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Capstone Papers
SJSU MSTM Class of 2001

"Examination of a More Effective Federal Role in the Deployment of Rural Intelligent Transportation Systems"
Mark A. Jensen

"The ADA and Transportation: Community Issues and Community Answers"
Donna Kelsay

"System Management in the Bay Area: Improving the Connection Between Caltrans and the MTC"
Judy Li

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16. Abstract

This publication is a collection of capstone papers from the Masters of Science in Transportation Management Program at San José State University graduating class of 2001. Subjects include the deployment of a rural Intelligent Transportation System; the impact of the Americans with Disabilities act upon transportation systems; and ways to improve project management between the California Department of Transportation and metropolitan transportation commissions (MTCs).

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FOREWORD

One of the unique educational opportunities afforded to Masters of Science in Transportation Management students is the publication of a capstone paper at the conclusion of their coursework, and as a graduation requirement. The MTM 290 course is designed to assist students in defining their topic, and to understand the research methodology they may encounter as part of their everyday work as a leader in transportation management. The students are permitted to select their own topics in their own area of interest which may be beneficial to their employment. The best of each graduating class' capstone papers are selected for publication by the Mineta Transportation Institute.

MTI is pleased to publish three capstone papers. The authors are Mark Jensen, Donna Kelsay and Judy Li. These members of the Class of 2001 have produced three very different papers offering discussion on several important issues the transportation industry is facing today.

Mark Jensen's paper, "Examination of a More Effective Federal Role in the Deployment of Rural Intelligent Transportation Systems" is designed to offer an outline for a new six-year rural Intelligent Transportation Systems program which may result in a more effective, innovative and successful rural ITS program.

"The ADA and Transportation: Community Issues and Community Answers" by Donna Kelsay touches the subject of the Americans with Disabilities Act, and how transit providers can best utilize funds allocated toward meeting the needs of the disabled.

"System Management in the Bay Area: Improving the Connection Between Caltrans and the MTC," which was written by Judy Li, offers suggestions as to ways the California Department of Transportation and the Metropolitan Transportation Commission can better facilitate communications between the two overlapping agencies. Judy's ideas can be applied to any agency seeing better communication with the Department during project preparation and construction.

It is my privilege to be the instructor for the MTM 290 capstone class. I find it very rewarding to help the students discover their areas of interest in transportation management, and it is my hope that the reader, and potential end user of these papers, will find the information within valuable and worthy of implementation.

Rod Diridon
Executive Director, MTI

Examination of a More Effective Federal Role in the Deployment of Rural Intelligent Transportation Systems

Mark A. Jensen

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Thank you to my wife, Rita Jensen, for providing a tremendous level of support to me throughout my involvement in the Mineta Transportation Institute Master of Science in Transportation Management Program.

Thanks also to Moe Zarean of SAIC, for sharing his superior knowledge of the Rural ITS technical area with me, and also Lisa Ballard of the Western Transportation Institute, for brainstorming with me on potential ideas for this paper.

Finally, thanks to Rod Diridon, Executive Director of MTI, for focusing my efforts on completing the task at hand, Research Director Trixie Johnson, Research and Publications Assistant Sonya Cardenas, and Editorial Associates Catherine Frazier and Robyn Whitlock for editing and publishing assistance.

EXECUTIVE SUMMARY

Through a series of assessments on the federal role of rural ITS deployments, this paper is intended to provide an input to U.S. DOT officials and congressional staff who have recently begun the task of developing the next phase of the ITS program for reauthorization following the conclusion of TEA-21 in 2004. This paper can thus support the development of an outline for a new six-year rural ITS program plan which would result in a more effective, innovative and successful rural ITS program.

The U.S. DOT's current ITS program began in the late 1980s under the Federal Highway Administration Intelligent Vehicle Highway System (IVHS) program. The original goal was to develop a series of advanced technologies that could lead to the development of an automated highway system (AHS). However, that goal has been amended in the mid-1990s to the ITS program, the major focus of which is improving travel safety and efficiency in densely populated areas. Secondary areas of focus were also developed to include transit ITS, commercial vehicle operations (trucking) and rural ITS.

Rural areas account for 80 percent of the total U.S. road mileage and 40 percent of the vehicle-miles traveled. The transportation systems of rural areas are substantially different from urban areas. Rural transportation systems have primarily nonrecurring congestion; have fewer alternate routes; generally lower traffic volumes; traverse rugged terrain; a higher percentage of older vehicles, commercial vehicles and slow-moving farm vehicles; animals wandering onto or bounding across roadways; and have a higher average speed, among other differences. Additionally, approximately 30 percent of the rural population has no access to transit services.

The Advanced Rural Transportation System Strategic Plan (ARTS), which was developed in 1997, provided the guidance necessary for the U.S. DOT to move forward with research, test and outreach designed to promote the expansion of the overall ITS program to rural America. This document provides two guiding principles that the U.S. DOT has used in underpinning this program. First, the federal role for rural ITS is one of support and fostering the implementation of advanced ITS technologies in rural America by others. It is simply an enabling program designed to bring rural ITS technology to maturity and explore institutional arrangements that provide feasible options to rural areas wanting to implement ITS. Second, the ARTS must be sustainable and developed through public/public and public/private initiatives involving both the highway community and the public transportation community, business interests, etc.

The paper provides both a detailed assessment of the ARTS Strategic Plan, as well as several case study assessments of successful practices in rural ITS deployment across the nation. The purpose of all of these assessments is to examine the federal role in the deployment of rural ITS systems, with a particular focus on the effectiveness of the U.S. DOT policy and practices in achieving rural ITS deployments, and areas for potential improvement. Based on these assessments, the paper has developed a set of recommendations that the federal government could implement which should result in a more effective and more robust rural ITS program, leading to a more aggressive

nationwide deployment of rural ITS systems over the coming years. These recommendations are:

- ***A National Rural ITS Architecture, with appropriate links to the existing National ITS Architecture components, but separate in functionality, should be developed***. Currently, there is little technical structure which states and local jurisdictions can use to integrate elements of their rural ITS programs. The need for specific architectures and standards specific to rural needs is apparent.

- ***Where feasible, rural ITS systems should be deployed regionally in the United States to allow for efficient use of funding and technical resources, and to promote seamless information available to the traveling public through consistent systems and standards. U.S. DOT should provide incentives for multi-state regional deployment of these systems.*** Some of the most successful rural ITS deployments to date, particularly in the areas of roadway and weather information and rural transit services, have been those that have been deployed regionally across states and jurisdictions.

- ***Where feasible, the innovative approach of developing non-traditional multi-agency and multi-service partnerships to share costs to deploy rural ITS systems should be encouraged by applicable agencies of the federal government, with leadership provided by the U.S. DOT***. Some jurisdictions have been successful in deploying rural ITS through the establishment of deployment partnerships with non-transportation agencies. This has allowed for cost sharing in the deployment of the ITS systems, and has provided valuable services to other local government agencies such as emergency management services.

- ***A significant outreach effort is required which would help to educate states and local jurisdictions on both the successful practices of rural ITS deployment, as well as the means and methods of obtaining federal funding sources for their projects.*** In many smaller states, there is both the lack of appreciation for the utility of a rural ITS deployment program, as well as a lack of awareness of the potential federal funding sources and the methods of acquiring them.

- ***As part of reauthorization, Congress should provide U.S. DOT with significant additional funding that can be applied towards the national deployment of rural ITS systems over the next decade.*** The stipulation in the 1997 ARTS Strategic Plan that the U.S. DOT should not be directly involved in funding rural ITS deployment projects should be revisited. Even with the available of politically-generated ITS deployment Earmarks, the funding source pie available for the deployment of rural ITS systems is woefully inadequate and this entire funding problem needs to be addressed significantly during reauthorization. Moreover, there may be an opportunity for the entire ARTS Strategy document to be revised

as an input to reauthorization, and this revised Strategy could potentially reflect a much more robust national deployment plan for rural ITS over the next decade.

Through further examination and/or implementation of these recommendations, "Examination of a More Effective Federal Role in the Deployment of Rural Intelligent Transportation Systems" will assist federal transportation policy makers in achieving effective strategies and policies regarding the potential nationwide deployment of rural ITS systems. This will allow for improved safety, mobility and efficiency on our nation's transportation systems.

CHAPTER 1: INTRODUCTION

This paper is intended to provide input to U.S. DOT officials and congressional staff who have recently begun the task of developing the next phase of the Intelligent Transportation System program for reauthorization following the conclusion of TEA-21 in 2004. More specifically, it is intended that these individuals might find this paper useful in developing the outline of a new six-year rural ITS program plan which would result in a more effective, innovative and successful rural ITS program.

The paper centers on a series of assessments of the federal role in rural ITS deployment. Based on these assessments, a set of recommendations have been developed that the federal government could implement which should result in a more effective and more robust rural ITS program, leading to a more aggressive nationwide deployment of rural ITS systems over the coming years. This, in turn, could quicken the pace at which improvements in traveler safety, traveler information, and state DOT traffic operations are realized in our rural communities.

It is important to note here that this paper makes an inherent assumption that nationwide deployment of rural ITS systems would be beneficial to the rural traveling pubic, and that our national and state governments should move forward with the deployment of these systems in the most effective manner possible. It is therefore not the topic of this paper to examine whether or not the nation "should" deploy these technologies.
This paper is organized into the following five chapters:

- **Background (Chapter 2)**: First, to set the context, a brief history is presented on the background and purpose of the rural ITS program, along with a description of some of its major technological programs to date. Secondly, an examination of the 1997 Advanced Rural Transportation System (ARTS) Strategy is presented–this is critical to this paper, since the ARTS Strategy of 1997 largely defined the federal role of the rural ITS program that is in effect today.
- **Assessment of the Federal Technical Leadership (Chapter 3)**: This section focuses on the technical leadership provided by the U.S. DOT to support the deployment of rural ITS systems in the U.S. More specifically, it addresses how the development of the ITS National Architecture is effecting the rural ITS program, and how the potential interaction between the ITS National Architecture and local rural ITS deployments could be potentially improved.
- **Assessment of Successful Deployments (Chapter 4)**: This section focuses on lessons learned from successful ITS deployments to date which could potentially be applied broadly in the future under an improved rural ITS program. Specific areas of focus in this section are multi-jurisdictional cooperation, success in the congressional earmarks funding process, and local rural ITS success stories.
- **Assessment of Federal Policy Role and Funding (Chapter 5)**: This section presents a look at the federal role in the rural ITS program, centering on improvements that could be made in the program's strategy developed for ARTS under reauthorization. Secondly, this section looks at ways in which the federal funding policy and outreach roles could potentially be improved.

- **Recommendations (Chapter 6)**: Based on the conclusions developed from the three assessments provided in chapters 3,4 and 5, a set of recommendations is provided which are intended to provide U.S. DOT and congressional staff with some specific ideas for improving the effectiveness of the rural ITS program under reauthorization.

CHAPTER 2: BACKGROUND

In order to set the context for this paper, the section below presents a brief history on the background and purpose of the rural ITS program, with a description of some of its major technologies programs to date. Secondly, in order to describe the genesis of the federal role in the rural ITS program today, the following section provides an overview of the 1997 Advanced Rural Transportation System (ARTS) Strategy.

The Rural ITS Program

The U.S. DOT's current intelligent transportation systems (ITS) program had its origin in the late 1980s under the Federal Highway Authority's (FHWA) Intelligent Vehicle Highway System (IVHS) program. This program's original goal was to develop a series of advanced technologies that could lead to the development of an automated highway system (AHS). As this goal proved to be ahead of its time, the program was modified in the mid-1990s to the ITS program, with the major focus being on improving travel safety and efficiency in densely populated urban areas. Secondary areas of focus were also developed and outlined as part of the ITS program, including transit ITS, commercial vehicle operations (trucking), and rural ITS.

The rural ITS program is being developed to respond to transportation issues particular to rural America. Rural areas account for 80 percent of the total U.S. road mileage and 40 percent of the vehicle-miles traveled. The transportation environment of rural America differs significantly from urban American. A 1997 study described the rural transportation environment as follows:[1]

- Congestion is primarily nonrecurring.
- Fewer alternate routes are available.
- Emergency services take longer to respond to rural incidents on average.
- The provision of cost-effective systems is more difficult in rural areas as there are many more miles of rural highways than urban, and traffic volumes on rural roadways are much lower.
- Rural highways tend to traverse more rugged terrain than urban.
- Rural roadways have fewer multiple vehicle accidents than urban and a high proportion of single vehicle accidents.
- Urban areas tend to be dominated by commuter trips, whereas rural and small urban roadways tend to have a much greater proportion of recreational trips, farming trips, and commercial vehicle tips.
- Trips in rural areas tend to be longer, thus fostering motorist inattention and dozing
- A higher percentage of older vehicles, commercial vehicles, and slow moving farm vehicles characterize rural traffic.
- Animals wandering on, or bounding across, the roadway present a hazard, which is unique to rural settings.
- Lack of existing infrastructure (e.g., electricity, telephone) in sparsely populated areas makes implementation of cost-effective systems more difficult.

[1] Zarean, M. "Rural Applications of Advanced Traveler Information Systems: User Needs and Technology Assessment." JHK and Associates for the FHWA, FHWA Publication No. FHWA-RD-97-034, July 1997.

- Roadway lighting is not usually provided in rural areas, so visibility is decreased compared to urban areas.
- Rural highways are more difficult to maintain because of the usually large area of coverage, resulting in more problems with the clearance of snow and ice, maintenance of bridges, etc.
- The average speed is typically higher in the rural environment.

A number of major transportation issues in rural areas have the potential to be improved with the deployment of ITS systems. In particular, there are three major areas, which are garnering a significant amount of attention under the rural ITS program–safety improvements, traveler information, and improved transit access.

The overriding objective of the rural ITS program is to improve vehicle safety on our national rural roads. Figure 2-1 illustrates the alarming percentage of fatal auto accidents on rural roads when compared to urban roads. It has been estimated that if a driver were warned of an impending collision one-half second earlier, 50 percent of rear-end and crossroad crashes and 30 percent of head-on crashes could be avoided.[2] A study conducted in Wyoming, Idaho and Montana concluded that 85 percent of the crashes in those states could be prevented through advanced vehicle control system countermeasures, with the most promising applications being ice or friction detection and warning systems, intersection crossing detection, animal-vehicle collision avoidance, and horizontal curve speed warning advisory.[3]

[2] "Transportation Infrastructure, the Development of Intelligent Transportation Systems." The Diebold Institute of Policy Studies, 1995.

[3] Gomke, R., "Rural Automated Highway System Case Study: Greater Yellowstone Rural ITS Corridor." Western Transportation Institute and Montana State University, 1998.

Figure 2-1. Fatal Automobile Crash Rates: Rural Versus Urban

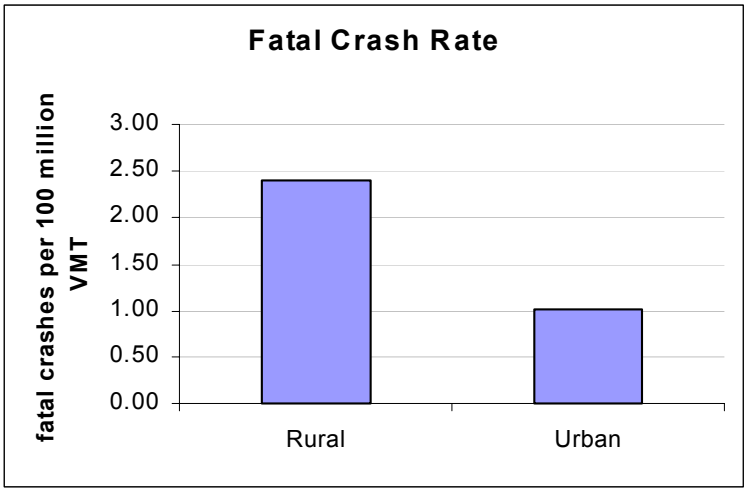


Figure courtesy of SAIC

Another major objective of the rural ITS program is to improve rural traveler information. The most important component here, which is also related to the safety objective above, is to provide accurate and localized weather information to the rural traveler particular to localized regional roads. The ITS response to these needs is undoubtedly the most mature component of the rural ITS program to date. Currently, a number of regions across the country have been deploying advanced Roadway and Weather Information Systems (RWIS), including a consortium in Washington State, a bi-state deployment in North and South Dakota, and a multi-state deployment in Wyoming, Idaho and Montana. These systems can provide the following functions for rural environments.[4]

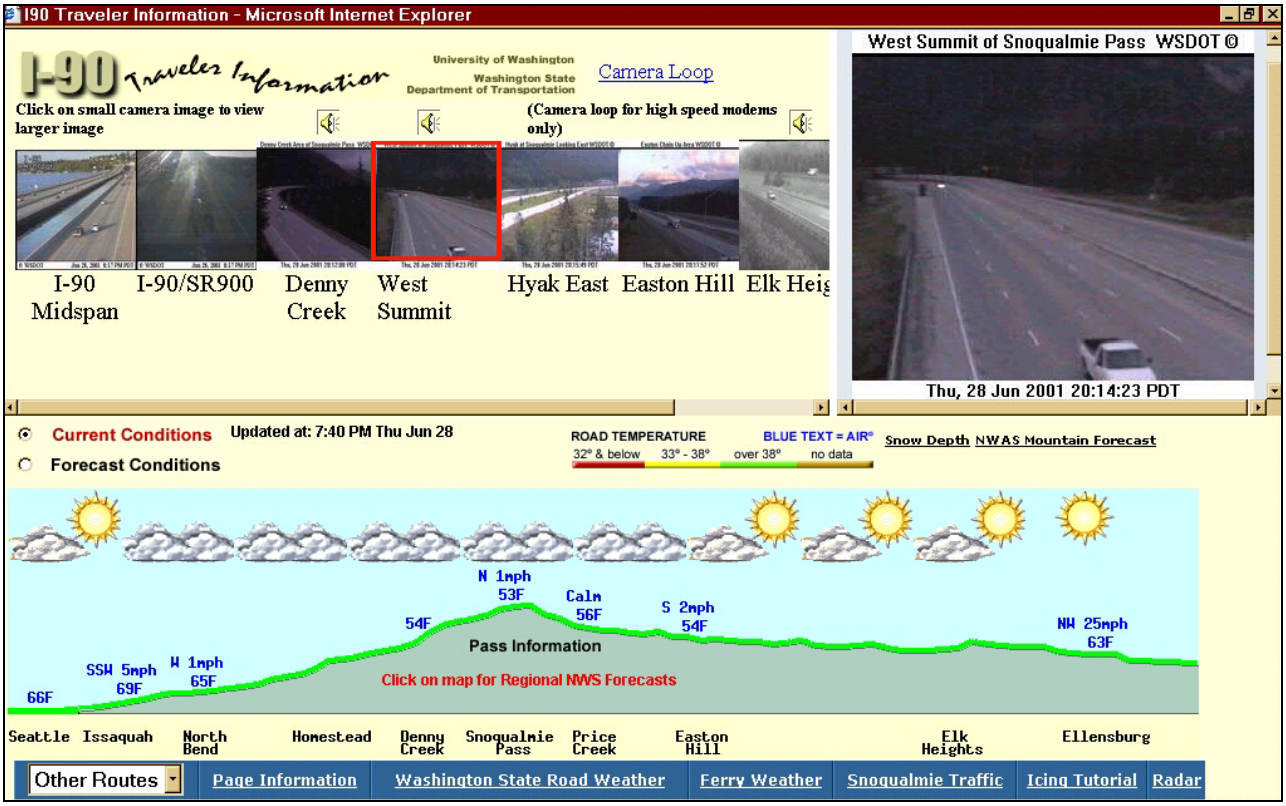
- Indicate when snow and ice control operations are required;
- Supplement tracking systems for weather conditions affecting year-round maintenance and traffic operations;
- Indicate the need for traffic advisories, warnings, or restrictions;
- Allow automatic hazard warning to motorists through roadside variable message signs and advanced traveler information systems;
- Provide site-specific weather and surface temperature forecasts to facilitate crew scheduling and assignments;

[4] "ITS Fact Sheet #5: Road Weather Management: Better Information and Tools Improve Operations, Save Lives." National Associations Working Group for ITS, no date.

- Allow automatic operation of permanently installed non-polluting anti-icing chemical spray systems on bridges and at other critical locations;
- Provide a climatological database for designing mitigation measures for blowing snow; and
- Provide current road and travel information to the public.

An example of the web page from the Washington State RWIS system, covering Interstate 90 over the treacherous Snoqualmie Pass in West Central Washington, is presented below in Figure 2-2.

Figure 2-2. Web Site for a Deployed RWIS System in Washington State



Another objective of the rural ITS program is to improve transit access. Improved transit access is especially important in rural areas, since the access to transit can affect the quality of life of many rural residents. It is important to note here that by definition under TEA-21, rural areas include small towns of less than 50,000 people. These communities typically have similar issues

to "rural" areas. According to FTA, approximately 38 percent of the rural population have no access to transit services, and 28 percent have very little access.[5] For small communities such as these, the impact that ITS can have on transit services in these communities has the potential to be dramatic. By the implementation of fleet monitoring and GPS technologies, small transit fleets could potentially be much more effective in delivering demand responsive services to small communities.

Currently, FTA is just beginning to test the concept of utilizing ITS as a means to effectively offer demand responsive services to the rural general public. As an example, a current field operational test is underway in Lake Tahoe, California, where a public-private partnership has been created which will allow the sharing of transit fleets across jurisdictions and also utilizing the casino transit fleets. The test is designed to see if the tourism public in this rural area will utilize demand responsive transit services as an alternative to driving/renting private automobiles. This ITS solution has the potential to reduce congestion and improve air quality in this rural tourist-dependent community.

Figure 2-3. Casino Buses in Lake Tahoe to Provide Transit Services as Part of an ITS Test

Currently, the vast majority of federal funding for the rural ITS program comes out of TEA-21. However, there is no specific line item for the rural ITS program. Therefore, in general, rural ITS projects must compete against urban ITS projects under the ITS Deployment Program. The ITS Deployment Program authorized in TEA-21 includes two components: integration and CVISN (Commercial Vehicle Information Systems and Networks). The ITS Integration component provides Federal ITS funding for the integration of multimodal ITS components in a variety of settings, including large regional or multi-state areas, metropolitan areas, and rural areas. In fiscal year 2001, the ITS program was designated $218 million in funding. Of this allocation, $118 million was assigned to the integration program and $100 million for ITS research and development. However, there were about 92 congressionally earmarked projects lowering the

[5] "Briefings of the Advanced Rural Transportation Systems Committee, Rural ITS: The Transit Perspective." Federal Transit Administration, 1997.

available funding to the following: $87.1 million for research and development and $103.7 million for integration.

The trend under TEA-21 toward increased congressional earmarked projects under the ITS Integration funding line has largely been detrimental to the deployment of rural ITS projects. The most obvious reason for this is that in many of the states where rural systems are most needed their congressional delegations tend to be smaller and less aware of the rural ITS program. In contrast, they are "competing" against states with very large metropolitan areas with correspondingly large congressional delegations.

It is important to note here though that there are other limited opportunities for funding for rural ITS projects under TEA-21. These include National Highway System (NHS) funding, Surface Transportation Program (STP) funding, Congestion Mitigation Air Quality (CMAQ), Borders and Corridors Program, Federal Transit Administration Block Grants, and innovative financing programs such as Transportation Infrastructure Finance and Innovation Act (TIFIA) and Infrastructure Banks.

The "ARTS" Strategic Plan

Developed in 1997, the Advanced Rural Transportation Systems (ARTS) Strategic Plan[6] defined the rural ITS program as we know it today. This strategic plan provided the guidance necessary for U.S. DOT to move forward with a research, test and outreach program designed to modestly promote the expansion of the overall ITS program to rural America.

While the implementation of the ARTS Strategic Plan has obviously been successful over the past four years in creating the rural ITS program, one could also argue that its guidance may also have been responsible for limiting what might have been a more robust deployment of rural ITS technologies to date across the nation. While this will be discussed in detail in Chapter 5 (Assessment of Federal Policy Role and Funding) of this paper, this section is intended to provide a foundation from which the current federal role in rural ITS deployment can be assessed.

Role of U.S. DOT Under ARTS

In its introduction, the document clearly delineates the role that U.S. DOT will play in the development of rural ITS as follows:

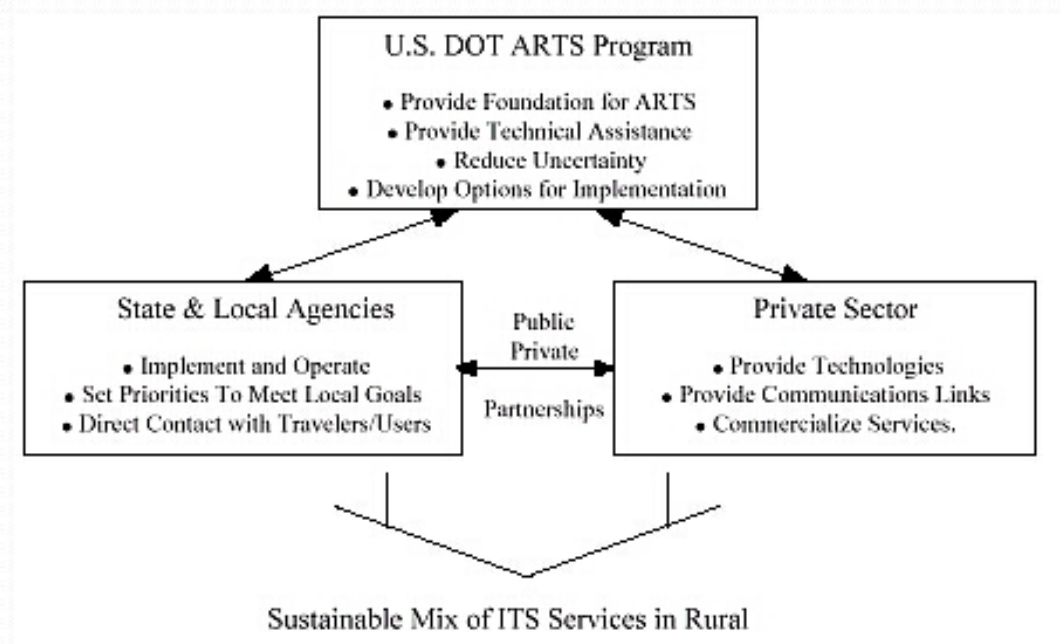
> It is important to note that this Strategic Plan represents the U.S. DOT perspective on rural ITS, and the U.S. DOT's roles and responsibilities for improving the rural transportation system through advanced technologies. In this role, the U.S. DOT program will work to bring rural ITS technologies to maturity and examine institutional arrangements for their

[6] See Advanced Rural Transportation Systems (ARTS) Strategic Plan, FHWA, 1997.

> deployment, providing feasible options to rural areas. In this context, the role of the ARTS Program is not to provide long term operational funding to rural ITS systems (though Federal funds may be available from other programs). Rather, the role of the ARTS Program is to work in partnership with those responsible for the implementation of ITS in rural areas – states and local agencies, and the private sector – to provide appropriate and sustainable (i.e., can be operated using existing and projected funding and resources) ITS solutions to rural problems and needs (see figure 1). Consequently, others will need to develop their own plans to compliment and coincide with this one.

Furthermore, as shown below in Figure 2-4, the document presents a flow chart which provides additional definition as to the specific roles of U.S. DOT, states and local agencies, and the private sector in the deployment of rural ITS technologies.

Figure 2-4. ARTS Strategy Figure of Primary Roles for Rural ITS Implementation



Source: Advanced Rural Transportation Systems (ARTS) Strategic Plan, FHWA, 1997

As the above details, in 1997 the U.S. DOT was very deliberate in limiting its role to one of guidance and technical assistance to states and private industry in the deployment of rural ITS systems. In fact, Figure 2-4 above illustrates that the U.S. DOT has an implied assumption here that states and local jurisdictions will not only implement and operate their own rural ITS elements, but that they will develop partnerships with the private sector ("public-private partnerships") that will allow for the implementation of commercially viable rural ITS services.

Vision and Mission

The ARTS Strategy document also provides both a vision statement and a mission statement. Here, the vision statement provides the future of rural America when the rural ITS program is

fulfilled, while the mission statement describes the U.S. DOT's purpose and functions that will allow the vision to be fulfilled.

Vision Statement

> An improved quality of life for rural residents and travelers through safer, more secure, available and efficient movement of people and goods in rural America through the judicious application of advanced ITS technologies.

Mission Statement

> To facilitate the development and application of Advanced Rural Transportation Systems which address rural transportation needs, through:
>
> (1) Development–Conduct research, operational testing and evaluation where necessary.
>
> (2) Deployment–Promote applications through demonstrations and deployment incentives of cost-effective technologies ready for implementation.
>
> (3) Delivery–Facilitating training and technical assistance to transportation providers planning or implementing ITS technologies.

Here, the vision statement sets forward a future where ITS has been applied to rural America for the public good, with special focus on safety and security. However, it is notable that limiting language is provided here in regards to "the ***judicious*** application of advanced ITS technologies."

Here also, the mission statement provides the specific programmatic guidance to U.S. DOT concerning what general activities and functions the department will carry out to promote the vision. It is made clear here under "deployment" that the U.S. DOT will promote rural ITS projects and provide deployment incentives for rural ITS projects. This is consistent with the language in the Introduction section of the document where the U.S. DOT was very deliberate in limiting its role to one of guidance and technical assistance to states and private industry in the deployment of rural ITS systems.

Guiding Principles

The ARTS strategy also provides two guiding principles that the U.S. DOT has as an underpinning to this program. These two guiding principles provide the assumptions and foundation for the goals, objectives, and program elements of the strategy.

Guiding Principles

(1) The Federal role for rural ITS is one of support and fostering the implementation of advanced ITS technologies in rural America by others. It is an enabling program designed to bring rural ITS technologies to maturity and explore institutional arrangements that provide feasible options to rural areas wanting to implement ITS.

(2) The ARTS must be sustainable. They must be developed through public/public and public/private partnering initiatives involving the highway community and the public transportation community, business interests, etc. They must be seamlessly connected to the rest of ITS (i.e., urban-suburban-rural connectivity, and highway-transit-ridesharing connectivity) and also compatible with non-ITS facilities and systems, and should employ innovative financing principles.

The first guiding principle again fosters the concept of the U.S. DOT as a source of guidance and assistance to others (states, local jurisdictions, private industry) who will be expected to deploy and operate the rural ITS systems.

The second guiding principle takes the concept even further by insisting that rural ITS deployments must be developed by multi-jurisdictional and/or public-private partnerships. Additionally, it is open to interpretation here on what U.S. DOT means when it states "the ARTS must be sustainable." The implication here may be that U.S. DOT wants to make sure that states and local jurisdictions are aware that the U.S. DOT will not be providing funding for operations and maintenance costs of rural ITS systems. As such, this also explains the unusual stipulation here that these systems should "employ innovative financing principles."

Goals and Objectives

The goals of the ARTS strategy are based on the "Few Good Measures" of the ITS program as applied to rural ITS, namely:

- Safety and security–Improve the safety and security of users of the rural transportation system.
- Mobility and convenience–Enhance personal mobility and accessibility to services and enhance the convenience and comfort of all users of the transportation system.
- Efficiency–Increase operational efficiency and productivity of the transportation system, focusing on system providers.
- Economic vitality and productivity–Enhance economic productivity of individuals, businesses and organizations.
- Environmental Conservation–Reduce energy consumption and environmental costs and negative impacts.

Note here that for each of these goals, the document also provides a list of specific supporting objectives.

External Factors Assessment

The ARTS strategy also provides an assessment of external factors which can effect the successful implementation of this strategy. Of particular note here is that one of the external

factors discussed is that U.S. DOT recognizes that many states and local jurisdictions will not have the ability to fund deployments of rural ITS–"there are large resource requirements for maintaining the current systems, and little additional funds for implementing new systems over the miles of rural network."

It is interesting to note here as well that in regard to these external factors, U.S. DOT offers: "Recognizing these external factors and updating the strategic plan as conditions change over the life of the program will keep it aligned with the overall mission and goals..."

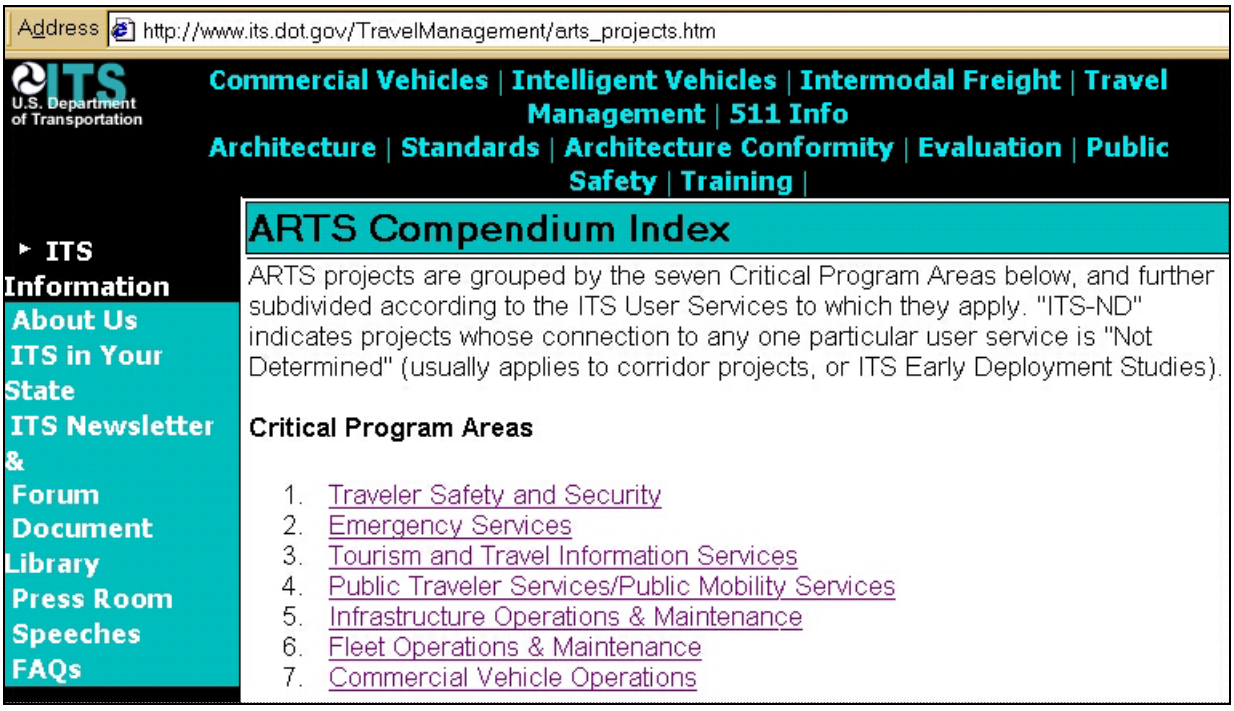
Strategies for Critical Program Areas

The final major portion of the ARTS Strategy is concerned with developing specific program strategies for the following six defined rural ITS program areas:

1. Traveler safety and security;
2. Emergency services;
3. Tourism and traveler information services;
4. Public traveler services and public mobility services;
5. Infrastructure operations and maintenance
6. Fleet operations and maintenance; and
7. Commercial vehicle operations

Further discussions on these program areas are not applicable to this paper. However, it should be noted that this breakout defined in the 1997 ARTS strategy still serves today as the programmatic guidance for the rural ITS program. As detailed in Figure 2-5, details on these seven program areas can be accessed at the online "ARTS Compendium," accessible to the U.S. DOT ITS program web site. The ARTS Compendium is an information system used to track ARTS projects. The compendium consists of a variety of project types, from planning studies to federally-funded field operational tests.

Figure 2-5. The ARTS Compendium


Address
http://www.its.dot.gov/TravelManagement/arts_projects.htm
ITS
U.S. Department of Transportation
Commercial Vehicles | Intelligent Vehicles | Intermodal Freight | Travel Management | 511 Info
Architecture | Standards | Architecture Conformity | Evaluation | Public Safety | Training |
ITS Information
About Us
ITS in Your State
ITS Newsletter & Forum
Document Library
Press Room
Speeches
FAQs
ARTS Compendium Index
ARTS projects are grouped by the seven Critical Program Areas below, and further subdivided according to the ITS User Services to which they apply. "ITS-ND" indicates projects whose connection to any one particular user service is "Not Determined" (usually applies to corridor projects, or ITS Early Deployment Studies).
Critical Program Areas
1. Traveler Safety and Security
2. Emergency Services
3. Tourism and Travel Information Services
4. Public Traveler Services/Public Mobility Services
5. Infrastructure Operations & Maintenance
6. Fleet Operations & Maintenance
7. Commercial Vehicle Operations

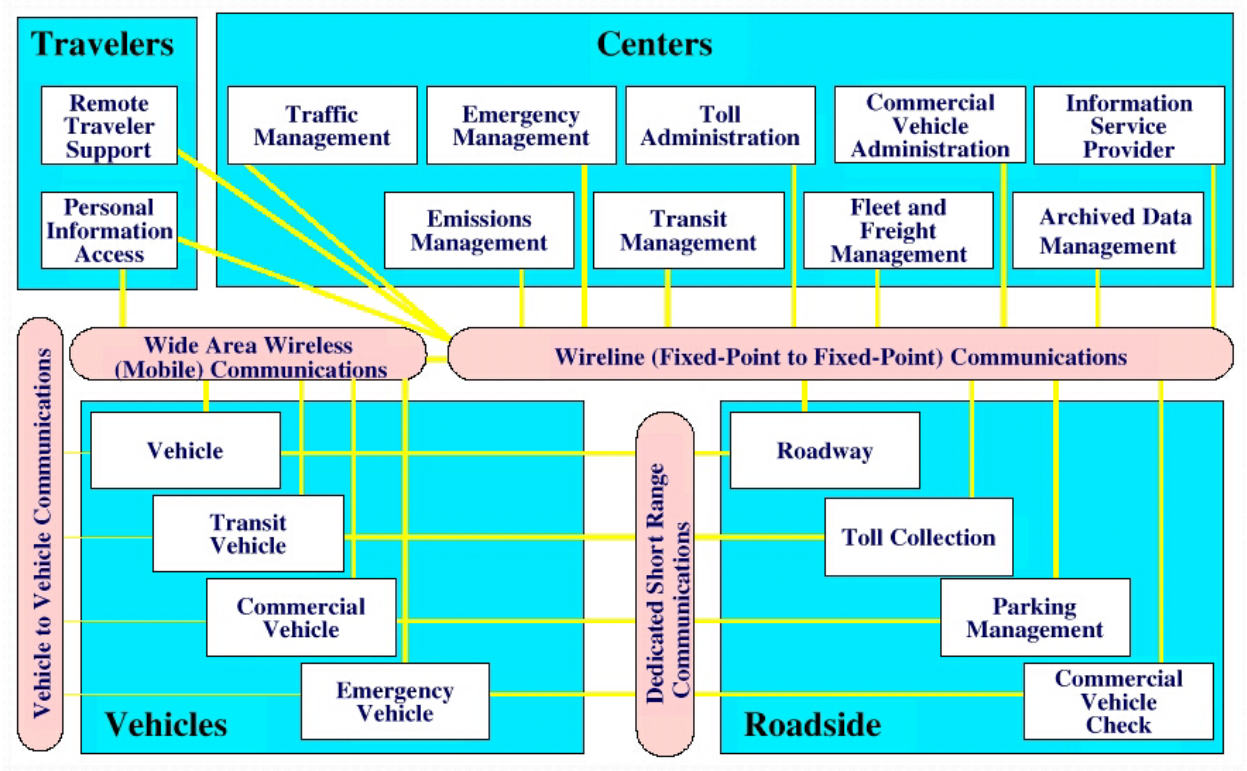
CHAPTER 3: ASESSMENT OF THE FEDERAL TECHNICAL LEADERSHIP

This section focuses on the technical leadership provided by the U.S. DOT to support the deployment of rural ITS systems in the U.S. More specifically, it addresses how the development of the ITS National Architecture is effecting the rural ITS program, and how the potential interaction between the ITS National Architecture and local rural ITS deployments could be potentially improved.

Under development for past seven years, the National ITS Architecture serves as the technical plan for the design and development of ITS technologies and systems. As highlighted in famous "sausage diagram" provided in Figure 3-1, it defines the functions that must be performed to implement a particular service (e.g., transit management), the physical entities or subsystems where these functions reside (e.g., roadside), the information flows and their associated and the communication requirements (e.g., wireline).

Figure 3-1. ITS National Architecture Overview – The "Sausage Diagram"[7]

[7] "ITS National Architecture Executive Summaries." Lockheed Martin Federal Systems and Odetics ITS Division, for the FHWA, December, 1999.


Travelers
Remote Traveler Support
Personal Information Access
Centers
Traffic Management
Emergency Management
Toll Administration
Commercial Vehicle Administration
Information Service Provider
Emissions Management
Transit Management
Fleet and Freight Management
Archived Data Management
Vehicle to Vehicle Communications
Wide Area Wireless (Mobile) Communications
Wireline (Fixed-Point to Fixed-Point) Communications
Vehicle
Transit Vehicle
Commercial Vehicle
Emergency Vehicle
Vehicles
Dedicated Short Range Communications
Roadway
Toll Collection
Parking Management
Commercial Vehicle Check
Roadside

The purpose of the national architecture is to provide a consistent tool for agency staff or contractors charged with designing and building ITS systems. By clearly delineating in detailed technical terms how various ITS components relate, duplication of effort is avoided and different ITS systems across agencies and jurisdictions will be compatible and be able to share information automatically and effectively. This technical paradigm is can encourage data exchange between communities and leverage human and financial resources in implementing and operating regional ITS systems.

The U.S. DOT has fully funded the development of the National ITS Architecture, and has made the details of it available to the public. By developing an open architecture, the U.S. DOT's intent is to foster competition and innovation in the ITS field, while at the same time provide a technological basis where different systems will still be compatible and be able to exchange information.

Closely related to the National ITS Architecture is the National ITS Standards program, which is again a program funded and supported by the U.S. DOT. The ultimate goal of these still-evolving standards will be to enable ITS hardware and communications components to be implemented consistently throughout the country. Use of ITS standards, consistent with the National Architecture, will make it possible for data to be exchanged between jurisdictions, communities, and institutions.

While there are differing opinions as to the level of effectiveness of the ITS National Architecture and Standards in assisting urban areas in deploying ITS technologies, there is a general consensus that the overall effort has been beneficial in allowing the deployment of ITS systems that can communicate with each other across jurisdictions and regions. Here though, by far the main focus of the architecture and standards efforts has been on the urban environment. According to Moe Zarean, a nationally recognized consultant on rural ITS, "the problem with the National ITS Architecture is that its main focus is on congestion, which is not typically a concern in rural transportation."[8]

To date, only cursory attention has been paid to potential new "ruralized" components. Very little research on rural ITS has focused Architecture and Standards. In fact, until the recent announcement that U.S. DOT was beginning an effort to add a new maintenance, operations and construction element to the National ITS Architecture,[9] the needs of the small rural ITS deployment community related to architecture development have not been met. According to Lisa Ballard, a rural ITS project manager at the Western Transportation Institute in Bozeman, Montana, "what we really need here is a 'ruralized'

[8] Telephone interview with Moe Zarean, Science Applications International Corporation (SAIC), conducted by Mark Jensen, April 2001.

[9] "National ITS Architecture: New User Service." *Federal Register*, Volume 66, Number 75, Wednesday April 16, 2001, Notices - Page 20026.

national ITS architecture. Projects such as the Greater Yellowstone ITS deployment are helping to develop this."[10]

The project Ballard is referring to is another regional roadway and traveler information system rural ITS project, this one being developed by the states of Wyoming, Montana and Idaho. For multi-state deployments such as this, jurisdictions are moving forward and developing their own regional rural ITS architectures with little architecture guidance from the national programs. In many cases, they are having difficulties in figuring out how to integrate legacy systems with new ITS systems and how to share information across jurisdictions. The excerpt below from a recent request for proposals from the Idaho DOT illustrates the problems that states are having in the absence of a "ruralized" National ITS Architecture. However, it is important to note here that the NTCIP information exchange protocol, which is being required by Idaho, was developed by the National ITS Standards Program.

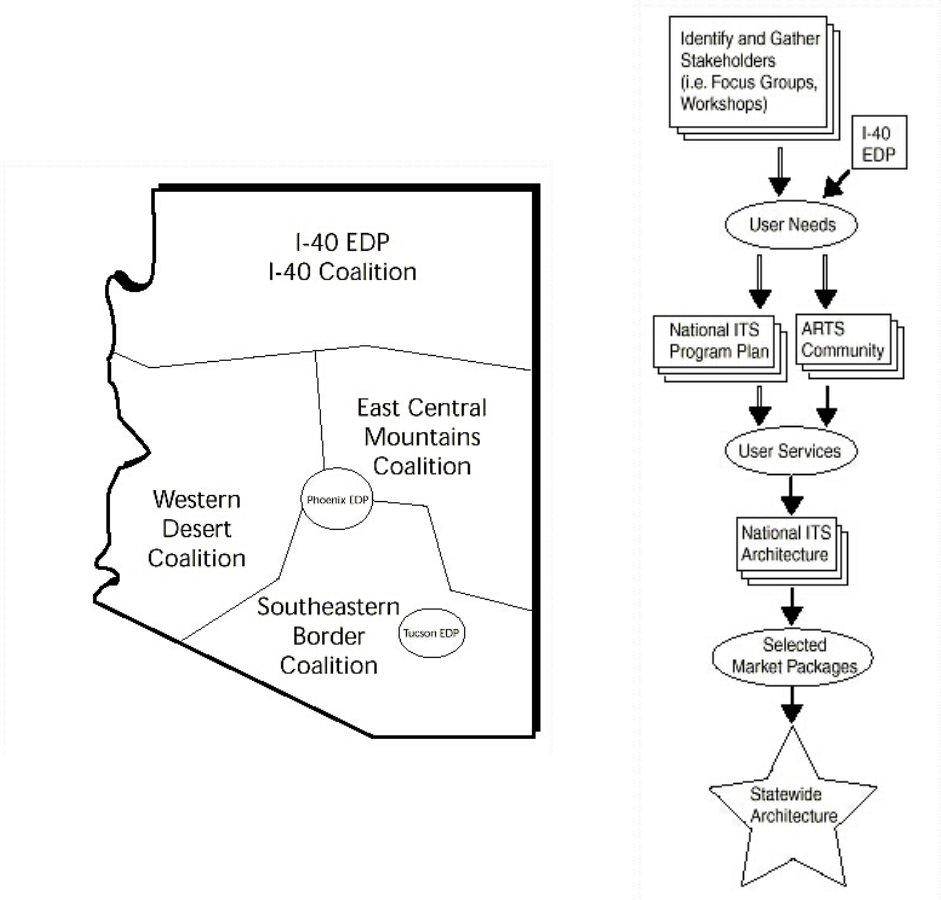
Idaho RWIS RFP Excerpt

> The Idaho Transportation Department, Division of Highways (ITD) does not have an integrated, real-time system for collecting and disseminating statewide road and weather information to travelers and winter maintenance operations personnel. Currently ITD has 24 RWIS installations around the state. Twenty of these RWIS are Surface Systems Inc. (SSI) systems with the remaining four provided by Nu-Metrics Inc. These two types of systems are currently not integrated, which is one focus of this project. In addition, ITD has approximately 25 RWIS sites planned for the future. These future sites could be any brand of RWIS as long as the RWIS vendor agrees to provide the needed data exchange software to export data into the system developed under this project. All new RWIS sites will be required to be NTCIP-ESS compliant and to conform to the results of this project.

In the absence of a "ruralized" National ITS Architecture, the state of Arizona decided several years ago to move forward and develop their own statewide rural ITS architecture, consistent where appropriate with the National ITS Architecture. The objective of this effort was to create a comprehensive, statewide architecture for deploying integrated and interoperable rural ITS technologies. Transportation planners in the state worked with regional stakeholder coalitions to develop and implement a process that led to the development of statewide rural ITS architecture and program plan. An overview of this successful process is presented below in Figure 3-2.

[10] Telephone interview with Lisa Ballard, Western Transportation Institute (WTI), conducted by Mark Jensen, April 2001.

Figure 3-2. Arizona Architecture Development Process and Stakeholder Regions[11]



Based on this process, the following three steps were implemented to create the statewide rural ITS architecture:[12]

- ***Identify Stakeholders and Develop Public Information Campaign***. Considerable effort went into gathering stakeholders to establish a strong technical and policy-oriented base of support for future ITS deployments. These efforts included holding two rural ITS workshops and four focus group meetings around the state, as well as getting on the agendas of other meetings that potentially interested stakeholders attended. Additionally, project fact sheets, quarterly newsletters, and positive stories carried by the news media were utilized.

[11] "Statewide ITS Architecture Development: Building a Framework for Statewide ITS Integration – Arizona's Rural Statewide ITS Architecture." FHWA and FTA, September 1999.

[12] Ibid.

- ***Assessing Rural Arizona's Transportation Needs.*** From over 200 needs cited in the outreach effort, 76 independent need statements were developed. Traveler information based on real-time roadway conditions, such as route information, weather warnings, or ***Integrated User Needs Plan***. The identified needs were matched with the ITS user services described in the National ITS Program Plan, and the six user services defined by the ARTS program. User services were then prioritized and grouped into common deployment timeframes based on common technologies or objectives. Market packages were then selected to provide these services. Out of the 56 market packages outlined by the National ITS Architecture, 49 were selected as candidates for deployment in Arizona. This process resulted in a set of objectives, technologies, and timeframes that served as the basis for the subsequent system architecture.

The above process utilized by the state of Arizona illustrates how a state or region can develop a rural ITS architecture, supported by the National ITS Architecture, in the absence of a true "ruralized" National Architecture. The process should be used a model for the development of regional rural ITS architectures.

Conclusions

In summary, there is inadequate technical architecture guidance from the U.S. DOT from which states and local jurisdictions can proceed to successfully integrate elements of their rural ITS programs. The need for architectures and standards specific to rural needs is apparent. A national Rural ITS Architecture, with appropriate links to the existing National Architecture components, but separate in functionality, should be developed. In the meantime, regional rural ITS architecture development efforts should be utilized as a "stopgap" measure.

CHAPTER 4: ASSESSMENT OF SUCCESSFUL DEPLOYMENTS

This section focuses on lessons learned from four successful ITS deployments to date which could potentially be applied broadly in the future under an improved rural ITS program. Specific areas of focus in this section are multi-jurisdictional cooperation, success in the congressional earmarks funding process, and local rural ITS success stories.

Case Study: Non-Traditional Rural ITS Partnerships in Pennsylvania
Up until the mid-1990s, communities in rural upstate Pennsylvania had a very inept emergency services program. The existing services utilized a fragmented communication system without geographic information systems (GIS) support.

In 1996, at the regional planning meeting of the North Central Pennsylvania Regional Planning and Development Commission (NCPRPDC), the commission began a plan to delivery coordinated emergency services. As this plan was looked into more detail, it evolved into a large plan dealing with the regional transportation issues.

As the rural transportation planning organization for the region, NCPRPDC recognized that improving emergency response could also be the beginning of a regional Intelligent Transportation System (ITS) program: "We knew that most rural roads had never been mapped and that an inventory of roads would improve emergency services. It was apparent that this was a starting point for ITS in our region," stated NCPRPDC's Director Amy Kessler.[13]

The GIS mapping and addressing of the first phase of the project was also used to develop the first phase of a regional ITS architecture, and included automated methods for gathering and distributing transportation-related data. This allowed for connectivity to other legacy transportation systems in the regional to transfer information such as messages alerting state authorities of local road closures. Additionally the digitized GIS map data developed here incorporated road centerlines, bridges, hydrology, floodplains and tax parcels, all of which the NCPRPDC intends to use as inputs to support to the regional the regional ITS architecture.

To build this system, which is now nearly deployed, four counties contributed a total of $2.3 million. The expected benefits of the project should include significant safety improvements, communications cost savings, and a starting point for the region's ITS program.

An important lesson from this case is that in the absence of federal funding, local transportation planners were able to package rural ITS development with emergency services, which allowed for the region to begin developing a rural ITS program. Here, it would likely have been much more difficult for theses four counties to fund $2.3 million

[13] "Rural ITS Project in PA: Working to Save Lives." National Association of Development Organizations (NADO) Research Foundation Newsletter, February-March, 2001.

in ITS improvements only, if the need for improved emergency services was not packaged with it.

Case Study: Bi-State and Multi-Agency Rural ITS Deployment in Oregon and California

Highway 199 is a main route between Grant's Pass on the 1-5 corridor and the Pacific coast. The nearby Pacific coast destinations draw frequent heavy traffic on this route with over 300,000 visitors annually. The California-Oregon Advanced Transportation System (COATS) ITS deployment project has been designed to improve safety and traveler information along this route. This project in bi-state and multi-agency, consisting of the following project participants: Oregon DOT (ODOT), Caltrans (Districts 1 and 2, Office of New Technology and Research, Traffic Operations Program), Oregon State Police, California Highway Patrol, California and Oregon ITS America Chapters, and the Western Transportation Institute, Montana State University, Bozeman.

The COATS team has already conducted an analysis on problem areas in Southern Oregon.[14] These data show that visibility, narrow clear zone and intersection related incidents are significant issues on this highway. Additionally, there are several road closure events annually due to landslide, high wind, high water or snow. Incident detection, verification and response times are relatively high as compared to other areas in the COATS study area. Getting information to the traveling public in a timely manner is critical since alternate routes tend to be long and very circuitous. The prior COATS study has identified specific locations that have problems. These will be addressed in the following COATS projects:

- **The Coos Bay-Gold Beach Weather Warning System**–Enhancements and supplements to the two weather stations currently deployed on US 199 to provide High Wind and High Water warning systems; additionally, a camera will be added at the Hayes Hill RWIS site to enhance hazard detection & incident verification at this critical location.
- **Highway 1999 VMS**–A dynamic message sign will be deployed on the south end of Grant's Pass on Hwy199 to provide drivers with advance notice about road closures, restrictions and incidents at their decision point prior to leaving Grant's Pass; additionally, a remotely activated, flashing beacon highway closure sign will be deployed at Cave Junction
- **Traveler Information System Enhancement**–primarily a software project that will provide various enhancements to the delivery of travel information through ODOT's TripCheck traveler information system. This system will integrate the

[14] see "TransPort 2000: An FY 2000 Federal Transportation Appropriations Bill Project Request." Oregon DOT and others, 2000.

rural information from the above two projects, as well as additional sources of statewide traveler information.

This project, which has received several million dollars to date in congressional earmarks under the ITS Deployment Program, together with complimentary project work in California, will provide better coordination among the agencies involved in managing these bi-state corridors through providing more complete real-time status information to operations personnel. The project will also improve traffic and roadway status information dissemination and access to drivers to avoid stranding drivers in remote locations due to unexpected road closures, restrictions and adverse weather conditions.

This rural ITS deployment project highlights the success that large states can have when forming partnerships with each other to acquire significant funding for rural ITS projects under the general ITS Deployment Program. Here, using their political leverage, the large combined congressional delegations from Oregon and California make a deployment such as this much more of a reality than if a couple of Midwestern states had teamed together. Nevertheless, developing multi-state projects supported by multi-agency coalitions is a good model for success in positioning states to go over ITS Deployment Program funds for their rural ITS projects.

Case Study: Multi-Agency Regional Coalitions for Rural Transit Needs – South Lake Tahoe

The roadway infrastructure in South Lake Tahoe is adequate to handle the customary and usual traffic needs of the locals (approximately 30,000) and a reasonable increase in highway loading due to visitors. However, when factoring in the actual visitor/tourist impacts resulting from an influx of 2 million people per year and population spikes of 200,000 people on peak-season days, local roadways frequently reach Level-of-Service E and F, which drives severe and unacceptable environmental damage to Lake Tahoe itself.[15]

Additionally, historically, transit ridership in the region is centered in large part on the transit dependent population. However, basin-wide only about 15.1 percent of the total population are potential transit dependents. Conversely, visitor ridership typically represents only about 10 percent of area transit ridership. When considering that 58 percent of transportation demand is visitor related and 42 percent is local related, it becomes apparent that the discretionary rider (especially the visitor sector) must be the primary target in order to achieve any significant reduction in current vehicular traffic levels. This realization has been fundamental to the development of the Coordinated Transit System (CTS) deployment.

Mandating changes in visitor behavioral patterns is not an option in a community that is dependent upon visitors for its economy. Rather, it is incumbent upon the regional

[15] See: Powers, Dick. South Shore Coordinated Transit System, Application for Participation in the FY 2000 ITS Integration Component of the ITS Deployment Program. Prepared by the Tahoe Regional Planning Agency for the U.S. DOT-FHWA, March 7, 2000.

governments to create alternatives that are more responsive to the needs of its customers –alternatives that may be more attractive to the non-transit dependent than use of the personal automobile. Evolving transit technology has now provided the opportunity for an ITS solution to the problem in the form of the CTS project.

CTS is a unique, multi-jurisdictional integration and coordination of public and private resources. It will combine across state lines the City of South Lake Tahoe Stage and Bus Plus services, El Dorado County Bus Plus, Douglas County Bus Plus, the Casino Park and Roll operations, the Heavenly Skier Shuttle and the Nifty "50" Trolley services. Fixed route, flex-route, deviated route and demand response operations will be blended into one system in order to provide a fully integrated transit capability and maximize cost efficiencies and passenger travel alternatives. Underlying these motives will be the fundamental requirement that CTS must be user friendly.

CTS will be driven by the creative deployment of three advanced technologies–automatic vehicle location (AVL), advanced traveler information (kiosks and telephony) and computer-aided dispatching (CAD). While each of these technical strategies have been proven in its own right, they have never been deployed or integrated in the format planned for South Lake Tahoe. Its unique service features are the availability of demand response service to the community at large (locals and visitors), the immediacy of response to ride requests (within minutes), and easily quantifiable results.

Here, the mitigation of air quality during tourist seasons in an otherwise rural setting was the impetus that brought federal attention to this region. Additionally, by building a multi-agency transit and transportation planning coalition in the immediate California and Nevada regions, the agencies positioned themselves well to be successful in getting a Congressional Earmark funding line item for this rural ITS project.

Case Study: Rural ITS Statewide Test – Minnesota

The second most common type of accident on Minnesota's rural freeways was vehicles hitting deer, which accounted for almost 25.1 percent of all of the accidents.[16] According to the Minnesota DOT, approximately 20,000 vehicle/deer collisions are reported each year in the state, while an estimated 40,000 additional crashes are unreported. The average vehicle damage cost in a non-injury crash is estimated at more than $2,000. Additionally, two to three motorists' deaths are reported each year in Minnesota as the result of crashes or attempts to avoid collisions.

In response to this, the Minnesota DOT (MnDOT) is funding on its own (without federal support) a two-year field operational test of a deer crossing warning system that will be the first of its kind in the nation. This system consists of traditional deer warning signs

[16] "Potential Safety Benefits of Intelligent Transportation System (ITS) Technologies." Howard Preston, BRW, Inc., published at: http://www.ctre.iastate.edu/pubs/semisesq/session2/preston/

with a beacon mounted on top. When a deer crosses the path of the sensor, a motion sensor activates a transmitter which then allows the warning lights to flash for about one minute, thus providing a visual caution to drivers to slow down and to watch for deer near the roadway.

Several sites will be tested based on the deer population in the area and the historical number of crashes reported. Following the test phase, MnDOT will analyze the results to see if the number of collisions has been reduced. If the test is successful, then these deer alert systems could be installed at key deer crossings statewide.[17]

This case illustrates that states with the will have the ability to operate their own ITS test and evaluation programs similar to what U.S. DOT does on a national scale for its ITS field operational test and evaluation programs. Where there is an important state public safety issue such as this, and where the federal government is not involved in providing the means to a solution, states have the ability to investigate and deploy rural ITS technologies on their own.

Figure 4-2. A permanent Variable Message Sign (VMS) being installed on I-90 east of Bozeman, Montana.

[17] "New deer alert system may lessen motorist-deer collisions in Minnesota. DOT news release." June 12, 2001. http://www.dot.state.mn.us/d8/newsrels/01/0612deeralertsystem.html

Conclusions

Some of the most successful rural ITS deployments to date, particularly in the areas of roadway and weather information and rural transit services, have been those that have been deployed regionally across states and jurisdictions. Where feasible, rural ITS systems should be deployed regionally in the United States to allow for efficient use of funding and technical resources, and to promote seamless information available to the traveling public through consistent systems and standards. U.S. DOT should provide incentives for multi-state regional deployment of these systems.

Additionally, some jurisdictions have been successful in deploying rural ITS through the establishment of deployment partnerships with non-transportation agencies. This has allowed for cost-sharing in the deployment of the ITS systems, and has provided valuable services to other local government agencies such as emergency management services. Where feasible, this approach of developing multi-agency partnerships to share costs and deploy rural ITS systems should be encouraged by multiple agencies of the federal government, with leadership provided by the U.S. DOT.

CHAPTER 5: ASSESSMENT OF FEDERAL POLICY ROLE AND FUNDING

This section presents a look at the federal role in the rural ITS program, centering on improvements that could be made in the program's strategy developed for ARTS under reauthorization. Secondly, this section looks at ways in which the federal funding policy and outreach roles could potentially be improved.

Redefining the ARTS Strategy

If the national is to move forward with a more aggressive deployment of rural ITS systems in the coming decades, then the ARTS Strategy document, outlined in detail in Chapter 2, must be modified to reflect a number of key policy changes. Over the next two years, U.S. DOT personal and Congressional staff will be working on reauthorization language for the TEA-21 follow-on transportation authorization bill. Thus, in order to provide a rural ITS input to this reauthorization effort, a significant revision of the currents ARTS document could be conducted and then presented to these decision-makers as a draft blueprint for a new and more robust rural ITS program.

In assessing the 1997 ARTS document, a number of changes could be made to the document which would have a major effect on the U.S. DOT policy on the rural ITS program, resulting in a much more aggressive deployment of rural ITS projects following reauthorization. These four changes are summarized as follows:

(1) ***ARTS Introduction***. The ARTS introduction should be modified to reflect a new and much more supportive ITS deployment philosophy. Here, the role of the ARTS program should be restated as one of not only supporting and working with local partners for implementation, but also funding key deployment projects as part of a new national rural ITS deployment effort under the leadership of U.S. DOT. Additionally, in hindsight, it is apparent now that the private sector commercialized services (see Figure 2-4) that was forecasted has failed to materialize. Instead of this hope for private industry to pay for rural ITS, it would be more realistic to have a statement or two that recognize that rural ITS services save lives and improve travel, and that they are therefore in the public good and it is reasonable for the federal and local governments to pay for their implementation and operation.

(2) ***Vision***. The original vision statement of "improving the quality of life for rural residents and travelers through safer, more secure, available and efficient movement of people and goods in rural America through the judicious application of advanced ITS technologies," is still largely applicable. However, the unnecessary limiting word "judicious" should be removed to reflect a more robust deployment effort envisioned by U.S. DOT.

(3) ***Mission.*** The mission statement should be reworked significantly to reflect a much more active U.S. DOT role in the funding and deployment of rural ITS systems. Specifically, for Item (2) Deployment, the current text reads: "Promote applications through demonstrations and deployment incentives of cost-effective technologies ready for implementation." This statement in its present form says that U.S. DOT is not in the business of deploying rural ITS technologies. To support a new and more

robust program, this could be modified to: "Promote applications through deployments of rural ITS technologies in strategic areas and in supported of ITS integration efforts."

(4) ***Guiding Principles***. The two existing guiding principles are concerned (1) with limiting the rural ITS program and not funding deployments, and (2) insisting that rural ITS deployments be sustainable, with the implication being that their needs to be some private revenue involved. These two existing principles are not acceptable and realistic if the rural ITS program is to be expanded and deployed nationally. In particular, the rural ITS deployments to date have not shown that a private "commercialized services" market for rural ITS services is likely to materialize anytime soon. These two existing guiding principles should be replaced with one that recognizes that these services are being deployed for the public good (safety, information), and another one that establishes U.S. DOT as the leader in deploying a national rural ITS system.

Improvements in Federal Funding Policy

The table below presents the ITS program funding authorized under TEA-21. Here, there are two major funding categories. The first category, "ITS Standards, Operational Tests & Research," is funded between $95 million to $110 million annually. The second category, "ITS Deployment," is funded between $101 million to $122 million annually.

Figure 5-1. Primary ITS Funding Levels Authorized Under TEA-21

Program Category	FY98	FY99	FY00	FY01	FY02	FY03	Total
1. ITS Standards, Ops Tests, Research	95.0	95.0	98.2	100.0	105.0	110.0	603.2
2. ITS Deployment	101.0	105.0	113.0	118.0	120.0	122.0	679.0
Total	196.0	200.0	211.2	218.0	225.0	232.0	1,282.2

Under the "ITS Standards, Operational Tests & Research" program, states, MPOs or other entities may apply for grant funding on an annual basis. Here, with much of the funding going to the development of the ITS National Architecture and Standards development, and other ITS research, perhaps the best opportunity for rural ITS proponents to achieve grant funding is if a state/MPO can make a case in their application for deploying new and innovative rural ITS technologies or concepts as part of a field operational test.

Under the "ITS Deployment" program, while this was intended to be an annual grant program, as alluded to previously, it has in effect been completely "hijacked" by the congressional earmarks process. Congress now simply earmarks the total dollars available in this program to a politically-derived set of state and local ITS projects which

are submitted by states, MPOs and local governments to their congressional delegations for review. Therefore, to achieve funding under this program, states or MPOs must now "sell their project" with the support of their congressional representatives. This highlights the need for rural ITS proponents to be politically savvy, and to frequently interface with their local congressional representatives to promote their programs.

Improvements in U.S. DOT Outreach Activities

All parties involved in rural ITS will tell you that a significantly more robust outreach program is required by U.S. DOT to both educate smaller states on the utility of rural ITS, and, more importantly, to help these states to work the funding issues that are required for them to garner federal assistance for their projects. According to Ballard, the federal rural ITS program "sometimes forgets that there are differences between a Caltrans and a Montana DOT." And according to Zarean, "a small town can be completely overwhelmed in trying to deploy a transit fleet monitoring system."

This more robust outreach effort could also focus on the successful practices of rural ITS deployments to date, such as those described in Chapter 4. Particular attention could be provided on how to develop multi-agency and regional teams to successfully deploy rural ITS technologies.

Conclusions

The stipulation in the 1997 ARTS Strategic Plan that the U.S. DOT should not be directly involved in funding rural ITS deployment projects should be revisited. Even with the available of politically-generated ITS deployment Earmarks, the funding source pie available for the deployment of rural ITS systems is woefully inadequate. Congress should address this during reauthorization, and should provide U.S. DOT with significant additional funding that can be applied towards the national deployment of rural ITS systems over the next decade. Moreover, there may be an opportunity for the entire ARTS Strategy document to be revised as an input to reauthorization, and this revised strategy could potentially reflect a much more robust national deployment plan for rural ITS over the next decade.

Additionally, in many smaller states, there is both the lack of appreciation for the utility of a rural ITS deployment program, as well as a lack of awareness of the potential federal funding sources and the methods of acquiring them. A significant outreach effort is required which would help to educate states and local jurisdictions on both the successful practices of rural ITS deployment, as well as the means and methods of obtaining federal funding sources for their projects

CHAPTER 6: RECOMMENDATIONS

Based on the conclusions developed from the three assessments provided in Chapters 3,4 and 5, a set of recommendations are provided which are intended to provide U.S. DOT and congressional staff with some specific ideas for improving the effectiveness of the rural ITS program under reauthorization.

- **A National Rural ITS Architecture, with appropriate links to the existing National Architecture components, but separate in functionality, should be developed**. Currently, there is little technical structure which states and local jurisdictions can use to integrate elements of their rural ITS programs. The need for specific architectures and standards specific to rural needs is apparent.
- **Where feasible, rural ITS systems should be deployed regionally in the United States to allow for efficient use of funding and technical resources, and to promote seamless information available to the traveling public through consistent systems and standards. U.S. DOT should provide incentives for multi-state regional deployment of these systems using joint powers authority.** Some of the most successful rural ITS deployments to date, particularly in the areas of roadway and weather information and rural transit services, have been those that have been deployed regionally across states and jurisdictions.
- **Where feasible, the innovative approach of developing non-traditional multi-agency and multi-service partnerships to share costs and deploy rural ITS systems should be encouraged by multiple agencies of the federal government, with leadership provided by the U.S. DOT.** Some jurisdictions have been successful in deploying rural ITS through the establishment of deployment partnerships with non-transportation agencies. This has allowed for cost sharing in the deployment of the ITS systems, and has provided valuable services to other local government agencies such as emergency management services.
- **A significant outreach effort is required which would help to educate states and local jurisdictions on both the successful practices of rural ITS deployment, as well as the means and methods of obtaining federal funding sources for their projects.** In many smaller states, there is both the lack of appreciation for the utility of a rural ITS deployment program, as well as a lack of awareness of the potential federal funding sources and the methods of acquiring them.
- **As part of reauthorization, Congress should provide U.S. DOT with significant additional funding that can be applied towards the national deployment of rural ITS systems over the next decade.** The stipulation in the 1997 ARTS Strategic Plan that the U.S. DOT should not be directly involved in funding rural ITS deployment projects should be revisited. Even with the available of politically-generated ITS deployment earmarks, the funding source pie available for the deployment of rural ITS systems is woefully inadequate and this entire funding problem needs to be addressed during reauthorization. Moreover, there may be an opportunity for the entire ARTS Strategy document to be revised as an input to reauthorization, and this revised strategy could potentially reflect a much more robust national deployment plan for rural ITS over the next decade.

ABBREVIATIONS AND ACRONYMS

AHS	Automated Highway System
ARTS	Advanced Rural Transport System
AVL	Automatic Vehicle Location
COATS	California-Oregon Advanced Transportation System
CTS	Coordinated Transit System
CMAQ	Congestion Mitigation Air Quality
CVISN	Commercial Vehicle Information Systems and Networks
FHWA	Federal Highway Authority
FTA	Federal Transit Administration
FY	Fiscal Year
GIS	Geographic Information Systems
GPS	Global Positioning Systems
IDT	Idaho Transportation Department
ITS	Intelligent Transportation System
IVHS	Intelligent Vehicle Highway System
Level of Service E & F	A measure of the level of freeway usage, with F being the most severe level of usage/congestion
MnDOT	Minnesota Department of Transportation
NCPRPDC	North Central Pennsylvania Regional Planning and Development Commission
NHS	National Highway System
NTCIP-ESS	National Transportation Communications for ITS Protocol-Environmental Sensor Station
ODOT	Oregon Department of Transportation
RWIS	Roadway and Weather Information Systems
SSI	Surface Systems, Inc.
STP	Surface Transportation Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TIFIA	Transportation Infrastructure Finance and Innovation Act
VMS	Variable Message Sign

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THE ADA AND TRANSPORTATION: COMMUNITY ISSUES AND COMMUNITY ANSWERS

Donna Kelsay

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ACKNOWLEDGEMENTS

This paper is dedicated to Jerald L. Hughes, who passed away on September 19, 2001. Prior to his death, he served as the San Joaquin Transit District's General Manager/CEO from 1990-2001. Jerry was active in the transportation industry for 34 years and spearheaded many innovative transit programs to improve public transportation

Jerry was honored as "1994 Business Manager/Operator of the Year" by the Greater Stockton Chamber of Commerce for his business achievements and contributions to the community. Jerry, with his exceptional management skills and commitment to the advancement of public transit, worked tirelessly to meet the transportation needs of the region. Jerry's vision, leadership and drive contributed to the advancement of public transit on local, regional and national levels. Every staff member who worked with Jerry was instilled with a sense of purpose and a desire to continuously improve the quality of public transit. Jerry's passing was an immeasurable loss to not only San Joaquin County, but to the transit industry as a whole. He will be greatly missed.

Jerry was a great mentor. Although I worked with him for only a short time, he quickly introduced me to the community leaders and organizations. He placed me in a highly visible position dealing with local social service agencies to resolve some tough issues involving ADA and SJRTD's delivery of services to the community. He gave me the opportunity and direction to successfully solve serious challenges. He made certain that I knew the staff, the issues, the community resources, and the community.

I wish to thank the staff at San Joaquin Regional Transit who gave me direction and assistance as I embarked on this quest for information about the ADA and how its implementation affected transportation.

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EXECUTIVE SUMMARY

There exists a community of well-informed transit professionals who have a comprehensive understanding of the Americans With Disabilities Act (ADA) and how it relates to transportation. Most of these individuals work specifically in this arena and deal with mobility-related issues on a routine basis. For those seeking additional knowledge, Internet web sites abound with information about the ADA, transportation, and complementary paratransit. In order to navigate successfully through these web sites, however, a basic understanding of the subject area is essential.

What about the novices? Many transit professionals are not often confronted with these issues, and are thus still unfamiliar with the ADA and its impact on transportation. Additionally, there are community leaders and concerned citizens who lack even a basic understanding of this important subject. Worse yet, most social service agency representatives and consumer advocates do not fully understand the ADA and how it relates to the transportation needs of the individuals they serve.

This is an important issue because successful management of effective transportation services under the ADA cannot rely on a well informed few, but must rather be made possible by the collaborative efforts of the entire community. Essential partnerships cannot function-or even form-until everyone involved understands what the ADA means to transportation and to the community.

The ADA puts the responsibility for paratransit service-and certification for that service-on the transit agency. It provides only basic guidelines about who can use the required paratransit services, but then says that eligibility must be “strictly limited to individuals who meet the regulatory criteria." Transit providers are experts at providing transportation services. They know about transit vehicles, on-time performance, miles between road calls, etc. They are not traditionally social service agencies or medical evaluators. Although they try, many understandably falter in these new roles

Transit providers trying to adhere to the ADA guidelines may be viewed by social service agencies and consumer advocates as arbitrarily providing or withholding necessary mobility services. These agencies and transit providers trying to adhere to the ADA guidelines are often viewed by social service agencies and consumer advocates as arbitrarily providing or withholding necessary mobility services. These agencies and advocates understand that they are often better equipped than transit providers to understand and assess the medical conditions and transportation needs of the individuals they serve are. At the same time, however, they are generally unaware of the limitations placed on transit agencies by the ADA

This paper is not intended to be a comprehensive guide to the ADA and transportation. It is intended to be a primer, providing the basic information necessary to initiate a dialogue between involved community members and transit providers. Only through such dialogue

can the varying groups involved form a partnership to effectively meet the transportation needs of the community.

Conclusions

Unfortunately, some passengers with disabilities have a misleading assumption of entitlement to paratransit services. They do not understand the real value of the ADA, or that they may be doing themselves a disservice by relying on paratransit services. The reality is that access to mainline service is the real entitlement.

When passengers understand the reality of accessibility and mobility, they realize that paratransit was never intended as the first or best choice, because it is not the first or best option. Riders must understand that fixed route or mainline transit should always be the first choice because it offers far greater accessibility and mobility. It is more convenient and provides greater flexibility in trip planning. It is, in fact, what the ADA is all about.

Fear of the unknown may prevent persons with disabilities from using fixed route services. According to one orientation and mobility specialist, sometimes parents and family members of persons with disabilities are the ones who experience the fear, and discourage their loved ones from using fixed route transit services. Only through education and mobility training can the obstacle of the fear be removed. (Bauer)

Recommendations

First of all, persons with disabilities need information about all of the transportation options available under the ADA. A drafter of the ADA statute and subsequent regulations was quoted as stating, “People need to understand what the ADA actually says, not what they want it to say.” This quote was used to emphasize, “the purpose of the statute is civil rights and non-discrimination, not preferential treatment or ‘entitlements’” (Piras).

Social service agencies and community leaders do not need to understand or even know all about the ADA and transportation. They do need to know enough about the subject to work productively with local transportation agencies to best serve the transportation needs of the entire community. A working knowledge of the ADA and transportation will facilitate the discussions necessary to resolve challenges and achieve consensus on local issues.

Secondly, persons with disabilities need access to mobility training. Mobility or travel training can help people with disabilities shift from dependence on paratransit to the independence available through fixed route usage.

Finally, success takes a community. Ideally, community stakeholders and the local transit provider will form a partnership to guarantee that every person with a transportation need will find the resources necessary to make the best use of locally available transportation services. Transportation is the vital link-for individuals, businesses, and educational institutions-the community as a whole. Because transportation is so vital to the success of individuals and the community, it is essential that all of the stakeholders participate in the dialogue about viable transportation options. When everyone involved or affected has a basic understanding of this multifaceted issue, a giant step on the road to meaningful dialogue will have been taken.

HISTORY AND BACKGROUND OF SERVICES FOR PASSENGERS WITH DISABILITIES

THE HISTORY OF FEDERAL INVOLVEMENT IN TRANSPORTATION FOR PERSONS WITH DISABILITIES

The current role of federal involvement in transportation dates from the Urban Mass Transportation Act of 1964. This comprehensive act was established, "because the welfare and vitality of urban areas, the satisfactory movement of people and goods within such areas, and the effectiveness of housing, urban renewal, highway, and other federally aided programs were being jeopardized by the deterioration or inadequate provision of urban transportation facilities and services…" (APTA). Congress felt federal intervention was necessary to avert widespread abandonment of transit services, which had recently changed from private to public management. The UMT Act expanded capital funding for transit and allowed funding for research, planning, and training. (Bartosiewicz). In 1970, Section 16 was added to the UMT Act, which introduced a "national policy" to serve the transportation needs of "elderly and handicapped persons." The Rehabilitation Act of 1973, with its Section 504, expanded the national goal by stating:

> No otherwise qualified handicapped individual in the United States...shall, solely by reason of...handicap, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

Providing transportation services to persons with disabilities was obviously a challenge. Most transit systems responded to the requirement for accessible transportation by creating separate systems to address the needs of this relatively small segment of the population. These separate systems were eventually called paratransit services. They were generally provided as a demand responsive, door-to-door service using small buses or vans. Eligibility for these services was fairly simple–use of a wheelchair or the possession of some other obvious disability were qualifying conditions. In other words, the presence of any disability authorized the use of paratransit services–thus introducing the idea that disability and paratransit were nearly synonymous terms.

During the late 1970s and the 1980s, the United States Department of Transportation (U.S. DOT) introduced several versions of regulations designed to enforce the requirements of Section 504. Although the U.S. DOT only called for either full accessibility or paratransit options, transit providers (led by the American Public Transit Association) fought and prevailed against complete implementation of U.S. DOT regulations.

THE AMERICANS WITH DISABILITIES ACT

In 1990, after years of frustration and controversy, the Americans with Disabilities Act (ADA) became law. The ADA extends civil rights similar to those available on the basis of race, color, national origin, sex and religion through the Civil Rights Act of 1964 to people with disabilities. It prohibits discrimination on the basis of disability in

employment, services rendered by state and local governments, places of public accommodation, **transportation**, and telecommunications services.

Separate, even if equal, services were no longer acceptable. Transit operators no longer had the option of full accessibility or a paratransit option–ADA requires a comprehensive, accessible fixed-route system and complementary paratransit services.

In part, ADA requires accessible fixed route buses, accessible bus stops, location announcements, personnel training, a written ADA plan, and complementary paratransit service.

THE ADA AND TRANSPORTATION: REQUIREMENTS, COSTS, AND ISSUES

REQUIREMENTS

Fixed-Route Services

The ADA stipulates that each person with a disability has an equal opportunity to use transportation services available to the general public if the individual is capable of using the service. What does this mean?

- All fixed route buses must be accessible;
- Bus stops and transit facilities must be accessible;
- Transit systems must provide audible location announcements for transfer points, major destinations and requested destinations;
- Transit systems must provide personnel training (awareness and sensitivity); and
- Transit systems must provide a written ADA compliance plan annually to the Federal Transit Administration (FTA).

The goal, of course, is that persons with disabilities have access to all fixed route services offered to the general public. Even after the transit agency does everything required, they must also provide comparable, complementary services to individuals who cannot use fixed-route systems.

ADA Paratransit Services

The ADA requires transportation organizations to provide paratransit or other special service to persons with disabilities as a complement to fixed route service. This must be available for individuals who are unable to use the public transportation routes available to the general public. This service may be operated by the transit agency or contracted out to private companies. However the service is provided, it must meet ADA requirements, which means:

- It must be operate at times comparable to mainstream service; and
- To the extent practicable, it must have comparable response and travel times to mainstream service.

Paratransit must be comparable and complementary to comply with the criteria of the ADA regulations. The ADA calls the service comparable if it provides a similar level of service that is available during the same days and hours of operation as fixed route service. The ADA calls it complementary because it provides a “safety net” for those persons who cannot use the regular fixed route service.
The ADA also requires that paratransit:

- Provide service 3/4 mile on either side of the fixed route;
- Provide next day service;

- Operate by reservation, and require an application and eligibility process; and
- Require an application and eligibility process.

ADA Paratransit Eligibility and Certification

The ADA does not give a comprehensive list of qualifying disabilities. It does say that paratransit must be available for those who fall into any of the following three categories:

1. Persons with a physical or mental impairment who cannot board, ride, or disembark from an accessible fixed route vehicle without assistance.
2. Persons who can use an accessible vehicle, but want to travel where there is no accessible vehicle available.
3. Persons who cannot travel to or from a bus stop or transit facility.

The ADA requires fixed route operators to have a certification process to determine paratransit eligibility. The certification process includes:

- Applications (created by the agency) and information in accessible format;
- A 21-day time limit for processing of the applications by the agency;
- Written notice of determination of eligibility;
- An appeals process;
- An identification card issued by the transit agency; and
- A recommendation for re-certification every 1-3 years.

COSTS

Paratransit trips are expensive-sometimes up to 10 times the cost of a fixed route trip. ACCESS Services in Los Angeles reports the average cost per trip is $24. Pierce Transit in Washington averages $23 per trip for traditional paratransit services (Piras). In Indiana, a new "Open Door" paratransit program costs approximately $18 per trip (PT May 2001). Because transit operators are allowed to charge no more than twice the regular fixed route fare and riders usually pay less than $2 per trip, the fiduciary impact on the transit provider is enormous.

Drafters of the statutes and regulations anticipated the financial impact of compliance with ADA standards. A regulatory analysis that "assumed that transit systems would adopt strict eligibility, operate with high efficiency and attempt to meet all of the eligible passenger demand" concluded that large systems could be expected to pay up to 10% of their operating budgets for paratransit, while smaller systems might spend 20%-30% of their annual operating budget. Paratransit costs are a significant part of each transit agency's budget. Quickly escalating costs for paratransit services have forced transit agencies to carefully consider the distinction between what the ADA requires and what

they provide. Services that go beyond the ADA are premium services that may compromise an agency's financial health if they are not managed responsibly (Piras).

ISSUES

Current issues related to ADA and Transportation include:

- Increasing Demand for Service: The number of persons requesting paratransit service since the passage of the ADA swells each year. The Project Action web site reported that over 1 million persons were certified eligible for paratransit services in 1996. This demand for service affects not only the budget, but the capacity of the system as well. With the ever- increasing demand for paratransit services, what can the provider do to assure its ability to meet the demand?

  ACCESS Services and other providers have adopted strict eligibility procedures. Although ACCESS denies eligibility for 25 percent of all applicants and restricts the eligibility of another 35 percent, ridership still increased 1600 percent from 1993-2000 (Piras).

- Capacity Constraints: The latest court decisions confirm that transit agencies must provide 100 percent of the trips requested by eligible riders. Robert Ashby, Assistant General Counsel with the U.S. DOT recently blasted transit agencies for what he called "systematic capacity constraints." He said that public agencies are failing to meet the growing need for paratransit. Rather than denying rides due to inadequate parataransit fleets, Ashby said, agencies should tighten eligibility requirement (ADA Compliance Guide June 2001).

- Eligibility Determinations are Inconsistent: Eligibility for paratransit services is loosely granted in some areas while it is strictly controlled in others. Although the ADA provides three general categories for determining eligibility, what seems like it should be a uniform certification process varies widely from one agency to another. This leads to frustration for everyone involved. Transit providers struggle to meet the ADA requirements and please transit users, while some users feel confused and discriminated against because of the variations in eligibility decisions from one agency to another.

- Requirements for professional assessment and verification of disabilities vary also. In the San Francisco area, the Metropolitan Planning Organization (MPO) established a nine-county regional eligibility process to decrease the complexity and subjectivity of individual transit system procedures. The method used is relatively liberal, requiring a "self-certification, with professional verification as needed." Even with this approach, a board member from AC Transit writes, "the region has a consistent form, with inconsistent implementation" (Piras).

- Paratransit Services are Inconsistent: Not all paratransit service is ADA complementary paratransit service. Even with ADA complementary paratransit,

the services provided vary. In addition to the inconsistency in eligibility requirements, actual service delivery may differ. The paratransit service may be curb-to-curb or door-to door. It may allow reservations up to 14 days in advance or it may allow a reservation only one day in advance. Many operators provide services that clearly exceed the requirements of the ADA, while others strictly limit the ADA paratransit services they provide. Furthermore, transit operators report inconsistent policies and enforcement of penalties for late cancellations and "no-shows."

- Paratransit Services Conflict with the Primary Intent of ADA: Robert Ashby, Assistant General Counsel U.S. DOT, acknowledged "paratransit is at odds with the ADA's emphasis on mainstreaming persons with disabilities," but said the service is "necessary to ensure that equivalent public transportation is available to those with severe disabilities that prevent them from using accessible bus and subway systems." Paratransit was never intended to be the preferred method of transportation for persons with disabilities. The primary goal of the ADA is to protect the rights of all passengers by making fixed route service accessible to as many as possible.

- Paratransit is NOT the Best Option: Because many view paratransit as a premium service, the number of requests for paratransit eligibility keeps climbing. With the cost to riders at less than $2.00 per trip, many consider the service as a personal, low-cost taxi service. Although paratransit does appear to offer some conveniences, after close examination, in most cases it is really not the best option.

- With the need for reservations at least one day in advance, paratransit actually compromises the spontaneity and flexibility of travelers. Since paratransit is a shared ride alternative, the ADA allows transit providers to schedule trips and pick up passengers within "windows" of time that can vary by up to an hour. Passengers must be ready up to 20 minutes earlier than their scheduled pick up time and may not be picked up until 20 minutes after, thus making it difficult to guarantee actual arrival or departure times at appointments or events.

ADA AND TRANSPORTATION: THE SAN JOAQUIN STORY

BACKGROUND

I started my new role as the Assistant General Manager at San Joaquin Regional Transit District (SJRTD) on January 2, 2001. On my first day at SJRTD, the District received a flyer announcing a public forum being held to discuss community concerns related to transportation issues for persons with disabilities. The flyer stated that federal, state, and local elected officials and federal ADA representatives would be present at the forum.

On Wednesday, January 10, 2001, the Mcfall Senior Service Center hosted the public forum titled, "Transportation Issues for Persons with Disabilities." District staff attended. Persons with disabilities, various social service agencies, representatives from state and federal legislators, and ADA federal representatives were also present at this forum. For nearly two hours, community residents (primarily persons with disabilities and social service caseworkers) expressed their frustrations with the transportation services provided and the transit agency. Before the meeting ended, local officials assured attendees that things would change.

The District received a transcript of the forum on January 24, 2001, and was asked to provide responses to community leaders within 45 days. Staff worked together to develop the responses that will be found in later sections of this report.

DISTRICT ACTIONS

Because the comments from the community were general in nature, the responses to the public comments were also necessarily general in nature. This was in contrast to the method SJRTD management prefers for effective response to customer comments. Through the District's "How Are We Doing?" program, SJRTD encourages customers to provide specific information (date, time, route, bus number, operator description, etc.) about incidents as soon as possible, because specific, timely information facilitates effective, timely resolutions.

During the public forum, it was apparent that the community was unhappy and frustrated. It was less apparent that the District was equally frustrated. Besides the little used "How Are We Doing?" program, the District regularly, unsuccessfully solicited public comments at a variety of meetings–unmet transit needs, monthly board meetings, and monthly Access Advisory Committee (AAC) meetings. Following the public forum, the District's General Manager repeatedly asked, "How can we fix things if we don't know they are not working?"

In an effort to understand and address the concerns of local agencies and citizens on the subject of transportation services for the disabled, District staff conducted research, updated internal procedures, and disseminated information to the community.

Research—District staff reviewed policies and procedures used by several other ADA paratransit systems, including Sacramento Paratransit Inc., East Bay Paratransit, and Access Services in Los Angeles. Additionally, staff reviewed training materials used in a

presentation by the Transportation Research Board titled, "Developing and Disseminating Creative Paratransit Operations Ideas." The goal of this research was to examine methods used by others in their delivery of transportation services for the disabled community.

Internal Procedures—Based on a review of internal procedures and a realization that the systems in place needed revision, the District's organizational structure was revised to place temporary responsibility for the District's ADA Compliance at the executive level under the authority of the Assistant General Manager.

Staff also examined internal procedures related to the customer comment process. Responsibility for oversight of this process also was elevated to the executive level, with the Assistant General Manager reviewing each customer report on a daily basis, and then meeting with senior staff members on a weekly basis to confirm satisfactory resolution of all customer concerns.

Information-Information and questions presented at the forum demonstrated a need for increased understanding by all involved (staff, passengers, caseworkers, local officials, and the general public) of the ADA and the District's service programs. With that in mind, SJRTD staff developed a presentation for use at workshops and other meetings to disseminate important information to the community. As a part of this process, SJRTD created a resource binder for distribution to social service agencies that includes the following sections:

1. General information material
    - Acknowledgement of all passengers' rights to accessible transportation services and SJRTD's commitment to provide these services;
    - Copies of SJRTD's ADA Eligibility Application and Standing Rides request forms;
    - Updated user's guides for Dial-A-Ride (DAR) passengers, which include answers to commonly asked questions, information about services, and important phone numbers; and
    - Magnets (suitable for use on refrigerators and/or office furniture) with the DAR reservation, cancellation, and customer comments phone numbers.
2. A printed copy of information available on SJRTD'S Website
3. Customer Comments Program Infomation
    - A flyer encouraging use of the "How Are We Doing?" brochure; and
    - A copy of "How Are We Doing?"
4. SJRTD Workshop PowerPoint Presentation-"Americans with Disabilities Act and District's Programs and Policies."

In an effort to forge effective partnerships with the social service agencies represented at the public forum, the General Manager and Assistant General Manager began a series of

meetings with the Executive Directors of local social service agencies. The purpose of the meetings was to open a dialogue and encourage participation in SJRTD's Access Advisory Committee and ongoing communication with the District.

On Thursday, February 8, 2001 District staff conducted a workshop at the Stockton Memorial Civic Auditorium. Representatives from 25 local agencies were invited to attend. Others in attendance included members of SJRTD's Access Advisory Committee and representatives from ATU Local 276. Staff gave a presentation on SJRTD's Dial-A-Ride and Fixed Route services. After the presentation, discussion was encouraged and the response was outstanding. The topics of discussion varied from Dial-A-Ride service related issues to fixed route questions and comments. Overall the workshop was a success and the District was invited to repeat the presentation to several other groups. Follow-up presentations were equally well-received.

On Thursday March 8, 2001, the Stockton City/County/Transit Liaison Committee met. The agenda included a required report on the "Transportation Issues for Persons with Disabilities" Forum and the District's much awaited responses to issues raised at the transportation forum. The mayor and vice-mayor were present, along with several County Board Supervisors, District board members, legal counsel, and staff. District staff gave a presentation on the District's report and a follow-up action plan. The Committee reviewed and discussed the report. The committee's comments and response to the report were favorable. After the meeting, the mayor sent a letter commending the District for its response to the community's concerns and reminding the District that he expected complete implementation of the proposed action plan.

DISTRICT RESPONSES

For the City/County/Transit Liaison Committee Meeting, the District's responses were incorporated into a binder, which was presented to community leaders and other interested parties and agencies. It included:

1. Introduction–This section provided information about the District's activities and programs related to transportation services for persons with disabilities.

- Background
- Activities
- Staff research
- Internal procedures updated
- Outreach efforts
- New user materials
- Workshop
- Social Service Agency meetings
- SJRTD's services for passengers with disabilities
- Fixed route service
- ADA Service Programs

2. Refined Transcript - this section contained a refined transcript from the forum. Staff reviewed the transcript received on January 24, 2001, and developed a refined transcript that italicized all community issues presented at the forum.

The second part of this section contained a 10-page table titled "Transcript Issue Categories." The italicized portions of the refined transcript were extracted and placed into this table. Each issue was organized into one of six primary categories, as follows: Scheduling, Service, Customer Service, Maintenance, ADA Certification, and Safety.

EXAMPLE:

Page Number	Community Issues	Category of Issues
Page 8	"…I get to my destination too late."	Scheduling–DAR arrives early/late for pick-up

1. District Response/Action Plan - This section contained a six-page table, one page for each primary category identified. Below each category, subcategories were listed. The table included District observations and proposed action plan items.

   EXAMPLE:

Categories of Issues	Observations	Action Plan
SERVICE	SMA ADA DAR is a Complementary ADA Paratransit service. It serves Only the area served by the Stockton Metropolitan Area fixed fixed route service.	Peak SMA/ADA DAR Revenue hours will be increased 15% effective 4/01/2001.
Areas served– SMA and Rural Areas		
Companions Five-minute wait Fixed route wheelchair usage	County Area Transit serves those rural areas outside of Stockton. The rural transit service program provides many services; one is to the elderly and disabled through the E & D DAR service. The rural ADA DAR service provided by the countywide GP DAR Service program.	New User's guides state the policy for companions. These will be distributed to all DAR passengers by 4/30/2001.

Action Plan Summary–The last section contains an action plan schedule and check-off sheet.

Action Plan Summary	Target Completion Date	Actual Completion Date
Elevate ADA compliance and customer comment Process oversight to the executive level under the Assistant General Manager	12/22/2000	12/22/2000
Increase the use of route checkers 12/11/2000	1/01/2001	
Install a reservation and dispatch voice recording system as Part of DAR transit operation	2/28/2001	2/19/2001
Streamline the complaint resolution process so all complaints will be investigated within 72 hours of receipt.	2/28/2001	2/21/2001
Install "How Are We Doing?" brochures on all revenue Vehicles.	2/28/2001	2/27/2001
Reinforce district policy with all Laidlaw employees that an operator may not leave a pickup location once visual contact is made with the passenger.	3/16/2001	3/8/2001
Increase peak SMA ADA DAR revenue hours 15%	4/1/2001	4/1/2001
Establish program to distribute free ride coupons to DAR Passengers, if DAR arrives outside of window, the delay is not beyond the control of Laidlaw, and the incident is reported and confirmed through the Customer Comment Process.	4/30/2001	4/30/2001
Notify wheelchair passengers of the availability of decals for use to identify securement locations on their wheelchairs	4/30/2001	4/30/2001
Monitor recordings for quality control during the first 60 days	4/30/2001	4/30/2001
Monitor daily schedules as they relate to customer service and operational efficiency.	4/30/2001	4/30/2001
Distribute new user's guides and magnets to all DAR passengers	4/30/2001	
Establish an emergency response procedure for DAR passengers to assure that no passenger is ever stranded as part of their return trip.	4/30/2001	4/30/2001
Complete development and distribution of a passenger code of conduct	4/30/2001	?

Conduct a series of refresher training workshops for existing operators.	5/31/2001	4/30/2001
Invite representatives from social services agencies to view the operator sensitivity program.	5/31/2001	5/31/2001
Monitor lift and ramp performance over the next 90 days to ensure good customer service is being performed.	5/31/2001	5/31/2001
Establish a subcommittee of the District's Access Advisory Committee and staff to review the application and certification procedures of other agencies. The subcommittee will evaluate: • the application process • the medical evaluation process • the re-certification process • the appeals process •the composition of the certification/re-certification board • develop a short form for re-certification of ADA DAR passengers with permanent disabilities. The subcommittee will meet and make recommendations to the district AAC.	6/30/2001	6/1/2001

IMPLEMENTATION OF THE ACTION PLAN

The action plan items were completed, as promised. Part of the action plan included establishing a subcommittee of the District's Access Advisory Committee and staff to review the application and certification procedures of other agencies. The subcommittee was selected and included some of the most outspoken community advocates. They evaluated:

- The application process;
- The medical evaluation process;
- The recertification process;
- The appeals process;
- The composition of the certification/re-certification board; and
- Developing a short form for re-certification of ADA DAR passengers with permanent disabilities.

The subcommittee reviewed the application and certification procedures of other transit agencies. They discussed the SJRTD application form and process, the medical evaluation requirements, the re-certification process, the appeals process, and the

composition of the certification/re-certification board. After this review and discussion, the subcommittee concluded that the District's procedures were in fact comparable to other transit agencies and appropriate for ADA complementary paratransit services. The group made only modest recommendations for improvement to the full AAC at the August 2001 meeting.

Through this review process, District staff and the subcommittee discovered that other groups, including the Bay Area Metropolitan Transit Commission (MTC), were considering exactly the same issues the subcommittee reviewed. A recent MTC RFP sought proposals for "Review and Evaluation of the Regional Paratransit Eligibility Program." The project description stated, "During the recently completed process to revise the ADA paratransit form, staff from the region's transit operators and MTC… concluded that the regional ADA paratransit eligibility program needs further improvement." Task two of the scope of work required the consultant to hold a workshop to discuss "different methods—their advantages and disadvantages, costs and benefits, etc.—used in the Bay Area to determine whether a person is eligible to use ADA paratransit service." District staff participated in that workshop so they could monitor the findings and recommendations of this project.

PROJECT ACTION and SJRTD—The Story Continues

Barbara Horton, an Independent Living Specialist for the San Joaquin Independent Living Center, was one of the coordinators and moderators of the original public transportation forum. She remained involved with the District's implementation of the action plan–meeting with staff members and attending AAC meetings. In March of 2001, Ms. Horton approached the District and asked for a letter of recommendation to attend an Easter Seals Project ACTION training program. This letter of support was necessary to fulfill the application requirements. The Easter Seals program "ADA…The Bus Stops Here" was designed to create working relationships between transit systems and social service agencies, so they can work together to assist consumers in making transportation decisions that are consistent with the best use of public resources and their abilities. In providing this letter of support, the District made a commitment to assist Ms. Horton with future training and community outreach efforts.

In June of 2001, District staff met with Ms. Horton to discuss and review the training she received from Easter Seals Project ACTION. Ms. Horton was excited by what she learned about the ADA and its relationship to transportation issues. She acknowledged that her previous lack of information compromised her ability to understand the issues and help her clients achieve greater mobility. She discussed Project ACTION's efforts to encourage passengers with disabilities to use fixed route services when possible instead of paratransit services. Because it takes special training to transition passengers with disabilities to fixed route service, Ms. Horton planned two training sessions within the next six months. The District agreed to work closely with Ms. Horton to help inform passengers about the District's fixed route services.

Inspired and intrigued by what they had heard about "ADA…The Bus Stops Here," District staff contacted Project ACTION trainers to find out how to bring the consumer

education training program to the San Joaquin County. Bryna Helfer, the Project ACTION Director in Washington DC, heard of the interest in the program and agreed to make San Joaquin a pilot project site. Easter Seals Project ACTION (ESPA) and SJRTD offered a two-day consumer education trainer seminar in Stockton on August 23 and 24, 2001. Twenty-five motivated participants learned to deliver "ADA…The Bus Stops Here." These participants were eager to share what they had learned throughout the community. They made plans for ongoing mobility training sessions at the local community college and at various other locations.

In December 2001, District staff continued community outreach efforts by attending Project ACTION's first Mobility Planning Services Institute (MPSI) in Washington D.C. Ms. Joni Bauer, an Orientation and Mobility Specialist for the Community Center for the Blind, also attended as part of the San Joaquin community leadership team. Topics of discussion and training included: Building Successful Collaborations, Conducting Community Assessments, Paratransit Eligibility Awareness, and Environmental Barriers Analysis. There were 22 leadership teams from across the nation who participated in MPSI. The training the community team received was invaluable.The opportunity to connect and compare current trends in paratransit and fixed route services for persons with disabilities with regards to the ADA and its implementation were phenomenal.

The District's goals for 2002 include evaluating the information received and incorporating changes into current ADA practices, along with continuing outreach efforts into the community. The District forged alliances with many community advocates and agencies during 2001. Together they will work together to provide the best mobility services possible to all residents of San Joaquin County.

Easter Seals Project ACTION (Accessible Community Transportation in Our Nation) is a federally funded program designed to promote transportation accessibility for people with disabilities and to help transit providers comply with the Americans with Disabilities Act (ADA). Under a cooperative agreement with the Federal Transit Administration, Project ACTION staff work to promote cooperation between the disability community and transportation industry.

This consumer training is an education program designed for people with disabilities to inform them of their rights and responsibilities as outlined in the transportation provisions of the ADA. For most, it is the first level of introduction to fixed route transportation services in the community. Over the past five years, ESPA has made the training available to consumers through a cooperative partnership of local transit and disability service organizations. By all accounts, the program has been a huge success.

OBSERVATIONS AND RECOMMENDATIONS

The Theory of Entitlement
As fixed route bus fleets come into compliance with the ADA, there is no longer any justification for an expectation that all wheelchair users should be allowed to use paratransit services. Disability and paratransit are not synonymous terms.

Unfortunately, many passengers with disabilities (especially passengers with permanent disabilities) feel entitled to paratransit services. Social service agencies and consumer advocates fight for the rights of their clients, which they believe to be the entitlement to paratransit. These passengers and advocates do not understand the real value of the ADA, or that they may be doing themselves and their clients a disservice by insisting on paratransit services.

Paratransit is not the answer. It is not in place because it is more convenient–it is only a safety net. The reality is that access to mainline service is the real entitlement.

The Reality of Accessibility and Mobility
The ADA calls paratransit a safety net. Sacramento Regional Transit's riders' materials refer to that safety net, saying that paratransit is similar to the safety net used by a circus performer on a flying trapeze-it is only there "just in case." Continuing with the analogy, they point out that if the trapeze artist fell into a net full of people, the net would not work as well, if at all. So also, the safety net of paratransit does not work well for passengers with truly special needs if it is full of people who could use accessible, fixed route service.

Paratransit was never intended as the first or best choice, because it is not the first or best option. Riders must understand that fixed route or mainline transit should always be the first choice because it offers far greater accessibility and mobility.

- It is more convenient and provides greater flexibility in trip planning.
- It is less expensive than paratransit.
- It is accessible to passengers with disabilities.
- It is what the ADA is all about.

The Fear Factor
Fear of the unknown is common. This fear of the unknown may be intensified for passengers with disabilities. While learning to ride the bus might be a challenge for some passengers, it might be nearly impossible, without special training, for some persons with disabilities, especially potential passengers who are blind. Although the task of learning to ride the bus is daunting for her students, Joni Bauer, a trainer at the Community Center for the Blind in San Joaquin County, insists that in almost all cases, fixed route service is the best option them.

Sometimes parents and family members of persons with disabilities are the ones who experience the fear, and discourage their loved ones from using mainline transit services. Until everyone involved understands the limitations of paratransit and the advantages of mainline transportation services, the fear factor limits the mobility options of many persons with disabilities. Only through education and mobility training can the obstacle of the fear be removed.

RECOMMENDATIONS

Provide Information

First of all, persons with disabilities need information about all of the transportation options available under the ADA. A drafter of the ADA statute and subsequent regulations was quoted as stating, "People need to understand what the ADA actually says, not what they want it to say." This quote was used to emphasize, "the purpose of the statute is civil rights and non-discrimination, not preferential treatment or 'entitlements'" (Piras).

Only with a complete understanding of the ADA and the local transportation options available can those with disabilities achieve the greatest level of independence through enhanced mobility. As mentioned earlier, Easter Seals Project ACTION offers a consumer education program called "ADA…The Bus Stops Here." It is designed to "help persons with disabilities learn about their rights and responsibilities as identified in the ADA, and gain greater familiarization with accessible fixed route transit buses and those who operate them." The follow-up program offered though Project ACTION's Mobility Planning Services Institute helps leadership teams (consisting of representatives from transit agencies, disability advocacy organizations, and disability service organizations) develop implementation strategies for building coalitions and administering comprehensive accessible transportation services in their communities. Project ACTION provides "ongoing technical assistance and support to communities and leadership teams before, during, and after the MPS Institute." (Project ACTION)

Social service agencies and community leaders do not need to understand or even know all about the ADA and transportation. They do need to know enough about the subject to work productively with local transportation agencies to best serve the transportation needs of the entire community, including the general public, persons with disabilities, social service facilities, and health care programs. A working knowledge of the ADA and transportation will facilitate the discussions necessary to resolve challenges and achieve consensus on local issues.

Provide Mobility Training

Social service or transit agencies or both should offer "how-to" or "hands on" training. It is important to offer guidance for people with a variety of disabilities. Training can eliminate the fear associated with fixed route ridership by answering questions and

providing information about the unknown. Some agencies provide one-on-one orientation and mobility training, while others recommend a travel buddy arrangement.

Mobility or travel training can help people with disabilities shift from dependence on paratransit to the independence available through fixed route usage. "In communities across the nation, disabled individuals have been isolated from societal opportunities that others take for granted, simply because transportation is unavailable to them. The ADA has altered this circumstance. The availability of travel training programs has become the critical ingredient to empower individuals with disabilities to use newly accessible mass transit services" (Moakley).

It Takes A Community—Use It

The ADA and U.S. DOT regulations make it clear that transit agencies have the responsibility for determining who needs and is eligible for the paratransit services provided by their agency. As mentioned earlier, transit agencies are more experienced in the delivery of transportation services, while service agencies are more experienced with the needs and disabilities of their clients. Social and human service staff members are usually better able to perform the functional ability assessments required for paratransit eligibility certification—perhaps even better than the medical providers often used for such assessments. If the agencies want to assist their clients and the transit agency with the decision-making, they must understand the intent of the ADA and the regulations that govern the transit provider.

Ideally, community stakeholders and the local transit provider will form a partnership to guarantee that every person with a transportation need will find the resources necessary to make the best use of locally available transportation services. For the passenger, this should include whatever assistance is necessary with the application and certification process, along with referrals for travel or mobility training.

REPORT SUMMARY

Bryna Helfer, the Director of Easter Seals Project ACTION, has spent nearly 20 years working on a wide variety of program services for people with disabilities. She said recently:

> My years of experience have taught me that accessible transportation is the difference between a life of isolation and an active lifestyle. This has become more apparent over the past ten years since the Americans with Disabilities Act (ADA) has opened new doors for all individuals. While there may be greater possibilities for work, school, and community participation, transportation continues to be the vital link. Transportation can either be a help or a hindrance when it comes to being able to take advantage of these opportunities.

Transportation is the vital link-for individuals, businesses, and educational institutions-the community as a whole. Many opportunities exist for community collaboration for transportation services. In fact, the success of many programs critical to the well-being of any community (welfare-to-work, air quality, etc.) can be significantly increased when a convenient, accessible transit system is in place. Because transportation is so vital to the

success of individuals and the community, it is essential that all of the stakeholders participate in the dialogue about viable transportation options. When everyone involved or affected has a basic understanding of this multifaceted issue, a giant step on the road to meaningful dialogue will have been taken.

ABBREVIATIONS AND ACRONYMS

ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ATU	Amalgamated Transit Union
FTA	Federal Transit Administration
Project Action	Accessible Community Transportation in Our Nation
MPO	Metropolitan Planning Organization
MPS	Mobility Planning Service
SJRTD	San Joaquin Regional Transit District
SMA DAR and CAT E & D	Stockton Metropolitan Area Dial-A-Ride and County Area Transit Elderly and Disabled
UMT Act	Urban Mass Transit Act
U.S. DOT	United States Department of Transportation

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ABOUT THE AUTHOR

On November 6, 2001, the San Joaquin Regional Transit District (SJRTD) Board of Directors appointed Donna Kelsay as the new General Manager/CEO of the agency. This decision followed the sudden death of Jerald L. Hughes, General Manager/CEO, who passed away in September.

Ms. Kelsay, formerly the Assistant General Manager, has over 15 years of supervisory and management experience in the transit industry. She came to SJRTD from the Sacramento Regional Transit District (RT), where she spent five years as part of the light rail start up team. While at RT, she also worked in the Operations Support, Engineering and Construction, and Facilities Management Departments where her responsibilities included capital facilities management, contract administration, and project management. Her last assignment included management of the system's 31 light rail stations.

Ms. Kelsay graduated summa cum laude from California State University Sacramento, with a Bachelor's Degree in Education. She completed a construction management program at the University of California, Davis in 1998,and has completed all formal course work toward a Master of Science Degree in Transportation Management at the Mineta Institute of Transportation Studies at San José State University. In 2001, Ms. Kelsay was recognized as one of the nation's top twenty graduate students by the Eno Transportation Foundation and was designated as an Eno Fellow. Ms. Kelsay is also a graduate of the Leadership APTA Program.

SYSTEM MANAGEMENT IN THE BAY AREA: IMPROVING THE CONNECTION BETWEEN CALTRANS AND THE MTC

Judy Li

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Additionally, I am grateful to those at Caltrans who have endured my inquiries over the past two years, and who support the continuing evolution of the service-oriented public sector.

EXECUTIVE SUMMARY

Traffic congestion in the San Francisco Bay Area consistently ranks as a top priority issue. It is projected that the Bay Area will receive an average of $4.4 billion in transportation funds annually for the next 20 years, with $1.3 billion toward maintaining and operating highways, streets, roads, and toll bridges. Yet adequate funding for improvements still seems elusive, leading to a circuitous route of blame.

Recent legislation has significantly influenced the roles and responsibilities of the various transportation agencies in the Bay Area. Senate Bill 45 granted control of 75 percent of the state transportation improvement funds (STIP) to the Metropolitan Transportation Commission (MTC) for regional improvements, leaving 25 percent for Caltrans to program for interregional improvements. Caltrans submits regular reports to the MTC on the financial status and project progress for its STIP projects. As funds must be used in the year they are programmed, Caltrans can be held directly accountable for project delays. With the passage of Proposition 35, contracting out may be a preferred option by the agencies to keep projects on track.

The role of Caltrans seems to change as new project management studies offer recommendations on how to improve. To be competitive for the 21st century, the core competency of Caltrans needs to be reexamined. Project management offers a private sector tool to improve project delivery, but adequate resources must be provided to ensure that the public sector has the same flexibility and accountability.

Determining transportation solutions for the Bay Area entails looking at regionwide issues and reaching consensus among a diverse constituency. A healthy relationship between Caltrans and the MTC is imperative to ensure common goals, in addition to maximizing the investment of the taxpayer dollar. More often than not though, Caltrans is viewed as a bureaucratic barrier. Meanwhile, the MTC is charging ahead to take full advantage of its increased responsibilities.

Numerous recommendations have been developed in the past, and some still merit action. Two key issues seem to be seeking consensus on regionwide mobility problems, and developing resources to deliver those solutions. In the Bay Area, this entails resolving the politics involved in choosing transportation projects, and fixing the bureaucratic impediments to effective public sector service.
Some recommendations include:

Redefine Project Teams

Project delivery remains a key factor for Caltrans to build respect from other agencies and the public. The project team is therefore essential to success, and may need structural changes to best fit the project management orientation. With contracting out now an approved option, the role of the public sector employee versus the private sector employee should be clarified. Possibilities include managed competition and public-private partnerships.

Reexamine role of assisting public transportation

As transportation needs continue to focus more on transit, maintenance, and operations, Caltrans should clearly define its roles and responsibilities as a state agency.

Exchange staff assignments

Rotating staff assignments between MTC and Caltrans would be a good exercise in building more understanding of each other's operations, and may lead to suggestions on how to improve the partnership.

Define regionwide goals and responsibilities for Bay Area

More emphasis should be placed on trying to solve transportation needs on a global basis, and then seeking and prioritizing available funds. Efforts to address and involve land use planning, environmental concerns, and social issues should continue.

The Bay Area Partnership represents a collaborative partnership of the region's transportation stakeholders, and may hold the key toward improving system management in the region.

CHAPTER 1: INTRODUCTION AND BACKGROUND

California comprises 13 percent of the nation's economy, and recently attained status as the world's fifth-largest economy. Yet this honor may be short-lived. Population increased over 18 percent between 1988 and 1998. Meanwhile, state highway capacity increased only one percent over the same time period, while vehicle miles traveled grew 21 percent overall, and 30 percent in urban areas. The inability to keep up with travel demand leads inevitably to congestion, and subsequent costs from delay, fuel, and excess emissions. In 1998, Caltrans estimated that congestion on urban highways costs $7.8 million a day, or a prodigious $2.8 billion a year in wasted time and excess fuel, and 418 additional tons of emissions per day (LAO, CA Travels, 2000). To ensure a continuing reign as a top economic power, California needs to effectively address its mobility issues.

San Francisco Bay Area

Within California, the San Francisco Bay Area represents a significant portion of the state economy. The Bay Area offers 3.5 million, or 22 percent, of jobs statewide and can claim rights as the highest cost region–the median home price in mid-2000 was $460,000. Over 6 million people in 100 cities live in the 7,000 square mile area. This area is divided into nine counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. San Francisco is the most densely populated county in the state, with over 17,000 people per square mile.

Perhaps it should come as no surprise that traffic congestion consistently remains a top priority issues in the Bay Area. Per the Texas Transportation Institute's 2001 Urban Mobility Study, the San Francisco-Oakland commute ranked second as worst in the nation, while San Jose tied for 15th. SF-Oakland motorists spent about 42 hours in traffic jams in 1999, at a cost of $3 billion dollars a year. 60 percent of Bay Area freeway miles are considered severely or extremely congested. On average, it takes 77 percent more time to reach work during the commute.

How can this mess be solved? The 25-year spending plan for the region focuses on more transit instead of just road building, a priority supported by many local groups as the right way to address congestion. On the other hand, the California Alliance for Jobs claims that only 6 percent of commuters use transit, so using 63 percent of funding for transit is misdirected (Gathright, 2001). Instead, every dollar spent on highway construction nets $5.70 in economic benefits, stemming from shorter trips, safer highway, and lower vehicle operating costs (Vorderbrueggen, 2001). Of course, the group may have a vested interest in sustaining highway construction, as it represents contractors and construction workers.

Even with a long-term plan, sufficient funding is required to execute solutions. In 1999-2000, state transportation revenues totaled $15.5 billion: $4.5 billion in State funds from the state gas tax, $3.3 billion in Federal funds from the Highway Trust Fund (federal gas tax), and $7.5 billion from local sales tax revenues. The Bay Area is forecasted to receive an average of $4.4 billion in transportation funds annually in the next 20 years, with $1.3 billion toward maintaining and operating highways, streets, roads, and toll bridges. Yet

adequate funding for improvements still seems elusive, leading to a circuitous route of blame.

Transportation players

Recent legislation has significantly influenced the roles and responsibilities of the various transportation agencies in the Bay Area. More authority was granted to the region for deciding upon certain transportation projects, but consultation and coordination with the state is still required. This partnership may not be apparent from the *Citizens' Guide to the Metropolitan Transportation Commission* (2000):

> **Caltrans** *California Department of Transportation*. The state agency that operates California's highway system.
>
> **MTC** *Metropolitan Transportation Commission.* The transportation planning, financing and coordinating agency for the nine counties that touch San Francisco Bay.

The MTC definition for Caltrans seems indicative of the underlying challenges between the two agencies. Over two decades have passed since Caltrans changed its name from the Division of Highways to the Department of Transportation to reflect its broader mission. Besides, the legislature defines Caltrans' highway responsibilities to include "planning, design, construction, maintenance, *and* operation" of the state highway system. So, in spite of all the partnerships and required collaboration, the mutual respect of colleagues appears lacking between these two agencies.

A healthy relationship is imperative to ensure common goals, and to maximize the investment of the taxpayer dollar. More often than not, though, Caltrans is viewed as an incompetent bureaucratic mess. Meanwhile, the MTC is charging ahead to take full advantage of its increased responsibilities.

What should be the role of Caltrans? How can Caltrans change its project management techniqes to be competitive for the 21st century? Over the past decade and a half, Caltrans has restructured itself to implement an official project management program and monitor project costs and progress. Caltrans is supposedly unique in retaining a large engineering staff. With the recent passage of Proposition 35, contracting out is now an allowable tool to help agencies keep projects on track.

This report will investigate how the role of Caltrans may be reshaped to help the Bay Area best meet its transportation needs. It will review the legislative environment facing transportation in the Bay Area, discuss organizational structure and project management at Caltrans, and explore the Caltrans-MTC relationship. The purpose of the report is to provide background information for the public and the employees of each agency. By understanding each other more, perhaps a collaborative model of participation can occur.

At that point, perhaps the Bay Area Partnership can help lead the way toward taking SF-Oakland off the hot list of worst commutes.

Bay Area Partnership. Often referred to as "The Partnership," this is a confederation of the top staff of various transportation agencies in the region (MTC, public transit operators, county congestion management agencies (CMAs), city and county public works departments, ports, Caltrans, U.S. Department of Transportation), as well as environmental protection agencies. The Partnership works by consensus to improve the overall efficiency and operation of the Bay Area's transportation network, including developing strategies for financing transportation improvements.

CHAPTER 2: LEGISLATIVE CONTEXT

Numerous legislation exists with respect to transportation. The landmark federal transportation bill ISTEA (Intermodal Surface Transportation Efficiency Act of 1991) started the shift towards flexibility of funds, emphasis on multimodalism, and devolution of power to state and local entities. TEA-21 (Transportation Equity Act for the 21st Century (1998)) continues and expands upon the achievements of ISTEA, while also providing substantial funding. California will receive over $20 billion to spend from 1998-2004, representing a 40 percent increase over prior levels.

In California, specific legislation has also affected transportation funding. The 1990 Ballot Measures–Prop 108 (Passenger Rail and Clean Air Bond Act), Prop 111 (Traffic Congestion Relief and Spending Limitation Act of 1990), and Prop 116 (Clean Air and Transportation Improvement Act)–proposed a multimodal approach, and delineated a "Blueprint for Transportation" for expenditure of funds. Allowance of permanent and temporary sales tax measures by counties and transit district have yielded considerable funding for improvements. Recently, the Transportation Congestion Relief Act (TCRA) of 2000 added a cash inflow of $1.1 billion in each of the next six years to help develop effective 21st century transportation infrastructure. The Bay Area will receive $1.6 billion total (33 percent), the second largest share in the state. 8 of the funds are allocated for rail-related projects, with only 11% for highway purposes. However, the TCRA only covers 26 percent of total project costs in the Bay Area, leaving the balance to be determined by the local agencies. Furthermore, with the energy crisis flaring in 2001, Governor Gray Davis proposed temporarily diverting almost a quarter of the TCRA funds to cover the state shortfall.

Other legislation especially influences the relationship between Caltrans and the MTC. These include Senate Bill 45, Proposition 35, Assembly Bill 1012, and various pending legislation.

SENATE BILL 45

Effective January 1, 1998, Senate Bill 45 (Chapter 622) significantly changed the transportation planning and programming process in California. The bill was coauthored by Senator Quentin L. Kopp and Assembly Member Lou Papan as a way to address criticisms at the current financing system for STIP. Ostensibly a way to simplify the funding process, SB45 also gives considerable more responsibility to the locals. Essentially, SB45 accomplishes the following:

- Changes transportation funding process;
- Changes components of the regional and state transportation improvement programs; and
- Provides that Caltrans continues as the responsible agency for the state highway system (Senate Bill 45, 1997).

The State Transportation Improvement Program (STIP) was shortened from a seven-year program to a four-year program, and changed from a project delivery document to a resource management tool. STIP funds are now divided among two programs: 75 percent for the Regional Transportation Improvement Program (RTIP) and 25 percent for the Interregional Improvement Program (IIP). While coordination and consultation is expected from all involved agencies, the responsibility for programming the RTIP now lies with the Regional Transportation Planning Agencies (RPTA) and the county transportation commissions, while Caltrans takes on the IIP. The idea is to continue the devolution of power started from ISTEA and TEA-21; give more power to the regions that know better how to handle regional problems; and let the state focus on connectivity between regions.

SB45 also added processes aimed to improve accountability and project delivery. All projects require a Project Study Report (PSR) or MIS (Major Investment Study) before they can be programmed. This requirement has caused problems due to the long lead time sometimes required to gather sufficient information. All projects must also specify the allocation, expenditure and year for the following milestones: 1) permits and environmental studies; 2) plans, specifications, and estimates (PS&E); 3) right-of-way acquisition; and 4) construction. No allocation is allowed for right-of-way or construction until completion of environmental studies and the selection of a preferred alternative (PSR). In addition, funding for these two phases is contingent upon the sponsoring agency completing the environmental process and proceeding with these two phases within the new four-year period. This way, premature project approval and costly delays can be avoided.

SB45 clearly states that " [Caltrans] is responsible for the planning, design, construction, maintenance, and operation of the state highway system and SB45 is not intended to alter that responsibility." Caltrans asserts that it will continue its role as "system manager for the state's transportation system" (Caltrans, Transforming the STIP, 1998). The IIP specifically includes projects that improve state highways, the intercity passenger rail system, and the "interregional movement of people, vehicles, and goods." However, the RTIP includes all projects funded in whole or in part with regional funds. As the MTC is placing the majority of funds into transit, it may seem to qualify as the system manager for the regional transportation system.

Caltrans' goal is to make SB45 "succeed for the Department, our transportation partners and the citizens we serve" (Caltrans "Transforming the STIP," 1998). Part of this success lies with the STIP guidelines Caltrans is required by SB45 to develop, in conjunction with the CTC, regional agencies and local goverrnments. These guidelines are to include standards to ensure compliance with SB45 is understood by all in terms of project deliverability, identifying projects and components, and cost estimating. In addition, objective criteria for measuring system performance and cost-effectiveness of candidate projects are to be developed.

An analysis of SB45 prepared for the Senate Third Hearing raised the specter of an entitlement program. Transportation planning and programming in California has always followed a collaborative process with local, state, and federal interests since the 1970s. Transportation needs statewide are identified, and all parties jointly develop a planning process and necessary funding sources. By creating shares of funding for regional improvement projects, SB45 relegates the state to act as a bookkeeper of state and federal funds, thereby reducing its role to identify and approve funding for transportation projects. In addition, SB45 does not explicity prohibit contracting out of functions histrorically state performed, but does require Caltrans to perform all project development work previously contracted out by locals (Stevens 1997).

Proposition 35

Approved by voters in November 2000 by a 54.8 percent margin, Proposition 35 amends the State Constitution to allow contracting out for architectural and engineering services for all phases of public works projects. Tellingly, it is known as the "Fair Competition and Taxpayer Savings Act." Previously, contracting out was allowed on an exception basis for services of a temporary nature, unavailable within civil service, or of a highly specialized and technical nature.

The goal of Prop 35 is to speed project completion, and is estimated to save up to $2.5 billion dollars annually due to the flexibility it affords (California Voter's Guide, 2000). This purported savings is almost equivalent to the price of congestion in the Bay Area! CELSOC, the organization of consulting engineers, states that congestion-relieving projects are backlogged due to the shortage of engineers at Caltrans. A 10 percent vacancy rate continues, and besides, peak staffing levels are undesirable. Caltrans has a chronic inability to fill positions, due to the incomparable compensation when compared to the private sector and even other public agencies, especially considering the lack of cost of living adjustments (Walters 2001). On the other hand, PECG states no competitive bidding rules are included with the ballot, and will lead to corruption and secret contracts.

Fresno County supervisor Stan Osken perhaps echoes the thoughts of many regional entities when he stated that Prop 35 "ensures that control of Fresno County projects will be in our hands, and not in the hands of bureaucrats in Sacramento." He was referring to the delay in completion of Fresno's Freeway 180 (Clemings, 2000), but his remarks could probably be applicable statewide. The May 2001 budget revision for California expanded contracting out, shifting more civil service PY work to private, and bringing the total positions to nearly 1,700. Meanwhile, the state Senate budget also calculated a $300 million savings next year by eliminating 5,622 vacant state positions (Walters, 2001).

Assembly Bill 1012

Effective October 1999, Assembly Bill 1012 (Chapter 783) aims to streamline and accelerate project delivery at Caltrans. The Department of Finance projects another 20-25 percent increase in population using California's overburdened transportation system in the next 20 years. The State Highway Account has a cash balance greater than $1.8

billion as of 1/1/99, almost three times its 60-plus year average of less than $500 million. Proposition 2 overwhelmingly passed in November 2000 to stop future diversion of transportation funds for non-transportation purposes.

AB1012 accomplishes the following:

- Creates State Highway Account (SHA) Loan Program for local transportation agencies.
- Creates advisory Project Delivery Teams.
- Adds two-year advance project development element in STIP process.
- Develops sophisticated MIS (Management Information System) for Caltrans project monitoring and project delivery.
- Develops Caltrans Reimbursable Work Program.
- Establishes 3-yr time limit on use of federal transportation funds.

The loan program allows local agencies to borrow dollars for "shelf ready" projects when the SHA is greater than $500 million and can be repaid within 4 years. The advance PD element allows evironmental studies, preliminary and final engineering, and right-of-way work to advance. The Reimbursable Work program aims to expedite project delivery by providing increased Caltrans assistance to locals, so reimbursement dollars are continuously appropriated regardless of fiscal year. The "use it or lose it" feature allows reallocation of funds by CTC to prevent losing federal budegtary authority to other states. The project delivery teams are established by the Director of Transportation and expire in June 2003. The four teams established are in District 2 (Northern California), District 4 (San Francisco Bay Area), District 6 (Central Valley), and District 11 (Southern California). Each team is required at minimum to include the district director (team leader), executive director of the regional planning organization, and representative members from transit, PECG, cities, counties, trade unions, the private sector, and Federal Highway Administration (FHWA).

Pending Legislation

Senate Bill 924

Introduced in February 2001, Senate Bill 924 (Alpert) revises procedures for awarding contracts. It attempts to clarify Proposition 35 by defining a fair, competitive selection process for contracting out architectural and engineering services. Cost estimates of state services are to include salaries, benefits, space, equipment, material, and all overhead costs attributable to performing the work within the project delivery timeframe. This basis will provide a more reflective picture of true taxpayer costs to compare with private competitive bids. Besides just the cost, the time factor may be taken into consideration to ensure that the taxpayer gets the most value for the dollar.

Senate Bill 1102
Also introduced in February 2001, Senate Bill 1102 (Alarcon) authorizes regional and local government entities to develop and adopt procedures to contract out for architectural and engineering services. Basically, it supports Prop 35 in defining the extent of A&E services.

Other Pending Legislation
The Legislative Analyst's Office (LAO) recommends that the state conduct an ongoing transportation needs assessment by reporting every five years. To be able to solve the problem, first identify the scope of the problem. The STIP and State Highway Operation and Protection Program (SHOPP) provide no information about unfunded needs as they are fiscally constrained, while 20-year RTPs are not yet compiled to provide a statewide view of needs.

In the 2001-2002 legislative year, several bills are being considered. Assembly Bill 411 (Diaz) requires the CTC, in consultation with Caltrans and RPTAs, to prepare a statewide transportation needs assessment every five years. Assembly Bill 631 (Oropeza) also requires a comprehensive sstatewide transportation needs assessment every five years with specific info on unfunded transportation needs.

Assembly Bill 887 (Daucher) establishes a Transportation Entreprenurial Government Program as a two-year pilot project to be administered by Caltrans. It would 1) encourage cost-cutting by the department; 2) eliminate activities not central to the mission of the department as determined by each division within the department; and 3) encourage entrepreneurship. Complentary to this bill is Assembly Bill 889 (Daucher) to require Caltrans adopt and implement a program to contract out its services and equipment to other state agencies or local government entities. This contracting out would probably help the department focus on its "core competencies."

CHAPTER 3: PROJECT MANAGEMENT AT CALTRANS

Several project managment studies have been performed on Caltrans. Project management may officially have started at Caltrans in 1988, as a means to address nagging project delivery concerns. In the years following, strategies and plans on how to implement such a system were developed. Caltrans even underwent 17 organizational changes in the 12 years prior to 1994.

Consultant Studies

In 1993, Caltrans Director Van Loben Sels issued a charter to hold a peer review of the project management implementation plan. The group was comprised of Bechtel Corporation, the U.S. Corps of Engineers, and the U.S. Department of the Navy. Some of the findings still relevant today include:

- Lack of realistic goals and objectives linked to civil service constraints;
- Lack of communication, with specific roles and responsibilities not uniformly understood;
- Lack of consistent management support with different district agendas; and
- Lack of authority, with micromanagement by headquarters. (Bechtel, et. al., 1993).

The stated goals of project management were to have a single individual responsible for a project from conception to completion. Project delivery goals were clearly defined, and all project team members were focused on and held accountable for achieving project goals and objectives. At the time of the review, the Project Manager at Caltrans held more of a "coordinator" role, with inadequate authority and freedom to perform his or her role.

In 1994, SRI International evaluated project management in response to Senate Concurrent Resolution No. 72. The study found that Caltrans remains "rule-driven" rather than "product-driven" due to its long-standing bureaucratic culture. Changes would need to be made in order to "reinvent" the business and instill a sense of timeliness and cost-consciousness into the system. Criteria for change include:

- Enhanced efficiency: more work with same or reduced forces.
- Enhanced effectiveness: greater ability to get the job done.
- Strengthened leadership: policy-setting responsibilities.
- Accountability: reward/disciplinary procedures to motivate performance.
- Responsiveness to stakeholders: honor committments and enhance time consciousness (SRI, 1994).

Several recommendations have been implemented since the report. These include the ability to contract out, development of enhanced project management tools and performance measures, and capital support accountability. Action is in place to develop a Management Information System (MIS). Regionalizing of some functions including lab

work, personnel, payroll and accounting also sought to increase efficiency, but District 4 is starting to move some functions back to the district.

Many findings still remain applicable today. SRI concluded in 1994 that the Caltrans culture, not the organizational structure, was the culprit. No private sector management tools exist to make up for the ineffective reward/ disciplinary measures and lack of policy direction, flexibility, and adequate performance measures. More resources need to be devoted to planning and early development stages to avoid costly changes in later phases, especially in construction. Too often it seems that certain contract change orders could be avoided if more money was permitted to be spent on initial site investigations. In addition, the hybrid project delivery process resembles a factory process, with each function simultaneously working on several projects. As a result, several functional units become overly committed.

Competitiveness of salaries was also mentioned, in reference to salary classifications and cost-of-living adjustments. Employee recruitment, retention, and motivation are all negatively affected in both the San Francisco and Los Angeles districts, where the cost of living is higher than other parts of the state.
Perhaps it is time to follow the alternative action plan and execute a full "reengineering the corporation"–separating unessential services from policy functions and truly focusing on core competencies. This could include:

- Clearly define the role of Caltrans in project delivery in the statewide transportation plan.
- Determine the leadership role of Caltrans in mass transportation activities.
- Publicize the established Caltrans billing rate reflecting full cost recovery: it can either appease an uniformed public or encourage employees to work harder.

In response to the SRI Report, Caltrans developed a set of 12 performance measures. The following table shows tracking of nine measures.

Table 3-1. Caltrans Performance Measures 1995-1998

Description	**Target**	**95-96**	**96-97**	**97-98**
Capital Support	None	Info Only	Info Only	Info Only
Support/Capital	< 33%	34%	30%	37%
Quality	TBD	n/a	n/a	n/a
Project Delivery (#)	> 90%	96%	93%	89%
Project Delivery ($)	> 100%	118%	111%	117%
Days Worked/Allotted	< 110%	111%	116%	121%
Award$/Programmed$	< 100%	n/a	n/a	n/a
Prop Final Est$/Award $	< 100%	101%	101%	109.5%
Final Estimate$/PFE$	< 100%	103%	103%	118.5%

Source: State of California, Department of Transportation, *Capital Support Performance Measures.* February 1, 1998, November 1, 1998, and December 1, 1998.

In 1999-2000, Caltrans delivered 82 percent of Programmed STIP Projects (Project Delivery - #), and 86 percent of programmed funds (Project Delivery - $), below the target performance measure theshold of 90 percent and 100 percent respectively. SHOPP Projects fared better, with 96 percent of programmed projects and 93 percent of programmed funds delivered.

Three additional performance measures cover capital delivery and support costs and were not yet established for measurement. Capital delivery measures the success in delivering capital improvements equal in value to expected funds, while support costs compare the actual versus programmed support costs during project development and construction.

Support costs constitute a tricky issue, especially when comparing to contracting out. The establishment of billing rates in the public sector often neglect to include resources often taken for granted, leading to unfair comparisons with the private sector. In 1991, *Engineering News Record* cites Caltrans as having 44 percent engineering costs for projects, a high enough number to raise the taxpayer's ire. Private sector percentages average about 21 percent for overhead and profit. With this comparison, contracting out seems like the better deal.

Table 3-2 shows the historical timeline of support costs calculated at Caltrans. For preliminary planning, workload projections are sometimes needed before PSRs are completed. In 1999, the factor of 35 percent was applied to estimated project costs in urban areas (CTC, Inventory, 1999).

Table 3-2. Caltrans Capital Support as % Capital Outlay 1988-1998

	Prelim/Env	Design/ROW	Construction	Total
88-89	12%	20%	14%	**46%**
89-90	10%	20%	12%	**42%**
90-91	11%	19%	12%	**42%**
91-92	9%	21%	14%	**43%**
92-93	8%	24%	15%	**46%**
93-94	4%	17%	15%	**36%**
94-95	4%	19%	15%	**38%**
95-96	3%	19%	12%	**34%**
96-97	2%	16%	12%	**30%**
97-98	4%	17%	16%	**37%**

Source: State of California, Department of Transportation, *Capital Support Performance Measures.* November 1, 1998.

In 1996, a peer review of the Caltrans Workload Development was prepared by three consultants and the Arizona Department of Transportation. Again, this report served to assess project management at Caltrans, and also compare practices with those of the private sector. Major barriers to success echoed previous reports in identifying:

- Lack of flexible resources and tools available to the project manager;
- Significant culture change required from functional managers to determine resource needs by project and accept the leadership role of the project manager;
- Ingrained bureaucratic cultural resistance to the flattened organizational structure centered on project delivery by a project manager; and
- Micromanagement of individual projects by headquarters (Robert Bein et al, 1996.)

Several recommendations are still applicable today. As an example, change projects from being schedule-driven to resource-driven. The critical path often follows constrained resources, due to the inflexibility to obtain resources as needed. The hybrid project delivery process exacerbates this process. Overcommitted functional units then can often respond only to putting out fires.

Major differences between Caltrans and the private industry were summarized as well. The private sector is more experienced in cost control, by estimating project specfic budgets and monitoring the budget on a weekly basis. Project managers enjoy more empowerment to provide efficient project delivery and are held accountable for all aspects of the project. Incentives for project development efficiencies serve to motivate the project manager and project team. At Caltrans, the tools to monitor and track project data have been developed, but the empowerment and incentives are still lacking.

Caltrans' Vision

The *1999 Caltrans Project Management Handbook* represents the compounded efforts from over a decade. The vision is to "deliver transportation improvements that meet customer needs." The organization has shifted from a functional to a strong matrix, and roles and responsibilities are defined for managers. The project manager is the single focal contact point for the project sponsor. The functional manager provides the resources to deliver the project. Task managers produce specific elements for the work breakdown structure (WBS), and functional coordinators ensure skilled staff are available.

However, the project team is defined as "every person who works on a project," which seems to imply the strong matrix is a sham. The Project Development Team (PDT) is actually the interdisciplinary steering committee that coordinates and solicits project stakeholder input. But wait, that description sounds like the project manager job description–the person who is directly responsible for a project and obtains products and services from different units. Are there too many managers? The handbook does state that overlapping responsibilities should be decided early on in the project. But who has the luxury, when constrained resources cause many employees to juggle several responsibilties?

Still, several project management tools are now available for the project manager to use. These include the project management plan, project scheduling software, information systems, and project management standards such as work breakdown structure (WBS), resource breakdown structure (RBS), and organizational breakdown structure (OBS). WBS gives the expected deliverables for a project, RBS identifies the type of resource assigned, and OBS identifies organizationally who will perform the work.
It seems that these tools have not been incorporated fully thus far and are still in transition. When insufficient resources exist, standards and tools that seem to take more time are usually the first to go in order to meet deadlines imposed by management thinking only of the short-term fix rather than the long-term solution.

The *1998 Business Plan for State Capital Projects* clearly defines objectives that support the project management process. It also adds performance measures to strengthen partnerships with external and internal groups to improve the effectiveness of transportation projects. For instance, it suggests performing a survey of all RTPAs and County Transportation Commissions. The survey would measure the effectiveness of Capital Projects in meeting the need for transportation improvements and in accomplishing timely cost effective delivery.

Transportation Funding
The 2001-2002 State Budget for Transportation looks promising–about $7.7 billion in expenditures, representing about 7.6 percent of all state expenditures. Proposed expenditures for Caltrans in 2001-2002 is $9.5 billion dollars, representing all fund sources including federal and bond dollars. With the TCRP, major increase in proposed highway program expenditures are planned: $3.9 billion in capital outlay expenditures (increase of 30 percent), and $1.8 billion in local assistance expenditures (increase of 18 percent).

Vacancies and contracting out will help determine project delivery. As of 12/31/00, 1,561 vacancies out of 24,619 authorized positions (6.3 percent) were available. 74 percent of these positions were in capital outlay support, especially in the Bay Area and Los Angeles where there is a higher cost of living (LAO Transportation 2001-2002, 2001).

CHAPTER 4: CALTRANS AND THE MTC

THE DOT-MPO Relationship

When ISTEA passed in 1991, MPOs evolved from advisory institutions to having direct influence over prioritization and allocation of transportation dollars. This empowerment caused more states and locals to take the MPO process seriously. TEA-21 continued the trend by designating specific funds with allocation responsibility.

An MPO acts as a small-scale version of a democracy trying to build consensus among various constituencies. Disparate political authority makes addressing regional transportation impacts and needs difficult, so funding is often the uniting factor. In the 1930s, for example, the federal government dispersed funds to promote national goals by persuading state and locals to look beyond self-interests. In 1962, Congress mandated transportation planning would receive federal dollars, and thus ensure some federal policy guidelines. The basis of metropolitan planning today derived its roots from the "3C Planning process"–continuing, comprehensive, and cooperative. Still, the lack of recognition of regional interests and substantive authority left many MPOs as paper pushers for the state DOT.

In 1973, Congress moved to formalize the regional planning process by allocating funds to establish or designate MPOS in certain-sized urbanized areas. These new MPOs served to counter the imperious influence of DOTs forever pushing highway projects. Still, multimodal efforts met with hostile reactions from the state, elected officials, and even the public. In 1976, California's efforts to construct a bus/carpool-only lane was abandoned due to excessive backlash. Over the next decade, presidential policy switched to less federal involvement and funding for regional planning and then back to a stronger federal role to solve the nation's problems. ISTEA implemented a national policy and centralized approach for regional planning, putting MPOs on a more equal footing with the state DOTs. MPOs received doubled funding and larger lead authority in selecting certain projects. Standardized procedures were issued to ensure that planning was more rational than political. Above all, cooperation with state DOTs was required.

The fiscal constraint requirement of ISTEA turned out to be a strong motivator to comply with partnering with state and local agencies. TEA-21 continued to support the MPO's lead role in transportation decision-making. MPOs serve as a forum for discussion and to form partnerships for action on regional issues. In California, state legislation allocated decision-making for a significant proportion of funds to MPOs. Caltrans remains in charge of statewide plans, areas outside metropolitan areas, and operations and new technologies. Still, the California MPOS are not in a clear lead position, as further delegation of decision-making authority is granted to county-level agiences granted by state legislation. MPOs must then act to coordinate among county plans (Goldman, 2000).

The most successful MPOs manage cooperative relationships with their state DOTs. Partnerships can be defined as "a working relationship between two organizations in which the lead organization yields some degree of control over a planning or decision-

making process in exchange for another's expertise and/or political support" (Goldman, 2000). Several types of partnership forms can be applied to public agencies: consultation, coordination, cooperation, consensus-building, and collaboration.

DOTs and MPOs can better coordinate and collaborate on regional and state long-range transportation plans, especially in determining mobility and system preservation needs. Stronger land-use transportation planning and policy linkage is still needed at a regional level. DOTs must also ensure efficient expenditure of funds. Early staff coordination is expected, with possible MPO/DOT staff exchange or assignments, and regular meetings among principals.

A national study was conducted on MPOs to evaluate availability and quality of information regarding planned projects, budgets, and justifications. MPOs were difficult to compare with each other, as procedures and measures were not standandized. It was found that most MPOs focused on how best to distribute the dollars received versus how best to solve the problem.

Successful MPO characteristics include:

- Effective leadership;
- Staff competence and credibility;
- Regional ethos;
- Public involvement;
- Cooperative relationship with state DOT;
- Streamlined, efficient process;
- Land use; and
- Accountability (Dempsey, 2000).

Regional Power: The MTC

The Metropolitan Transportation Commission (MTC) was created by the California Legislature in 1970 to provide transportation planning for the Bay Area. It serves as both the state designated RPTA and the federally designated MPO. One of its key duties is to prepare the RTP (Regional Transportation Plan), a 20-year planning document that serves as a comprehensive blueprint for the region. State and federal laws have greatly expanded the MTC role to include administereing federal, state, and local funds, overseeing the Bay Area Toll Authority (BATA), and shifting its focus from project selection in the STIP to program implementation and performance. One of its goals support the Commission, and ensure cooperative partnerships and a responsible decision-making process.

The MTC is nationally regarded as one of the most competent and innovative of MPOs (Innes, 2000). The agency employs 100 people, headed by an Executive director that reports to a Commissison. The Commission is composed mainly of elected officials from

each of the nine Bay Area counties, and oversees working committees and three citizen advisory committees.

Currently, the 2001 RTP update is under development. The 25-year plan involves extensive public outreach to decide how to spend over $12 billion in local, state, and federal funds available until 2026. Transit and maintenance play big roles, as well as new programs from Freeway Service Patrol (FSP), TravInfo, Environmental Justice, Smart Growth and Transportation for Livable Communities (TLC) grants.

In FY 2000-2001, MTC total expenses were $57.2 million. $57.2 million in revenues came from federal funds (48 percent), state and local funds (46 percent), and MTC Reserves (6 percent). Capital expenses of $22.9 million represent 40 percent of costs, while operation costs comprise the remaining $34.3 million, or 60 percent.

Required Relationships

Both Caltrans and the MTC sees itself as a lead agency, which may explain the lack of a regional management strategy. Caltrans, with the nation's largest budget in DOTs, has a new leader who is shifting the focus to customers. Director Jeff Morales belives that Caltrans must wholly embrace its transportation roots:

> We are evolving from being a builder of infrastructure to being an operator of a transportaiton system... Every mode of transportation needs to be considered, from bicycles to pedestrians to trains, buses, and automobiles. If we don'ts give people a choice, they will have no choice but to drive their cars (Voderbrueggen, 2001).

Morales believes Caltrans must stop playing the "silent financial partner-type" and actively take a lead role in the projects it funds. On the other hand, MTC Executive Director Steve Heminger believes this role-playing requires a delicate balancing act. "It's a difficult subject because there are places, in my opinion, where the state may not be planning as strong a role as it should, and there are other cases where the state should recede." For example, Heminger believes the focus of Caltrans should be on improving freeway operations and providing more connected travel choices among major regions. In other words, let the region take care of itself. (Voderbrueggen, 2001).

How successful is regional planning? It seems that even with standardized procedures in place, the process remains rather political:

> Commissioners appreciate the political influence of the agency and its Executive Director as it seems to bring them more resources than the region would otherwise get. While some are genuinely concerned with the regional implications of their politics, they are somewhat limited in their ability to pursue a regional agenda, in part because of the possibility that opposing staff or other commissioner might risk projects in their districts (Innes, 1999).

MTC decision-making is characterized by project-based political agreements. The players involved seem to focus on how to maximize the dollars and projects they bring in, perhaps reflective of the electoral political process. “The RTP was a stapled package of projects which all players agreed to support, rather than a meaningful strategy to solve congestion or other regional access problems (Innes, 1999).”

State and regional planning may also be difficult to separate as regions continue to experience growth. Due to rising home prices, a growing number of workers commute into the Bay Area from outside counties. Who should manage the responsibility? The Intercity Rail Program seems to emphasize the blurring of state and lcoal roles. With SB45, the state must focus on intercity rail while local and regional agencies focus on regional rail systems. Instead, some intercity rail is in direct competition with regional commuter rail on the same corridor, such as the San Joaquin Amtrak route and the Altamont Express (LAO Transportation 2001-2002, 2001).

In terms of delivering transportation projects to meet customer needs, two areas of focus could be TMCs (Transportation Management Center) and traffic management infrastructure, reflecting the emphasis on improved operations of existing systems. Senate Bill 473 (Perata) aims to improve regional transportation planning. Measures include having the MTC establish performance measure criteria to evaluate future projects for the RTP, as well as developing plans for commuter rail services and bus rapid transit. Another measure focuses on coordination between Caltrans, the California Highway Patrol (CHP), and the MTC.

Currently, the Freeway Management Program Executive Committee meets monthly, and involves the District 4 Director Harry Yahata, the CHP Chief at Golden Gate Division Mike Peterson, and the MTC Executive Director Steve Heminger. The purpose of this meeting is to coordinate system management. Specifically, a demonstration for an operational plan of incident detection and coordinated response is scheduled to launch July 2001 on I-80 Corridor. Traffic will be monitored using the Caltrans detection system and the TMC, with appropriate incident response. The goal is to implement a comprehensive information system notifying travelers of congestion and offering alternatives.

A lack of statewide goals and responsibilities led the MTC to hire a consultant to work with MTC, Caltrans, and the CHP, and define them for optimal freeway operations. One consensus was that the staffing levels at the District 4 TMC is inadequate to deal with the workload. Inadequate electrical engineering staff and an aggressive loop installation schedule led to installation and construction problems in the Bay area as well. Most loop detectors and CCTVs in the district are currently not functioning, at a cost of $7.6 million to repair. An advanced traffic management system (ATMS) could also enable Caltrans and the private sector to provide real-time traffic information to the public. Poor coordination between districts and the state led to inability to implement development.

Caltrans estimates that about half of all highway congestion is caused by traffic incidents. In lieu of an existing state system, the Bay Area implemented its own customized but limited system- Interim Freeway Surveillance System (IFSS). The PATH Pilot Performance Measurement System (PeMS) could also be helpful to obtain real time freeway info accessible by web or cell phone.

The Bay Area Partnership is a good example of achieving cooperation among various constituencies, and working to build consensus. But the MTC has also been criticized for not including more citizen involvement and instead using a separate advisory counsil to solicit public participation. Furthermore, it seems that the Partnership has succeeded in agreeing about what projects to fund, but have mostly ignored larger policy issues such as growth and development: "The actual players at MTC . . .spent very little time discussing how to solve transportation problems. They discussed requirements, formulas, criteria, and projects, but not problem solving and not future visions or objectives (Innes, 1999). Failure to agree on regional issues translates into a lack of a strategic approach for the region, which means money is being spent on band-aid solutions.

Collaborative planning seems like the right approach to involve multiple stakeholders and jointly resolve problems. The Bay Area Partnership should focus on developing an understanding for how the region works as a economy, its primary needs and problems, and how the transportation system works as a whole (Innes, 1999). Only then can an effective transportation solution for the region be developed and implemented.

CHAPTER 5: PLANNING AHEAD FOR SUSTAINABLE GROWTH

Reinventing Government

Following trends to revitalize the public sector, California Governor Davis charged state agencies and departments to improve customer service, and find new and better ways to make interacting with government more convenient. The Governor's Office for Innovation in Government was created to offer leadership, solutions, and expertise. At Caltrans, partnering was offered as a project management tool used to achieve mutual goals with contractors. The bottom line seems to be implementing timely solutions to transportation problems at the most value to the customer.

Employees represent internal customers. Removing bureaucratic barriers is a simultaneous goal to promote and sustain the changing culture. How can employee satisfaction be gauged? Discovering the right "keys" can help, to provide a sense of genuine appreciation and validation for working in the challenging public sector. With contracting out an option to provide similar services for a greater profit in the private sector, the public sector needs to justify incentives to stay. Managed competition may be an option, or a redefining of the core competency of Caltrans. What issues will be prevalent in the 21st century, and what resources are needed to solve them?

DOTs in the 21st century

Asset management will be a deciding factor for DOTs. Anthony Kane, Executive Director of FHWA, states, "We should look at ourselves as a business, responsible for billions of dollars of assets...The bottom line is that you can either be part of the change–lead and shape it–or follow it and perhaps be forced to live with something that will not fit your needs." Think more like the private sector in terms of performance-based operations, with a set bottom line, margins, rate of return, and report to stockholders. The general trend seems to be moving toward privatization, and many states already contract out more than 90 percent of their design work.

Also, public participation will embrace an interactive and collaborative approach, offering flexibility, responsiveness, and adaptability. DOTs will take a more proactive role in informing the community, and obtain input before plans fully developed. Collaborative groups will involve a diverse range of interests to generate substantial dialogue.

Governance is not about control structures and maintaining a system of checks and balacnes. Instead, it should be about the direct engagement of citizens with each other around shared geographic areas. By building social, intellectual, and political capital among citizens, collaborative solutions can by more readily achieved (Innes, 2000). In a sense, that is the essence of successful relationships. By keeping all parties involved and informed of developments, there is less chance for problems to arise.

CHAPTER 6: RECOMMENDATIONS

Numerous recommendations have been developed in the past, and some still merit action. Two key issues seem to be seeking consensus on regionwide mobility problems, and developing resources to deliver those solutions. In the Bay Area, this entails resolving the politics involved in choosing transportation projects, and fixing the bureaucratic impediments to effective public sector service.
Some key points include:

Redefine Project Teams
Project Delivery remains a key factor for Caltrans to build respect from other agencies and the public. Steps toward implementing project management show promise, but it may take a few more years to realize the full benefits. Instead, project teams can be restructured to avoid overlap of responsibilities and provide motivation for employees. With contracting out now an approved option, the role of the public sector employee versus the private sector employee should be clarified. Possibilities include looking at managed competition and public-private partnerships.

Reexamine role of assisting public transportation
As per LAO Transportation 2001-2002 Analysis, Caltrans should determine how it will best fit in its all- encompassing transportation role. SB45 granted local and regional responsibility for public transit, as most state transit funds go to intercity rail. The TCRP will dispense $2.8 billion dollars over six years, with a large majority in transit projects. In addition, there is a projected gap in transit operator funding. By working in a collaborative partnership with regional and local agencies, Caltrans can define a role that will help the transportation needs of the region and maintain state responsibilities.

Exchange staff assignments
Having staff rotate between MTC and Caltrans would be a good exercise in building more understanding of each other while also working on collaborative projects. Currently, Caltrans uses staff assignments in resource agencies to help understaffed agencies expedite review of projects. By creating more opportunity for relationships between the two agencies, the greater the possibility to develop mutual respect.

Define regionwide goals and responsibilities for Bay Area
Transportation needs for the region need to be looked at on a global basis. Since the region has succeeded in obligating its authorized funds, more emphasis should be placed on trying to solve mobility issues, and then seeking and prioritizing the funds to fix the problems. Efforts to address and involve land use planning, environmental concerns, and social issues should continue.

The Bay Area Partnership represents a collaborative partnership of the region's transportation stakeholders, and may hold the key toward improving system management in the region.

ABBREVIATIONS AND ACRONYMS

ATMS	Advanced Traffic Management System
Caltrans	California Department of Transportation
CHP	California Highway Patrol
CMA	Congestion Management Agency
DOT	Department of Transportation
FHWA	Federal Highway Administration
FSP	Freeway Service Patrol
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
LAO	Legislative Analyst's Office
MIS	Management Information System
MPO	Metropolitan Transportation Agency
MTC	Metropolitan Transportation Commission
OBS	Organizational Breakdown Structure
RBS	Resource Breakdown Structure
RTIP	Regional Transportation Improvement Program
RPTA	Regional Planning Transportation Agency
SHA	State Highway Account
SHOPP	State Highway Operation and Protection
TCRP	Transportation Congestion Relief Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TIP	Transportation Improvement Plan
TLC	Transportation for Livable Communities
TMC	Transportation Management Center
WBS	Work Breakdown Structure

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