WELCOME
to the
2011 ITS-NY
Eighteenth Annual Meeting
and
Technology Exhibition!
2011 ITS-NY EIGHTEENTH ANNUAL MEETING  
June 9 – 10, 2011; Saratoga Springs, NY  
ITS: Managing Now and Planning for the Future  
AGENDA

Thursday, June 9, 2011
7:30 a.m. Registration Desk and Exhibit Hall Open; Full Breakfast in Exhibit Hall Foyer

9:00 Opening Session  
Opening Keynote: Dr. Yuko Nakanishi, ITS-NY President, and Christopher Jones, 2011 Annual Meeting Chair
Keynote Address: Commissioner Joan McDonald, NYS Department of Transportation
“Developing a National Transportation Strategy,” Joseph M. Giglio, Professor, Northeastern University

9:45 Break in Exhibit Hall

10:30 Panel 1: How ITS Supports Maintenance and Operations
Panel Moderator: Frank Dolan, Bergmann Associates
Gabriel N. Guevara, FHWA, “Road Weather Management Initiatives and Accomplishments (Clarus)”

Noon ITS-NY Luncheon (Exhibits Closed for 45 minutes during Lunch)
Keynote: Paul Feenstra, Vice President of Government and Public Affairs, ITS America,
“Status of Authorization” and a preview of the 2011 ITS World Congress

1:30 p.m. Panel 2: Bus Rapid Transit Planning and Operations
Panel Moderator: Steve Levine, TransCore
Kristina Younger, Capital District Transportation Authority, “Capital District BRT Initiative”
Ted Orosz, MTA New York City Transit Authority, “Results of the Initial Operation of the New York City BRT Lanes”
Ed Brandis, Clever Devices, “Chicago Transit Authority BusTracker Project”

3:00 Break in Exhibit Hall

3:30 Panel 3: Emerging Information Strategies – There’s an App for That
Panel Moderator: Jennifer Strasser, Cambridge Systematics, Inc.
Richard Fantozzi, Capital District Transportation Authority, “Information Technology: Leading in Connecting CDTA with Customers”
Dana Alexander Nolfe, RIDOT Chief Public Affairs Officer, “Using Social Media for Weather Event Notifications – Rhode Island Road Flooding”
Rexy William, NYSDOT, “511 Mobile Apps”
Sohaib Mallick, MTA New York City Transit Technology and Information Services (Internet Technologies), “Customer-facing Web and Mobile Applications at the MTA New York City Transit”

5:00 2011 Annual ITS-NY Project of the Year Awards
Session Host: Dr. Isaac Takyi, ITS-NY Vice President
ITS-NY Project of the Year Award Winners Spotlight Presentations

6:00 Reception for All Conference Attendees in Exhibit Hall – Exhibits Close 7:30 p.m.
Friday, June 10, 2011

7:00 a.m. ITS-NY Board of Directors Meeting, Garden Room
7:30  Registration Desk and Exhibit Hall Open; Full Breakfast in Exhibit Hall Foyer

8:30  Panel 4: Current ITS University Research and Projects
Panel Moderator: Dr. Camille Kamga, CUNY/University Transportation Research Center
Dr. Adel Sadek, University at Buffalo/SUNY, “The NITTEC – SUNY Buffalo Data Warehousing Project”
Jonathan Muckell, Ph.D. Candidate, University at Albany/SUNY, “Management of Large-scale GPS Trace Data: Compression and Query Techniques”
Dr. Kaan Ozbay, Rutgers University, “Advanced Software for Spatial Integrated Safety and Transportation System Monitoring and Evaluation for WIM”
Dr. Alain Kornhauser, Princeton University/ALK Technologies Inc., “Role of GPS on the Off-Hour Delivery Project in New York City”

10:00 Break in Exhibit Hall (Exhibit Hall Closes at 10:30 a.m.)

10:30  Panel 5: What the Future Holds – Intelligent Vehicles and Infrastructure
Panel Moderator: Jeff Randall, ITS-NY Treasurer-Secretary, Siemens Intelligent Traffic Solutions
Dr. Robert L. Bertini, ITS JPO/Research and Innovative Technology Administration, “Transforming Transportation Through Connectivity”
Rick McDonough, NYSDOT/I-95 Corridor Coalition, “Commercial Vehicle Infrastructure Integration”
Pete Costello, Inrix, “A Non-Infrastructure Based Traffic Data Solution”

Noon  ITS-NY Closing Luncheon
ITES-NY Officers and Board of Directors Election Results; Free Weekend and CITE Course Drawings

1:30 p.m. Adjourn
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How ITS Supports Maintenance and Operations

2011 ITS-NY 18th ANNUAL MEETING & TECHNOLOGY EXHIBITION

Gabriel Guevara, P.E.
Federal Highway Administration
Road Weather Management Program
Contents

- The Road Weather Management Program - Who are we
- The Role of ITS on Highway Maintenance and Operations -
  - Clarus
  - MDSS, MODSS, and MMS
  - The Connected Vehicle effort
Who we are....

• The Road Weather Management Program
  - US Department of Transportation/Federal Highway Administration/Operations Office
  - Paul Pisano - Team Leader
    • Roemer Alfelor, Staff
    • Gabriel Guevara, Staff
    • David Yang, Turner Fairbanks Lab
    • Ray Murphy, Resource Center
    • Dale Thompson, Rita
    • Charles (Chaz) Harris, Noblis
  - National Academies Report, “Where the Weather Meets the road”
  - Section 5308 of SAFETEA-LU Funding and Guidance
Why should we care?

**Safety:**
- 1.57 ± million weather-related crashes/year
  - 7,400 fatalities; 690,000 injuries
- 24% of all crashes occurred on slick pavement or under adverse weather Conditions

**Mobility:** Cost of congestion is $9.45 billion/yr for the 85 major urban areas (weather causes ~25% of non-recurrent delay on freeways)

**Productivity:** Weather-related delay adds $3.4 billion to freight costs annually

**Environment:** Chemicals effect watersheds, air quality and infrastructure
Why Should we Care (cont.)

There is also a lot of money at stake...

- Billions of dollars are spent annually maintaining the nation’s highways:
  - Pavement Preservation
  - Bridge preservation
  - Roadsides
  - Winter Maintenance
  - Appurtenances: drainage, signal, and lighting systems, signing, striping, etc.

- IT can, and does, play a key role helping manage highway assets
Getting From Problems to Solutions
Advanced Decision Support

Transportation Resources & System Status

Weather Forecast Models

Observing Systems

Decision Support Systems & Assessments

Societal Benefits

Management & Policy Decisions

On-going feedback to optimize value and reduce gaps
The *Clarus* System

- The *Clarus* System provides near real-time atmospheric and pavement observations from participating states’ environmental sensor stations (ESS).

- Functions include:
  - data assimilation,
  - quality checking, and
  - data dissemination
**Clarus System Objectives**

1. Provide a North American resource to **collect**, **quality check**, and **disseminate** weather and road condition **observations**

2. Demonstrate that these observations will support **general purpose weather forecasting**

3. Demonstrate that the observations will support **real-time operational responses** to weather

4. Support the enhancement and creation of models to improve forecasts at and near the earth’s surface
The Clarus System is an experimental product and is being used for evaluation and demonstration purposes only. This is provided as a public service.

No warranties on accuracy of data are intended or provided. See link to contributor’s data disclaimer in metadata file contrib.csv.
Maintenance Decision Support System

- **Data Ingest Module**
  - Numerical model data
  - Road Weather Information System (RWIS) data
  - Miscellaneous observations (e.g., airport)

- **Road Wx Forecast and Data Fusion Module**
  - Consensus forecast generation

- **Road Condition and Treatment Module**
  - Road temperature and condition forecasts
  - Rules of practice for anti-icing and deicing operations
  - Treatment recommendations

- **Java-based Display**
  - Delivery of information and data from upstream modules to end users via an interactive Graphical User Interface
Maintenance & Operations Decision Support Systems (MODSS)

- Offshoot of the MDSS- also assist maintenance managers with strategic and tactical decisions.
- For year-round/non-winter maintenance operations such as
  - Paving
  - Striping
  - Herbicide application
  - Controlled burning
- Not the same as an Asset Management tool (these are primarily inventory tools; not real time)
Maintenance Management Systems (MMS)

• Management tool to:
  - Monitor assets
  - Measure performance

• (focused on keeping track of labor and materials and used to plan maintenance actions.)

• Data entry is labor intensive & prone to errors
Next Step...

- A Happy Marriage....

MDSS ➔ MMS

Maintenance Office Computer with MMS and MDSS software

Vehicle Sensor Data:
location, speed, air temp.,
pavement temp., pavement friction, plow position, chemical application rate, etc.

Vehicle Sensor Data

MMS Database

Separate storage if needed

MDSS Interface

Resource Data
Connected Vehicles & Road Weather

Real-time Data Capture and Management

- Vehicle Status Data
- Weather Data
- Truck Data
- Transit Data

Data Environment

Dynamic Mobility Applications

- Reduce Speed 35 MPH
- Transit Signal Priority
- Weather Application
- Real-Time Travel Info
- Fleet Management/Dynamic Route Guidance
- Signal Phase & Timing Adjusts Real-Time Conditions
- Safety Alerts and Warnings
In Conclusion....

ITS can, and does, play a very significant role in today’s highly technical maintenance activities associated with the transportation system. Much has been accomplished with the integration of ITS technologies in the maintenance realm, but much more is expected....
FHWA Road Weather Research Team

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Arterial Performance Measurement System with Wireless Magnetic Sensors

Steve Kimble
Sensys Networks
Wireless Sensor Network Solutions
ITS-NY
June 9, 2011
The Problem

Arterials carry half the traffic – but there’s an operational void
- Arterials vs. freeways and transit system
- 1 or 2-day volume study for managing non-recurring delay?

What’s the operational goal and how do we know when we reach it?
- Budgets - need the educated in “educated decision”
- How much good are we providing public? (now?!)  
- Current emphasis: historical & qualitative measures at peak
- 5-10% all traffic delay is due to improper signal timing

Arterial travel time - a true challenge
- Flow is interrupted by signals
- Spot speeds/density/mid-block not meeting the challenge
- New technologies arrive – but side issues

Bottom line – “where’s the data?”
How it fits together
ATTS - Hardware

Wireless Sensor

Access Point

Repeater

SNAPS Server

Re-identification Server
ATTS – How it fits together
Arterial Performance Measurements

- Arterial Travel Time uses a patented technology called **magnetic re-identification** to provide arterial performance measures and travel times along signalized corridors – all done anonymously with no privacy invasion or tracking of specific vehicles.

- System provides vehicle counts, vehicle speeds and arterial occupancy

- Approximately 65% match rate for typical application (1.5 to 2 miles)
What measures do you get?

The output of Arterial Travel Time System provides:

- Complete distribution of travel times
- Median Travel Time (sec)
- 80\textsuperscript{th} percentile Travel Time (sec)
- 90\textsuperscript{th} percentile Travel Time (sec)
- Vehicles in segment (number)
- Counts & Speed
- Level of Service
The “new” Arterial Performance Measures

Recurring Traffic management and operations
- True real-time operations
- Quantifying success and failures in real-time
- Can we use travel time to feed adaptive?

Non-recurring congestion management
- Detecting and managing incidents / emergencies
- Real-time, active traffic/modal re-routing (ICM)
- Giving travelers an informed choice with ATIS

Other: Planning / Maintenance / Engineering / Management
- Defining needs – educated decisions!
- Resources to focus engineering beyond peak times
- RIP: qualitative historical demand models, delay and LOS . . .TBD?
- Break up the HCM delay into real-time measurements
- Quantitative and easy reporting to decision-makers
Added Benefit - Sensys ATTS Solution

Data Accuracy + Quality
- 65% to 80% vs. 5% match = accurate data + MORE data
- True travel time distribution
- Timely – no need for historical data; any vehicle = data

Privacy / Policy Friendly
- Not dependent on unique ID traceable personal info

Security
- Proprietary protocol – hacker safe

Availability
- Data safely processed at server and accessed via XML
- You own the data

“Future-Proof”
- Not dependent on technology from outside markets

Multi-functional Investment
- Same hardware as loop replacement signal actuation, advanced/adaptive detection, count/speed stations
From One Intersection—To an Entire Region

Flexible, dependable, low-cost universal platform for all detection applications
Integrated Corridor Management

Wireless sensor networks provided accurate, real-time data for efficient load balancing between major arterials and freeway during extensive roadway re-construction, improving alternate route diversions and preventing extended closures along I-15 in Provo, Utah.
Problem:
Freeway construction required extensive traffic rerouting between Provo and Lehi.

Solution:
Sensys Networks’ Arterial Travel Time, deployed along three major arterial routes provided:

- Volume
- Occupancy
- Real-time travel times for 14 VMS
- Travel time distribution
- Level of Service
- Vehicles in segment (queue detection)

Benefit:
24 Arterial Travel Time stations deployed in record time (>2 weeks) mitigated significant congestion and kept traffic moving smoothly throughout the region.
Dynamic Trail Blaze Sign with Directional Arterial Travel Time
Integrated Corridor Management & Traffic Light Synchronization

Wireless sensor networks provide accurate, real-time performance measures, arterial travel time, and traffic light synchronization optimization for federally funded Integrated Corridor Management project along San Diego-area I-15 corridor.
Problem:
Primary artery between Los Angeles and San Diego (with reversible HOT lanes), carries near constant heavy traffic.

Solution:
Sensys Networks’ integrated solution provided accurate performance measures including:

- Volume
- Occupancy
- Real-time travel times for VMS, 511
- Travel time distribution
- Level of Service
- Vehicles in segment (queue detection)

Benefit:
Enhanced corridor management across the shared network provided accurate data for traveler information and decision support systems for optimized regional mobility.
MoDOT Arterial Performance Measures

• Phase 1 installed and running: April 2011
• 5 main arterials
  – Route 67 North from I-70 to Route 367 ~ 12 miles
  – Route 67 Central from I-70 to Manchester Rd ~ 10 miles
  – Route 67 South from Big Bend Rd to I-255 ~ 8 miles
  – Route 141 from I-64 to I-55 ~ 20 miles
  – Old Route 94 from I-70 to I-64 ~ 11 miles

• Total coverage with initial installation > 60 miles of key arterials
• Equipment used for Travel Time along these arterials:
  – 67 Access Points
  – 901 Wireless Sensors