USDOT Perspective on Data Collection, Aggregation and Distribution

Transportation Research Board
Annual Conference Workshop on Pervasive Data
Date: Sunday, Jan. 23, 2011

Walter During
Transportation Specialist
Office of Transportation Management
Federal Highway Administration
Presentation Outline

- The Wireless Networked Environment
- The Real-Time Data Capture & Management Programs
- Data Environments
- Outcomes
- Getting Involved
Networked Environment

DATA IN, ACTIONABLE INFORMATION OUT

The Networked System

- Vehicle Status Data
- Weather Data
- Truck Data
- Transit Data
- Infrastructure Status Data
- Location Data
- Reduce Speed 35 MPH
- Weather Application
- Transit Signal Priority
- Fleet Management/Dynamic Route Guidance
- Signal Phase & Timing Adjusts Real-Time Conditions
- Safety Alerts and Warnings

Real-Time Travel Info
The U.S. DOT Mobility Program

Real-time Data Capture and Management

- Vehicle Status Data
- Infrastructure Status Data
- Weather Data
- Truck Data
- Transit Data
- Location Data

Mobility and Environmental Applications

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

Vision

• Active acquisition and systematic provision of integrated, multi-source data to enhance current operational practices and transform future surface transportation systems management.

Objectives

• Enable systematic data capture from connected vehicles (automobiles, transit, trucks), mobile devices for passengers, and infrastructure.

• Develop data environments that enable integration of data from multiple sources for use in transportation management and performance measurement.

• Reduce costs of data management and eliminate technical and institutional barriers to the capture, management, and sharing of data.
Creating a Data Environment

Data environment:

- **Well-organized** collection of data of specific type and quality
- Captured and stored at **regular intervals** from one or more sources
- **Systematically shared** in support of one or more applications
Key Issues in Defining A Data Environment

- **What Data Do We Capture?**
- **How Do We Use The Data?**
- **What Data Do We Keep?**
- **How Do We Structure The Data?**
Data Sources and Uses

**Sources**
- Mobility
- Safety
- Environment

**Uses**
- Traveler Performance Measurement
- Traveler Information
- Eco-Drive
- Queue Warning
- Variable Speed Limits
- Mobility
- Safety
- Other

**Source Categories**
- Traveler
  - Location
  - Decisions
- Vehicular
  - Transit
  - Light Vehicle
  - Freight
- Infrastructure
  - Loop
  - Radar
  - Other
- Other

Data Aggregation and Structure

AGGREGATION

AREA-WIDE AGGREGATION

RAW DATA

STANDARDS
QUALITY
ACCESS
IP
PRIVACY
STORAGE
REGULATION

STRUCTURE
Data Structure

Access: Balance issue of open access of data with legitimate security concerns

IP rights: Ensure licensing restrictions of private sector data are preserved while making as much data as possible available without cost

Standards: “Tech neutral”
Anticipated DCM-related Standards Relevant NTCIP, TCIP, Freight, IEEE, SAE & International Standards

Storage: Explore the concept of virtual warehousing in addressing storage requirements

Regulation: Address Data Ownership, Terms & Conditions

Privacy: Address concern about protecting the privacy of participants

Data Quality: Implement a data quality assurance matrix
Elements of Data Capture and Management

- **Meta data:**
  - Provision of well-documented data environment

- **Virtual warehousing:**
  - Supports access to data environment and forum for collaboration

- **History/context:**
  - Objectives of data assembly

- **Governance:**
  - Rules under which data environment can be accessed and procedures for resolving disputes
Projected Outcomes

• Establish one or more data environments
• Broad collaboration supporting data environment utilization
• Implementation of data management processes representing best practices
• Provide data resources through data.gov initiative

• Multiple applications developed leveraging multi-source data
• Research spurs commercialization
• Applications enable transformational change
Getting Involved

• Provide feedback on program direction, goals, data environment, mobility applications

• Respond to upcoming funded requests for research and development of mobility applications

• Seek to leverage the program’s data and applications resources in other non-federally funded research projects

• Offer new data sets and applications

• Actively commercialize mobility applications developed within the mobility applications program
For More Information…

Brian Cronin  (brian.cronin@dot.gov)

Gene McHale  (gene.mchale@dot.gov)

Walter During  (walter.during@dot.gov)

www.its.dot.gov