Applying Connected Vehicle Concept for Next Generation Mobility Management

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Mobility Management Challenge
Connected Mobility Management

U.S. Department of Transportation

Consumer with Mobility Needs

Simplified Access

Funding Agencies

Transportation Service Providers

U.S. State & Local Government Funds, Policies, and Regulations

Independence

Employment

Health Care

Family

Education

Recreation

Public Transit Authority

Private Taxi

Disability Service Provider

Transit Pass

Agency on Aging

Head Start

Medical Transit Provider

Faith Based Transit

ADA Paratransit

Transportation

Interior

Social Security

Veterans Affairs

HHS

Agriculture

Housing

Labor
Connectivity Enables Coordination

- E-payment Transactions
- Signal Phase and Timing Information
- Real Time Network Data
- Situation Relevant Information
- Opportunity for Innovation
- V2V Safety Messages
- Probe Data
- Infrastructure Communications

“The Network”
Connectivity is the Key: Learning from Ants

“It’s important to remember that whatever the ant is doing, it’s not rocket science.” — Deborah M. Gordon
What is Connected Vehicle?

- Connected Vehicle is a suite of technologies and applications that use wireless communications to provide **connectivity**:
  - Among vehicles of all types
  - Between vehicles and roadway infrastructure
  - Among vehicles, infrastructure and wireless consumer devices

**All Roads, All Modes, All The Time!**
Three Connected Vehicle Application Areas

**Safety**
- 33,963 deaths/year (2009)
- 5,800,000 crashes/year
- Leading cause of death ages 4 to 34

**Mobility**
- 4.2 billion hours of travel delay
- $78 billion cost of urban congestion

**Environment**
- 2.9 billion gallons of wasted fuel
Connected Vehicle for Mobility

Real-time Data Capture and Management

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

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
Gwo-Wei, so where are we going from here?

Courtesy: Montreal Gazette
Leverage Multi-Source Data

- Leverage high-quality data integrated from mobile and fixed sources to develop multiple applications (mode-specific and multi-modal)
Dynamic Transit Operations

- Dynamic scheduling, dispatching and routing of a vehicle by matching compatible trips
- Traveler provides desired destination & departure time tagged with their current location through personal mobile device
- Considers various modal options, including demand responsive service, fixed-route service and private service, such as taxi
- Considers real-time traffic conditions and vehicle capacity
- May replace some late night or mid-day fixed-route service
Connection Protection

- Requires transit inter-modal and inter-agency coordination
- Uses real-time and historical data to examine the arrival status of a transit vehicle and transmits a “hold” message to another vehicle if the lateness falls within a pre-determined threshold
- Transfer requests may be initiated by transit riders
- Monitors the situation and provides connection protection status to travelers
Dynamic Ridesharing

- Uses dynamic ridesharing technology, personal mobile devices, and voice activated on-board equipment to match riders and drivers along their route.

- Allows trip-by-trip ridesharing (dynamic as opposed to preset carpooling).

- Can take into account individual ridesharing preferences and constraints.

- May include technology to verify the number of people in a vehicle for HOV enforcement and toll discounts.
Smart Emergency Communication and Evacuation

- Use Connected Vehicle communications to improve evacuation efficiency
- User pre-registration into a central database prior to emergency,
- Updated user needs status/location during an evacuation,
- Dynamic dispatching and routing of vehicles during an evacuation with real-time, up-to-date information.
Connectivity Enhances Mobility Management

- Learning from the ANTS

http://link.brightcove.com/services/player/bcpid271557392?bctid=1681718043
For More Information…..

Imagine that…

transit and truck drivers receive regular updates, allowing them to stay on schedule — and stay in business.

Message to Stakeholders from RITA Administrator Peter Appel

RITA is working with our colleagues and stakeholders to implement the Intelligent Transportation Systems (ITS) Strategic Research Plan, 2010 - 2014. Read more.

Spotlight

- Public Transit Intelligent Transportation Systems (ITS) Implementations — Lessons Learned
- Connected Vehicle Test Beds featured in Thinking Highways Magazine 40(4)11
- AERIS Program featured on White House Blog 40(3)11

More News>>

Our Current Research

Applications Mode-Specific Cross-Cutting

- Vehicle-to-Vehicle Safety
- Vehicle-to-Infrastructure Safety
- Real-Time Data Capture
- Dynamic Mobility Applications
- Environment
- Road Weather

More >>

Procurement Opportunities

As we implement the ITS Research Strategic Plan, open procurements may become available through a variety of solicitations. More >>

Public Meetings

View >>

ITS Video Challenge

Grab your camera and share the story of your community’s ITS deployment. More >>

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