What to Expect in 2008

• Current Program: A year of research results
• Future Program: A strategic vision and action plan
Current Program: A Year of Research Results

Clarus

- 8 states and 3 Canadian provinces have integrated their road weather data into a nationally available system
- 3 multi-state teams have drafted Concepts of Operation that define Clarus-based applications
- Regional demonstrations to build these applications are starting in ‘08
- Innovations:
  - Most advanced quality checking of road weather (pavement-specific) observations ever
  - Demonstrating international data exchange and shared development of road weather information systems
Current Program: A Year of Research

Results

• Electronic Freight Management
  – Developed and evaluated an open architecture information exchange to improve cargo visibility and the efficiency of a truck-air-truck supply chain.
  – Six month operational test with an active supply chain was conducted May - Dec. ‘07
  – Early results:
    • Reduced freight forwarder time to prepare transportation status by 4 hours per day each (>75%)
    • Improved data accuracy at container freight station by at least 12%
    • Eliminated manual data entry and re-keying errors
    • Validated information exchange protocols / standards
  – Ready to advance industry adoption
Current Program: A Year of Research Results

Integrated Corridor Management

– Pioneer sites completed concepts of operation
– Finishing requirements documents
– Up to three sites selected for analysis, modeling and simulation of ICM in Summer ‘08
– Modeling Innovations:
  • Combine macro-, meso- and micro-scopic modeling to conduct full multimodal corridor modeling addressing interacting effects of
    – Transit service enhancements
    – Responses to traveler information
    – Tolling, HOT lanes, and congestion pricing
    – Varying corridor conditions: weather, incident patterns, demand
Current Program: A Year of Research Results

Integrated Vehicle-Based Safety Systems

- Prototype testing for Phase I is nearing completion
- Expect to initiate Phase II including field testing for light and heavy vehicle platforms Spring ’08
- Fall ’08: Initiate light & heavy vehicle full-scale Field Operational Tests (FOT)
- Test Innovations:
  - Multiple warning systems integrated into a vehicle
  - Arbitration between warning systems
  - FOTs to assess real-world system effectiveness
Current Program: A Year of Research Results

Maintenance Decision Support System

– Version 5.0: incorporates radar and satellite images, updates the road temperature model, and generates alerts to predicted problems
– Moved from a research project to a market ready technology
– Innovations:
  • First program to convert weather forecasts into a transportation decision tool
  • Integrated AVL data into MDSS for tactical tool and strategic use
**Current Program: A Year of Research Results**

**Mobility Services for All Americans**

- Phase I sites design development in Summer ‘08
- Two sites selected for field testing to begin in ‘08
- Test Innovations:
  - Electronically connected human services transportation network
  - Optimizing human services transportation providers for efficient service
  - Single point of contact for the customer
- Multi-modal trip planner: First door-to-door multi-modal regional trip planner
Current Program: A Year of Research Results

Next Generation 911

- Concept of Operations, Requirements and Architecture documents completed in ’07
- Proof of Concept: combination Lab / Live PSAP testing of selected components of the NG911 architecture (Spring 2008)
- Test Innovations:
  - Ability to place 911 “calls” to PSAPs via text message
  - Ability to transmit telematics data directly to PSAPs
  - Ability to interconnect individual PSAP networks
Current Program: A Year of Research Results

Vehicle Infrastructure Integration

- Safe Trip 21: demo in November ‘08
- Proof of concept test underway in MI and CA

  • Innovations:
    - Most extensive DSRC/WAVE protocol test bed to date (56 RSEs)
    - Prioritization of radio channel access for safety (while also supporting other applications)
    - Multi-channel DSRC radios use entire 75 MHz DSRC bandwidth to assure capacity; Supports many vehicles and many services
    - System supports wide diversity of applications with single radio
      - Local safety systems, network services, V2V, Probe Data, Advisories, etc
    - Groundbreaking method to maintain privacy & anonymity while ensuring legitimacy of messages & data
    - Common vehicle data interface across vehicle OEMs

- Applications development starting with stakeholder discussions
- New public web site: http://www.vehicle-infrastructure.org/
**Current Program: A Year of Research Results**

**ITS Standards Program**

- SAFETEA-LU Section 5307, Part 4 directed ITS Standards Expert Panel
- TRB Published June 18, 2007 Report Recommendation:
  - “Articulate a strategic vision of the role of standards in furthering the development and use of ITS and define USDOT’s role in realizing this vision.”
- JPO developing Standards Program Strategic Plan
  - Process defined by March ’08, plan complete Fall ’08
  - Will engage relevant stakeholders in process
Current Program: A Year of Research Results

Professional Capacity Building

- New look at workforce development, education and training
- Engage associations and universities in discussion to leverage and coordinate all resources
Future Program: A Strategic Vision & Action Plan

ITS Advisory Committee

Program Plan

Major Initiatives Ending

Reauthorization

Common, Clear, Concise Vision
Future Program: A Strategic Vision & Action Plan

Transportation Problems

- Congestion
- Safety
- Productivity

System Performance
**Future Program: A Strategic Vision & Action Plan**

**Information Technology Explosion**

- Expectations for information
- Ubiquitous Connectivity
- Hand-held devices
- Person-to-person Networking

**A Wireless World**

- Mobile Wireless Devices: 2B
- TVs: 1.5B
- PCs: 820M
- Game Boys: 190M
- iPods: 50+M
- PDAs: 50M
Future Program: A Strategic Vision & Action Plan

Wireless World

System Performance

Federal Research & Technology Transfer
Future Program: A Strategic Vision & Action Plan

– Connected vehicle
  • Vehicle to vehicle
  • Vehicle to infrastructure
  • Communicate appropriately with driver

– Real time information
  • All roads
  • All modes
  • All the time
Observations: Public Sector

- General acceptance of technology in transportation
  - ITS use has grown: TIM, signals, freeway mgt, transit mgt, toll collection, CVISN
  - ITS investment is slow;
  - Constrained resources
    - Growth in public/private partnerships
    - Growth in tolling & pricing
- Data limitations (extent and quality) limit value
- Looking for new models for data acquisition

- 70-77% freeway/arterial agencies collect **volume**
- 61% of freeway & arterial agencies collect **speed**
- 39% signalized **intersections** covered by electronic surveillance
- 39% freeway agencies disseminate **weather** info
- 38% freeway miles in metro areas with **R-T traffic data** collection by the public sector
- 35% freeway agencies disseminate **travel times**
- 14% states disseminate **transit** data
- 13% arterial agencies deploy **parking** data collection systems
- 8% freeway agencies disseminate **parking** information
511 Deployment Status

Accessible by 46% of Population

as of October 15, 2007

Accessible by 65% of Population in 2008

- Green = 511 Operational (“Live”)
- Blue = Expected “Live” in 2008

Accessible by 65% of Population in 2008
Current Statistics – National Traffic & Road Closure Information Web Site (public agencies)

- 98% include work zone locations
- 80% provide camera images
- 78% provide incident information
- 68% link to private data sources
- 58% provide weather conditions
- 46% provide traffic flow information
- 28% provide traffic speed
- 22% provide travel time or delay
- 14% provide transit information
Travel Times on DMS Status

Total, as of November 14, 2007

= Provide Travel Times (36)
= Plan to Provide Travel Times (19)
Future Program: A Strategic Vision & Action Plan

Observations: Technology Private Sector

- Fast technology evolution
  - Growing use of navigation systems (on 69% of all models)
  - Growing desire to deliver real-time traffic information
  - Some are marketing real-time information
  - Data quality and coverage is limited
  - Many technologies are vying to be the data solution
  - No clear winner…yet
  - OEMs are looking to technology for vehicular safety
  - Autonomous safety systems are growing
“NavTraffic” coverage growth since launch

- **2004 Launch: 20 Markets**
  - Flow data in 15 Markets (4,800 road miles with flow)

- **Today: 79 Markets**
  - Flow in 24 Markets (8,500 road miles with flow)

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<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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<td>Markets with Flow data</td>
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<td>Total road miles with flow data</td>
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<td>7,700</td>
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Source: Vehicle Traffic Information Coalition
Sensor Coverage

Markets

Source: Vehicle Traffic Information Coalition
Automotive Adoption of Real-Time Traffic
Number of OEM Models with available factory-installed XM NavTraffic

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<thead>
<tr>
<th>OEM</th>
<th>Traffic Intro</th>
<th>2004</th>
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<td>1</td>
<td>4</td>
<td>4</td>
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<td>-</td>
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<tr>
<td>GM/Cadillac</td>
<td>MY 2005</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Toyota/Lexus</td>
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<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
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<td>-</td>
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<tr>
<td>Nissan/Infiniti</td>
<td>MY 2007</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ferrari</td>
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<td>0</td>
<td>0</td>
<td>1</td>
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<td>-</td>
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<td><strong>9</strong></td>
<td><strong>19</strong></td>
<td><strong>40+</strong></td>
<td><strong>50+</strong></td>
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**OEM NavTraffic Annual Production**

Source: Vehicle Traffic Information Coalition
Future Program: A Strategic Vision & Action Plan

Observations of the ITS Program

- Specific ITS applications are moving forward through leadership in the modal administrations (FHWA, FTA, FMCSA, NHTSA)
  - Signal systems
  - Freeway & traffic incident management
  - Transit management
  - CVISN
- ITS program should focus on a few high-leverage issues
  - Potential for significant pay off at a national scale
  - Issues that transcend a single mode
Vision – What would we wish for?

- **End-to-end transportation trip information**
  - Everything I need to know for my trip (time, cost, weather, environmental impacts)
  - Supports transportation options for personal lifestyle choices
  - Available whenever and however I want

- **Transportation network is managed for optimal performance** (including the use of pricing)

- **Technology-enabled performance measures support outcome-based investment decisions**
  - Infrastructure
  - Maintenance
  - Operational performance

- **End-to-end freight movement is seamless and secure**
Future Program: A Strategic Vision & Action Plan

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- **Technology-enabled performance measures support outcome-based investment decisions**
  - Infrastructure
  - Maintenance
  - Operational performance
- **End-to-end freight movement is seamless and secure**
Average trip speed was 18.5% faster than conventional navigation.

Comparison of average trip speed during Feb ‘07

Average trip speed [km/h]

- Conventional navigation: 15.0 km/h
- Fastest route: 18.5 km/h

Average trip speed was 3.0 km/h faster than conventional navigation.
Average Fuel Consumption was 10.5% less than conventional navigation.

Comparison of Fuel Consumption during Feb ‘07
Vision – What would we wish for?

- Vehicles can “see” what’s happening around them and communicate appropriately with drivers
  - Vehicles are wrapped in information
  - Everyone has technology-enabled safety in their vehicles
  - Information is communicated to drivers appropriately

- Technology in transportation reduces negative impact on the environment (air quality & fuel consumption)
  - Improved system performance
  - Improved driver decision-making
Future Program: A Strategic Vision & Action Plan

– Connected vehicle
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  • All roads
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  • All the time
Future Program: A Strategic Vision & Action Plan

- Reconceive public and private roles and responsibilities
- Understand the benefits
  - Safety
  - Mobility
  - Productivity
  - Environmental
- Look to the next generation technology solutions
- Leverage worldwide research
Mission & Goal Areas

• JPO’s mission is to lead the creation of information and communications technology solutions to achieve the best performing surface transportation system in the world.

• Goal Areas
  – Safety
  – Mobility
  – Environment
  – 21st Century Institutions and Partnerships
Goal: Safety

Theme: Prevent fatalities and injuries on the surface transportation network

- **Connected Vehicle** – Create capability for all vehicles to have 360 degree awareness of hazards, and communicate appropriately with drivers
Goal: Mobility

**Theme:** Improve network performance for movement of people and goods

- Realize complete transportation system visibility
  - Real Time data on all roads, all modes, all the time

- Enable performance measurement across the transportation system
- Catalyze the development of applications to optimize network performance
- Enable delivery of end-to-end transportation information for trip planning (personal & business)
Goal: Environment/Energy

Theme: Minimize impact of surface transportation on the environment by reducing the carbon footprint and increasing fuel efficiency

• Conduct research to understand relationship between technology-enabled congestion reduction and environmental impacts (carbon footprint & fuel efficiency)
• Conduct research to understand the relationship of the combined impacts of safety, mobility, and environment on the transportation system
Goal: 21st Century Institutions and Partnerships

Theme: Foster new institutional relationships to enable better use of technologies in transportation

- Research new public-private partnerships to improve the use of ITS technologies in transportation
- Examine innovative financing models to foster use of ITS technologies in transportation
- Identify and research solutions to address institutional barriers in the use of ITS technologies in transportation
Future Program: A Strategic Vision & Action Plan

Next Steps

• Comments on mission and goal areas
• Refine and narrow goal areas
• Clarify Federal role
• Develop metrics for each goal
• Develop an action plan
• Publish the updated Program Plan
  – Update on current program status
  – New section on the Strategic Vision and Action Plan
What to Expect in 2008

• **Current Program**: A year of research results
• **Future Program**: A strategic vision and action plan
  – Connected vehicle
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Your thoughts and comments are welcomed