Rural VII

Opportunities and Challenges

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VII Background

- **Vehicle Infrastructure Integration** development has been primarily focused on mobility and safety applications in urban areas for passenger vehicles.
- Day 1 applications offer rural opportunities.
- Rural environments present some challenges.
Rural Mobility and Safety

• Mobility
  – Road Weather
  – Closures
  – Detours

• Safety
  – Crash notifications ➔ EMS response
  – Collision avoidance
Dedicated Short Range Communications (DSRC)

- 5.9 GHz
- Safety and Mobility; commercial
- V to V and V to I
- 300 meter range
- Low latency, high bandwidth
- Intersection safety applications, signalized and stop signs
Vehicle to Vehicle applications (DSRC) are fully enabled for rural settings.

Vehicle to Infrastructure applications are dependent on network communications:
- DSRC
- Cellular
- WiFi
- WIMAX
- Satellite
Day 1 Applications (V to I)

- Traffic Signal Violation Warning*
- Stop Sign Violation Warning*
- Driver Assistance at Intersections*
- Curve Speed Warning*
- In-vehicle signage
- Traffic Signal Optimization
- Ramp Metering
- Traveler Information
- Corridor Management
- Roadway Maintenance
- Electronic Toll Collection
- Electronic Payment
- Remote Diagnostics and Warranty Management

* These don’t require wide area networks
What are the Rural Limitations for Vehicle to Infrastructure Communications?

• DSRC
  – Spacing of Roadside Equipment
  – Back Haul Communications

• Cellular, WiFi, WIMAX, Satellite
  – Coverage Gaps
Potential **Vehicle to Vehicle** applications

- Exchange road weather observations (traction control, ABS, wipers).
- Exchange electronic map updates
- Rear end collision warning
- Relay Vehicle to Infrastructure data messages
- Relay Mayday messages (air bags deployed, roll over, high deceleration rate)
- Applications depend on development decisions by automakers
What can we do to facilitate VII deployment?

• Stay informed of developments.
• Support Vehicle to Vehicle application development
• Support the use of multiple communications modes
• Support the development of a Rural VII Test Bed Facility