2007 ITS-NY FOURTEENTH ANNUAL MEETING
“Integration – Pulling It All Together”
AGENDA

Thursday, June 7, 2007
7:30 a.m. Registration Desk and Exhibit Hall Open; Full Breakfast in Exhibit Hall Foyer

9:00 Opening Session
Rick Zabinski, ITS-NY President, and Jeff Randall, 2007 Annual Meeting Chair
Opening Keynote:  Brian Rowback, Chief Operating Officer, NYSDOT

9:45 Break in Exhibit Hall

10:30 Panel 1:  Traffic Management and CAD Integration
Panel Moderator:  Jeff Randall, Siemens ITS
“A Legacy of Traffic Management Using Computer Aided Dispatch (CAD),”
John Mecca, New York State Thruway Authority
“NITTEC and CAD,” Thomas George, Niagara International Transportation Technology Coalition

Noon  ITS-NY Luncheon (Exhibits Closed for 45 minutes during Lunch)
Keynote:  Stan Gee, Executive Deputy Commissioner, NYSDOT

1:30 p.m. Panel 2:  Planning for Operations
Panel Moderator:  Rob Jaffe, Consensus Systems Technologies
"Linking Planning and Operations,” Steven Gayle, Binghamton Metropolitan Transportation Study
"Planning for Operations -- An Objectives-Driven, Performance-Based Approach," John Mason, SAIC
"Planning For Operations in NYSDOT,” Brian Rowback, NYSDOT

3:00 Break in Exhibit Hall

3:30 Panel 3:  World Congress 2008 Update and
2007 Annual ITS-NY Project of the Year Awards
Session Host: Joseph Tario, ITS-NY Vice President
• WC08 Update, Rick Zabinski, ITS-NY President
• ITS-NY Project of the Year Award Winner(s) Spotlight(s)

5:30 Reception and Entertainment for All Conference Attendees in Exhibit Hall;
Exhibits Close 7:00 p.m.
2007 ITS-NY FOURTEENTH ANNUAL MEETING
“Integration – Pulling It All Together”

AGENDA
- continued -

Friday, June 8, 2007
7:30 a.m. Registration Desk and Exhibit Hall Open; Full Breakfast in Exhibit Hall Foyer
ITS-NY Board of Directors Meeting in Ballroom

8:30 Spotlight Presentation: “The Hudson Valley TMC Experience,”
Sgt. Ira Promisel, NYS Police

9:00 Panel 4: Bus Rapid Transit
Panel Moderator: Steven Levine, TransCore
“The New York City BRT Initiative,” Ted Orosz, MTA NYC Transit and
Joe Barr, New York City Department of Transportation
“The Westchester County BRT Initiative,” Naomi Klein, Westchester County DOT

10:15 Break in Exhibit Hall (Exhibit Hall Closes at 10:45 a.m.)

10:45 Panel 5: Integrated Corridor Management
Panel Moderator: Robert Reiss, Dunn Engineering Associates
“The Federal Initiative,” Louis Neudorff, Siemens ITS
“ICM Technology,” Dr. Christopher Hill, Mixon/Hill, Inc.
“The New York State Corridor Program,” Gordon Peters, New York State DOT

12:15 p.m. ITS-NY Luncheon and Keynote Address
Keynote Address: Fred Neveu, NYSDOT
Recognition of Retiring ITS-NY Board Members;
ITS-NY Officers and Board of Directors Election Results
Free Weekend and CITE Course Drawings

2:00 p.m. Adjourn
ITS-NY President Rick Zabinski opens the 2007 Annual Meeting and welcomes the group to Saratoga Springs…

Opening Keynoter Brian Rowback, Chief Operating Officer of NYSDOT, provides insightful remarks…

ITS-NY 2007 Annual Meeting Chairman Jeff Randall of Siemens ITS assumes the duties of Master of Ceremonies.
ITS-NY
2007 Annual Meeting

PANEL 1
Traffic Management and CAD Integration
Panel 1
June 7, 2007

Traffic Management and CAD Integration

Panel Moderator: Jeff Randall, Siemens ITS

“A Legacy of Traffic Management Using Computer Aided Dispatch (CAD),”
John Mecca, New York State Thruway Authority

“NITTEC and CAD,” Thomas George, Niagara International Transportation Technology Coalition
A Legacy of Traffic Management Using Computer Aided Dispatch (CAD)

John J. Mecca
New York State Thruway Authority
Communications Supervisor

- Thruway SP Relationship Co-located 1962
- Thruway Dispatches Road Statewide
- Paper System, DMV Calls on the Phone, Computerized NYSPIN in 1960s, 1970’s
- Thruway Traffic Supervisors
Early Days (1980s – 1990s)

- Notification to Public
- 1-800-THEROAD
- Shadow Traffic in New York
- Mid-1980s TRANSCOM
- Information Exchange Network (IEN) on I-95
- HAR Development Began – First DMS, CCTV
- 1-800 THRUWAY
1997 First Planning for CAD Deployment
2000 Contract Awarded
August 13, 2002 CAD went Live
- 500-600 Daily Calls for Service
- Re-designed the Internal Business Processes
2003 Computerized Phone System
- Added Call Takers
- 25,000 Monthly Calls
CAD/ATMS Integration

2003
- Added a Dedicated Senior Dispatcher to Monitor CAD and Performed Traffic Management Duties
- CAD Data to Thruway Website

2004
- CAD Data to NYS DOT CARS System

2005
- Thruway Starts Advanced Traffic Management System Deployment
CAD/ATMS Integration (continued)

2006

– TransAlert System
– NYSTA CAD to NYSTA CARS
– CAD Information becomes Traffic Management Tool
– Automated Integration of CAD Events into CARS
– Operators Take-over and Manage Events
CAD/ATMS Integration (continued)

2007
- Automated TransAlerts Based on CARS Events
- Automated Transfer of CARS Events
- Improved Thruway Website
  - CARS Events and CCTV
January 6, 2004

3:01 p.m. A minor accident at MP 145.7 North between 2 tractor trailers and a car. NYS Police are on the scene, and 2 tow trucks have been called.

3:18 p.m. Secondary accident at MP 144.3 Northbound. (Traffic backed-up over 1 mile within 15 minutes of original report)

3:32 p.m. Notified that an ambulance is necessary at the first accident.

3:50 p.m. Both Northbound lanes are closed with fire trucks and ambulance.

4:03 p.m. One lane open and serious personal injury is noted.

4:24 p.m. Closed lane opens, other lane closes for recovery.

4:27 p.m. Senior Dispatcher is advised: VMS and HAR are activated, the Capital District TMC is also notified. Several calls note that traffic is severely backed-up including Southbound on I-787 and Southbound on the Northway.
The dispatcher enters the accident into CAD, and handles the incident management with State Police, tow services, ambulance, etc.

The CAD event is sent automatically to the ATMS where the operator takes over the event, and can activate the suggested response.

- VMS MP 139 Northbound:

ACCIDENT AHEAD
WATCH FOR SLOW OR STOPPED TRAFFIC

- Similar wording is sent automatically to the Albany HAR.
- Automatic TransAlert Notification.

The operator verifies the situation, invokes the response automatically, and within minutes travelers are warned.
AMBER ALERT and the ATMS

Current Situation

- Statewide AMBER Alert takes up to 1 hour or HAR and DMS Activation
- Statewide Travel Plaza and Toll Station Amber Alert System

Future

- Automated HAR message generation
  - Simultaneous recording and distribution of HAR messages
- Event Driven Messages to all DMS Through CARS
The Future

What does the ATMS do with the information?

– Service Area Televisions
– Automated Response Plans based on the ATMS event
  • DMS
  • HAR
– Travel Times on DMS and Static Signs

Next Generation CARS-CAD

– Potential Data input from OnStar
Questions?
Contact:

John Mecca@thruway.state.ny.us
(518) 436-2813
NITTEC and CAD
Integration of ATMS with Public Safety Computer Aided Dispatch
Introduction

- Overview
  - NITTEC and Erie County Central Police Services
  - Incident Management Role
  - Performance Measurement Implications

- Integrated System Design
  - Architecture and Components
  - Data Exchanged
  - Features
  - Benefits
NITTEC

- Multi-Agency Transportation Operations Coalition
  - Centralized Operations and Traffic Management Services for Bi-National Region
- Regional Collaboration and Leadership
  - Technology Deployment
  - Operations
  - Incident Management
  - Traveler & Traffic Information
Erie County Central Police Services

- Administrative Criminal Justice Agency
  - Centralized Support Services for Public Safety and Criminal Justice Agencies

- Countywide Services
  - Enhanced 911
  - Police Radio Communications
  - Computerized Systems including CAD
  - Technology Development and Deployment
Regional Collaboration
Traffic and Incident Management

- Crossroads System - ATMS
  - Intelligent Freeway Traffic Management System
  - Monitors & Displays Highway Events & Incidents
  - Deploys ITS Elements in Region

- CHARMS (Complaint History and Record Management System) - CAD
  - Computer Aided Dispatch System for Police Agencies
  - Dispatch System for Mobile Communications
  - Database for Complaint and Response Tracking
Regional Collaboration
CAD – ATMS Integration

CAD – ATMS Data Sharing

- Real Time Data Sharing Through Direct Network Connectivity
- Between Independent Agencies
  - Transportation – Coalition Members
  - Public Safety Agencies
- Value Added Opportunity
- Backbone for Future Data Sharing
Incident Management Benefits

- Early Notification
- Reduces the Need for Additional Verbal Communications
- Single Data Source for Multiple PSAP’s (16 in County)
- Improves Accuracy of Information and Verification
- Improves Operational Efficiency and Ability to Disseminate Information
- Enhances Relationships
Performance Measurement Benefits

- Response and Clearance Times Automatically from CAD
- Enhances Public Safety Understanding of Needs and Benefits of Performance Measurement
- Increases Coverage Area for Performance Tracking (traditionally done via Phone or CCTV)
- Improves Credibility of Performance Reports with Public Safety
- Enhances Relationships
NITTEC/CAD Integrated System
Physical Architecture
Intelligent Information Integration Broker (I3B) Features

**INTELLIGENT**
- XML data filtering
  - Text based
  - Geospatial based
- XML data transformation
  - Standard to standard

**INTEGRATION**
- Standard interface
  - XML & Web Services
- Custom interfaces
  - Data Translation and Protocol Conversion (I3Bi)

**INFORMATION**
- Data distribution to multiple systems
- Data storage
- Data viewing

**BROKER**
- Guaranteed delivery
- Secure receipt and delivery
- Logging, reporting and alerting
Message Types Used

- All messaging conforms to ITS standards
  - IEEE 1512 – Incident/Work Zone/Close/Merge
  - FEU – Queue
- CHARMS to CROSSROADS
  - Incidents
- CROSSROADS to CHARMS
  - CROSSROADS Incidents
  - CHARMS incident updates
  - Planned events
  - Queue events
Message Data Exchange
Supported by the Interface

- Event ID, author (CH, AMH, TT, NITTEC)
- Event location (link name, lat/long (point, head/tail), travel direction)
- Event type (accident, accident with injuries, disabled vehicle, road construction, long queue, etc)
- Event status (unconfirmed report, initial response en-route, initial response on scene, closed)
- Descriptive text
- Lane status (open/closed)
- Times
  - Issue, update
  - Start, end
  - Responder dispatch/arrival/departure times
    - Law enforcement, fire, rescue, wrecker, additional help
NITTEC I3B Features

- CROSSROADS I3Bi
  - Message conversion
    - SQL messages to/from IEEE 1512 messages
  - Event type mapping
    - CROSSROADS event types to/from ITIS event types
  - Road name mapping
    - CROSSROADS road names to/from IEN road names
- CHARMS I3Bi
  - Message conversion – XML to XML
  - Road name mapping
    - CHARMS road names to/from IEN road names
    - Default geo-coding by road name
NITTEC I3B Features (cont.)

- I3B
  - Road name filtering
    - Messages for incidents on CROSSROADS roads
  - Geo-filtering
    - Messages for incidents on cross streets near CROSSROADS roads
  - Message transformation
    - IEEE 1512 messages to/from FEU messages
- Database I3Bi
  - Data storage
    - All received messages from all sources
New CROSSROADS Features

- User Interface
  - Accept/reject/update CHARMS events
  - Display of responder time data - dispatch/arrival/departure times
  - Merge CROSSROADS event with CHARMS event
- Return acknowledgement that CHARMS data viewed by Operator
  - Occurrence, verification, clear
New CHARMS Features

- Geo-coding of complaints based on address
- Mapping of CHARMS complaint types to/from IEEE 1512 event types
- Conversion of CHARMS complaint messages to/from IEEE 1512 messages
- Display of acknowledgement when CHARMS data viewed by NITTEC operator
Benefits of NITTEC-CAD Integration Approach

- NITTEC awareness of all incidents that impact roads and incident response status
- CPS can be awareness of traffic conditions and road construction
- NITTEC updates of CHARMS incidents can be reported to CHARMS
- Supports merging of duplicate events
  - Condition occurs if CROSSROADS receives new incident from CHARMS for incident already entered in CROSSROADS
Benefits of NITTEC-CAD Integration Approach (cont.)

- Supports integration with IEN and other systems using I3B
  - Compatible with NYSDOT IEN interface
  - Eliminates duplicate entry of data in CROSSROADS and CARS
ITS-NY President Rick Zabinski thanks Mark Kulewicz, AAA New York State, for his years of service on the ITS-NY Board of Directors...
Panel 2
Planning for Operations
June 7, 2007

Panel Moderator: Rob Jaffe, Consensus Systems Technologies

"Linking Planning and Operations,” Steven Gayle, Binghamton Metropolitan Transportation Study

"Planning for Operations -- An Objectives-Driven, Performance-Based Approach," John Mason, SAIC

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ITS-NY
2007 Annual Meeting

PANEL 2
Planning for Operations
Planning for Operations
An Objectives-Driven, Performance-Based Approach

A Discussion with New York ITS Leadership

John Mason, SAIC

June 7, 2007
A Joint Initiative of the
Office of Operations and Office of Planning, FHWA and
Federal Transit Administration
Session Purpose

- Share emerging thinking on how to address challenges in performance of our transportation system by incorporating transportation system management and operations (TSM&O or M&O) into the solution set.

- Encourage objectives-driven, performance-oriented operations thinking.

- Note criticality of ITS to developing and achieving M&O goals.
Discussion Outline

- **Motivation** for new thinking
- **Opportunity** to make a difference
- **Goals and Objectives** to point the direction and measure performance
- **Implications** for planners and operators
- **Planning for Operations** provides opportunities for ITS
- **New Thinking** - a cultural shift

With ITS a key tool
Motivation –

Increasing Concerns

- Increasing congestion
- Traffic incidents
- Goods movement
- Special events
- Homeland security
- Emergency response
- Modal choices
- Work zones
- Weather

"... and everyone is faced with budget constraints, decreased funding, and rising expectations"
Motivation –

Sources of Congestion: National Summary

- Traffic Incidents (25%)
- Bottlenecks (40%)
- Bad Weather (15%)
- Work Zones (10%)
- Poor Signal Timing (5%)
- Special Events/Other (5%)

Traffic Congestion and Reliability. FHWA (September 2005)
Motivation –

Growth in Wasted Hours

In the 13 largest regions, drivers spend the equivalent of almost eight work days each year stuck in traffic

Annual Hours Lost to Congestion Per Peak Hour Driver
Very Large Metro Areas, 1983 v. 2003

2005 Urban Mobility Report, TTI
Motivation –
Capacity Constrained

Vehicle Travel up 88%
Road Miles up 5%
1980 - 2003

VMT growing at 4% annually
Capacity growing at 0.2% annually
Motivation –

What Do Our Customers Want?

- Travel smoothly and safely
- Be kept informed of conditions
- Timely information to make mode and route choices
- Goods moved efficiently and quickly
- Incidents detected and cleared quickly
- Efficient evacuations
- Coordination of construction projects

Consistently across jurisdictional boundaries
Motivation – SAFETEA-LU Requirements

- **Planning factor:** Promote efficient system management and operations

- **M&O strategies:** MTP shall include “operational and management strategies to improve the performance of existing facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods”

- Additionally, for TMAs, a Congestion Management Process (CMP) required
Opportunity –
M&O in Context of MTP Requirements
Opportunity –
Transportation Systems Management and Operations (TSM&O or M&O)

Integrated program to optimize performance of existing infrastructure through the implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects designed to

- Preserve capacity, and
- Improve security, safety, and reliability
Opportunity –
TSM&O Includes

- Incident Management
- Traveler Information
- Freeway Management
- AVL for Transit
- Traffic Signal Coordination

- Work Zone Traffic Management
- Roadway Weather Information
- Electronic Payment
- Freight Management

...all of which involve ITS.
## Opportunity – Typical ITS Opportunities

<table>
<thead>
<tr>
<th>TSM&amp;O Strategies</th>
<th>Local</th>
<th>Metro</th>
<th>Statewide</th>
<th>Evacuation</th>
<th>Security</th>
<th>Data</th>
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<td><strong>Traveler Information</strong></td>
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<td><strong>Transit Priority Systems</strong></td>
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<td><strong>Work Zone Management</strong></td>
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<td><strong>Special Events Planning</strong></td>
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Motivation –

Increasing Concerns

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- Homeland security
- Emergency response
- Modal choices
- Work zones
- Weather

"... and everyone is faced with budget constraints, decreased funding, and rising expectations"
Opportunity –
TSM&O Addresses Regional Concerns

TSM&O Strategies
- Traffic incident management
- Traveler information services
- Freeway management
- Traffic signal management
- Transit priority systems
- Work zone traffic management
- Road weather management
- Electronic payment services
- Freight management
- Special events planning

Transportation Concerns
- Commuter congestion
- Traffic incidents
- Goods movement
- Special events
- Homeland security
- Emergency response & management
- Modal choices
- Work zones
- Weather
Goals and Objectives – Rationale for Regional Operations

Goals/Objectives in MTP

- More objective (rather than subjective) approach to addressing operations (to include ITS)
- Focused transportation investment prioritization
- Improved resource allocation
- Increased accountability and measurement of performance
- Engaging the operations community in a more substantive way

With ITS a Key Tool
Goals and Objectives –

M&O Goals

Goal describes a desired end-state

Illustrative M&O-related goals:

- The “X” region will optimize the operation of the regional highway and transit system
- The “X” region will provide a reliable regional transportation system
- The “X” region will ensure effective transportation responses to emergencies
Goals and Objectives –

Characteristics of Objectives

Specific. Sufficient to guide variable approaches

Measurable. Quantitative measurement

Agreed. Consensus among partners

Realistic. Can be accomplished

Time-bound. Identified time-frame for accomplishment
Goals and Objectives –
Examples of Regional Operations Objectives

By [year], reduce the clearance time of traffic incidents on freeways and major arteries in the region from a current average of X minutes to an average of Y minutes.

By [year], decrease average annual traveler delay associated with road closures, major incidents, and weather-related conditions on interstate highways by 20 percent from 2005 levels.
Implications for Regional Planning

Traditional Planning Process
- Elected/appointed officials
- Collective regional plan development
- Long-term planning focus
- Near-term project funding
- Projects of local and regional significance
- Historical trends

Planning Influenced by TSM&O
- Operations thinking influences vision and goals
- Measurable objectives identified
- Decisions engage operations managers
- Operations/capital mix optimized
- Performance measures reflect objectives
- Regional performance informs planning
- ITS considered early

Improving regional transportation system performance
### Implications for Transportation Operations

#### Typical “O&M”
- Jurisdictional/Agency focused
- Maintenance oriented
- Peak-period focused
- Limited real-time information
- Targeted coordination for specific events
- Output-based measures

#### Regional TSM&O
- Regional cross-jurisdictional, multi-agency, multi-modal system
- Real-time information sharing 24/7 to support operations decisions
- Deliberate and sustained collaboration and coordination
- Customer-focused performance measures
- Regional forums for collaboration
- **ITS opportunities maximized**

---

**Improving regional transportation system performance**
Planning for Operations –

Why Link Planning and Operations?

- Customer expectations for improved system performance
- New technologies, especially ITS
- Environmental, community and funding constraints
- Benefits of operational strategies, especially in 3 – 5 year timeframe
- Federal requirement – “promote efficient system management and operations”
Planning for Operations - Implications for Linking Planning and Operations

Typical Interactions

- Specific projects.
- Major special events.
- Post 9-11 emergency planning.
- Regional ITS architecture development.

Opportunities to Advance

- Regional forums for collaboration.
- Performance measures.
- Data collection and sharing.
- Congestion management systems.
- TSM&O projects.
- Funding/resource sharing.
- Regional ITS architecture use.

Shifting the culture to improve system performance
Planning for Operations –
A “Cultural Shift”

Coordination Among Decisionmakers

Regional Transportation Planning and Investment Decisionmaking

Linkages

Regional ITS Architecture
Performance Measures
Data Collection and Sharing
Regional TSM&O Projects
Funding/Resource Sharing
Institutional Arrangements
Congestion Management Process
Regional Concept(s) for Transportation Operations

Coordination Among Day-to-Day Operations Managers

Transportation Systems Management and Operations
Linkage: Regional ITS Architecture

- Framework for ensuring institutional agreement and technical integration for ITS with a region

- Linkage possibilities:
  - Operators view ITS projects in context
  - Planners see value of integrated data and technology for transportation system efficiency
Example: *Hampton Roads Regional ITS Architecture*

- Planning for ITS was impetus for regional communication and coordination
- Region’s ITS Committee hosted by MPO; plans and coordinates ITS deployment
- ITS Plan feeds into region’s long range plan
- Led to Incident Management RCTO that is in progress

http://www.hrpdc.org/transport/program4.shtml
Linkage: Performance Measures

- Focus attention on operational issues (e.g., congestion, incident clearance time, etc.)
- Demonstrate value of operational projects/programs
- Linkage possibilities:
  - Planners and operators jointly develop measures
  - Incorporate operational performance measures in state/regional plans (e.g., LRP, MTP)
  - Use operations data for annual performance report
Examples: NTOC Performance Measures

- Customer satisfaction
- Extent of congestion
- Delay – Non-recurring
- Delay – Recurring
- Incident duration
- Speed
- Throughput – Person
- Throughput – Vehicle
- Travel time – Link
- Travel time – Reliability
- Travel time – Trip

Linkage: Data Collection and Sharing

- Planners and operators share data
- Planners and operators benefit from archived, forecasted, and real-time data
- Linkage possibilities
  - Planners use archived operators data for modeling
  - Pinpoint problems to focus investment decisions
Example: **ARTMIS Traffic Management System**

- Located in Cincinnati region
- Collection of advanced technologies that provide freeway and incident management
- Shared radio communications system between public safety, transit, freeway service patrols
- Data archives available to all partners
- ARTMIS traffic data shared with Kentucky statewide 511 system

http://www.artimis.org/
Linkage: TSM&O Projects

- Serves as basis for ongoing collaboration
- Increases coordination with transportation planning
- Linkage possibilities
  - MPOs play coordinating role in regional project
  - Operations organizations work together to obtain funding in TIP
Example: *Kansas City’s Operation Green Light*

- **Function:** Synchronize traffic signals between jurisdictions
- **Participants:** MARC, Missouri & Kansas DOTs, 17 cities
- **Motivating factors:**
  - Missouri CMAQ funds to address air quality
  - Champions of regional partnerships
- **Benefit:** Average expected travel delay reduction – 17%

http://www.marc.org/transportation/ogl/
Linkage: Funding/Resource Sharing

- Basis for regional coordination of equipment, services, etc.
- Economies of scale; reduce redundancies
- Linkage possibilities
  - Shared facilities lead to interagency connections
  - Staff exchanges build understanding and trust
Example: Southeast Michigan Snow and Ice Management Partnership

- Formed in 1998 by four local road agencies
- Transit agency donates bandwidth on radio communication system
- Road agencies contribute funding

Benefits:
- Saved money on procurement by acquiring the same technology for maintenance vehicles
- Joint effort received earmark and CMAQ funding

http://www.rcocweb.org/Home/semsim.asp
Linkage: Institutional Arrangements

Regional committees or coalitions where operations managers and planners maintain dialogue and work toward common goals

Linkage possibilities

- MPO committee on operations, ITS, freight, etc.
- Involvement of regional operations committees in regional plan development process
Example: *Niagara International Transportation Technology Coalition (NITTEC)*

- **Function:** Provide a traveler information clearinghouse, help to coordinate incident management, advance technology, and facilitate collaboration.
- **Participants:** 14 agencies in Western New York and Southern Ontario
- **Benefits:**
  - Operates regional ITS equipment
  - Provides forum for members to plan for planned special events
  - Develop multi-agency incident management training

http://www.nittec.org/
Linkage: Congestion Management Process

CMP includes:
- Monitoring system performance
- Finding causes of congestion
- Providing alternative mitigation strategies
- Federal requirement if population > 200,000
- Project development requirements based on air quality
Example: *Dallas/Ft. Worth CMP*

- MPO has fully integrated CMP into planning process
- Focus on management and operations began because of air quality challenge
- CMP used to show effectiveness of incident management
- CMP strategies given high priority in long-range plan

http://www.nctcog.org/trans/cmp/index.asp
The “Cultural Shift” – Making It Happen

- **Build on current planning and collaborative processes**, to include ITS architecture efforts
- **Think TSM&O** – operational strategies to address challenges, most of which involve ITS
- **Link planning and operations**
- **Involve operators and users of system** (public safety, tourism, freight, etc.)
- **Create mix of capital and operations projects in investment decisions** (MTP, TIP, STIP)
A Final Thought!

“Traffic congestion is essentially a regional phenomenon requiring regional approaches to mitigate its impacts.”

- Anthony Downs, The Brookings Institute

“The Need for Regional Anti-Congestion Policies”
For More Information

**Contact:**
Wayne Berman, FHWA, Office of Operations
wayne.berman@fhwa.dot.gov
Harlan Miller, FHWA, Office of Planning
harlan.miller@fhwa.dot.gov
Charlie Goodman, FTA
charles.goodman@dot.gov

**Websites:**
http://www.plan4operations.dot.gov
http://www.ntoctalks.com
Spotlight Presentation
“The Hudson Valley TMC Experience”
Sgt. Ira Promisel, NYS Police

June 8, 2007
INTEGRATION
WHY WE NEED TO BREAK THE SYSTEM

SGT IRA S PROMISEL
INTRODUCTION

- NYSP AND THE HVTMC
- PHILOSOPHY
- CURRENT SYSTEM
- INTEGRATION - IT IS SO EASY
- FAILURES
- PROBLEMS, BIG PROBLEMS
- CHANGING THE PARADIGM: MAKING IT WORK
- HVTMC’s INTEGRATION
NYSP AND THE HVTMC

- NYSP is a primary partner with DOT
- “Teamwork and Technology”
- Transportation Management Center with Multiple Missions (SOC)
- Opportunities for Economies of Scale
- “Lab” for Testing and Deploying Technology
- Cross Agency Efforts
PHILOSOPHY

- One Point of Entry
- Connect Systems in the Back End
- Keep it Simple For the User
- Illicit User Input Early
- Plan, but also Do
- Make the Technology Fit the Business Rules NOT the Business Rules Fit the Technology
- Test New Ideas, Deploy Proven Technology
- Partner With Non Traditional Agencies/Be Inclusive
- GIS Integral (All Use the Same Base)
- Ensure Works with NIMS and Unified Command Philosophy
CURRENT SYSTEM

• CAD
  • Mobile Data Terminals/Mobile PC’s (currently over 200 units deployed in F and K and T including HELP)
  • Suitable for Daily Operations and Emergency Management

• ATMS
  • ITS Elements

• OTHER SYSTEMS
  • IIMS
  • SJS
  • MAMIS
  • EJUSTICE
  • DISASTER LAN
CURRENT SYSTEM

Fully Deployed Elements Include:

• Tracs
• Wireless Connectivity (CDMA)
• Connections to HELP / Local PD’s
• MDB
• LPR
• Digital Video
• CAD Connectivity
• Interfaces with SJS, NYSPIN, ATMS, AVL
• Time Synchronization
CURRENT SYSTEM

Tested / Partial Deployed Elements Include:

- VPN Integration
- Mobile Video Applications
- PDA Applications
- Mobile Mapping
- AVL Integration
NEW INITIATIVES

- CAD to CAD
- IIMS Integration (NYC/DOT Incident Management System)
- Messaging Outside the System (AMBER)
  - Integrated Into Existing Screens
- Tracs, LPR Integration
- Links to New Systems (SEMO All Hazard Portal)
- Adding Nontraditional Partners
  - Maintenance
  - Construction
  - Towing
INFRASTRUCTURE

- Wireless
  - CDMA
  - Security (VPN, Encryption, Mobile IP)
- NYSP Network Over the NYeNET Backbone
- Mobile Computers
- Modems
- Digital Video
- Ports, USB Connections, Serial VS UDP
- Servers, Servers, Servers
INTEGRATION

ITS SO EASY!

• Use of common standards
• XML
• We’re all on NYeNet
• I3B
• It is just data, maybe some pictures
• Everyone wants to connect
INTEROPERABILITY
(ALPHABET SOUP)

ATIS

TMC

HVTMC

PUBLIC SAFETY

DISASTER MANAGEMENT

FIRE/EMS

IEEE 1512.1
Traffic IM

IEEE 1512.2
Traffic IM PS

IEEE 1512.2
EDXL

IEEE 1512.2
EDXL

EDXL

EDXL

TBD
1512?
IPSTSC
LEITSC
OOPS, WE BROKE IT

- Too Much Stuff
- Too Little Stuff
- The Wrong Stuff
- Volume, Volume, Volume
- Stuff that Breaks it (characters)
- Power
- Network
- Wireless Problems Abound
PROBLEMS

- Who owns the data
- Standards, what standards
- Dollars
- How big and where does it live
- Who fixes it
- Operators
- Competing priorities
  - Use of Vendors/Universities/Home Grown
  - Unrealistic Expectations (time, results, doing everything, etc)
- People Problems
  - The “no syndrome”
  - IT Departments
  - You always miss someone for buy in
  - Someone is doing the same thing...better
CHANGING THE PARADIGM

- Agency buy in at all levels
- Outreach and Team with Partners
- Don’t worry where the idea came from
- Break it now, before we become essential...
- Create a system centralized at the Region Level, but can be replicated across the State
- We don’t live in a Perfect World. Deal with it.
- Be Persistent..Be Persistent
I 95 STUDY

• Prepared in 9/03
• Roadmap for CAD to CAD
• Stresses a non-proprietary system
• Included:
  • Information flow
  • Current technologies
  • Survey of Systems
  • Proposed Solutions (software, network, etc)
HVTMC CAD TO CAD

- Uses the I3B as its heart
- Centralized at HVTMC, Can be Replicated/Redundant Across the State
- Outreach done early
- Funded by DOT and I 95 CC
- Chose to initially keep it limited:
  - Key incident info
  - AVL
  - Messaging
- Standards
QUESTIONS
ITS-NY
2007 Annual Meeting

PANEL 4
Bus Rapid Transit
2007 ITS-NY FOURTEENTH ANNUAL MEETING AND TECHNOLOGY EXHIBITION

June 8, 2007

Panel 4

Bus Rapid Transit

Panel Moderator: Steven Levine, TransCore

“The New York City BRT Initiative,” Ted Orosz, MTA NYC Transit and Joe Barr, New York City Department of Transportation

“The Westchester County BRT Initiative,” Naomi Klein, Westchester County DOT
• Flexible, integrated, high performance system with a quality image and a strong brand identity.

• Essential elements
  – Speed
  – Reliability
  – Attractiveness
Goals for BRT

- Provide fast and reliable transit for trips not currently served by subway routes
- Improve service for current riders and attract new riders
- Manage congestion
- Balance bus mobility goals with other community goals
- Support economic development
- Promote environmentally-friendly transportation options
Need for BRT in New York City

• Bus travel speeds relatively low
• Very limited ability to expand network
  – Roadways
  – Subways
• Expected 2030 growth (PlaNYC 2030)
  – 1 million additional residents
  – 750,000 additional jobs
In New York City
- 54% of the time buses are in motion
- 21% of the time buses are at traffic signals
- 22% of the time is spent boarding/alighting

15 Corridors - % of Trip by Component

- Average In-Motion Time: 53.7%
- Average Dwell Time: 22.4%
- Average Stop Signal Delays: 21.0%
- Average Other Delays: 2.9%
New BRT Stations
Range of Running Ways

Interior/Offset Bus Lane Boston

Curb Bus Lane NYC
Running Way Color and Markings

Seoul

Auckland

Sao Paulo

Running Way Color and Markings
Intelligent Transportation Systems (ITS)

- Automatic vehicle location
- Passenger information
- Signal priority
- Fare collection
- Vehicle guidance and control

Signal Priority
NYCT SMCIS TYPICAL SCREEN
ITS Systems: Passenger Information

On Board
Paris: Val de Marne Busway

At Stations
LA: Metro Rapid Bus
Bus Propulsion
Comparison of Local, Limited, and BRT

- **Local**
- **Limited**
- **BRT**
Legislation has been submitted to permit enforcement of Bus Lanes by still or video cameras. Pilot would permit camera enforcement on first five BRT corridors only.

Use of either fixed cameras mounted on stanchions or cameras mounted on buses.
Viva BRT
York, Ontario
Bus Rapid Transit

Corridor Screening
BRT Benefits are based on the following metrics:

1. Base BRT Ridership
2. Ability to support Frequent/All-Day Service
3. Potential Travel Time Savings
4. Ridership Trend/Future Growth
5. System Connectivity
BRT Compatibility is based on the following metrics:

- Traffic impacts on corridor
- Parking regulation changes required
- Ability to provide full range of station amenities
- Extent of dedicated running ways on corridors
# Overall Corridor Rankings

## Results of Evaluation

<table>
<thead>
<tr>
<th>Rank</th>
<th>Corridor</th>
<th>Borough</th>
<th>BRT Benefits</th>
<th>BRT Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1st/2nd Avenue</td>
<td>Manhattan</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Union Turnpike</td>
<td>Queens</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Fordham Road/Pelham Parkway</td>
<td>Bronx</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>Hillside Avenue</td>
<td>Queens</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Nostrand Avenue</td>
<td>Brooklyn</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>West Side Manhattan</td>
<td>Manhattan</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Merrick Boulevard</td>
<td>Queens</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>8</td>
<td>Horace Harding Expressway</td>
<td>Queens</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>Flatbush Avenue</td>
<td>Brooklyn</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Hylan Boulevard</td>
<td>Staten Island</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Kings Highway/Flatlands Avenue</td>
<td>Brooklyn</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Flushing to Jamaica</td>
<td>Queens</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>Guy R. Brewer Boulevard</td>
<td>Queens</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>Grand Concourse</td>
<td>Bronx</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>15</td>
<td>Webster Avenue</td>
<td>Bronx</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>
The Bronx:
**Fordham Road-Pelham Parkway** (Bus Route Bx12)

Brooklyn:
**Nostrand Avenue** (Bus Route B44)

Manhattan:
**First / Second Aves** (Bus Route M15)

Queens:
**Merrick Boulevard** (Bus Route Q5)

Staten Island:
**Hylan Boulevard** (Bus Route S79)
Queens – Merrick Boulevard Corridor Plan

Jamaica Center Station
York College Station
Linden Blvd Station
Baisley Blvd Station
Springfield Blvd Station
Farmers Blvd Station
225th St Station
233rd St Station
Merrick/Hook Creek Station
Hook Creek/Sunrise Hwy Station
West East Green Acres Mall Stations

Transfer to E 4 7

- Existing Q5 Limited Stop
- BRT Station
- Merrick Blvd BRT Alignment
- Bus Lane

Miles
0 0.5

N

MTA New York City Transit
On Merrick Boulevard
- 63% of the time buses are in motion
- 18% of the time buses are at traffic signals
- 17% of the time is spent boarding/alighting
Merrick Boulevard Corridor – AM Peak Ridership

- Merrick Blvd & 107 Av
- Merrick Blvd & 109 Av
- Merrick Blvd & 111 Av
- Merrick Blvd & Linden Blvd
- Merrick Blvd & Foch Blvd
- Merrick Blvd & Baisley Blvd
- Merrick Blvd & Selover Rd
- Merrick Blvd & Springfield Blvd
- Merrick Blvd & 224 St
- Merrick Blvd & 230 St
- Laurelton Py Sr S & Merrick Blvd
- 168 St & Archer Av
- Liberty Av & Merrick Blvd

New York City Transit
Merrick Boulevard Corridor – Cross Sections

Merrick Boulevard at 225th Street

EXISTING LAYOUT

PROPOSED LAYOUT

PROPOSED BRT STATION

MTA New York City Transit

DOT NEW YORK CITY

7
The Bronx – Fordham Road-Pelham Parkway Corridor Plan
On Fordham Road / Pelham Parkway:
- 49% of the time buses are in motion
- 21% of the time buses are at traffic signals
- 28% of the time is spent boarding/alighting

**Components of Travel Time**

- **Average In-Motion Time**: 49.2%
- **Average Dwell Time**: 27.7%
- **Average Stop Signal Delays**: 21.3%
- **Average Other Delays**: 1.8%
Traffic Signal Priority Measures:
On Nostrand Avenue
- 45% of the time buses are in motion
- 26% of the time buses are at traffic signals
- 24% of the time is spent boarding/alighting

**B44 - % of Trip by Component**

- **Average In-Motion Time**: 44.5%
- **Average Dwell Time**: 24.0%
- **Average Stop Signal Delays**: 26.0%
- **Average Other Delays**: 5.4%
Rogers Avenue at Church Avenue

**Existing Layout**
- Rogers Avenue
- Church Avenue
- Nostrand Avenue

**7am to 10am Parking Restriction Applies in Peak Periods. Parking Permitted in Off-Peak.**

**Proposed Layout**
- Rogers Avenue
- Church Avenue
- Nostrand Avenue

**Restrict Parking in Peak Periods to Provide Additional Travel Lane.**

**NEW LANE**
- Proposed BRT Lane

<table>
<thead>
<tr>
<th>Existing Layout</th>
<th>Proposed Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/B Parking and Travel Lane</td>
<td>N/B Bus Only Lane</td>
</tr>
<tr>
<td>20' N/B Travel Lane</td>
<td>12' N/B Travel Lane</td>
</tr>
<tr>
<td>12' N/B Travel Lane</td>
<td>11' N/B Travel Lane</td>
</tr>
<tr>
<td>12' N/B Travel Lane</td>
<td>11' N/B Travel Lane</td>
</tr>
<tr>
<td>12' N/B Travel Lane</td>
<td>12' N/B Travel Lane</td>
</tr>
<tr>
<td>Sidewalk</td>
<td>Sidewalk</td>
</tr>
</tbody>
</table>
Manhattan – First/Second Avenues Corridor Plan
Components of Travel Time

- On First/Second Avenues
  - 54% of the time buses are in motion
  - 21% of the time buses are at traffic signals
  - 22% of the time is spent boarding/alighting

M15 - % of Trip by Component

- Average In-Motion Time: 54.1%
- Average Dwell Time: 21.7%
- Average Stop Signal Delays: 20.5%
- Average Other Delays: 3.7%
Components of Travel Time

- On Hylan Boulevard
  - 67% of the time buses are in motion
  - 15% of the time buses are at traffic signals
  - 15% of the time is spent boarding/alighting

S79 - % of Trip by Component

- Average In-Motion Time: 67.1%
- Average Dwell Time: 14.9%
- Average Stop Signal Delays: 14.6%
- Average Other Delays: 3.4%
Hylan Boulevard Corridor – Cross Section

Hylan Boulevard at Wiman Avenue

EXISTING LAYOUT

PROPOSED LAYOUT
Anticipated BRT Elements

- Bus Lanes, with improved markings / signs
- New Stations / New Shelters
- Traffic Signal Priority at Selected Locations
- Enhanced Service Plan - More frequent and longer hours of service
- Wider Station Spacing
- Branding on Vehicles and at Stations
- Enhanced Enforcement of Bus Lanes
Follow-up Activities

BRT Elements that Will Be Phased in

- New buses
- More sophisticated fare collection, such as a Smart Card system, particularly at Subway Terminals
- Corridor-Wide Traffic Signal Priority and other changes to signal timing
- Real-time customer information at stations
- Bus lane enforcement cameras (or other new methods)
Determine Order of Implementation Based upon:

- Complexity of Implementation
- Timing of Other Nearby Projects
- Public Input

Perform Additional Technical Analysis:

- Traffic and parking effects
- Transit Ridership

Implementation:

- Two Corridors by early 2008
Bus Rapid Transit

NYCBRT Study
Central Avenue

Bus Rapid Transit Assessment

June 8, 2007

Naomi Klein
Principal Planner
Westchester County Department of Transportation
Westchester County, New York

- 950,000 people (2006)
- 433 square miles

- Second largest bus system in the state after MTA New York City Transit
- 27.8 million annual riders
- 100,000 daily weekday riders
- 64 Routes operated each Weekday
- 31 Routes operated each Saturday
- 22 Routes operated each Sunday
Equipment Fleet
Over 300 buses

Articulated 60 foot bus
30 foot transit bus
40 foot transit bus
Commuter Coach
Equipment Fleet – Latest Addition

- Bee-Line’s New Hybrid buses at their dedication on July 17, 2006
Westchester County contracts with three transit operating companies to provide the needed service

- Liberty Lines Transit, Inc.
- Port Chester Rye Transit, Inc.
- PTLA Enterprises, Inc.
To support the transit system there are

- Over 3,000 bus stops
- 300 bus shelters
- 24 hour Passenger Information Center
- Two County owned bus maintenance facilities
MetroCard has Arrived!

• The Bee-Line started honoring the region’s fare card on April 1, 2007
• Provides discounted fares
• Easy transfers
• Extended travel for one fare, including MTA subway and bus
• Over 60% use to date
The Central Avenue Corridor

Serves Westchester County between White Plains and Yonkers, and links Westchester to New York City

• 12 miles long
• Extends from County Center to Bronx Line, through City of White Plains, Town of Greenburgh and City of Yonkers
Central Avenue Corridor
3 Bee-Line Routes

- 20 and 21 connect Westchester with the New York City subway trains B & D at Bedford Park station and 4 at Woodlawn Station.
- BxM4C Westchester – Manhattan Express – links Westchester to mid-town and lower Manhattan.
Bee-Line Ridership on Central Avenue (2004)

- 3.4 million total annual riders
- 2.7 million on the Route 20 – 10% of total system ridership
- 676,000 annual riders on the 21 and BxM4C
- Average daily weekday ridership approximately 10,000.
Major Destinations

- Westchester County Center
- Cross County Shopping Center – 1.5 million square foot retail development
- Yonkers Raceway – 7,500 Video Lottery Terminals
- NYC Subway – 30% of riders
High Concentration of Residential, Retail and Commercial Development
Opportunities for Development
Pedestrian Challenges

- Incomplete sidewalks
- Wide crossings
Traffic and Bus Stops

- 58 bus stops, spaced approximately every $\frac{2}{10}$ of a mile
- 44 traffic signals spaced approximately every $\frac{3}{10}$ of a mile
Why BRT on Central Avenue?

- It is the single most heavily travel bus route in the County
- It has been necessary to increase the scheduled running time of Routes 20, 21 and BxM4C along Central Avenue because of traffic congestion
- Potential for increased ridership – MetroCard, Yonkers Raceway
Objective of the Central Avenue Bus Rapid Transit Assessment

The objective of this study is to identify components of Bus Rapid Transit for the Central Avenue Corridor that will:

• Reduce travel times
• Attract new riders
• Improve mobility in the corridor
• Create an integrated and customer friendly transit service
What is Bus Rapid Transit (BRT)?

• BRT is based on light-rail transit principles. It combines the most attractive features of light rail transit with the lower costs of bus technology.

• Instead of trains and tracks, BRT invests in improvements to roadways, rights-of-way, intersections, and traffic signals to speed up bus transit service.
Major Elements of BRT

1. Stylish Vehicles
2. Attractive Stations
3. Faster Fare Collection
4. Guideways and Rights of Way
5. Intelligent Transportation Systems
6. Operations
7. Land Use
8. Access to Stations
9. Strong Brand Identity
1. Stylish Vehicles

- Easy boarding
- Comfortable interiors
- Modern and sleek design
2. Attractive Stations

- Comfortable
- Attractive
- Welcoming
3. Faster Fare Collection

- Collect fares at stations (not on bus)
- All door BRT boarding speeds trips
- Someday smart cards, cell phones or watches can be used to pay fares
4. **Guideways & Rights of Way**

Separating BRT vehicles from other traffic increases speed and reliability. Several options:

- Exclusive bus ways. Own road.
- Bus only lanes
- Mixed flow lanes with queue jumpers
- Special bus only on ramps
5. Intelligent Transportation Systems – Traffic Priority Elements

To keep BRT moving...

- Traffic light pre-emption
- Traffic light extended green
- Queue jumpers
5. Intelligent Transportation Systems – Traveler Information

- **Real time passenger information provided:**
  a) At stations
  b) Via cell phone
  c) On internet

- **Traveler information may include:**
  a) Next bus arrival
  b) Delays
  c) Trip itinerary planning
6. Operations

- Frequent service
- Fewer stops
- Easy to understand routes
- Intermodal connections
- Works in concert with local bus service
7. Land Use

Coordinating transit supportive land uses around BRT stations will create transit friendly environments.
8. Access to Stations

Getting to BRT stations is important. Depending upon the station, customers can walk, bike, take a shuttle bus or drive/park & ride.
9. Strong Brand Identity

BRT is a new service with a new image
Key Study Tasks

- Data Collection - Underway
- Modeling
- Develop a short list of BRT alternatives
- Develop a phased Implementation Plan
- Public Outreach - First public open house June 26, 2007
- Final Report
For More Information:

Westchester County Department of Transportation
100 East First Street
Mount Vernon, NY 10550

Naomi Klein
Principal Planner
(914)813-7758
nkk3@westchestergov.com

Charles Sutter
Planner
(914)813-7761
cjs2@westchestergov.com

www.westchestergov.com/transportation
ITS-NY
2007 Annual Meeting

PANEL 5
Integrated Corridor Management
Panel 5
Integrated Corridor Management

Panel Moderator: Robert Reiss, Dunn Engineering Associates

“The Federal Initiative,” Louis Neudorff, Siemens ITS

“ICM Technology,” Dr. Christopher Hill, Mixon/Hill, Inc.

“The New York State Corridor Program,” Gordon Peters, New York State DOT
Integrated Corridor Management (ICM)

Overview of the US DOT Initiative
ITS NY: June 8, 2007
Louis Neudorff, P.E.
Siemens ITS
Background – ICM

- Surface transportation systems are made up of several independent networks
  - Freeways, Bus / Rail Transit, Arterials, etc.
- Adjacent networks overlay to form corridors
- Efforts to reduce congestion have focused on optimization of individual networks
  - Minimal cross network management in response to increased demand / reduction in capacity
- Initiative Goal: To provide the institutional guidance, operational capabilities, and ITS technical methods needed for proactive management of transportation corridors
Definition – Corridor

- Largely linear geographic band defined by existing and forecasted travel patterns involving both people and goods.
- Serves a particular travel market or markets that are affected by similar transportation needs and mobility issues.
- Includes various networks that provide similar or complementary transportation functions.
- Includes cross-network connections that permit the individual networks to be readily accessible from each other (without undue travel time penalties).
Generic Corridor
ICM Initiative Phases

1: Foundational Research
   - Understanding of the institutional, operational, and technical integration needs and issues

2: Development of Tools and Strategies
   - Modify / develop analytical tools & methods that enable deployment & evaluation of ICMS

3: Site Demonstrations
   - Demonstrate the application of institutional, operational, and technical integration approaches and ICM strategies in the field ("Pioneer" Sites)

4: Knowledge and Technology Transfer
Phase 1 Activities

- Definitions: Corridor & Integrated Corridor Management
- Criteria for Delineating a Corridor
- Relationship Between Corridor Management and Regional Management
- ICM Approaches and Strategies
- ICM Institutional Strategies and Administration
- ICM Approaches and Strategies Requirements and Issues (Operational and Technical)
Phase 1 Activities (cont.)

- ICMS “Concept of Operations” (for the generic corridor)
- ICMS Implementation Guidance
  - Based on Systems Engineering Process
- ICM Feasibility (Potential Benefits and Costs)
- Significant Stakeholder Involvement / Review
- Phase 1 Work is Complete

http://www.itsdocs.fhwa.dot.gov/icms/compendium.htm
Definition – ICM

- Integrated Corridor Management (ICM) consists of the operational coordination of multiple transportation networks and cross-network connections comprising a corridor and the coordination of institutions responsible for corridor mobility. The goal of ICM is to improve mobility, safety, and other transportation objectives for travelers and goods.
## Regional vs. Corridor Management

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Region</th>
<th>Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundaries</td>
<td>Geographically defined (jurisdictional &amp; agency boundaries).</td>
<td>Operationally defined (travel markets, patterns, networks and cross-network linkages)</td>
</tr>
<tr>
<td>Overall Focus</td>
<td>Information sharing and coordination of agencies that operate networks.</td>
<td>Direct integrated operations of adjacent networks and linkages / interfaces.</td>
</tr>
</tbody>
</table>

Common stakeholders.

Corridor management is how regional management gets accomplished.
ICM Approaches

- Information Sharing / Distribution
- Improve Operational Efficiency at Network Junctions
- Accommodate (Passive) / Promote (Active) Cross Network Route and Modal Shifts
- Modify Capacity – Demand Relationship
  - Short Term / Long Term

Approaches are NOT Mutually Exclusive
Represent a “Spectrum” of Potential ICM Activities
Information Sharing/Distribution

• Manual information sharing (phone, email)
• Automated information sharing (real time data, video)
• Information Clearing House / Information Exchange Network (corridor agencies)
• Corridor ATIS database
  – Provide users with pre-trip information
  – Access by Information Service Providers (ISPs)
• En-route traveler information devices (DMS, 511, transit PA systems) being used to describe current conditions on other networks
Improve Operational Efficiency of Network Junctions

- Transit Signal Priority
- Signal pre-emption / “best route” for emergency vehicles
- Multi-modal electronic payment
- Transit hub connection protection (holding one service while waiting for another feeder service to arrive)
- Multi-agency / multi - network incident response teams / service patrols and training exercises
- Coordinated operation between ramp meters and arterial traffic signals
- Coordination of traffic signals and rail crossing signals
Accommodate / Promote Cross – Network Shifts

• **Passive Network Shifts** – Provide Information to Users (“Inform”) & Accommodate “User-Determined” Shifts:
  – Modify arterial signal timing, ramp meter rates, transit priority parameter to accommodate shifting traffic

• **Promote Network Shifts** (“Instruct”):
  – Using en-route traveler information devices (e.g., DMS, HAR, “511”, transit PA) to advise travelers of congestion / incidents, and directing them to adjacent freeways / arterials / transit services / parking / etc.

• Assumes Spare Capacity on Adjacent Networks
Manage Capacity–Demand Relationship (Short-Term)

- Lane use control (reversible lanes / contra-flow)
- Convert regular lanes to transit – only / truck - only
- Add transit capacity by adjusting headways / number of vehicles; or by adding new service (“bus bridge”)
- Increase roadway capacity by modifying HOV restrictions / opening up HOV / HOT lanes / shoulders
- Restrict ramp access
- Variable speed limits
- Modify toll / HOT pricing / modify parking fees
- Modify transit fares to encourage ridership
- Coordinate scheduled maintenance & construction activities between networks
Potential Benefits of ICM

Potential Range of Benefits

Corridor-wide Travel Time Reduction Benefits

Corridor-wide Information (Passive Division/Roadway Only) Proactive Diversion (Multi-Modal where applicable) + operational strategies Demand Management/Increased Corridor Capacity

SIEMENS
ICM Implementation Issues: Technical

- Overall ICMS architecture
- Expanded surveillance coverage to optimize ICM
  - Detector technologies, distribution, accuracy
- Data processing / aggregation / common display
- Communication links / technologies between network-based systems (C2C)
  - Capacity for data and video distribution
- Data compatibilities and center-to-center standards (e.g., NTCIP, TCIP, IEEE, ATIS)
  - System interfaces (e.g., “translators” for legacy systems).
- Video sharing and video switching standards
- Real-time decision support software (automated response plan selection / management tools)
ICM Implementation Issues: Operational

- Development of operational response plans for numerous corridor scenarios and events
- Policy towards route and modal shifts
  - “Inform” vs. “Instruct”
- Policies & procedures for implementing demand – capacity strategies
- Pricing strategies (fares, parking, tolls, HOT)
- Procedures & protocols for the shared use / control of resources & ITS devices
- Policies for disseminating traveler information in a consistent manner across networks
- Corridor-based performance measures
- Simulation / analysis tools – “corridor-wide analysis”
- Marketing / public outreach
ICM Performance Measures

• ICM requires “mode – neutral” performance measures that reflect overall corridor mobility and reliability
  – Person-based or trip-based utilizing travel times & delays
  – Environmental (emissions)
  – Customer satisfaction measures
• “Corridor – wide” performance measures are in addition to any network-specific performance measures
• Metrics (“success thresholds”) should be developed for these performance measures.
• Map corridor performance measures to ICM objectives
ICM Implementation Issues: Institutional

- Identification & distribution of responsibilities (e.g., lead, support roles) between corridor stakeholders
- Organizational structure and administrative framework in support of ICMS operations and coordination
- Involvement of Public Safety Agencies
- ICMS funding mechanisms
- Policies and arrangements with private entities – parking, ISP
- Inter-agency liabilities
- Inter-agency agreements documenting the resolution of various operational / technical / institutional issues
- Updating the agreements
Phase 2 Activities

- **ICMS Surveillance & Detection**
  - Needs Analysis, State of the Practice, Requirements, Application Guide

- **ICMS Decision Support Subsystem (DSS)**
  - Needs Analysis, State of the Practice, Requirements, Feasibility of developing & integrating decision support into ICMS, Logical & Physical Architecture

- **ICMS Device-to-Device Communication and Control**
  - For example: bus to traffic signal for signal priority.
  - Initial Design & Prototype Plan for example ICMS device-to-device interfaces, Application Guide

- **ICM Institutional Arrangements Application Guide**
Phase 2 Activities (cont.)

• **ICMS C2C Standards**
  - Assessment of the ITS Standards deployment readiness for developing the capabilities required in an ICMS.
  - Developing a plan (with SDOs) for revising the applicable ITS Standards / filling any gaps in the ITS Standards
  - ICMS ITS Standards Application Guide.

• **Analysis, Modeling, and Simulation (AMS) Tools**
  - Data requirements
  - Potential analytical approaches and methodologies for the assessment of corridor operations
  - Development of an ICM AMS Methodology (AMS tools / development of required support routines)
Phase 3 – Pioneer Sites

- Request for Applications issued Spring 2006
  - 8 Sites Selected
- Stage 1: Each of the 8 Pioneer Sites to develop corridor-specific Concept of Operations and Requirements Document for deploying an ICMS
- Up to 4 sites selected for Stage 3 – ICM Demonstration
  - $ 10 million total
- 4 sites to be used as Pioneer AMS Sites
  - Perform the Analysis, Modeling, and Simulation of their corridors.

SIEMENS
Stage 1 Pioneer Sites
ICM Technical Integration Activities

Christopher J. Hill, Ph.D.
Mixon/Hill
Technical Integration (TI) Summary

- Provide Technical Assistance as requested by the Pioneer Sites
- Identify needs and develop ‘how to’ guidance for ICM surveillance and detection
- Develop ICM Decision Support System requirements and architecture
- Assess feasibility of device-to-device communications and control to support ICM
- Develop institutional to systems linkages guide
- Update ICM Implementation Guide
- Assess the general feasibility of demonstrating ICM

➤ Result – Suite of Technical Assistance Guides to Support ICM Implementation
TI Tasks

- Technical Assistance for Pioneer Sites
- ICMS Surveillance and Detection
- ICMS Decision Support System
- ICMS Device to Device Communication and Control
- Institutional Arrangements Application Guide
- Update of ICM Implementation Guide
- Decision Point #3 – Site Demonstration Feasibility Report
Needs Analysis Approach

- Two needs analyses have been produced:
  - Surveillance and detection
  - Decision support system
- Identify and document the underlying needs in an ICMS
- Compare these needs with current practices and available technologies
- Identify the gaps where needs are likely to remain unfulfilled
- Detailed review of Phase 1 documents:
  - Identify relevant statements
  - Discuss intent of statement
  - Infer needs
  - Abstraction of high-level needs from detailed analysis
**ICM Context**

- Operational coordination of multiple networks and cross-network connections that comprise a corridor
- Coordination of the organizations responsible for mobility in that corridor
- Key feature is “integration”
  - sharing of information and combining of resources from multiple organizations to facilitate more seamless operation
  - required integration exists in three forms: operational; institutional; and technical
ICMS Context

- Integration of existing, agency-specific ITS systems to facilitate transportation management and operations on a corridor-wide basis
- Assumes that the individual agencies within the corridor are already using ITS technologies to actively manage their respective networks, and the operation of the individual networks is “approaching optimization”
Synthesis of S&D Abstracted Needs

• Real-time, automated data sharing
• Load balancing to use spare capacity
• Real-time route/mode shift
• Network-wide traveler info view
• Real-time traffic monitoring (recurring/non-recurring congestion) & response to incidents/events (inc. WX)
• Efficient transit operations
  – Ease of use by travelers
  – Network-wide monitoring
  – Connection protection
  – Transit signal priority
Synthesis of S&D Abstracted Needs contd.

- Variable pricing (inc. highways, transit, parking)
- Variable lane operations (reversible, contra-flow, transit only, shoulders)
- Coordination of ramp meters/signals & signals/ rail crossings
- Operating conditions return to normal
- Utilization of assets by multiple agencies
- Provide all necessary data and in consistent formats
- Support archiving, performance measurement, and modeling
ICMS Decision Support
Synthesis of DSS Abstracted Needs

- Comply with inter-agency policies & procedures
- Use real-time data from multiple agencies
- Provide output to multiple agencies in real-time
- Base response on available assets and known constraints
- Base response on known network characteristics
- Capability to compare current and expected travel conditions to detect anomalies
Synthesis of DSS Abstracted Needs contd.

- Use info on real-time capacity availability
- Conduct risk analyses of alternatives
- Perform real-time analysis and modeling to support plan selection (inc. predictive modeling)
- Detect emerging travel patterns in real-time
- Continuously expand knowledge base and develop new response plans
- Automated plan selection
Next Steps

• Investigate gaps:
  – Surveillance and detection:
    • Arterial streets
    • Transit networks
  – Decisions support systems
    • Multi-agency decision support
    • Real-time data inputs
    • Real-time predictive modeling
Integrated Corridor Management — ICM

For More Information:
http://www.its.dot.gov/icms/index.htm

Dale.Thompson@dot.gov, 202-493-3420
Chris.Hill@mixonhill.com, 540-822-9717
New York State’s Corridor Program

Gordon Peters
Policy & Strategy Division
NYS Department of Transportation
ITS-NY June 8, 2007
WHY CORRIDORS? FOCUS!

- Deliver the most value with available $
- Focus on our users and their varying needs:
  - Trade
  - Commuter
  - Tourism
  - Intercity travel
- Focus on the most important corridors and facilities
CORRIDOR CONCEPTS

- Customer-based: outcomes!
- Comprehensive:
  - Multi-modal
  - Multi-layered
    - Top-down, strategic
    - Bottoms-up, tactical (responsive to local needs)
    - Overlap of user types
  - Statewide
    - Multi-jurisdictional/ jurisdictionally blind
- Consistency, coordination & integration of ops
- Complementary
  ... in sum, a big conceptual shift
SCOPE

- Broad consideration all aspects of corridors to effectively and efficiently manage multiple modes:
  - Maintenance
  - Operations
  - Use technology
  - Enhance and strategically expand services and facilities

- Economic development opportunities and land use/transportation relationships
CORRIDOR FRAMEWORK

- Statewide foundation for the overall effort
- Vision, guiding principles/policies
- Goals, objectives, performance measures (outcome) and targets
- Corridor definitions and designation criteria
- Identification of corridors and facilities
- Planning, programming, operational and maintenance elements, including corridor management plans

...evolving
TRADE CORRIDORS

- Geographic band of multi-modal facilities
- Move high volume/high value goods
- To, from, within and through NYS
- Connect economic centers
- Tie-in to local distribution system
SOME RECENT ACTIVITIES

- **Corridor manager designations:**
  - Regional corridor managers
  - Trade corridor managers

- **Regional program update -- trade corridor emphasis areas:**
  - Data collection
  - Travel information
  - ETO/ incident management
  - Oversize/overweight vehicles
  - Mitigate construction impacts
  - Rest areas
  - Integrated corridor management: interagency collaboration, system integration, network management
TRAVELER INFORMATION

➢ Focus on long distance travelers’ needs:
  • **When:** pre-trip & enroute (key decision points, bottlenecks, etc.)
  • **What:** time “windows”, routing, truck parking

➢ Multiple means of delivery – phone, radio, internet, VMS, kiosks in rest areas etc.
DATA COLLECTION

- Blind spots: locations and facilities where data is needed the most
- Travel speeds & time
- Information-sharing between agencies
EMERGENCY TRANSPORTATION OPERATIONS

- Better use of technology/ ID problem locations:
  - Improve incident detection
  - Improve incident response

- Alternate routes

- Interagency information-sharing and communication needs
MITIGATE CONSTRUCTION IMPACTS

- Coordinate scheduling of work
- Uniform work zone traffic management
- Consider infrastructure upgrades
OVERSIZE/ OVERWEIGHT VEHICLES

Permits needed for super load and double-wide movements; 10,000 since 2003.

- The most heavily traveled routes: are these the best ones? Are improvements needed?
- Streamline the permit process
- ID a vehicle envelope for pre-permitting
- Coordinate movements with construction, maintenance and traffic operations
REST AREAS

- System wide network of facilities
- Customer focus
- Include private services
- New rest area I-81 north of Syracuse
SOME OTHER THINGS GOING ON...

- Statewide trade overview study
  - Describe the system from a broad perspective
  - Identify freight bottlenecks
  - Strategic solutions
  - Identify economic development opportunities
- Statewide data collection: truck GPS data and rest area intercept
- ITS borders and corridors strategic plan
- Corridor studies
  - I-90, Van Wyck...
  - Integrated corridor management (Capital District and Niagara Region)
- Rest area plan
- Commercial vehicles e-screening
- Multi-state efforts
  - Continental 1
  - Northern Tier
- Framework refinement
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AND TECHNOLOGY EXHIBITION

Closing Luncheon and Keynote Address By
Fred Neveu, NYSDOT
June 8, 2007
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