Research Report
Research Project T9903, Task 80
ATIS Business Plan

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION ADVANCED TRAVELER INFORMATION SYSTEMS BUSINESS PLAN

by

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Prepared for

Washington State Transportation Commission
Department of Transportation
and in cooperation with
U.S. Department of Transportation
Federal Highway Administration

June 1999

TECHNICAL REPORT STANDARD TITLE PAGE

1. REPORT NO.	2. GOVERNMENT ACCESSION NO.	3. RECIPIENT'S CATALOG NO.
WA-RD 461.1		

4. TITLE AND SUBTITLE	5. REPORT DATE
Washington State Department of Transportation Advanced Traveler Information Systems Business Plan	June 1999
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Catherine Bradshaw, Mark E. Hallenbeck, Dawn McIntosh	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. WORK UNIT NO.
Washington State Transportation Center (TRAC) University of Washington, Box 354802 University District Building; 1107 NE 45th Street, Suite 535 Seattle, Washington 98105-4631	11. CONTRACT OR GRANT NO. Agreement T9903, Task 80
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Washington State Department of Transportation Transportation Building, MS 7370 Olympia, Washington 98504-7370	Research report
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

This study was conducted in cooperation with the U.S. Department of Transportation, Federal Highway Administration.

16. ABSTRACT

This report sets out WSDOT's view of the appropriate roles, responsibilities and allocation of costs for public and private providers of advanced traveler information systems (ATIS) services, given WSDOT's goals of providing traveler information to promote the safety and efficiency of its transportation facilities, encouraging private sector investment in ATIS services, and reducing WSDOT's ATIS costs.

The report provides background about current ATIS services, infrastructure, and participants in the Puget Sound region, the area of the Washington in which ATIS implementation is most advanced. The report describes the private sector ATIS business opportunity and the need to balance that opportunity with public sector goals of broad access to traveler information. It discusses the emerging private sector market for fee-based ATIS services and projects a significant expansion of the market in the Puget Sound region beginning in about 2002, based on a detailed ATIS market analysis.

The report recommends near-term actions that respond to the current speculative and highly volatile consumer market for ATIS services and a still developing public infrastructure model for data sharing (the ITS Backbone). These recommendations include guidelines for public/private cooperation, promotion and enhancement of the ITS Backbone, and testing the revenue potential of current WSDOT ATIS services through the Smart Trek program.

For the longer-term, the report recommends that WSDOT prepare for the anticipated expanded private sector ATIS market by taking actions to move toward private sector funded operation of the ITS Backbone. The report also recommends that in two to three years, the performance of the ITS Backbone concept and operating model be reviewed for continued appropriateness to the emerging private sector ATIS market.

17. KEY WORDS	18. DISTRIBUTION STATEMENT
Advanced traveler information systems, ATIS, business plan, ITS implementation	No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA 22616

19. SECURITY CLASSIF. (of this report)	20. SECURITY CLASSIF. (of this page)	21. NO. OF PAGES	22. PRICE
None	None		

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EXECUTIVE SUMMARY

The Washington State Department of Transportation (WSDOT) has been actively pursuing the deployment of advanced traveler information systems (ATIS) as way of increasing mobility, particularly in the congested Puget Sound region. As a method of managing transportation demand, these ATIS efforts directly support Washington's Transportation Plan for 1997-2016. According to that plan, "Transportation demand management, traffic operations, access controls and land use alternatives through the Growth Management Act are the first choices in meeting the mobility service objective. System expansion for single occupancy vehicles is a last resort strategy."

Advanced traveler information systems (ATIS) use computer and telecommunication technologies to provide information about traffic congestion and incidents, transit routes and schedules, transit service status, weather-related road conditions, parking availability, alternative routes, and other traveler advisories. Often this information is provided in combination with other services such as news, weather, stock quotes, and sports scores.

The concept behind ATIS is that by providing travelers with up-to-date information about their available travel options, individuals and businesses are able to select their travel options more efficiently. These individual decisions to avoid congestion coincidentally then help relieve congestion. Travelers benefit from having more control over their travel, saving time and reducing stress. Transportation agencies, like WSDOT, benefit because the transportation system operates more efficiently, and congested locations return to non-congested operating conditions more quickly.

Today, the majority of ATIS services, such as radio traffic reports or Web pages, broadcast region-wide information to a region-wide audience. Such services are able to highlight only specific trouble spots that may or may not be relevant to an individual

traveler. These services are normally advertiser supported or sponsored by a public agency. As the data available for ATIS services expand and delivery technologies advance it will become easier to provide individualized information tailored to customers who are willing to pay a fee for these premium services.

ATIS IN WASHINGTON STATE

State Transportation Policy Support for ATIS

Both the intention to provide broad access to traveler information and the desire to do so in partnership with the private sector are strongly supported by the Washington State Transportation Policy[1]. The policy includes eight "policy objectives" and supporting "policy principles." The following excerpt from the adopted policy objectives and policy principles relates directly to ATIS services:

> "Policy Objective—Provide viable mobility choices for the customer and expand the system to accommodate growth.
>
> Policy Principle—Promote modal connections to provide seamless travel to the customer. (Specifically—under Transportation System Management —Employ transportation system management measures to increase transportation efficiency, and provide up-to-date traveler information to the public.)"

In July 1996, the Washington State Transportation Commission also adopted policy specific to advanced technologies and Intelligent Transportation Systems (ITS)[2]. It states:

> "A. Washington State's commitment to ITS:
> - Aggressively pursue the application of advanced technology to transportation systems in Washington.
> - Continue WSDOT's lead role in coordinating the statewide implementation of ITS technology, working collaboratively with

[1] http://www.wsdot.wa.gov/commission/policy.htm

[2] Washington State Transportation Commission Policy Catalog, http://www.wsdot.wa.gov/commission/catalog.pdf

cities, counties transit agencies, other state agencies, and the private sector, and consistent with the state ITS strategic plan, "Venture Washington." (Venture Washington calls for developing a comprehensive, integrated regional traveler information system for Central Puget Sound.)

"B. Partnerships—Transportation agencies in Washington should:

- Be aggressive in forming partnerships among state, federal, and local agencies where relevant.
- Be aggressive in seeking and forming partnerships with private companies that have technological resources and knowledge applicable to ITS applications.
- Require a significant benefit to the public in any public/private technology partnership and pursue advanced technology applications that allow access and use by the broadest possible spectrum of the traveling public."

ATIS in the Puget Sound Region

In Washington State, most existing ATIS services are in the Puget Sound metropolitan region serving heavily congested freeways. Some rural ATIS services also exist, primarily for the mountain passes. Other urban and rural applications are planned throughout the state.

For quite some time, WSDOT has been leveraging its investment in advanced traffic management systems (ATMS) by providing the resulting congestion and incident information to travelers via mechanisms such as variable message signs, highway advisory radio, and closed-circuit television. More recently WSDOT has used the Internet and automated telephone technologies to provide information to the traveling public.

Over the last two years, the Smart Trek program, extensively supported by the U.S. Department of Transportation, has succeeded in expanding the geographic, jurisdictional, and modal coverage of traveler information in the region. It has also produced a far more integrated system through the development of the Intelligent Transportation Systems (ITS) Backbone that serves as the primary means of consolidating and sharing data that are multi-modal and multi-jurisdictional.

Figure 1 provides an overview of the Puget Sound ATIS, showing the ITS Backbone along with the other mechanism currently being used as interfaces between the data collection process and the data dissemination process.

Puget Sound ATIS services are provided by both public and private entities. Specific ATIS services available, or expected to be available soon, are shown in Table 1. The Smart Trek Internet Web site (http://www.smarttrek.org) provides a single portal with which to access, or find more information about, all of these ATIS services.

WSDOT's ATIS Business Partnerships

WSDOT's interest in supporting the growth of ATIS services is based on the value these services will provide to the customer, and the value the customers' resulting travel behavior will provide to WSDOT. However, WSDOT recognizes two key points.

1) It does not have the resources to explore and/or operate all potential information dissemination options.
2) The private sector is better equipped to provide targeted information to specific markets (i.e., individualized services).

Consequently, WSDOT is interested in cooperating with private companies that would like to provide ATIS services, thereby assisting the public in using state transportation facilities more safely and efficiently.

One of the key roles of the private sector will be to expand the options that consumers have for obtaining timely traveler information. Expanding the types of source information available for delivery to the consumer will be primarily the role of the public sector, although WSDOT will also encourage the private sector to undertake the development of new types of information.

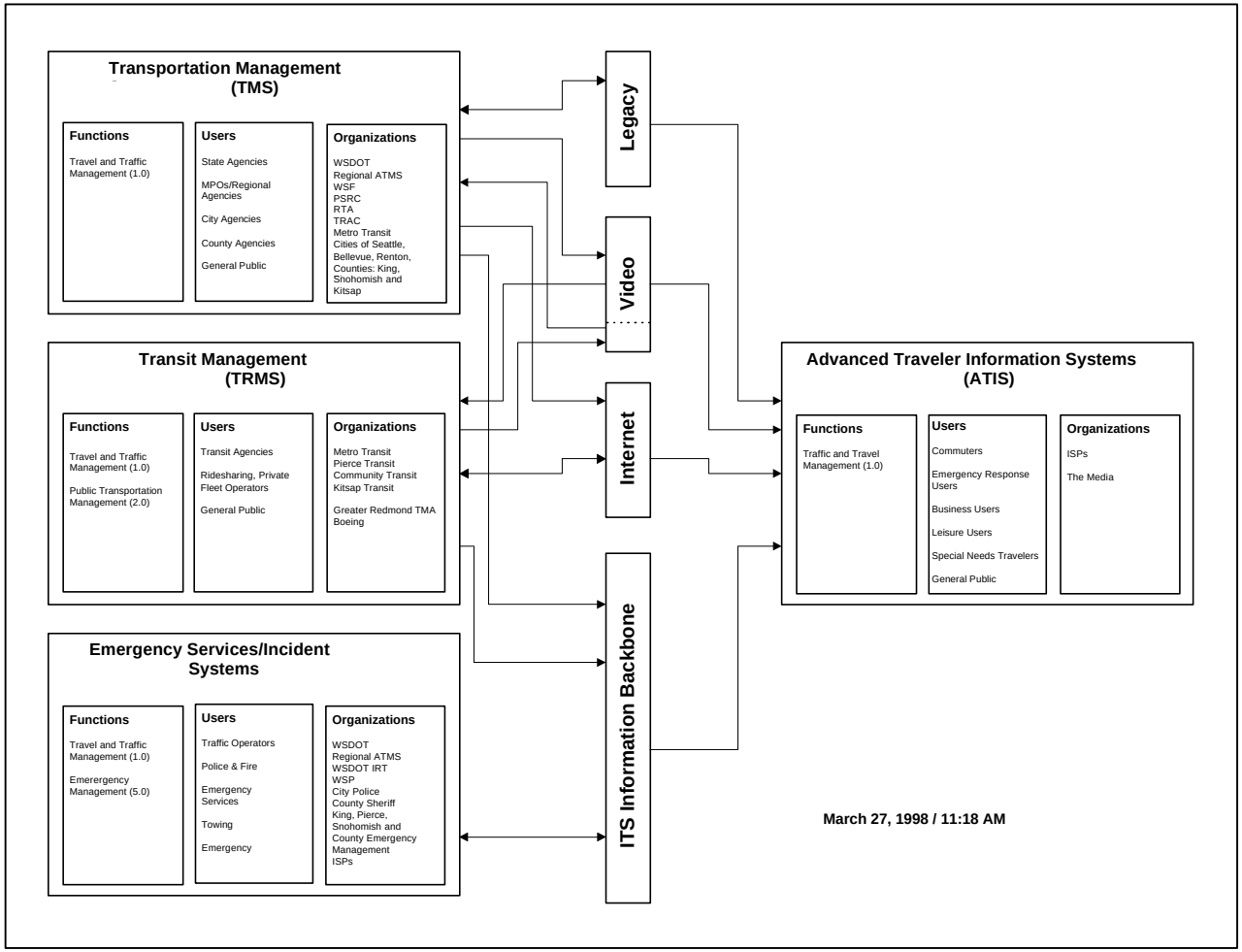

Figure 1[3] —Puget Sound ATIS Overview

Table 1—ATIS Services in the Puget Sound Region

Currently Available	Delivery Mechanism	Source
Freeway congestion (speed and camera images)	Internet Web site, for-fee private service, TV, cable TV, radio, automated phone service	WSDOT
Freeway and arterial incidents	Radio, automated phone service, Internet Web site (additional devices planned: pagers, in-vehicle units, palmtops)	WSDOT, Metro Networks, Washington State Patrol
Arterial cameras	Internet Web site	City of Bellevue (City of Seattle planned addition)
Road conditions due to weather – mountain passes	Internet Web site including camera images, automated phone service	WSDOT, King County
Dynamic carpool matching	Internet Web site	Greater Redmond Transportation Management Association
Static bus schedules, routes, fares	Internet Web sites, kiosks (Riderlink)	Metro Transit, Community Transit, Kitsap Transit, Pierce Transit
Static train schedules, routes, fares, reservations	Internet Web sites, kiosks	Amtrak
Transit system weather-related alerts	Internet E-mail notification, Internet Web site, radio, TV	Metro Transit
Dynamic bus locations	Internet Web site (BusView), for-fee private service (Fastline)	Metro Transit
Dynamic bus arrival/departure predictions	Transit Watch displays at 2 transit centers and Boeing Renton plant, planned for 2 P&Rs	Metro Transit
Static ferry sailing schedules	Internet Web site	WSDOT
Dynamic ferry loading area congestion	Live camera images on Internet Web sites	Private operators, WSDOT
Dynamic ferry vessel locations	Internet Web site	WSDOT
Planned Additions	**Delivery Mechanism**	**Source**
Estimated ferry waiting times	Variable message signs	WSDOT
Parking availability @ Seattle Center	Variable message signs	City of Seattle
Canadian border delay	Internet Web site	WSDOT
On-line transit itinerary planning	Internet Web sites, kiosks (Riderlink)	Metro Transit, Community Transit, Pierce Transit

EMERGING PRIVATE SECTOR BUSINESS OPPORTUNITY

The private sector is currently an active participant in providing ATIS services through radio and television broadcasts. However, over the next several years, as the amount of travel-related information grows and the capabilities of consumer electronic devices and communication systems expand, the business opportunity for the private sector is expected to dramatically increase. The individualized services that will give travelers information customized for their trip are likely to drive this growth as market penetration for electronic devices such as cell phones, palmtop computers, and in-vehicle computers increases.

Because ATIS involves technologies that are still emerging, few concrete data are available to predict its market potential. In 1997, ITS America and the U.S. Department of Transportation published ITS National Investment and Market Analysis, prepared by Apogee Research. Although the findings are not directly comparable to the results from the market projections done for this Washington State ATIS Business Plan, they do support the market growth assumptions used for the plan.

The Apogee report looked at the entire ITS market, including mayday, vehicle safety, and obstacle warning systems. Apogee concluded that total annual market for en-route guidance and information products would rise from approximately $500 million in 2000 to $8 billion in 2010, growing an astonishing 1500 percent over 10 years. This reflects the assumption that substantial market penetration of in-vehicle navigation devices would be achieved as a result of new, factory-equipped vehicles.

The Hagler Baily firm, formerly known as Apogee Research, updated its study and recently released the 1999 edition called The Market for Emerging Technology Applications in Transportation. According to the January 11, 1999, issue of *Inside ITS*, the study found that the overall market for private sector ITS is moving even faster than

predicted in the original study two years ago. A shorter than expected technology cycle and a faster drop in prices than expected were two of the reasons cited.

For the purposes of this plan, private sector ATIS revenue for the Puget Sound region was projected on the basis of a variety of assumptions applied to the demographics of the region. The results indicate an annual total of between $3 million and nearly $9 million in private sector gross revenue by the year 2008. Figure 2 shows the projected low-end and high-end private sector ATIS market revenue, with the results of the 1997 Apogee research (in $ billions) included for reference.

These revenue estimates are highly speculative and highly dependent on the development and consumer acceptance of the consumer electronic devices needed to deliver this information. Although it is impossible to be precise about the future of the private sector ATIS market, it is clear that given the assumptions, the market is poised to expand dramatically beginning in about 2002.

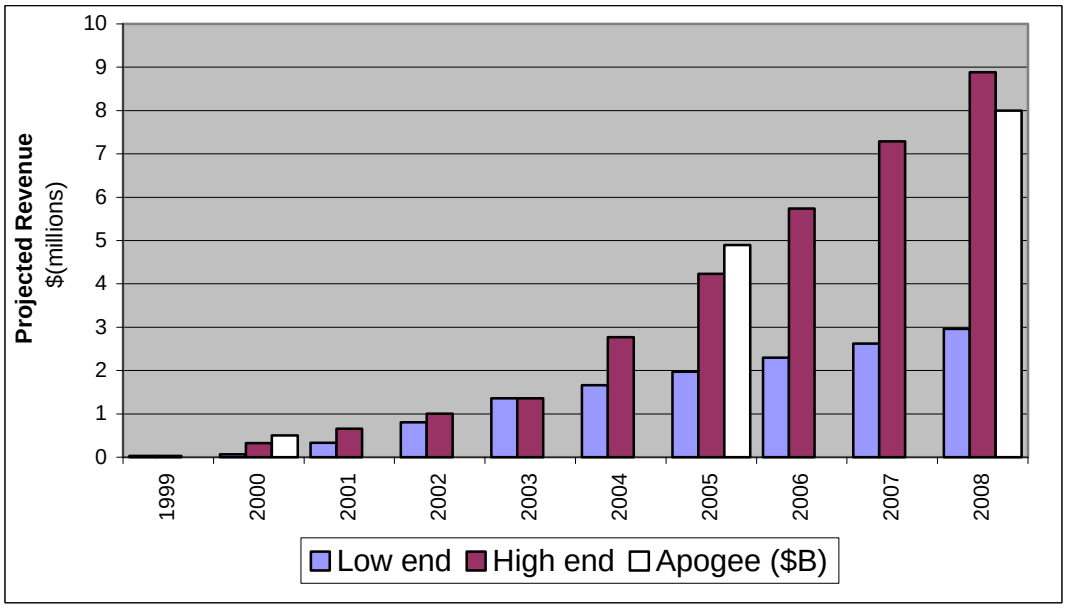

Figure 2—Private Sector ATIS Market Growth

ATIS BUSINESS PLAN PURPOSE

As the state transportation agency, WSDOT is responsible for the safe and efficient operation of state transportation facilities. It has also assumed a leadership role in addressing regional traffic congestion. To that end, WSDOT gathers the traffic data necessary to meet its responsibilities and to improve the management and operation of regional and statewide transportation facilities.

Travelers value the information derived from these data because it has general news value and because understanding the state of the transportation system improves their mobility by giving them opportunities to change their travel behavior to better meet their personal needs.

The public sector also benefits from individual traveler's decisions. One reason is that many of these decisions help improve the operational performance of the transportation system. For example, people can choose to avoid heavily congested roads by delaying trips or choosing alternative routes, destinations or modes, thereby easing congestion. Another reason is that the ability to make these decisions increases the mobility of the general population, thereby supporting WSDOT's public service mission.

Providing a basic level of traveler information free to the public supports WSDOT's mission of safe and efficient operation of its facilities and is consistent with policy adopted by the Washington State Transportation Commission.

The fact that traveler information is perceived as valuable by travelers presents private sector business opportunities. However, creating these private sector business opportunities requires tradeoffs. The goals of improving transportation system efficiency by making traveler information broadly available for free, and of providing limited access to this information to create an incentive for private sector investment, are mutually exclusive. Neither can be fully achieved without hindering the success of the other; one must be emphasized over the other.

Given these circumstances, the purpose of the ATIS Business Plan is to set out WSDOT's view of the appropriate roles, responsibilities, and allocation of costs for public and private providers of ATIS services.

WSDOT ATIS BUSINESS GOALS

The actions recommended as part of this ATIS Business Plan (Chapters 6 and 7) are intended to achieve the following three goals:

1. Promote the safety and efficiency of WSDOT transportation facilities by providing traveler information services as a by-product of transportation management systems.
2. Encourage private sector investment in ATIS services as a way to further leverage WSDOT data resources and to further promote the safety and efficiency of WSDOT transportation facilities.
3. Reduce WSDOT’s costs of providing traveler information services.

The market for consumer ATIS services and devices is evolving, and private sector ATIS investments are still highly speculative. However, there is mounting optimism, particularly in the in-vehicle device area, that the consumer market for ATIS services and devices will take off in the next two to three years. (See Chapter 4 for further discussion of the evolving ATIS market.)

In the long run, WSDOT will benefit from the existence of a large market for private ATIS services. Until the private ATIS market matures, WSDOT will need to subsidize the ATIS infrastructure (ITS Backbone). Clearly, the private sector ATIS market will have a much greater chance of success if the public sector continues to nurture it for a few more years.

Particularly through the Smart Trek program, WSDOT has created an ATIS infrastructure (the ITS Backbone) designed to encourage and support deployment of private sector ATIS services. WSDOT intends this investment in the ITS Backbone to stimulate the private sector ATIS market.

WSDOT is unlikely to bear the full cost of supplying and supporting ATIS data indefinitely. Provided that ATIS markets actually materialize, private sector companies taking advantage of public sector data can first begin to recoup their investment, then provide some return, and then share in paying ATIS operations and maintenance costs.

BUSINESS PLAN IMPLEMENTATION

The ATIS Business Plan implementation actions are summarized in Figure 3. From an implementation point of view, two approaches to the ATIS Business Plan are necessary: near-term actions for the next two or three years, and future actions to prepare for a more mature ATIS market.

The primary drivers of the actions recommended for the next couple of years are a speculative and highly volatile consumer market for ATIS services and a still developing, and somewhat untested, public infrastructure model (the ITS Backbone). Both of these issues can be expected to have proved themselves one way or the other over the next couple of years. Beyond this timeframe, the factors that will drive a longer-term ATIS business plan remain uncertain.

Near-Term Actions

The next two years should see substantially more activity by private sector ATIS service providers as personal communication devices penetrate the consumer market and telecommunications constraints diminish. The three actions key to stimulating (and preparing for) the emerging private sector ATIS market over the next two years are described below.

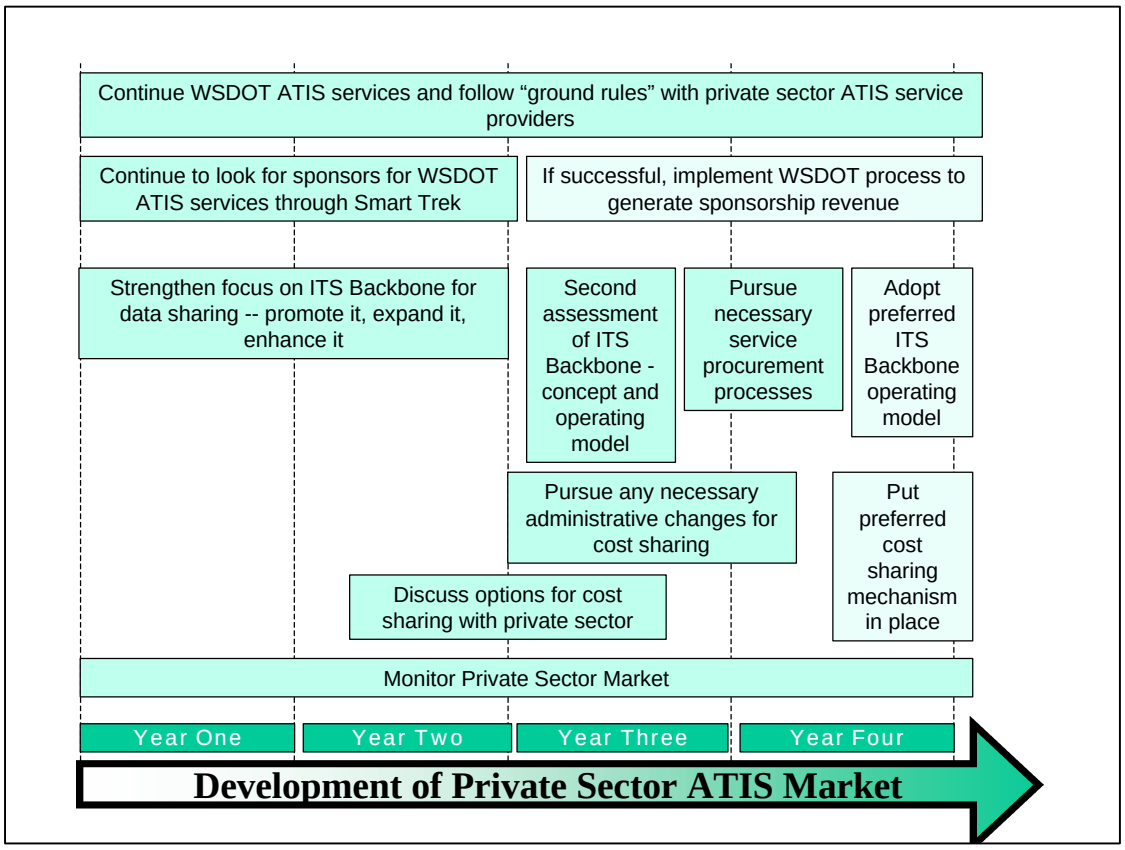

Figure 3—ATIS Business Plan Summary

Adopt Guidelines for Public/Private Cooperation for ATIS

WSDOT is willing to cooperate with any private company that will offer services to assist the public in using the state's transportation facilities more safely and efficiently. However, that cooperation is subject to the overriding goals and objectives of the state and region, as well as the fiscal and managerial constraints of WSDOT. The following "ground rules" reflect WSDOT's expectations of the appropriate public and private sector roles in providing ATIS services.

ATIS Business Guidelines

1. In support of its role in managing the state's transportation facilities, and consistent with adopted policy guidance, WSDOT will continue to provide traveler information services that meet the following criteria:

- The source data are generated by systems used to perform the core business functions of operating, monitoring, and evaluating WSDOT facilities. (WSDOT does not intend to add data collection capability solely for the purpose of meeting the data needs of the private sector ATIS services.)

- The traveler information service is available to a broad segment of the public. (For example telephone, television, radio or Internet-based services, highway advisory radio, and variable message signs.)

(Significant enhancement of these services, with personalized information for example, would compete with similar private sector initiatives and could possibly discourage private sector ATIS service investment. It is important that WSDOT's services remain directed at the general population and geared to the technology that is generally available to the public either at home, at work, at school, or in public libraries.)

2. WSDOT will allow private companies (including radio and television broadcasters) to access information about facility performance.

3. The ITS Backbone will be the primary mechanism for sharing WSDOT data with private companies (and other public agencies).

4. The private companies will be responsible for all costs incurred to access the data (Internet connections, fiber connections, etc.).

5. WSDOT will not develop and implement individualized or specialized services in competition with the private sector.

6. WSDOT will cooperate with any private firm in providing ATIS so long as the effort provides a net benefit to the public, the net benefit exceeds WSDOT's cost to cooperate with that effort, and the funds needed to cooperate with that effort are available for this purpose. When more requests for cooperation exist than budget allows, WSDOT will prioritize those private sector requests on the basis of the size of the public good provided, the degree to which the project is perceived to be in the public or state's interest, and the cost of WSDOT's participation.

7. A private sector firm may contribute funding or services to WSDOT to reduce the net cost of WSDOT's cooperation in order to obtain its cooperation.

8. All private sector partners will be treated equally. There will be no exclusive access agreements. For example, all radio stations will have equal access to WSDOT data, except where a station pays for a marginal improvement in that

service. However, all stations will have the option of purchasing that same marginal improvement in service. This treatment is subject to the issues of capacity and access described above.

9. WSDOT will not enter into markets already served by the private sector, but it may remain in an existing market if a private vendor enters it. WSDOT may voluntarily relinquish that service to the private sector provider for its own business reasons (e.g., significant cost reductions can be achieved or other benefits will accrue).

10. Where WSDOT sees a need and significant public benefit from a new information service, and that new information service can be provided at little marginal cost to WSDOT, WSDOT may undertake that service. If a private company wishes to offer that same service, it is free to do so. WSDOT will cooperate with that company under the same conditions as mentioned above. WSDOT will not enter a market segment already served by the private sector unless significant public benefit will be gained from the addition of such a service.

Promote and Enhance the ITS Backbone

The ITS Backbone is the gateway for private sector access to public sector data to support ATIS services. WSDOT's commitment to continue funding the operation of the ITS Backbone, at least in the short term, is necessary in order to derive long-term benefit from this investment.

To stimulate and foster the development of a private sector ATIS market, the ITS Backbone needs to continue operating for at least the next two years. By generating private sector use of public ATIS-related data, WSDOT would benefit from a robust private sector ATIS market in which more people would have access to travel-related information.

Although Smart Trek has make great strides in the development of the ITS Backbone, more work is needed to support a broad range of ATIS service providers. Without further promotion and development of the ITS Backbone, WSDOT can expect limited use of this investment and fewer ATIS services available for consumers.

Specific needs include making additional data (from a variety of sources) available on the ITS Backbone; outreach to private sector ATIS service providers;

targeting ITS Backbone enhancements toward new potential markets; and developing and implementing improvements to data quantity, quality, and reliability to better meet the needs of private sector data users.

Test the Revenue Generating Potential of WSDOT ATIS Services

WSDOT operates several popular ATIS services that may have the potential to generate revenue. These services include Internet Web pages (traffic congestion, ferry services, and mountain pass conditions), automated telephone service (traffic conditions and mountain pass conditions), and cable TV broadcast of traffic conditions (UW cable TV). These existing ATIS services not only provide good sources of public information that are broadly accessible, but their existence also has acted as a catalyst for the development of other ATIS services in this region.

The popularity of the Internet Web services, in particular, indicates that at least the potential for advertising revenue exists. The Smart Trek program provides an opportunity to test the revenue generating potential of these services.

The Smart Trek program is already actively seeking commercial sponsorship of the TrafficTV application. However, Smart Trek provides an opportunity to also “test the waters” for the revenue generating potential of the Web-based and telephone hotline applications. This effort could also identify the costs associated with generating this revenue.

If Smart Trek efforts were successful and WSDOT decided to continue pursuing these revenue sources, WSDOT would require some staff time and cost dedicated to this effort. This cost can be expected to be as much as 50 percent of the gross revenue, as evidenced by the management costs for similar efforts such as transit advertising.

Longer-Term Implementation

This plan assumes that the market for private sector ATIS services and devices will "turn the corner" toward profitability within the next two to three years.

Implementation of the strategies in this chapter would occur three to four years from now. However, it is appropriate to prepare to implement these strategies during the next couple of years. The longer-term strategies for the ATIS Business Plan are described below.

Move Toward Private Sector Funding of ITS Backbone Operations

Assuming that the private sector ITS market will grow as expected, it is expected that public support of ATIS services will diminish over time, eventually reducing to zero, as the private sector market evolves.

Significant resistance to cost sharing should be expected from the private sector until the market has been proven. If the timing is right, however, it is more likely that the private sector will accept reasonable cost sharing arrangements but will demand higher levels of data reliability and accuracy than Smart Trek currently provides.

Private sector funding of the operation and maintenance of the ITS Backbone could take several forms, each with its own advantages and disadvantages that would become more or less important as the private sector ATIS market developed. Given the volatility of the market and the changing mix of players, it is most appropriate to make the cost sharing mechanism decision later.

The cost sharing mechanism options include creating a consortium, setting up data access fees based on the amount of data used, establishing fees for participating in the ITS Backbone, or taking a percentage of profits earned by the private sector participants.

As WSDOT begins to share the cost of operating the ITS Backbone, the companies that must pay for that service will logically demand higher levels of system reliability than are currently being provided. The ability to obtain and deliver the data private companies have promised to their customers is of paramount concern to the private information service providers working with Smart Trek. Without reliable

operation, customers will not purchase services from these vendors. It is likely that achieving these higher levels of reliability will require additional expenditures on computer hardware, computer software, and possibly communications infrastructure to create more fault-tolerant systems.

Second Assessment of the ITS Backbone Concept and Operating Model

In the short term, operation of the ITS Backbone will be covered by the Smart Trek operations plan currently under development. That plan is expected to address issues such as roles and responsibilities, maintenance requirements and response times, security and data access, configuration management, and standards and protocols.

The hardware, software, and procedures that make up the ITS Backbone can continue to be operated by WSDOT (through the University of Washington), or the operation could be contracted out to a third party. In the longer term, it is likely to become desirable to encourage a private or non-profit entity to operate the ITS Backbone if doing so would improve its operation or reduce the cost of its operation. The academic research aspect of the ITS Backbone is anticipated to diminish over the next couple of years, minimizing the value of continuing its operation at the University of Washington.

A move to another operator should be evaluated as both the ATIS market and the ITS Backbone mature. WSDOT should monitor the success of other business models over the next couple of years. Given the experiences of other cities and states, the stability of operating through third parties should be clearer. At that time, the operation of the ITS Backbone could be competitively bid, with demonstrated reliability a key determinant in the selection of the successful bidder.

CHAPTER 1: INTRODUCTION

The Washington State Department of Transportation (WSDOT) has been actively pursuing the deployment of advanced traveler information systems (ATIS) as way of increasing mobility, particularly in the congested Puget Sound region. As a method of managing transportation demand, these ATIS efforts directly support Washington's Transportation Plan for 1997-2016. According to that plan, "Transportation demand management, traffic operations, access controls and land use alternatives through the Growth Management Act are the first choices in meeting the mobility service objective. System expansion for single occupancy vehicles is a last resort strategy."

The concept behind ATIS is that by providing travelers with up-to-date information about their available travel options individuals and businesses are able to select their travel options more efficiently. With timely and reliable traffic and transit information, individuals and companies are able to shift routes, change trip times, or change modes to avoid congestion and to help ensure timely arrival at their destinations. The idea is that these individual decisions to avoid congestion coincidentally help relieve congestion. As a result, the region's mobility (and its perceived level of mobility) is increased without the expense and environmental impacts of new roadway capacity. Travelers benefit from having more control over their travel, saving time and reducing stress. WSDOT benefits because the transportation system operates more efficiently, and congested locations return to non-congested operating conditions more quickly.

In the Puget Sound region, WSDOT has been developing ATIS capabilities, primarily as part of the Smart Trek program. For quite some time WSDOT has been leveraging its investment in advanced traffic management systems (ATMS) by providing the resulting congestion and incident information to travelers via mechanisms such as broadcast radio and television, variable message signs, highway advisory radio, and

closed-circuit television. More recently WSDOT has used the Internet and automated telephone technologies to provide information to the traveling public.

Over the last two years, the Smart Trek program, extensively supported by the U.S. Department of Transportation, has succeeded in expanding the geographic, jurisdictional, and modal coverage of traveler information in the region. It has also produced a far more integrated system through the development of the Regional Intelligent Transportation Systems (ITS) Backbone that serves as the primary means of consolidating and sharing data that are multi-modal and multi-jurisdictional.

Smart Trek has also successfully attracted the participation of private sector partners in providing ATIS services in the Puget Sound region. These private sector companies hope to eventually make a profit by providing customized traveler information as the electronic consumer devices (such as AutoPCs and in-vehicle navigation units) necessary to deliver traveler information achieve a higher level of market penetration. Eventually, the cost of operating public ATIS infrastructure can be shared with the private ATIS service providers that benefit from it. Private sector participation also generally brings with it specialized skills and capabilities, as well as experience working with market forces to create services valued by the public.

As an emerging market, in the short-term ATIS services will continue to need public sector support. Without public sector support, private ATIS providers are unlikely to survive the next few years, after which the consumer demand for these services is expected to finally generate a profit. If the private sector companies do not survive, the promise of improving mobility through ATIS can not be realized.

As the development and implementation phases of the Smart Trek program come to a close, WSDOT must address the basic operating concepts of the Puget Sound ATIS in general, and its own continuing role and private sector relationships specifically. This document, the ATIS Business Plan, is an initial plan that is expected to assist in the creation, operation, and management of new services as the state's ATIS services expand

both in terms of number of users and geographically. The ATIS market is expected to change dramatically over the next several years, and the ATIS Business Plan will need to be updated to reflect those changes.

PURPOSE OF ATIS BUSINESS PLAN

This report presents short-term and longer-term recommendations for the continued operation of ATIS services in partnership with private sector interests. At this time, these recommendations apply specifically to ATIS infrastructure and services currently operated by WSDOT in the Puget Sound region. However, the basic concepts presented in this document generally will apply beyond the Puget Sound region as ATIS infrastructure and services are implemented in other regions of the state.

The report is intended to answer the following basic question:

> How should WSDOT work with private sector companies in the provision of ATIS services?

The report's emphasis is on WSDOT's role and functions within the regional ATIS; however, the success of the ATIS is in large part dependent on the participation of a range of agencies and companies. Therefore, this report also describes the current business relationships and operational roles of the public and private partners that cooperate in the operation of the regional ATIS. It does not discuss how each of the other participants in the ATIS will fund or perform its own tasks, nor does it discuss the costs to these agencies and firms for participating.

ORGANIZATION OF THIS DOCUMENT

The next chapter provides background about ATIS services and the private sector business opportunity they provide. Chapter Three details the current state of ATIS services, infrastructure and partnerships in the Puget Sound region, the area of the state in

which ATIS implementation is most advanced. Chapter Four discusses the emerging private sector market for ATIS services.

Chapter Five presents the objectives of the ATIS Business Plan and Chapter Six and Chapter Seven identify the near-term and longer-term implementation actions recommended to achieve WSDOT's ATIS business-related goals. Implementation issues are presented in Chapter Eight. The appendices provide detailed ATIS market analysis and revenue projections, an overview of national trends in ATIS business models, and a glossary of terms used throughout the report.

CHAPTER 2: BACKGROUND

Advanced traveler information systems (ATIS) use computer and telecommunication technologies to provide information about traffic congestion and incidents, transit routes and schedules, transit service status, weather-related road conditions, parking availability, alternative routes, and other traveler advisories. Often this information is provided in combination with other services such as news, weather, stock quotes, and sports scores.

Most people are familiar with traffic reports on the television and radio during peak commute times. Before a trip starts, travelers can get information at home, school, the office, library, or mall. This "pre-trip" information is generally provided over the telephone, on the radio or television, on computers connected to the Internet, or at public kiosks. After a trip is already started, "en-route" information can be accessed by cell phone, car radios, palmtop computers using wireless connections to the Internet, pagers, in-vehicle navigation devices, or public kiosks at transit centers.

ATIS AND WASHINGTON STATE

In Washington State, most existing ATIS services are in the Puget Sound metropolitan region serving heavily congested freeways. In addition, some rural ATIS services exist, primarily for the mountain passes. Other urban and rural applications are planned throughout the state.

WSDOT has played a lead role in developing ATIS services in the state, but although this document addresses issues related to WSDOT's role in providing ATIS services, participation by a broad range of entities is necessary for ATIS to be successful. Arterial condition data are needed from city and county traffic jurisdictions. Information such as ferry and bus schedules and current service status is needed from transit agencies

and ferry operators. Parking availability information must come from parking lot operators. Encouraging broad participation is a key element of a successful ATIS.

Two things about ATIS motivate WSDOT's interest in supporting the growth of ATIS services. The first is the value it provides the customer. The second is the value the customers' resulting travel behavior provides WSDOT.

WSDOT is charged with operating a safe and efficient transportation system. Given growing travel demand and limited capacity, the Department seeks to make the best possible use of the facilities in its purview. As with any other government entity, strong public support for its services are essential.

High quality customer service helps build public support. Part of what these customers are starting to expect is timely and accurate information that helps reduce anxiety about traffic delays, improves trip time reliability, or makes possible better decisions about how and when to travel.

In the long run, the impact of full-scale ATIS services is to better manage the demand for limited facility capacity. By providing accurate and timely information about road conditions, WSDOT hopes to influence some drivers to change their routes or departure times to avoid congested conditions. They may even choose to ride the bus instead or avoid the trip altogether. The expected results are less congestion, safer driving conditions, and more efficient use of existing facilities.

Because these results are not possible until more people have the information they need to make better travel decisions, WSDOT has been actively involved in supporting and demonstrating ATIS services.

ATIS BUSINESS PARTNERSHIPS

WSDOT recognizes two key points.

1. It does not have the resources to explore and/or operate all potential information dissemination options. Because private firms intend to profit

from the dissemination of traveler information (with or without adding value to WSDOT-provided data), private sector revenue could potentially offset a portion of WSDOT's ATIS-related expenses.

2. The private sector is better equipped to provide targeted information to specific markets (i.e., individualized services).

Consequently, WSDOT is willing to cooperate with any private company that is able to provide services that assist the public in using state transportation facilities more safely and efficiently.

One of the key roles of the private sector will be to expand the options that consumers have for obtaining timely traveler information. Expanding the types of source information available for delivery to the consumer will be primarily the role of the public sector, although WSDOT will also encourage the private sector to undertake the development of new types of information.

WSDOT envisions new ATIS services, provided by the private sector, as a means of enhancing the value of existing data resources at low marginal cost to WSDOT. To that end, WSDOT encourages partners to use the existing WSDOT data resources, add value to them, and deliver them to customers. These value-added services could include, but would not be restricted to, the following:

- personalizing the delivery of that information (so that the traveler receives information that pertains only to his or her trip or interests)
- developing new delivery mechanisms that provide the traveler with information in a more timely or more useful fashion
- manipulating the available information to provide more insight into travel conditions (for example, forecasting conditions on the basis of current conditions)
- collecting additional information to provide the traveler with even better information on alternatives than is currently available.

STATE TRANSPORTATION POLICY SUPPORT FOR ATIS

Both the intention to provide broad access to traveler information and the desire to do so in partnership with the private sector are strongly supported by the State Transportation Policy adopted in May 1996 by the Washington State Transportation Commission.

The Washington State Transportation Policy[1] states the purpose of Washington's transportation system as providing "safe, efficient, dependable and environmentally responsible transportation facilities and services to promote a positive quality of life for Washington citizens, enhance the economic vitality of all areas of the state and protect the natural environment and improve the built environment." The policy identifies eight "policy objectives" and supporting "policy principles" that are intended to achieve this purpose. The following are excerpts from the adopted policy objectives and policy principles that relate to ATIS services:

> "Policy Objective—Operate transportation systems to work reliably and responsibly for the customer.
> Policy Principle—Promote the use of advanced technologies to improve system efficiency and service."

> "Policy Objective—Provide viable mobility choices for the customer and expand the system to accommodate growth.
> Policy Principle—Promote modal connections to provide seamless travel to the customer. (Specifically—under Transportation System Management—Employ transportation system management measures to increase transportation efficiency, and provide up-to-date traveler information to the public.)"

> "Policy Objective—Cooperate and coordinate with private and public transportation partners so that systems work together cost effectively.
> Policy Principle—Promote regional coordination of state, local and private transportation planning and activities.
> Policy Principle—Promote public-private partnerships.
> (Specific to Partnerships—Washington State should formalize and expand its leadership role in promoting public-private partnerships at every government level.—Specifically—Continue efforts to increase private sector involvement in

[1] http://www.wsdot.wa.gov/commission/policy.htm

transportation wherever practical and in the public interest, and encourage joint public-private initiatives for financing transportation facilities and operations.)"

"Policy Objective—Continuously improve the efficient and effective delivery of agency programs.
Policy Principle—Focus on the customer in delivering services.
Policy Principle—Take advantage of available, cost effective technologies to improve processes and systems."

In July 1996, the Washington State Transportation Commission also adopted policy specific to advanced technologies and Intelligent Transportation Systems (ITS)[2]. It states the following:

"A. Washington State's commitment to ITS:

- Aggressively pursue the application of advanced technology to transportation systems in Washington.
- Continue WSDOT's lead role in coordinating the statewide implementation of ITS technology, working collaboratively with cities, counties transit agencies, other state agencies, and the private sector, and consistent with the state ITS strategic plan, "Venture Washington." (Venture Washington calls for developing a comprehensive, integrated regional traveler information system for Central Puget Sound.)

"B. Partnerships—Transportation agencies in Washington should:

- Be aggressive in forming partnerships among state, federal, and local agencies where relevant.
- Be aggressive in seeking and forming partnerships with private companies that have technological resources and knowledge applicable to ITS applications.
- Require a significant benefit to the public in any public/private technology partnership and pursue advanced technology applications that allow access and use by the broadest possible spectrum of the traveling public."

ATIS DATA COME FROM FACILITY MANAGEMENT SYSTEMS

In most metropolitan areas, and in the Puget Sound in particular, ATIS services have been made possible by previous investments in traffic and transit management systems. The same loop data used to detect incidents and manage ramp meters are used

[2] Washington State Transportation Commission Policy Catalog, http://www.wsdot.wa.gov/commission/catalog.pdf

to compute travel speed and display it on a Web page. The same bus location data that are used to manage transit operations help predict actual bus arrival times at transit centers. The computer and telecommunications infrastructure needed to provide ATIS services adds value to the data collected by the freeway and transit management systems.

Private traveler information service providers often augment public data sources with on-the-road observers or aircraft surveillance. In some cases, detection equipment may be installed specifically for traveler information purposes rather than system management purposes. By integrating this detection equipment into existing traffic and transit management systems, the traffic and transit operators can share in the benefit of this additional investment.

Figure 1 shows the relationship between public advanced traffic management systems (ATMS), advanced public transportation systems (APTS), public and private ATIS infrastructure (such as ATIS-specific detection, data fusion, and data dissemination), and the public and private ATIS services they support.

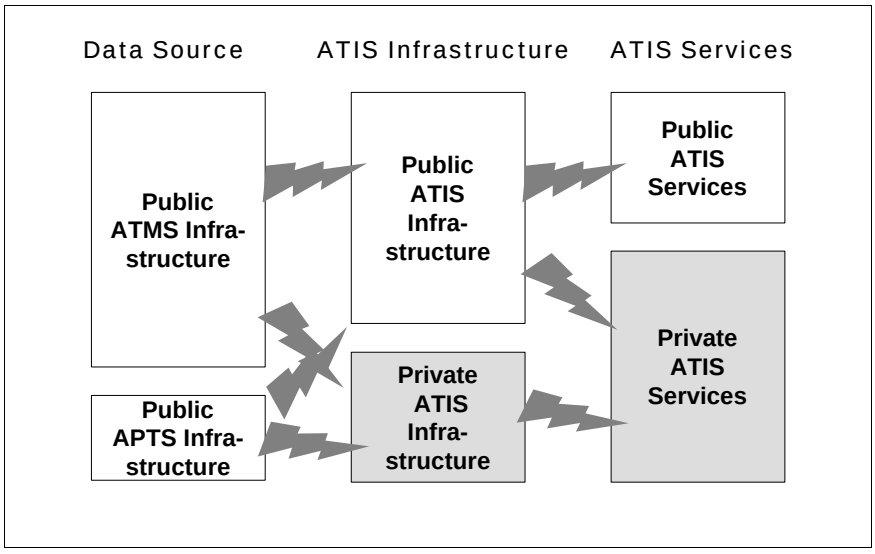

Figure 1.-- Public and Private ATIS Structure

GENERALIZED AND INDIVIDUALIZED SERVICES

Today, the majority of ATIS services, such as radio traffic reports or Web pages, broadcast region-wide information to a region-wide audience. Such services are able to highlight only specific trouble spots that may or may not be relevant to an individual traveler. These services are normally advertiser supported or sponsored by a public agency. Sometimes radio stations, cell phone vendors, or paging companies offer traveler information as a way of broadening their market share. Generally, travelers don't pay a fee specifically for this type of generalized traveler information.

As the data available for ATIS services expand and delivery technologies advance it will become easier to provide individualized information tailored to customers who are willing to pay a fee for these premium services. For example, a paging service may offer travelers the opportunity to identify their typical commute routes, directions, and travel times, and then send traffic condition or transit service status messages only to those travelers whose normal commutes are affected. In-vehicle navigation units are usually combined with global positioning systems (GPS) that can be used to tailor traffic messages to a traveler's current location.

The private sector is currently an active participant in providing ATIS services through radio and television broadcasts. However, in most major metropolitan areas, the market for generalized ATIS services such as these broadcasts is already saturated. Nevertheless, over the next several years, as the amount of travel-related information grows and the capabilities of consumer electronic devices and communication systems expand, the business opportunity for the private sector is expected to dramatically increase. (See market projections in Chapter 4.) The individualized services that will give travelers information customized for their trip are likely to drive this growth as market penetration for electronic devices such as cell phones, palmtop computers, and in-vehicle computers increases.

BALANCING PUBLIC AND PRIVATE GOALS

The remainder of this chapter presents basic assumptions about what partnerships between the public and private sectors bring to ATIS implementation and operation. The text for this section is excerpted from Choosing the Route to Traveler Information Systems Deployment: Decision Factors for Creating Public/Private Business Plans prepared by TRAC in 1998.

The most important decision regarding the ATIS is the role it will play in the transportation system's operation. For example, will the ATIS's primary role be a tool that can help manage travel demand (encouraging mode, route, and/or temporal shifts) as part of a larger public infrastructure and operations management effort? Or will the ATIS be primarily a "consumer oriented" system to provide travelers with information that is beneficial to their quality of life?

Most ATIS efforts will want to accomplish both of these goals. However, variations in the relative importance of these roles will result in an ATIS that is either public policy driven or consumer (market) driven, as shown in Figure 2. Both of these approaches are reasonable and realistic, but they tend to require different business plans and partner relationships.

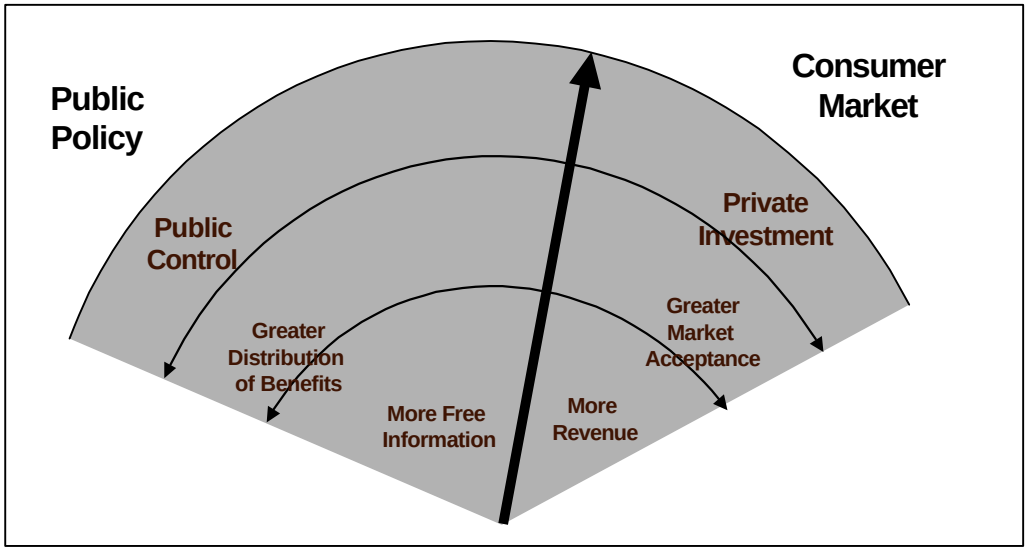

Figure 2—ATIS Business Plan Tradeoffs

An ATIS that is heavily oriented toward meeting major public policy goals will require significantly more financial and managerial input from the public sector than a consumer-oriented service. To meet public policy goals, the public sector will have to ensure that specific types of data are available and that the information is presented in forms and formats that help achieve public goals. An ATIS focused on achieving common public policy goals such as increased high occupancy vehicle use requires collection and delivery of information related to transit and high occupancy vehicle use. Such a focus allows the system's implementation to be geographically segmented (that is, the ATIS can be implemented one corridor at a time) because the goal is to make the system effective in a given location rather than to reach the largest possible market. This approach also implies that the public sector will fund the creation and, in some cases, operation of services that serve the public good but that may have limited commercial market potential.

The consumer-oriented alternative is a market driven approach that requires the dissemination of information for which consumers are willing to pay. An ATIS focused on consumer marketability must be accessible to the largest possible audience, which in most markets tends to be single occupant vehicles. It must also cover the widest possible geographic area to increase the number of potential customers. Such a system is likely to focus on broad, area-wide information (such as general incident reports and general traffic congestion information), rather than on the detailed modal and corridor-specific information necessary to influence modal shifts. Consequently, consumer oriented ATIS may focus on fewer modes of travel and may even ignore specific market segments (e.g., captive transit riders) because those market segments are not likely to provide significant revenue sources.

The advantage of the consumer-oriented approach to ATIS is that it has a greater chance of generating revenue to support its operation. It is also more likely to be eagerly championed by consumer electronics manufacturers because they will also be looking for

the largest consumer markets possible. The disadvantage of this approach is that it is less likely to help achieve public policy goals. For example, in many regions the devices and information provided as part of a consumer oriented system do not include substantial transit information.

In balancing these two approaches, the public sector has to remember that its preferences for the role of the ATIS must often be tempered by financial and political realities. In a perfect world a jurisdiction might desire a public policy oriented ATIS. However, because it lacks the funding to operate the ATIS, it will accept the consumer oriented approach offered by the private sector in return for greater private sector support in that market.

The balancing also affects the consumer approach. Because the ATIS market is uncertain, many private companies want public sector support for system development. In return for this support, many private sector firms are happy to emphasize aspects of the ATIS that promote public policy efforts. In addition, the private sector is almost always willing to distribute information provided freely by the public sector when that information can benefit the private sector's consumers, particularly when the marginal cost of adding that information is small.

Finally, note that these approaches are not mutually exclusive. In many markets, the information that holds significant consumer interest is the same information that matches public policy.

CHAPTER 3: ATIS IN THE PUGET SOUND REGION

Although ATIS activities are expanding across Washington State, currently only the Puget Sound region has the infrastructure, congestion, and potential ATIS customers sufficient to attract significant private sector business interest.

The Puget Sound region has invested substantially in the intelligent transportation systems (ITS) infrastructure that serves as the basis for ATIS services. The jurisdictions in this region are nationally recognized as leaders in ATIS implementation.

Current Puget Sound region (see Figure 3) ATIS services are supported by information collected from a variety of publicly owned transportation control systems within the following geographic boundaries:

- the Canadian border to the north
- Olympia, Washington, to the south
- just east of the summit of the Cascade Mountain range to the east
- the western edge of Puget Sound on the west.

This area includes portions of nine counties (Thurston, Pierce, King, Kitsap, Snohomish, Skagit, Island, San Juan, and Whatcom) and most of the major activity centers in the northwestern portion of the state.

Data collection facilities and ATIS services coverage within the region are not evenly distributed. Considerably more information is available for the metropolitan Seattle area freeway system than for the freeway system outside of the metro area or for other types of facilities. The geographic area within which data are collected and ATIS services are offered can be expected to expand over time, along with the number and extent of facilities covered.

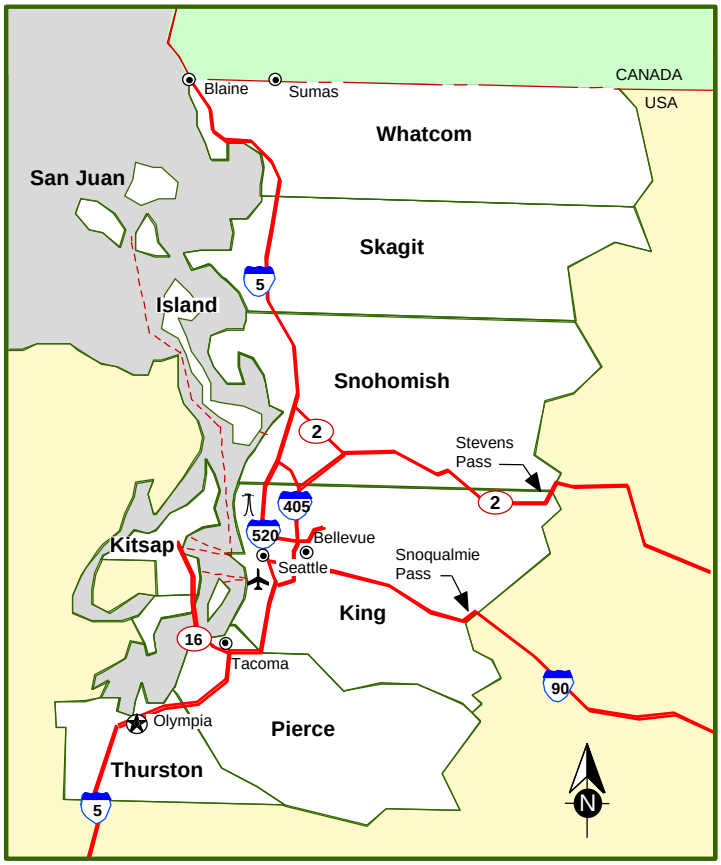

Figure 3 – ATIS Coverage Area, Puget Sound Region

This chapter provides an overview of the existing ATIS services, ATIS infrastructure, and public and private sector ATIS participants in the Puget Sound region.

EVOLUTION OF ATIS IN THE PUGET SOUND REGION

Historically, WSDOT has provided traveler information as a by-product of its traffic system management efforts. Information has traditionally been provided to travelers via variable message signs (VMS), highway advisory radio (HAR), and the local media (radio and TV). The intent of these efforts has been both to increase the efficiency of the transportation network and to provide a public service. To provide traveler information, WSDOT delivers to the general public the data that it already collects to monitor and control roadway system performance. The existing delivery mechanisms

operated by WSDOT either are directly associated with facility operation (VMS/HAR) or were designed to cost effectively meet WSDOT's public information and public service functions.

With the same loop detector data that it uses to operate freeway ramp control systems for example, WSDOT provides a map of freeway conditions on the World Wide Web. This map provides WSDOT operations staff with a real-time picture of region-wide freeway performance. Provision of this map on the Internet gives WSDOT an easy, low cost means of informing the news media about current freeway conditions in the region. Providing general access to this map gives the public valuable information, at very little additional cost to WSDOT. Another example is a transit customer information Web site (BusView) that shows current bus locations based on information from King County Metro Transit's automatic vehicle location (AVL) system. The AVL system provides the current location and status of Metro's transit coaches. It allows Metro's control center staff to respond to service delays and mechanical or security incidents in a timely way.

The Smart Trek effort is successfully leveraging past investment in these publicly owned operation and control systems by integrating private sector delivery systems as a way of disseminating this information to more travelers in more meaningful ways. The term "Smart Trek" continues to be used to market the combined services of the public and private organizations cooperating on ATIS in the Puget Sound region.

EXISTING ATIS SERVICES

Puget Sound ATIS services are provided by both public and private entities. ATIS services provided by public agencies include the following:

- Internet Web sites
  - freeway flow map
  - freeway camera images

  - ferry and bus schedules
  - ferry terminal camera images
  - weather related roadway condition (coming)
  - bus locations (from ITS Backbone)
- Transit Watch (from ITS Backbone)
- Traffic TV on UW cable TV (from the ITS Backbone)
- automated telephone information
  - freeway incidents, flow
  - Snoqualmie Pass (seasonal)
  - ferry and bus schedules
- highway advisory radio
- variable message signs
- video to TV stations

Private companies are currently providing the following ATIS services:

- radio and TV traffic broadcasts
- ferry terminal camera images on the Internet
- private Web sites that "frame" the WSDOT flow map and camera images
- traffic incident and congestion information to consumer electronic devices (Etak/Metro Networks/Cue Paging/Auto PC)
- Fastline Embarc (from the ITS Backbone).

Specific ATIS services available, or expected to be available as a result of Smart Trek, are shown in Table 1. The table indicates the mechanisms used to deliver these services, the source of the data, and whether this information is on the Regional ITS Backbone (described later in this chapter).

The Smart Trek Internet Web site (http://www.smarttrek.org) provides a single portal with which to access, or find more information about, all of these ATIS services. (See Figure 4.)

Table 1—ATIS Services in the Puget Sound Region

Currently Available	Delivery Mechanism	Source	On ITS Backbone
Freeway congestion (speed and camera images)	Internet Web site, for-fee private service, TV, cable TV, radio, automated phone service	WSDOT	Loop data (not video)
Freeway and arterial incidents	Radio, automated phone service, Internet Web site (additional devices planned: pagers, in-vehicle units, palmtops)	WSDOT, Metro Networks, Washington State Patrol	Planned
Arterial cameras	Internet Web site	City of Bellevue (City of Seattle planned addition)	No
Road conditions due to weather – mountain passes	Internet Web site including camera images, automated phone service	WSDOT, King County	No
Dynamic carpool matching	Internet Web site	Greater Redmond Transportation Management Association	No
Static bus schedules, routes, fares	Internet Web sites, kiosks (Riderlink)	Metro Transit, Community Transit, Kitsap Transit, Pierce Transit	No
Static train schedules, routes, fares, reservations	Internet Web sites, kiosks	Amtrak	No
Transit system weather-related alerts	Internet E-mail notification, Internet Web site, radio, TV	Metro Transit	No
Dynamic bus locations	Internet Web site (BusView), for-fee private service (Fastline)	Metro Transit	Yes
Dynamic bus arrival/departure predictions	Transit Watch displays at 2 transit centers and Boeing Renton plant, planned for 2 P&Rs	Metro Transit	No
Static ferry sailing schedules	Internet Web site	WSDOT	No
Dynamic ferry loading area congestion	Live camera images on Internet Web sites	Private operators, WSDOT	No
Dynamic ferry vessel locations	Internet Web site	WSDOT	No
Planned Additions	**Delivery Mechanism**	**Source**	**On ITS Backbone**
Estimated ferry waiting times	Variable message signs	WSDOT	No
Parking availability @ Seattle Center	Variable message signs	City of Seattle	Planned
Canadian border delay	Internet Web site	WSDOT	No
On-line transit itinerary planning	Internet Web sites, kiosks (Riderlink)	Metro Transit, Community Transit, Pierce Transit	No

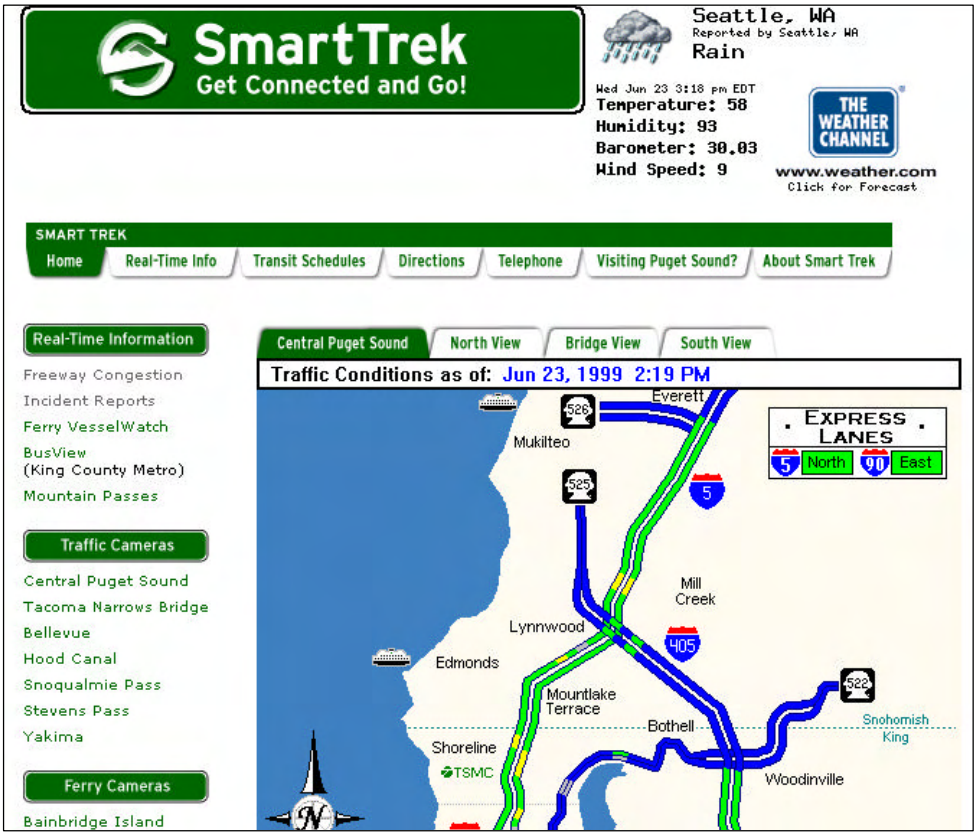

Figure 4--Smart Trek Web Page

EXISTING ATIS INFRASTRUCTURE

In its purest form, an ATIS is an integrated system with three primary components: the collection of data, the consolidation (or "fusion") of those data, and the dissemination of the resulting traveler information. The reality is a bit more complex. In the Puget Sound, due in large part to the Smart Trek project, a major component of the ATIS infrastructure is the Regional ITS Backbone, a virtual entity in which collected data are consolidated (or "fused") and prepared for dissemination. (See Figure 5.) However, some ATIS services are also currently delivered outside of this framework. For example, both King County Metro Transit and WSDOT provide information directly to the public

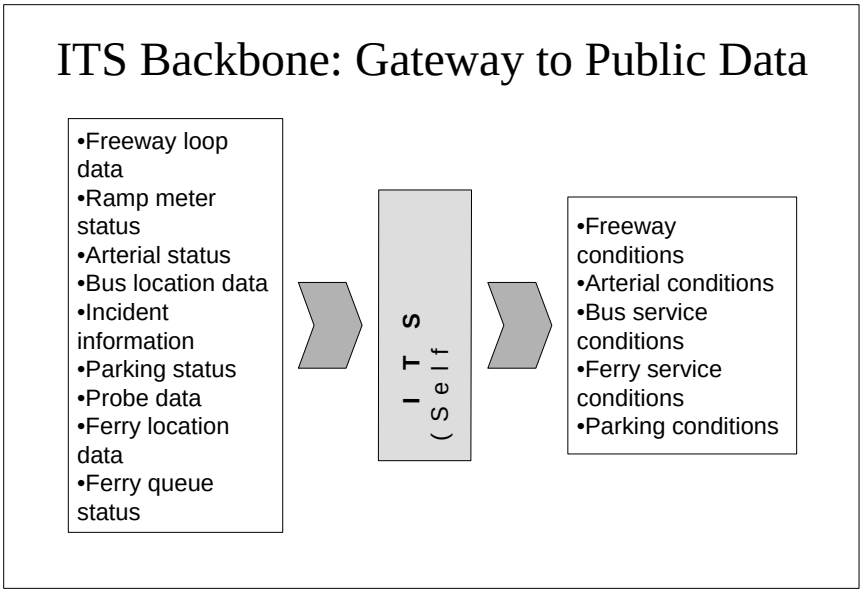

Figure 5--Function of ITS Backbone

through the Internet and automated telephone services. In addition, WSDOT provides direct video feeds for use by television stations and King County Metro Transit's control center.

Most of the existing data "fusion" process, however, is performed by the ITS Backbone with software developed by the University of Washington. The resulting information is provided to participants over the Internet through protocols developed under Smart Trek and earlier WSDOT projects. The fusion process includes the following functions:

- combining transportation system performance data from different sources
- performing quality control and/or quality assurance checks that help ensure the validity of the data
- computing new performance measures from collected data, such as vehicle speeds from vehicle volume and lane occupancy data, travel times from estimates of speed, and traffic conditions forecast on the basis of historical patterns
- creating data feeds consistent with an end user's needs (e.g., producing a specially formatted data feed that meets a desired input format).

The long-term goal is for the ITS Backbone to act as the single point of interface between public organizations collecting data and private sector information service providers (ISPs). This ITS Backbone concept is gaining acceptance on the national level as well. Not only does the ITS Backbone provide a mechanism by which the public sector can make data available to the private sector, but it is also a convenient way for public agencies to share their data with other public agencies for facility operation.

As mentioned earlier, and shown in Figure 6, other mechanisms besides the ITS Backbone are currently used as interfaces between the data collection process and the data dissemination process. There are three such interfaces: legacy connections (data connections that existed before the ITS Backbone was implemented), video, and the Internet. Examples of legacy connections include dial-up access to pre-recorded traffic messages and dial-up data interfaces to WSDOT's Northwest Region Traffic Systems Management Center (TSMC). Examples of the users of the video interface include the Washington State Patrol, King County Metro Transit's control center, radio and television stations, and the UW Traffic TV cable television service. Internet interfaces include the WSDOT traffic FLOW map, the transit Riderlink site, and the Washington State Ferries site.

EXISTING ATIS PARTICIPANTS

Twenty-nine public and private sector agencies and companies are officially participating in the Smart Trek project. At least thirteen more public agencies will provide data for ATIS services through their participation in one of several multi-jurisdictional transportation management system projects. Additional public sector agencies (such as U.S. Customs and Canadian Customs) will join in as their planned systems are completed. Table 2 lists the public sector agencies that are currently contributing to the ATIS.

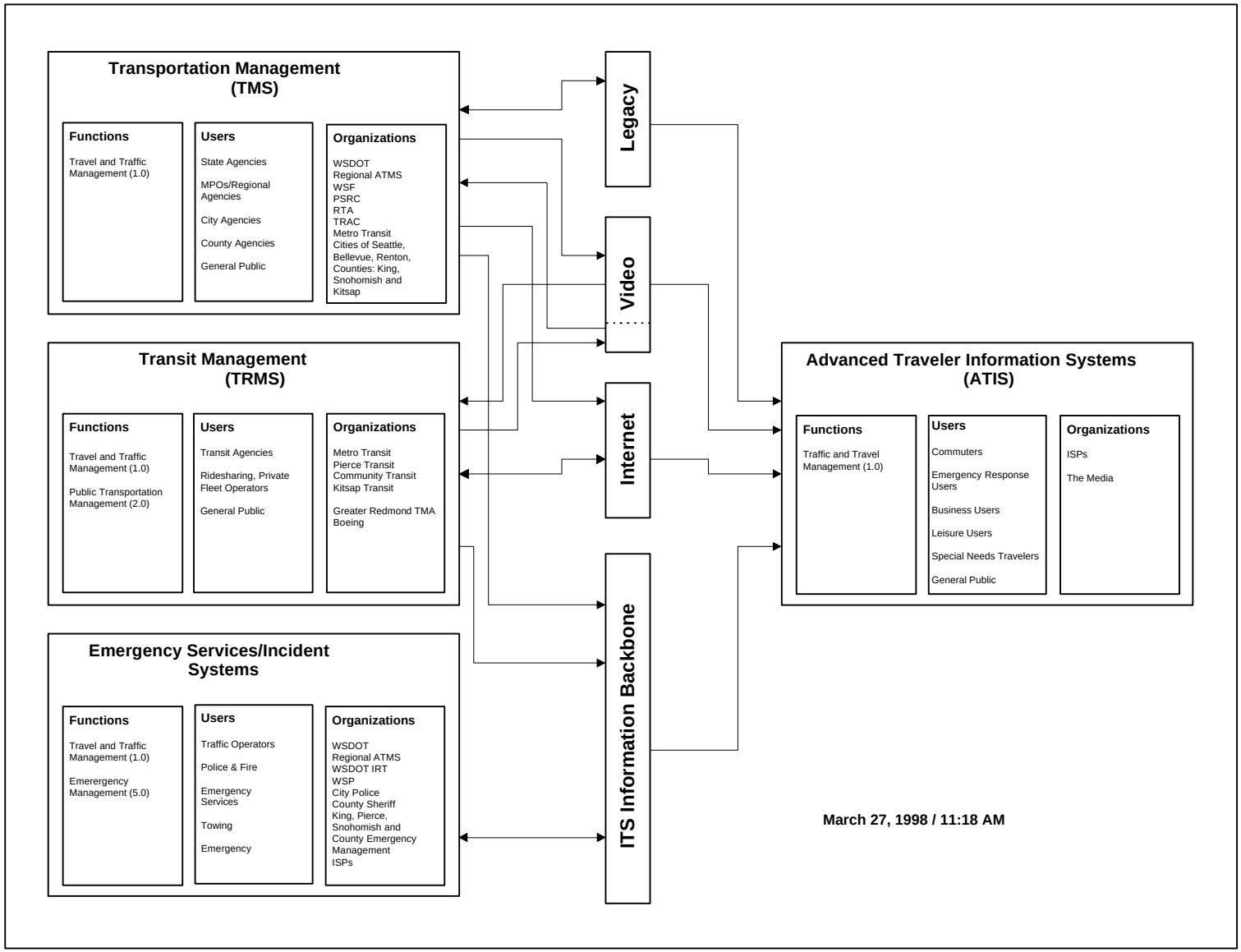

Figure 6[3] -- ITS Information Backbone

[3] Figure is from Smart Trek's "Systems Engineering Requirements Specification Version 2.0" (March 31, 1998 prepared for WSDOT by Battelle.

Table 2—Public Sector ATIS Partners

Federal, State, Regional	Other	City
Washington State Dept of Transportation (including Washington State Ferries)	King County (including Roads Division and Metro Transit)	City of Seattle
		City of Bellevue
Federal Highway Administration	Everett Transit	City of Redmond
Federal Transit Administration	Community Transit	City of Montlake Terrace
University of Washington	Kitsap Transit	City of Lake Forest Park
Washington State Patrol	Pierce Transit	City of Lynnwood
Puget Sound Regional Council	Sea-Tac Airport	City of Everett
	Snohomish County	City of Marysville
		City of Bothell
		City of Edmonds
		City of Federal Way
		City of Kenmore
		City of Shoreline
		City of Mill Creek
		City of SeaTac
		City of Kirkland

Federal government involvement in the ATIS (through USDOT) has included provision of funding for systems development, deployment, and evaluation under Smart Trek. USDOT does not play a role in the operation of completed systems but is responsible for ensuring that systems developed and deployed with federal assistance support the national effort to standardize and promote ATIS services.

An important goal of the Smart Trek project has been to attract private sector participation in ATIS in the Puget Sound region. The private sector has historically restricted its ATIS work to producing commercial media broadcasts (radio and TV). With the advent of modern electronic devices and inexpensive wireless communications, private companies have begun to market various personalized traffic condition and transit system information services. To provide these services, in most cases private companies

develop message sets by accessing public data sources, reformatting those data, and then broadcasting the message sets to customers.

The current private sector participants in the regional ATIS are listed in Table 3, organized by the role they play in the ATIS. (Some may be listed in more than one category.) There are four basic roles:

1. companies that deliver traveler information
2. companies that facilitate the delivery of that information (i.e., they perform an intermediate data processing step, contribute data to the existing data stream, or provide communication infrastructure used by a participating information service provider)
3. companies that provide consulting services that have helped create the data management and/or data delivery services used by other ATIS participants
4. companies that support ATIS by taking a lead role in making ATIS products and services available to their employees.

The list of both public and private participants can be expected to grow slowly over time as new data resources are deployed, as new data delivery mechanisms are marketed, and as these products and services begin to penetrate the market.

Table 3—Private Sector ATIS Participants

Deliver ATIS	Facilitate ATIS	Consultants	Support ATIS
Seiko Communications Systems[4]	Etak, Inc.	Battelle	Boeing Co.
CUE Data Corporation	Metro Traffic Control Inc.	David Evans & Assoc.	Greater Redmond TMA[6]
Microsoft Corporation	TV and radio stations	Pacific Rim Resources	
Fastline	Greater Redmond TMA[5]	PB/Farradyne	
Metro Traffic Control Inc.		IBI Group	
TV and radio stations			
Greater Redmond TMA[7]			
Etak, Inc.			

4 Seiko Communications Systems officially dropped out of the Smart Trek project late in 1998.

5 Greater Redmond Transportation Management Association -- Representing 160 corporations and their 31,600 employees. Member companies include Microsoft, Nintendo of America, Eddie Bauer, Safeco Insurance, AlliedSignal, Edmark Corporation, Group Health Cooperative, Lake Washington School District, Overlake Christian Church and Physio-Control.

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CHAPTER 4: THE EMERGING ATIS MARKET

Traveler information has already proven itself as a generator of advertising revenue, particularly for "drive time" radio traffic reports. Commercial television stations value traffic reports as a way of generating viewership, a key indicator in setting the advertising rates that sustain the station. In some cases, advertisers and sponsors are also paying for the exposure that traveler information Web pages and telephone hotline services provide. However, what the traveler information industry is really waiting and hoping for is revenue generated by personalized or enhanced traveler information services as a result of technological advancements in both traveler information and mobile consumer devices.

Private sector companies plan to make a profit either through charging consumers directly (subscription fees) for specific personalized traveler information services, or through wholesaling traveler information to consumer device vendors looking to traveler information services as a way to differentiate their products in a highly competitive environment.

This chapter discusses advertising (and sponsorship) revenue and fee-for-service revenue. It is assumed that in almost all cases the private sector will generate the overwhelming majority of this revenue. From the public sector viewpoint, the expectation is that, eventually, the public sector will be able to offset some of its ATIS-related costs by sharing in private sector ATIS profits.

REVENUE GENERATION

Revenue generation is highly dependent on the development and growth of the traveler information market, which is itself dependent on the deployment and marketing of new consumer electronic devices by the private sector. There is widespread belief that in addition, ATIS will be most successful, both financially and from a public benefit

standpoint, if the available traveler information covers all major modes and geographic areas. Thus, to gain the benefits of a larger traveler information market, WSDOT has a stake in helping other public transportation agencies add their real-time data to the ATIS.

Advertising and Sponsorship Revenue

The most developed of the ATIS markets, commercial radio and TV broadcasts describe current traffic conditions on the radio or, accompanied by visual depictions of traffic conditions, comment on current traffic conditions on TV.

This market currently generates considerable revenue for the private firms that serve it, either in the form of direct advertising revenue or overall advertising rates as a result of market share assessments.

These businesses use WSDOT data as a major source of the information upon which these broadcasts are based. They obtain their data from the same sources WSDOT uses to provide "free" information (the Internet, automated telephone services) to the general public. However, private firms usually add value to this information by collecting additional information (e.g., by flying planes over the area during the commute hours) and by making the traffic information conveniently available to customers through radio and TV broadcasts. In addition, TV stations frequently rebroadcast live WSDOT closed-circuit TV (CCTV) images. These images are made available through the Traffic Systems Management Center. These full motion CCTV images are not available to the general public, although "still frame" images from some of these cameras are available freely over the Internet.

Another segment of the commercial media market is the creation of new broadcast services not currently offered by commercial stations. "TrafficTV," developed as part of Smart Trek, is an example of such a new service. TrafficTV provides continuous traffic updates during peak traffic hours on public access cable television. TrafficCheck is a similar private sector offering by Etak in Atlanta, San Francisco, and

Phoenix. These services can either be offered over public access broadcast channels (supported by advertisements in the form of "sponsorships") or commercial cable television. They could also be sold (licensed) to existing commercial stations, which would integrate them into their existing programming.

Internet Web sites and automated telephone services that provide traveler information have the potential to generate advertising or sponsorship revenue.

WSDOT's Internet Web site (including congestion maps, traffic cameras, and mountain pass conditions) has been quite well received, attracting between 350,000 and 400,000 user sessions[8] per month. Until recently, a similar map could be obtained from the Microsoft Sidewalk Web site. Currently, Sidewalk provides a link to the WSDOT Web site, as do many other public and private Web sites. Advertiser-supported Web sites for two of the major television stations in the Seattle area (KOMO and KIRO) provide framed versions of the WSDOT congestion map. In other cities, Maxwell Technologies (now part of SmartRoute Systems) offers both publicly funded and advertiser-supported congestion maps on the Internet. WSDOT has not pursued advertising or sponsorship of its Internet congestion map except for an advertisement on the mountain pass road condition Web site as part of an agreement with an outdoor equipment retailer (REI) to sponsor the mountain pass telephone call-in line during the 1997–1998 ski season.

WSDOT's telephone call-in line provides an automated information resource for current freeway conditions, mountain pass conditions (during the winter season), and construction updates. It is an expansion and combination of several previous telephone systems run by WSDOT. During the 1997-1998 winter, the 1-800 service for the mountain pass line was supported by REI, which placed an advertising message on the call-in line and Web site in return for a $40,000 payment to WSDOT (initially a $30,000 payment toward the phone line and a $10,000 payment for Web advertising). The

[8] For the WSDOT ATIS Web pages, user sessions are estimated to equal 6% of the total number of "hits" based on analysis done by Battelle.

agreement was not renewed for the 1998–1999 ski season. In some cities, cell phone companies provide this service as a way of differentiating their service in a competitive market. In 1997, WSDOT entered into an agreement with a company called Toll Free Cellular to allow advertising by Toll Free Cellular when citizens used their cellular telephones to call WSDOT's congestion information service. In return for this advertising capability, Toll Free Cellular paid for the cellular airtime charges. This agreement lasted until Toll Free Cellular went out of business in early 1998.

Fee-for-Service Revenue

This market segment includes broadcasting traveler information directly to paying customers. Customers may pay a fee specifically for the traveler information, or they may pay for traveler information as part of a bundled set of personalized information services such as stock quotes, weather, and news. This market is specifically designed to generate user fees, usually in the form of monthly subscriptions, and is heavily reliant on public data for information content. Mobile consumer communication devices are used to deliver these traveler information services. These devices include in-vehicle navigation units, handheld computers, and pagers.

PRIVATE SECTOR ATIS MARKET PROJECTIONS

Because ATIS involves technologies that are still emerging, few concrete data are available to predict their market potential. In 1997, ITS America and the U.S. Department of Transportation published ITS National Investment and Market Analysis, prepared by Apogee Research. Although the findings are not directly comparable to the results from the market projections done for this Washington State ATIS Business Plan, they do support the market growth assumptions used here.

The Apogee report looked at the entire ITS market, including mayday, vehicle safety, and obstacle warning systems. Its "en-route guidance and information" products group is the most closely related to ATIS services.

Apogee's conclusions were that the total annual market for en-route guidance and information products would rise from approximately $500 million in 2000 to $8 billion in 2010, growing an astonishing 1500 percent over 10 years. This reflects the assumption that substantial market penetration of in-vehicle navigation devices would be achieved as a result of new, factory-equipped vehicles.

The Hagler Baily firm, formerly known as Apogee Research, updated its study and recently released the 1999 edition called The Market for Emerging Technology Applications in Transportation. According to the January 11, 1999, issue of *Inside ITS*, the study found that the overall market for private sector ITS is moving even faster than predicted in the original study two years ago. A shorter than expected technology cycle and a faster drop in prices than expected were two of the reasons cited.

In the Puget Sound region, anecdotal evidence from focus groups and the success of related technologies and services (e.g., the popularity of drive time radio traffic reports and cellular telephones) strongly support the belief that a market for pay-for-service transportation information exists. However, it is possible to estimate the eventual size of this potential market only by making a variety of assumptions and by applying those assumptions to the demographics of the region. Whether the products will ever reach these levels of market penetration and the amount of time required to reach that market size are subject to a number of variables[9] that are themselves impossible to accurately predict. However, results from this analysis are supported by the Apogee results.

For the purposes of this plan, private sector ATIS revenue for the Puget Sound region was projected on the basis of a variety of assumptions applied to the demographics

[9] Most importantly, this market depends on whether private companies are successful in selling the consumer electronics necessary to allow receipt of these data when consumers want them.

of the region. For the analysis, the personalized traveler information services market was divided into two sub-markets, the personal traveler and the commercial (or freight) traveler. Sizes for both markets were computed independently and then added together to estimate total market size. A complete list of the assumptions used to estimate potential fee-for-service revenue is included in Appendix A, along with a complete description of the methodology used to compute the revenue estimates. The results indicate an annual total of between $3 million and nearly $9 million in private sector gross revenue by the year 2008.

These revenue estimates are highly speculative and highly dependent on the development and consumer acceptance of the consumer electronic devices needed to deliver this information. Table 4 and Figure 7 show the projected low-end and high-end private sector ATIS market growth based on the analysis presented in Appendix A, with the results of the 1997 Apogee research (in $ billions) included on Figure 7 for reference.

Although it is impossible to be precise about the future of the private sector ATIS market, it is clear that given the assumptions, the market is poised to expand dramatically beginning in about 2002.

Table 4—Worst Case and Best Case Total Revenue for ATIS in the Puget Sound Region

Year	Worst Case Total Revenue	Best Case Total Revenue
1999	$32,000	$32,000
2000	$65,000	$322,000
2001	$329,000	$657,000
2002	$803,000	$1,004,000
2003	$1,363,000	$1,363,000
2004	$1,663,000	$2,772,000
2005	$1,973,000	$4,229,000
2006	$2,293,000	$5,735,000
2007	$2,624,000	$7,287,000
2008	$2,963,000	$8,889,000

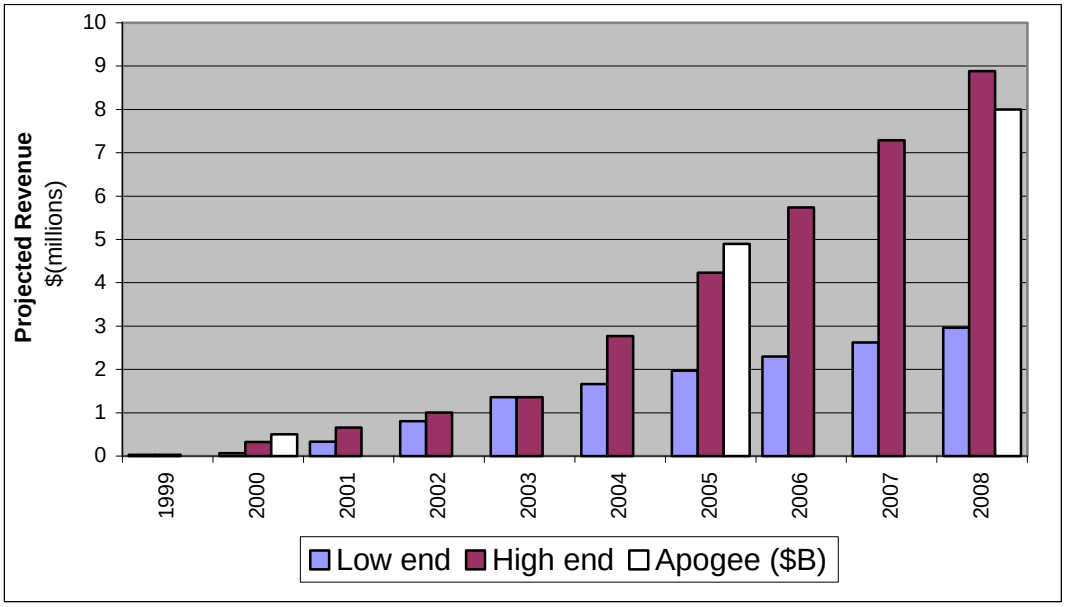

Figure 7 -- Private Sector ATIS Market Growth

CHAPTER 5: ATIS BUSINESS PLAN OBJECTIVES

VALUE FROM TRAVELER INFORMATION

As the state transportation agency, WSDOT is responsible for the safe and efficient operation of state transportation facilities. It has also assumed a leadership role in addressing regional traffic congestion. To that end, WSDOT gathers the traffic data necessary to meet its responsibilities and to improve the management and operation of regional and statewide transportation facilities.

Travelers value the information derived from these data because it has general news value and because understanding the state of the transportation system improves their mobility by giving them opportunities to change their travel behavior to better meet their personal needs.

The public sector also benefits from individual traveler's decisions. One reason is that many of these decisions help improve the operational performance of the transportation system. For example, people can choose to avoid heavily congested roads by delaying trips or choosing alternative routes, destinations or modes, thereby easing congestion. Another reason is that the ability to make these decisions increases the mobility of the general population, thereby supporting WSDOT's public service mission.

Providing a basic level of traveler information free to the public supports WSDOT's mission of safe and efficient operation of its facilities and is consistent with policy adopted by the Washington State Transportation Commission.

The fact that traveler information is perceived as valuable by travelers presents private sector business opportunities. However, creating these private sector business opportunities requires tradeoffs. The goals of (1) improving transportation system efficiency by making traveler information broadly available for free and (2) providing limited access to this information to create an incentive for private sector investment are

mutually exclusive. Neither can be fully achieved without hindering the success of the other; one must be emphasized over the other.

OBJECTIVES OF THE BUSINESS PLAN

The purpose of the ATIS Business Plan is to set out WSDOT's view of the appropriate roles, responsibilities, and allocation of costs for public and private providers of ATIS services.

The actions recommended as part of this ATIS Business Plan (Chapters 6 and 7) are intended to achieve the following three goals:

1. Promote the safety and efficiency of WSDOT transportation facilities by providing traveler information services as a by-product of transportation management systems.
2. Encourage private sector investment in ATIS services as a way to further leverage WSDOT data resources and to further promote the safety and efficiency of WSDOT transportation facilities.
3. Reduce WSDOT’s costs of providing traveler information services.

The market for consumer ATIS services and devices is evolving, and private sector ATIS investments are still highly speculative. However, there is mounting optimism, particularly regarding in-vehicle devices, that the consumer market for ATIS services and devices will take off in the next two to three years. (See Chapter 4 for further discussion of the evolving ATIS market.)

In the long run, WSDOT will benefit from the existence of a large market for private ATIS services. Until the private ATIS market matures, WSDOT will need to subsidize the ATIS infrastructure (ITS Backbone). Clearly, the private sector ATIS market will have a much greater chance of success if the public sector continues to nurture it for a few more years.

Particularly through the Smart Trek program, WSDOT has created an ATIS infrastructure (the ITS Backbone) designed to encourage and support deployment of private sector ATIS services. WSDOT intends this investment in the ITS Backbone to stimulate the private sector ATIS market.

WSDOT is unlikely to bear the full cost of supplying and supporting ATIS data indefinitely. Provided that ATIS markets actually materialize, private sector companies taking advantage of public sector data can first begin to recoup their investment, then provide some return, and then share in paying ATIS operations and maintenance costs.

IMPLEMENTATION OF THE BUSINESS PLAN

From an implementation point of view, two approaches to the ATIS Business Plan are necessary: near-term actions for the next two or three years, and future actions to prepare for a more mature ATIS market.

The primary drivers of the actions recommended for the next couple of years are a speculative and highly volatile consumer market for ATIS services and a still developing, and somewhat untested, public infrastructure model (the ITS Backbone). Both of these issues can be expected to have proved themselves one way or the other over the next couple of years. Beyond this timeframe, there can be little certainty about what will drive a longer-term ATIS business plan.

Near-term implementation actions are presented in Chapter 6. Chapter 7 identifies longer-term actions.

CHAPTER 6: NEAR-TERM IMPLEMENTATION

The next two years should see substantially more activity by private sector ATIS service providers as personal communication devices penetrate the consumer market and telecommunications constraints diminish. All over the country public ATIS services in particular, such as WSDOT's Internet-based traffic flow map, are raising awareness of the availability and usefulness of real-time traffic information.

The three actions key to stimulating (and preparing for) the emerging private sector ATIS market over the next two years are listed below and discussed in more detail in the remainder of this chapter.

1) Adopt "ground rules" guiding cooperation and public ATIS initiatives.
2) Promote and enhance the ITS Backbone.
3) Test the ability of WSDOT ATIS services to generate sponsorship revenue.

ADOPT GUIDELINES FOR PUBLIC/PRIVATE COOPERATION FOR ATIS

WSDOT is willing to cooperate with any private company that will offer services to assist the public in using the state's transportation facilities more safely and efficiently. However, that cooperation is subject to the overriding goals and objectives of the state and region, as well as the fiscal and managerial constraints of WSDOT.

Below are guidelines for public ATIS service initiatives and cooperation with private sector ATIS companies. These "ground rules" reflect WSDOT's expectation of the appropriate public and private sector roles in providing ATIS services.

ATIS BUSINESS GUIDELINES	
1	In support of its role in managing the state's transportation facilities, and consistent with adopted policy guidance, WSDOT will continue to provide traveler information services* that meet the following criteria: • The source data are generated by systems used to perform the core business functions of operating, monitoring, and evaluating WSDOT facilities. (WSDOT does not intend to add data collection capability solely for the purpose of meeting the data needs of the private sector ATIS services.) • The traveler information service is available to a broad segment of the public. (For example telephone, television, radio or Internet-based services, highway advisory radio, and variable message signs.)
2	WSDOT will allow private companies (including radio and television broadcasters) to access information about facility performance.
3	The ITS Backbone will be the primary mechanism for sharing WSDOT data with private companies (and other public agencies).
4	The private companies will be responsible for all costs incurred to access the data (Internet connections, fiber connections, etc.).
5	WSDOT will not develop and implement individualized or specialized services in competition with the private sector.
6	WSDOT will cooperate with any private firm in providing ATIS so long as the effort provides a net benefit to the public, the net benefit exceeds WSDOT's cost to cooperate with that effort, and the funds needed to cooperate with that effort are available for this purpose. When more requests for cooperation exist than budget allows, WSDOT will prioritize those private sector requests on the basis of the size of the public good provided, the degree to which the project is perceived to be in the public or state's interest, and the cost of WSDOT's participation.
7	A private sector firm may contribute funding or services to WSDOT to reduce the net cost of WSDOT's cooperation in order to obtain its cooperation.
8	All private sector partners will be treated equally. There will be no exclusive access agreements. For example, all radio stations will have equal access to WSDOT data, except where a station pays for a marginal improvement in that service. However, all stations will have the option of purchasing that same marginal improvement in service. This treatment is subject to the issues of capacity and access described above.
9	WSDOT will not enter into markets already served by the private sector, but it may remain in an existing market if a private vendor enters it. WSDOT may voluntarily relinquish that service to the private sector provider for its own business reasons (e.g., significant cost reductions can be achieved or other benefits will accrue).
10	Where WSDOT sees a need and significant public benefit from a new information service, and that new information service can be provided at little marginal cost to WSDOT, WSDOT may undertake that service. If a private company wishes to offer that same service, it is free to do so. WSDOT will cooperate with that company under the same conditions as mentioned above. WSDOT will not enter a market segment already served by the private sector unless significant public benefit will be gained from the addition of such a service.

*Significant enhancement of these services, with personalized information for example, would compete with similar private sector initiatives and could possibly discourage private sector ATIS service investment. It is important that WSDOT's services remain directed at the general population and geared to the technology that is generally available to the public either at home, at work, at school, or in public libraries.

PROMOTE AND ENHANCE THE ITS BACKBONE

The ITS Backbone is the data sharing mechanism developed and implemented under the Smart Trek project. (See Chapter 3.) It is the gateway for private sector access to public sector data to support ATIS services. WSDOT's commitment to continue funding the operation of the ITS Backbone, at least in the short term, is necessary in order to derive long-term benefit from this investment.

To stimulate and foster the development of a private sector ATIS market, the ITS Backbone needs to continue operating for at least the next two years. By generating private sector use of public ATIS-related data, WSDOT would benefit from a robust private sector ATIS market in which more people would have access to travel-related information.

Although Smart Trek has made great strides in the development of the ITS Backbone, more work is needed to support a broad range of ATIS service providers. Without further promotion and development of the ITS Backbone, WSDOT can expect limited use of this investment and fewer ATIS services available for consumers.

The primary role of the ITS Backbone should be re-evaluated toward the end of this two-year period. (See further discussion of this strategy in Chapter 7.) An evaluation at that time would reflect the state of the ATIS market, the business relationships that have evolved, and the private sector demand and willingness to participate in funding additional services.

For the ITS Backbone to act as a market stimulus, the cost of operating it should include support services that will facilitate the use of WSDOT data (and other public data on the ITS Backbone) by private ATIS companies. As proposed by the Smart Trek project team, the support services necessary to promote and enhance the ITS Backbone include the following:

- creating and distributing outreach materials to private sector ATIS service providers to generate interest in use of the ITS Backbone

- answering queries from prospective users of the ITS Backbone data
- investigating new potential market segments toward which to target ITS Backbone enhancements and outreach
- soliciting additional public agencies (and private sector entities) that collect transportation system data to make those data available on the ITS Backbone to expand its geographic coverage and capability
- developing and implementing improvements to the ITS Backbone processes, hardware, software, and tools
- providing technical support to new data providers and data users
- developing and implementing improvements to data quantity, quality, and reliability to better meet the needs of private sector data users.

TEST THE REVENUE GENERATING POTENTIAL OF WSDOT ATIS SERVICES

WSDOT operates several popular ATIS services that may have the potential to generate revenue[10]. These services include Internet Web pages (traffic congestion, ferry services, and mountain pass conditions), automated telephone service (traffic conditions and mountain pass conditions), and cable TV broadcast of traffic conditions (UW cable TV). These existing ATIS services not only provide good sources of public information that are broadly accessible, but their existence also has acted as a catalyst for the development of other ATIS services in this region.

The popularity of the Internet Web services, in particular, indicates that at least the potential for advertising revenue exists. The Smart Trek program provides an opportunity to test the revenue generating potential of these services.

10 Advertising opportunities are not discussed for roadside information systems such as variable message signs and highway advisory radio. WSDOT policy opposes adding visual distractions that affect motorists' ability to concentrate on the task of driving their vehicles. Advertising on VMS or HAR might also reduce the effectiveness of these devices by creating a situation in which motorists ignore the travel-related messages because they expect only advertising.

The Smart Trek program is already actively seeking commercial sponsorship of the TrafficTV application. However, Smart Trek provides an opportunity to also "test the waters" for the revenue generating potential of the Web-based and telephone hotline applications. This effort could also identify the costs associated with generating this revenue.

If Smart Trek efforts were successful and WSDOT decided to continue pursuing these revenue sources, WSDOT would require some staff time and cost dedicated to this effort. This cost would likely be as much as 50 percent of the gross revenue, as evidenced by the management costs for similar efforts such as transit advertising.

In the long-term, commitment to the concept of generating revenue from ATIS services sponsorship would entail at least the following:

- assigning staff (or hiring a firm that specializes in these matters) to recruit advertisers for the systems that will carry advertising (Currently the Heritage Corridors program administers a contract with an advertising broker for traveler services-related advertising at rest areas.)
- developing guidelines for acceptable advertising material.

The analysis suggests that annual net revenue of an estimated $195,000 could be expected. (Revenue estimate analysis is presented in Appendix B.) Net revenue is projected at 50 percent of gross revenue because to the costs of soliciting advertisers and sponsors. These revenue estimates are highly speculative (except the telephone call-in revenue, which has already been demonstrated), and it must be noted that despite the efforts of the Smart Trek program, to date no commercial sponsorships have been secured.

CHAPTER 7: LONGER-TERM IMPLEMENTATION

This plan assumes that the market for private sector ATIS services and devices will "turn the corner" toward profitability within the next two to three years. Implementation of the strategies in this chapter would occur three to four years from now. However, it is appropriate to prepare to implement these strategies during the next couple of years. The longer-term strategies for the ATIS Business Plan are as follows:

1) Begin sharing the cost of operating the ITS Backbone with those that benefit from it.
2) Re-assess the ITS Backbone concept and current operating model.

MOVE TOWARD PRIVATE SECTOR FUNDED ITS BACKBONE OPERATION

Assuming that the private sector ITS market will grow as expected, public support of ATIS services is expected to diminish over time, eventually reducing to zero, as the private sector market evolves.

Significant resistance to cost sharing should be expected from the private sector until the market has been proven. If the timing is right, however, it is more likely that the private sector will accept reasonable cost sharing arrangements but will demand higher levels of data reliability and accuracy than Smart Trek currently provides.

Private sector funding of the operation and maintenance of the ITS Backbone could take several forms, each with its own advantages and disadvantages that would become more or less important as the private sector ATIS market developed. Given the volatility of the market and the changing mix of players, it is most appropriate to make the cost sharing mechanism decision later.

The cost sharing mechanism options include the following:

- Consortium—This option would create a group made up of the public agencies and private companies that provide data to, or derive benefit from,

the ITS Backbone. As a group, the participants would make decisions regarding the operation and evolution of the ITS Backbone. Each agency or company would also contribute a percentage of the total operating cost of the ITS Backbone. This approach would greatly diminish WSDOT's control over the ITS Backbone but would result in the ITS Backbone more closely meeting the needs of the consortium members.

- Data Access Fee—Under this scenario, private sector companies would be charged for access to the data desired. Mostly likely, the charge would be monthly or annual and would vary by data type. The goal would be for the total charged to equal the cost of operating the ITS Backbone. The fee could possibly take the form of a usage charge that reflected the actual amount of data taken off the ITS Backbone. This approach would keep control of the ITS Backbone with WSDOT, but WSDOT would have to put concerted effort into making sure the ITS Backbone met the needs of its customers. This approach would also be likely to create a large administrative burden, given the potential complexity of the fee structure.
- Participation Fee—This option would require all ITS Backbone operating expenses to be covered by fees paid by the public agencies and private companies that derived benefit from the ITS Backbone. It is different from the Consortium option in that it would not include any management of the ITS Backbone by the group. Participants would simply pay some percentage of the total operating cost while WSDOT continued to manage the operations of the ITS Backbone. This approach would be more of a team approach, with WSDOT continuing to have significant control over the ITS Backbone and its services.
- Profit Sharing—This option would give WSDOT (and other public agencies participating in the backbone) a share in any profits obtained by private

companies selling public data. This approach would lead to the basic accounting problem of reliably computing "profit." Although some agencies have decided to collect a percentage of gross revenue in place of a fraction of "profit" to surmount this problem, this approach would underplay the basic "commodity" role of public data in the private provision of traveler information.

A challenge for WSDOT will be to know when one of these cost-sharing alternatives can be reasonably implemented. For the private sector, paying for access to public data will raise the cost of providing these services, decreasing the profit potential of the ATIS services. Such charges will also be likely to cause private providers to increase fees charged to consumers. Consequently, if charges are imposed too soon, they may create a further impediment to the growth of the ATIS market. Until the market has grown to sufficient size, such an impediment will be counter-productive to WSDOT's traffic management objectives and its general policy objectives for providing the public with information.

Therefore, WSDOT should expect to subsidize the operation of the ITS infrastructure (specifically the ITS Backbone) until the market is well established. The actual start of cost sharing to support the ITS Backbone will be subject to the development and growth of private sector revenue streams and should entail considerable input from the private sector.

As WSDOT begins to share the cost of operating the ITS Backbone, the companies that pay for that service will logically demand higher levels of system reliability than are currently provided. The ability to obtain and deliver the data that private companies have promised to their customers is of paramount concern to the private information service providers working with Smart Trek. Without reliable operation, customers will not purchase services from these vendors. Achieving these higher levels of reliability will likely require additional expenditures on computer

hardware, computer software, and possibly communications infrastructure to create more fault-tolerant systems.

The concept of “reliability” has several facets, including the two most important ones:

- whether the “system” is operating (i.e., whether the customer’s device provides information when the customer wants it)
- whether the data provided are accurate.

To make their devices work, the private information service providers need a continuous feed of data on the performance of the transportation system. For Smart Trek, that feed comes from the ITS Backbone, to which these criteria for "reliability" will be applied.

The ITS Backbone currently operates about 95 percent of the time. This has been acceptable during the Smart Trek project, partly because most private sector partners are still in the product testing stage of their service implementation, and partly because the data are being provided free of charge. In addition, most private sector partners have yet to begin charging customers for their services and therefore are not being held accountable for system down time to the same degree that they will be.

The second aspect of data reliability, “accuracy,” may mean something different to an ATIS service provider than it does to WSDOT. ATIS service providers may want greater accuracy or a higher level of detail than WSDOT needs for traffic management purposes. Even if it decides to charge for access to data, WSDOT is basically in the market of providing “existing” data. It has never intended to create new data collection systems simply to meet the needs of the private sector. If the existing data are not sufficiently accurate to meet the private sector’s needs, WSDOT simply will not have a market.

This is not to say that planned improvements in WSDOT’s data collection capabilities will not increase the “accuracy” of available information. Specific

limitations in the current data, such as lack of coverage on many facilities, slow detection of incidents or inadequate incident location information, may be resolved over time as new information sources such as arterial data or probe data are developed as part of continuing improvements to the region's transportation management system. Certainly one of the "value added services" that the private sector can offer is the development of "more accurate" data, either through the collection of additional information or through new analytical techniques that use existing information.

One other consideration is that because paying ISPs can reasonably expect a higher level of service, if WSDOT charges for access to its data, paying companies may have the right to expect that WSDOT will perform its own computer system maintenance functions in off hours. In other words, enhancements to the TSMC operations computer system that WSDOT currently makes routinely could disrupt the flow of information to the ISPs. Consequently, WSDOT might need to perform these upgrades at times that are least disruptive to the ISPs (e.g., late at night), rather than at times when the operational requirements for those data are minimal (i.e., when the ramp metering system is not needed, such as in the late morning). Such constraints will be necessary if WSDOT wishes to maximize the cost-sharing concept. These constraints are less critical when the cost of data to the private sector is minimal.

SECOND ASSESSMENT OF THE ITS BACKBONE CONCEPT AND OPERATING MODEL

In the short term, operation of the ITS Backbone will be covered by the Smart Trek operations plan currently under development. That plan is expected to address the following issues:

- roles and responsibilities
- hours of operation
- maintenance requirements and response times

- data accuracy
- reporting requirements
- security and data access
- configuration management
- standards and protocols
- system documentation
- operational agreements
- consistency with the National ITS Architecture.

The hardware, software, and procedures that make up the ITS Backbone can continue to be operated by WSDOT (through the University of Washington), or the operation could be contracted out to a third party. In the longer term, encouraging a private or non-profit entity to operate the ITS Backbone might become desirable if doing so would improve the Backbone's operation or reduce the cost of its operation. The academic research aspect of the ITS Backbone is anticipated to diminish over the next couple of years, minimizing the value of continuing its operation at the University of Washington.

Some states and cities have opted for third party operation of their ATIS infrastructure, but unlike WSDOT, they have started from scratch in setting up their ATIS services. In the case of WSDOT, the Smart Trek project provided the funding to establish the ITS Backbone, although operating the existing ITS Backbone infrastructure through a contract with a third party (other than the University of Washington) is clearly still an option.

The option of contracting with a third party may have an advantage in providing a more supportive environment for private sector ATIS service development. It may also be a lower cost option if competitively bid. However, the option of continuing to operate the ITS Backbone through the University of Washington has a slight advantage in that it reduces risk to WSDOT. Even with a very good contract in place with tight controls, if

the third party goes out of business, for example, WSDOT will be left to either abandon the ITS Backbone or scramble to take over its operation.

A move to another operator should be evaluated as both the ATIS market and the ITS Backbone mature. WSDOT should monitor the success of other business models over the next couple of years. Given the experiences of other cities and states, the stability of operating through third parties should be clearer. At that time, the operation of the ITS Backbone could be competitively bid, with demonstrated reliability a key determinant in the selection of the successful bidder.

CHAPTER 8: BUSINESS PLAN IMPLEMENTATION ISSUES

The desired outcomes of implementing the ATIS Business Plan are continued basic traveler information available free to the general public, a fertile ground for private sector investment in consumer devices and individualized traveler information services, and, eventually, reduced public sector support of ATIS infrastructure, specifically the ITS Backbone.

Three near-term and two longer-term implementation activities designed to achieve these results have been presented in the previous two chapters. This chapter briefly reviews the implementation issues associated with each of the five actions. The plan is summarized in Figure 8.

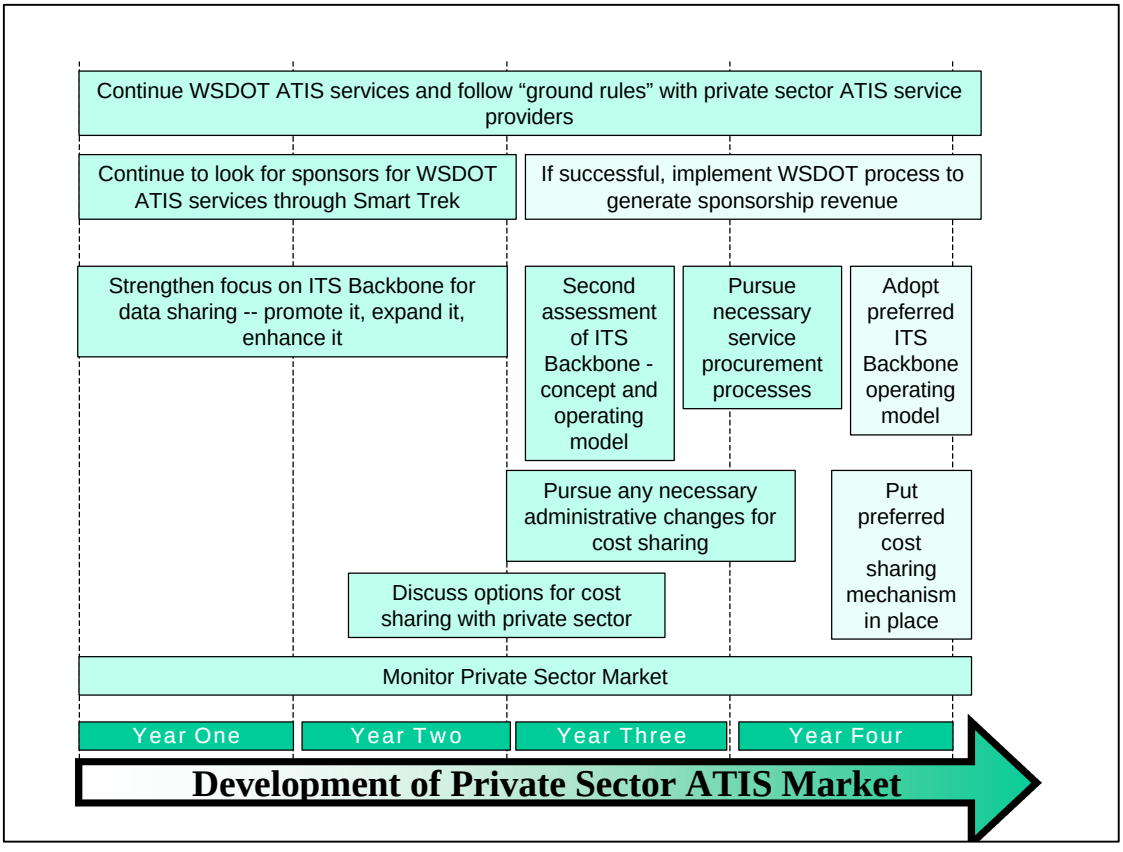

Figure 8 - ATIS Business Plan Summary

ADOPT "GROUND RULES" TO GUIDE PUBLIC/PRIVATE COOPERATION FOR ATIS

- Already, the popularity of WSDOT's Web-based Flow Map is starting to create periods of excessive load on the WSDOT server. Rather than increase capacity, WSDOT could consider cooperating with a private sector or non-profit entity to set up an additional server. The private sector or non-profit group would purchase, operate and maintain the equipment using advertising or sponsorship revenue. WSDOT would continue to operate its own Flow web site but would direct users to the auxiliary site, especially during peak usage periods.
- It will be important to distribute the "ground rules" (presented n Chapter 6) broadly to both WSDOT and private sector companies. WSDOT should encourage other public agencies to adopt similar guidelines for working with the private sector and pursuing public ATIS services.
- These guidelines have not been tested and may need some modifications over time. WSDOT should be open to feedback from both the private sector and public sector. The key issues are likely to be lack of exclusive access to public data and guarantees of continuous data feeds.

PROMOTE AND ENHANCE THE ITS BACKBONE

- This plan assumes that the 1999-2001 budget request to support operation, maintenance, and enhancement of the ITS Backbone is funded. This will allow the Smart Trek program team to follow through on promotion, enhancement, and expansion of the ITS Backbone.
- These promotion and enhancement efforts need to be clearly planned and directed over the next two years. The value of the ITS Backbone to private sector ATIS service providers will expand as the available data expands. Expansion to a statewide source of multi-modal data may provide private

companies with incentive to offer traveler information services for smaller urban and rural markets.

- In particular, Smart Trek needs to identify and plan to meet the quantity, quality, and reliability demands of public and private entities that will be asked to share in the cost of operating the ITS Backbone.
- The goal should be to complete major enhancement and promotion efforts and stabilize the ITS Backbone during the 1999-2001 biennium to reduce the cost of supporting the ITS Backbone during the 2001-2003 biennium.
- An evaluation of the success of the Smart Trek enhancement, expansion, and promotion effort should be planned for late 2001 or early 2002.

TEST THE REVENUE GENERATING POTENTIAL OF WSDOT ATIS SERVICES

- If Smart Trek is successful in generating advertiser interest significant issues about the desirability and appropriateness of advertising, particularly on the WSDOT Web pages, will need to be addressed within the organization.
- Eventually, distribution of revenue from these efforts will become an issue to be resolved. Every effort should be made to reinvest this revenue into the operation and maintenance of ATIS services.
- Given some success with testing the ability of these services to generate advertising or sponsorship revenue, and the desire to expand advertising to WSDOT services, WSDOT would need to begin the process of requesting authority to pursue this funding source during 2001 if Smart Trek's results are promising.
- Efforts could also be made to secure ATIS-related, in-kind services (telecommunications, cameras, and other equipment) in exchange for sponsorship or advertising opportunities.

MOVE TOWARD PRIVATE SECTOR FUNDING OF THE ITS BACKBONE

- WSDOT should continue to monitor the private sector ATIS market nationally and locally to be able to determine appropriate timing for beginning cost sharing for the ITS Backbone.
- Analysis of the cost sharing options (consortium, data access fee, participation fee, and profit sharing) should begin as early as 2001. Discussions of these alternatives should be held with private sector companies that are using, or planning to use, the ITS Backbone at that time.
- WSDOT should begin the process of requesting authority for implementing the preferred cost-sharing model as early as 2001.
- WSDOT can expect to continue supporting operation of the ITS Backbone during the 2001-2003 biennium. The goal should be to have a cost sharing process in place for the 2003-2005 biennium.

CONDUCT A SECOND ASSESSMENT OF THE ITS BACKBONE CONCEPT AND OPERATING MODEL

- WSDOT should continue to monitor the success of ATIS business models being used elsewhere in the country.
- Analysis of the operating model options should begin as early as 2001.
- If appropriate, WSDOT should begin the process of moving operation of the ITS Backbone to a private sector or non-profit operator in 2003, unless it becomes clear earlier (prior to the 2001-2003 biennium) that operation of the ITS Backbone needs to be moved to a third-party operator.
- The goal should be to have a long-term operating model in place for the 2003-2005 biennium.

APPENDIX A
Private Sector ATIS Revenue Estimation for the Puget Sound Region

Personalized and enhanced traveler information services depend on the availability of modern wireless information devices to deliver personalized traveler information. Two separate sub-markets make up this market, the consumer market and the commercial market.

The personal market is assumed to comprise individual drivers. The fees needed to pay for these ATIS services are assumed to come from the discretionary household incomes of the owners of these devices. Consumers are assumed to be willing to pay for these services because the personal benefits they would obtain from having access to ATIS information would outweigh the cost of these services.

On the other hand, in the commercial market the cost of these services is paid for by a company/agency so that its employees can obtain specific benefits. In most cases, this means faster, more reliable delivery of goods or services, which increases employee efficiency. The company is assumed to be willing to pay for ATIS services because of cost savings it would achieve if its employees and/or freight were stuck less often in traffic.

These two markets and the revenue potential they represent are discussed below.

MARKET SIZE ESTIMATES

To estimate revenue, it was first necessary to determine the total market size for ATIS devices and to make educated judgments about the number of individuals and firms that could actually be expected to make that purchase. For the purposes of this analysis, the entire potential market was split into the "consumer market" and the "commercial market."

Consumer Market

The potential size of the consumer ATIS market in the metropolitan Puget Sound region was based on the expected population of the area[1] and the results of two WSDOT research projects that characterized both the interest of people in obtaining and using transportation information (and thus being interested in purchasing this information) and the prices those consumers would be willing to pay for those services.

Separate but related markets were estimated for three types of devices. Each type of device represents a range of specific information delivery services. The willingness of someone to purchase and use one of these devices was based on whether individuals would be interested in receiving transportation information and how they would be willing to change their travel behavior given that information. (For example, if travelers would not change their travel behavior at all on the basis of information, they were assumed to be unlikely to pay for information delivery services. If they would be willing to change routes, but not modes they would be a candidate for devices that assist in route guidance decisions but not modal choice decisions.)

The types of information delivery devices that were examined include the following:

- specialty pagers (such as the Seiko message Watch tested in the Swift project)
- in-vehicle navigation devices with external links to real-time traffic conditions
- portable, full function laptop/palmtop computers with Internet accessible traffic messaging services.

These devices are shown in Table A-1 along with the monthly consumer price for each type of service.

[1] Island, King, Kitsap, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom counties.

Table A-1: Assumptions about Consumer Willingness to Pay[2]

		Willingness to Pay	
ATIS Product	**Type of Service**	**Initial Product Cost**	**Monthly Service**
Paging devices	Commute oriented. Traffic information available on routes selected by user. Includes the Auto PC.	$75-$200	$6.00
In-vehicle navigation units	Provides turn by turn directions. Contains a wireless connection to real-time condition information.	<$2,000	$8.00
PC laptop/palm top	Fully functional computer. Multi-function device with wireless connection to Internet-based information delivery services.	<$1,500	$30.00 ($8.00 of which pays for the transportation information service)

The pager was assumed to be used primarily for commute purposes and to have the lowest market entry costs for consumers. The in-vehicle navigation device was assumed to meet navigation requirements for both commute trips and recreational trips because most of these systems allow the purchase of map databases for multiple parts of the country. Therefore, this device would reach a different, but (because of its high entry cost) more affluent, market than the pager services. Finally, the laptop/palmtop computers are intended to meet the needs of a technologically savvy and affluent population, in that these devices provide multiple complex capabilities.

To further assist in estimating market acceptance, the nine county region was split into four age groups: 18-24, 25-44, 45-64, and 65+. This provided a simple surrogate measure of the population's level of "technology acceptance" and purchasing power. The youngest group (18-24) was assumed to restrict its interests to the pager services because it could not afford the more expensive devices. Members of the oldest group (65+) were assumed to use only the in-vehicle navigation device (primarily for recreational purposes) because they have less need for commute trip information and are

[2] Source: WSDOT. "SWIFT Consumer Acceptance Study" Final Report (Draft). 3 April 1998.

generally less technology friendly. However, the affluent members of this age group travel often for recreational purposes. The remaining two age groups were assumed to be willing to purchase all three types of services, although the higher earning power of the oldest of these groups would allow members to purchase a slightly higher fraction of in-vehicle units, whereas the higher level of technology acceptance of the 25-44 year old group would allow members to emphasize the laptop/palmtop computer choice.

None of these simplifications is totally accurate, and considerable market research is needed to provide a better estimation of the market potential of these devices. For the sake of this study, it was assumed that errors in the estimated behavior of these groups would cancel each other. That is, for every person in the eldest group that would purchase a pager, one less person in the youngest group would make that purchase.

As was noted above, within each of the age groups, adoption of specific technologies would be further constrained by the owner's desire to own and/or use such a device. The population's general interest in using traveler information was reported in "Improving Motorist Information Systems[3]" (April 1990). Their willingness to pay for these services was reported in the draft report called "SWIFT Consumer Acceptance Study Final Report.[4]" The first of these reports stated that there are four basic types of commuter responses to traveler information.

- Route changers (RC - 20.6% of the market) are willing to change routes before or during a commute but are not willing to change departure times or modes.
- Route and time changers (RTC - 40.1% of the market) are willing to change route and time of departure but not their mode of travel.

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3 Improving Motorist Information Systems: Towards a User Based Motorist Information System for the Puget Sound Area, by Haselkorn, Spyridakis, Barfield, and Conquest, WA.RD #187.1, April 1990

4 Draft, SWIFT Consumer Acceptance Study: Final Report, by SAIC, for WSDOT, April 3, 1998

- Pre-trip changers (PC - 15.9% of the market) are willing to change their route, time, or mode before leaving their origin if travel conditions warrant, but they are unwilling to change their travel plans once they have started the trip.
- Non-changers (NC - 23.4% of the market) are unwilling to alter their commute, regardless of the information they receive or the timing of that information.

By assuming that these groups were constant across the four age categories, and by assigning purchasing characteristics to these groups, it was possible to compute total market potential. (See Table A-2)

It was assumed that the Non-Changer group would not purchase traveler services. Because they are not willing to change their travel plans, it was assumed to be unlikely that they would be willing to pay for personalized traveler services. Similarly, the Pre-trip Changer market was assumed to be unwilling to purchase in-vehicle devices because they would not change routes. Finally, it was assumed that the remaining two market segments would purchase all three types of services.[5]

Table A-2 was computed with 1996 census data. To project market size to current and future years, a simple 2 percent annual population growth rate was used.

[5] The distribution of the purchase of services between alternatives is somewhat judgmental, as is the total market penetration estimate. These values were selected by the project team on the basis of the findings of the SWIFT project and a review of available ATIS literature.

Table A-2: Puget Sound Regional ATIS Market[6]

			pager		in-veh nav unit		palmtop	computer
Age Group	**Audience**	**Potential Market**	**%Market Penetration**	**market size**	**%Market Penetration**	**market size**	**%Market Penetration**	**market size**
18-24	RC	68,831	6.00%	4,130	1.00%	688	0.05%	34
	NC	78,186	0.00%	0	0.00%	0	0.00%	0
	RTC	133,986	20.00%	26,797	2.00%	2,680	0.10%	134
	PC	53,127	6.00%	3,188	0.00%	0	0.05%	27
subtotal		**334,129**	**10%**	**34,115**	**1%**	**3,368**	**0.06%**	**195**
25-44	RC	253,543	22.00%	55,779	5.00%	12,677	10.00%	25,354
	NC	288,005	0.00%	0	0.00%	0	0.00%	0
	RTC	493,546	30.00%	148,064	8.00%	39,484	20.00%	98,709
	PC	195,695	22.00%	43,053	0.00%	0	10.00%	19,570
subtotal		**1,230,789**	**20%**	**246,896**	**4%**	**52,161**	**12%**	**143,633**
45-64	RC	151,191	10.00%	15,119	10.00%	15,119	5.00%	7,560
	NC	171,742	0.00%	0	0.00%	0	0.00%	0
	RTC	294,310	20.00%	58,862	20.00%	58,862	5.00%	14,715
	PC	116,696	10.00%	11,670	10.00%	11,670	5.00%	5,835
subtotal		**733,939**	**12%**	**85,651**	**12%**	**85,651**	**4%**	**28,110**
65+	RC	79,902	0.00%	0	4.00%	3,196	0.05%	40
	NC	90,762	0.00%	0	0.00%	0	0.00%	0
	RTC	155,537	0.00%	0	3.00%	4,666	0.05%	78
	PC	61,672	0.00%	0	0.00%	0	0.10%	62
subtotal		**387,872**	**0%**	**0**	**2%**	**7,862**	**0.05%**	**179**
Total		**2,686,729**		**366,662**		**149,042**		**172,117**

The last assumptions required to make market projections are the actual levels of market penetration that have occurred during any given year. (The estimates in Table A-2 are assumed to be the maximum possible market penetration.) Work performed for the SWIFT evaluation indicated that consumer acceptance of ATIS services was expected to be between 4 and 12 percent. Consequently, alternative revenue scenarios used these values as the minimum and maximum ten-year market penetration of electronic, wireless, information delivery devices. In addition, an intermediate set of values was developed. For each of these three scenarios, actual market penetration was estimated to grow from zero at the present time to the assumed ten-year maximum level of penetration. This growth pattern was not linear, but started slowly and increased over time.

[6] Population estimates were based on 1996 census data. The specific source material was "Estimates of the Population of Counties By Age, Sex, Race, and Hispanic Origin: 1990 to 1996," PE-58

Commercial Market

The second market for pay-for-service traffic information is the business community, primarily the commercial freight industry, which includes both long-haul and short-haul trucking companies. Some service oriented businesses (such as plumbers who drive conventional sized vans) are also strong potential "business" customers for vehicle navigation equipment, even though they do not drive "trucks" and are thus not included in most "commercial" or "freight" traffic statistics.[7] All of these companies have a direct financial interest in avoiding congestion as much as possible because delays caused by congestion directly increase their cost of doing business. Therefore, it is logical that if available traffic information can improve their productivity, they have a financial interest in purchasing these services.

The key assumptions used to estimate revenue to be obtained from these potential customers were as follows:

- An estimate of total daily truck trips in the Puget Sound region by four categories of trucks (long-haul, short-haul extra-regional, local distribution, and through trucks) was obtained from the Puget Sound Regional Council (PSRC).[8]
- Each of these four commercial trip types has different characteristics that were used to determine a preference for one of two types of personalized traveler information service: pager services and route guidance services.
- Route guidance services were expected to be obtainable by either a "conventional" externally linked route guidance device or as part of an on-

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7 For this analysis, the "business market" also includes employees who use cars to make sales and other business calls and who perform other business travel. The market potential of these commercial users was not computed separately but was assumed to be contained within the market estimates computed with freight statistics. This makes the assumptions and computations presented in this report more conservative than they initially appear.

8 "Analysis of Freight Movements in the Puget Sound Region," by Science Applications International Corporation, for the Puget Sound Regional Council, September 1997.

board computer system that would maintain external links to the World Wide Web. In both cases, the cost of the transportation information delivery service was assumed to be the same.

- ATIS participation rates (by device) were then assumed equal to those for the consumer market.
- Prices for ATIS services (except as noted above) were assumed equal to those for the consumer market.
- The commercial market was estimated to grow by 2 percent (straight line) each year.[9]

Table A-3 lists the estimated freight market size and the distribution of the markets between pagers and in-vehicle navigation units. In general, vehicles that travel predictable paths were assumed to be primarily interested in paging services because they are lower cost (including initial price) and can be obtained over a wide geographic area. In addition, these users could easily set a "user profile" that would meet their needs. Vehicles that travel different paths each day, particularly those that routinely must find unfamiliar destinations, would be more likely to purchase navigation devices with external communications links because no single route profile would meet their needs and because the navigation device would help them find unfamiliar destinations more efficiently (thus saving time and money), even under good traffic conditions.

Table A-3: 1994 Freight Industry Market Sizes

		1994 Commercial Trucking Audience			
	total	pagers		in-vehicle route guidance units	
Truck Type	trucks	%	subtotal	%	subtotal
Long-haul	4,697	25%	1,174	75%	3,523
Short-haul Extra-Regional	2,853	33%	941	67%	1,912
Local Distribution	14,370	33%	4,742	67%	9,628
Through Traffic	4,870	0%	0	100%	4,870
subtotal	26,790		6,858		19,932

[9] The PSRC freight statistics initially obtained were for 1994.

- Unlike the consumer market, all commercial vehicles were assumed to be potential ATIS customers.
- However, as with the consumer revenue estimates, the market penetration rates for commercial vehicles were assumed to be a fraction of the "ultimate market," ranging from the worst case of 4 percent of the total market to a best case of 12 percent.

The commercial market size calculations that support the private sector revenue projections are given below in Table A-4.

Table A-4: Total Freight Market Size Computations

	Total	Pagers		Navigation Units	
Truck Type	**Trucks**	**Percent**	**Subtotal**	**Percent**	**Subtotal**
1994 -					
Long-haul	4,697	25.0%	1,174	75.0%	3,523
Short-haul Extra-Regional	2,853	33.0%	941	67.0%	1,912
Local Distribution	14,370	33.0%	4,742	67.0%	9,628
Through Traffic	4,870	0.0%	0	100.0%	4,870
Total			6,858		19,932
1995					
Long-haul	4,791	25.0%	1,198	75.0%	3,593
Short-haul Extra-Regional	2,910	33.0%	960	67.0%	1,950
Local Distribution	14,657	33.0%	4,837	67.0%	9,820
Through Traffic	4,967	0.0%	0	100.0%	4,967
Total			6, 995		20,331
1996					
Long-haul	4,885	25.0%	1,221	75.0%	3,664
Short-haul Extra-Regional	2,967	33.0%	979	67.0%	1,988
Local Distribution	14,945	33.0%	4,932	67.0%	10,013
Through Traffic	5,065	0.0%	0	100.0%	5,065
Total			7,132		20,729
1997					
Long-haul	4,979	25.0%	1,245	75.0%	3,734
Short-haul Extra-Regional	3,024	33.0%	998	67.0%	2,026
Local Distribution	15,232	33.0%	5,027	67.0%	10,206
Through Traffic	5,162	0.0%	0	100.0%	5,162
Total			7.269		21,128
1998					
Long-haul	5,073	25.0%	1,268	75.0%	3,805
Short-haul Extra-Regional	3,081	33.0%	1,017	67.0%	2,064
Local Distribution	15,520	33.0%	5,121	67.0%	10,398
Through Traffic	5,260	0.0%	0	100.0%	5,260
Total			7,406		21,527

Table A-4: Total Freight Market Size Computations (cont.)

	Total	Pagers		Navigation Units	
Truck Type	**Trucks**	**Percent**	**Subtotal**	**Percent**	**Subtotal**
1999					
Long-haul	5,167	25.0%	1,292	75.0%	3,875
Short-haul Extra-Regional	3,138	33.0%	1,036	67.0%	2,103
Local Distribution	15,807	33.0%	5,216	67.0%	10,591
Through Traffic	5,357	0.0%	0	100.0%	5,357
Total			7,544		21,925
2000					
Long-haul	5,261	25.0%	1,315	75.0%	3,945
Short-haul Extra-Regional	3,195	33.0%	1,054	67.0%	2,141
Local Distribution	16,094	33.0%	5,311	67.0%	10,783
Through Traffic	5,454	0.0%	0	100.0%	5,454
Total			7,681		22,324
2001					
Long-haul	5,355	25.0%	1,339	75.0%	4,016
Short-haul Extra-Regional	3,252	33.0%	1,073	67.0%	2,179
Local Distribution	16,382	33.0%	5,406	67.0%	10,976
Through Traffic	5,552	0.0%	0	100.0%	5,552
Total			7,818		22,723
2002					
Long-haul	5,449	25.0%	1,362	75.0%	4,086
Short-haul Extra-Regional	3,309	33.0%	1,092	67.0%	2,217
Local Distribution	16,669	33.0%	5,501	67.0%	11,168
Through Traffic	5,649	0.0%	0	100.0%	5,649
Total			7,955		23,121
2003					
Long-haul	5,542	25.0%	1,386	75.0%	4,157
Short-haul Extra-Regional	3,367	33.0%	1,111	67.0%	2,256
Local Distribution	16,957	33.0%	5,596	67.0%	11,361
Through Traffic	5,747	0.0%	0	100.0%	5,747
Total			8,092		23,520
2004					
Long-haul	5,636	25.0%	1,409	75.0%	4,227
Short-haul Extra-Regional	3,424	33.0%	1,130	67.0%	2,294
Local Distribution	17,244	33.0%	5,691	67.0%	11,553
Through Traffic	5,844	0.0%	0	100.0%	5,844
Total			8,229		23,919
2005					
Long-haul	5,730	25.0%	1,433	75.0%	4,298
Short-haul Extra-Regional	3,481	33.0%	1,149	67.0%	2,332
Local Distribution	17,531	33.0%	5,785	67.0%	11,746
Through Traffic	5,941	0.0%	0	100.0%	5,941
Total			8,367		24,317
2006					
Long-haul	5,824	25.0%	1,456	75.0%	4,368
Short-haul Extra-Regional	3,538	33.0%	1,167	67.0%	2,370
Local Distribution	17,819	33.0%	5,880	67.0%	11,939
Through Traffic	6,039	0.0%	0	100.0%	6,039
Total			8,504		24,716

Table A-4: Total Freight Market Size Computations (cont.)

	Total	Pagers		Navigation Units	
Truck Type	**Trucks**	**Percent**	**Subtotal**	**Percent**	**Subtotal**
2007					
Long-haul	5,918	25.0%	1,480	75.0%	4,439
Short-haul Extra-Regional	3,595	33.0%	1,186	67.0%	2,409
Local Distribution	18,106	33.0%	5,975	67.0%	12,131
Through Traffic	6,136	0.0%	0	100.0%	6,136
Total			8,641		25,115
2008					
Long-haul	6,012	25.0%	1,503	75.0%	4,509
Short-haul Extra-Regional	3,652	33.0%	1,205	67.0%	2,447
Local Distribution	18,394	33.0%	6,070	67.0%	12,324
Through Traffic	6,234	0.0%	0	100.0%	6,234
Total			8,778		25,513

REVENUE ESTIMATES - CONSUMER AND COMMERCIAL MARKETS

Table A-5 lists the expected market penetration and total revenue generated for each of the three user services for the lowest market penetration estimate (4 percent after ten years). Table A-6 illustrates a moderate growth scenario, while Table A-7 illustrates the high growth scenario of a maximum of 12 percent market penetration.

Table A-5: Personalized Travel Information Service Revenue Forecast
Worst Case (4% Market Penetration)

User Services:	Monthly Fee	Market Size	Market Penetration	Units in Service	Monthly Revenues	Annual Gross Revenues
1999						
Pager	$6	396,222	0.05%	198	$1,189	$14,264
In-vehicle navigation	$8	179,957	0.05%	90	$720	$8,638
Palm-top ricochet service	$8	182,444	0.05%	91	$730	$8,757
Total Service Revenues						**$31,659**
2000						
Pager	$6	403,698	0.10%	404	$2,422	$29,066
In-vehicle navigation	$8	183,353	0.10%	183	$1,467	$17,602
Palm-top ricochet service	$8	185,886	0.10%	186	$1,487	$17,845
Total Service Revenues						**$64,513**
2001						
Pager	$6	411,173	0.50%	2,056	$12,335	$148,022
In-vehicle navigation	$8	186,748	0.50%	934	$7,470	$89,639
Palm-top ricochet service	$8	189,329	0.50%	947	$7,573	$90,878
Total Service Revenues						**$328,539**
2002						
Pager	$6	418,649	1.20%	5,024	$30,143	$361,713
In-vehicle navigation	$8	190,144	1.20%	2,282	$18,254	$219,045
Palm-top ricochet service	$8	192,771	1.20%	2,313	$18,506	$222,072
Total Service Revenues						**$802,831**
2003						
Pager	$6	426,125	2.00%	8,523	$51,135	$613,620
In-vehicle navigation	$8	193,539	2.00%	3,871	$30,966	$371,595
Palm-top ricochet service	$8	196,213	2.00%	3,924	$31,394	$376,730
Total Service Revenues						**$1,361,945**
2004						
Pager	$6	433,601	2.40%	10,406	$62,439	$749,263
In-vehicle navigation	$8	196,934	2.40%	4,726	$37,811	$453,737
Palm-top ricochet service	$8	199,656	2.40%	4,792	$38,334	$460,007
Total Service Revenues						**$1,663,006**
2005						
Pager	$6	441,077	2.80%	12,350	$74,101	$889,211
In-vehicle navigation	$8	200,330	2.80%	5,609	$44,874	$538,486
Palm-top ricochet service	$8	203,098	2.80%	5,687	$45,494	$545,928
Total Service Revenues						**$1,973,625**

Table A-5: Personalized Travel Information Service Revenue Forecast (cont.)
Worst Case (4% Market Penetration)

User Services:	Monthly Fee	Market Size	Market Penetration	Units in Service	Monthly Revenues	Annual Gross Revenues
2006						
Pager	$6	448,553	3.20%	14,354	$86,122	$1,033,466
In-vehicle navigation	$8	203,725	3.20%	6,519	$52,154	$625,844
Palm-top ricochet service	$8	206,540	3.20%	6,609	$52,874	$634,492
Total Service Revenues						**$2,293,802**
2007						
Pager	$6	456,029	3.60%	16,417	$98,502	$1,182,026
In-vehicle navigation	$8	207,121	3.60%	7,456	$59,651	$715,809
Palm-top ricochet service	$8	209,983	3.60%	7,559	$60,475	$725,700
Total Service Revenues						**$2,623,536**
2008						
Pager	$6	463,505	4.00%	18,540	$111,241	$1,334,893
In-vehicle navigation	$8	210,516	4.00%	8,421	$67,365	$808,382
Palm-top ricochet service	$8	213,425	4.00%	8,537	$68,296	$819,552
Total Service Revenues						**$2,962,827**

Table A-6: Personalized Travel Information Service Revenue Forecast Intermediate Case (Varying Market Penetration)

User Services:	Monthly Fee	Market Size	Market Penetration	Units in Service	Monthly Revenues	Annual Gross Revenues
1999						
Pager	$6	396,222	0.05%	198	$1,189	$14,264
In-vehicle navigation	$8	179,957	0.05%	90	$720	$8,638
Palm-top ricochet service	$8	182,444	0.05%	91	$730	$8,757
Total Service Revenues						**$31,659**
2000						
Pager	$6	403,698	0.50%	2,018	$12,111	$145,331
In-vehicle navigation	$8	183,353	0.20%	367	$2,934	$35,204
Palm-top ricochet service	$8	185,886	0.10%	186	$1,487	$17,845
Total Service Revenues						**$198,380**
2001						
Pager	$6	411,173	1.00%	4,112	$24,670	$296,045
In-vehicle navigation	$8	186,748	1.00%	1,867	$14,940	$179,278
Palm-top ricochet service	$8	189,329	0.50%	947	$7,573	$90,878
Total Service Revenues						**$566,201**
2002						
Pager	$6	418,649	1.50%	6,280	$37,678	$452,141
In-vehicle navigation	$8	190,144	1.50%	2,852	$22,817	$273,807
Palm-top ricochet service	$8	192,771	1.20%	2,313	$18,506	$222,072
Total Service Revenues						**$948,020**
2003						
Pager	$6	426,125	2.00%	8,523	$51,135	$613,620
In-vehicle navigation	$8	193,539	2.00%	3,871	$30,966	$371,595
Palm-top ricochet service	$8	196,213	2.00%	3,924	$31,394	$376,730
Total Service Revenues						**$1,361,945**
2004						
Pager	$6	433,601	4.00%	17,344	$104,064	$1,248,771
In-vehicle navigation	$8	196,934	4.00%	7,877	$63,019	$756,228
Palm-top ricochet service	$8	199,656	2.40%	4,792	$38,334	$460,007
Total Service Revenues						**$2,465,006**
2005						
Pager	$6	441,077	6.00%	26,465	$158,788	$1,905,452
In-vehicle navigation	$8	200,330	6.00%	12,020	$96,158	$1,153,900
Palm-top ricochet service	$8	203,098	2.80%	5,687	$45,494	$545,928
Total Service Revenues						**$3,605,279**

Table A-6: Personalized Travel Information Service Revenue Forecast (cont.)
Intermediate Case (Varying Market Penetration)

User Services:	Monthly Fee	Market Size	Market Penetration	Units in Service	Monthly Revenues	Annual Gross Revenues
2006						
Pager	$6	448,553	8.00%	35,884	$215,305	$2,583,664
In-vehicle navigation	$8	203,725	8.00%	16,298	$130,384	$1,564,610
Palm-top ricochet service	$8	206,540	3.20%	6,609	$52,874	$634,492
Total Service Revenues						**$4,782,766**
2007						
Pager	$6	456,029	10.00%	45,603	$273,617	$3,283,406
In-vehicle navigation	$8	207,121	10.00%	20,712	$165,696	$1,988,358
Palm-top ricochet service	$8	209,983	3.60%	7,559	$60,475	$725,700
Total Service Revenues						**$5,997,465**
2008						
Pager	$6	463,505	12.00%	55,621	$333,723	$4,004,679
In-vehicle navigation	$8	210,516	12.00%	25,262	$202,095	$2,425,145
Palm-top ricochet service	$8	213,425	4.00%	8,537	$68,296	$819,552
Total Service Revenues						**$7,249,376**

Table A-7: Personalized Travel Information Service Revenue Forecast
Best Case (12% Market Penetration)

User Services:	Monthly Fee	Market Size	Market Penetration	Units in Service	Monthly Revenues	Annual Gross Revenues
1999						
Pager	$6	396,222	0.05%	198	$1,189	$14,264
In-vehicle navigation	$8	179,957	0.05%	90	$720	$8,638
Palm-top ricochet service	$8	182,444	0.05%	91	$730	$8,757
Gross Service Revenues						**$31,659**
2000						
Pager	$6	403,698	0.50%	2,018	$12,111	$145,331
In-vehicle navigation	$8	183,353	0.50%	917	$7,334	$88,009
Palm-top ricochet service	$8	185,886	0.50%	929	$7,435	$89,225
Total Service Revenues						**$322,566**
2001						
Pager	$6	411,173	1.00%	4,112	$24,670	$296,045
In-vehicle navigation	$8	186,748	1.00%	1,867	$14,940	$179,278
Palm-top ricochet service	$8	189,329	1.00%	1,893	$15,146	$181,756
Total Service Revenues						**$657,079**
2002						
Pager	$6	418,649	1.50%	6,280	$37,678	$452,141
In-vehicle navigation	$8	190,144	1.50%	2,852	$22,817	$273,807
Palm-top ricochet service	$8	192,771	1.50%	2,892	$23,133	$277,590
Total Service Revenues						**$1,003,538**
2003						
Pager	$6	426,125	2.00%	8,523	$51,135	$613,620
In-vehicle navigation	$8	193,539	2.00%	3,871	$30,966	$371,595
Palm-top ricochet service	$8	196,213	2.00%	3,924	$31,394	$376,730
Total Service Revenues						**$1,361,945**
2004						
Pager	$6	433,601	4.00%	17,344	$104,064	$1,248,771
In-vehicle navigation	$8	196,934	4.00%	7,877	$63,019	$756,228
Palm-top ricochet service	$8	199,656	4.00%	7,986	$63,890	$766,678
Total Service Revenues						**$2,771,677**
2005						
Pager	$6	441,077	6.00%	26,465	$158,788	$1,905,452
In-vehicle navigation	$8	200,330	6.00%	12,020	$96,158	$1,153,900
Palm-top ricochet service	$8	203,098	6.00%	12,186	$97,487	$1,169,845
Total Service Revenues						**$4,229,197**

Table A-7: Personalized Travel Information Service Revenue Forecast (cont.)
Best Case (12% Market Penetration)

User Services:	Monthly Fee	Market Size	Market Penetration	Units in Service	Monthly Revenues	Annual Gross Revenues
2006						
Pager	$6	448,553	8.00%	35,884	$215,305	$2,583,664
In-vehicle navigation	$8	203,725	8.00%	16,298	$130,384	$1,564,610
Palm-top ricochet service	$8	206,540	8.00%	16,523	$132,186	$1,586,230
Total Service Revenues						**$5,734,504**
2007						
Pager	$6	456,029	10.00%	45,603	$273,617	$3,283,406
In-vehicle navigation	$8	207,121	10.00%	20,712	$165,696	$1,988,358
Palm-top ricochet service	$8	209,983	10.00%	20,998	$167,986	$2,015,834
Total Service Revenues						**$7,287,599**
2008						
Pager	$6	463,505	12.00%	55,621	$333,723	$4,004,679
In-vehicle navigation	$8	210,516	12.00%	25,262	$202,095	$2,425,145
Palm-top ricochet service	$8	213,425	12.00%	25,611	$204,888	$2,458,657
Total Service Revenues						**$8,888,481**

Tables A-8 through A-10 show the computation of total revenue streams for personalized travel information services and the distribution of those revenues between the commercial (freight) and consumer (traveler) markets.

Table A-8: Worst Case Total Revenue Streams

	Pager			Navigation Units			Palmtop	
Year	Traveler	Freight	Revenue	Traveler	Freight	Revenue	Traveler	Revenue
1999	194	4	$14,000	79	11	$9,000	91	$9,000
2000	396	8	$29,000	161	22	$18,000	186	$18,000
2001	2,017	39	$148,000	820	114	$90,000	947	$91,000
2002	4,928	96	$362,000	2,003	279	$219,000	2,313	$222,000
2003	8,360	163	$614,000	3,398	473	$372,000	3,924	$377,000
2004	10,208	199	$749,000	4,149	577	$454,000	4,792	$460,000
2005	12,115	236	$889,000	4,924	685	$538,000	5,687	$546,000
2006	14,080	274	$1,033,000	5,723	796	$626,000	6,609	$634,000
2007	16,104	313	$1,182,000	6,546	910	$716,000	7,559	$726,000
2008	18,186	354	$1,335,000	7,392	1,028	$808,000	8,537	$820,000

Table A-9: Intermediate Case Total Revenue Streams

	Pager			Navigation Units			Palmtop	
Year	Traveler	Freight	Revenue	Traveler	Freight	Revenue	Traveler	Revenue
1999	194	4	$14,000	79	11	$9,000	91	$9,000
2000	3,960	77	$291,000	322	45	$35,000	186	$18,000
2001	8,067	157	$592,000	1,639	228	$179,000	947	$91,000
2002	16,426	320	$1,206,000	2,504	348	$274,000	2,313	$222,000
2003	25,080	488	$1,841,000	3,398	473	$372,000	3,924	$377,000
2004	34,026	662	$2,498,000	6,916	962	$756,000	4,792	$460,000
2005	43,266	842	$3,176,000	10,552	1,468	$1,154,000	5,687	$546,000
2006	52,799	1,027	$3,875,000	14,308	1,990	$1,565,000	6,609	$634,000
2007	62,626	1,218	$4,597,000	18,183	2,529	$1,988,000	7,559	$726,000
2008	72,746	1,415	$5,340,000	22,177	3,084	$2,425,000	8,537	$820,000

Table A-10: Best Case Total Revenue Streams

	Pager			Navigation Units			Palmtop	
Year	Traveler	Freight	Revenue	Traveler	Freight	Revenue	Traveler	Revenue
1999	194	4	$14,000	79	11	$9,000	91	$9,000
2000	1,980	39	$145,000	805	112	$88,000	929	$89,000
2001	4,033	78	$296,000	1,639	228	$179,000	1,893	$182,000
2002	6,160	120	$452,000	2,504	348	$274,000	2,892	$278,000
2003	8,360	163	$614,000	3,398	473	$372,000	3,924	$377,000
2004	17,013	331	$1,249,000	6,916	962	$756,000	7,986	$767,000
2005	25,960	505	$1,905,000	10,552	1,468	$1,154,000	12,186	$1,170,000
2006	35,200	685	$2,584,000	14,308	1,990	$1,565,000	16,523	$1,586,000
2007	44,733	870	$3,283,000	18,183	2,529	$1,988,000	20,998	$2,016,000
2008	54,559	1,061	$4,005,000	22,177	3,084	$2,425,000	25,611	$2,459,000

APPENDIX B
WSDOT-Operated ATIS Revenue Estimation

WSDOT operates telephone, Internet and Cable TV traveler information services. These services may be able to generate advertising or sponsorship revenue. Table B-1 presents the estimated revenue for WSDOT-operated ATIS services. The assumptions and projections for these revenue estimates are below. (Note that the costs associated with generating advertising or sponsorship revenue can be assumed to be about half the gross revenue.) All estimates are presented in 1999 dollars.

Table B-1: Revenue Estimates for WSDOT ATIS Services
(1999 Dollars)

	Annual Gross Revenue	Annual Net Revenue[1]
Telephone Information Line	$40,000	$20,000
Web Pages	$250,000	$125,000
Cable TV	$100,000	$50,000
Total	**$390,000**	**$195,000**

TELEPHONE INFORMATION

The telephone call-in line can be accessed in two ways, a (206) area code number that operates year round, and a 1-800 number that operates from October to April. The (206) phone number provides urban congestion, road construction, and ferry system information year round, as well as the winter time mountain pass report.

Recreational Equipment, Incorporated, (REI) sponsored the mountain pass report (available through both call-in numbers) for the winter of 1997-1998. REI paid the state $30,000 for the right to place a short, recorded advertisement on this taped telephone message, which a caller had to listen to before getting to the mountain pass roadway condition information. An additional $10,000 was added to the initial sponsorship amount to allow REI to place a small ad on the WSDOT Web page that provided

[1] Net revenue is 50% of gross revenue due to cost of administering an advertising program.

mountain pass condition information and access to still-frame images from a CCTV camera located on I-90 at Snoqualmie Pass. This analysis assumed that this revenue would continue to be generated by these services. Additional revenue could be generated if the advertising were included year-round on the telephone call-in line. At this time, advertising is only included when the mountain pass report is active.

It is not clear how much additional funding could be obtained by soliciting advertisements for the telephone call-in system year-round. REI is not interested in the urban traffic reporting aspects of the system. It is interested in reaching people who travel to and through the mountains during the winter because a large portion of them are potential purchasers of REI's winter clothing and recreational gear (skis, snowboards).

Because WSDOT is not actively pursuing advertising on the telephone call-in system, the conservative estimate for revenue from this system is that revenue generated from these services will not increase beyond $40,000.

INTERNET WEB PAGES

Revenue estimates for the WSDOT Web site were based on advertising rates for the World Wide Web, which currently runs between $10 and $70 per 1,000 "impressions" (the number of times an add is viewed)[2]. The low end of these rates is comparable to the radio advertisement rates cited above, while the high end for the Web is considerably higher. High end Web rates are usually reserved for services that can provide well targeted viewing markets, that is, a well defined market that is central to the advertiser's business.

According to WSDOT statistics for November and December 1998, the WSDOT Northwest Region's Web site generated the "hits" listed below in Table B-2. Because of the way it works, users of WSDOT's Web pages actually generate far more "hits" than

[2] Based on published ad rates found on September 4, 1998 on several search engine Web sites, including the Netscape home page, the Yahoo home page, and the Look Smart search engine home page.

one per "page view." From the perspective of an advertiser "page views" is a much more meaningful measurement of the amount of exposure and advertisement would get. Analysis by Battelle[3] indicates that "page views" can be assumed to be about 12 percent of the total number of "hits."

If advertisements were placed on just one quarter of WSDOT's Web pages, even at $10 per thousand page views, annual revenue could exceed $250,000.

Table B-2: Use of WSDOT Web Pages

	Nov '98	Dec '98	Monthly Average
Total "hits"	57,994,541	82,070,725	70,032,633
Total "page views"	6,959,345	9,848,487	8,403,916

CABLE TV

Because UWTV does not track current viewer characteristics, and because the Traffic TV application is unique, it is very difficult to estimate the number and type of viewer response to such a program. However, because advertising and sponsorship rates for other television and radio shows are well known, by making a variety of assumptions it was possible to estimate potential revenue from these data.

Revenue estimates for commercial TV broadcast services (the new TrafficTV channel) were based on current Public Broadcast System (PBS) sponsorship rates in Seattle (Channel 9, KCTS). In addition, the resulting figures were checked to ensure that the revenue estimates were realistic, given the much lower viewership expected for the cable TV-based TrafficTV application than currently exists for PBS shows.

By law, “public access” programs can not contain convention advertising. However, “sponsorships” can be sold and used to provide revenue to support both the broadcast costs and the production costs. Sponsorship rates for some programs are higher

[3] Analysis of February 1999 WSDOT Web access statistics. C. Cluett 3/23/99.

than for others both because of differences in the total number of viewers expected for each show and because of differences in the demographics of those viewers.

Most public access broadcasts have few or no sponsorships. However, the Public Broadcast System (PBS) generates significant revenue in this manner. KCTS charges sponsors between $7,500 and $15,000 per hour per day per sponsor for morning and evening prime time shows. Multiple sponsorships are available for all prime time programs, although in some cases a single sponsor takes all available sponsorship positions. (For example, “Sesame Street” is currently sponsored exclusively by Fred Meyer.) These rates are based on the assumption that the sponsored show will air once per week for 52 weeks. Sponsorship rates vary if a given show airs more or less often.

Sponsors of a PBS show are allowed a 10- to 15-second message at the beginning and ending of each (usually an hour) program indicating their sponsorship. These short segments usually also promote the "good works" or "good name" of the sponsor. (Basically they state, "We are a good company because we help provide this good programming.") The sponsorship message must be approved by the Federal Communications Commission (FCC) and must meet KCTS on-air guidelines.

Converting these rates into estimates of viewership for UWTV’s TrafficTV programming was difficult because the total number of viewers for such a program was not known, and UWTV does not track the number of viewers of its programs. Therefore to make these revenue estimates, the following assumptions were made.

- The TrafficTV programming would operate for three hours each weekday morning (6 to 9 AM) and three hours each weekday evening (4 to 7 PM).
- Two sponsors would be found for each day of the week, one for the morning three hours, and one for the evening three hours.
- Sponsorships would cost $13,000 for 52 weeks of a single weekday morning, and $7,500 for 52 weeks of a single weekday evening. This

would yield a total income of $102,500 annually [(5 * 7,500) + (5 * 13,000)].

- Assuming that roughly half of this revenue would be returned to the WSDOT yielded a revenue estimate of $50,000.

As a "sanity" check, the following additional thoughts are offered. For a similar time period, assuming four sponsors per show and 1-hour shows, KCTS would generate twelve times the estimated revenue. This means that the Traffic Channel would need an average of roughly 1/12th the number of viewers of KCTS to attract sponsors.

A second sanity check is based on the advertising rates charged for other cable TV shows. Currently the lowest ad rate on cable TV is $35 for a 30-second spot on Northwest Cable News.[4] If the TrafficTV sponsorship spot was assumed to be 30 seconds long and would be offered twice per hour (once every half hour), the cost of each 30-second spot would vary between $24 and just over $41.50, depending on the morning or evening sponsorship rate. The fact this these values are close to the lowest rate currently charged on local cable TV further validates these rates. (Note, however, that providing shorter, more frequent sponsorship spots (four 15-second spots per hour) might be a better "advertising" mechanism because most viewers would not be expected to watch Traffic TV for 30 minutes and thus might not see the sponsor's name.)

The last "sanity check" is based on radio advertising rates. The current KUOW add rate is $7 to $10 per thousand listeners. Given the $41.50 per spot computed above, Traffic TV would need to attract an audience of roughly 4,000 to 6,000 households during peak periods. To reach this viewership, roughly 1 percent of the 600,000 households in the Seattle Metropolitan region that can currently obtain UW TV[5] would have to watch the program each hour in the morning. If UW TV coverage expanded as

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4 Information provided by Tim Lorang of UW TV, 7/24/98

5 Ibid.

the TCI Cable system expanded, the percentage of viewers needed to reach this rate would decline.

It is not clear that efforts to obtain sponsors for TrafficTV broadcasts would be completely successful. As with conventional advertising, the ability to raise sponsorship money is in large part driving by the size of the potential viewing audience and the value a sponsor would obtain from identification with that program. Most public access broadcasts have few or no sponsorships. However, an exclusive "TrafficTV" show has a strong potential audience, particularly in the AM peak when many commuters could easily access the programming. The revenue potential of such a show would be controlled by the following factors:

- How many households can access that channel? Many cable systems in the metropolitan area do not have sufficient bandwidth to carry the channel, and even where the cable channel is accessible, many people do not subscribe to cable TV. Digital satellite systems (DSS), which are challenging cable for market share, can not access local public access channels such as the UW TV.
- Would a viewer watch long enough to learn who the sponsor was? The idea behind TrafficTV is that it will always be available to users when they want it, thus allowing them to get their information quickly. This short viewing time could reduce the likelihood that a sponsor would be identified to the viewer.
- Can alternative mechanisms for giving sponsors credit be developed that meet the legal requirements for public access sponsorships but also allow that credit to occur within the time frame of the traffic broadcast viewer?

Because Traffic TV programming is of sufficient viewer interest, its broadcast rights could also (or alternatively) be sold or licensed to one or more commercial stations that could then use it as they currently use conventional CCTV images and/or the WSDOT Web page image. Traffic TV programming could be sold regardless of the fact that WSDOT provides free access to its CCTV cameras because its operation would

require additional information that would be available only over the ITS Backbone. If interest was high enough, it might even be possible to broadcast TrafficTV on a commercial cable channel (like the Weather Channel is now broadcast), although the competition for access to these channels is fierce.

APPENDIX C
National Trends in ATIS Business Models

Other ATIS efforts around the country have taken other approaches to financing and operating their ATIS efforts. Some of these other efforts could be applied to the Seattle area, although none are currently recommended. Most of these alternative financing plans would require revision of the roles WSDOT is currently performing. Many would also require WSDOT to change the nature of its relationships with Smart Trek private sector partners.

One alternative financing mechanism would be to contract out the construction and operation of the ATIS to the private sector. Several cities (e.g., Boston, Philadelphia, and Cincinnati) have selected this option. Ongoing funding for such contracts is supplied by the transportation agencies in the region (mostly state DOTs). This structure has been quite effective in helping provide ATIS capabilities where none exist and where state staffing resources has been limited. Basically, this approach allows states to purchase private sector skills and to use private financing to build and operate these systems in return for guaranteed payments. Because WSDOT has existing ATIS infrastructure and a long history of ATIS operations (and thus the skills to operate the ATIS), this approach would provide few benefits to the Department and relatively little, if any, cost savings.

A second approach, being investigated in Detroit and used in Washington, D.C., involves obtaining private sector funding for the operation of an already built ATIS (or in the case of Washington, D.C., an ATIS being built primarily with federal dollars). In both of these cases, the private operator of the ATIS has been asked to take over and fund the operation of the ATIS based on revenues to be obtained from sale of ATIS services and data. Public transportation agencies in Washington, D.C., have a contract with SmartRoutes that requires SmartRoutes to fund the ATIS operation within three years of the start of operations (roughly in the year 2000).

SmartRoutes generates revenue from the sale of advertising on an Internet congestion map, a telephone call-in line, and (soon) a cable TV application. It also hopes to sell real-time traffic performance information to independent service providers that will in turn sell this transportation information to customers on a fee-for-service basis.

Revenue from these services are used to provide not only the information delivery mechanisms mentioned above, but also the data fusion of available public agency data and the delivery of those fused data to the participating public agencies. In return, SmartRoutes has exclusive access to the data it fuses and the ability to resell those data to other potential data distributors. It is not clear whether the agreement will generate sufficient revenue to produce a profit in the time frame originally expected.

In Detroit, similar plans were developed to fund and operate the data fusion and distribution services of the Detroit Metropolitan ATIS effort. At last word, a contract for the services had not been signed. Delays in signing this contract are widely believed to be caused by the private sector's reassessment of the near-term revenue potential of the ATIS market. (That is, the lack of a large fee-for-service market in the next few years would eliminate the revenue needed to operate the Detroit ATIS during that period. This makes the private sector contractor reluctant to agree to fund the total cost of the ATIS operation.)

From the private sector's point of view, this type of agreement is risky in that the ATIS fee-for-service market has taken longer to develop than many professionals in the field have predicted. From the public sector viewpoint, these types of agreements also raise concerns because the private ATIS operator usually supplies the knowledge and software needed to run the system. Thus if the operator abandons the market for economic reasons, the remaining ATIS partners are left with an inoperable system and large expenses to bring that system on-line.

There is some concern that in Washington, D.C., SmartRoutes will be unable to generate sufficient revenue to maintain the ATIS system, which relies in part on software supplied by SmartRoutes. If this occurs, one of three options is left for the ATIS.

- SmartRoutes can continue the ATIS operation at a loss (if it expects the system to become profitable soon).
- SmartRoutes can abandon the ATIS operation (in which case it would take with it the software it developed and owns, which would leave the Washington, D.C., metropolitan area without an ATIS).
- The participating public agencies can agree to provide SmartRoutes with additional revenue to maintain their access to other agency data. (Currently the public agencies obtain access to neighboring jurisdictions' congestion data and information through the SmartRoutes system.)

Only in the first case would the public agency benefit, and that case might be temporary if the ATIS market (which is uncertain) did not materialize soon.

WSDOT could pursue a similar approach with the Puget Sound region's ATIS. This would entail hiring a private contractor to operate the ITS Backbone. To a certain extent this is already happening, since the UW operates the ITS Backbone under contract to WSDOT. However, the WSDOT owns the software developed and operated by the UW. This substantially reduces the risk associated with this approach.

Basically, even if a contractor were brought in to operate the ATIS, the available sources of revenue generation would not change. All that would change would be the agency that was responsible for generating that revenue and the agency that controlled the systems upon which that revenue generation was dependent. In the Smart Trek model, many of these systems remain in WSDOT hands. In the Detroit/Washington, D.C., model, these systems are provided exclusively by the private contractor.

One other consideration is that adopting the Detroit/Washington, D.C., model would mean giving control of the real-time data to the contractor, who could then

generate revenue from other private sector companies by charging fees for access to those data. For WSDOT this would mean revision of the Smart Trek partnering agreements, as well as agreements such as that signed with Microsoft (which accesses WSDOT data and video directly). It would also mean that the Department would relinquish control of the data available on the ITS Backbone.

Other metropolitan ATIS efforts are also investigating business plans that are related to the plans discussed above. In Houston and San Antonio, Texas, and Atlanta, Georgia, the public sector has maintained control of the ATIS and any funding that it generates. In Southern California, although plans are not complete, it appears that public sector transportation data will be controlled by a single public, non-profit agency. This agency would be responsible for the generation of ATIS revenue, which would then be used to support the public sector's ATIS costs. The public, non-profit agency would promote advertising opportunities on ATIS devices, package and sell data provided by public transportation agencies, and return some of the revenue to agencies that supplied the data. The cost of these "asset management" tasks would be taken from the revenue generated. Control of the data collection effort would remain with the existing public agencies. The available documentation does not clarify which agency would be responsible for the data fusion to physically provide the public data.

APPENDIX D
GLOSSARY

ATIS	Advanced traveler information system
ATMS	Advanced traffic management system
AVL	Automatic vehicle location
CCTV	Closed-circuit television
DSS	Digital satellite systems
FLOW	WSDOT's surveillance, control, and driver information system for the Seattle metropolitan area
GPS	Global positioning system
ISP	Information service provider
ITS	Intelligent transportation system
HAR	Highway advisory radio
PBS	Public Broadcasting System
PSRC	Puget Sound Regional Council
REI	Recreation Equipment Incorporated
Smart Trek	The Model Deployment Initiative project in Seattle, a federally funded transportation program under which four metropolitan areas, including Seattle, were chosen to showcase the deployment of ATIS technologies
SWIFT	Seattle Wide-Area Information for Travelers
TSMC	Traffic Systems Management Center (WSDOT)
UW	University of Washington
VMS	Variable message signs
WSDOT	Washington State Department of Transportation