information to some degree.

Model B: Public Stimulated/Funded

In these instances, the public partner, usually the state DOT, has committed to regional traffic management services. Often a traffic management center has

been well established prior to deployment of ATIS. Operations and maintenance are also supported by the public partners. In both the Aztech (Phoenix, AZ) and SmarTrek (Seattle, WA), strong federal support allowed public agencies to establish PPPs.

The private partners' primary responsibility is to disseminate the data. The means by which data is disseminated is the result of collaboration between public and private partners. In both Phoenix and Seattle, initial private partnerships did not succeed. There are differences in the public-partner approach to subsequent PPPs. In Seattle, private partners are welcomed, as long as no additional data collection requirements are placed on the public sector.[25] In contrast, AzTech has chosen to review proposals and support only those private partners who are likely to succeed.

The Arizona DOT Freeway Management System furnished the infrastructure basis of the AzTech Project. The AzTech Server was designed to collect and fuse data from a variety of sources, including freeways, arterial roadways, and transit. Two private partners joined the project from the start: TRW, which designed, created and implemented the AzTech Server, and ETAK, which developed an ATIS server that interfaced between the AzTech server and other internet service providers.[26]

Smart Trek includes several public partners: Washington DOT, the University of Washington, several suburban cities, King County Metro Transit, Washing State Ferries, King County DOT, and the Port of Seattle. Current private partners include ETAK and Metro Networks. Unlike AZTech, private partners were contracted to help manage several different aspects of project management, as two partners were designated as deputy project managers, one for system integration and one for operations and maintenance.[27]

Model C: Public Stimulated/Non-Funded & Model D: Private Partnered

TravInfo, in San Francisco, began as a field operational test that ran from September 1996 to September 1998. It was unique in that it encouraged an open architecture for its ATIS, allowing any private vendor to easily access collected data and provide specialized service to the traveling public. This data was collected and fused by the public partners and disseminated via means such as a telephone advisory service. Unlike those metropolitan areas in Model B, there were few start-up funds contributed to support private-sector ventures. Model C represents partnerships that hope to stimulate private sector information dissemination without public support and resources.

Difficulties in data collection and fusion led to an underutilization of the telephone service, as the information provided was viewed as often inaccurate

and incomplete.[28] Because of the resulting lack of successful PPPs, the project has evolved into Model D: private partnered. Public partners, represented by the Metropolitan Transportation Commission of the San Francisco Bay area, have committed $37.7 million for 2000–2006, partnering with PB Farradyne.[29] This partnership reflects a desire for the public to maximize the usage of the ATIS services. Incentives are provided to the private partner to increase the number of telephone calls and other measures of access to this information.

SUNGUIDE, in South Florida, originally began as Model E: privately controlled, including the expectation of revenue returned to the partnership. The public partners contribute data from freeways, while SmartRoute Systems, the private partner, collects data from cameras, from reports from the Florida Highway Patrol reports, and from a traffic airplane. Smart Route fuses all data and disseminates it via a telephone advisory service and e-mail updates.

The initial agreement with Smart Route was that the ATIS service provision would become self-sufficient within a specified timeframe, and that a percentage of profits after that time will be returned to the public agency. In South Florida, $3.96 million was paid to Smart Route Systems for three years. In turn, Smart Route Systems agreed to operate the ATIS for an additional two years without additional payment.

Smart Route has announced that no revenue has been generated from sales of disseminated information. The public partners have continued with the partnership, resulting in a clear shift to Model D. Initial assessment shows an enthusiastic response from a limited number of users responding to a satisfaction survey. With the advent of 511, the number of calls has risen dramatically in the second year of operation. Issues regarding the appropriate market and public outreach roles among public and private partners remain.[30]

Model E: Private Controlled

With Model E, the public may have built some data collection infrastructure by entering into traditional contractual roles. The private partner provides a significant amount—if not a majority—of the data collection, and performs all data fusion and dissemination functions. The public partner pays for these three functions, including the data collection. There is the expectation that private partners will generate revenue from the sale of advertising and subscription services, with a return of revenue to the public sector.

This model is labeled “private controlled” because there are few alternatives left to the public sector if the PPP is viewed as a failure. The private partner controls the revenue generated and the amount returned to the public partners. Because data fusion and dissemination is under the control of one private partner, involving other partners in these functions is unlikely.

There are few metropolitan areas in which this model remains viable. Partnerships in the Washington, DC and Northern Virginia area (Partners in Motion), and in South Florida (Sunguide) began using this model. Revenue returned to the public partnership in each area has either lessened or is not forthcoming.[31] As a result, Partners in Motion has failed,[32] while Sunguide has moved to Model D.

Another example of this partnership can be found in ARTIMIS, the ATIS PPP that serves Cincinnati and Northern Kentucky. The initial agreement between the states of Ohio and Kentucky for the ARTIMIS system was made in January 1994 with TRW, Inc., the systems manager. Both states contracted separately (with vendors other than TRW) for installation of loop detectors and cameras, with TRW providing design, testing, integration, implementation, and system maintenance of the software needed for the ARTIMIS traffic management center. TRW has continued as a private partner, providing systems manager functions for operations, including managing the traffic management center, a variety of dissemination means, the incident management program and the service patrol program.[33]

PPP EFFECTIVENESS: CRITERIA FOR ASSESSMENT

Assessing the effectiveness of ATIS PPPs can occur along several dimensions. As a result of lower traffic congestion, fewer accidents, fewer traffic related fatalities, and time saved traveling—with fewer delays—are examples of outcome measures. These criteria must be analyzed taking into account factors other than those that result from ATIS that may cause these outcomes. The number of travelers, weather, time of day, time of response to existing accidents by law enforcement are all examples of these factors.[34]

A significant output measure is the number of uses of the ATIS furnished data. For example, the number of calls received by a telephone advisory service or the number of hits on a website can be much more easily tallied. This measure assumes that, the greater the number of users, the greater the potential for trip diversion and the greater the chance that congestion will be lessened. There are few ways to measure, however, the extent to which this assumption is correct. The lack of viable arterial roadways, for example, may mean that travelers may decide to remain on a congested freeway even after accessing the ATIS service.

Interpreting results raises the key issue of standards. It is assumed that if the number of uses increases over time, that the ATIS services are effective. The introduction of 511, however, has caused vast increases in the number of callers. Although this is a positive result, it is recognized that the easy to remember three-digit number may be the major reason calls have risen. The number of calls as a percentage of the traveling public remains very small in all metropolitan areas.[35]

Consumer or user surveys potentially can offer a wide variety of useful data. Overall satisfaction with the accuracy and timeliness of the data can be evaluated.[36] There is a more valid assessment of how often alternative routes are chosen, and/or to what extent public transportation was used instead of the personal vehicle. Traditionally these surveys suffer from data collection challenges, as only those who access the ATIS are interviewed. To obtain data regarding awareness of ATIS services, focus groups have been used on a limited basis.

For example, two efforts to gauge satisfaction with ARTIMIS (Cincinnati/Northern Kentucky: Model E) have shown favorable results. A user survey in March 1999 concluded a very high satisfaction with the accuracy of the information received.[37] Similarly, in February 2000, Cambridge Systematics[38] held two focus group meetings regarding ARTIMIS usage. Forty percent of those interviewed were aware of ARTIMIS, but only 26 percent had used the telephone advisory service. Overall, though, satisfaction and perceived quality of service was quite high, and levels of traffic congestion were viewed as lessening.

CONCLUSION

Initial assessments of ATIS PPPs have indicated mixed success. In some cases a strong public-sector alliance coupled with limited private-sector involvement has worked well—at least in terms of achieving public partner goals. Memoranda of Agreements have been developed under the SmarTraveler ATIS (Model B) in Seattle, for example, that involve 17 suburban city agencies as well as Washington State DOT and the City of Seattle. The experience of TravInfo in San Francisco (Model C), however, indicates that without any initial public financial support private partners will not succeed. Likewise, the experience with Partners in Motion in Washington DC (Model E) indicate that public partners cannot expect revenue return from private partners in most metropolitan areas.

PPPs that are characterized by the two remaining models: Public Controlled (Model A) and Private Partnered (Model D) may have the most chance of continued success. Those metropolitan areas that exhibit a strong history of cooperation among public agencies and that have committed substantial funding toward building the infrastructure needed for an ATIS can be effective without much private partner involvement. This success may continue as long as the market for customized ATIS services remains nonexistent. If and when the demand for these customized services becomes viable, there is likely to be an evolution from Model A to B or C in order to maximize the effectiveness of private partners.

In those metropolitan areas without strong public agency cooperation, or with a culture that is favorable toward traditional contractual public private

relationships, Model D may become the most effective. To achieve continued success, though, public partners may have to demonstrate sufficient management capacity to ensure that private partners continue to effectively perform the necessary functions required by ATIS.

The role of public partners and the choice of private partners in the context of whatever model is chosen continue to be complex and challenging. The key issues in PPP creation are 1) the quality and effectiveness of the technology (software and hardware) that is deployed to collect and fuse the data; 2) the delivery of the information to the traveling public in terms of dissemination mode choice and the reliability and accuracy of that data; and 3) the private marketing efforts that will determine how diligent the private partners will be in pursuing subscribers and advertisers in a given region. For PPPs to be successful, stated goals relevant to all three issues must be achieved.

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