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MAINSTREAMING ITS WITHIN THE TRANSPORTATION PLANNING PROCESS

REVIEW OF THE CHICAGO, ILLINOIS METROPOLITAN AREA

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FOREWORD

This paper 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. Mr. David W. Jackson and Ms. Elizabeth Deysher of the Volpe Center are the principal authors. Mr. Allan J. DeBlasio of the Economic Analysis Division is the project leader and should be contacted concerning comments on this report at (617) 494-2032. Mr. Brian Gardner and Mr. Douglas Laird of the Office of Metropolitan Planning and Programs provided the direction for this report.

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EXECUTIVE SUMMARY

PURPOSE AND METHODOLOGY

State and local transportation officials are beginning to consider ITS solutions for transportation problems but are challenged by the fact that planning for ITS solutions has not occurred wholly within the metropolitan transportation planning process. In addition, operations planning currently receive little or no consideration in the planning process. The purpose of this research is to better understand how consideration of ITS products and services as tools to manage travel and congestion is being “mainstreamed” or integrated into the metropolitan transportation planning process.

From February through October 1998, staff from the U.S. Department of Transportation’s (U.S. DOT) John A. Volpe National Transportation Systems Center (Volpe Center) conducted this research for the Federal Highway Administration’s Office of Metropolitan Planning and Programs. This document details efforts taken by the Chicago metropolitan planning organization (MPO), the Illinois Department of Transportation, and other transportation agencies in the Chicago Metropolitan Area to mainstream ITS. A cumulative summary report (*Mainstreaming ITS within the Transportation Planning Process: A Summary of Strategies in Ten Metropolitan Areas*) highlights the findings from a larger study in which ten metropolitan areas were contacted to learn about their mainstreaming efforts.

The general scope of the larger study was two-fold: (1) review how ITS have been incorporated into metropolitan transportation planning processes, and (2) document processes that were implemented successfully and can be duplicated by agencies in other metropolitan areas. This study used a variety of research methods to both ascertain which metropolitan areas were best for study and to obtain information to apply to this study. Background data and information were gathered on an initial list of 80 metropolitan areas, phone interviews were conducted with targeted agencies in ten areas, and site visits were made to four metropolitan areas. The study team conducted phone interviews with representatives from agencies in ten metropolitan areas in March and April 1998. In total, 25 representatives from ten MPOs, seven state DOTs, and three transit agencies were interviewed by phone. The study team used the preliminary phone interviews to ascertain the degree that ITS is incorporated in the metropolitan planning process.

The Chicago, Dallas-Fort Worth, Los Angeles, and Miami Metropolitan Areas were selected for in-depth case studies based on eight factors that included 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 (TIP), the existence of an ITS committee that combines both operations and planning people, and the MPO staff’s collection of ITS data and use or potential use of the data in the planning process, among other items. The mere fact that the other six areas (Albany, Denver, Milwaukee, Seattle, Washington, D.C., Winston-Salem) were not chosen does not mean that the MPOs and their area transportation agencies were not performing efficiently or effectively in regards to ITS planning and deployments. Rather, the four areas selected exhibited some unique characteristics that would lend themselves to in-depth study.

During site visits to the four case study areas, the study team delved into greater depth as to how ITS is accepted by elected officials and transportation professionals and how ITS is incorporated into transportation planning documents such as the regional transportation plan, TIP, congestion management system (CMS) plan, major investment studies, and ITS plans. The areas also were examined to determine how relationships between planning and operations staffs and between agencies work, and how ITS project and program communication and coordination is occurring. In addition, data needs and processes to collect and use this data were investigated. The study team discussed these issues with 63 officials from 36 agencies or organizations during the four site visits.

This research revealed that mainstreaming ITS within the metropolitan planning process can be greatly assisted by fulfilling any or all of three conditions. These conditions exist or are at least being considered in areas where ITS planning is more mature:

1. The public *endorsement of ITS* initiatives by elected officials or agency administrators.
2. The presence of *communication and coordination* among transportation agencies in the metropolitan area that leads to a regional perspective for the deployment of ITS technologies.
3. The willingness of area agencies to *collect, share, and use data and information* to determine the benefits of deploying ITS products and services, and to make ongoing improvements to operations and planning of the transportation network.

Further, a list of 17 strategies that help create these conditions emerged from the discussions with the transportation professionals. Although the list of strategies is very extensive, officials from none of the metropolitan areas stated they were currently implementing all of them:

1. Use or create MPO or non-MPO Committees or Task Forces
2. Include ITS, or a reference to ITS, in the Regional Transportation Plan
3. Include ITS projects in the TIP
4. Include ITS in other MPO planning documents (CMS, major investment study, etc.)
5. Develop regional ITS plans
6. Determine data collection needs
7. Determine the most efficient and effective ways to apply the data
8. Educate elected officials and top and mid-management of area transportation providers
9. Educate other stakeholders (public safety, emergency response, trucking industry)
10. Educate MPO staff
11. Educate general public
12. Conduct field trips for upper management
13. Use ITS advocates in the region (at the MPO and other agencies)
14. Develop a major program of regional projects
15. Utilize the National ITS Architecture or develop a Regional Architecture
16. Use peer-to-peer networking

17. Involve academia.

Public Agencies and Significant Organizations

The Chicago Metropolitan Area was reviewed because of the outreach efforts and the level of involvement in ITS planning by the Chicago Area Transportation Study (CATS), the Chicago metropolitan planning organization (MPO). There are multiple agencies involved in the numerous ITS deployments, both regional and multi-state efforts.

The Illinois DOT and other transportation agencies in the Chicago Metropolitan Area have been implementing and experimenting with technologies for nearly four decades in an effort to improve mobility. The Illinois DOT's effort with active freeway management dates back to 1963, when it began operating the Traffic Systems Center, which was used to monitor the freeways and manage the ramp meter and changeable message signs. Today, the Traffic Systems Center is about to enter its third generation of central hardware and software and the Illinois DOT is moving toward a full Multi-Modal Traveler Information System.

Under the Intermodal Surface Transportation Efficiency Act of 1991, the transportation corridor from Gary, Indiana, through Chicago, Illinois, to Milwaukee, Wisconsin (the Gary-Chicago-Milwaukee [GCM] ITS Priority Corridor), was selected by the U.S. DOT to test the application of ITS. The GCM Corridor Coalition, formed in 1993, is composed of all of the major transportation agencies in the Corridor. The objective of the GCM Corridor Program is to improve the efficiency and effectiveness of the Corridor's transportation infrastructure through the planning, design, deployment, and evaluation of leading edge ITS applications. The *Northeastern Illinois Strategic Early Deployment Plan* is a companion document to the GCM Priority Corridor Program Plan. The *Deployment Plan*, led by the CATS, expands on GCM Corridor projects and identifies ITS applications that will yield mobility, environmental, and quality of life benefits to the travelers in the Chicago region.

During the course of the Chicago site visit, 23 transportation professionals from nine transportation and related agencies throughout the Chicago Metropolitan Area were interviewed. Each agency has unique responsibilities for planning, operating, maintaining, or monitoring the transportation system. This section briefly reviews the responsibilities and involvement with ITS of key agencies in the metropolitan area.

The **Chicago Area Transportation Study** is the designated MPO for the northeastern Illinois region. The CATS was formed in 1955 to develop the first comprehensive, long-range transportation plan for the region. Since 1975, the 20-member CATS Policy Committee, as MPO, has been responsible for overseeing the regional transportation planning. The CATS region encompasses 152 municipalities in the five collar counties, 123 in suburban Cook County, and the City of Chicago.

The **Illinois Department of Transportation** has responsibility for planning, construction, and maintenance of Illinois' extensive transportation network, which encompasses highways and bridges, airports, public transit, rail freight and rail passenger systems. Both the Illinois DOT District 1 Office and the Illinois DOT ITS Program Office under the Office of Planning and

Programming's Bureau of Urban Programs are involved in the planning and deployment of ITS in the Chicago Metropolitan Area.

The **Regional Transportation Authority**, created through a referendum in 1974, is a special purpose unit of local government and a municipal corporation of the State of Illinois. The Authority's mission is to insure financially sound, comprehensive, and coordinated public transportation for northeastern Illinois. In 1983, all operating and fare responsibilities in the three transit "Service Boards" (the Chicago Transit Authority, Metra Commuter Rail, and Pace Suburban Bus) were given to the Authority. The **Chicago Transit Authority**, the nation's second largest transit system, delivers 1.4 million bus and rapid transit rides on an average weekday in Chicago and 38 surrounding municipalities. **Pace**, the Suburban Bus Division, provides 240 fixed bus routes, dial-a-ride (paratransit) services, vanpools, and special event buses to 210 communities throughout Chicago's six-county suburban region. **Metra**, the Commuter Rail Division, provides commuter rail service connecting downtown Chicago with 68 other Chicago locations and 100 suburban communities.

The **City of Chicago Department of Transportation** is the agency within the City of Chicago government responsible for all ground transportation-related functions and regulation of the public way. In addition, Chicago Mayor Richard Daley formed the **Metropolitan Mayors Caucus** in 1997 to work with the chief executives of suburban communities on a list of "priority issues" designed to improve the quality of life and make the Chicago area more competitive in attracting and retaining businesses. As part of this mission, the mayors agree to push for transportation improvements. The Mayor also formed the **Mayor's Traffic Management Task Force** in 1996 to improve communication and coordination among the City of Chicago and its abutting municipalities.

Founded in 1962, the **DuPage Mayors and Managers Conference** is a not-for-profit council of 35 municipal governments in DuPage County, Illinois. The mayors and managers represent their communities on voting matters and may serve on the Conference's standing committees. Through its monthly Transportation Technical Committee and Transportation Policy Committee meetings, the Conference provides a forum where representatives from highway and transit agencies gather to discuss programs and projects affecting DuPage municipalities. The Conference is one of the MPO's designated 11 Regional Councils of Mayors.

The **Illinois State Toll Highway Authority** operates toll facilities on five interstate highways throughout the Chicago Metropolitan Area. The Toll Authority's operating priority is to maintain a transportation system that provides tollway patrons with acceptable levels of pavement condition, safety, and operations. Since 1995, the Toll Authority has deployed the I-Pass electronic toll collection system to 200 lanes at toll plazas. Their current efforts are to expand the I-Pass collection and express lane network to full systemwide coverage of 500 lanes.

In addition to the state and regional agencies, a number of local agencies have taken the initiative to plan and deploy ITS components. The **Advanced Technologies Task Force**, led by CATS staff, is the metropolitan area's ITS task force. Along with the GCM Priority Corridor committee structure, this 18-member Task Force provides the best opportunities for agencies in

the Chicago Metropolitan Area to develop a coordinated regional effort for ITS planning and deployment.

REGIONAL STRATEGIES USED IN THE CHICAGO METROPOLITAN AREA FOR ITS PLANNING AND DEPLOYMENT

Endorsement of ITS

Publicly endorsing ITS products and services 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. All interviewees indicated that elected officials are the most important people from whom to garner support for ITS since they make funding decisions and can influence support by other stakeholders. It is also important for mid- and upper-level transportation managers to support ITS since they inform elected officials and guide funding decisions within their respective transportation organizations. To gain their support, elected officials and transportation managers need to be provided with data and information that define ITS products and services, explain how the technologies are used, and detail the benefits that can be realized.

In Chicago, the most common method used by transportation staff to **inform elected officials** and managers about ITS are presentations to the MPO Board and management staff of key agencies, or one-on-one discussions regarding specific projects. Over a five-month period in 1998, CATS staff made presentations on ITS to all 11 Regional Councils of Mayors, which coordinate the 271 municipalities comprising the Chicago Metropolitan Area. A key purpose of these presentations were to update the mayors and local transportation officials on the status of the *Northeastern Illinois Strategic Early Deployment ITS Plan*, to discuss ITS in general, and to provide an opportunity for additional input into the *Deployment Plan* development process. Most interviewees in the Chicago area conjectured that once ITS projects are operational for a period of time, elected officials will want sound operational data and information to decide whether it is worthwhile to continue funding, upgrade, or expand the advanced systems.

In general, the transportation officials in the Chicago Metropolitan Area have not used **scanning reviews** to increase support of ITS projects. The consensus among agencies is that with limited funds, there are other methods to obtain support and learn about ITS technologies. These include the use of consultants knowledgeable of deployments and ITS operations throughout the country and opportunities presented at professional organization meetings to learn what is occurring in other parts of the country. An Illinois DOT representative did note that site reviews in advance of a specific project help decision-makers conceptualize what they need.

Elected officials and transportation managers can also become educated on ITS technologies, products, and services by participating on **committees**, especially those established to consider ITS solutions. There are not a lot of committees in the Chicago Metropolitan Area that provide the opportunity to educate policy makers on ITS. However, the ITS and transportation committees that do exist enable ITS solutions to be raised, which can be passed on to those individuals whose support is deemed critical. These committees include the GCM Priority Corridor Deployment (or Technical) Committee and the CATS' Advanced Technologies Task

Force. The MPO staff's best opportunity to reach local politicians is through the 11 Regional Councils of Mayors where a variety of transportation-related issues are discussed.

Gaining **citizens' support** for ITS products and services is an alternative way to indirectly gain elected officials' support. Most of the agency representatives said that public outreach is a later step in the local ITS program. Their first priorities are programs that educate and gain support of politicians and other stakeholders, such as emergency service providers and the private sector. Representatives from the CATS and some local jurisdictions reported that currently the best way to reach the public regarding ITS is through established media ties, including the occasional published article or television news report favorable to ITS.

Once support has been garnered, endorsement of ITS deployments can be demonstrated through planning and programming activities, including those required as part of the MPO's federal responsibilities. In Chicago, the **regional transportation plan** is a policy document that outlines the regional policy commitments. ITS was referenced for the first time in the November 1997 *Destination 2020 Regional Transportation Plan*. In *Destination 2020*, there is a stated need for integrating ITS technologies, and ITS use is supported in a policy statement as a Transportation Congestion Management strategy. In fact, six of the 11 Transportation Congestion Management strategies are ITS-related. Officials in Chicago remarked that their regional transportation plan is slowly evolving and conjectured that the Plan should eventually include advanced transportation systems and their associated operational impacts. This next generation of transportation plans would include specific ITS strategies and projects, possibly under an ITS section.

MPO staff in some areas go beyond the basic federal requirement of including transportation projects receiving certain types of federal funds in a region's **TIP** and use the TIP to highlight ITS projects. An ITS section was added to the Chicago Metropolitan Area's latest TIP to highlight the existence of ITS projects in the region and aid in further mainstreaming ITS into the planning process. In addition, administrators from the Illinois DOT, the Illinois State Toll Highway Authority, and the CATS cooperatively decided for informational purposes to include GCM Priority Corridor projects in the latest TIP.

Most agency officials believe that adding ITS projects to the TIP does not produce the exposure that adding an ITS policy statement in the regional transportation plan provides. The TIP is seen as a large document that compiles the priority projects from a number of transportation entities and regional associations, but not as a list of priorities for the entire region. A CATS planner noted that until the methodology and criteria for selection are regionalized, ITS deployments are best aided by being included in bigger capital projects. The respondents predicted that as ITS projects mature and as the system interconnectivity becomes critical, operating costs, along with capital costs, will be included in the TIP.

In a number of areas, ITS products and services are now included in **planning documents** such as feasibility studies, conformity determinations, **congestion management plans**, and **major investment studies**. The respondents in the Chicago Metropolitan Area stated that with the initiation of the GCM Corridor project and the *Northeastern Illinois Strategic Early Deployment Plan* effort, there is newly attained knowledge of ITS, and the use of advanced technologies are

now referenced in a number of CATS' planning documents. The Congestion Management System study includes several ITS strategies, such as improved signal system performance.

ITS plans can be useful tools to both gain and demonstrate endorsement of ITS by transportation managers and elected officials. In the Chicago Metropolitan Area, there has been a great deal of effort to develop ITS plans at every level. The 1995 *Gary-Chicago-Milwaukee Priority Corridor ITS Plan* represents a multi-state area. The *Northeastern Illinois Strategic Early Deployment Plan*, under development since 1997, represents the metropolitan level. The initial focus of the *GCM Corridor Plan* was on the expressways. The *Northeastern Illinois Plan* has brought the GCM Corridor effort closer to the local level by concentrating on the arterials as connectors to the expressway. At the local level, the DuPage Mayors and Managers Conference's three-year Strategic Plan was updated in 1999 and the City of Chicago has drafted an ITS Master Plan as a compendium to the City's Transportation Management Plan. A local official noted that sharing the plans with their elected officials has helped develop support for regional ITS deployments from those who make funding decisions.

Elected officials and transportation managers sometimes use or form committees through which they act as **regional advocates for ITS**. In Chicago, no committees for elected officials have an agenda specifically devoted to ITS applications. The Metropolitan Mayors Caucus, the Mayor's Traffic Management Task Force, and the 11 Regional Councils of Mayors are three groups that were formed to involve elected officials and transportation managers in transportation issues. Elected officials and top-level administrators rely on staff to synthesize and relay only the most applicable information on new technologies.

In some metropolitan areas, elected officials and transportation managers have personally taken on the responsibility to act as advocates for ITS products and services. A number of interviewees said that there were not many outspoken proponents for ITS projects in the Chicago area because ITS components have been around for almost four decades and are accepted as part of normal operations. Officials admitted, however, that an external advocate might also be valuable in pushing for inclusion of ITS solutions into the MPO's planning process. One such "quiet" advocate is Chicago Mayor Richard Daley. What the Mayor did was make a commitment to add capacity to the transportation system without building more roadways, opting to manage and operate the area's existing transportation systems better. In addition, elected officials and staff from the DuPage Mayors and Managers Conference are working as a team to create a long-term vision for applying ITS in the collar counties of the Chicago Metropolitan Area.

Communication and Coordination

ITS technologies can be most useful when planned and deployed with a regional perspective that cuts across geographic boundaries, agencies, and transportation modes. A wide range of stakeholders should have input into ITS planning and deployment activities since many of these agencies will be required to operate these systems or must provide some coordination or information to enable these systems to run efficiently. This requires elected officials and staff within and across agencies to communicate and coordinate with one another. It can, however, be difficult to plan for and deploy ITS within a region, especially in areas composed of many local

autonomous communities. In the Chicago Metropolitan Area, there are approximately 270 governmental jurisdictions and another dozen regional or statewide agencies that have some ties to transportation.

Some elected officials have taken their support a step further and have formed **committees** to coordinate ITS activities throughout the metropolitan region. Mayor Daley of Chicago and leaders from more than 30 suburban communities have created a policy-level coordinating committee, known as the Metropolitan Mayors Caucus. Increasing transportation system capacity through improved operations and management of the existing system is one of many agenda items that Caucus members consider. Because of the Caucus, more opportunity has been provided to initiate new ideas for integrating ITS among the City of Chicago and other jurisdictions. The Metropolitan Mayors Caucus operates outside of the MPO structure. The Regional Councils of Mayors have acted as a forum, within the MPO structure, that has increased communication and coordination of ITS issues among the suburban elected officials.

In the Chicago Metropolitan Area there have been a few **educational efforts** that have been targeted specifically to elected officials. As part of its outreach effort to inform and involve local governments in the development of ITS, CATS staff conducted a series of presentations to and discussions with the MPO's 11 Regional Councils of Mayors. These presentations have produced some discussions of what could be coordinated across geographic boundaries. Extensive efforts to increase the communication and coordination with elected officials will occur later, after the ITS components are producing easily defined benefits. Lead transportation officials admit that their first effort is to increase knowledge and communication among the management and staffs of the transportation agencies.

Education can improve coordination across jurisdictions and modes in several ways, including increasing awareness of ITS products and services, reducing tensions between agencies representing different modes, and getting planners and operations staff to understand each other's responsibilities and terminology. The Chicago MPO has sponsored workshops and stakeholder meetings on ITS. These sessions enabled the CATS staff to receive input as to what these stakeholders wanted from ITS. The outreach meetings increased overall ITS awareness and helped all agencies rationalize why they deploy ITS. These initial meetings helped set the stage for the creation of the Advanced Technologies Task Force. The MPO staff also found that they had to educate the Regional Transportation Plan Committee on regional ITS needs in order to get the most effective policy statement for ITS usage placed in the *Destination 2020 Plan*.

Creating an **ITS committee** is a common and effective strategy for improving communications on transportation needs and ITS project concepts among transportation agencies, jurisdictions, and other stakeholders. Staff from the CATS created and now lead the Advanced Technologies Task Force. The Task Force coordinates ITS activities generated as part of the *Northeastern Illinois Strategic Early Deployment Plan*. The Task Force provides a forum for operations and planning staff from different agencies and jurisdictions to talk, learn about different agencies' projects, including those occurring within the GCM Priority Corridor, and develop contacts for each project. The Task Force has evolved from an educational committee to a planning body and is now targeting short and mid-term deployments and creating a regional architecture.

The Chicago Metropolitan Area was included within one of the federally designated **Priority Corridors** – the GCM ITS Priority Corridor. Communications and coordination channels in the form of extensive committee structures operate within each Priority Corridor. Most of the ITS coordination that has occurred throughout the Chicago Metropolitan Area has occurred primarily through the GCM Priority Corridor, which covers a region twice the area of the Chicago Metropolitan Area. At first, participants on the GCM Corridor committees focused only on expressways. More recently, the GCM Project Managers also focused on Chicago's arterials and the interaction of these arterials with the Illinois DOT's expressways. From the guidance obtained from the GCM Committee members' effort, the Chicago area's Advanced Technologies Task Force members are now discussing how to incorporate the regional architecture at the project level. Discussions between the Chicago Transit Authority and the Illinois DOT staffs on how highway and transit can coordinate and benefit from each other's technologies have occurred as a direct result of the GCM Priority Corridor program.

The **MPO** is generally seen as an impartial third party with a strong regional perspective. A number of transportation officials espoused that it is up to the CATS to create a regional vision for ITS applications and to lay the groundwork for ITS deployments, which is being done with the development of the *Strategic Early Deployment Plan*. Since ITS is evolving, the MPO is the natural entity to lead short-term collaborative efforts because the local jurisdictions are not as familiar with federal regulations or programs. The MPO's role is to expand projects or connect ideas to an interest group. ITS leadership by the MPO requires that they are capable of understanding ITS technologies and that staff have some background as to how to plan for and operate these systems. Interviewees stressed that the learning exchange between the planners, the engineers, and the operators at the committee level enables the MPO to better serve its membership.

It is equally important and beneficial for department staff within the same agency to coordinate ITS and capital projects early in the project planning stage. With **intra-agency coordination**, agency staff are able to design for later ITS infrastructure installation when designing capital projects. In addition, precautions can be taken to not destroy installed ITS technology during reconstruction of capital infrastructure. Since 1996, Chicago DOT Commissioner Walker has been providing ITS education opportunities for his staff. The Chicago DOT has hosted education sessions on ITS using Public Technologies, Inc. and has invited people from other metropolitan areas to discuss their ITS deployments. In addition, the City of Chicago has an internal task force of City department heads that discuss potential ITS deployments.

The Regional Transportation Authority integrates ITS for transit and is responsible for coordinating ITS for transit for the Illinois part of the GCM Corridor. Recently, the officials from the Regional Transportation Authority have taken a more active role to stimulate the ITS deployments and is using its financial management functions to force the three transit Service Boards to coordinate. With this new effort, the Regional Transportation Authority, Chicago Transit Authority, Pace, and Metra staff are attempting to create an internal ITS transit group.

Collection of Data and Use of Information

Reliable data are important inputs into regional transportation project planning and into transportation planning system assessment. Although gathering data generated by ITS technologies is not yet widespread throughout the country, collecting good data, sharing that data, and turning that data into useful information speeds the incorporation of ITS solutions into the transportation planning process. In this study, operational data are differentiated from planning data based on the use and age of the data. Operational data are used to assess the status of the current transportation system and make ongoing modifications to improve the system. Data to be used for planning are needed for a wider range of purposes, from project development and impact assessment to system evaluation and re-engineering.

In the Chicago Metropolitan Area, there are three driving forces to initiate a formalized method of data collection, data sharing, and standardized data analysis: (1) the opening of an information clearinghouse, (2) the large scale planning for the data being generated and to be generated, and (3) the creation of an analytical tool for ITS. The first item refers to the Corridor Traveler Information Center and Gateway operations, a GCM Priority Corridor project being managed by the Illinois DOT. 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. The second force is the development of the *Northeastern Illinois Strategic Early Deployment Plan*. As part of this effort, the participating agencies are discussing how to make use of all the disorganized data, what key elements of the data should be archived, and how to archive data. The final initiative that is increasing the data discussions is the involvement of some of the area's transportation officials in the national effort to develop an ITS analysis tool known as the ITS Deployment Analysis System (IDAS).

While a great deal of ITS operational data is being generated from ITS deployments in the Chicago Metropolitan Area, there is still not a great deal of data collection, sharing, and analysis outside of any agency that has gathered that data. Instead, ITS activities are currently centered on planning and deploying ITS systems. Currently, one of the main **planning uses** of ITS-related data is to justify the selection of specific technologies. **Pre-deployment information** on ITS project proposals is developed with cooperation from the sponsoring agency and the CATS. The Chicago MPO staff are not yet estimating benefits and costs for projects and are currently relying on data available from other areas for their project analyses. In addition to CATS staff's use in modeling for congestion and air quality analysis, data are being used to evaluate the performance of some ITS test projects in the area. The Illinois DOT is the primary agency that has conducted these project evaluations, as well as surveys and before-and-after studies.

The Illinois DOT's Traffic Systems Center is the main source of transportation data. The Traffic Systems Center had a strong research orientation in the past and it was the Traffic Systems Center staff that originally thought to save data for other applications. The goal of the GCM Priority Corridor's data clearinghouse, the Corridor Traveler Information Center and Gateway system, is attempting to collect and integrate data from numerous sources in three states. Just like the Traffic Systems Center, there is minimum data currently being used because the data are not archived in an aggregated format needed by planners.

It is the potential use of the data being generated and to be generated from the ITS technologies that makes the Chicago area unique. While only a small amount of ITS data is being used in the planning and operations of the metropolitan transportation system, there is a great amount of activity in planning how to utilize this data. While the Illinois DOT staff plays a large role in data gathering, the Chicago MPO staff have taken the lead in planning for the system-wide coordination efforts for collecting ITS data.

The combination of the operations of the Traffic Systems Center and Corridor Traveler Information Center represents a complex and large ITS database development problem. In the future, the Illinois DOT will seek another entity, such as the CATS, a research lab, or a university, to archive the data for a longer period of time. Representatives from a number of agencies believe that the MPO is a good fit for coordinating the **data archiving**. These individuals see the CATS planning staff as already being the local experts in data collection and manipulation. An MPO official noted that the future of ITS for the CATS may lie in the development and use of arterial signal data, probe vehicle data, and data archiving. To understand the data requirements, officials from the CATS are already leading a data task force for the *Deployment Plan* and are heavily involved in the Federal Highway Administration's IDAS efforts. The IDAS project is being developed as a tool to assist MPO staffs in effectively incorporating ITS deployments into their regional transportation planning process.

While **operational data** have been in use for over three decades in the Chicago Metropolitan Area, operational data sharing has only been prevalent since the advent of the GCM Priority Corridor program. For the past 35 years, the Illinois DOT Traffic Systems Center has used operational data collected from loop detectors installed along the expressways. From the occupancy rate data, the Traffic Systems Center staff compute speed, travel times, and traffic counts, and update any messages on the variable message sign network.

A new Traffic Systems Center computer system, consistent with the National ITS Architecture, is scheduled to come on-line by early 2000. It will be able to manipulate and analyze a greater volume of data automatically and house the data in a user-friendly database. The Corridor Traveler Information Center is targeted as the multi-agency clearinghouse for operational data originating in the three-state region. Traffic Systems Center data, sent to the Corridor Traveler Information Center through dedicated lines, is only one of the seven information sources that currently feed into the Corridor Traveler Information Center.

Currently, one mode that is sharing only minimal operations data is transit. Like other transit agencies, the three transit Service Boards - Chicago Transit Authority, Metra, and Pace - have used operational data their entire history. Vehicle location information has primarily been manual through operator connection to dispatch via radio communication. The Regional Transportation Authority is examining its role as a clearinghouse for schedule information from its three Service Boards through a new Itinerary Planning System.

The transportation officials interviewed in this area maintained that there needs to be clearly defined roles for collecting and archiving data. Agency managers feel it is important to keep the operations functions and operational data separate from archiving functions and planning data. The Chicago MPO staff have initiated the use of ITS planning data and are leading the efforts to

determine data needs, how to share the network, and how to maintain the historic data (the archives). The Illinois DOT staff have likewise led the efforts to utilize operational data. With the expansion of the Traffic Systems Center and the GCM Priority Corridor's Corridor Traveler Information Center and Gateway networks, a wider range of agencies will be applying the transportation data received from these centers for both planning and operations purposes.

MAINSTREAMING AND DEPLOYING ITS: WHAT WORKS IN THE CHICAGO METROPOLITAN AREA

There are at least five key factors leading to increased coordination and mainstreaming of ITS in the Chicago Metropolitan Area:

- Gary-Chicago-Milwaukee ITS Priority Corridor
- CATS' Advanced Technologies Task Force and the *Northeastern Illinois Strategic Early Deployment Plan*
- Regional Transportation Authority's coordination effort with transit
- Commitment of Chicago's Mayor to manage and operate the area's existing transportation system more efficiently and work through the Metropolitan Mayors Caucus
- Involvement of the collar counties through the work of the DuPage Mayors and Managers Conference.

First and foremost, the Gary-Chicago-Milwaukee (GCM) ITS Priority Corridor has been most influential in increasing ITS deployment opportunities, as well as increasing the general awareness of ITS in the region. The CATS staff have taken the initiative to coordinate ITS within the Chicago Metropolitan Area and close the gap between the GCM regional focus on the expressways and the arterial efforts in the Chicago area. The CATS management created and leads the Advanced Technologies Task Force, which is the coordinating mechanism for the *Deployment Plan* and provides opportunities for agency representatives to discuss common issues and develop contacts for the various projects.

The Regional Transportation Authority has recently assumed a leadership role in getting transit deployments jump-started and coordinated among its three public transportation Service Boards. At the municipal level, Mayor Daley of Chicago has made a commitment to think regionally and has initiated the Metropolitan Mayors Caucus to examine improved operations and management of the existing system. Interaction from this Caucus has resulted in new ideas for ITS integration among the City of Chicago and other jurisdictions. In addition, the counties and other local jurisdictions surrounding the inner city are now becoming involved in ITS planning, coordination, and deployment. This new involvement is largely due to the DuPage Mayors and Managers Conference staff who have assumed an ITS coordination role for all of the suburban counties and municipalities in the Chicago Metropolitan Area.

STRATEGIES USED TO MAINSTREAM ITS IN THE CHICAGO METROPOLITAN AREA

The interviewees in the Chicago Metropolitan Area recommend seven strategies as the most effective strategies for transportation officials in other metropolitan areas to follow to achieve one or more conditions which aid in mainstreaming ITS :

1. Create and use a committee or task force that fosters ITS discussions and opens communications
2. Reference ITS in the regional transportation plan
3. Develop an ITS plan
4. Educate elected officials and agency administrators in ITS
5. Educate other prime stakeholders (beyond the traditional transportation agencies) about ITS
6. Make use of ITS advocates in the region to promote ITS applications
7. Develop regional ITS programs and projects.

ROLE OF THE MPO IN THE ITS EFFORTS IN THE CHICAGO METROPOLITAN AREA

Transportation officials in the Chicago Metropolitan Area believe that the MPO staff play a constructive role in increasing awareness of ITS within the region, and should market successful prototype projects and work with operating agencies to develop regional systems. At a minimum, the MPO should provide a forum for discussions regarding the planning, development, and integration of ITS and in educating the stakeholders and public. Area officials see the forum need being accomplished through the Advanced Technologies Task Force.

Lastly, most interviewees saw a role for the Chicago MPO in the organization, analysis, and archiving of the data generated by ITS technologies deployed in the Chicago Metropolitan Area. The CATS is already leading the study that is determining data needs of the area agencies to get a better idea of what responsibilities and commitments are needed from each key agencies.

APPLICABILITY TO OTHER METROPOLITAN AREAS

Even though few metropolitan areas can rival the population and area of the Chicago Metropolitan Area, the experiences and successes of the area's public agencies to mainstream ITS into the metropolitan transportation planning process can be applied to other areas of any scale. In the Chicago Metropolitan Area, much of the communication regarding ITS occurs outside of the MPO's structure. Based on the experiences of the Chicago agencies, communication is the first step to any coordinated ITS effort. The local agencies, led by the MPO, used the momentum of the large multi-state program to gain endorsement of ITS among area officials and public agencies and build from the communication channels already in place through the GCM Corridor structure. Other areas should seek opportunities to develop momentum within an area through the creation of a regional ITS plan or determining where advanced technology projects from different modes and agencies can be linked to provide benefits to a wider audience.

MAINSTREAMING ITS WITHIN THE TRANSPORTATION PLANNING PROCESS: REVIEW OF THE CHICAGO METROPOLITAN AREA

1. PURPOSE AND METHODOLOGY

Identifying and integrating intelligent transportation systems (ITS) strategies and other operational improvements within the metropolitan transportation planning and decision-making process presents a challenge to transportation planners and operations staff. Developing ITS involves new disciplines, increased inter-jurisdictional and inter-agency cooperation, and operations planning. State and local transportation officials are beginning to consider ITS solutions for transportation problems but are challenged by the fact that planning for ITS solutions has not occurred wholly within the metropolitan transportation planning process. In addition, operations planning currently receive little or no consideration in the planning process. The consideration of ITS solutions alongside traditional capital investments and transportation demand and management strategies will expand the set of possible solutions available to transportation planners. This action, in turn, should improve the outputs of the metropolitan transportation planning process. Therefore, there are clearly demonstrated benefits from the routine consideration of ITS products and services, which may lead to “mainstreaming” ITS in the “mainstream” transportation investment decision-making process.

How to get to the point of routine consideration of ITS is the problem that most transportation officials must overcome. The purpose of this research is to better understand how consideration of ITS products and services as tools to manage travel and congestion is being “mainstreamed” or integrated into the metropolitan transportation planning process.

From February through October 1998, staff from the U.S. Department of Transportation’s (U.S. DOT) John A. Volpe National Transportation Systems Center (Volpe Center) conducted this research for the Federal Highway Administration’s Office of Metropolitan Planning and Programs. This document details efforts taken by the Chicago metropolitan planning organization (MPO), the Illinois Department of Transportation, and other transportation agencies in the Chicago Metropolitan Area to mainstream ITS.

1.1 GOALS OF THE STUDY

The general scope of the study is two-fold: (1) review how ITS has been incorporated into metropolitan transportation planning processes, and (2) document processes that were implemented successfully and can be duplicated by agencies in other metropolitan areas.

Initially, the research focused on answering six questions:

1. What steps are required to incorporate the routine consideration of management and operational strategies, including ITS solutions, into the metropolitan planning process?

2. What are the appropriate mechanisms for achieving the inter-jurisdictional coordination required to develop and operate a multi-modal transportation system involving advanced technologies?
3. What information is needed to equally consider potential investments in improved operations and management, including ITS solutions, in the decision-making process?
4. Are changes in policies required to ensure that the appropriate data, including ITS-generated data, are being collected and used properly to manage and operate the transportation system?
5. What types of operational and management functions should be included in a typical state-of-the-practice regional transportation plan?
6. What, if any, modifications to the regional transportation plan and transportation improvement program (TIP) processes must occur to ensure that the 20-year vision for the transportation system encompasses ITS services?

In the course of the study, however, responses to these questions indicated that there were other questions that the research should seek to answer in order to adequately learn from the mainstreaming efforts being studied. The respondents provided limited insight as to what information was needed to consider ITS solutions, primarily because ITS projects were still so new and the questions asked by the decision-making bodies were not yet consistent. Likewise, there were not enough ITS deployments in operation for an adequate period of time to determine what policies are needed to accommodate the new ITS data and to ensure that the data generated by the ITS components are to be used properly. Finally, while still important, the study revealed that inclusion of ITS into the regional transportation plan and the TIP are only one of many strategies that aids in mainstreaming ITS in the metropolitan transportation planning process.

This research has yielded a number of informational products. The results include an inventory of approaches used by MPOs and other agencies to integrate ITS in the metropolitan transportation planning process. This list highlights effective methods of gaining and demonstrating endorsement of ITS solutions, and identifies mechanisms used to coordinate ITS development and operations. The study team has also provided details on actions needed to address the collection and use of data for monitoring and measuring the performance of advanced transportation systems. The final product includes the documentation of strategies successfully used by MPOs and other agencies to develop, integrate, and ultimately operate ITS programs, projects, and products and services.

1.2 APPROACH

This study used a variety of research methods to both ascertain which metropolitan areas were best for study and to obtain information to apply to this study. Background data and information were gathered on select metropolitan areas, phone interviews were conducted with targeted agencies in ten areas, and site visits were made to four metropolitan areas. During these site visits, representatives from a broad range of transportation agencies were interviewed on ITS activities within their agencies and region.

Approximately 80 metropolitan areas, out of the 341 metropolitan areas with MPOs in the United States, were initially reviewed for possible inclusion in this study. These areas were selected because the U.S. DOT was tracking the extent of ITS deployment in them and the level of ITS deployment was one of the criteria used to select areas for further review. There were other criteria used to select ten sites from the list of 80 metropolitan areas:

- involvement of the MPO in ITS and other transportation projects
- technical capabilities of the MPO staff
- policy-making capabilities of the MPO
- size of the MPO
- geographic distribution
- area population.

Figure 1 shows the geographic distribution of the ten sites selected for telephone interviews. The interview team visited the four sites indicated with white stars. Table 1 provides summary information on the MPOs in the ten metropolitan areas:

1. Albany, New York
2. Chicago, Illinois
3. Dallas-Fort Worth, Texas
4. Denver, Colorado
5. Los Angeles, California
6. Miami, Florida
7. Milwaukee, Wisconsin
8. Seattle, Washington
9. Washington, D.C.
10. Winston-Salem, North Carolina



Figure 1. Metropolitan Areas Reviewed in the Mainstreaming ITS Study

The study team conducted phone interviews with representatives from agencies in the ten metropolitan areas in March and April 1998. The team interviewed ITS staff from all ten MPOs and officials from either the state department of transportation (DOT) or the regional transit agency. In total, 25 representatives from ten MPOs, seven state DOTs, and three transit agencies were interviewed by phone. The study team used the preliminary phone interviews to ascertain the degree that ITS is incorporated in the metropolitan planning process by discussing several topics:

- ITS plans and studies
- ITS projects in the area
- regional coordination of ITS projects
- regional transportation plan and transportation improvement program planning process
- involvement of agencies in ITS projects and ITS outreach
- data collection and use
- staff skills and ITS information sources
- appropriate MPO role in ITS activities.

Table 1. Metropolitan Planning Organizations Included in the Review

Metropolitan Area	Metropolitan Planning Organization	Jurisdiction	Composition
Albany, N.Y.	Capital District Transportation Committee (CDTC)	8 cities, 70 villages 4 counties	Regional Planning Commission
Chicago, Ill.	Chicago Area Transportation Study (CATS)	236 municipalities 6 counties	Policy and Research Organization
Dallas-Fort Worth, Tex.	North Central Texas Council of Governments (NCTCOG)	75 municipalities 9 counties	Council of Governments
Denver, Col.	Denver Regional Council of Governments (DRCOG)	41 municipalities 8 counties	Council of Governments
Los Angeles, Cal.	Southern California Association of Governments (SCAG)	180 municipalities 6 counties	Association of Governments
Miami, Fla.	Miami-Dade County MPO (Miami Urbanized Area MPO)	30 municipalities 1 county	County Agency
Milwaukee, Wis.	Southeastern Wisconsin Regional Planning Commission (SEWRPC)	147 villages and cities, 7 counties	Regional Planning Commission
Seattle, Wash.	Puget Sound Regional Council (PSRC)	64 municipalities 4 counties	Council of Governments
Washington, D.C.	National Capital Region Transportation Planning Board	9 cities, 7 counties 2 states, 1 district	Council of Governments
Winston-Salem, N.C.	Winston-Salem Transportation Advisory Committee (elected)	20 municipalities 1 county	City Agency

After discussing the results of the telephone interviews with the Federal Highway Administration project sponsors, the study team selected four of the ten metropolitan areas for in-depth case studies. Eight factors were used to select the Chicago, Dallas-Fort Worth, Los Angeles, and Miami Metropolitan Areas:

1. MPO Board supports ITS.
2. MPO top management supports ITS.
3. ITS is included in the long-range plan and the transportation improvement program.
4. MPO has an ITS committee that combines both operations and planning people.
5. MPO is involved at a high level (active member of a committee) for regional ITS plans.
6. MPO has a good working relationship with the state DOT and transit.
7. MPO educates elected officials and other groups.
8. MPO is collecting data and using it in the planning process.

The mere fact that the other six areas were not chosen does not mean that the MPOs and their area transportation agencies were not performing efficiently or effectively in regards to ITS planning and deployments. Rather, the four areas selected exhibited some unique characteristics that would lend themselves to more in-depth study.

Based on the preliminary phone interviews, the Chicago Area Transportation Study (CATS), the Chicago MPO, exhibited good outreach mechanisms to other agencies and had organized a technical ITS committee. Staff at the MPO are also discussing with other area transportation officials how to use the National ITS Architecture. In addition, outreach is occurring through other channels such as with the Illinois DOT, the DuPage Mayors and Managers Conference, and the City of Chicago's Mayor's Office.

Transportation agency administrators in the Dallas-Fort Worth Metropolitan Area have a strong commitment to ITS, led by the management of the North Central Texas Council of Governments, the Dallas-Fort Worth MPO. A new regional ITS committee has been formed that is being led by MPO management, with strong support from representatives of the Dallas Area Rapid Transit, the Texas DOT, and many other area agencies and organizations. Other special characteristics of the Dallas-Fort Worth Metropolitan Area include an ITS committee for elected officials and the involvement by the private sector in planning for ITS.

Preliminary discussions with ITS staff in the Los Angeles Metropolitan Area revealed that diverse ITS committees exist in which the MPO staff are involved. One of the committees involves the private sector and a second involves top transportation managers who want to ensure that ITS projects continue after the Southern California Priority Corridor Study is complete. The MPO officials' intentions to obtain and use operations data from the California DOT for planning are also unique.

The Miami-Dade MPO's coordination with two other MPOs in the region for ITS planning is likewise unique. The Miami MPO has also formed an ITS committee that brings together both operations and planning professionals.

During site visits to the four case study areas, the study team delved into greater depth as to how ITS is accepted by elected officials and transportation professionals and how ITS is incorporated into transportation planning documents such as the regional transportation plan, TIP, congestion management system (CMS) plan, major investment studies, and ITS plans. The areas also were examined to determine how relationships between planning and operations staffs and between agencies work, and how ITS project and program communication and coordination is occurring. In addition, data needs and processes to collect and use this data were investigated. The study team discussed these issues with 63 officials from 36 agencies or organizations during the four site visits.

There are a number of reports produced as a result of this research that provides insight into how ITS are incorporated into the metropolitan planning process. This document details efforts taken by the transportation agencies in the Chicago Metropolitan Area to mainstream ITS. In addition, there are companion reports, similar to this Chicago study, that detail the mainstreaming strategies used in the Dallas-Fort Worth, Los Angeles, and Miami Metropolitan Areas. Finally, a cumulative summary report (*Mainstreaming ITS within the Transportation Planning Process: A Summary of Strategies in Ten Metropolitan Areas*) highlights the findings from ten study areas initially contacted about their mainstreaming efforts.

1.3 FINDINGS

From the initial discussions, a list of strategies emerged that have helped increase ITS awareness and integrate ITS activities within the planning processes of several metropolitan areas. These strategies may have been conducted either within or outside of the traditional metropolitan transportation planning process, but have been instrumental in moving ITS projects to the forefront of the regional transportation planning process and thereby assisting in the deployment of ITS in the metropolitan area. The list of strategies became very extensive; although no metropolitan area stated they were currently doing or planning to utilize all of these strategies:

1. Using or creating MPO Committees/Task Forces
 - Composed of operations and planning staff or upper management of operating agencies
 - Composed of elected officials
2. Using or creating non-MPO Committees/Tasks Forces
 - Composed of operations and planning staff or upper management of operating agencies
 - Composed of elected officials
3. Including ITS, or a reference to ITS, in the Regional Transportation Plan
4. Including ITS projects in the TIP
5. Including ITS in other MPO planning documents (CMS, major investment study, etc.)
6. Developing regional ITS plans
7. Determining data collection needs
 - Pre-deployment to determine benefit and cost from ITS deployment (to sell ITS)

- Post-deployment data being gathered from advanced equipment (to improve operations and long range planning)
8. Determining the most efficient and effective ways to apply the data
 9. Educating elected officials and top and mid-management of area transportation providers
 10. Educating other stakeholders (public safety officials, emergency response services, trucking industry)
 11. Educating MPO staff
 12. Educating general public
 13. Conducting field trips for upper management
 14. Using ITS advocates in the region (at the MPO and other agencies)
 15. Developing a major program of regional projects
 16. Utilizing the National ITS Architecture or developing a Regional Architecture
 17. Using peer-to-peer networking
 18. Involving academia

After the site visits were completed, it became clear that there was a great deal of overlap among the strategies, and they could be further condensed into three conditions that aid in mainstreaming ITS within the metropolitan planning process:

1. Endorsement of ITS
 - Gain endorsement of ITS.
 - Demonstrate endorsement of ITS.
2. Improved Communication and Coordination
 - Across geographic boundaries.
 - Across agency jurisdictions and modes.
 - Within agencies.
3. Collection of Data and Use of Information
 - For planning use.
 - For operational use.

Initially, each of these three conditions may not be present in a metropolitan area where ITS is in the early planning and deployment stages. However, these conditions exist or are at least being considered in areas where ITS planning is more mature. There are various strategies that are associated with the three conditions. The strategies used within each metropolitan area will vary because of the differing degrees of ITS planning and deployment efforts, and therefore, the areas will have different needs. Strategies that are implemented will also vary depending on the role that the MPO plays in integrating and coordinating ITS within the planning process. MPOs influence the mix of transportation projects in different ways, depending on staff size and expertise, control over the allocation of funds, and the political environment in which they operate.

2. OVERVIEW OF THE CHICAGO METROPOLITAN AREA

The Chicago Metropolitan Area was reviewed because of the outreach efforts and the level of involvement in ITS planning by the Chicago Area Transportation Study (CATS), the Chicago metropolitan planning organization (MPO). There are multiple agencies involved in the numerous ITS deployments, both regional and multi-state efforts. This chapter includes selected



demographic and geographic information about the Chicago Metropolitan Area; reviews the area's political composition as it relates to transportation; and provides descriptions of the public agencies and organizations of significance to the transportation system, including ITS components. Each of the agencies listed has unique responsibilities for funding, planning, deploying, operating, or maintaining the transportation system within the Chicago

Metropolitan Area. This chapter also details the structure of the MPO and where ITS elements are included within the structure. To provide context and background, the region's current transportation system is briefly described and the significant ITS planning and deployment efforts are reviewed.

2.1 DEVELOPMENT OF THE CHICAGO METROPOLITAN AREA

The Chicago Metropolitan Area is a vast region that ranges 80 miles north to south, 50 miles east to west, and encompasses almost 3,800 square miles. With a population of more than 7.25 million, the Chicago Metropolitan Area is the country's third most populous area. The Chicago region comprises the City of Chicago, located entirely within Cook County, and the five surrounding counties referred to as "the collar counties" (DuPage, Kane, Lake, McHenry, and Will Counties).

Chicago has developed in a traditional urban model, with a strong urban core and suburbs stretching along radial transportation corridors. Suburbanization in northeastern Illinois occurred as early as the 1860's. The growth of railroad lines radiating west, north, and south from Chicago enabled access to the new communities. Beginning in the late 1940's, an aggressive road building program by the State of Illinois, the start of the tollway system, and the creation of the federal highway system supported the suburbanization drive. In the ten years after the tollway and interstate systems were established, the region's urban expressway component was virtually completed.

The central city, including the central business district known as the Chicago Loop, is no longer the dominant destination for travel. While there is still a large demand for the traditional suburb-to-city commuting trips, the changes in regional development has contributed to a rapid growth in suburb-to-suburb trips. Employment clusters have emerged in numerous locations, such as along the I-88 corridor in DuPage County and in Schaumburg in suburban Cook County. Since 1950, most of the region's population growth has taken place in the suburbs. In the last two decades, population growth for the entire metropolitan area has slowed significantly to four percent between 1970 and 1990.

2.2 THE CHICAGO TRANSPORTATION SYSTEM TODAY

The Chicago Metropolitan Area's transportation system includes the surface roadway network; extensive transit services; a major aviation hub; a prominent freight movement network that includes rail, trucking, pipeline, air, and waterway modes; and bike and pedestrian facilities. Both the freeway and transit rail systems have been developed with a radial configuration centered on downtown Chicago.

The highway system consists of 54,200 lane miles of freeways and expressways, arterials and collectors, and local streets. Approximately five percent (2,700 miles) of the total lane miles in the CATS planning region is classified as freeways and expressways. These 2,700 total miles of freeways and expressways equate to 449 total centerline miles. Of the total 449 centerline miles, the Illinois DOT has jurisdiction of 252 miles, the Illinois State Toll Highway Authority has 188 miles, and the Chicago DOT control the nine-mile Chicago Skyway. Compared with the 50 urban areas examined by the Texas Transportation Institute, Chicago had one of the lowest actual miles of freeway and expressway and the lowest in freeway miles per capita. In the last decade, highway lane miles increased by five percent, while the vehicle-miles of travel increased by 40 percent.

The highway pavement widths are not substantial relative to other roadway systems in the Midwest region. The freeways are primarily six lanes, while major arterials are mostly four lanes. Two river corridors, the Des Plaines River and the Fox River, actually impact the highway system configurations and limit traffic capacity, especially on a number of arterial streets. The arterial system in the Chicago region is on a grid pattern, with a major arterial spaced every half-mile within the City of Chicago and spaced every two to five miles in the suburban counties. No restricted-use (high-occupancy vehicle) lanes currently exist in the entire metropolitan area. Instead, planning policy has given priority to encouraging use of the fixed-guideway (rail) transit system.

The Regional Transportation Authority oversees the transit service in the six-county area. Combined, the Regional Transportation Authority's three Service Boards (Chicago Transit Authority, Metra Commuter Rail, and Pace Suburban Bus) constitute the second-largest rail and third-largest bus system in North America. There are nine radial transit lines operated by the Chicago Transit Authority. There are 11 radial commuter rail lines, ten operated by Metra and one operated by the South Shore Railroad. Suburb-to-suburb transit is provided by Pace. The public transportation system provides maximum accessibility to the Chicago Loop. This system serves longer-distance trips, but does not serve shorter-distance trips within the growing Chicago central area. Like the highway system, the transit system has both capacity and capital maintenance deficiencies. There are at least one Chicago Transit Authority rail line and two Metra commuter rail lines that have physical constraints that prevent increased service to meet the demands of the growing ridership.

There is an extensive park-and-ride system in the region, connected predominantly to the commuter rail system at most of the system's 200 stations. The rapid transit system has been

created primarily for Chicago Transit Authority bus feed and walk-in ridership; therefore, few large parking facilities exist at the rapid transit stations.



Figure 2. Map of the Chicago Metropolitan Area

In addition to the regional highway and transit systems, there are two other transportation systems of notable size – the airports and the freight system. Chicago-O’Hare and Midway airports are very large operators of intercity travel, also functioning as magnets for many other trips. O’Hare has a major influence on the traffic conditions in the northwest Cook County and northeast DuPage County. Midway has a similar, though smaller, presence in southwest Cook County. Chicago continues to enjoy a favorable geographic position relative to the U.S. domestic freight rail and truck system, as well as international port linkages. Major intermodal yards are located in the central and south parts of the City of Chicago and in suburban Cook County.

2.3 PUBLIC AGENCIES AND OTHER SIGNIFICANT ORGANIZATIONS

During the course of the Chicago site visit, a wide range of transportation professionals from transportation and related agencies throughout the Chicago Metropolitan Area were interviewed. Each of the agencies has unique responsibilities for planning, operating, maintaining, or monitoring the transportation system. This section briefly reviews each agency's responsibilities with the transportation system in the metropolitan area. Other agencies of note, whose staff or officials were not interviewed for this study, but were mentioned by the interviewees as having some bearing on the regional transportation system, are also listed.

2.3.1 Transportation and Other Agencies Contacted

The **Chicago Area Transportation Study** is the designated metropolitan planning organization for northeastern Illinois. The CATS was formed in 1955 to develop the first comprehensive, long-range transportation plan for the northeastern Illinois region. Since 1975, the 20-member CATS Policy Committee has been the designated MPO for the region and, therefore, responsible for overseeing the regional transportation planning. The CATS region encompasses 152 municipalities in the five collar counties, 123 in suburban Cook County, and the City of Chicago.

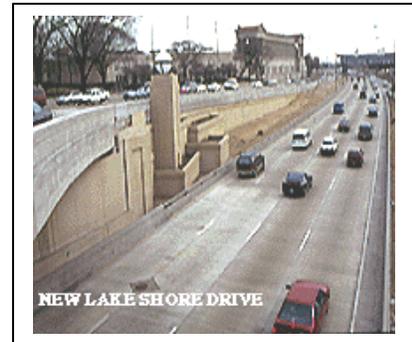
The **Illinois Department of Transportation** has responsibility for planning, construction, and maintenance of Illinois' extensive transportation network, which encompasses highways and bridges, airports, public transit, rail freight and rail passenger systems. It operates with an annual budget of approximately \$5 billion. Both the Illinois DOT District 1 Office and the Illinois DOT ITS Program Office are involved in the planning and deployment of ITS in the Chicago Metropolitan Area. The **Illinois DOT-District 1** is the Illinois DOT district office that is responsible for the six-county northeastern Illinois region that includes Cook, Lake, McHenry, Kane, DuPage, and Will Counties. The **Illinois DOT ITS Program Office** is under the Office of Planning and Programming's Bureau of Urban Programs. The ITS Program Office was initially formed to manage the ADVANCE (Advanced Driver and Vehicle Advisory Navigation Concept) project, a dynamic route guidance field operational test. This office's responsibilities have since expanded to statewide ITS coordination.

The **Regional Transportation Authority** was created in 1974 upon approval of a referendum in the northeastern Illinois region of Cook, DuPage, Kane, Lake, McHenry and Will Counties. The Authority is a special purpose unit of local government and a municipal corporation of the State of Illinois. The Authority's mission is to insure financially sound, comprehensive, and coordinated public transportation for northeastern Illinois. In 1983, the Regional Transportation Authority Act was amended to make substantial changes in the Authority's organization, funding, and operations. The amended Act placed all operating and fare responsibilities in three "Service Boards" (the Chicago Transit Authority, Metra Commuter Rail, and Pace Suburban Bus) and gave the Authority increased oversight powers concerning budgets and a responsibility to monitor the financial condition of the Service Boards. Additionally, the Regional Transportation Authority was given responsibility for issues requiring a regional perspective, including the coordination of transportation planning activities, market development, and insuring compliance with federal and state guidelines. To guide the Authority's financial

oversight, the Act requires the Authority's Board of Directors to approve an annual budget and two-year financial plan. The Act further requires that half of the operating expenses of the entire Regional Transportation Authority system must be covered by farebox revenue. Additionally, the Authority's Board of Directors is required annually to review and approve a five-year capital plan, which is a blueprint of the capital activities to be funded by the Authority and executed by the Chicago Transit Authority, Metra, and Pace.

The **Chicago Transit Authority**, the nation's second largest transit system, delivers 1.4 million bus and rapid transit rides on an average weekday in Chicago and 38 surrounding municipalities. The Transit Authority's 1,900 buses serve nearly 12,200 bus stops and carry approximately 900,000 weekday riders while the Transit Authority's 1,150 train cars serve 141 rapid transit stations in and around the City of Chicago and carry approximately 500,000 weekday riders.

The **City of Chicago Department of Transportation** is the agency within the City of Chicago government responsible for all ground transportation-related functions and regulation of the public way. Chicago DOT activities include the design and construction of transit facilities, arterial streets, and bridges and viaducts; the implementation of neighborhood infrastructure programs; street asphalt repaving; and the maintenance and operation of the city's movable bridge system. In addition, the Department is in charge of a wide range of traffic-related programs and services. The Department's functions are performed through an organization divided into six bureaus: (1) Highways, (2) Streets, (3) Traffic, (4) Bridges and Transit, (5) Inspections, and (6) Administration and Planning. Management control is provided by the Commissioner's Office.



Founded in 1962, the **DuPage Mayors and Managers Conference** is a council of 35 municipal governments in DuPage County, Illinois. The mayors and managers represent their communities on voting matters and may serve on the Conference's standing committees. The Conference is a not-for-profit organization dedicated to addressing municipal, regional, state, and national public policy issues. Through its Transportation Technical Committee and Transportation Policy Committee, the Conference provides a forum for intergovernmental dialogue where representatives from highway and transit agencies gather monthly to discuss programs and projects affecting DuPage municipalities. The Committees provide input into county and regional transportation plans and programs such as the Chicago region's *Destination 2020 Regional Transportation Plan*. The Conference also directs the allocation to DuPage governments of over \$6 million of federal surface transportation program funds each year. The Conference is one of the MPO's designated 11 Regional Councils of Mayors.

2.3.2 Other Transportation Agencies and Groups

In the Chicago area, there are almost 300 jurisdictions, agencies, and organizations that have some governing authority over or other responsibilities with the transportation network. However, many of these agencies have little involvement or impact on the ITS efforts in the

Chicago Metropolitan Area. While representatives from the majority of key agencies were interviewed for this study, not all of the public agencies that are actively involved in the ITS program or that have significant influence and impact on the region's transportation policies, programs, and projects were contacted. These agencies are summarized in this section.

The **Illinois State Toll Highway Authority** operates 188 centerline miles of roadways and 44 toll facilities on five interstate highways throughout the Chicago Metropolitan Area. The Toll Authority operates 274 centerline miles of roadways throughout the State of Illinois. The tollway system in the region include I-294, I-88, I-355, I-90 west of O'Hare Airport, and I-94 in Lake County. The Toll Authority's operating priority is to maintain a transportation system that provides tollway patrons with acceptable levels of pavement condition, safety, and operations. Since 1995, the Toll Authority has deployed the I-Pass electronic toll collection system to 200 lanes at toll plazas. Their current efforts are to expand the I-Pass electronic toll collection and I-Pass express lane network to full systemwide coverage of 500 lanes at a total deployment cost of \$450 million.

Pace, the Regional Transportation Authority's Suburban Bus Division, provides 240 fixed bus routes, dial-a-ride (paratransit) services, vanpools, and special event buses to 210 communities throughout Chicago's six-county suburban region. Pace carries approximately 130,000 weekday riders. Pace began operating in June 1984 after the three Service Boards were created by an amendment to the Regional Transportation Authority Act in November 1983. A 12-member board made up of current and former suburban village presidents and city mayors govern Pace. Pace operates nine divisions and has contracts with public and private carriers. Using 300 vans, the Pace's Vanpool Incentive Program is the country's second-largest public van program, behind only Seattle. Pace began using transfer cards with magnetic strips in 1996, and expanded the computerized program system-wide in February 1997. Stored-value cards that will be used to pay Pace fares are expected in 1999.

Metra, the Regional Transportation Authority's Commuter Rail Division, provides commuter rail service connecting downtown Chicago with 68 other Chicago locations and 100 suburban communities. Metra carries approximately 270,000 weekday riders.

CATS staff coordinate with a number of other planning agencies. The **Northeast Illinois Planning Commission** is the comprehensive land use planning agency for the northeastern Illinois region. The **Northwestern Indiana Regional Planning Commission** is the designated MPO for the northwestern Indiana region in and around Gary, Indiana. The **Southeastern Wisconsin Regional Planning Commission** is the designated MPO for the Milwaukee region.

Chicago Mayor Richard Daley formed the **Metropolitan Mayors Caucus** in 1997 to work with the chief executives of suburban communities on a list of "priority issues" designed to improve the quality of life and make the Chicago area more competitive in attracting and retaining businesses. As part of this mission, the mayors agree to push for transportation improvements. In addition, the Mayor also formed the **Mayor's Traffic Management Task Force** in 1996 to improve communication and coordination among the City of Chicago and its abutting municipalities. This group reviews and coordinates projects and special events that have a significant impact on traffic. The projects are grouped according to geographic location, which

generally follow the seven planning districts defined by the Chicago Department of Planning and Development.

The **Advanced Technologies Task Force**, led by CATS staff, is the metropolitan area's ITS task force. Along with the GCM Priority Corridor committee structure, this 18-member Task Force provides the best opportunities for agencies in the Chicago Metropolitan Area to develop a coordinated regional effort for ITS planning and deployment. In addition to the agencies already cited, there are other active members of this ITS Task Force:

- Argonne National Laboratory
- Illinois Commerce Commission
- Illinois Environmental Protection Agency
- Illinois State Police
- Illinois Transportation Association
- Lake County
- University of Illinois – Chicago / University Transportation Center.

2.4 THE MPO ORGANIZATION

The CATS has traditionally provided a forum for bringing state and local governments, transit agencies, and others together to reach consensus on regional issues. The Chicago MPO's activities are numerous and varied. According to the *1997 Association of Metropolitan Planning Organizations' Profiles of MPOs*, CATS staff's and committees' current roles are to develop the *Destination 2020 Regional Transportation Plan*, the transportation improvement program (TIP), and the annual unified planning work program; oversee and conduct conformity analysis, transportation control measures, and travel demand forecasting; manage the planning for the freight and airport systems, as well as the subregional transit, traffic, and parking plans. In addition, CATS staff are responsible for the collection and analysis of travel data; outreach and education for the air quality improvements programs, including the traffic demand management; administration of the region's ridesharing program; and the operations of the Council of Mayors. Staff utilize and apply a variety of planning tools and software to perform their responsibilities, including PlanPac, UTPS, EMME/2, ARC Info, and Atlas GIS.

The **Policy Committee** of the CATS was initially designated as the MPO for northeastern Illinois in 1975 and reconfirmed in 1981. The northeastern Illinois region comprises six counties: Cook, DuPage, Lake, Kane, McHenry, and Will Counties, and a portion of Kendall County. The CATS Policy Committee, which is multi-modal in nature, is composed of 20 transportation representatives from the federal, state, regional, and local governments, and transportation operators. Each member participates in regional planning and programming related to transportation improvement. The Policy Committee's decisions are made with support from a network of technical and advisory committees and CATS staff.

The CATS has created 11 Regional Councils of Mayors, which are assemblies that include the mayors and managers of all municipalities in northeastern Illinois who joined together for the purpose of providing municipal input to the regional transportation planning and programming

process. The **Council of Mayors Executive Committee** is composed of 22 members representing the 11 Regional Councils, which represent the 270 suburban municipalities in northeastern Illinois, and the City of Chicago. This committee links local elected officials with the Chicago Area Transportation Study Policy Committee.

The **Work Program Committee** is made up of the same agencies that are on the Policy Committee plus six additional members. The Work Program Committee, a standing technical committee, meets and reviews all the issues that will come before the Policy Committee for resolution. As part of its responsibilities, recipient agencies provide financially constrained lists of projects to the Work Program Committee for approval. The Committee also creates additional MPO committees, subcommittees, and task forces, as well as their chair, membership, and purpose.

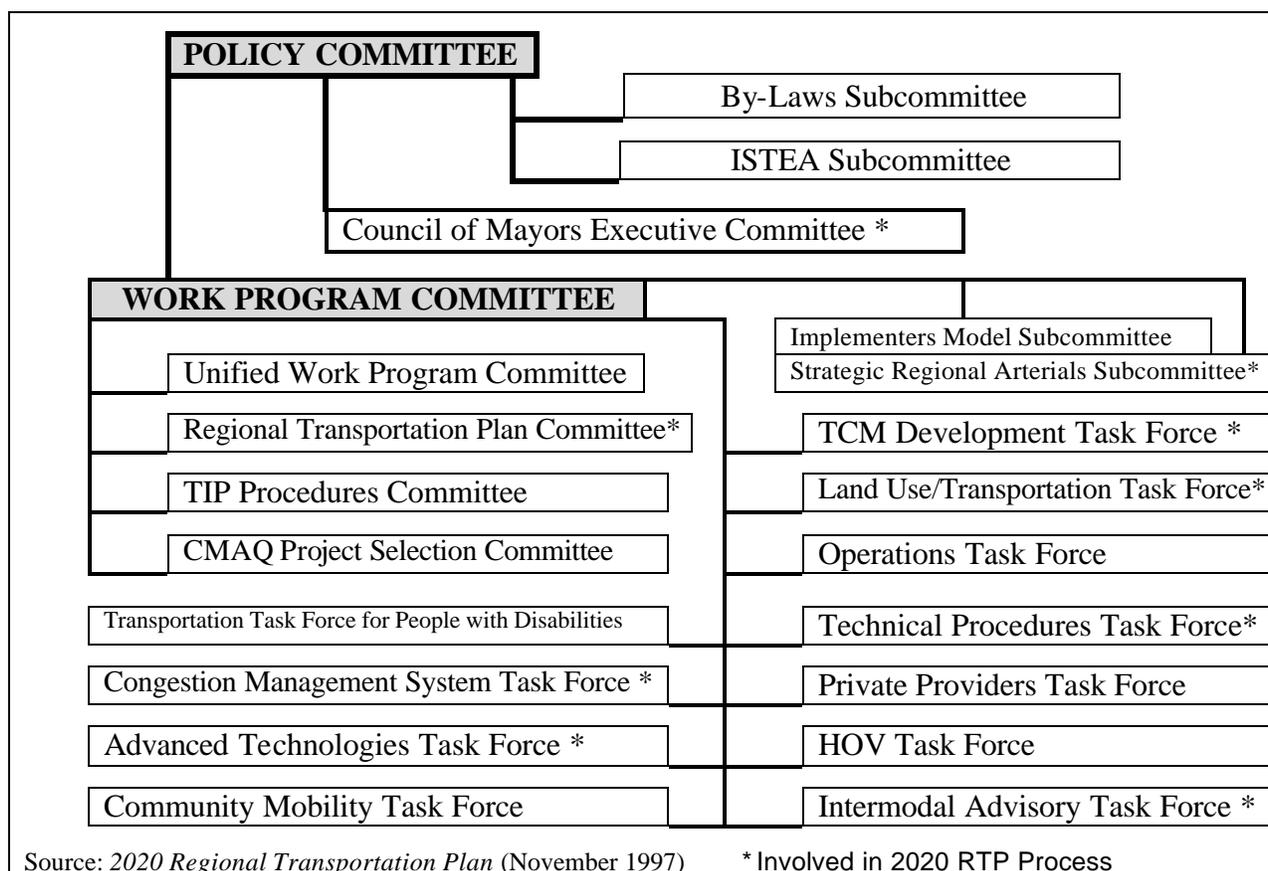


Figure 3. Committee Structure of the Chicago Area Transportation Study

The Work Program Committee currently is using 17 other committees and task forces to deal with program activities of the MPO. These committees and task forces are listed in Figure 3. Most groups are a mix of Work Program Committee members and individuals that represent certain interests or can provide specific expertise to the subject of the task force. In general, the committee designation means that there is a long-term mission. Subcommittees usually have short-term assignments. The task forces include half of their membership from citizen participants and may have either long-term or short-term assignments.

While a number of the CATS' committees, subcommittees, and task forces review and discuss ITS-related projects and issues, only the **Advanced Technologies Task Force** is specifically charged with handling ITS issues. According to one MPO official, this Task Force has proven the best way for agencies to understand ITS project phases and stages, how the projects developed fit into the Regional Transportation Plan, and how they should be combined to create a regional architecture. Since the Task Force's inception in 1996, its charge has been to develop the *Northeastern Illinois Strategic Early Deployment Plan*. Once the *Deployment Plan* is completed, it is expected that the Task Force's responsibilities will expand.

2.5 ITS ACTIVITY IN THE CHICAGO METROPOLITAN AREA

The Illinois DOT and other transportation agencies in the Chicago Metropolitan Area have been implementing and experimenting with technologies for nearly four decades in an effort to improve mobility. The Illinois DOT's effort with active freeway management is longer than almost any other program in the country. In 1963, the Illinois DOT began operating the first "smart" freeway section in the region. The Illinois DOT's Traffic Systems Center used its central control system to monitor the freeways and manage the ramp meter and changeable message signs.

Today, the Traffic Systems Center is about to enter its third generation of central hardware and software. The Illinois DOT has already deployed a Corridor Traveler Information Center and is moving toward a full Multi-Modal Traveler Information System. The Regional Transportation Authority and its Service Boards are now deploying technology applications for traveler information and transit vehicle management. Illinois State Toll Highway Authority is now utilizing ITS technology for automatic vehicle identification and electronic toll collection. In addition, Chicago DOT currently has traffic signal control and fiber optic communication initiatives underway.

There are many plans for, deployments of, and operations of ITS products and services currently occurring in the Chicago Metropolitan Area. Because there are so many ITS projects, only the most significant ITS initiatives for the northeastern Illinois region are noted.

2.5.1 ITS and Related Plans

Under the Intermodal Surface Transportation Efficiency Act of 1991, the transportation corridor from Gary, Indiana, through Chicago, Illinois, to Milwaukee, Wisconsin (**the Gary-Chicago-Milwaukee [GCM] ITS Priority Corridor**), was selected by the U.S. DOT to test the application of ITS. The GCM Priority Corridor is a 16-county corridor that is home to more than 10 million people and is the Midwest's largest business and distribution center. This effort is guided by the June 1995 **GCM ITS Priority Corridor Initial Program Plan** and its subsequent July 1997 update. The 20-year Program Plan is the governing document that identifies, programs, and coordinates on-going work by each of the participating agencies throughout the GCM Priority Corridor. The Plan was developed in a cooperative effort by the GCM Corridor

Coalition, led by the Illinois DOT, the Indiana DOT, and the Wisconsin DOT, in partnership with the U.S. DOT. The Coalition also includes leading multi-modal local, regional, and state agencies, as well as other interest groups throughout the corridor. The GCM Priority Corridor Program continues to use committees and work groups that meet on a regular basis.

As noted in the **Northeastern Illinois Strategic Early Deployment Plan**, this is not a typical early deployment plan in that there is nothing particularly “early” about it because the first “smart” freeway section in the region has been in operation for 35 years. The *Deployment Plan* study is being led by The CATS in cooperation with several other agencies, including the Chicago DOT, Illinois DOT, Federal Highway Administration, Regional Transportation Authority, Chicago Transit Authority, Illinois State Toll Highway Authority, and local governments. The *Deployment Plan* was initiated to identify ITS applications that will yield mobility, environmental, and quality of life benefits to the travelers in the Chicago region. The *Deployment Plan* is meant to be a companion document to the GCM Priority Corridor Program Plan and deployment efforts by expanding on those projects already recommended as part of the GCM Corridor and providing more detail as to how local agencies may integrate with and benefit from these efforts. The *Deployment Plan* is a series of consultant-produced technical working papers or memoranda developed between 1997 and 1998.

The *2010 Transportation System Development Plan*, developed by CATS staff in 1989, was a precursor to the *GCM Corridor Plan* and the *Deployment Plan*. The *2010 Plan* highlighted the need for coordinated and cooperative transportation strategies. The *2010 Plan* included the creation, under the **Operation Greenlight Program**, of the **Strategic Regional Arterial System** and the **Strategic Regional Transit System**. The Strategic Regional Arterial System is a 1,400-mile network of high-design arterial roadways intended to supplement the expressway system in handling subregional long-distance travel. Further, the Regional Transportation Management Strategies, approved by the CATS Policy Committee in November 1993, included the Operation Greenlight’s Strategic Regional Arterial System development strategies. These strategies included coordinated and demand-actuated traffic systems and have been responsible for signal coordination along specific corridors.

2.5.2 Current ITS Projects and Operations

According to the *Northeastern Illinois Strategic Early Deployment Plan*, there are 72 ITS-related projects in the northeastern Illinois region. As of mid-1997, well over half were termed “operational” and are providing service to the public. There were 14 projects classified as GCM Priority Corridor projects, 40 classified as other ITS-related projects, and 18 private ITS initiatives.

The **GCM ITS Priority Corridor Program** is a multi-agency program. The GCM Corridor Coalition, formed in 1993, is composed of all of the major transportation agencies in the Corridor. The objective of the GCM Corridor Program is to improve the efficiency and effectiveness of the Corridor’s transportation infrastructure through the planning, design, deployment, and evaluation of leading edge ITS applications. While there are numerous projects identified by the Corridor Coalition, only 14 were noted to have a direct impact on the Chicago

Metropolitan Area. Of these, several could be defined as “programs” that may actually be divided into many smaller individual projects:

- Corridor Traveler Information Center
- Multi-Modal Traveler Information System
- GCM Priority Corridor Program Plan
- Gateway Implementation Project
- GCM Data Pipe
- Integrated Transit System
- Incident Management Programs
- GCM Technical and Planning Support
- Traffic Management Systems
- Commercial Vehicle Operations
- Traffic Signal Integration
- Vehicle Transponder Systems
- Advanced Incident Reporting and Mayday Security
- Private/Public Partnerships

The **Corridor Traveler Information Center** is the prototype for the Gateway Traveler Information System, which is currently being developed. The Corridor Traveler Information Center, operational since 1997, began as an offshoot of the ADVANCE operational test project and has evolved into a clearinghouse of traveler information for the GCM Priority Corridor. The Corridor Information Center is currently operational and collecting congestion and incident data from a variety of sources. These data are currently available for use with a variety of transportation control systems. Center staff are distributing the real-time data to the public through the Internet.

The **ADVANCE** (Advanced Driver and Vehicle Advisory Navigation Concept) project was designed to assess the feasibility of providing dynamic route guidance and its impact on travel time for drivers in the northwest Chicago area. As part of the ADVANCE project, 75 vehicles were equipped with in-vehicle navigation and route-guidance systems. Traffic condition data, from both traditional detection devices and from the 75 probe vehicles were used to monitor the traffic network and provide a real-time determination as to the route that would provide the shortest travel time to a predetermined destination for a test vehicle. This operational test began in 1991 and was completed in late 1995. The project evaluation was concluded in January 1997.

A significant legacy of ADVANCE for the GCM Priority Corridor has been the use of the ADVANCE Transportation Information Center’s transition into the Corridor Traveler Information Center. The ADVANCE Center is being expanded to include new sources of transportation information throughout the GCM Corridor. In 1997, the Corridor Traveler

Information Center was connected to MONITOR, the Milwaukee area traffic management center. In 1998, Indiana began providing real-time traffic and incident information on the Borman expressway, making the Corridor Traveler Information Center a true three-state clearinghouse for transportation information. There are now a number of systems connected to the Corridor Traveler Information Center:

- Illinois DOT District One's Communication Center
- Illinois DOT's Traffic Systems Center
- *999 cellular phone-based motorist aid system
- weather data from Surface Systems, Inc.
- Illinois State Toll Highway Authority construction and maintenance information system
- Chicago DOT Communication Center
- Wisconsin DOT Communication Center
- MONITOR Freeway Traffic Monitoring System for the Milwaukee Area
- Indiana tollways construction and maintenance information system
- Indiana DOT Communication Center.

The **Multi-Modal Traveler Information System** provides a basis for future regional traveler information systems. The goal of this project, currently underway, is to develop a comprehensive integrated and multi-modal information system, including a corridor architecture and strategic plan. The system will serve the needs of travelers and operators within the GCM Priority Corridor. The **Gateway** builds on work in the Multi-Modal Traveler Information System project. The Gateway will serve as the information collection and distribution point for traveler information. The information will be distributed through the data pipe, Internet, personal communication device, kiosks, and other methods. The **data pipe** will provide a backbone communication system for the transportation and support agencies in the Corridor. This system communication will be deployed in three phases beginning in 1999.

The **Illinois DOT Traffic Systems Center** monitors over 136 centerline miles of freeway using more than 2,200 loop detectors, 113 ramp meters, 20 changeable message signs, and several closed-circuit TV cameras. The Traffic Systems Center was opened for operation in 1963. The Illinois DOT will be upgrading hardware and software to improve traffic management. The Traffic Systems Center expansions will boost the surveillance network to nearly 153 miles.

The **Video Surveillance Expansion** project, underway in 1997-98, will provide real-time video signals from two major interchanges (I-94/I-290 and I-94/I-55) over microwave links to the Traffic Systems Center and integrate the signals with three existing closed circuit television camera sites along the Kennedy Expressway. In addition, a video infrastructure will be deployed so that three separate centers (Operations and Communication Center, Traffic Systems Center, and the GCM Corridor Traveler Information Center) can view freeway conditions.

The **Illinois DOT Emergency Traffic Patrol** (also known as “**Minutemen**”) has been providing expressway assistance for motorists for over 20 years. They assist over 100,000 motorists annually. The Minutemen fleet consists of 35 medium-duty patrol trucks, 11 light 4X4s, and other specialty and heavy-duty units. Each of the medium-duty patrol trucks are equipped with hands-free, quick tow devices to safely and quickly remove disabled vehicles, and five are also equipped with automatic vehicle location and global positioning system stations. Also, a ***999 Cellular Emergency Express Line** has been established to aid with emergency services. In 1992, the Illinois State Toll Highway Authority assumed operating responsibility for the *999 Center which currently receives over 200,000 calls per month. The operators receiving these calls key in relevant incident data, forward this information to the Corridor Traveler Information Center database, and dispatch emergency response teams when necessary.

Since 1994, the Illinois State Toll Highway Authority has successfully implemented its “**I-Pass**” electronic toll collection and traffic management program on 200 lanes of I-355, I-88, and I-294 outside Chicago. The Toll Authority plans to implement its entire system with electronic toll collection technology by the end of 1998. As part of this expansion, staff from the Illinois DOT, in coordination with the Toll Authority staff, are conducting a test of an automatic vehicle identification and traffic management system using the Toll Authority’s electronic toll collection system. When completed, almost all limited access facilities in northeastern Illinois will be under some form of traffic management system surveillance.

The Regional Transportation Authority currently operates a **Transit Traveler Information Center**. This facility provides information on all transit services to callers 20 hours per day, every day. The Regional Transportation Authority has developed specifications for an upgrade of the system, that currently uses up to 60 operators at peak times, to an automated itinerary planning system. The Chicago Transit Authority opened a new transit control center in 1997. The Chicago Transit Authority has also developed a **Bus Services Management System** that includes the instrumentation of over 1,500 buses with a global positioning system and mobile data terminals for bus management and location. As part of this project, 250 buses are being tested with schedule adherence systems that enable bus signal priority in cooperation with the Chicago DOT. Pace is likewise looking into the installation of automatic vehicle location on its fleet and a Bus Services Management System.

Many agencies in the region operate signal systems along major arterials. These agencies include the Illinois DOT and the Chicago DOT. Most of these signal systems are closed-loop types with on-street masters interconnected to local intersection controllers. The Illinois DOT is adding approximately 25 signals per year to its closed loop signal systems. The Illinois DOT currently has 216 coordinated signal systems involving over 1,400 intersections in operation. The City of Chicago operates several closed loop systems as well as a centralized MIST system at 73 intersections in the downtown core. All of the counties operate several closed loop systems that optimize traffic flow through signalized intersections along arterial routes. DuPage County operates 25 Econolite closed loop systems and Cook County operates nine. As an extension of the Strategic Regional Arterial initiative, the CATS is looking at how to coordinate all of the traffic signal control systems operated by the Illinois DOT, the Chicago DOT, and some of the other counties. The **Cermak Road Corridor** project is targeted as the prototype for further

coordination and will include signal coordination, emergency service preemption, and transit vehicle priority.

Other ITS-related projects of note in the Chicago Metropolitan Area include a pilot test of advisory on-board vehicle **warning systems at railroad grade crossings**, the comprehensive communications system initiative within the City of Chicago called **ChicagoNET**, and the **Northwest Central Dispatch Center**. The Northwest Central Dispatch Center handles emergency and non-emergency calls for a number of communities in the northwest suburbs and passes traffic incident information on to the Corridor Traveler Information Center. There is a number of private ITS initiatives that fall under the commercial vehicle operations category, such as computer system tracking of vehicles and cargo. Most of the public-private commercial vehicle operations efforts are either multi-state or national projects, not metropolitan-based.

3. REGIONAL STRATEGIES FOR ITS PLANNING AND DEPLOYMENT

This chapter relates how the transportation officials and agency staff in the Chicago Metropolitan Area are utilizing the various strategies enumerated in Chapter 1 to aid in mainstreaming intelligent transportation systems (ITS) activities into the metropolitan transportation planning process. Mainstreaming can be greatly assisted by fulfilling any or all of three conditions:

1. The public *endorsement of ITS* initiatives by elected officials or agency administrators.
2. The presence of *communication and coordination* among transportation agencies in the metropolitan area that leads to a regional perspective for the deployment of ITS technologies.
3. The willingness of area agencies to *collect, share, and use data and information* to determine the benefits of deploying ITS products and services, and to make on-going improvements to operations and planning of the transportation network.

In this chapter, each strategy will be presented under its related condition. Figure 4 displays the three conditions for mainstreaming ITS and their associated strategies. Some of the strategies are associated with more than one of the three conditions. In these cases, the objective of that strategy may undergo subtle changes to attain each condition. For example, an ITS committee may be directly responsible for increased communication and coordination among agencies, but indirectly linked to gaining the endorsement for ITS from elected officials or agency management through the increase in ITS awareness that the committee brings about.

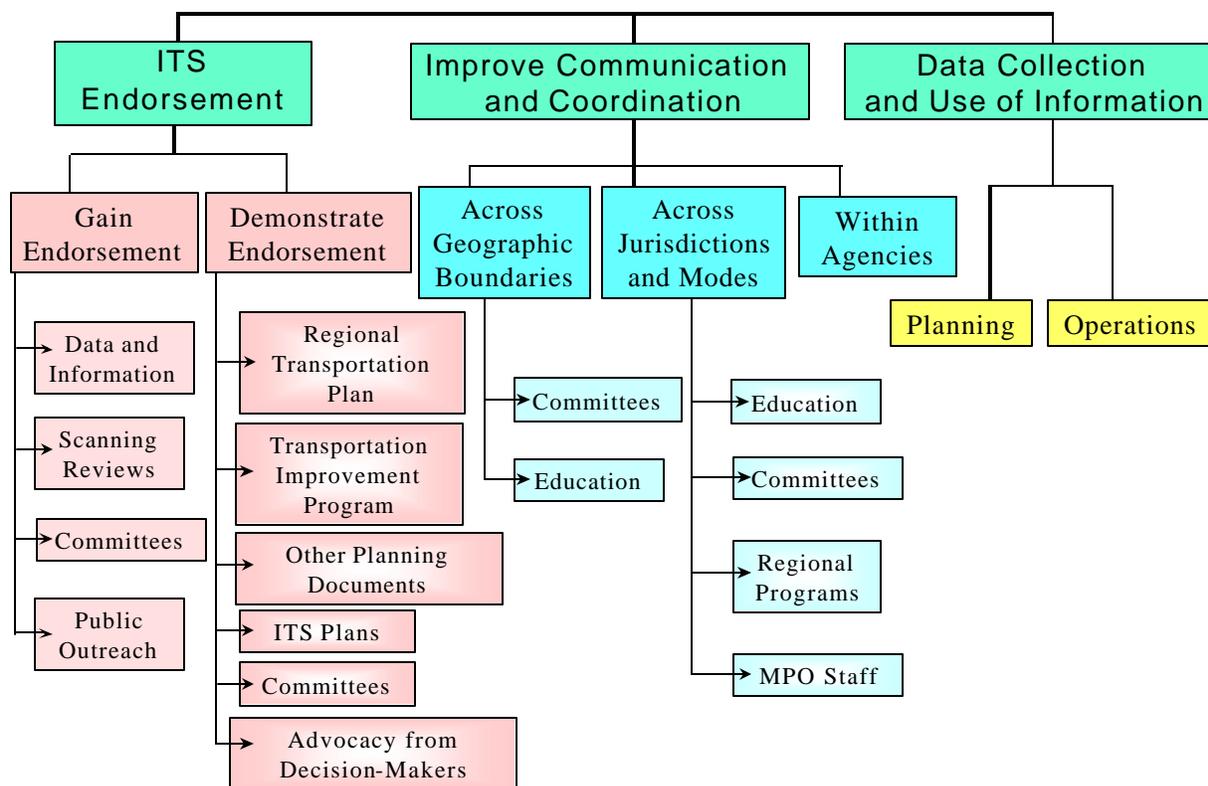


Figure 4. Three Conditions and Associated Strategies for Mainstreaming ITS in the Transportation Planning Process

3.1 ENDORSEMENT OF ITS

Publicly endorsing ITS products and services 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. According to interviewees, one of the most important endorsements for ITS products and services comes from elected officials. Elected officials not only set the tone for spending priorities, but their support raises the level of awareness for ITS products and services to other transportation agencies. Interviewees also cited upper- and mid-managers as important supporters who can increase awareness and advocate ITS technologies to other transportation professionals and to elected officials.

This section is divided into two subsections:

- ❖ Strategies to Gain Endorsement of ITS
- ❖ Strategies to Demonstrate Endorsement of ITS.

Section 3.1.1 describes the strategies used in the Chicago Metropolitan Area to gain endorsement of ITS. It is not a given that elected officials and transportation managers will readily endorse ITS products and services. They may need to be convinced of the benefits through different education strategies. Section 3.1.2 provides examples of strategies used to demonstrate endorsement. Once support for ITS solutions is gained, there are channels through which to demonstrate endorsement of ITS solutions to organizations throughout the Chicago Metropolitan Area, such as through planning documents.

3.1.1. Strategies to Gain Endorsement of ITS

All interviewees indicated that elected officials are the most important people from whom to garner support for ITS since they make funding decisions and can set the tone for support by other stakeholders. It is also important for mid- and upper-level transportation managers to support ITS since they inform elected officials and guide funding decisions within their respective transportation organizations. To gain their support, elected officials and transportation managers need to be provided with data and information that define ITS products and services, explain how the technologies are used, and detail the benefits that can be realized. This information can be made available through one-on-one discussions with agency management, presentations, scanning reviews, and committees. Educating the general public is also a viable way to inform elected officials.

This section discusses four strategies:

- ❖ Data and Information
- ❖ Scanning Reviews
- ❖ Committees
- ❖ Public Outreach

Convincing elected officials to endorse ITS is not always easy or successful. Issues such as welfare and crime can receive priority over transportation issues, which can be complex and difficult to understand. Interviewees also stated that elected officials at the local and county levels need to be convinced that the system-wide benefits produced by ITS also produce benefits at the local jurisdiction level. Efforts to coordinate arterial signal systems across counties may cost a single county only \$20,000, but those funds are competing for other projects that are important to voting citizens, such as senior citizens centers. Overall, elected officials think ITS is a good idea, but are skeptical and need proof that there are benefits for their jurisdictions. Another common hurdle is that the many acronyms used to describe ITS products and services make ITS concepts difficult for elected officials and others not familiar with the technologies to understand.

Transportation managers, although more knowledgeable and usually more accepting of ITS solutions than are elected officials, have to make funding decisions between competing interests within their organizations. ITS products and services are only one of many items that compete for funds. One interviewee stated that he has educated four different presidents of a transit agency. The current president is the first to openly support ITS. In the past, other presidents favored buying new transit vehicles over investing in ITS technologies. Interviewees from some agencies stated that they do not have direct access to elected officials, and that educating elected officials is a role most appropriately assumed by the metropolitan planning organization (MPO). It was commonly agreed that the better transportation professionals know their elected officials, the more likely the professionals would conduct some ITS outreach directly to the elected officials. Many interviewees in upper management positions indicated that educating elected officials is a time-consuming part of their job.

Data and Information

Many interviewees stated that operational data demonstrating the benefits of ITS would be useful to educate elected officials but that the data are not yet available on a regular basis or in large quantities since ITS technologies are in the early stages of deployment. The gathering and use of ITS generated data are in the planning stages in the Chicago Metropolitan Area. Therefore, elected officials and managers must be sold on ITS through the presentation of qualitative and anecdotal information, and from quantitative studies, such as benefit-cost estimates, completed in other metropolitan areas.

In Chicago, the most common method used to inform elected officials and managers about ITS are presentations to the MPO Board and management staff of key agencies, or to discuss specific projects with elected officials on a one-on-one basis. Over a five-month period in 1998, staff from the Chicago Area Transportation Study (CATS) made presentations on ITS to all 11 Regional Councils of Mayors, which coordinate the 271 municipalities comprising the Chicago Metropolitan Area. A key purpose of these presentations were to update the mayors and local transportation officials on the status of the *Northeastern Illinois Strategic Early Deployment ITS Plan*, to discuss ITS in general, and to provide an opportunity for additional input into the *Deployment Plan* development process. Although many interviewees stated that the MPO is the natural entity to inform elected officials, staffs from the transportation operators are also assuming this responsibility in the Chicago area.

One interviewee suggested that the message to elected officials and managers must be that they consider ITS products and services as one of many tools used in transportation and that integration of ITS projects across a metropolitan area takes a long time to achieve. A few interviewees suggested that elected officials need only be provided with simple facts. An MPO official noted that the level of data and information provided to elected officials and managers must be targeted to the ITS sophistication of the audience. Staff from the DuPage Mayors and Managers Conference, a council of local governments in Chicago's Metropolitan Area that is far ahead in considering ITS products and services, believe that information should be shared to build support in any method possible; so they welcome the MPO awareness presentations and provide training for projects specific to the DuPage County area. Conference staff have educated their local elected officials to the point that the municipal leaders in DuPage County are comfortable with ITS-related terminology.

An Illinois DOT official added that data and information should be presented when support for a particular ITS project or program is needed. Representatives from many of the agencies felt that because of the smaller budgets of ITS projects, ITS projects are not a primary concern to most politicians, therefore not requiring a great deal of data to overcome any opposition. A highway official from a second county stated that the senior managers and elected officials know little about ITS. Because there are only a few staff from the county's operations, planning, and economic development offices that are knowledgeable about ITS, and their time is limited, they must rely on outside agencies, such as the MPO and the Advanced Technologies Task Force to disseminate information on ITS. If staff had to be involved with excessive training, then the six-month period to obtain funding approval would expand.

For the Chicago area, most interviewees conjectured that once ITS projects are operational for a period of time, elected officials will want information to decide whether it is worthwhile to continue funding the operations as well as to upgrade or expand the advanced systems. At that point, there will be even more intensive competition with traditional capital projects and more need to provide sound operational data and information to elected officials to enable them to justify their support of ITS projects and possible increases in operating costs.

Scanning Reviews

Scanning reviews, or the visiting of facilities in cities that have deployed ITS, is one useful strategy being used nationally for informing not only elected officials and upper management, but other stakeholders as well, such as staff from fire, police, and public works departments. Scanning reviews, such as visits to traffic management centers, help make people aware of ITS when it was not previously a priority to them.

While there have been some examples of agency staff visiting other areas to learn about ITS deployments, in general, the transportation officials in the Chicago Metropolitan Area have not used scanning reviews to increase support of ITS projects. The general feeling among agencies is that with limited funds, there are other methods to obtain support and learn about ITS technologies. The DuPage Mayors and Managers Conference uses an on-call engineering consultant that has first hand knowledge of many field deployments and ITS operations

throughout the country. This individual's knowledge replaces the need for site visits. Transportation administrators and staff have also used the opportunities presented at ITS America, ITS Midwest, and Public Technologies, Inc. meetings to learn what is occurring in other parts of the country. As part of the ADVANCE project, the Illinois DOT conducted many scanning reviews of their facilities. This provided an additional opportunity for the Illinois DOT's ITS staff to communicate with and learn from elected and technical representatives of other metropolitan areas.

An Illinois DOT representative stated that when exposure is needed in advance of a specific project, these site reviews can be critical in obtaining support for an ITS project in that they help decision-makers conceptualize what they need. Unless there is quick action that follows these reviews, regular scanning reviews can appear as a waste of public funds. Because there were no transit systems with radio, global positioning system and automatic vehicle location communications in the U.S. in 1990, Chicago Transit Authority technical staff and managers had to visit European cities to learn what applications would best fit their transit system. The Chicago Transit Authority staff noted that this research activity would not be necessary today because there are a number of transit systems in the United States with these applications.

Committees

Elected officials and transportation managers can become educated on ITS technologies, products, and services by participating on committees, especially those established to consider ITS solutions. The goal of some ITS-related committees is to educate members on ITS technologies in general, while the goal of other committees is to examine ITS options that can help solve regional transportation problems. Participation on either type of committee improves the knowledge base of elected officials, who are then more likely to support ITS deployments. ITS advocates are especially important if they are linked to the policy-level decision-making process as are elected officials and upper managers in transportation organizations.

There are not a lot of committees in the Chicago Metropolitan Area that provide the opportunity to educate policy makers on ITS technologies and aid in gaining the endorsement for the use of ITS products and services. However, the ITS and transportation committees that do exist enable ITS solutions to be raised, which can be passed on to those individuals whose support is deemed critical. At the supra-regional level, the Gary-Chicago-Milwaukee (GCM) Priority Corridor Deployment (or Technical) Committee is a 25-member group that discusses and develops specific GCM Corridor projects. While there are no elected officials on this committee, it does include some agency administrators. Likewise, elected officials and upper management do not usually attend Advanced Technologies Task Force meetings. However, members of the Advanced Technologies Task Force reported that most of them do return to their agencies and discuss issues with administrators, who in turn may pass this information on to elected officials within their jurisdiction.

Many of the respondents relayed that the MPO task forces, working groups, and subcommittees are where the actual decision-making for the MPO occurs and where most information is disseminated. Much of the work of the 20-member Policy Committee is procedural, and there is limited time for educational opportunities. The MPO staff's best opportunity to reach local

politicians is through the 11 Regional Councils of Mayors where a variety of transportation-related issues are discussed. The MPO staff has already made informational presentations on ITS to all of these Council of Mayors. Staff at the DuPage Mayors and Managers Conference, one of the Councils of Mayors, uses two Transportation Committees to educate its membership on transportation issues and solutions, including ITS. Staff education of this committee primarily targets elected officials and their representatives. Similarly, the Metropolitan Mayors Caucus provides an opportunity to reach elected officials about transportation issues, which have included ITS. It is currently unclear if any of the education efforts in the region has produced support, but transportation officials noted that awareness has not created any opposition.

Public Outreach

Gaining citizens' support for ITS products and services is an alternative way to indirectly gain elected officials' support. This is seen as a slow process. An Illinois DOT official said that the public outreach they conduct requires a coordinated effort between the Illinois DOT and the local elected officials to make sure the audience is targeted in a manner that will appeal to them. By targeting the message to the public rather than using the same informational material used to gain support from elected officials or agency administrators, agency staff and local politicians can avoid responding to unnecessary concerns about ITS products and services raised by the citizenry.

Most of the agency representatives said that public outreach is a later step in the local ITS program. Their first priorities are programs that educate and gain support of politicians and other stakeholders, such as emergency service providers and the private sector. While the public was able to attend the educational sessions provided by the CATS with each Regional Council of Mayors, they were not targeted. The public has also been educated at recent regional public forums sponsored by the CATS on Congestion and Mobility, in which ITS was one of the components discussed. The CATS and some local jurisdictions representatives reported that currently the best way to reach the public sector regarding ITS is through their established media ties, including the occasional published article or television news report favorable regarding ITS.

3.1.2. Strategies to Demonstrate Endorsement of ITS

Once support has been garnered, endorsement of ITS deployments can be demonstrated through planning and programming activities, including those required as part of the MPO's federal responsibilities, or other planning activities that occur outside of the MPO process. This section describes channels through which ITS endorsement can be demonstrated:

- ❖ Regional Transportation Plan
- ❖ Transportation Improvement Program (TIP)
- ❖ Other Planning Documents
- ❖ ITS Plans
- ❖ Committees
- ❖ Advocacy from Decision-Makers

The first four strategies demonstrate ITS endorsement through planning and programming activities. For example, citing ITS in the MPO's regional transportation plan provides a policy statement that the region is committed to ITS, allowing all operating agencies to know that ITS products and services are options that can be considered to solve transportation problems. These strategies can be especially useful in areas where there is little direct support from elected officials. In such areas, ITS tends to be planned and deployed piecemeal, in a bottom-up fashion, instead of top-down. Including ITS in planning documents can help transportation providers think through how to bring together all of the decentralized ITS activities and integrate them into a regional context.

The fifth strategy is the use of committees through which elected officials and upper-managers support regional planning and deployment of ITS. The sixth and final strategy is the effort of some elected officials and transportation managers who have publicly acted as advocates of ITS solutions.

Regional Transportation Plan

Nationally, many MPO staffs include or are planning to include ITS in their regional transportation plans. Some plans contain more detail than others, depending on the area's ITS needs and level of ITS development. The main objective is to raise the significance of ITS at the policy level and make a regional commitment to ITS. This legitimizes ITS products and services and helps encourage transportation professionals to consider them as solutions when addressing transportation problems and to include ITS solutions within other planning documents, such as in major investment studies.

In Chicago, the regional transportation plan is a policy document that outlines the regional policy commitments. ITS was referenced for the first time in the November 1997 *Destination 2020 Regional Transportation Plan*. In that Regional Transportation Plan, there is a stated need for integrating ITS technologies, and ITS use is supported in a policy statement as a Transportation Congestion Management strategy. In fact, six of the 11 Transportation Congestion Management strategies are ITS-related. The *Destination 2020 Plan* lists major facility projects, mostly transit and highways. However, projects that are difficult to forecast over the next 20 years, such as ITS, bicycle and pedestrian, and arterials projects, are not listed in the plan. This is especially true in the case of ITS projects, in which technologies can change in a short amount of time making their long-range direction unclear.

The majority of interviewees said that ITS inclusion in the Regional Transportation Plan as a policy statement for ITS support is more important than getting ITS projects listed in the TIP. Inclusion in the Regional Transportation Plan provides good exposure for ITS. A high-level MPO administrator noted that the bottom line was to get an ITS statement in the Regional Transportation Plan and initially not pursue too great an ITS element to which neither the Regional Transportation Plan Committee and the Operations Task Force could agree. If ITS is not in the Regional Transportation Plan, then it will not become a priority for regional funding.

Officials in Chicago remarked that their area's regional transportation plan is slowly evolving and conjectured that the Plan should eventually include advanced transportation systems and

their associated operational impacts. This next generation of regional transportation plans would include specific ITS strategies and projects, possibly under an ITS section. Some of the respondents suggested that operating costs would have to be addressed in the future with increased ITS deployment. However, there is no consensus on whether these costs should be included in regional transportation plans and TIPs.

Transportation Improvement Program

Most ITS projects, like other transportation projects receiving certain types of federal funds, must be included in a region's TIP. Some MPO staff, however, go beyond this basic requirement and use the TIP to highlight ITS projects. Administrators from the Illinois DOT and the CATS cooperatively decided to include GCM Priority Corridor projects funded through the Illinois DOT in the Chicago Metropolitan Area's latest TIP, even though they were not required to go into the TIP. Officials from the Illinois State Toll Highway Authority likewise included ITS projects in the Chicago TIP, although not required because they were neither federally funded nor capital improvement projects. These projects were included for informational purposes.

Most agency officials believe that adding ITS projects to the TIP does not produce the exposure that adding an ITS policy statement in the regional transportation plan provides. The TIP is seen as a large document that compiles the priority projects from a number of transportation entities and regional associations, but not a list of priorities for the entire region. Many transportation officials said the approach of documenting individual agency priorities limits the ability to flexibly plan how to best apply transportation resources to accomplish complex and occasionally conflicting regional transportation and air quality objectives.

The Chicago area TIP identifies all projects funded with surface transportation program, national highway system, congestion mitigation and air quality improvement (CMAQ), and GCM Corridor funds. In the Chicago urbanized area, many decisions involving the allocation of transportation resources are based primarily on historical formulas. Based on a formula, surface transportation program funds are allocated to several large agencies, including the Regional Transportation Authority, the City of Chicago, and the 11 Regional Councils of Mayors. Each Council then sets its own methodology as to how to distribute the funds to its local jurisdictions. The CATS Policy Committee controls all CMAQ funds. Projects funded with CMAQ go through a selection criteria process, including quantitative analysis. CATS staff have minimum control over the selection criteria and the analysis of non-CMAQ projects submitted for TIP inclusion.

Each agency, jurisdiction, or Council of Mayors has its own ranking methodology to prioritize projects, which will be submitted for inclusion into the TIP. The MPO staff aid the suburban Councils of Mayors with the development of their project ranking methodologies. In most of the jurisdictions, ITS is still an unknown application and it is too early for ITS to have separate criteria for project selection. However, in DuPage County, where Transportation Congestion Management projects are mainstreamed, the DuPage Council of Mayors sets aside federal surface transportation program funds for Transportation Congestion Management projects, which include ITS projects. The City of Chicago DOT has likewise developed criteria that have given

some ITS projects a higher priority, such as the citywide signal system and the traffic control center (Chicago Net). A CATS planner noted that until the methodology and criteria for selection are regionalized, ITS deployments are best aided by being included in bigger capital projects.

Even with the agency-segmented TIP process, area transportation officials have seen benefits from the inclusion of ITS-related projects in the TIP. Other than the GCM Corridor projects, which are broken out separately in the TIP, ITS projects are included like other projects. An ITS section was added to the latest TIP document to highlight the existence of ITS projects in the region and aid in further mainstreaming ITS into the planning process. The ITS section has identified \$6.9 million worth of projects. It was estimated that roughly ten percent of the projects in the TIP are ITS-related, but many ITS components are included within other larger projects. The Regional Transportation Authority sees the value of the TIP process in providing information on ITS projects that are being conceived and planned by other agencies, including the municipalities in which public transit services are provided.

The majority of respondents from the Chicago area agencies foresee ITS projects being part of the normal planning process and all ITS applications being documented separately. While there is no call to do this by the CATS or other agencies at this time, it is possible to develop a program summary of all the ITS plans and deployments. As the ITS projects become more mature and the systems from one agency need to be interconnected with a system from a separate agency, the respondents see a time when operating costs, along with capital costs, will be included in the TIP. Currently, the individual agencies consider operating costs with each project, but do not discuss it in a regional context. This will present further impetus for planning and operations people to communicate.

Other Planning Documents

In a number of areas, ITS products and services are now included in planning documents such as feasibility studies, conformity determinations, congestion management plans, and major investment studies. Including ITS in any of the documents indicates movement toward mainstreaming ITS products and services into the transportation planning process. Similar to including ITS in the regional transportation plan, this action increases awareness of ITS products and services to agencies and operators and makes a statement that ITS products and services are acceptable solutions.

The respondents in the Chicago Metropolitan Area stated that with the initiation of the GCM Corridor project and the *Northeastern Illinois Strategic Early Deployment Plan* effort, there is newly attained knowledge of ITS, and the use of advanced technologies are now referenced in a number of CATS' planning documents. The Congestion Management System study includes several ITS strategies, such as improved signal system performance. While the Chicago MPO staff does include signal coordination and other ITS projects in the network models for conformity determinations, it is difficult to break out individual ITS impacts from the entire network model. CATS staff did, however, complete a special analysis for the I-Pass system during the last round of conformity, underlying the significance of this electric toll collection deployment for the Illinois State Toll Highway Authority.

ITS Plans

ITS plans can be useful tools to both gain and demonstrate endorsement of ITS by transportation managers and elected officials. Interviewees revealed that ITS plans can capture the attention of the top management of transportation operators who had never before considered ITS products and services. The plans can also provide a regional perspective that ties together ITS projects in those areas in which ITS has been planned for and deployed on an individual project basis.

Finally, it is with these plans that the first steps can be taken to incorporate ITS projects into the metropolitan transportation planning process. The creation of a plan causes many transportation officials in a region to consider ITS technologies for the first time. The plan provides a roadmap and helps to develop consensus among operators and agencies. After the initial ITS project consideration, the next step occurs and many projects identified in these ITS plans are submitted for funding through the regional TIP development process.

In the Chicago Metropolitan Area, there has been a great deal of effort to develop ITS plans at every level. At the multi-state level, the *Gary-Chicago-Milwaukee Priority Corridor ITS Plan* was completed in 1995 and updated in 1997. At the metropolitan level, the *Northeastern Illinois Strategic Early Deployment Plan* has been under development since 1997. At the local level, the DuPage Mayors and Managers Conference's Strategic Plan was updated in 1999 and the City of Chicago has drafted an ITS Master Plan as a compendium to the City's Transportation Management Plan.

Like many large metropolitan areas with numerous agencies and organizations, ITS products and services in the Chicago Metropolitan Area have been deployed individually, in a project-by-project fashion. The initial focus of the GCM Corridor Plan was on the expressways. The *Northeastern Illinois Strategic Early Deployment Plan* has brought the GCM Corridor effort closer to the local level by concentrating on the arterials as connectors to the expressway. There has been a conscious effort not to have the *Deployment Plan* duplicate the larger GCM Corridor effort. The *Deployment Plan* is a unique subset of the GCM Corridor Plan; it addresses local projects and lays out vision for how things will be locally. This Deployment Plan, led by the CATS, and co-sponsored by the Illinois DOT, Illinois State Toll Highway Authority, Regional Transportation Authority, and Chicago DOT, helped to create a regional view of individual ITS projects of individual agencies. The *Deployment Plan* provided each agency with information on ITS activities, and areas were identified where integration could occur. Short and mid-range project proposals from the plan are now being developed and completed.

On a more local scale, members of the DuPage Mayors and Managers Conference consider ITS technologies as part of their three-year strategic plan. The Mayors and other local leaders had little concept of the GCM Priority Corridor until the Conference's Strategic Plan was developed, which required that they find out what was happening elsewhere in Illinois. The DuPage officials learned that they could benefit by tying their efforts to the GCM Priority Corridor. The *Early Deployment Plan* has incorporated the projects from the Conference's Strategic Plan, but the Strategic Plan does not directly tie into the MPO's *Destination 2020 Regional Transportation Plan*, which was adopted in 1997. However, like the City of Chicago's ITS Plan, the ITS

projects included in the Conference's Strategic Plan will eventually be incorporated within a future update of the regional transportation plan. A DuPage official conveyed the value of these plans. The individual noted that although only planning agencies and operators generally read the plans, the sharing of the plans with their elected officials has helped develop support for regional ITS deployments from those who make funding decisions.

Committees

Elected officials and transportation managers sometimes use or form committees through which they act as regional advocates for ITS. Through these committees, they influence ITS policy and specific projects. They also encourage staff of transportation agencies to consider ITS products and services at a regional level to solve transportation problems. In Chicago, the Metropolitan Mayors Caucus and the Mayor's Traffic Management Task Force are two groups that were formed to involve elected officials and transportation managers in transportation issues. The 11 Regional Councils of Mayors are forums in which transportation discussions can be conducted among elected officials. However, none of these groups have an agenda specifically devoted to ITS applications.

Most of the committees that are more narrowly focused on ITS deployments and issues are composed of staff from various transportation agencies and jurisdictions. Because elected officials have limited time to attend "another committee meeting," information from these committee meetings disseminated by staff to the politicians and other decision-makers are instrumental in gaining support. Elected officials and top-level administrators rely on staff to synthesize and relay only the most applicable information on new technologies.

Advocacy from Decision-Makers

In some metropolitan areas, elected officials and transportation managers have personally taken on the responsibility to act as advocates for ITS products and services. A number of interviewees said that there were not many outspoken proponents for ITS projects in the Chicago area because ITS components (traffic control centers, emergency traffic patrols, variable message signs, connections to media) have been around for almost four decades. ITS solutions are accepted as part of normal operations in Chicago and there is only a limited need for high-profile proponents of ITS. A state DOT manager noted that there is "quiet support" for ITS. The individual cited the Illinois Secretary of Transportation and others in the Illinois DOT who encourage ITS projects. However, an external advocate could help increase support outside of the Illinois DOT and with the public. The official added that an advocate may also be valuable in pushing for inclusion of ITS solutions into the MPO's planning process.

Without making a specific commitment to ITS, Chicago Mayor Richard Daley has become one of the most influential ITS advocates in the Chicago Metropolitan Area. What the Mayor did make was a commitment to add capacity to the transportation system without building more roadways, opting to manage and operate the area's existing transportation systems better. At the same time, Mayor Daley has stressed a regional and cooperative view. The Commissioner of the Chicago Department of Transportation and his staff have determined that ITS applications are one method of meeting the Mayor's goals and, therefore, consider ITS to solve transportation

problems. In keeping with this policy direction, the Chicago DOT staff have developed an ITS Master Plan that will be incorporated into the city's transportation management plan and eventually into the regional transportation plan.

Although most municipalities and counties have required a great deal of "handholding" from the CATS to be included in the ITS planning and deployment process, representatives from Lake County, the municipalities of DuPage County, and the City of Chicago have been the main local officials to step up and lead the local interest. The membership of the DuPage Mayors and Managers Conference's Transportation Technical Committee and the Conference's staff are working as a team to create a long-term vision for applying ITS in the collar counties of the Chicago Metropolitan Area.

In addition, staff at both the Illinois DOT and the Chicago MPO have acted as regional advocates for ITS efforts. Officials from both the Illinois DOT and the CATS have worked with the Federal Highway Administration to sponsor federally-developed Professional Capacity Building ITS courses. These courses have been made available to decision-makers, administrators, and staff from a wide variety of transportation agencies in the area. The Illinois DOT's ITS Program Manager was praised by a number of transportation officials for making the ITS Office a resource center for ITS information. The CATS' Deputy for Operations is also considered a primary advocate for ITS deployments and has been instrumental in the formation of the Advanced Technologies Task Force, as well as efforts to include ITS references within the MPO planning documents. Most of the advocacy work is still directed to the staff level. One official admitted that someone still needs to take the leadership role and cultivate the support from elected official in order to get greater levels of ITS products and services deployed.

3.2 COMMUNICATION AND COORDINATION

ITS technologies can be most useful when planned for 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. It can, however, be difficult to plan for and deploy ITS within a region, especially in areas composed of many local autonomous communities. For example, in Chicago, there are about 270 governmental jurisdictions and another ten regional or statewide agencies that have some ties to transportation.

The staffs of public works departments and transit operating agencies tend to focus on only those activities that fall within the boundaries of their individual jurisdictions, such as roadway construction and maintenance, transit service, and incident clearance. It is also difficult for one agency to communicate and coordinate with another agency about ITS planning and deployments if there is not a centralized process internal to each agency that allows representatives can speak and act for the agency.

Section 3.2 is divided into three subsections:

- ❖ Strategies to Improve Communication and Coordination across geographic boundaries
- ❖ Strategies to Improve Communication and Coordination across jurisdictions and modes

❖ Strategies to Improve Communication and Coordination within agencies.

Strategies for communicating and coordinating across geographic boundaries call for the involvement of policy makers and elected officials. Strategies for communicating and coordinating across jurisdictions and modes depend on the active participation of transportation professionals. Coordinating ITS solutions within agencies is an intra-agency strategy. This strategy focuses on the importance of coordination between departments within the same agency, such as between the ITS staff and capital improvements staffs.

3.2.1. Strategies to Improve Communication and Coordination across Geographic Boundaries

Encouraging transportation staffs to plan and operate ITS on a regional level requires elected officials from cities and suburban communities to communicate and coordinate with one another and encourage the transportation agencies within their jurisdictions to do the same. Interviewees stated that elected officials create committees to accomplish these goals. Although not as widely used, targeted ITS education can also be an effective strategy.

Committees

Interviewees collectively expressed that elected officials' support was most useful for obtaining funding and raising the awareness and acceptability for ITS products and services. However, some elected officials have taken their support a step further and have formed committees to coordinate ITS activities throughout the metropolitan region. This on-going coordination among committee members helps to shorten the time needed for project development and to procure funding.

Mayor Daley of Chicago and leaders from more than 30 suburban communities have created a policy-level coordinating committee, known as the Metropolitan Mayors Caucus. The overall objective of the Caucus 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 system is one of many agenda items that Caucus members consider. This Caucus has had meetings to identify corridors where certain ITS technologies would be applied.

Because of the Caucus, politicians and administrators from area jurisdictions now talk more often with one another. This has provided the opportunity to initiate new ideas for integrating ITS among the City of Chicago and other jurisdictions. These ideas include coordinated traffic signal systems and bus-priority corridors. In addition, the Caucus has endorsed solutions developed by other regional organizations, which assists their likelihood for funding. The DuPage Mayors and Managers Conference identified a bottleneck at an interstate location where two tollways merge. This congested area presents a local problem with regional impacts. The Conference's consulting engineer suggested interim ITS solutions costing \$500,000 until the long-term solutions can be designed and implemented. The Caucus members endorsed the idea.

The Metropolitan Mayors Caucus operates outside of the MPO structure, although the MPO staff participate in the group's efforts. There are also coordination activities within the MPO structure. The suburban mayors have a representative on the Advanced Technologies Task Force, the ITS coordinating committee formed by the MPO. At the Task Force meetings, staff from the area's operating agencies discuss local ITS activities with one another. The Regional Councils of Mayors' representative to the Technologies Task Force relays issues discussed by members of the Task Force through the Council of Mayors network and directly to the mayors. The Councils of Mayors themselves have acted as a forum, within the MPO structure, that has increased communication and coordination of ITS issues among the suburban elected officials.

Education

In the Chicago Metropolitan Area there have been a few educational efforts that have been targeted specifically to elected officials. Most ITS training courses have been for transportation professionals. Select elected officials have been invited to attend some of the Federal Highway Administration's ITS awareness courses. When elected officials are included, the by-product of these education initiatives is the enhancement of ITS discussions among elected officials from various jurisdictions. As part of its outreach effort to inform and involve local governments in the development of ITS, CATS staff conducted a series of presentations to and discussions with the MPO's 11 Regional Councils of Mayors. These presentations have produced some discussions of what could be coordinated across geographic boundaries. In the spring of 1998, the Illinois DOT's ITS Program Office developed a public relations and outreach plan that outlines methods to be taken to educate local officials about ITS and to increase communication among the decision makers regarding ITS deployments.

Many transportation officials throughout the United States see scanning reviews as an extremely useful process to get the participating elected officials to learn about how to use the technologies. Including both elected officials and technical staffs has enhanced the discussions occurring on the scanning reviews. However, the Chicago area transportation officials believe that there are better ways to educate elected officials and to enhance communication regarding ITS deployments. While some awareness training for elected officials is occurring, extensive efforts targeting elected officials to increase their communication and coordination will occur later, after the ITS components are producing easily defined benefits. These officials admit that their first effort is to increase knowledge and communication among the management and staffs of the transportation agencies.

3.2.2. Strategies to Improve Communication and Coordination across Jurisdictions and Modes

All stakeholders should have input into ITS planning and deployment activities since many of these agencies will be required to operate these systems or must provide some coordination or information to enable these systems to run efficiently. In addition, ITS projects are inherently capable of serving the needs of many agencies. This requires improved communications and coordination across agencies and jurisdictions. Interviewees listed a variety of strategies to accomplish this:

- ❖ Education
- ❖ Committees
- ❖ Regional Programs
- ❖ MPO staff

The first two strategies involve educating staff members and participation on committees. Most interviewees stated that committees were the most commonly used strategy to improve communications and foster coordination. However, some interviewees stated that before a committee is formed, agency and jurisdiction staff should be educated on the benefits of regional planning for ITS so that the proper level of importance would be attached to the concept of working with other agencies. This may be the first time some agency staff would find themselves being asked to coordinate with other agencies. One interviewee stated that the most appropriate staff member might not be sent to represent an agency unless that agency attaches enough importance to a committee. This can make the committee less effective.

The third strategy uses the development of major regional programs and projects to increase interaction among staff from many agencies. This strategy was cited as useful in those areas studied where ITS already had been deployed in a piecemeal manner; Chicago being one of those metropolitan areas. Finally, the last strategy identifies the unique role that MPO staff have assumed in improving communications and coordination between agencies that are planning ITS projects.

Education

Education can improve coordination across jurisdictions and modes in several ways, including increasing awareness of ITS products and services, reducing tensions between agencies representing different modes, and getting planners and operations staff to understand each other's responsibilities and terminology. Many interviewees stated that there are no real opponents to ITS, but that a lack of awareness of the products and services and their benefits hinders the routine consideration of ITS technologies in a region's planning and deployment processes. In addition, tensions between modal agencies and the reluctance of planners and operations staff to talk to one another can inhibit ITS planning and deployment.

In Chicago, CATS staff were cited as best suited to educate regional stakeholders. In addition, the Illinois DOT and Regional Transportation Authority staff also willingly assumed this responsibility. The MPO staff found that they had to educate the Regional Transportation Plan Committee on regional ITS needs as part of their regional transportation plan education in order to get the most effective policy statement for ITS usage placed in the *Destination 2020 Regional Transportation Plan*.

The Chicago MPO has sponsored workshops and stakeholder meetings on ITS. These meetings have involved representatives from the local transit agencies, the state DOT, local communities, the Federal Highway Administration, and the Federal Transit Administration. At the meetings, staff from the Illinois DOT, other deploying agencies, and the CATS discussed the ITS deployment process. These sessions enabled the CATS staff to receive input as to what these stakeholders wanted from ITS. The outreach meetings increased overall ITS awareness and

helped all agencies rationalize why they deploy ITS. These initial meetings helped set the stage for the creation of the Advanced Technologies Task Force. Along with the ITS meetings, the CATS has held a regional forum on Congestion and Mobility in which ITS was one of the components discussed. All of these sessions have enabled the stakeholders to get to know each other. The attendees have noted that familiarity with other stakeholders has improved their working relationships.

Committees

Creating an ITS committee that operates either within or outside of the MPO structure is a common and effective strategy for improving communications on transportation needs and ITS project concepts among transportation agencies, jurisdictions, and other stakeholders. Most interviewees stated that the value of interfacing between member agencies provided by participating on an ITS committee should not be understated. Initially, participating on ITS committees provides staff members more opportunities for communication than for actual coordination and integration of projects. However, preliminary coordination between stakeholders does occur at the ITS committees for individual projects. Many times, improved communications between committee members leads to collaboration and extensive coordination outside of the committee. Finally, many interviewees emphasized that committees bring operations and planning staff together, improving communication between these two distinct groups; and thus, the likelihood that ITS products and services will be successfully planned, deployed, and integrated.

Interviewees collectively stated that each agency's meaningful and effective assignment of personnel to an ITS committee is important. Qualified staff who are knowledgeable about their individual organizations should represent the agencies and jurisdictions. These individuals can bring useful information to the committee, and can effectively convey information back to their agency. Getting the most qualified representatives involved in the committee may require securing the commitment of the top management of member organizations. If ITS is not a priority, then a less knowledgeable staff person may be sent to the committee, therefore reducing the effectiveness of the committee.

Staff from the CATS created and now lead the Advanced Technologies Task Force. The Task Force coordinates ITS activities generated as part of the *Northeastern Illinois Strategic Early Deployment Plan*. This effort covers only about five percent (\$5 million) of all the money used for ITS deployments in the metropolitan area. The majority of ITS projects are conceived, developed, and coordinated through the GCM Priority Corridor. Nevertheless, the Task Force provides a forum for staff from different agencies and jurisdictions to talk to one another, learn about different agencies' projects, including those occurring within the GCM Priority Corridor, and develop contacts for each project. In the past, agency staff coordinated with one another through individual one-on-one relationships. The Advanced Technologies Task Force maintains a table of ongoing activities and a member list of contacts. The list of contacts directs agency staff to individuals from other agencies with common interests, whose introductions may have been made only by accident before the Task Force existed.

The Advanced Technologies Task Force brings together operations staff of transportation providers where only planning staff had traditionally participated. The Task Force has evolved from an educational committee to a planning body and is now targeting specific short and mid-term deployments and creating a regional architecture. This wide scope would not be possible without the involvement of planners, engineers, and operations professionals participating on the committee and receiving support from their agency administrators. The Task Force also includes organizations that would not normally be involved in the metropolitan planning process, such as representatives for the suburban mayors, county governments, the Center for Neighborhood Technology, the American Automobile Association, the University of Illinois, and Argonne National Laboratory.

The GCM Corridor is focused on the Interstate network and major transit, while the Advanced Technologies Task Force is focused on local primary and feeder routes. Task Force members are developing guidelines for transit signal priority. As part of this effort, DuPage Council of Mayors' staff, who are represented on the Task Force, have expanded their role in two demonstration corridors which will have coordinated signals across jurisdictional boundaries and may also include transit priority.

A number of the transportation officials stressed that the goals and objectives of an ITS committee should be clearly defined, preferably during the creation of the committee. Many interviewees stated that ITS committees should provide a forum for improving communications and interaction among agencies. Such a committee would also enhance regional transportation planning. Others described committees that would focus on specific projects and address substantive coordination issues regarding actual and planned projects deploying advanced technologies. Some officials thought that improving communications was a valuable role for the committee and project coordination was best left between agencies, outside of the committee.

Regional Programs

The Intermodal Surface Transportation Efficiency Act of 1991 set aside federal funds for four Priority Corridors to promote the deployment and integration of ITS products and services. The Chicago Metropolitan Area was included within one of the designated Priority Corridors – the Gary-Chicago-Milwaukee Priority Corridor. Communications and coordination channels in the form of extensive committee structures operate within each Priority Corridor, bringing all stakeholders together to solve identified transportation problems with ITS solutions.

A number of interviewees believed that creating a major regional program of ITS projects is a useful strategy for any region. It provides a forum for agencies across broadly defined regions to communicate, coordinate, and organize formal data-sharing practices. This will become more important in the future as the information is increasingly used to improve operations and to identify benefits in the face of increasing competition with capital projects. Participants begin to think regionally and include groups not traditionally targeted for transportation planning, such as representatives of airports, seaports, and trucking interests.

Some interviewees cautioned that this strategy of creating regional programs of ITS projects could be a dangerous and potentially wasteful strategy for areas with less mature ITS planning

processes. The region as a whole could move too quickly in the wrong direction with a new program. Instead, officials should start with small ITS projects in order to learn from them and incrementally work up to the point of developing a large program. In fact, this is what has occurred in the Chicago Metropolitan Area, where ITS products and services were deployed in small projects, and then major programs were developed bringing all of the deployments together.

Most of the ITS coordination that has occurred throughout the Chicago Metropolitan Area has occurred primarily through the GCM Priority Corridor. The Corridor covers a region twice the area of the Chicago Metropolitan Area. At first, participants on the GCM Corridor committees focused only on expressways. More recently, the GCM Project Managers also focused on Chicago's arterials and the interaction of these arterials with the Illinois DOT's expressways. More local ITS planning and deployment efforts are included in *the Northeastern Illinois Strategic Early Deployment Plan* and are coordinated through the Advanced Technologies Task Force at the Chicago MPO. Staff from the Chicago MPO, Illinois DOT, Regional Transportation Authority, Chicago Transit Authority, and Chicago DOT participate on both the GCM Priority Corridor committee and the MPO's Advanced Technologies Task Force. While both the GCM program and the *Strategic Early Deployment Plan* have created vast opportunities for communication and coordination regarding ITS for the transportation professionals in and around the Chicago Metropolitan Area, an effort is made not to duplicate the objectives and work of the two efforts.

The GCM Priority Corridor members are structured into three levels of committees. At the policy-making level is the Executive Committee composed of the Secretaries of Transportation from the three member states, Illinois, Indiana, and Wisconsin. The top management-level Coordinating Committee has a Chief ITS Engineer from each state and one Federal Highway Administration representative from each of the division offices. At the staff level, the Deployment Committee has 25 members; staff from the three MPOs within the Priority Corridor, including the CATS, are included on this technical committee. The GCM Deployment Committee also includes all major transit operators, toll authorities, principal cities, and primary academic and transportation research organizations.

A regional architecture is being developed through the GCM Committee. The National ITS Architecture served as a model for the regional architecture. From the guidance obtained from the GCM Committee members' effort, the Chicago area's Advanced Technologies Task Force members are now discussing how to incorporate the regional architecture at the project level, perhaps in the form of a checklist. Those involved with this effort contributed that going through the exercise of creating an architecture will encourage coordination as stakeholders and integration opportunities are identified.

The Chicago Transit Authority is one agency in the metropolitan area heavily involved in the regional architecture effort. There have been discussions on how highways and transit officials can coordinate and benefit from each other's technologies. For example, the Illinois DOT's expressways have many sensors but arterials are without sensors. Buses could act as probes on arterials for estimating speeds and congestion, supplement highway loop detectors, and provide arterial information. Using the Illinois DOT's vehicle message signs, highway travelers can

receive estimated comparative travel time by car and by transit. Both the Illinois DOT and the Chicago Transit Authority variable message signs can display highway congestion and the availability of parking spaces at specific Transit Authority lots and also display suggestions that drivers board transit to get downtown faster. In addition, information kiosks can provide comparative traveler information. Although still preliminary, these discussions between the Chicago Transit Authority and the Illinois DOT staffs have occurred as a direct result of the GCM Priority Corridor program.

MPO staff

MPO staff typically build relationships with staff from the metropolitan area's operating agencies. This puts the MPO staff in a useful role to help different agency staff coordinate with one another on specific ITS projects. Interviewees stated that in the Chicago Metropolitan Area, as with many large, old metropolitan areas, there is a reluctance to change. Regional action tends to be through consensus, increasing the proportionate power of any opposition to change. Interviewees in both planning and operations functions said that the planning discipline has a natural propensity to push change and adapt to newer systems. The MPO is generally seen as an impartial third party with a strong regional perspective. In fact, a number of transportation officials espoused that it is up to the Chicago MPO to create a regional vision for ITS applications and to lay the groundwork for ITS deployments. Many parties interviewed said that the CATS is advancing this vision through the development of the *Northeastern Illinois Strategic Early Deployment Plan*.

A CATS executive said that in order to lay the groundwork, coordination by the MPO is its most important ITS role at this time. The individual sees a larger role for MPOs in ITS than with traditional capital projects. Since ITS is evolving, the MPO is the natural entity to lead the coordination for the near term because the local jurisdictions are not as familiar with federal regulations or programs.

This coordination role includes conceptualizing and developing individual projects. CATS staff have assisted in ITS deployment when interest in certain projects or ideas are initiated by mid or lower level staff from a member organization. The MPO's role is to expand projects or connect ideas to an interest group. The MPO can take risks where no single agency could propose multi-jurisdictional projects. This allows an idea to not be stymied by upper management of a single agency and be raised in a regional context without placing agency staff in jeopardy of challenging their administrators. The CATS can also pick up a project if the Board of an operating agency does not want a project, but others believe that the project has merit. After the projects are established in the region, the CATS would then let the operating agencies take over. This occurred with the signal coordination project. Municipal engineers wanted to coordinate their signals with those along the state routes. Officials from the Illinois DOT District One did not desire to initiate this project because there were over 230 communities and many signal systems required the coordination of only two or three signals. The initiative that began with the local governments ended up at the MPO. CATS staff are now coordinating with the Illinois DOT on a regional signal coordination program. Illinois DOT officials added that the CATS does provide the Illinois DOT greater exposure to the local agencies.

MPO staff stated that ITS leadership by the MPO requires that they are capable of understanding ITS technologies and that staff have some background as to how to plan for and operate these systems. The CATS staff includes industrial engineers, civil engineers, and professional planners. Just as with many MPOs, communication and electrical engineering backgrounds are the most glaring omission in staff skills that could be applied to ITS efforts. CATS staff has used a couple of different means to expand their technical knowledge and make their input and leadership more useful. Historically, the MPO staff have used their technical task forces to learn about a variety of technologies. The Advanced Technologies Task Force is no different. Interviewees stressed that the learning exchange between the planners, the engineers, and the operators at the committee level enables the MPO to better serve its membership. For the *Deployment Plan*, CATS staff use a technical consultant to fill the gap in their knowledge of communication systems.

Representatives from local jurisdictions agreed that they would like the MPO staff to expand their role with ITS beyond the traditional planning process with greater education, outreach, and leadership. It should be the MPO managers that step forward to discuss the linkages of systems operated by separate entities and become the experts in the regional architecture. One transportation executive noted that the CATS staff already have expertise in understanding sources of funding and should apply that knowledge to develop more creative funding for ITS. All parties noted that ITS is not mature enough, nor are the benefits established to allow it to receive automatic approval in the TIP process. To rapidly move forward, ITS deployments will require push from a variety of entities, including the Federal Government and the MPO. One aspect of this push is the requirement for even more presentations by the MPO staff on transportation technologies to individual political interest groups.

3.2.3 Strategies to Improve Communication and Coordination Within Agencies

It is important for department staff within the same agency to coordinate ITS and capital projects early in the project planning stage. This coordination and communication may occur and be enhanced within an agency in three ways. First, the creation of internal ITS committees of knowledgeable staff representing different functions, such as planning, engineering, and operations, can improve and enhance communication and coordination. Second, informal or scheduled presentations to key department representatives on the status of ITS plans and deployments can aid in internal coordination and communication. Third, and probably the most lasting, is the creation of standard operating practices that require document checks or project checklists to ensure that advanced technologies have been considered for any new project.

There are many benefits from internal coordination. Agency staff are able to design for later ITS infrastructure installation when designing capital projects. In addition, precautions can be taken to not destroy installed ITS technology during reconstruction of capital infrastructure. Expensive mistakes can be made, for example, if fiber optic cable installed along a highway is damaged during highway reconstruction because construction crews were not aware of the existence or location of the cable.

Since 1996, Chicago DOT Commissioner Walker has been providing ITS education opportunities for his staff. The Chicago DOT has hosted education sessions on ITS using Public Technologies, Inc. and has invited people from other metropolitan areas to discuss their ITS deployments. The Chicago DOT Commissioner has also invited members from the MPO's Advanced Technologies Task Force to these training sessions, which are primarily targeted to the Chicago DOT's high level administrators and managers. In addition to the training sessions, the City of Chicago has an internal task force of City department heads that discuss potential ITS deployments. This task force, called the ADVANTAGE-21 Task Force, is developing its own ITS plan using the *Northeastern Illinois Strategic Early Deployment Plan* as its model.

The region sees the Regional Transportation Authority as the agency that integrates ITS for transit and, as a voting member with the GCM Corridor Steering Committee, is responsible for coordinating ITS for transit for the Illinois part of the region. Since the commencement of the GCM Corridor project, the transit ITS projects in the Chicago region had been floundering. Recently, the officials from the Regional Transportation Authority have taken a more active role to stimulate the ITS deployments and is using its financial management functions to force the three transit Service Boards to coordinate. The Regional Transportation Authority staff have begun to take more initiative to ensure the three transit Service Boards better coordinate and implement interoperable technologies. A transit official noted that the GCM Corridor project managers attempted to use carrots to get ITS deployed, while the Regional Transportation Authority has begun using a stick through its control of capital funds. With this new effort, the Regional Transportation Authority, Chicago Transit Authority, Pace, and Metra staff are attempting to create an internal ITS transit group. This group will concentrate on building consensus for transit technologies that can be used throughout the region to obtain maximum efficiencies and creating performance specifications for both the technologies and the individual transit agencies.

3.3 COLLECTION OF DATA AND USE OF INFORMATION

The benefits from ITS are greater than those accrued from the TV monitors at a transportation, traffic, or transit control center; from coordinated traffic signals; or from the existence of an electronic toll collection system. Greater benefits are attained from gathering data and useable information generated from the advanced systems and applying that data to manipulate the transportation system in order to maximize the system throughput through better planning or improved operations. Maximizing the system includes being able to accurately model traffic conditions and plan for these conditions: using data to reduce a customer's wait for transit services; being able to electronically process a driver's electronic toll collection card which encourages others to use this service; and identifying, responding to, and clearing incidents to avoid extended congestion.

Reliable data are important inputs into regional transportation project planning and into transportation planning system assessment. Although gathering data generated by ITS technologies is not yet widespread, collecting good data, sharing that data, and turning that data into useful information speeds the incorporation of ITS solutions into the transportation planning process. These data can be used to estimate the benefits and costs of ITS projects before and

after deployment, estimate operational costs of ITS systems, provide performance measures to assess the operational health of the transportation system, and improve the design of future systems.

Transportation professionals from areas just beginning to develop ITS products and services need pre-deployment information to make decisions about the systems that will meet their needs. Pre-deployment information can include needs analyses and surveys from other areas that have deployed ITS. Professionals from areas with more mature ITS programs need post-deployment information, or operational data, from their own area in order to evaluate their projects and the transportation system as a whole. Data used for planning purposes will be more generalized and based on longer time frames, while data used for operations purposes will be more detailed and, if possible, in real-time. The purpose can greatly effect what data are needed. The data used for ITS-related purposes, planning or operational, are generated from ITS equipment in the field and from other “traditional” field equipment, simulated through modeling, or estimated based on information from other ITS deployments.

Section 3.3 is divided into two subsections:

- ❖ Strategies to Collect Data and Use Information for Planning Purposes
- ❖ Strategies to Collect Data and Use Information for Operational Purposes.

In this study, operational data are differentiated from planning data based on the use and age of the data. Operational data are used to assess the status of the current transportation system and make ongoing modifications to improve the system. These data are being used day-to-day (or within a relatively short time period) by personnel with direct control of transportation system operations. Data to be used for planning are needed for a wider range of purposes, from project development and impact assessment to system evaluation and re-engineering. Transportation officials initially need benefit and cost data when developing a project. This information is critical in obtaining political and funding approval. Planning data can also be used to conduct project evaluations in which benefits are calculated after deployment. Planning data are necessary to measure the operational costs of proposed ITS systems and those already deployed and used to improve the design of future systems. A consideration for all of the data falling within the long-range planning realm is how to accommodate the long-term storage of the short-term operations data and information generated by the ITS technologies.

In the Chicago Metropolitan Area, there are three driving forces to initiate a formalized method of data collection, data sharing, and standardized data analysis: (1) the opening of an information clearinghouse, (2) the large scale planning for the data being generated and to be generated, and (3) the creation of an analytical tool for ITS. The first is the Corridor Traveler Information Center and Gateway operations, a GCM Priority Corridor project being managed by the Illinois DOT. 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. The second force is the development of the *Northeastern Illinois Strategic Early Deployment Plan*. As part of this effort, the participating agencies are discussing how to make use of all the disorganized data, what key elements of the data should be archived, and how to archive data. The final initiative that is increasing the data discussions in the Chicago Metropolitan Area is the

involvement of some of the area's transportation officials in the national effort to develop an ITS analysis tool known as the ITS Deployment Analysis System.

3.3.1 Strategies to Collect Data and Use Information for Planning Purposes

While a great deal of ITS operational data is being generated from ITS deployments in the Chicago Metropolitan Area, there is still not a great deal of data collection, sharing, and analysis outside of any agency that has gathered that data. Instead, ITS activities are currently centered on planning and deploying ITS systems. Currently, one of the main planning uses of ITS-related data is to justify the selection of specific technologies. Data sharing initiatives are also in the planning stages in the Chicago Metropolitan Area.

Pre-deployment information on ITS project proposals is developed with cooperation from the sponsoring agency and the CATS. The Chicago MPO staff are not yet estimating benefits and costs for projects and are currently relying on data available from other areas for their project analyses. In the last round of air quality conformity assessment, CATS staff did a special analysis for I-Pass, the electronic toll collection system for Illinois. As part of the *Strategic Deployment Plan*, a consultant will measure some benefits from current traffic engineering data, such as savings to the traveler, delays, and reduced emissions. In addition, the consultant will further analyze I-Pass impacts, such as traffic volumes and emissions, queue lengths, average processing times, and delays.

Much of the analysis conducted by the CATS and the consultants is to assess the impacts of projects funded under the Congestion Mitigation and Air Quality Improvement Program or other projects that are part of the congestion management system program. Although the CMS has an arterial orientation, the Chicago MPO is planning to use data from the Illinois DOT's Traffic Systems Center for the CMS analysis if a corridor has an expressway within its parameter. CATS staff gather signal system data as part of its CMS analysis. Traffic engineers remarked that conducting the signal analysis for the CMS to determine delays and travel times has proven to be a complex effort. The signal systems were designed for signal operation and not for providing data. One interviewee stated that if data gathering activities had been a part of the initial signal system development, then the system could have been designed to provide data in the form that the MPO staff need.

In addition to their use in modeling for congestion and air quality analysis, data are being used to evaluate the performance of some ITS test projects in the area. The Illinois DOT is the primary agency that has conducted these project evaluations, as well as surveys and before-and-after studies. The Illinois DOT has conducted evaluations for the ADVANCE dynamic route guidance project and various warning technologies used at at-grade railroad crossings. Currently, they are evaluating automated clearance technologies at truck weigh stations. While the Illinois DOT's ITS staff still conduct quantitative evaluations when appropriate, they have found that qualitative analysis using anecdotal data for project evaluation is more cost effective and many times just as useful. Illinois DOT officials found that they spent a significant amount of staff and financial resources to quantify benefits for the ADVANCE project. Less effort has

been expended to evaluate subsequent projects because the gains in knowledge gleaned from the evaluation did not appear to justify the resources spent for the ADVANCE project evaluation.

Data from the evaluations have been made available to other agencies. The Illinois DOT and the project evaluator have made the ADVANCE project data available on the Internet. The parties took great care to explain the context of the data collection and the different data sources to prevent its misuse by parties accessing the information from the Internet. Data being collected for the automated clearance at truck weigh stations evaluation includes fuel usage, brake pad wear, improved level of deliveries, truck delays, commercial vehicle backups/queuing, trucker bypass, overall savings to truckers, and improved safety. Representatives from the Illinois DOT and other operating agencies believe that some projects, like traveler information and traffic management, are difficult to evaluate and will not be able to be quantified until they are fully built and are more mature. A number of transportation officials noted that they are looking forward to using operational data in the project evaluations, once the data are available.

Currently, the CATS does not gather any ITS-related data. The Chicago MPO receives traffic count data for the road networks from the Illinois DOT, the Illinois State Toll Highway Authority, the counties, and the municipalities. The Toll Authority did not originally intend to collect travel time data, but through the I-Pass revenue recording system, these data are easily provided. The Toll Authority is now a very cooperative partner with the CATS in data collection. The transit services do share information with the CATS when requested, but a formalized data sharing process has not been established. One problem is that the MPO and Chicago Transit Authority use two incompatible computer systems. CATS staff noted that they do envision the Chicago Transit Authority providing ITS data from their automatic passenger counter and automatic vehicle location systems.

The Illinois DOT's Traffic Systems Center is the main source of transportation data. The Traffic Systems Center had a strong research orientation in the past and it was the Traffic Systems Center staff that originally thought to save data for other applications. CATS staff discovered this data resource, primarily for expressway data, and developed pipeline from the data source to the MPO. Now there is a more formal institutional mechanism in place to share this data. Now, the CATS staff make extensive use of data from the Illinois DOT's Traffic Systems Center. It is used in validating models (hourly variation data, vehicle-miles of travel comparisons, seasonal variation data, etc.), descriptive analysis, and operational analysis (accident rates, sampling designs, planning for high occupancy vehicle lanes, etc.). The Traffic Systems Center data are a major input into the Chicago area *Travel Atlas* developed by the CATS. The *Travel Atlas* includes a series of maps of the region's expressway system displaying various transportation data. Information in the *Travel Atlas* developed from the Traffic Systems Center data include the average annual daily traffic, ramp volumes, monthly seasonal factors, day-of-week traffic variations, holiday travel rates, hourly variation of traffic, travel times, and speeds for the region's expressways.

There are other multi-agency data collection sites within the Chicago Metropolitan Area. The goal of the GCM Priority Corridor's data clearinghouse, the Corridor Traveler Information Center and Gateway system, is attempting to collect and integrate data from numerous sources in three states. Just like the Traffic Systems Center, there is minimum data currently being used

because the data are not archived in an aggregated format needed by planners. The Traffic Systems Center's output is currently on paper and saved on tape. Although the data are available to interested individuals, the fact that the data are stored in a binary format makes retrieval of the data rather difficult. The Corridor Traveler Information Center data are saved on disks for only one week before being deleted. The Illinois DOT's Gateway project, a first attempt to archive and distribute data, calls for data to be stored for a few days and then backed up on tapes, which are then recycled every few weeks. Data archiving was explicitly excluded as a Gateway function in the system design because of the storage requirements.

It is the potential use of the data being generated and to be generated from the ITS technologies that makes the Chicago area unique. While only a small amount of ITS data is being used in the planning and operations of the metropolitan transportation system, there is a great amount of activity in planning how to utilize this data. While the Illinois DOT staff plays a large role in data gathering, the Chicago MPO staff have taken the lead in the planning for the system-wide coordination efforts for collecting ITS data.

The combination of the operations of the Traffic Systems Center and Corridor Traveler Information Center represents a complex and large ITS database development problem. In the future, the Illinois DOT will seek another entity, such as the CATS, a research lab, or a university, to archive the data for a longer period of time. Both the CATS and Argonne National Laboratory, a research agency, have expressed interest in archiving and packaging the data for the Gateway project. To properly fulfill this function, the lead agency must understand how much data can be generated, the audiences to whom the data will be targeting, how to manipulate the data, and how much storage space will be required. Illinois DOT officials see their agency roles as a user and provider, maintaining the function of gathering data for day-to-day operations at the Illinois DOT.

Representatives from a number of agencies believe that the MPO is a good fit for coordinating the data archiving. These individuals see the CATS planning staff as already being the local experts in data collection and manipulation. An MPO official noted that the future of ITS for the CATS may lie in the development and use of arterial signal data, probe vehicle data, and data archiving. To understand the data requirements, officials from the CATS are already leading a data task force for the *Northeastern Illinois Strategic Early Deployment Plan* and are heavily involved in the Federal Highway Administration's ITS Deployment Analysis System efforts. The MPO-led task force composed of academic and research participants are developing a process and network in which transportation agencies in the region may share transportation data gathered by ITS equipment. Based on past experience, the transportation agencies in the region have found that if useful data are to come out of ITS components, it should not be an afterthought, but part of the system design. The ITS Deployment Analysis System project is being developed as a tool to assist MPO staffs in effectively incorporating ITS deployments into their regional transportation planning process. This is being accomplished through the examination of ways to build upon existing modeling capabilities to model ITS better and ultimately provide better deployments.

Even though there will be an extensive amount of data generated from the technologies, a CATS official feels that a new archival system will be providing supplemental data and not completely

replacing other data collection methods. Some interviewees noted that data collection and analysis can be costly in staff or consultant time; installation and maintenance of collection equipment; and computer resources required to store, analyze, and archive the data. A data specialist noted that the actual cost of this work would not be the data storage, but the effort to get the data into useful information. As part of its current *Deployment Plan* effort, the CATS is looking for assistance and advice as to how to fund the data management for the area.

3.3.2 Strategies to Collect Data and Use Information for Operational Purposes

Operational data are characterized as data used daily or on an ongoing basis to adjust transportation systems or to provide real-time information to operators or customers of the system. This data allows the immediate response to an activity or incident. Effective collection and use of operational data does not require planners, only operational staff, including dispatchers and technicians, that can control or coordinate multiple systems (e.g., traffic signal timing adjustments to accommodate spillover of traffic onto local streets during an incident).

Operational data have been in use for over three decades in the Chicago Metropolitan Area; however, the sharing of the operational data is just now taking off, in large part due to the influence of the Gary-Chicago-Milwaukee Priority Corridor program. For the past 35 years, the Illinois DOT Traffic Systems Center has used operational data collected from loop detectors installed along the expressways. Today there are 2,250 detectors providing occupancy rate counts in 20-second intervals. From the occupancy rate data, the Traffic Systems Center staff compute speed, travel times, and traffic counts, and update any messages on the variable message sign network. If the Traffic Systems Center operators suspect an incident, they can notify the Illinois DOT District 1 Communication Center directly to dispatch the Emergency Traffic Patrol or use a leased phone line data feed, which is normally updated with congestion information every five minutes. The District 1 Communication Center likewise uses this information to automatically update their highway advisory radios. In addition to incident notification, the Illinois DOT District uses information from the Traffic Systems Center for a variety of its operations. These operation functions include estimating average speeds and counts over a day to determine when to close lanes for construction or to determine the best time to switch the reversible lanes on the Kennedy Expressway.

A new Traffic Systems Center computer system is consistent with the National ITS Architecture and scheduled to come on-line by early 2000. It will be able to manipulate and analyze a greater volume of data automatically and house the data in a user-friendly database. In addition to its current use, the data will be available to the Illinois DOT District Traffic Department for analyzing traffic flow to improve design and operations. Illinois DOT staff will be able to redesign bottlenecks, refine lane closures, or remove contractors from roadways early if traffic reaches a certain threshold. Real-time accident data will be fed to the Traffic Systems Center as accidents occur, as well as real-time information on the tollway and a portion of an Indiana DOT expressway that connects with the Illinois DOT system.

The Illinois DOT Traffic Systems Center is primarily responsible for obtaining data from the Chicago area expressways (e.g., volumes, speeds, occupancy, etc.) and utilizing that data to

manage the Illinois DOT roadways. The Corridor Traveler Information Center is targeted as the multi-agency clearinghouse for operational data originating in the three-state region. Traffic Systems Center data, sent to the Corridor Traveler Information Center through dedicated lines, is only one of the seven information sources that currently feed into the Corridor Traveler Information Center:

- Illinois DOT Traffic Systems Center
- MONITOR Freeway Traffic Monitoring System for the Milwaukee Area
- Northwest Central Dispatch Center
- *999 Cellular Express Line
- Surface Systems Inc. for weather data, including surface and subsurface temperatures, and roadway condition information
- Illinois State Toll Highway Authority travel time information from a prototype automatic vehicle identification toll tag demonstration
- Construction and maintenance information from the Illinois DOT, Wisconsin DOT, Indiana DOT, and Illinois State Toll Highway Authority.

At the Corridor Traveler Information Center, the construction data are manually entered and overlaid with real-time traffic data. The Corridor Traveler Information Center will soon be receiving information from the Borman Traffic Operations Center in northwest Indiana. The GCM Corridor Deployment Committee is looking into using automatic vehicle location data from emergency vehicles to determine incident locations, times of incidents, and clearance times. This information will also be provided as an input into the Corridor Traveler Information Center database. Other agencies are using operational data to monitor their system performance. The Toll Authority is beginning to collect automatic vehicle identification data. A number of municipalities and counties operate their own traffic control centers that monitor arterial road volumes and manage the signal system timings. The Corridor Traveler Information Center and Gateway plans call for the incorporation of signal system data if available from the local sources. Through the CATS and the local agencies, some traffic signal data are already being shared. Because they are initiating regional signal coordination plans, CATS staff are also interested in the coordination of the traffic signal data.

There are still a number of problems with and holes in the operational information available at the Corridor Traveler Information Center, most notably, transit and the tollway real-time information. The lack of transit and tollway information is very evident on the GCM Corridor website. Incident data obtained through the *999 cell phone system is also incomplete and prone to misinterpretation because the coverage area is limited and does not include all incidents in the Chicago Metropolitan Area. A great deal of information is still generated by radio reports from the field and not through automatic notification by ITS equipment.

The intent of the data pipeline, detailed in the *Northeastern Illinois Strategic Early Deployment Plan*, is to provide a process and network in which transportation agencies in the region may share transportation data gathered by the ITS equipment. A recent eight-hour power outage at the Traffic Systems Center allowed the operating agencies to test “simulated” data against real-

time data to find out how good the simulations were (“truth in data”) compared to the information generated by the ITS field equipment. A data manager at the Chicago Area Transportation Study reported that this was a good learning experience.

One mode that is sharing only minimal operations data is transit. Like other transit agencies, the three transit Service Boards - Chicago Transit Authority, Metra, and Pace – have used operational data their entire history. Vehicle location information has primarily been manual through operator connection to dispatch via radio communication. Transit service information has rarely been shared with outside agencies or the general public unless there was an extensive delay or rerouting of services. One transit manager noted that nationally, the transit industry needs to provide the public useful information in a format that is clearly understandable. The public does not have to know the technologies used, just what information can be provided. In that regard, transit is moving forward in Chicago to make its operations data more accessible to the public.

The Regional Transportation Authority is examining its role as a clearinghouse for schedule information from its three Service Boards through a new Itinerary Planning System. The Regional Transportation Authority is also working with the Illinois DOT to determine how the service data will be provided directly to the Gateway Regional Multimodal Traveler Information Center and how data from the Corridor Traveler Information Center will be provided directly to the transit dispatch terminals. The Illinois DOT does currently share incident and weather directly with the area’s public transportation Service Boards.

Agency interviewees from the Chicago Metropolitan Area consistently pointed to a lack of funding and staffing to fuse and retain ITS data. Illinois DOT officials support the use of ITS-generated data for day-to-day operations, but are realistic in what they as an agency can do with the data beyond what is already being performed by the Traffic Systems Center and Corridor Traveler Information Center operations staff. The Illinois DOT has lost over a third of its staff in the last few years due to early retirements and downsizing. If the data are to be used to adjust operating strategies, the data manipulation and analysis will have to be performed by the private sector or out-sourced to another agency. Other agency representatives agree that it is critical for their staff to learn how to manipulate and interpret data before the usefulness will be actualized. Regardless, at this point-in-time, the current ITS system is too young to see operations modification benefits. A couple of transportation managers pointed out that it is an on-going struggle to fund operational projects over capital projects. If operational projects do not continue to receive funds, systems and data retention deteriorate. However, benefits displayed as a result of the generation and analysis of operational data can be instrumental in gaining support for further funding of operational projects.

In **summary**, the transportation officials interviewed in the Chicago Metropolitan Area maintained that there needs to be clearly defined roles for collecting and archiving data. However, because of the large amount and variable use of the data, agency administrators and managers feel it is important to keep the operations functions and operational data separate from archiving functions and planning data. The Chicago MPO staff have initiated the use of ITS planning data and are leading the efforts to determine data needs, how to share the network, and how to maintain the historic data (the archives). The Illinois DOT staff have likewise led the

efforts to utilize operational data. Interviewees suggested that transportation professionals will have different data requirements depending on the extent to which ITS is deployed. With the expansion of the Traffic Systems Center and the GCM Priority Corridor's Corridor Traveler Information Center and Gateway networks, a wider range of agencies will be applying the transportation data received from these centers for both planning and operations purposes.

4. SUMMARY

This chapter presents a summary of what the transportation agencies in the Chicago Metropolitan Area are doing that are having positive impacts on deploying ITS products and services and mainstreaming ITS in the transportation planning process. These efforts are tied to a list of strategies that have been used in ten metropolitan areas. Although the involvement of a number of agencies in the metropolitan area was examined, the focus of this report was on mainstreaming ITS into the metropolitan transportation planning process, which is primarily a MPO function. Therefore, the role of the MPO in ITS activities is also discussed.

The fourth section identifies how the examples from the Chicago Metropolitan Area are applicable to other metropolitan areas. It is widely recognized that there is no one MPO structure or single model of the metropolitan transportation planning process. However, there are lessons that can be learned from those areas that have already struggled to develop ITS plans, to include ITS projects within traditional planning documents, to deploy and operate ITS components, and to link individual ITS components into a multi-jurisdictional network. The transportation professionals in the Chicago Metropolitan Area have already experienced many of these actions and do have successes to emulate.

4.1 MAINSTREAMING AND DEPLOYING ITS: WHAT WORKS IN CHICAGO

Only recently has ITS been part of the planning process in the Chicago Metropolitan Area, even though ITS applications have been in place and in use in the area since the 1960s. Much of the early ITS deployments were state-funded efforts and were developed largely within the Illinois DOT. With the Illinois DOT still playing a pivotal role in these new efforts, the regional agencies are now considering how to expand the earlier ITS systems into integrated, multi-modal, multi-agency, and multi-jurisdictional systems. Since 1994, the Chicago Area Transportation Study (CATS), the Chicago MPO, has been more involved in ITS deployments, stressing the connection between the regional freeways and the local arterial and transit systems. There are also a number of educational and coordinating opportunities happening outside of the metropolitan planning process. There are at least five key factors leading to increased coordination and mainstreaming of ITS in the Chicago Metropolitan Area:

- Gary-Chicago-Milwaukee ITS Priority Corridor
- CATS' Advanced Technologies Task Force and the *Northeastern Illinois Strategic Early Deployment Plan*
- Regional Transportation Authority's coordination effort with transit
- Commitment of Chicago's Mayor to manage and operate the area's existing transportation system more efficiently and work through the Metropolitan Mayors Caucus
- Involvement of the collar counties through the work of the DuPage Mayors and Managers Conference.

First and foremost, the Gary-Chicago-Milwaukee (GCM) ITS Priority Corridor has been most influential in increasing ITS deployment opportunities, as well as increasing the general awareness of ITS in the region. The GCM Priority Corridor project set up a committee structure to coordinate the ITS technologies throughout the three-state region. Most of the coordination that has occurred throughout the Chicago Metropolitan Area has occurred primarily through the GCM Priority Corridor activities.

The Chicago Area Transportation Study has taken the initiative to coordinate ITS within the Chicago Metropolitan Area and close the gap between the GCM regional focus on the expressways and the arterial efforts in the Chicago area. The CATS management created and leads the Advanced Technologies Task Force, which is the coordinating mechanism for the *Northeastern Illinois Strategic Early Deployment Plan*. While the *Deployment Plan* effort only covers about five percent of all the ITS deployments occurring in the GCM region, the Advanced Technologies Task Force has proven very valuable as a coordination and educational opportunity within the Chicago Metropolitan Area. The Task Force provides additional opportunities for representatives from different agencies and jurisdictions to discuss common issues, find out what projects exist, and develop contacts for the various projects.

While the three Chicago area transit Service Boards are becoming more involved with ITS deployments and applications, they have remained slow to spend funds generated by the GCM Priority Corridor. The Regional Transportation Authority has recently assumed a leadership role in getting transit deployments jump-started and coordinated among its three public transportation Service Boards. The Regional Transportation Authority is also assuming a greater role in ITS planning coordination between the transit agencies, so transit can more easily be coordinated with the activities of other local agencies when necessary; for example, with traffic signal priority for transit.

At the municipal level, Mayor Daley of Chicago has made a commitment to think regionally about adding more capacity to the existing system through improved operations and management. The Chicago DOT Commissioner has linked the Mayor's commitment to ITS applications. In addition, the Mayor has initiated the Metropolitan Mayors Caucus to examine improved operations and management of the existing system. The Caucus has been one forum that has been successful in opening up the lines of communication between operating agencies and jurisdictions. This interaction has resulted in new ideas for ITS integration among the City of Chicago and other jurisdictions. These new ideas have been developed outside of the MPO planning process, although the MPO staff have participated in these efforts.

The counties and other local jurisdictions surrounding the inner city are now becoming involved in ITS planning, coordination, and deployment. Officials in DuPage County have proven to be the most innovative among the local jurisdictions. The DuPage Mayors and Managers Conference is considering ITS technologies as part of its strategic plan. They use an on-call consultant engineer and an in-house transportation planner to keep the Conference members educated on ITS technologies and recommend which technologies will be most applicable in fulfilling the Conference's transportation vision. In addition, the Conference staff have assumed an ITS coordination role for all of the suburban counties and municipalities in the Chicago Metropolitan Area. A staff member from the DuPage Mayors and Managers Conference is the

sole representative for the local jurisdictions on the Advanced Technologies Task Force. In this role, the Conference staff member now represents all 11 Regional Councils of Mayors.

4.2 STRATEGIES USED TO MAINSTREAM ITS

Interviewees representing transportation agencies from the ten metropolitan areas initially provided a long and varied list of strategies they used to increase opportunities for ITS deployments in their region. The list of strategies was then organized and presented to the interviewees at each of the four case study sites. The interviewees reviewed the list and selected the strategies they believed are the most effective strategies on which they would expend resources. Some of the respondents learned from their experiences and ranked some strategies that they had not attempted over other strategies that they or others in their agency or region had applied, but had minimum success using. While all of the strategies were deemed worthwhile, because of the limited resources that plague most regions and their transportation agencies, it was essential to have the transportation officials narrow the list to the highest priority strategies, which they felt should be emulated by other metropolitan areas.

It was clear from the officials interviewed that the results of executing these strategies are to achieve the three conditions that aid in mainstreaming ITS within the metropolitan planning process. These three conditions are: (1) the endorsement of ITS by key officials, (2) the improvement in communication and coordination among key officials and agencies, and (3) the efficient and effective collection of data and use of information. Most agency officials felt that strategies that increased communication and coordination were the most important, followed by those that lead to endorsement of ITS solutions. A majority of interviewees believed that the full benefits of the collection, management, and use of data would not come to fruition until the ITS deployment needs were conceived or even until the equipment was in operation for a period. At that time, parties could see what data could actually be generated and translated into useful information.

As noted in Chapter 1, a number of the 17 strategies listed in Table 2 could be used to generate more than one of the three conditions stated as being instrumental in mainstreaming ITS in the metropolitan planning process. (Note, in Table 2, the two strategies promoting committees were merged into one because some interviewees said the sponsor of the committee made no difference). Chapter 3 detailed how each strategy may produce a specific condition. From the analysis of their responses, we can conclude that the interviewees in the Chicago Metropolitan Area recommend seven strategies as the most effective strategies for transportation officials in other metropolitan areas to follow to achieve one or more conditions which aid in mainstreaming ITS. Whether these strategies are being utilized within or outside the MPO structure, they have been the most instrumental in moving ITS projects to the forefront of the regional transportation planning process:

1. Create and use a committee or task force that fosters ITS discussions and opens communications
2. Reference ITS in the regional transportation plan
3. Develop an ITS plan

4. Educate elected officials and agency administrators in ITS
5. Educate other prime stakeholders (beyond the traditional transportation agencies) about ITS
6. Make use of ITS advocates in the region to promote ITS applications
7. Develop regional ITS programs and projects.

4.3 ROLE OF THE MPO IN THE ITS EFFORTS IN THE CHICAGO METROPOLITAN AREA

Initially, the study team focused on the MPO's role in mainstreaming ITS into the metropolitan transportation planning process. The team speculated that an MPO might include ITS in its planning documents, provide a forum to coordinate ITS projects and data across agencies and jurisdictions, prioritize ITS projects for the region, and help compare ITS projects with capital ones. Ideally, the MPO could develop a regional transportation plan with a vision that includes ITS, and then analyze ITS projects to identify those that fit into the vision.

After the visits to four metropolitan areas and discussions with officials from different agencies were completed, it appeared that no single mainstreaming model could apply to all areas. Just as the political and organizational structures and the level of maturity of ITS planning and deployment differ from region to region, so will the strategies to mainstream ITS differ. This includes the role of the MPOs. Often this role depends on their responsibilities in the allocation of funds and application of these funds to projects, and their level of involvement with transportation operations within the area.

The Chicago Area Transportation Study staff and area officials believe that the MPO plays a constructive role in increasing awareness of ITS within the region. While there is a wide range of thought as to what this entails, the representatives from the area's public agencies believe that, at a minimum, the MPO should provide a forum for discussions regarding the planning, development, and integration of ITS and in educating the stakeholders and public. The area officials see this being accomplished through the Advanced Technologies Task Force and support from the Chicago MPO staff. Additionally, the MPO staff see a role in marketing prototype projects that have been successfully applied in the Chicago Metropolitan Area and working with operating agencies to develop regional systems.

The MPO has a strong internal advocate who believes that full integration of ITS can occur within the MPO structure, that ITS operational costs should be included in the TIP, and that the MPO can analyze operational projects as part of the decision-making process. The Operations Planning Task Force at the CATS is in the position to perform an inter-municipal coordination role, but the MPO currently has no staff or time to perform this role.

Table 2. Assessment of Strategies By Agencies in the Chicago Metropolitan Area

Strategies Used to Increase ITS Awareness, Increase ITS Deployments, and Integrate ITS Activities within the Planning Process	CATS (MPO) Management	CATS Staff	Illinois DOT (ITS Ops)	RTA (Transit)	CTA (Transit)	City of Chicago DOT	DMMC (Council of Mayors)	Other – ATTF	Area Consensus
Use or create MPO or non-MPO Committees/Task Forces	H	H	H	H	-	H	M	H	H
Include ITS, or a reference to ITS, in the Regional Transportation Plan	H	H	H	-	H	H	-	-	H
Develop ITS plans	M	H	H	H	H	H	-	-	H
Educate elected officials, top management of area transportation providers	M	H	M	H	H	H	H	-	H
Educate other stakeholders (emergency response services, trucking)	H	H	M	H	-	M	H	-	H
Use ITS advocates in the region (at the MPO and other agencies)	-	H	H	-	-	M	H	-	H
Develop regional ITS programs and projects	-	H	H	-	-	H	-	H	H
Include ITS projects in the TIP	M	M	M	-	-	H	L	M	M
Include ITS in other MPO planning documents (CMS, MIS, etc.)	M	H	H	-	-	M	-	-	M
Determine data collection needs	L	H	M	M	M	M	L	-	M
Use data for planning and operations improvements (applying the data)	L	H	M	M	M	M	L	-	M
Educate MPO staff	H	H	M	-	-	L	H	-	M
Educate general public	-	M	L	-	-	H	M	-	M
Conduct field trips for upper management (scanning reviews)	-	H	M	L	-	L	-	-	M
Utilize the National ITS Architecture or developing a regional architecture	-	-	H	-	-	-	-	-	-
Use peer-to-peer networking (experts outside the metropolitan area)	-	H	H	-	-	-	H	-	-
Involve academia	-	H	-	-	-	-	-	-	-
Ratings of Strategies:	“.” No response provided				ATTF: Advanced Technologies Task Force				
H – High Priority. Most effective strategy. Interviewees recommend spending time and funds on this strategy.					DMMC: DuPage Mayors and Managers Conference				
M – Medium Priority. This strategy is recommended if the agency or region has time and funds.									
L – Low Priority. This strategy is not recommended for areas just initiating ITS efforts due to time or funds.									
<i>Source of Ratings: Interviews conducted with representatives of transportation agencies in the Chicago Metropolitan Area in July 1998</i>									

Lastly, most interviewees saw a role for the Chicago MPO in the organization, analysis, and archiving of the data generated by ITS technologies deployed in the Chicago Metropolitan Area. CATS staff currently have the technical expertise necessary to manipulate the data, however, their concerns are the staff and computer resources required to perform data management, analysis, and archival responsibilities. The CATS is leading the study that is determining data needs of the area agencies to get a better idea of what commitments are needed by any of the agencies that will perform these responsibilities.

4.4 APPLICABILITY TO OTHER METROPOLITAN AREAS

Even though few metropolitan areas can rival the population and area of the Chicago Metropolitan Area, the experiences and successes of the area's public agencies to mainstream ITS into the metropolitan transportation planning process can be applied to other areas of any scale. One interviewee from the Chicago region felt that the list of strategies used to mainstream ITS may be best applied to smaller metropolitan areas, where the MPO and other principal agencies can apply the strategies evenly among all agencies and jurisdictions within their borders.

In spite of the differences in the size of metropolitan areas, political composition, and agencies involved, there are some common strategies that transportation operators and jurisdictions use to mainstream ITS within their metropolitan areas. In some cases, mainstreaming is occurring within the transportation agencies first, before they submit their projects to the MPO. Coordination between agencies and jurisdictions takes place through several methods, be it through MPO or non-MPO committees or creating ITS plans. Another important consideration is to obtain support from the elected officials. This may be more important for getting ITS projects deployed than actually for mainstreaming. However, their support is so important that it is considered important to educate them as part of the mainstreaming process.

In the Chicago Metropolitan Area, much of the communication regarding ITS occurs outside of the MPO's structure. While most projects still need to go through the MPO and the transportation planning process, communication outside of the planning process has not appeared to be detrimental to any ITS project. Based on the experiences, communication is the first step to any coordinated ITS effort. To ensure that projects are coordinated across jurisdictions or modes, a lead agency for a project in any area, be it the MPO, the state DOT, a transit property, or a municipal agency, should determine if there are any groups or organizations currently existing that brings administrators or staff from various agencies together to facilitate communications.

The Chicago area agencies have been fortunate enough to benefit from the GCM ITS Priority Corridor program. However, the local agencies, led by the MPO, used the momentum of the large multi-state program to gain endorsement of ITS among area officials and public agencies and build from the communication channels already in place through the GCM Corridor structure. While there are few metropolitan areas that can benefit from the federal designation as an ITS Priority Corridor or a Model Deployment Initiative site, there are many opportunities to develop momentum within an area through the creation of a regional ITS plan or determining

where advanced technology projects from different modes and agencies can be linked to provide benefits to a wider audience.

4.5 CONCLUSION

This study was undertaken to determine how ITS has been incorporated into the metropolitan planning process and to document processes that were used successfully and can be implemented in other metropolitan areas. As a result of this research, we have learned that there are three conditions that help bring ITS solutions into the metropolitan transportation planning process:

1. Endorsement of ITS by elected officials and transportation managers
2. Improved communication and coordination across geographic boundaries and between agencies
3. Collection of data and use of information.

To generate these conditions, different strategies were applied. For example, in some areas, existing committees were used to gain endorsement of ITS, while in others, new committees were formed. Because political and organizational structures and the level of maturity of ITS planning and deployment differ from region to region, the strategies used in the disparate localities varied. Therefore, elected officials and transportation managers who want to facilitate the incorporation of ITS solutions into the metropolitan transportation planning process in their areas should follow three steps.

First, the transportation officials must determine which strategies are most appropriate for their area. Not all strategies are needed or are applicable in all locations. Second, after selecting the strategies, they must then make and keep a commitment to implement those strategies. This is the most crucial step; elected officials and transportation managers must provide the resources to make the selected strategies successful. Third, they must reassess the strategies after a period of time has elapsed. This may involve modifying the approach to meet new needs for the region and each agency involved. As ITS planning and development matures, the officials and managers may create new priorities causing some of the original strategies to be eliminated and the addition of new strategies.

As demonstrated in several metropolitan areas, local officials and agency representatives have become aware of the potential opportunities that ITS products and services can provide. This, in turn, has led these managers and their staffs to routinely consider ITS solutions when making investment decisions concerning the transportation system. While a number of individual agencies are routinely considering ITS solutions, mainstreaming ITS into the transportation planning process is necessary if ITS deployments are to thrive on a regional basis.

The metropolitan areas that are meeting the three conditions described in this report are now able to mainstream ITS into the planning process. However, a number of agency officials noted that mainstreaming efforts must go beyond the current focus of getting ITS projects deployed and operating. These efforts must accommodate the integration of the deployed systems by applying a regional architecture. These efforts must also ensure the continued long-term operations and

maintenance of the systems by identifying the resources required by agencies to perform these functions. Many of the transportation officials interviewed asserted that this vision could be best achieved when considered within the metropolitan transportation planning process.

APPENDIX A REFERENCES

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APPENDIX B

ACRONYMS AND ABBREVIATIONS USED BY TRANSPORTATION OFFICIALS IN THE CHICAGO METROPOLITAN AREA

ADA	Americans with Disabilities Act of 1990
ADVANCE	Advanced Driver and Vehicle Advisory Navigation Concept
ADVANCE TIC	Transportation Information Center for ADVANCE
AMPO	Association of Metropolitan Planning Organizations
APTA	American Public Transit Association
ATIS	advanced traveler information systems
ATMS	advanced traffic management systems
ATR	automated traffic recorder
ATTF	Advanced Technologies Task Force
AVI	automated vehicle identification
AVL	automated vehicle location
BSMS	Chicago Transit Authority's Bus Services Management System
CATS	Chicago Area Transportation Study (the Chicago MPO)
CBD	central business district
CCTV	closed circuit television
CDOT	City of Chicago Department of Transportation
CFP	call for proposals
CMAQ	congestion mitigation and air quality improvement program
CMS	congestion management system
COM	Council of Mayors
COM Center	Illinois DOT District 1's Communication Center
CTA	Chicago Transit Authority
C-TIC	Illinois DOT's Corridor Traveler Information Center
CVO	commercial vehicle operations
DOT	Department of Transportation
EDP	early deployment planning
EFP	electronic fare payment system

ETC	electronic toll collection system
ETP	Illinois Emergency Traffic Patrol
FHWA	U.S. Department of Transportation Federal Highway Administration
FMS	freeway management system
FREQ	University of California at Berkeley freeway traffic flow simulation model
FTA	U.S. Department of Transportation Federal Transit Administration
GATEWAY	GCM regional traveler information database and system
GCM	Gary-Chicago-Milwaukee (Priority Corridor)
GIS	geographic information system
GPS	global positioning system
HAR	highway advisory radio
HOV	high occupancy vehicle
HQ	headquarters
IDAS	Intelligent Transportation System Deployment Analysis System
IDOT	Illinois Department of Transportation
IDOT-District 1	IDOT district office responsible for the northeastern Illinois region
IDOT-DPT	IDOT Division of Public Transportation
IDOT-OPP	IDOT Office of Planning and Programming
IEPA	Illinois Environmental Protection Agency
IMS	incident management system
I-PASS	electronic toll collection system used by ISTHA
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ISTHA	Illinois State Toll Highway Authority
ITS	intelligent transportation system
IUTRC	Illinois Universities Transportation Research Consortium
LOS	level of service
Metra	commuter rail division of the Regional Transportation Authority
MHz	megahertz
MIS	major (transportation) investment study
MMTIS	Illinois DOT's Multi-Modal Traveler Information System

MONITOR	Milwaukee area traffic management center
MPO	metropolitan planning organization
NHS	National Highway System
NIPC	Northeast Illinois Planning Commission
NIRPC	Northwestern Indiana Regional Planning Commission
NWCD	Northwest Central Dispatch Center
OGL	Operation Greenlight, a multi-agency congestion and mobility program
Pace	suburban bus division of the Regional Transportation Authority
PL	Federal transportation planning fund
RC	Chicago MPO's Regional Council of Mayors (there are 11 RCs)
RF	radio frequency
RFP	request for proposals
RMTIC	regional multimodal traveler information center
RTA	Regional Transportation Authority
RTP	Regional Transportation Plan (<i>Destination 2020 Transportation Plan</i>)
SCAT	IDOT's Signal Coordination and Timing Program
SEDP	Northeastern Illinois Strategic Early Deployment Plan
SEWRPC	Southeastern Wisconsin Regional Planning Commission
SIP	state implementation plan
SRA	strategic regional arterial (highway) system designated in the 2010 RTP
SRT	strategic regional transit system
STP	Surface Transportation Program
TCC	Transit Control Center
TCC	Traffic Signal Control Center
TCM	transportation control measure
TDM	transportation demand management
TIC	traveler information center
TIP	transportation improvement program
TMS	transportation management strategies (include TDM, TSM, and ITS)
TOC	traffic operations center
TSC	Illinois DOT's Traffic Systems Center

TSCS	traffic signal control system
TSD	<i>2010 Transportation System Development Plan</i> (previous Chicago RTP)
TSM	transportation system management
UIC/UTC	University of Illinois – Chicago / University Transportation Center
U.S. DOT	United States Department of Transportation
UTCS	urban traffic control system
VMS	variable message sign
VMT	vehicle-miles traveled
Volpe Center	U.S. Department of Transportation John A. Volpe National Transportation Systems Center
WPC	Chicago MPO's (CATS') Work Program Committee