

**University Transportation Research Center, Region 2  
REGIONAL RESEARCH CONFERENCE  
PROCEEDINGS**

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**Table of Contents**

- I. Regional Research Needs, page 1**
- II. Regional Training and Education Needs, page 4**
- III Focus Area: Infrastructure, page 5**
- IV. Focus Area: ITS, page 5**
- V. Focus Area: Transit and Intermodalism, page I 1**

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25, 1996)**

The following is a synopsis of the presentations made by Region 2 transportation agencies at the Regional Research Conference at Rutgers University in New Brunswick, New Jersey.

***Regional Research Needs***  
***Richard Albertin, NYSDOT***

**Freight:** In Halifax, a major port is well under development. In Norfolk, a major port is competing with the New York metropolitan area. Cargo ships are growing in size and draft. Our area is experiencing an ongoing silt problem and rock bottom limitations. What role should our area then plan for freight in the next 20 years? Will manufacturing grow? Will we be a transit port? What do we plan for?

**Funding:** Every government and transportation agency at all levels are having difficulties obtaining adequate funding. As transportation professionals, what recommendations do we make to ensure we're prepared for the future but are living within existing resources?

**"One-Stop Shopping":** In building construction and private industry, the designer also does the construction. This offers the owner "one-stop shopping" and the designer, knowing he will build the facility, takes special interest in the design. Should government consider such an arrangement? What would be the pros and cons?

**"Re-use" of Facilities:** The region has invested a lot in transportation and infrastructure that's now been abandoned. When economic development opportunities arise, how do we encourage "re-use" of these facilities, rather than significant reinvestments in entirely new ones?

**Public Funds:** How do we convince the public that we're making the best use of our share of the public's funds? What measure do we use? What does the public really care about in transportation? A good example is highway maintenance. A typical maintenance operation performs a dozen activities, none more than 10-15% of the effort. How do we measure success?

**Misc:** How do we measure the benefits of ITS? What techniques should we use to augment our ability to inspect and repair/replace culverts? What more can we do to help localities enforce posted/restricted bridges?

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25, 1996)**

*Gerard Soffian, NYCDOT*

As many agencies in government become more narrowly focused on their “core” mission - delivering essential services at the least cost with the fewest people, the task of researching new ways to get the job done becomes increasingly more difficult. In transportation, the need for research and related assistance from universities is great. Now, more than ever, the research should be “applied”, not theoretical. This can be done most efficiently through case studies and prototypical applications. The universities can form teams with government agencies to:

1. Conceive and design a project,
2. Document the planning and implementation process, and
3. Analyze and evaluate results, with recommendations for improvement.

This type of partnership would be mutually beneficial. It would provide universities with a “testing ground” for ideas and theories, and give agencies a chance to become acquainted with new techniques and approaches. More importantly, the public would also benefit from improved practices. The areas most promising for partnerships include: Traffic Calming, Maintenance and Protection of Travel, TDM, and ITS.

traffic Calming means making our communities safer, more pedestrian friendly. New devices being introduced in the NYC area are speed humps, neckdowns, discontinuous one-way street patterns, and high-visibility pedestrian crosswalks/uncontrolled intersections. Universities can help address these questions: How effective are these devices? What are the safety issues? What are the costs to install and maintain them? Do they promote non-motorized travel, or add to travel miles and emissions? How do they relate to the traditional principles of traffic engineering?

Maintenance and protection of traffic generate these questions: What are the trade-offs between construction time and motorist inconvenience (cost/benefit, how much delay are motorists able to handle in exchange for accelerated construction?) How do we best communicate with motorists?

TDM issues - How agreeable are motorists to changing their travel routines (path, time, and mode of travel)? What is the true potential/under what application (new developments/residential, sporting arenas)? What is government’s role (note that auto travel solutions are preferred by government decision makers because the majority of auto cost is borne by the motorist)? How should transportation agencies be structured to promote, design, and implement TDMs (transit/traffic operators may cooperate with each other)? How can costs be borne by the private sector (employers/retailers) ?

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ITS - Some of the issues are: technology and application, financing and fees, institutional - new lines of communication may be needed, and synthesis of current practices affected by ITS.. Examples of ITS projects are: develop and implement a plan for a "long-range vision" for using ITS technology on the local street system, identify local arterials most suitable for ITS application.

Larry Fleisher, MTA

The main question we ask when we choose research projects: Does the project help move us toward the capital budgeting goal? Does it solve travel problems? Direct links to those questions must be established before projects are funded. Some of the major research the MTA has undertaken in the past few years include: 1) East Side Access 2) Access to the Core 3) Brooklyn and lower Manhattan travel problems. Other studies have included how transit investments generate long-term economic benefits (relation to personal income, sales). Should UTRC compete with consultants on what size projects? Is an issue that the UTRC should consider and address.

Arthur Roberts, NJDOT

We need better ways to measure wear on system, traffic, and quality of service. Also, ways to test new materials (recycled materials in particular), new designs, new ways of getting real-time information are of interest to NJDOT. Life cycle costing is another area of concern.

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25, 1996)**

**Regional Training and Education Needs**

*Raymond Ruggieri, NYMTC*

We've had many applicants with masters degrees, but they lacked knowledge expected of graduate students. They didn't have a good grasp of the region; they didn't know what MetroNorth was or where Queens was located. Real-world knowledge is essential in this business. Also, communications skills are very valuable.

I recommend the intern program - we had a great one; the interns did substantive work and have gone on to great jobs. If we start another intern program now, we can't pay them, but the opportunities will be tremendous. Is there any way to obtain the money somewhere else, perhaps as a part of a work-study or other program?

*Don Hannon, NYSDOT*

I asked the heads of departments at NYSDOT what the burning Education and Training issues are. Since many managers think in terms of goals and objectives, not in terms of education and training, I didn't get many responses, so I rephrased the question - what issues do your department face?

GIS was the most often cited - many managers would like to be able to use GIS software for bridges, highways, etc. Transportation's role in economic development was another issue. Communication skills (writing and speaking) were of common concern; even doctoral students were found to be deficient in writing skills. People skills were another concern.

*Eleanor DiPalma, NYCDOT*

The new NYCDOT commissioner has demonstrated renewed commitment to training. Why training? Training can resolve morale problems, increase productivity, help workers adapt to changes (workforce reductions), and teach new skills. NYCDOT's current training program was described. Training trainers is extremely important. Some training areas of concern are communication skills, computer skills, management skills, and planning skills.

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25, 1996)**

Working Group Focus Area: Infrastructure  
Robert Baker, NJDOT

Research topics of interest to NJDOT:

- Testing of synthetic air entrainment systems in concrete
- Correlation of compressive strength and other nondestructive tests for concrete
- Rutting: when the road is rutted, is it better to fill in and resurface rather than milling?
- Feasibility of resurfacing only lanes which need it instead of entire width of roadway.
- Correlation of FWD, Seismic Pavement Analyzer, and GPR with pavement analysis.
- Evaluation of NDT methods to find foundation details for bridges with unknown foundations
- Infrastructure Library
- Is telecommuting worth it for employers?
- Real cost of transportation in New Jersey
- Issues surrounding congestion pricing.
- Switching to end result specs for non-destructive testing
- Determining durability of materials performance measurements
- What type of communication lines are most effective and under what situations?
- 3D review of traffic generator signs

Working Group Focus Area: ITS  
*Richard Zabinski, NYSDOT*

The first area of concern is “How do we get ready for ITS technology?” NYSDOT has a mature transportation system and is not likely to build new physical capacity; hence, NYSDOT would like to “maximize technology to minimize construction”. We would like advice on near and far term horizons and identify the technologies that we should be readying ourselves to accommodate, use, and exploit.

Are there roadway design elements and features associated with these new ITS technologies that we should be incorporating as we rebuild or change the highway system? For example, HOV lanes may provide the basics for a “controlled” roadway appropriate for early guided vehicle implementation. The driving technologies, in this case, are guidance systems that permit closer vehicle headways and more people “through-put”. Another example: roadways are being designed and maintained to last longer than in the past, with increased intervals between

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25,1996)**

reconstructions. Features associated with powered roadways, new sensing and communications systems, guidance systems, etc. may need to be anticipated and accommodated.

The second area is “ITS Markets and Business Opportunities”. How do public agencies such as NYSDOT go about exploiting the business potential of ITS? Making money gets the attention of decision makers and provides funds for ITS implementation, operation, and expansion, but it is not easy for government agencies. Agencies do not have practice doing business evaluations and market analyses. Identifying what will sell, who from the private sector should be involved, and structure of “sophisticated” and mutually beneficial business arrangements are issues that NYSDOT needs help in addressing. A business school working with UTRC schools may research these issues, identify who might be the partners, how to proceed in developing such a business, point out what are the potential legal tangles and their solutions, and identify necessary or helpful legislative changes.

The third area is ITS in transit management. Transit operators have adopted or are adopting many ITS technologies (AVL, AVI, advanced fare collection systems). The research question is, “Are they using the ITS technologies most effectively?” Because the state provides a large amount of transit operating assistance, this question is an important one.

*James Kemp, NJ Transit*

Issues:

- e There is no unified, unbiased user forum for exchange of ITS experiences.
- e ITS has thus far concentrated on “mainstream” surface transportation. Bureaucratic support for ITS deployment renders “official” ITS cost and benefit figures suspect.
- University affiliations with deployment focused trade groups calls academic objectivity into question.

The role of universities is not to make and accept assumptions but to challenge them. Universities should participate in the proposal of ITS concepts, development of ITS concepts, development of ITS technologies, evaluation of ITS concepts, policies and strengths, and the compilation and dissemination of unbiased ITS research.

Current available guidance: What technologies to deploy in “mainstream” surface transportation, “best case” potential benefits, timing of deployment, how best to deploy them, how to acquire project funding, how to coordinate technology deployments.

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25, 1996)**

Needed: Methodology for determining when it is or is not ultimately cost-effective to deploy ITS technology, how to focus short-term improvements toward long-term solutions, how to coordinate technical and non-technical solutions, how to integrate non-traditional surface transportation systems, how to develop dynamic, "sustainable" infrastructures, and unbiased ITS equivalent of "consumer reports".

Universities can help broaden our understanding of ITS costs and benefits. When is ITS deployment cost-effective? Definition of "real world" potential benefits is vital (magnitude, character, thresholds, probability of occurrence, incremental impact of occurrence - of potential benefits). Definition of "real world" costs is also important (deployment costs, other assumed improvements, lifetime support costs, short and long-term induced costs). Universities can broaden our understanding of the total social system of which ITS and surface transportation are but a part.

"How to focus short-term improvements toward long-term solutions"

is an area that should be addressed by considering: guidelines for development of unifying strategies, guidelines for root cause analysis, regional analysis, evaluation of current and completed projects, evaluation of current policies and strategies, and lessons learned.

"How to coordinate technical and non-technical solutions"

is another area that may be addressed by considering: guidelines for implementing unifying strategies, evaluation of current and completed projects, and lessons learned. "How to integrate non-traditional surface transportation systems" (such as rail and intermodal freight, pedestrian commerce - personal communication services, taxi service, jitney service, transit service, rideshare, emergency services) and

"How to integrate non-surface transportation systems"

(such as innovative ideas for non-traditional intermodal ITS opportunities - air carrier, air freight general aviation, and analyses of common information needs) should be considered by universities. They can provide innovative ideas for ITS product development.

"How to develop dynamic, 'sustainable' ITS infrastructures"

is a question that can be addressed by considering guidelines for object-oriented ITS, guidelines for leased versus owned infrastructure, strategies for coordination with cable, telephone, PCS, and cellular infrastructure development, evaluation of current and completed projects, technology development, and lessons learned. "ITS Consumer Reports" can be developed by the accumulation of user experience (what works, what doesn't, what works but doesn't do what was hoped for) and the accumulation of contractor experience (what works, what doesn't, what's

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25, 1996)**

easy, what's complicated, what lowers cost, what drives cost up).

**Isaac Takyi, NYC Transit**

**Key transit ITS applications:**

Automatic Vehicle Location (AVL) and Computer Aided Dispatch (CAD)  
Promote efficient fleet management, reduce run times, improve OTP and safety.

**Smart Cards**

Reduce fare evasion, enhance data collection capability, provide more flexible and integrated pricing

**Automatic Passenger Counters and Annunciation**

Better utilize passenger load data for route and service optimization

**Passenger Information Systems**

Provides real-time information that makes transit easier to use, increases customer satisfaction, and increases ridership

**Automatic Signal Preemption**

Reduces run times, improves vehicle and labor productivity

At NYCT, the main ITS activities are focused on the field/operational test, deployment of kiosks, early deployment planning study, and the model deployment initiative; they are described below. Other activities NYCT is involved in are: national committees (NTCIP, APTS, etc.), system architecture and standards development, Urban ITS Center at Polytechnic University, NY-Paris ITS Cooperation, TRANSCOM, and the I-95 Corridor Coalition.

The field operational test is a \$5 million, 3-year federally funded demonstration project. It is a public-private partnership among 6 public and 4 private companies. The objectives of the project are to provide real-time information at bus stops via electronic signs and monitors, and network/schedule information via interactive kiosks. AVL/CAD data will be utilized.

The deployment of kiosks will provide 5 prototype kiosks displaying region wide, intermodal travel information in the MTA service region, and 4 localized kiosks generating subway and bus information at Brooklyn hospitals.

## **University Transportation Research Center Regional Research Conference Proceedings (Oct. 25, 1996)**

The early deployment plan is a \$750 million federally funded, 1-year study managed by MTA, NYSDOT, the Port Authority, and NYCDOT. The objective is to develop a strategic plan for ITS deployment in the NYC region. The study will identify potential projects eligible for ITS funding.

The model deployment initiative is a \$10.8 million initiative involving a public agency consortium led by TRANSCOM and a private agency consortium led by Lockheed Martin. The objective is to showcase and integrate ITS technologies.

### General Research Needs:

- Proposal development
- Program planning (partnership building, procurement guidelines, education of transit management and political leaders)
- Training ITS specialists to promote FHWA training agenda
- Project coordination
- Testing and evaluation (development of test criteria, lab and field testing, impact evaluation)

### Specific Research Needs:

- Local evaluation of current/proposed ITS projects (field operational test, project, kiosk projects, model deployment initiative)
- Apply ITS to address specific operational problems (bus stop/lane violation using wide area detection techniques, schedule adherence and alternative routing under congested conditions using fuzzy-logic/neural network, effect of traveler information on ridership growth using market research and economic-based analytic techniques, low floor and CNG bus operational impacts using modeling and diagnostics techniques)
- Data collection and management tools (automatic passenger counting techniques using sensor and image processing techniques, database management system for regional transit travel using relational database, route algorithm for pre-trip planning using optimization models, GIS as a service planning tool)
- Technology transfer and implementation strategies

In general, universities need strong transit programs to attract research projects. Universities and local transit agencies need a strong and close working relationship. Universities should provide teaching opportunities for transit professionals and opportunities for joint publication and research. Also, transit professionals could cooperate with universities by serving as jurors on student projects and providing advice on curriculum development. Support of internship programs is also encouraged.

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25, 1996)**

***Raman Patel, I-95 Corridor Coalition***

ITS is about using technology for efficient transportation in all modes; it is not about building bridges or roads. During the Interstate Highway era, separate engineering disciplines worked well. Today, however, all three or four disciplines of engineering must come together to serve the needs of the ITS users. ITS is an integration of computer technologies, communications networking, information management technologies. Together, all three components are needed to produce and transfer information related to transportation and its end users.

Making a whole of ITS from the sum of its parts is the driving principle in the regional setting such as the I-95 Corridor Coalition. Hence, universities should focus on multidiscipline courses in the system engineering concentration (I. Introduction, II. Intermediate, III. Policy and Program). Information integration techniques, innovative financing, and evaluation techniques are other ITS related courses that should be developed.

The multijurisdictional institutional issues are better resolved through unified technologies and communication capabilities that individual agencies will not or cannot afford to initiate or achieve. That is what the I-95 Corridor Coalition is trying to achieve.

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25, 1996)**

**Working Group Focus Area: Transit and Intermodalism**

***Ross Kapilian***, NYC Transit

- e NYC Transit schedules 30 trains per hour on its busiest lines. However, long dwell times can reduce the amount of service actually operated. Research might target reducing dwell time and improving service regularity.
- e Scratch graffiti has become a serious problem on the windows of subway cars and buses, and on the walls of stainless steel subway cars. Research is needed to identify cost-effective means of reducing or eliminating scratch graffiti.
- e Labor accounts for approximately 70% of transit operating expenses. These costs are directly related to the means by which schedules are developed. A compendium of transit scheduling practices that shows how transit agencies throughout the world prepare train and bus schedules would benefit the transit industry.
- e The introduction of “smart” technologies offer opportunities to improve transit service speed and reliability. This project will inventory international experiences with introducing new technologies in large, urban transit systems. The end products should be an “incident management plan” for subways and an “operations manual” for buses.
- e Transit agencies expend hundred of millions of dollars to comply with the ADA. Identifying cost-effective means of complying with the ADA would be beneficial to the industry.

***Michael Strasser***, NYCDOT

Some of the topics concerning the NYC transportation system:

- e Where do you put bus storage for subsidized franchised bus systems?
- e Amphibious vehicles can operate on both water and land, and are being used for tourism purposes in Tennessee and Missouri. Would these be practical forms of transportation in the NYC area?
- e NYCDOT contracts out bus service to 7 franchised bus companies. Annually, \$100 million in government subsidy is provided to operate the service. Ridership declines mean

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25,1996)**

that maintenance costs should be reduced, but they are not. Ways to increase the efficiency of fleet management must be determined.

NYCDOT must ensure that competitive bidding of franchised bus service takes place. Analyses of competitive contracting at other properties would be useful.

The City would like to remanufacture older RTS buses and place CNG tanks on them. Fire Department regulations state that CNG tanks must be placed on top of the buses. Is this structurally plausible?

On June 1, 1996, NYCDOT implemented a peak/off-peak local bus fare. What have been the effects of this change on ridership patterns?

Downtown Jamaica is congested with passenger cars, livery vehicles, legal and illegal vans, and buses all competing for the same curb space adjacent to subway station entrances. Regulations now allow "van stops", similar to bus stops. The creation of a "van stop" plan for the Jamaica Avenue-Archer Avenue corridor is needed.

*Jerry Lutin, NJ Transit*

Having spent roughly equal portions of my career with a research university and transit agency, my perception is that researchers and transit operators don't communicate well and that the two communities have very different cultures. Here are my observations.

It is helpful for the transit researcher to have an image of the customer as something more than a statistic.

The marketplace is ever changing. Transit must change to survive in the ever more competitive environment. Research can play a key role in this.

Transit operators believe that cost savings from innovations are illusory. And, research is antithetical to the mission of a transit agency because research requires taking risks and agencies are risk averse.

Don't bring solutions in search of a problem. Build a good relation with the transit operator and pay attention to their needs.

**University Transportation Research Center  
Regional Research Conference Proceedings (Oct. 25,1996)**

- A transit operator will not get excited about a concept unless he or she has confidence that the idea can be implemented, will not interfere with passenger operations or compromise safety, and that the operating and maintenance costs are known.

***Gerhardt Muller, The Port Authority***

Discussed the Port Authority's intermodal research needs.

***Jeffrey Zupan, The Regional Plan Association***

- Transit - How do we examine the issue associated with common routings of rail modes (airport access, institutional labor, funding, operations, physical compatibility)? How do we design a truly universal fare media? How do we test the impact of transfers?
- 1 Transit Friendly/Pedestrian Friendly - How do we determine the transportation impacts of urban design and micro level amenity features? How do we provide enough space for pedestrians in our core? How do we test the law of declining traffic with less space for vehicles? (The other side of "build the highway and the traffic will come?") How do we measure the economic and psychological impacts of congestion in our subways?
- 1 Highway - How do we measure the economic and psychological impacts of congestion on our roads? How do we determine the value of incentive tolling? How do we use EZ Pass to institute incentive tolling without being Big Brother? How can we use EZ Pass as early warning devices to drivers and operators, emergency responses to incidents? How do we count traffic and pinpoint congestion from traffic, not just from incidents?
- 1 Freight - How do we get those tractor-trailers to stop jack-knifing and stop causing havoc on the highways? How do we deal with the urban goods movement, lading docks in urban areas, narrow streets, etc.? How do we determine what we need for ports?
- 1 Process - How do we determine the economic impacts of new transit access? How do we deal with the law of self-fulfilling negativism? We marvel at European tunnels, but build elevated highway replacements. How do we show citizens the benefits of transit friendly design? How do we advance the public participation process? How do we overcome the stifling effect of NIMBYism? Or of BANANA? (That is, how do we split the banana?) (BANANA - build absolutely nothing anywhere near anyone)