The Context for Intelligent Transportation Systems in New York State

Opportunities, Constraints, and the Need for Greater Institutional Coordination

A Report to the Legislature by the NYU Wagner Rudin Center for Transportation Policy and Management, at the request of the NYS Assembly Legislative Commission on Critical Transportation Choices

Assemblyman Darryl Towns
Former Vice-Chair

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Given the rapidly changing political and technological contexts within which Intelligent Transportation Systems continue to evolve, every effort was made to provide the most recent and accurate description possible of ITS efforts at the federal, state, and local levels. The Authors regret any errors or omissions.

EXECUTIVE SUMMARY

Prepared at the request of the New York State Assembly Legislative Commission on Critical Transportation Choices, and funded by an appropriation made available from the New York Department of Transportation's budget, the purpose of this report is to provide a review of Intelligent Transportation Systems (ITS) as they relate to New York State transportation programs and policy and to highlight policy concerns for further consideration by the State.

Information for this document was obtained primarily through an extensive literature search, including websites for various ITS-related governmental and private organizations. In addition, interviews were held with New York State Department of Transportation officials directly involved with ITS policy and applications. Finally, information was generated from ITS-NY's annual meeting,[1] and outreach to its individual members through a written survey.

Why Intelligent Transportation Systems are Important for New York

Defined as systems that apply "well-established technologies in communications, control, electronics, and computer hardware and software to improve surface transportation system performance," intelligent transportation systems hold much promise for reducing congestion, improving safety, and mitigating negative environmental impacts related to transportation. In some cases, ITS are already being utilized. For example, E-ZPass is already being used throughout the state and New York City has an Advanced Traveler Information System that allows people to view real-time traffic conditions via the internet.

However, the importance of ITS for New York goes beyond transportation. ITS are important to New York State for economic reasons as well. Several New York companies, including Corning (Corning), IBM (Armonk), and Veridian (Buffalo) are leaders in technologies relevant to ITS. Moreover, it is estimated that the New York share of the national ITS infrastructure investment for the period 1995-2005 will be $1.8 billion. For the twenty-year period, ending 2015, New York's share of the total national market for ITS could well approach $20 billion.

Framework for the Report

National studies have concluded that the quality of technology is not a major barrier to the deployment of ITS. "Off-the-shelf" technology exists in most cases to support ITS functionality. The overarching need to be met at the ITS systems level is three-fold: system integration (the integration of the various

[1] ITS-NY is an organization that was created to serve as a voice for New York State's ITS concerns at the local, state, regional and national levels.

components of ITS), interoperability (ensuring that ITS components can function together), and institutional coordination (integrating information and systems of different organizations).

To fully understand these conclusions and their significance for New York, it is necessary to first provide the context within which ITS have evolved. Thus, Section I begins with some definitions and broad discussion about the importance of ITS nationally, and to New York more specifically. Section II outlines the policy origins of ITS, focusing particularly on the role of the federal government. Current trends are then summarized. Section III assesses the current status of ITS in New York State, with emphasis on the New York City metropolitan region. A number of barriers to and opportunities for ITS implementation are then specified. Drawing on this assessment, Section III also highlights a number of policy concerns for further consideration by New York State. Section IV is devoted to one of the key barriers, namely institutional coordination. Finally, Section V follows with an overall assessment of ITS in New York with policy issues related directly to improving institutional coordination.

Findings and Recommendations

ITS already play important roles in transportation systems around New York State, and will continue to do so in the future. While obstacles to the successful implementation of ITS exist, there are also numerous opportunities. Successfully responding to these opportunities will often require increased and sustained interagency coordination. How to best achieve this prompts several questions for further review by New York State policymakers.

1. Integrating ITS Components to Achieve Common Transportation Goals. ITS offer tools to aid transportation agencies in achieving their goals and objectives. However, since each agency tends to pursue its own goals (i.e., meeting its own customers' requirements) the integration of ITS components to achieve higher regional and state goals is generally not happening, except in rare cases such as E-ZPASS. Moreover, there is little agreement on an overall transportation plan and goals for the region. What should the overall transportation plan and goals be for New York and what levels of coordination will be necessary for implementation?

2. Building Upon Existing Institutional Foundations. New York State already has several successful interagency efforts to date, such as the I-95 Coalition, TRANSCOM, and the E-ZPASS Interagency Group. How might these serve as the foundation upon which to enlarge and expand interagency efforts, particularly at the more local levels?

3. Models and Best Practices. There are successful applications of institutional cooperation in other locations, including Houston, San Francisco, Vancouver and others. Can such examples be replicated in New York or does it need to develop its own systems, specific to its particular concerns and situation?

4. The Role of the Metropolitan Planning Organization. What role can and should the New York Metropolitan Transportation Council (NYMTC) play in the metropolitan region, and in particular, with respect to fostering and encouraging interagency cooperation related to ITS design and implementation?

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I. Introduction

This study was prepared at the request of the New York State Assembly Legislative Commission on Critical Transportation Choices, and was funded by an appropriation made available from the New York Department of Transportation's budget. The purpose of this report is twofold; (1) to provide an overview of intelligent transportation systems (ITS) as they relate to New York State transportation programs and policy; and (2) to examine more closely the importance of improved interagency coordination for successfully implementing ITS in New York State, and especially in the New York Metropolitan Region.

Information for this report was obtained through an extensive literature search, including websites for various ITS-related governmental and private organizations. In addition, interviews were held with New York State Department of Transportation officials directly involved with ITS policy and applications. Finally, information was generated from ITS-NY's annual meeting,[2] and outreach to its individual members through a written survey.

Defining Intelligent Transportation Systems

As defined by the United States Department of Transportation, Intelligent Transportation Systems apply "well-established technologies in communications, control, electronics and computer hardware and software to improve surface transportation system performance."[3] Central to most ITS activities are four categories of technologies:

1. ***Sensing*** – the ability to note the position and speed of vehicles using the infrastructure (e.g. rail lines, roadways, bridges, tunnels);

2. ***Communicating*** – the ability to send and receive information, between vehicles, between vehicles and infrastructure, and between infrastructure and centralized transportation operations and management centers;

3. ***Computing*** – the ability to process large amounts of data collected and communicated so that conclusions can be drawn and assessments made; and,

4. ***Algorithms*** – computer programs which process information gathered by ITS and develop operating strategies for transportation facilities.

Intelligent transportation systems are utilized to fulfill a number of objectives. They can help reduce congestion, enhance safety, mitigate the environmental impacts of transportation systems, enhance energy performance, and improve productivity.

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[2] ITS-NY is an organization that was created to serve as a voice for New York State's ITS concerns at the local, state, regional and national levels.

[3] U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), *What We Have Learned from Intelligent Transportation Systems* (Washington, D.C.: December 2000).

The Economic Benefits of Intelligent Transportation Systems

Many New York industries are directly engaged in the development of ITS; many more provide ITS-related products. For example, Corning (Steuben County) is a leading manufacturer of fiber optics, IBM (Westchester County) is a leader in computer-related technologies, and Veridian (Erie County) provides safety-related technologies. Numerous attempts have been made to define the market for ITS in the United States and then to relate this national market to New York to determine how important ITS is to state-based industries. While a more detailed study would be required to determine the specific economic impact in New York, the magnitude of economic importance can be estimated from national studies.

The most comprehensive study to date was conducted in 1996 by Apogee Associates for ITS America and the United States Department of Transportation. This study was, in fact, a refinement of earlier analyses and reflects almost a decade of experience in developing a market for ITS. The total national market estimate for ITS for the period between 1996 and 2015 is $420 billion (in 1996 dollars). This estimate is based on two components – public infrastructure-driven markets, and private (consumer and commercial) markets.

Private consumers and the commercial market are expected to spend over $300 billion during this 20-year period, generating over 600,000 jobs. The major applications for the private market include:

- Route guidance and information
- Mayday systems
- Obstacle warning systems
- Fleet tracking
- Driver vision systems
- Driver monitoring systems
- Vehicle safety systems
- Payment systems

The estimate for investment in ITS-related public infrastructure over a 20-year period is $80 billion across the United States. For the first 10 years (through 2005), the estimate is $27-$30 billion. For New York State, the estimate for this same period is $1.8 billion, or about 6% of the national total.[4] If New York State were to have a 6% share of the private market as well, its share would approach $20 billion (6% of $300 billion). A more detailed study on New York industries would be required to directly parallel the national study, something beyond the scope of this report. However, the conclusion is clear: ITS are big business and New York industries play a significant role.

[4] Apogee Associates, *ITS National Investment and Market Analysis* (Washington, D.C.: Intelligent Transportation Society of America (ITS America) and USDOT, 1997).

The Role of ITS in Solving Key Transportation Problems

In addition to economic benefits, ITS have already made, and continue to make, contributions to addressing the nation's transportation problems. The 1996 U.S. DOT study projected that more than 80% of the transportation-related benefits of ITS investments through 2006 would be in travel time savings (41%), and accident reductions (42%). The balance of the benefits is distributed as follows: reduction in emissions and fuel use (6%), operating cost savings (6%), and public agency cost savings (5%).

The study also estimated the benefit-cost ratio for ITS investments in every major metropolitan area. In summary, the 75 largest metropolitan areas have a combined benefit-cost ratio of 8.8 to 1, and the top 300 metropolitan areas have a benefit-cost ratio of 5.7 to 1.

While the national study estimates broad economic and transportation benefits, New York State directly experienced the value of ITS during and after the tragic terrorist attack on the World Trade Center on September 11th. There are numerous articles citing the use of information from various ITS networks by emergency management and traffic management personnel to mitigate the travel impacts of the attack. The ITS profession is embarking on a review of how ITS can assist further in areas of homeland security.

II. The Policy Context of Intelligent Transportation Systems

The national effort to develop and implement intelligent transportation systems is more than a decade old. While the use of technological advances has long been integrated into transportation (the INFORM system in Long Island, New York[5] was initiated in the 1970s and computerized traffic signal systems have a 30-year history, for example), the national ITS program (originally called IVHS – Intelligent Vehicle and Highway Systems) arose from a need to effectively deal with several factors:

- ***Congestion.*** Congestion was increasing across the nation, and the ability to build new facilities was limited by political, fiscal, environmental and community concerns.
- ***Safety.*** National efforts were underway to improve the safety of transportation systems.
- ***Foreign Deployment of U.S. Technology.*** Japan and Europe were demonstrating significant advances in the development and deployment of transportation technologies. In many cases, the technology was developed in the United States but was packaged and marketed in other countries for transportation purposes, leaving the United States behind.
- ***Customer Service.*** Transportation professionals were becoming more sensitive to dealing with customer concerns.
- ***Communications Technology.*** Communications capability was rapidly expanding.

Initial federal funding for ITS was provided by ISTEA in 1991.[6] ISTEA's early focus was on encouraging the necessary planning for ITS on a national, regional and statewide basis; funding research on transportation technologies; and implementing and evaluating various ITS projects in select locations. Moreover, ISTEA also designated ITS America as the coordinating entity in the development and deployment of intelligent transportation systems throughout the United States. The mission of ITS America – an organization that represents more than 60,000 individuals involved in ITS programs – is to foster public/private partnerships to increase the safety and efficiency of surface transportation through the application of advanced technologies. Half of ITS America's membership is private sector based; the balance of its members represents academe, government and associations.

Under ISTEA, the Federal Highway Administration (FHWA) took a lead in the national development of ITS, but involved other bureaucracies within the U.S. Department of Transportation (most notably the Federal Transit Administration). Five years later, in 1996, U.S. Secretary of Transportation Federico Peña announced a national initiative to install the Intelligent Transportation Infrastructure (ITI) in the 75 largest urban areas by 2006.

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[5] The INFORM (Information FOR Motorists) system is one of the nation's largest and most advanced traffic information systems for motorists. It covers Long Island's 35-mile central corridor. At the core of the INFORM system are its Transportation Management Center, electronic pavement sensors, closed-circuit televisions and variable message signs.

[6] ISTEA (Intermodal Surface Transportation Efficiency Act) was enacted by Congress and signed into law in 1991. It authorized the Federal surface transportation programs for highways, highway safety, and transit for a 6-year period, 1991-1997.

The ITI consists of nine component systems, all of which already exist in some form in many parts of the country:

- Traffic signal control systems
- Freeway management systems
- Transit management systems
- Incident management systems
- Electronic fare payment systems
- Electronic toll collection systems
- Regional multi-modal traveler information centers
- Railroad grade crossings
- Emergency management systems

Each individual system has benefits, but the theory behind the ITI is that combinations or the integration of systems yield benefits greater than the sum of individual benefits.[7]

In 1998, the successor program to ISTEA, the Transportation Equity Act for the 21st Century (TEA-21) was enacted. It continued the ITS program, funding $1.3 billion in authorizations. The renewed program included four primary features:

- Research and development funding;
- Incentive grants to states to foster integrated ITS deployment;
- A requirement that all ITS projects carried out using Federal-aid highway trust funds use nationally established ITS standards and be consistent with a national architecture; and,
- In an attempt to "mainstream" ITS into regular transportation investments, TEA-21 makes clear that many categories of Federal-aid highway funds can be used for the purchase and operation of ITS technology.[8]

Over the past two years, the national ITS program has been undergoing a reassessment under the direction of the U.S. Department of Transportation, in cooperation with ITS America. The reevaluation coincides with a major new federal initiative to emphasize operations and management of the transportation system. The importance of systems management, and ITS as a tool to manage the system, has been elevated given today's political, fiscal and quality of life realities that make construction of new facilities less feasible. The operations and management initiative is being considered by the Administration for inclusion in the next federal reauthorizing legislation, scheduled for 2003. The conclusions drawn from the U.S. Department of Transportation/ITS America reevaluation can be summarized as follows.

- ***Technology*.** The quality of technology is not a major barrier to the deployment of ITS. "Off-the-shelf" technology exists in most cases to support ITS functionality.

- ***Systems.*** The overarching need at the ITS systems level is three-fold: system integration (the integration of the various components of ITS), interoperability (ensuring that ITS components can

[7] Henry Peyrebrune, *Technology: A Bridge to the States* (Washington, D.C.: Public Technology Incorporated, 1996).
[8] USDOT, FHWA, United States Senate, *Christine Johnson*, *Statement Before the Committee on Environment and Public Works, Subcommittee on Transportation, Infrastructure and Nuclear Safety* (Washington, D.C.: 10 September 2001).

function together), and institutional integration (integrating information and systems of different organizations).

- ***ITS is at the Heart of the New Federal Focus on Operations.*** Planning for operations requires a long-term perspective by transportation agencies and the political sector. ITS can provide less expensive solutions but they are not free. Operating costs and maintenance are critical issues.

- ***Mainstreaming ITS.*** Mainstreaming is critical and includes integrating ITS features into conventional construction projects, as well as eventually eliminating or reducing ITS as a specifically funded program.

- ***Human Resources.*** An important barrier to success in the deployment of new technologies and applications embodied in ITS is a lack of trained people to support such systems.

- ***Positioning of ITS.*** In the past ITS have been oversold and sometimes categorized as "solutions in search of a problem." ITS need to be put to work in solving problems that the public and governmental agencies feel truly exist.

- ***Operator vs. Customer Perspective:*** Information needs to be available to both operators and customers.[9]

In addition to the reevaluation, the United States Department of Transportation and ITS America recently published the *National Intelligent Transportation Systems Program Plan: A 10-Year Vision*.[10] The development of this national plan included extensive participation by the ITS stakeholder community, including members from the public sector, private sector, and academe. Like the reevaluation, the *National Intelligent Transportation Systems Program Plan* will also serve as a resource for the 2003 reauthorization of transportation programs.[11]

Current Trends in Advanced Transportation Technologies

While a summary of programs and projects is helpful, there are some more general trends and shared objectives that are important to outline. ITS America recently released the following top-ten list of trends and goals for ITS applications:

- ***511.*** Dialing 511 soon will provide access from anywhere in the nation to local information on traffic, transit schedules and weather information. *Goal: easy access to traveler information.*

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[9] USDOT, FHWA, *What We Have Learned from Intelligent Transportation Systems*.
[10] TEA-21 required that such a document be developed. ITS America, *National Intelligent Transportation Systems Program Plan: A Ten-Year Vision* (Washington, DC: ITS America, 2002). The full report may also be found on the world wide web at http://www.itsa.org/resources.nsf/Files/PPRA_Full_Final/$file/PPRA_Full_Final.pdf.
[11] There are many federal and national resources available regarding ITS. Many are summarized in the document, *ITS Resource Guide 2001*, published by the United States Department of Transportation. In addition, ITS America has a website, www.itsa.org. that contains an extensive amount of information. Another major source used for information for this report is the *Transportation Communications Newsletter*, which is published daily in an electronic format, Transportation-communications-subscribe@yahoogroups.com. In addition, the I-95 Coalition is sponsoring an electronic referral service, ITSindex.com that is designed to facilitate searches on the Internet for ITS related materials.

- ***Telematics.*** Wireless links to vehicles will provide drivers with traffic conditions, concierge services, dynamic routing and voice activated Internet access. *Goal: increased availability of real-time information.*

- ***Collision-Avoidance Technologies.*** An electronic cocoon will surround vehicles and alert drivers to potentially dangerous situations on the highways and at intersections. *Goal: saving lives.*

- ***Human/Machine Interface.*** Design of telematics features or safety-related alerts will be guided by solid human-factors research. *Goal: avoid driver distraction.*

- ***Public Safety.*** Transportation, fire, police and emergency medical services staff will share timely information. *Goal: resolve traffic incidents faster, save lives and mitigate injuries.*

- ***Trip planning.*** Scheduling information for all transportation carriers will lead to one call for reservations, including parking spaces. *Goal: increase multi-modal options.*

- ***Data Gathering.*** Roads and cars together will transmit transportation data on the level of congestion. *Goal: regularly updated traffic-related information.*

- ***Data Sharing.*** Vehicles equipped with automatic crash notification will be able to send post-accident data directly to emergency responders. *Goal: provide faster response to accidents.*

- ***Privacy Principles.*** An opt-in standard will guide the collection of personally identifiable traveler information and an opt-out standard will guide the collection of anonymous information. *Goal: peace of mind.*

- ***Standards.*** Backed by a common technical approach, similar ITS products and services can be used across the country. *Goal: what works in one place will work in another.*[12]

[12] http://www.napsnet.com/pdf_archive/6/50864.pdf

III. ITS in New York State

As indicated previously, transportation agencies in New York have a long history of involvement in, and have provided leadership in the development and implementation of, ITS applications and projects. In the early 1990s the New York State Department of Transportation, in conjunction with what was then known as the Commerce Department, sponsored a statewide conference on ITS. At that time the State's interest in an ITS program was two-fold: (1) to consider ITS applications as one of many possible transportation solutions to known or anticipated mobility problems; and (2) to assist New York State industries involved in technology and transportation in competing globally in the ITS market place.

As a result of this first conference, a permanent public-private partnership organization, ITS-NY, was established. ITS-NY now has over 40 member organizations and serves a number of useful purposes, including disseminating information on ITS and alerting New York industries on market opportunities.

In addition to the creation of ITS-NY, the conference resulted in the New York State Department of Transportation immediately "mainstreaming" ITS into its highway project development process, fostering ITS activities statewide. State highway funds, as well as federal resources were made available to priority ITS projects. New York also supported the development of local ITS strategic plans to guide the coordinated implementation of ITS projects. These efforts culminated in a series of nationally prominent projects and initiatives:

- ***Electronic Toll Collection.*** The E-ZPass Coalition was created and E-ZPass has been deployed at multiple facilities throughout New York and adjoining states.
- ***TRANSCOM.*** Now composed of three states, TRANSCOM allows institutional information sharing on traffic conditions.
- ***R & D.*** The New York State Department of Transportation, the New York State Thruway Authority, and TRANSCOM are all supporting research and development efforts in ITS.
- ***Highway Emergency Local Patrol.*** Highway Emergency Local Patrol (HELP) incident response teams, coordinated and monitored by local transportation management centers, minimize motorist delays and increase safety on major expressways by offering disabled vehicles free motorist emergency road service
- ***I-95 Coalition.*** New York played a leadership role in establishing and supporting the multi-state I-95 Coalition that has secured significant funding for ITS projects and studies in the corridor.
- ***Red Light Cameras.*** In New York City, the red light camera program has been implemented. With cameras installed in various traffic lights, violations can be caught on tape and ticketing streamlined.

Today, New York State's highway-related ITS program is called *NY MOVES*, and is aimed at improving the public's transportation-related **M**obility, **O**perations, **V**ehicular systems, **E**nvironment and **S**afety through the use of new transportation systems and technologies. *NY MOVES* advances ITS implementation in upstate and downstate regions of the state, in both rural and urban areas. It seeks to facilitate travel for motorists, transit riders, commercial vehicle operators and public safety providers. The

program emphasizes cost-effective deployment that will result in area-wide, real time operation of the transportation system, integration of an enhanced, multi-modal transportation system, and the development of user-friendly transportation systems. (Information on the current status of ITS deployment in New York is found in the Appendix.)

ITS in the New York Metropolitan Region

The ITS program in the New York metropolitan area can best be summarized by describing the individual efforts of the various quasi-public, and governmental agencies in the region.[13]

TRANSCOM. TRANSCOM is a consortium of 16 transportation and enforcement agencies in the three-state region of New York, New Jersey and Connecticut. TRANSCOM acts as an information clearinghouse, alerting public and private organizations of traffic incidents, coordinating construction schedules, and undertaking research and demonstration projects for the benefit of the region. The organization does not have any operating responsibilities. TRANSCOM has developed a regional communications architecture to enhance the existing information network. The organization leads a $10 million Model Deployment grant from the federal government and private system developers to create a regional communications system that will transmit real-time multi-modal information that will be delivered by numerous media outlets.

***Port Authority of New York and New Jersey (PANYNJ*).** PANYNJ uses ITS technologies to enhance customer service. Applications include:

- *Automatic Toll Collection.* E-ZPass has been deployed on all toll lanes, and its expansion is planned for parking facilities at airports.
- *Automated Fare Collection.* PATH has implemented the "QuickCard" and, along with the Metropolitan Transportation Authority and New Jersey Transit, it is developing a single fare card that can be used seamlessly on all three transit systems.
- *Automated Cargo Expediting System.* Freight mobility has been improved by SEALINK, a computerized trucker identification system.
- *Incident Management.* An incident management program has been instituted on highways, bridges and tunnels.
- *Transit information.* PATHVISION, a passenger information display system was recently implemented.[14]

New York State Department of Transportation (NYSDOT). As indicated previously, the New York State Department of Transportation's program, *NY Moves*, is described in the Appendix. Highlights related to the New York Metropolitan region include the following.

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[13] Carolyn S. Konheim, "Intelligent Transportation Systems in the New York Region: An Overview," *ITS-NY Newsletter* (Winter 1998/99); New York State Department of Transportation, *Brochure on ITS in New York* (Albany: NYSDOT, Summer 2001); Rudin Center for Transportation Policy and Management, "Large City Technical Exchange and Assistance Program: Final Report on Inter-Jurisdictional Coordination for Traffic Management, Interagency Fiber Optic Sharing, Planning for Pedestrians in Large Urban Centers (NY: Rudin Center, NYU, November 2000).

[14] For more on the system and status of implementation, see www.nassauvision.com/images/PATHVision_web.pdf.

- *Traffic Management Centers.* Currently, there are regional traffic operations centers on Long Island (INFORM), New York City (co-located with the New York City Department of Transportation and the New York City Police Department), and in Westchester County (co-located with the New York State Police).
- *Construction Command Centers.* Construction Command Centers are being used where ITS can mitigate the effects of construction. The implementation of ITS infrastructure during construction also allows the system to be integrated into existing Traffic Management Centers after construction is completed.
- *Highway Emergency Local Patrol (HELP).* HELP operates over 350 miles of limited access roadways, parkways and expressways saving the motoring public millions of hours of vehicle delay.

Metropolitan Transportation Authority (MTA). Using ITS, the Metropolitan Transportation Authority is striving to enable its customers to access accurate, relevant and timely travel information whenever and wherever they need it, as well as improve the reliability of its trains and buses, reduce expenses and enhance the quality of information. The Metropolitan Transportation Authority's ITS program highlights include:

- *Automated Fare Collection.* The MetroCard, a magnetic stripe card, has been fully deployed on the subway and bus system since 1998. Its implementation allowed the discounted fare medium, including time of day passes.
- *Automatic Toll Collection.* E-ZPass has been implemented on the Metropolitan Transportation Authority's nine tunnel and bridge facilities, making toll collection faster and more convenient.
- *Customer Information.* Projects are underway to provide bus and subway customers with real time information including a new automated public address system and electronic signage. In addition to real-time information, information on trains and buses is currently available on the Metropolitan Transportation Authority's website, www.mta.nyc.ny.us.org.
- *Train Control Centers.* Transportation management is provided by Metro-North Railroad's state-of-the-art train control center, and the New York City Transit Authority's new control center.
- *Automatic Vehicle Locator System.* MTA-New York City Transit and MTA-Long Island Bus are installing automated satellite-based tracking systems on their buses to improve service reliability by reducing bus bunching.

New York City Department of Transportation (NYC DOT). The New York City Department of Transportation deploys a variety of ITS applications to improve travel safety, increase the efficiency of the local transportation network, and enhance mobility for motorists, bus and ferry users, bicyclists and pedestrians. Highlights of its program include:

- *Traffic Management Center.* New York City's Traffic Management Center in Long Island City, is co-located with the New York State Department of Transportation and the New York City Police Department. Designed to "maximize efficiency of operations, maintenance, and traffic engineering support," the Center contains 86 closed circuit television cameras, focused on major arteries throughout the five boroughs.[15]
- *Vehicle Traffic Control System.* Throughout New York City, the Vehicle Traffic Control System controls 6,600 intersection traffic signals and monitors 4,000 loop detectors (these detect vehicle flow on the roadways and, when needed, can be programmed to detect vehicle class as well as presence). At this point, all 2,650 signals in Manhattan are controlled

[15] See the NYC DOT website at http://nyc.gov/html/dot/html/travroad/its.html.

through this system; over the next 5 years, more than 2,000 signals in the Bronx, Queens, and Brooklyn will be added.[16]

- *Office of Emergency Response.* NYC DOT maintains an emergency response communications center to deal with traffic related emergencies.
- *Red Light Camera Program*. As described earlier, these cameras help to catch violations of failing to obey traffic control signals. Running of red lights at red light camera intersections has been reduced 40%.
- *Advanced Pedestrian Safety System*. In 1999, NYC DOT installed such a system near P.S. 66 in Richmond Hill, Queens. The system includes weight sensors on the sidewalks which, when stepped upon, light an overhead crosswalk sign to alert drivers that someone is using the crosswalk. Similar systems have been installed in other locations.
- *Advanced Traveler Information System.* This system allows people to view real-time traffic conditions on major arteries around the city of New York. With 78 cameras (Manhattan, 42; Queens, 13; Brooklyn, 12; Bronx, 9; Staten Island, 2), the Advanced Traveler Information System provides both streaming video and frequently updated still images from locations in the five boroughs.[17]

Constraints and Opportunities to Implementing ITS in New York State

A survey of the members of ITS-NY was conducted to obtain input on how the New York State ITS program is perceived by both the public and private sector. Members were asked to identify barriers to implementing ITS in New York, as well as to identify opportunities to increase its deployment. Six broad areas were identified, most with corresponding constraints and opportunities. Since no single priority area was identified, they are listed alphabetically.

1. ***Funding:*** The expense of implementing, operating and maintaining ITS was mentioned as a barrier, as was the lack of funding priorities and incentives for ITS. (Moreover, respondents indicated concern with the overall transportation funding picture in New York State, in particular the failure of the public to approve the recent Transportation Bond Act proposal, and the continued use of debt financing for both highways and transit.) The future of a healthy ITS program for New York is viewed as directly related to stable transportation funding.

   An opportunity was cited to increase federal funding and to provide the necessary flexibility to utilize these funds for ITS operations, maintenance and capital expenditures.

2. ***Institutional Fragmentation/Coordination:*** Paralleling the national experience, New York members cite institutional barriers (difficulty in creating partnerships, inability to share data) as a barrier to implementing ITS. Transportation responsibilities in New York are spread among a large number of public agencies and authorities, each with their own funding sources and governance structures. Coordination of activities, sharing of information and sharing of resources has been a traditional problem, especially in the New York metropolitan area. Public agencies responding to the survey emphasized this point.

   Opportunities were cited for partnering to increase mobility, including supporting existing partnerships such as TRANSCOM and the I-95 Coalition, greater sharing of information including Geographic Information Systems, shared telecommunications networks, a clearinghouse for potential ITS projects to promote coordination, and a statewide standards committee.

[16] Ibid. For most recent numbers, personal communication with NYC DOT personnel on 7/1/02.
[17] The system may be accessed via computer at http://nyctmc.org/.

Recommendations proposed to improve integration of ITS applications involved developing requirements for coordinating safety, traffic management, incident management, and emergency management, as well as integrating information from wireless communications and E-ZPass to improve system monitoring.

3. ***Policy:*** There is concern that public agencies are not totally committed to implementing ITS where it is appropriate, that the commitment varies within an agency, and that a uniform understanding of the benefits of ITS is lacking.

   There is an opportunity for the federal government to continue and increase its policy focus on ITS through the next reauthorization of federal transportation programs.

4. ***Procedural Issues:*** The implementation of ITS projects is different from standard construction projects, yet this is often unrecognized. Procedural barriers stem from:

   - the federal regulatory network;
   - a lack of uniform standards;
   - the slowness of administrative processes, coupled with the speed of technological advances;
   - low bid requirements;
   - an inability to do build-operate-transfer projects; and
   - the lack of publicly accepted measures of performance to demonstrate success.

5. ***Public Awareness:*** Concerns were raised that the private sector (especially the goods movement industry), public officials, and legislators are not aware of ITS and its potential benefits.

   There is an opportunity to increase public and private sector awareness of ITS technologies and the resulting benefits of their application.

6. ***Training and Expertise:*** The New York ITS community mirrors the national concern that there is a lack of professionals with ITS expertise, and a lack of funding for training programs to reverse this trend.

   State on-call expertise and college scholarships for ITS students were two ideas presented to address the lack of expertise.

Many of the above barriers and opportunities are linked. Thus, improvements in one area may yield benefits in another.

Key Policy Concerns for Further Consideration

Based on the literature search, the experience with national and state programs, and the results of the survey on barriers and opportunities, nine broad ITS-related policy concerns were identified for further consideration by New York State.

1. ***Policy and Programmatic Coordination*****.** A decade of experience has demonstrated that ITS implementation works best when the systems and programs are fully integrated. ITS cuts across many different legislative program areas and disciplines (for example, transportation, the

environment, privacy, and economic development) making it difficult to coordinate and capture fully the impact of proposed changes. For example, legislation designed to regulate one aspect of ITS can have unintended consequences on other programs, inhibiting integration. To foster integration, it might be helpful to have a single, focused legislative entity that would coordinate and screen proposed statutory changes and programs that affect the implementation of ITS in New York. Further, a legislative clearinghouse for ITS could help facilitate a dialogue with policy-makers on ideas for improving implementation.

2. ***New York State ITS Programs for Security and Emergency Response.*** The numerous benefits of ITS have been well documented in the wake of the terrorist attacks on the World Trade Center. Two areas of ITS application in particular, emergency response and security, have been, and will continue to be, a subject of great interest. The tragedy of September 11th has sparked a number of different ITS-related research efforts by national and state transportation organizations such as ITS America, the American Association of State Highway and Transportation Officials, the Transportation Research Board and ITS-NY. There is a need for monitoring and analysis of the outcomes of these studies to determine their applicability to New York, and to identify what, if any, policy changes are necessary to meet the State's unique emergency management and security needs. Among the activities being studied are: the vulnerability of communications satellites and global positioning systems (GPS), the use of onboard video systems on airplanes and other public transportation systems, the ability of 911 systems to locate cell phones, other methods of surveillance and response systems, improved institutional coordination and sharing of information, and better integration of transportation operations, incident management and emergency management activities.

3. ***Policy for Use of ITS as a Safety and Enforcement Tool.*** The role of ITS as an enforcement tool has emerged as a significant policy issue. There is a need to develop an overall policy that equitably provides for the consideration of specific requests to utilize ITS technologies for enforcement purposes.

4. ***Institutional Issues Regarding Information Sharing and Program Coordination.*** The lack of institutional coordination between governmental agencies in the development and use of ITS applications is a barrier to integration and diminishes the cost effectiveness of ITS investments. A recently completed study by New York University for the Federal Highway Administration and the National Association of City Transportation Officials found that institutional coordination could be achieved without agencies giving up their statutory responsibilities.[18] Examples of institutional coordination were cited including: integrated transportation management; incident management and emergency management; the sharing of fiber optic systems among transportation and other public

[18] Rudin Center, *Large City Technical Exchange and Assistance Program*.

agencies; and the sharing of information and surveillance systems. These examples could be used to formulate State policy and incentives to foster institutional coordination.

5. ***Implementation of the 511 National Program in New York.*** On July 21, 2000, the Federal Communications Commission assigned 511 as the nationwide telephone number for traveler information. There is a national coalition reviewing 511 issues, including institutional leadership, content, national consistency and consumer pricing and the cost of providing 511 systems. Some states and metropolitan areas have implemented 511 traveler information systems. New York State is in the early stages of evaluation. Its implementation will require policy decisions and state legislation that need identification.

6. ***ITS and Commercial Freight in New York.*** The Texas Transportation Institute estimates that it costs $50-$70 an hour to operate a commercial vehicle. Every minute stuck in traffic snatches a dollar from the bottom line for the average truck fleet. Nationwide, the study estimates that $3.3 billion a year is lost in fuel, wages and idle vehicle time. There are numerous ITS activities underway in New York State to improve freight movement. For example, the HELP incident management program, border crossing electronic credentials and customs/immigration clearance, and real time information for shippers. However, these programs appear to be fragmented and do not address the issues in a comprehensive and coordinated manner.

7. ***Pedestrians and ITS.*** Pedestrian safety is a continuing problem with statistics increasingly indicating pedestrian involvement in accidents. There are a number of new engineering technology systems that have been used successfully either in New York City or other places that should be explored for their further applicability and effectiveness in reducing pedestrian accidents. These include: count-down signals, pavement embedded lighting for crosswalks, “Animated Eyes” display, mid-block crossings with medians, raised intersections, supplementary pedestrian crossing channelization devices, and overhead lighted crossing signs that are activated by the presence of a pedestrian in a crosswalk.

8. ***ITS and Vehicle Safety Systems:*** One of the major markets for the private sector in ITS is in-vehicle equipment. While some of the systems are essentially consumer preference items such as navigation systems or telematics, experience has shown that these systems can have public safety implications. An example of this is the controversy over the use of hand-held cell phones while driving and the resulting legislation prohibiting their use. Whether the State should be pro-active in reviewing the

safety aspects of in-vehicle technology before implementation or respond after the fact is a continuing source of debate.[19]

Additionally, there are a number of technologies such as crash avoidance systems, crash warning systems and adaptive cruise control systems that are commercially available and have been proven to reduce accidents. Whether such mechanisms should be state-mandated (e.g., there is a national debate on requiring crash avoidance systems on all commercial trucks) is also an area for discussion.

9. ***ITS Information and Public Privacy Issues.*** The balance between the benefits of ITS information and the privacy of members of the public has been a prominent issue in the State Legislature. Several states have issued policies on the public availability of ITS information for a variety of different uses. The privacy principles of ITS America include an "anonymity principle" stating that "where practicable, individuals should have the ability to utilize Intelligent Transportation Systems on an anonymous basis." Recent developments in smart cards, digital cash, and encryption software, as well as in distributed architectures (which allow applications to be deployed to multiple servers) suggest virtually all ITS services and market packages can be delivered without maintenance of databases containing personally identifiable information. New York State lacks an overall policy on privacy that would cover ITS applications.

Among these concerns, institutional issues (namely the need for better coordination and cooperation) are particularly important since success in designing and/or implementing systems to deal with many of the other ITS policy concerns will be based at least in part on institutional coordination among key agencies. Thus, the following section examines more closely the opportunities for and impediments to increased institutional coordination in New York State.

[19] The new cell phone law, which entered into effect in December 2001, does require the Department of Motor Vehicles to gather statistics on motor vehicle accidents for which distracted driving is a contributing factor, and to submit a report with recommendations to the Governor and the Legislature no later than December 1, 2005. Chapter 69 of the Laws of 2001 (A9280, Ortiz).

IV. INSTITUTIONAL COORDINATION AROUND THE COUNTRY AND IN NEW YORK STATE

A national review of the first ten years of ITS provided in the report, *What Have We learned About ITS? A Synthesis*, concludes that it is not technical difficulties which form the key barrier to ITS deployment, but institutional impediments. According to the authors:

> Fundamentally ITS deployment requires cultural change in transportation deployment organizations that have traditionally focused on providing conventional infrastructure. No silver bullet exists for achieving this cultural change; rather it is a continuing, ongoing arduous process, and one that must be undertaken if ITS [are] to be successfully deployed.[20]

The study also identifies ten critical areas in which potential barriers may exist and must be overcome. They are as follows:

1. Awareness and perception of ITS
2. Long term operations and maintenance
3. Regional deployment
4. Human resources
5. Multi-organizational relationship
6. Ownership and use of resources
7. Procurement
8. Intellectual property
9. Privacy
10. Liability

Examples from Selected Cities

During the past few years, a number of case studies on institutional coordination and cooperation have been completed. To provide a sense of what is being done nationally and to supply some ideas of what can be in this region, it is worthwhile to summarize several success stories.

Houston, Texas – TranStar Program: TranStar is a consortium founded in 1994 which includes the City of Houston, Harris County, The Metropolitan Transit Authority and the Texas DOT. TranStar has two main functions: (1) transportation management; and, (2) emergency management. A main feature of TranStar is that all the consortium agencies, and many of the emergency management agencies, are located in the same building and share responsibility for operating the management center and sharing information. From the agencies' perspective, a key benefit to this arrangement is the day-to-day, face-to-face contact between agency personnel as well as increased access to various electronic information sources. The San Antonio area has built a similar regional Transportation Management Center. Houston also has a multi-agency ITS fiber optics network under development.[21]

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[20] USDOT, FHWA, *What Have We Learned from Intelligent Transportation Systems*, p. 12. There is a rich literature on this subject. An excellent reference for information on this topic is USDOT, FHWA, *ITS Resource Guide* (Washington, D.C.: USGPO, 2001).

[21] Rudin Center for Transportation Policy and Management, NYU, *Large City Technical Exchange and Assistance Program: Inter-jurisdictional Coordination for Traffic Management* (NY: Rudin Center, NYU, November 2000); also see Valerie Briggs and Keith Jasper, *Organizing for Regional Transportation Operations: Houston TranStar Case Study*, Prepared for the Federal Highways Administration (FHWA) and Institute of Transportation Engineers (ITE) by Booz-Allen & Hamilton (McLean, VA: August 2001).

Portland, Oregon – Multi-Purpose Fiber Optics Sharing: Governmental agencies within the City of Portland and in the greater Portland area have come together to create a fiber optics backbone system by sharing fiber optics cable, conduits, related infrastructure, operation software and maintenance and operations. The transportation agencies in the area from the City and State, and the regional transit operator joined with the City communications office to create a multi-purpose fiber optics system using the ITS program and the City fiber optics franchising system. The greater Austin Texas area also has developed a multi-purpose, multi-agency fiber optics sharing program, as has the Denver area.

San Francisco, California – Metropolitan Transportation Commission (MTC): The Metropolitan Transportation Commission (MTC) acts as a forum for discussion, consensus-building, marketing and advocacy on issues affecting multiple jurisdictions in San Francisco. Created by the California legislature in 1970, and appointed as the region's metropolitan planning organization four years later, the Commission MTC is the transportation planning, financing and coordinating agency for the nine-county San Francisco Bay Area. Each year, the MTC plans for and allocates close to $1 billion in federal, state and local funds to transportation improvements and operations in the Bay area. MTC also administers revenue from tolls on Bay Area bridges and directs dedicated funding for regional freeway incident programs. It helps coordinate and integrate transit services and fare-payment methods and oversees the operations of the region's advanced traveler information system.[22]

Vancouver – TransLink: Formally called the Vancouver Transportation Authority, TransLink was created through Vancouver provincial legislation in 1998 and launched on April 1, 1999. It is governed by a 15-member Board of Directors comprised of local elected officials. TransLink's mandate is to "…plan, finance, operate and manage a regional transportation system that moves people and goods efficiently and supports the regional growth strategy, air quality objectives and economic development of the Greater Vancouver metropolitan area." The title "TransLink" reflects that Authority's role as *the* coordinator of the region's transportation network, and indeed, the Authority funds and oversees the planning, service levels, budgets, and financing of several subsidiary companies, which are in turn responsible for operations of the regional transportation network. TransLink raises funds through regional transportation sources, including fares, gas taxes, parking and vehicle fees and tolls.

Key features of TransLink include:

- Planning and funding responsibility for regional transit, roads, transportation demand management and emissions programs under a single authority.

[22] Rudin Center NYU, *Large City Technical Exchange and Assistance Program* and Briggs and Jasper, *Organizing for Regional Transportation Operations: Houston TranStar Case Study*. See also, Briggs and Jasper, *Organizing for Regional Transportation Operations: San Francisco Bay Area Case Study*, Prepared for the FHWA and ITE by Booz-Allen & Hamilton (McLean, VA: FHWA, August 2001).

- Integration of transportation planning, funding and operations functions within the context of a greater community vision and plan.
- Funding though regional sources.
- Contracted operations through wholly-owned subsidiary corporations and partnerships with local and provincial governments.[23]

Los Angeles: The Los Angeles case study covers three projects that have been identified as examples of best practices involving interagency coordination: the Santa Monica Freeway Smart Corridor; the establishment of an advanced transit priority system project between LA DOT and MTA along two major transit corridors; and, a countywide signal synchronization program.[24]

There are numerous additional case studies and publications that bear mentioning. Public Technology Inc., under contract to USDOT, for example, has published several case studies on interagency cooperation, including its most recent publication, *How Can We Work Together?*, which includes 16 case studies with two New York examples (Monroe County and Erie County).[25] Along with AASHTO and NACTO, PTI also produced the 1996 report, *Technology: A Bridge to the States* which identifies strategies for using ITS as a mechanism to achieve better intergovernmental cooperation.[26]

Institutional Fragmentation in the New York Metropolitan Region

Across New York State there are several successful examples of varying degrees of institutional coordination related to transportation. In the Capital District, for example, the New York State Transportation Management Center is housed in the State Emergency Management building and the State Police are partners in the Center; in Rochester, NYSDOT, Monroe County (which operates highways for both the county and the City of Rochester), and the State Police have agreed on a shared Transportation Operations Center. In the Niagara Frontier, the Niagara International Transportation Technology Coalition (NITTEC) is a consortium of 14 regional transportation system owners from the United States and Canada who have joined together in a cooperative effort to initiate a program to improve regional and international transportation mobility.

Notwithstanding these examples from around the state, the New York Metropolitan Region still displays a great deal of institutional fragmentation. Indeed, there are a large number of agencies and organizations which have some form of responsibility for various surface transportation modes. With this in mind, and since the ITS-NY comments were derived from agencies in the metropolitan region, the remainder of the discussion will focus on the downstate area.

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[23] Rudin Center, *Large City Technical Exchange and Assistance Program*; and, see Briggs and Jasper, *Organizing for Regional Transportation Operations: Vancouver TransLink*, Prepared for the FHWA and ITE by Booz-Allen & Hamilton (McLean, VA: FHWA, August 2001).
[24] Rudin Center, *Large City Technical Exchange and Assistance Program*
[25] Public Technology Inc., *How Can We Work Together? A Guidebook to Smart Response through Coordinating Local Public Safety and Transportation Information and Technology* (Washington, D.C.: PTI, Feb. 2001).
[26] Henry Peyrebrune, *Technology: A Bridge to the States – Opportunities for Intergovernmental Cooperation on Intelligent Transportation Systems* (Washington, D.C.: PTI, 1996).

Highways: There are at least eight different agencies or organizations that deal with highways in the New York metropolitan region. Their responsibilities may be summarized as follows:

- *New York State DOT*. NYS DOT has responsibility for the construction and operation of the major highways in the area. The highways are designated by statute. Funding for State highways comes from the federal government as well as appropriations of State funding from the Legislature. Within the City of New York, the role of the State and the City in construction and operations is a constant topic of debate.

- *Port Authority of New York & New Jersey*. The Tunnels, Bridges, and Terminals division of the Port Authority controls the construction and operation of these facilities linking New York and New Jersey. The Port Authority has its own board and funding sources.

- *MTA Bridges and Tunnels*. Within the MTA structure, the Bridges and Tunnels Authority operates certain facilities which link the five boroughs. The MTA has its own board and fund sources and receives federal funding for their facilities

- *New York State Thruway Authority*. The Authority has a number of key facilities in the area. It has its own board and funding sources and receives federal funding for capital maintenance.

- *New York State Bridge Authority*. The Authority has responsibility for several bridges across the Hudson River north of New York City. The Authority has its own board and own funding sources and competes for federal funding.

- *New York City DOT*. NYC DOT is the lead transportation agency for the City, but the City Planning Commission has a transportation planning group. Several city agencies have transportation construction and maintenance responsibilities and the Police Department plays the lead role in day-to-day operations and enforcement. Funding comes from federal and state sources as well as city appropriations.

- *County Transportation Agencies*. Each county in the area has a highway organization responsible for the construction and operation of county highways. They are eligible for federal and state funding and also receive county funding directly.

- *Town and Villages*. There are numerous town and village highway departments with responsibility for town and village highway construction and operations. They are eligible for federal and state funding, supplemented by local funding.

Public Transportation: A similar fragmentation of responsibilities exists in the provision of public transportation services. Among the many agencies are:

- *Port Authority of New York & New Jersey*. PANYNJ operates the PATH rail system between New York and New Jersey.

- *Metropolitan Transit Authority*. The MTA includes New York City Transit, the Long Island Railroad, Metro North (operating 3 lines from New York City to outlying suburbs), Long Island Bus, and Bridges and Tunnels.

- *NYS DOT*. NYS DOT provides operating and capital funding.

- *City – Ferry Operators*. In New York City, there are public and private ferry operators.

- *County – Bus Services*. Bus operators exist in each county.

- *Towns*. Several town governments have separate bus services.

- *Private Bus Services*. Such operators are eligible for federal and state funding through a public sponsor.

A number of common elements relate to institutional coordination. ***First***, all of these organizations have separate governing structures set up by statute with specific delineated responsibilities and accountability for performance either to a board or an elective body. ***Second***, all agencies are essentially competing for ITS funding, either through existing federal funding, State programs or internally driven funds. (The only exception is the Port Authority which does not receive federal funding.) ***Third***, in the case of toll agencies and transit service providers, they have operational responsibilities directly related to their customers who, in essence, pay the bills. In the case of the non-toll highway agencies, the average driver does not know or care if they are driving on a state, city, county or local highway; he/she wants the total system involved in the trip to be satisfactory.

In many instances highway and transit agencies feel that they are competing for customers and funding. This separation and competition often can frustrate attempts to plan and develop multimodal and intermodal transportation systems that consider the following:

- modal alternatives to solving transportation problems;
- the appropriate role of each modal alternative and the appropriate mix of modes to meet the objectives; and,
- integration and connections between modes.

Current Efforts to Increase Coordination

Though fragmentation exists, there are examples of efforts to coordinate institutions within the New York metropolitan region.

New York Metropolitan Transportation Council (NYMTC): NYMTC is the primary coordination mechanism for transportation in the region by virtue of its designation by the Governor as the metropolitan planning organization (MPO) for the region to meet federal planning requirements. Since 1962, federal legislation has required the establishment of a continuing, coordinated, comprehensive transportation planning process as a requirement for eligibility for federal highway and transit funding. Recent legislation, (ISTEA in 1991 and TEA21 in 1997) have increased the emphasis on MPOs for three main products: a long-range transportation plan; a multi-year transportation improvement program (TIP); and, an annual unified planning work program (UPWP).

NYMTC is the successor organization to the Tri-State Regional Planning Commission which was abolished in 1982. NYMTC is basically a committee of signatories who have agreed to participate in a

coordinated planning process for the purposes of meeting federal planning requirements. NYMTC includes the following elements:

- *Council*. The principal elected officials of the region and the heads of the major transportation agencies meet and approve by consensus the products of the planning process and give direction to the planning activities.
- *Central Staff*. Formerly housed in the World Trade Center, the staff of professionals is responsible for accomplishing portions of the annual work program.[27]
- *Transportation Coordinating Committees*. There are three sub-committees of the Council: the coordinating committees in New York City, Long Island, and Mid-Hudson. They develop and approve the planning products for their area before they are considered on a regional basis.
- *Planning Programs of the Member Organizations*. The Council passes money through to the member agencies to accomplish planning activities as specified in the UPWP and in contracts between NYMTC and the organizations.

NYMTC is not considered to be a strong coordinating mechanism in the region. While the process meets federal guidelines and the region continues to be eligible for federal transportation funds because of NYMTC, it does not play a strong role in coordinating and guiding ITS programs. NYMTC could take on such a role if the elected officials and the heads of the transportation agencies wanted it to, but in the past they have given NYMTC very limited attention and power in operations matters. Further, there is no statutory requirement for a coordinated planning and development process for the use of state, public authority and local funds. In fact, state statute creates other mechanisms for review and approval of individual agency transportation programs which are often at odds with the MPO process.

I-95 Coalition: Begun informally by a group of transportation professionals who were interested in overcoming barriers to institutional cooperation, the I-95 Coalition became a formal entity in 1993, after the USDOT labeled the area of I-95 between Virginia and Maine a priority corridor. The Coalition today is a regional partnership of major public and private transportation agencies, toll authorities and industry associations. Its web site describes its mission as follows:

> Built on a foundation of cooperation, consensus and coordination, the Coalition members come together to address ITS solutions to shared transportation problems and challenges. By leveraging resources, sharing information and coordinating programs, the Coalition adds value to individual member organizations activities and provides a synergy for more dynamic and seamless transportation solutions throughout the corridor.

With respect to ITS, in the near term the Coalition is focusing on improving traveler information, commercial vehicle safety and productivity, and electronic payment options. Emphasis is being directed, in particular, toward:

[27] NYMTC was housed in the World Trade Center and lost 3 people and all their records due to the terrorist attacks of 9/11. They are trying to recover and continue to meet the federal planning requirements. A permanent arrangement for NYMTC is currently under consideration.

- allowing the public and shippers to smartly plan trips between major origin and destination points in the Corridor by providing a comprehensive source of information on all modes of travel;
- achieving the productivity and safety goals associated with implementing the FHWA's Commercial Vehicle Information System Network (CVISN) throughout the corridor; and,
- allowing travelers to seamlessly make electronic payments throughout the corridor and supporting achievement of national ITS program goals related to interoperability of electronic toll and commercial vehicle operations applications.[28]

New York Members of the Coalition include the MTA, MTA Bridges and Tunnels, the Thruway Authority, PANYNJ, NYS DOT, NYC DOT, and the New York State Bridge Authority.

TRANSCOM: TRANSCOM is a coalition of 16 highway, transit, and public safety agencies that are responsible for the safe and efficient movement of people and goods in the tri-state region. TRANSCOM acts as a multi-agency coordinating committee with respect to construction coordination, incident management and testing ITS technology. New York Members include the MTA, MTA Bridges and Tunnels, MTA Transit Authority, NYC DOT, NYS DOT, New York State Police, the Thruway Authority, Palisades Interstate Park Commission, Port Authority PATH, and NYS Bridge Authority.

In addition to the more formal coordinating mechanisms described above, there are also several interagency project or program activities currently underway in the metropolitan region, involving the coordination of ITS implementation some of which have been mentioned previously. In addition to limited fiber optics sharing among transportation agencies on a project-by project basis, more formal examples are described below.

- *Integrated Incident Management System* (IIMS). A system to improve incident management and response by improving sharing of incident data among those agencies involved in incident management, a project has begun in New York City that involves the following agencies: NYC DOT, NYS DOT, NYC Police Department, NYC Fire Department/EMS, the Mayor's Office of Emergency Management, NYC Department of Environmental Protection, NYC Department of Sanitation, and the MTA NYC Transit. Current deployment involves nine NYC Police Department and three NYC DOT Emergency Response vehicles.[29]

- *Video Sharing*. NYC DOT has obtained a federal grant to construct a fiber optic network connecting City DOT, New York City Transit, and MTA bridges and Tunnels. The fiber network will carry video feeds and data generated by the three agencies.

- *Transportation Management Centers*. As previously described, these exist in New York City, Long Island (INFORM) and in the Mid-Hudson.

- *E-ZPASS Interagency Group*. This group is comprised of representatives from 16 toll agencies in seven eastern states (Delaware, Maryland, Massachusetts, New jersey, New York, Pennsylvania and West Virginia).

[28] For more information on the Coalition's goals, see www.I95coalition.org.
[29] NYS DOT, "New York MOVES: ITS Program Status Report," June 2002, p. 12.

The level of inter-agency coordination and cooperation has changed since September 11th. There are numerous examples of interagency coordination which occurred and are being maintained in response to the terrorist attacks. At the January 2002 Transportation Research Board meeting, nearly every agency speaker from the New York metropolitan area cited these interagency coordination efforts and expressed the hope that this new era of coordination would extend beyond the current crisis. It remains to be seen whether homeland security will be the activity which unites these agencies or whether they will return to business as usual.

V. Conclusion

ITS are already playing important roles in transportation systems around New York State, and will continue to do so in years to come. When viewed from an individual agency perspective, current ITS efforts around the state have been successful. In particular, the leadership and implementation of the NYS DOT statewide ITS program has been very effective, especially in the light of the cutbacks and downscaling of NYS DOT programs. There is a qualified, dedicated ITS staff in the main office to provide program guidance and technical support, and each region now has some ITS capability and is involved in ITS activities. There will soon be multi-agency traffic control centers in all the major urban areas and several rural ITS applications. ITS activities are visible in all of the other transportation authorities in the state to varying degrees, with the highway authorities most committed to ITS at the present time (versus transit agencies, for example). With the exception of several local governments in the New York Metropolitan Region, and in particular the New York City Department of Transportation and Monroe County in upstate New York, the role of local government transportation agencies is minimal.

While obstacles to the successful implementation of ITS exist, there are also numerous opportunities. Successfully exploiting those opportunities will require, in many cases, increased and sustained interagency coordination. When determining how best to achieve the needed levels of cooperation and coordination, and which agencies to involve, several issues arise that may warrant further review by New York State.

1. Integrating ITS Components to Achieve Common Transportation Goals. ITS offer tools to aid transportation agencies in achieving their goals and objectives. However, since each agency tends to pursue its own goals (i.e., meeting its own customers' requirements) the integration of ITS components to achieve higher regional and state goals is generally not happening, except in rare cases such as E-ZPASS. Moreover, there is little agreement on an overall transportation plan and goals for the broader New York metropolitan region. What should the overall transportation plan and goals be for New York and what levels of coordination will be necessary for implementation? Once these questions are addressed, the role ITS can play is easier to discern.

The events of 9/11 prompted the implementation of a number of transportation policies which had been under discussion for many years, including a ban on single occupancy vehicles in portions of Manhattan, restrictions on bridges and tunnels, and increased reliance on public transportation and high-occupancy vehicle lanes. Whether or not these policies should be continued, and how ITS can play a role would be worthy of review.

2. Building Upon Existing Institutional Foundations. New York State already has several successful interagency efforts to date, such as the I-95 Coalition, TRANSCOM, and the E-ZPASS Interagency

Group. How might these serve as the foundation upon which to enlarge and expand interagency efforts, particularly at the more local levels?

Again, the attacks of 9/11 served as a catalyst in a number of initiatives aimed at increasing interagency coordination and cooperation. Indeed, a potential model may be derived from the security related aspects of ITS. The movement toward coordinated incident management using ITS as the platform was visible in the presentations at a recent conference in Syracuse. The coordination between NYS DOT and the State Police is visible in almost every part of the state. In the Metropolitan Region, TRANSCOM and the I-95 Coalition have involved all the transportation and emergency response agencies in a regional approach to sharing information on incidents and minimizing the transportation impacts of incidents. How best to link local agencies into this framework is a much needed discussion.

3. Models and Best Practices. There are successful applications of institutional cooperation in other locations, including Houston, San Francisco, Vancouver and others. Can such examples be replicated in New York or does it need to develop its own systems, specific to its particular concerns and situation?

4. The Role of the Metropolitan Planning Organization. What role can and should NYMTC play in the metropolitan region, and in particular, with respect to fostering and encouraging interagency cooperation related to ITS design and implementation?

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APPENDIX

Status of New York State's ITS Program

New York MOVES
Through Intelligent Transportation Systems

June 2002

Available upon Request from the Rudin Center. Call (212) 998-7545.