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INCORPORATING ITS SOLUTIONS INTO THE METROPOLITAN TRANSPORTATION PLANNING PROCESS

Overcoming Institutional Barriers



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Foreword

This report was prepared by the U.S. Department of Transportation's (U.S. DOT) John A. Volpe National Transportation Systems Center (Volpe Center) for the Federal Highway Administration's Office of Metropolitan Planning and Programs and the U.S. DOT's Intelligent Transportation Systems Joint Program Office (JPO). Elizabeth Deysher of the Center's Service Assessment Division was the principal author. David W Jackson and Allan J. DeBlasio, the project manager, from the Economic Analysis Division provided additional support. Mr. Brian Gardner of the Office of Metropolitan Planning and Programs and Dr. Joseph I. Peters, the JPO's Program Assessment Coordinator, provided the direction for this project.

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INCORPORATING ITS SOLUTIONS INTO THE METROPOLITAN TRANSPORTATION PLANNING PROCESS: Overcoming Institutional Barriers

ITS solutions are used more frequently to solve transportation problems, yet planning for them is not yet a routine part of the regional transportation planning process.

Transportation professionals consider intelligent transportation system (ITS) products and services more often now than ever before as tools to manage travel and congestion. In some areas, however, ITS solutions still are not routinely considered as part of the metropolitan transportation planning process. Institutional barriers still exist that impede the regular consideration of ITS solutions.

To better understand these barriers, the Office of Metropolitan Planning and Program, within the Federal Highway Administration, sponsored a research study. The purpose of this research is (1) to review how the consideration of ITS solutions has been incorporated into metropolitan transportation planning processes and (2) to document processes that were implemented successfully and can be duplicated by agencies in other metropolitan areas.

A study team from the John A. Volpe National Transportation Systems Center conducted phone interviews with representatives from agencies in ten metropolitan areas, Albany, Chicago, Dallas-Fort Worth, Denver, Los Angeles, Miami, Milwaukee, Seattle, Washington, D.C., and Winston-Salem, in March and April 1998. The interviews were intended to ascertain the degree that ITS is incorporated in the metropolitan planning process. In total, 25 representatives from ten metropolitan planning organizations (MPOs), seven state departments of transportation (DOTs), and three transit agencies were interviewed.

From these ten areas, the Volpe Center team selected the Chicago, Dallas-Fort Worth, Los Angeles, and Miami Metropolitan Areas for in-depth case studies based on several factors:

- the MPO's policy board and administration support for ITS applications
- the inclusion of ITS in the long-range plan and the transportation improvement program
- the existence of an ITS committee that combines both operations and planning personnel
- the collection of ITS data and use or potential use of the data in the planning process in the metropolitan area.

Information from these four areas was gathered through site visits, in which representatives from the MPO, state DOTs, transit agencies, turnpike or tollway authorities, and local elected officials were interviewed.

Three conditions facilitate the routine consideration of ITS solutions in the metropolitan transportation planning process.

The research team learned that in areas where ITS solutions were being routinely considered and evaluated in the metropolitan transportation planning processes, one or more of three conditions existed.

Condition 1: Endorsement of ITS by Elected Officials and Transportation Managers

Condition 2: Improved Communication and Coordination Across Geographic Boundaries and Between Agencies

Condition 3: Collection of Data and Use of Information

These conditions can be thought of as preliminary but necessary steps that heighten awareness of the benefits of ITS solutions, with the ultimate goal of routinely considering ITS solutions alongside of traditional capital projects. At the time of this study, the transportation professionals and elected officials from the ten areas were struggling with creating one or more of these conditions. They were relying on various strategies to accomplish this. In some areas, preliminary attempts were being made to incorporate the consideration and evaluation of ITS solutions *directly* into the transportation planning process. In other areas, strategies were being implemented *outside* of the formal planning process.

The Three Conditions

The three conditions and the strategies used to achieve these conditions are presented in Figure 1. At least one of the three conditions is present in each of the metropolitan areas reviewed for this study. A single strategy may be used to help create more than one condition.

Condition 1: Endorsement of ITS by Elected Officials and Transportation Managers

It is important for elected officials and transportation professionals to support ITS products and services, and especially to publicly endorse them to their peers and the general public. This demonstrates to all regional players that ITS is accepted as a tool to solve transportation problems and will be seriously considered as a funding option in a metropolitan area's transportation planning process. Elected officials are key supporters since they make funding decisions and can influence support by other stakeholders, while upper-level transportation managers are key supporters since they inform elected officials and guide funding decisions within their respective transportation organizations.

Endorsement of ITS by elected officials and upper-level transportation managers sends a message to transportation professionals that ITS solutions will be seriously considered to address transportation problems.

In some metropolitan areas, the personal endorsement of ITS technologies and services by elected officials and transportation managers has spurred local transportation operators to coordinate planning for ITS solutions. It took the political will of a single elected official and the coordination of five regional agency administrators to start an ITS program in the Dallas area. The primary focus on the program is how to improve the coordination of technology across the region in order to move toward ITS implementation and the associated operational issues. Also in Dallas, MPO's Regional Transportation Council members, who are elected officials, initiated an effort to develop new TIP project evaluation criteria to help identify acceptable ITS projects for funding.

Condition 2: Improved Communication and Coordination Across Geographic Boundaries and Between Agencies

ITS technologies can be most useful when planned and deployed with a regional perspective that cuts across geographic boundaries, agencies, and transportation modes. This requires elected officials and staff within and across agencies to communicate and coordinate with one another. Improved communications also helps overcome the differences in the goals of modal agencies and reduces the reluctance of planners and operations staff within and across agencies to talk to one another. It can, however, be difficult to achieve the appropriate level of communication and coordination, especially in areas with many local autonomous communities.

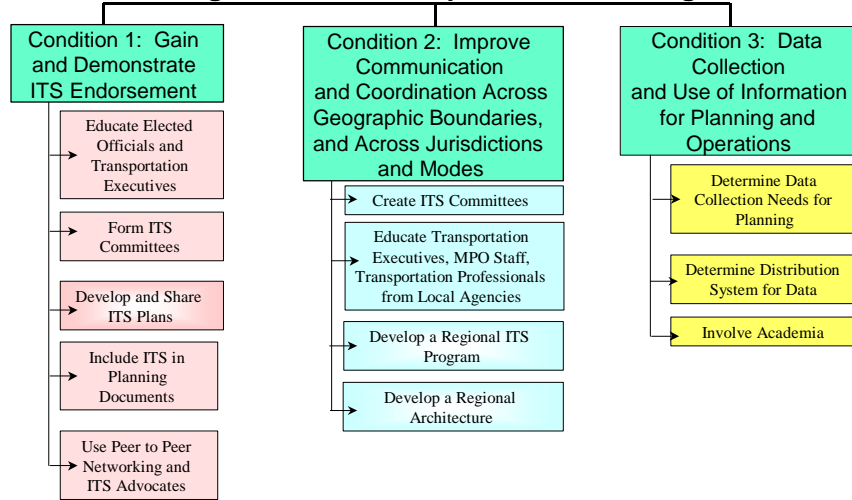
True regional ITS initiatives require communication and coordination between highway and transit staffs, between planning and operations staffs, and between staffs at different government levels.

In the Chicago Metropolitan Area there are 270 municipalities and another dozen regional or state agencies that have some ties to transportation. In this area there are several efforts through which transportation activities are coordinated at the agency, subregional, and regional level. One of these efforts involves the mayor of Chicago and leaders from more than thirty suburban municipalities in the Chicago Metropolitan Area who have created a policy-level coordinating committee, known as the Metropolitan Area Mayors' Caucus. The overall objective of the committee is to improve the quality of life and make the Chicago area more competitive in attracting and retaining business. Increasing transportation system capacity through improved operations and management of the existing transportation system is one of many agenda items that Caucus members consider.

Condition 3: Collection of Data and Use of Information

Although not as critical for incorporating ITS into the transportation planning process as the first two conditions, collecting, sharing, and turning ITS-generated data into useful information helps policy makers improve their decisions in a multitude of ways. These data can be used to estimate the benefits and costs of ITS projects before and after deployment, estimate operational costs of ITS systems, assess the operational health of the transportation system, and improve the design of future systems. In some areas across the nation, such as the Chicago Metropolitan Area, transportation staff are preparing for the capability to gather, analyze, share, and archive locally generated ITS data.

Figure 1. Three Conditions and Associated Strategies for Mainstreaming ITS in the Transportation Planning Process



ITS data help in planning ITS systems that are appropriate for a region and improve transportation operations.

The Chicago Metropolitan Planning Organization (MPO) staff are leading two efforts to collect and share data supplied by the local ITS systems. As part of an ITS strategic early deployment plan, representatives of participating agencies are deciding how to organize the collection and sharing of data, the key elements of the data to be archived, and the data that will be gathered in the future. In addition, the Corridor Traveler Information Center is the gathering point for multi-region transportation data requiring that this data must be managed in some orderly fashion.

STRATEGIES THAT HELP TO ATTAIN THE CONDITIONS

The strategies most frequently cited to help mainstream ITS into the planning process are ones already applied in many other areas of transportation planning.

Transportation officials apply several strategies to achieve the three desired conditions. The first four strategies are the most frequently cited and are explained in more detail in the next section.

1. Create an ITS committee involving regional stakeholders

ITS-related committees can serve a variety of purposes, such as educating members, influencing policy, and improving communication across jurisdictions and modes on regional needs and specific projects.

2. Educate elected officials and transportation executives

Elected officials and transportation managers need to be provided with information that defines ITS products and services, explains how the technologies are used, and details the benefits that can be realized.

3. Include ITS in MPO planning documents

Including ITS solutions in metropolitan transportation planning documents demonstrates to transportation professionals that ITS solutions will seriously be considered as solutions when addressing transportation problems. In addition, being involved with the development of an ITS strategy or a regional transportation plan that includes ITS can educate transportation providers on ITS.

4. Develop a program of regional ITS projects

A regional ITS program can help improve communication and coordination of ITS plans and projects across a defined region, especially if the planning effort is supported by transportation executives from the region or with dedicated transportation funds.

5. Educate MPO staff

An MPO staff that is educated on ITS products and services can develop a regional vision for ITS applications and promote that vision to the region's transportation organizations and local jurisdictions.

6. Educate other stakeholders

Support for and coordination with ITS programs and projects from non-traditional stakeholders is an outgrowth from efforts to educate them on the existence and benefits of ITS technologies. These non-traditional stakeholders include private transportation providers, public safety agencies, freight operators, seaports, airports, and toll authorities.

7. Educate the general public on specific ITS projects

The success of some ITS projects, such as variable message signs or ramp meters, can hinge on public support. The public should be educated as much as possible before an ITS project becomes operable so that they understand its purpose and mechanics.

8. Use ITS advocates in the region

A regional network of ITS advocates and experts can provide support for ITS-related policy initiatives and technical assistance for particular projects, especially in areas where few in-house staff are dedicated to work on ITS.

9. Utilize the National ITS Architecture to develop a Regional Architecture

A regional ITS architecture provides a framework for regional ITS planning that encourages stakeholders to coordinate with one another and optimizes the opportunities for integration of ITS products and services.

10. Use peer-to-peer networking

Peer-to-peer networking enables planners to learn from the experiences of other planners across the nation. It provides a rich source of information that planners can use when considering the benefits and costs of ITS technologies.

11. Involve academia in regional ITS planning

University talent can be used for a range of studies, from project-specific feasibility studies to conceptualizing how regional ITS data should be gathered and stored.

12. Determine data collection needs for planning purposes

ITS technologies supply data that can be used as inputs into the planning process. The challenge is culling out the data that are useful for planning from the huge amounts that potentially can be gathered.

13. Determine the most efficient and effective ways to distribute and apply ITS-generated data

Creating a standard process for routine distribution of ITS data ensures that it will reach the user in a timely manner and be available to use toward improving operations as well as for longer term planning purposes.

FOUR COMMONLY CITED STRATEGIES FOR INCORPORATING ITS INTO THE METROPOLITAN TRANSPORTATION PLANNING PROCESS

Transportation professionals have cited four strategies as the most useful for incorporating ITS into the metropolitan transportation planning process:

Strategy 1: Create an ITS committee involving regional stakeholders

Strategy 2: Educate elected officials and transportation executives

Strategy 3: Include ITS in MPO planning documents

Strategy 4: Develop a program of regional ITS projects

These strategies help to gain or show endorsement by officials, improve communication among stakeholders, or both.

Strategy 1: Create an ITS committee involving regional stakeholders

Committees may be used to educate members as well as serve as forums to examine ITS products and services. ITS committees serve a variety of purposes, such as educating members, influencing regional ITS policy, and improving communication across jurisdictions and modes on regional ITS needs and specific projects.

Improved communications among ITS committee members can lead to coordination outside of the committee. Participating on ITS committees helps elected officials and transportation managers improve their understanding of ITS products and services, likely leading to their support of ITS deployments in the areas they serve. Some ITS committees are formed which enable elected officials and transportation executives not only to become educated, but also to act as regional advocates for ITS. Through these types of committees, elected officials influence regional ITS policy and encourage staffs of transportation agencies operating within their respective jurisdictions to consider ITS products and services to solve transportation problems. ITS committees also provide forums for operations and planning staff from transportation organizations to come together, improving communication between these two distinct groups

and thus the likelihood that ITS products and services will be successfully planned, deployed, and integrated.

Initially, participating on ITS committees provides staff members more opportunities for communication than actual coordination and integration of projects. However, preliminary coordination between stakeholders may occur for individual projects. Many times, improved communications between committee members leads to collaboration and extensive coordination outside of the committee.

The goals and objectives of an ITS committee should be clearly defined, for example, setting parameters as to whether the committee will provide a forum for regional planning and improved communications among members, or for coordination of specific projects. In addition, meaningful and effective assignment of personnel representing each agency is important, and may require securing the commitment of the top management of member organizations. Qualified staff who are knowledgeable about their individual organizations can bring useful information to the committee and can effectively convey information back to their agency. Also, the same representatives should be sent from each agency so committee members become more knowledgeable as a group.

The Miami Metropolitan Area

In the Miami Metropolitan Area, participation on ITS committees helped secure the endorsement of transportation managers and improve communications between agencies. Until the mid-1990's, the Metro-Dade County MPO staff did not know about the benefits of ITS products and services, with the exception of small items like closed circuit television cameras. The MPO Director learned about ITS technologies and the benefits from systems integration while representing the Miami Metropolitan Area on the Public Technologies, Inc.'s (PTI) ITS Committee and while serving as the Vice-Chair of PTI's Urban Consortium Transportation Task Force, which focuses only on ITS. With his new knowledge, the MPO Director presented ITS to the Transportation Planning Council, the policy-making body of the MPO.

This action prompted the Council to create the ITS Coordinating Committee, which provides a forum for all regional and local agencies and organizations to update one another on ITS activities and to identify opportunities for

Meaningful and effective assignment of personnel representing each agency can influence the success of the committee.

coordination. This has helped foster a countywide perspective of ITS to transportation operators and relevant agencies. Membership on the committee includes transit, rail, and highway agencies; turnpike and expressway authorities; universities; county agencies, such as the public works and information technology departments; neighboring MPOs; and consultants assigned specific tasks, such as public outreach. To form this committee, now called the ITS Standing Committee, the MPO staff identified people at high levels in each organization who would be familiar with the ITS activities throughout their individual organizations and who had some decision-making authority.

Committee meetings are held at the MPO offices and are facilitated by MPO employees. This allows MPO staff to promote a regional vision of ITS, use their role as the regional planning agency to encourage cooperation of ITS projects between agencies, and incorporate the ITS activities into the metropolitan planning documents at both the policy and project level.

Several initiatives have been developed through the committee: a study to develop a fiber optic network, a study to develop a system of interactive kiosks, the Dade County ITS Plan and ITS Plan Update, and an application for federal Model Deployment Initiative funds. In addition to these products, interaction of committee members has led to a breakdown of agencies' parochial interests. Members discuss which ITS technologies would be useful countywide and have become knowledgeable about the needs of other agencies. Differing opinions and priorities still exist among agencies, but members now talk with one another about project ideas and seek to address everyone's needs. Information available within agencies has also improved as Committee members bring relevant information back to their individual agencies.

The ITS Committee members are conceptualizing ITS projects on a regional nature more than before the Committee was established. For example, the electronic toll collection project for the Florida Turnpike is being planned on a regional scale, whereas in the past the focus would have been more location-specific. Also, the Florida Department of Transportation's traffic operations center in Dade County now has the ability to link up to the traffic control centers for Dade, Broward, and Palm Beach

Counties. It is acknowledged that this may not have been done before the Committee existed.

Various agencies that are planning similar ITS deployments are encouraged to use compatible technologies. Through the Committee, it was learned that the Miami-Dade County Public Works Department and the Florida Turnpike were using different transponders for electronic toll collection. The two organizations were asked to explore the possibility of using similar technology so automobile drivers need carry only one type of transponder. Although they are continuing to use separate technologies, their administrators have agreed to integrate their technologies at a later date, after the Turnpike's SunPass system has been adequately tested.

The most complex project being handled by the ITS Committee is the development of a fiber optic network. A fiber optics study was completed through the ITS Committee. This generated new ideas for operating the fiber optic system. The ITS Committee members requested that the county fiber optic network support a planned advanced traveler information system and other county transportation needs. The network will enable the Florida DOT freeway operations systems to communicate between the DOT's traffic operations center and field sites, the Miami-Dade Transit Authority to locate transit vehicles and maintain kiosks, the school board to transmit data between schools, and the court system to communicate through teleconferencing so that prisoners do not have to be transferred for court appointments. The Dade County Information Technology Department staff, who are responsible for much of the fiber network installed throughout the county, attested that participation on the ITS Committee has improved communications, their understanding of projects other agencies are planning, and the data and communication requirements of each agency.

Strategy 2: Educate elected officials and transportation executives

Elected officials and transportation executives who are educated about ITS products and services are more likely to support ITS planning efforts in their areas. Education can occur through informal meetings and discussion, and through formal training, courses, and seminars. Also, before-and-after studies, benefit-cost analyses, and operational data demonstrating the benefits of ITS can be used to educate elected officials and transportation managers.

The Dallas-Fort Worth Metropolitan Area

In the early planning and deployment stage, common sense goes a long way toward educating top decision-makers. Operational data gathered from ITS projects is not needed.

At the same time that they are participating in the planning for system upgrades and creating institutional agreements for gathering and sharing data, the transportation staff of the North Central Texas Council of Governments, which houses the Dallas-Fort Worth MPO, use qualitative information and common sense to secure elected officials' support for ITS. MPO staff continually brief officials on the logical arguments supporting freeway management; local congestion information; and the relationship among incidents, congestion, and air pollution. MPO staff provide examples of ITS products and services deployed in other metropolitan areas and explain how ITS products and services can help solve transportation problems in the Dallas-Fort Worth Metropolitan Area.

For example, local arrangements for traffic control in the Dallas area impede incident clearance. Each municipal police agency is responsible for its own traffic control, and each has separate incident clearance procedures. According to one elected official, they were not aware of this problem until the MPO staff briefed them. After the staff showed the officials that ITS products and services can help the multitude of agencies operating independently of one another to cooperatively clear incidents faster and reduce congestion, these officials are now considering the ITS products and services that could remedy the situation.

Scanning reviews are more effective when elected officials attend at the beginning of regional planning efforts or when exposure is needed in advance of a specific project.

Visiting ITS facilities, such as traffic management centers, in other metropolitan areas is another educational strategy. Staff members from the Dallas-Fort Worth MPO, the Texas DOT Dallas District, and several of the area's elected officials attended scanning reviews in Southern California,

Atlanta, and Houston. They visited traffic management centers run by state DOTs, transit agencies, and local jurisdictions.

Elected officials, high-level policy staff, and operations staff can learn more about each other's needs when they attend scanning reviews together.

The scanning reviews provided participants with a broad perspective of ITS that not only highlighted the technologies, but helped elected officials and transportation executives visualize how the technology could be used. Therefore, instead of focusing on the fact that few ITS products and services were installed in the Dallas-Fort Worth area, participants discussed the needs in Dallas, the users of the technologies, and the value ITS technologies could provide. Including both elected officials and technical staff enhanced these discussions and improved communications between the two groups in terms of their expectations from ITS products and services. Operations staff gained a better understanding of the non-technical concerns of the elected officials, and elected officials better understood the level of effort and timelines associated with deploying ITS projects. The visits boosted support for the traffic management centers being planned to serve the Dallas-Fort Worth area and provided elected officials with a balanced comparison between Dallas and other metropolitan areas.

Strategy 3: Include ITS in MPO planning documents

Endorsement for ITS is demonstrated by including ITS solutions in transportation planning documents, either at the conceptual level in the regional transportation plan or at the project level in the transportation improvement program (TIP).

Because the regional transportation plan is the single most important planning document and presents an area's transportation policy, transportation professionals stated that including ITS in the plan shows notable support.

Incorporating an ITS policy message in the transportation plan elevates the significance of ITS at the policy level, demonstrates a regional commitment to ITS, and helps encourage transportation professionals to consider ITS solutions when addressing transportation problems. The level of ITS detail and the policy message vary according to the needs of a metropolitan area. ITS can be included directly or a regional ITS strategy can be developed and then incorporated in the regional transportation plan.

Producing the ITS component of the transportation plan provides educational opportunities to the transportation professionals and elected officials involved in the plan development process. Transportation professionals refine their knowledge of ITS solutions and conceptualize how the

technologies can help address regional transportation issues. Elected officials learn about ITS solutions and the associated benefits as the drafts of the transportation plan are presented to them for review and approval.

The TIP is also a useful tool to demonstrate support for ITS. Some MPO staff have modified their TIP project evaluation processes to accommodate the difference between traditional capital projects and ITS projects, resulting in a more equitable process to evaluate the two types of projects.

Albany-Schenectady-Troy Metropolitan Area

Staff for the Albany-Schenectady-Troy Capital District Transportation Committee, which is the area's MPO, have mainstreamed ITS into the metropolitan transportation planning process by including ITS products and services in the regional transportation plan, titled "New Visions," and the TIP. The New Visions plan defines different priority networks, including an ITS network. The staff "can not overstate the regional commitment to ITS that grew through the plan development process."

MPO staff sought broad input while developing the New Visions document and included the views from twelve task forces which included, among others, bike and pedestrian, freight, transit, and expressway. The Expressway Task Force was particularly influential in bringing ITS into the planning process. Members were charged with ensuring that the elements for guaranteeing the continued efficiency and safe operations of the highway system were included in the regional transportation plan. One person on the task force was the New York State DOT ITS Coordinator. This person brought ITS information to the task force members, such as reference documents from ITS America that described the user services. Increased interest in the potential of ITS products and services led to the development of an ITS strategic plan. This plan is part of the New Visions document.

MPO staff encouraged their Policy Committee, which is composed of elected officials who approve the regional transportation plan, to include ITS in the plan. In the course of developing New Visions, members of each task force wrote a white paper that was presented to the Policy Committee. The Policy Committee also received presentations on individual ITS projects and will continuously

receive ITS educational sessions to keep up the momentum for ITS support gained at this point. These sessions will be especially effective once local benefit information is available.

Currently, MPO staff rely largely on benefit information from other states. MPO staff, however, are participating in a steering committee for a study funded by the New York State DOT that is isolating the effects of various factors affecting ITS benefits so as to provide an arguably location-independent tool for benefit estimation. This study is another indication of the desires of the MPO and New York State DOT staffs to better understand what ITS projects do and to bring this understanding into the planning and project selection processes.

Including ITS in the regional transportation plan has increased awareness and support of ITS and, as a result, ITS technologies are considered for possible inclusion in most transportation projects that appear in the TIP. This is an ongoing process. The MPO staff create a fact sheet for each project under consideration for inclusion in the TIP. On each sheet, the staff indicate on which priority network, as defined in New Visions, the project appears (goods movement, ITS, etc.). Each sheet is then reviewed by the funding agency to ensure that it is filled out correctly. This exchange of information provides an opportunity for MPO staff to point out the opportunities for adding ITS technologies to a project, such as laying fiber optic cable during a highway reconstruction. MPO staff also have the opportunity to review individual projects with respect to including ITS technologies as they participate on the scoping and technical committees for many projects, and receive draft design reports, on which they provide comments, for every project in the TIP.

TIP evaluation criteria for ITS project proposals should consider benefits obtained under incident conditions, when ITS components would be applied, and recognize benefits from system linkages and other regional benefits.

ITS projects were funded in the latest TIP for the Albany area, in part as a result of revised project evaluation methodologies. During the TIP revision process, the MPO staff provided a level playing field upon which to compare ITS projects with other transportation projects. First, MPO staff separated proposed ITS projects from all other projects. Then, benefit-cost estimates were calculated for each ITS project using the travel demand model as it is used for traditional projects.

This calculation, however, included an additional step for ITS projects. The MPO staff used accident data, logs from freeway service patrols, and other sources to estimate the number of “incident conditions” occurring each year and, thus, the probability of incident conditions arising during a period of analysis. This process allowed staff to estimate the potential benefits an ITS application could provide during these special conditions. The resulting benefit-cost estimates were provided to the planning committee, whose members used them along with other considerations in their project selection decisions.

Dallas-Fort Worth Metropolitan Area

The evaluation criteria used to select projects for the Dallas-Fort Worth TIP were modified in order for ITS projects to be fairly evaluated. The MPO’s Regional Transportation Council members, who are elected officials, believed that the traditional process unfairly excluded valuable ITS projects by not considering the regional benefits associated with these projects. Working through the MPO committee structure, which combined the efforts of elected officials and transportation professionals, guidelines were developed to help identify acceptable ITS projects for funding.

All projects, including ITS products and services, submitted for inclusion in the TIP were initially evaluated according to the criteria assigned to the projects’ funding source. The evaluation criteria favored high occupancy vehicle lanes, intersection improvements, and signal improvements. Those ITS projects that were not selected during the original call for projects were reevaluated. Duplicative ITS projects were removed and guidelines were developed to help identify which projects to fund. The guidelines specified five new criteria:

1. Implement the recommendations in the Congestion Management Plan by targeting incident detection and response technology and mobility assistance programs on congested corridors.
2. Fill gaps in existing corridor management efforts by completing critical system linkages.
3. Enhance the communication and information exchange between the Texas DOT and local transportation agencies.

4. Leverage transportation resources by creating or enhancing public-private partnerships that will target the identification and mitigation of traffic congestion.
5. Leverage transportation resources by targeting investment, where possible, to facilities undergoing reconstruction.

Projects selected according to these guidelines included ITS technologies, such as variable message signs, electronic stations for accident investigation, a fiber optic cable network, closed circuit television systems, inter-district communication systems, motorist information systems, and highway advisory radio. These projects would not have been considered under the previous selection process.

Strategy 4: Develop a program of regional ITS projects

Regional programs encourage agencies to consider their roles for planning and deploying ITS and to ask practical questions about system and data linkages.

Regional ITS programs that span entire metropolitan areas and include multiple transportation organizations and jurisdictions facilitate communications and improve coordination of ITS plans and projects across the region. While individual ITS committees functioning in the absence of a regional ITS program can improve communications, coordination does not necessarily improve. Regional programs provide an incentive to coordinate either from funding tied to the program or support from the transportation leaders in a given metropolitan area.

Communications and coordination channels in the form of extensive committee structures have been developed to plan for ITS products and services within the transportation corridors of some metropolitan areas, such as Chicago, Los Angeles, and, more recently, Dallas-Fort Worth. The committees bring all stakeholders together to solve identified transportation problems with ITS solutions. This includes stakeholders who traditionally have not been included in the metropolitan transportation planning process, such as representatives of airports, seaports, and trucking interests. Through these committees, regional or agency-specific ITS plans are developed that take into consideration all of the ITS activity in the region.

Los Angeles Metropolitan Area

In Southern California, a regional program has been in place since 1996 to address the technical coordination of ITS across seven counties. ITS had already been deployed for many years but had not been coordinated or integrated across the region. Now, numerous agencies and jurisdictions communicate and coordinate their ITS needs with one another through an elaborate committee structure.

Agencies and jurisdictions are represented by mid and senior management from both technical and policy areas. A Steering Committee oversees four geographically defined subgroups composed of representatives of transportation agencies within the area covered by the subgroup. Each subgroup has an advisory group, a mission statement that has been signed off by a high-level official, and a subregional plan. The subregional plans are rolled up into one twenty-year long-range ITS plan. The subgroups also help the Steering Committee implement activities at the local level.

Technical groups are created by and report to the Steering Committee. Some members of technical groups work on adapting the regional architecture to conform to the National ITS Architecture. A transit subcommittee was created to better address transit issues, and an outreach subcommittee develops public relations materials for elected officials, cities, counties, transit agencies, the private sector, and the general public.

The Los Angeles MPO has recently made organizational and policy changes to ensure that planning decisions made as part of the regional program are included in the metropolitan planning process. ITS responsibilities have been moved from the MPO's Planning and Policy Department to the Southern California Economic Partnership (The Partnership).

The Partnership, which is part of the MPO structure and uses MPO staff, is a non-profit public-private entity designed to bring the private sector perspective to the planning process and to explore advanced transportation technologies for the regional transportation plan. As part of its new responsibilities, the Partnership staff will ensure that federally funded ITS projects are in the TIP, that they are identified as ITS projects, and that those projects using technologies intended to exchange information are

consistent with the regional ITS architecture developed through the regional ITS program. Partnership staff may also bring stakeholders together to facilitate project development and implementation, and may act as a pass through for funding.

ITS programs do not have to span an entire metropolitan area to be useful. At a more local level, the Los Angeles County Metropolitan Transportation Authority staff developed the Traffic Signal Management Program because within any given county in the metropolitan area, it is difficult to manage across jurisdictions, the California DOT's road network, and locally-controlled roads. Each city has different funding capabilities, and some cities have more advanced technologies than others. Authority staff help the 88 cities that operate their own traffic signals within the county to coordinate with one another and overcome these challenges.

Authority staff help to build consensus among jurisdictions through the program, which began in 1995 and is expected to continue to 2002. As part of the program, eight local traffic forums have been created. Each is composed of 10-30 cities. The boundaries are defined by the location of arterial roads. Members of each forum are provided seed money by the Authority for feasibility studies to coordinate their arterials. Each forum has a ten-year plan. Currently, over \$250 million has been allocated for signal synchronization and preparing for future ITS deployments. As signals are upgraded, forum members will consider more advanced technologies. To further facilitate coordination, the Authority staff conduct meetings with the staff from the cities, help identify project needs and provide technical assistance. They also provide administrative assistance to get projects approved and to coordinate signal synchronization and share traffic concerns.

Dallas-Fort Worth Metropolitan Area

The Dallas-Fort Worth Metropolitan Area is composed of many jurisdictions, and transportation planning and operations are not centralized. There is a diversity of thought and need in the Dallas-Fort Worth area and many ITS activities have been planned or deployed independently of one another. To rectify the situation, agencies are coming together from across the region to coordinate the regional deployment of ITS.

The Dallas-Fort Worth area has an unusual situation whereby the transportation executives meet informally but regularly to discuss regional and organizational needs, and to update one another on their organizational activities. From these meetings, they discovered that each was undertaking ITS planning independent of the others. Therefore, in May 1998, a memorandum of understanding was signed by the chief executives from the seven regional transportation agencies in which they agreed to work together to develop a regional ITS program. A regional ITS committee has been formed to implement the program. The committee's membership includes transit and highway agencies, local communities with populations over 50,000, and the tollway and airport authorities. The MPO staff facilitate the meetings and the Texas Transportation Institute personnel assist the committee. The committee is a structure of peers without a board of directors. Funds for the committee operations are provided by the North Central Texas Council of Governments and Dallas Area Rapid Transit.

Since different agencies are at varying levels of ITS readiness, the seven transportation executives told their staffs to begin making their programs "mutually complementary" among agencies. The goals are to create complementary plans, systems, and system operations.

The final product will be a three-ring binder containing all of the ITS plans and an executive summary complete with roadmaps and a timeline defining each agency's responsibilities. Agreements among agencies and jurisdictions will be created for data sharing. Committee members also hope to fill in geographic holes and linkages now that ITS will be planned on a more regional level instead of in a piecemeal fashion.

The committee meets monthly, sharing the hosting responsibilities across the region. Four subject areas are discussed at each meeting:

1. Developing ITS implementing procedures.
2. Identifying additional ITS funding opportunities.
3. Identifying ITS strategies for special events
4. Identifying gaps in existing ITS plans and monitoring parallel planning efforts.

The primary focus on the meetings is how to improve the coordination of technology across the region in order to move toward ITS implementation and the associated operational issues. This subject receives the most attention now that there is a regional transportation plan from the MPO and ITS plans from each of the Dallas and Fort Worth Texas DOT Districts. The goal is to build on the early deployment planning studies, filling in details that were not addressed during the initial planning efforts. Members are seeking to answer four questions:

- How shall interagency communication occur? Do they need to identify interagency agreements?
- What are the implementation issues that need to be answered?
- What data will be exchanged and with whom?
- What operations tests need to be completed?

The committee has hired a communications expert to complete an inventory of interagency communications needs and make a recommendation regarding a wide-area network and the dedication or sharing of fiber optic cable that will soon be deployed from one agency to another.

SUMMARY

There are three conditions that help bring ITS solutions into the metropolitan transportation planning process:

Condition 1: Endorsement of ITS by Elected Officials and Transportation Managers

Condition 2: Improved Communication and Coordination Across Geographic Boundaries and Between Agencies

Condition 3: Collection of Data and Use of Information

Transportation officials in metropolitan areas have employed various strategies to generate these conditions. The strategies used in the disparate localities vary from region to region due to the regions' diverse political and organizational structures and the level of maturity of ITS planning and deployment. There are four strategies that are most commonly used:

Strategy 1: Create an ITS committee involving regional stakeholders

Strategy 2: Educate elected officials and transportation executives

Strategy 3: Include ITS in MPO planning documents

Strategy 4: Develop a program of regional ITS projects

Although the elected officials and transportation managers in different metropolitan areas will not use the same strategies, they should follow the same three basic steps to facilitate the incorporation of ITS solutions into their metropolitan transportation planning processes. First, they must determine which strategies are most useful for their area. Second, after selecting the strategies, they must then make and keep a commitment to implement those strategies. As part of this crucial step, they must provide the resources to make the selected strategies successful. Third, transportation officials must reassess their approach after a period of time and modify it as their needs change. As ITS planning and development matures, they may give new

priorities to the original strategies, eliminate some, and add new ones.

The strategies listed in this report represent the state-of-the-practice for those areas that have taken steps toward incorporating ITS solutions into the metropolitan transportation planning process. As demonstrated in these metropolitan areas, it is possible to create the necessary conditions to bring ITS into the planning process. This action, in turn, will result in identifying better solutions to address the transportation issues facing the nation today.

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