Overview of California Connected Vehicle Testbed

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Agenda

- History
- Technical Description
- Ongoing Research
- Support for Industry Partners
- Future Plans
Testbed Beginnings

- Established in 2005 by Caltrans, Metropolitan Transportation Commission and PATH in Palo Alto
  - First dedicated short-range communications (DSRC) testbed in U.S. that was locally funded
  - 5 intersections on El Camino Real (ECR) equipped with Denso 5.9GHz roadside units (RSUs)
- Allowed for Vehicle-to-Infrastructure (V2I) Testing in a real world environment
  - Early users included Daimler, VW and Toyota
  - Early use cases included red-light violation warning, traveler information, probe data, in-vehicle signage
2014 Testbed Upgrade

- Expanded to 11 intersections on El Camino Real
  - Connected to new state-of-the-art Type 2070 traffic signal controllers
  - Broadcast signal phase and timing (SPaT) and MAP messages over DSRC
  - 4G LTE backhaul
- Supported by USDOT
  - Complies with latest Connected Vehicle (CV) standards
  - Part of USDOT’s network of Affiliated CV Testbeds
Typical RSU Installation

- DSRC Radio
- DSRC Antenna
- Processor
- Network switch
- 4G Backhaul
Current California CV Testbed

- 11 DSRC intersections covering 2 miles of ECR
  - Near OEM research facilities, tech companies, start-ups
  - ECR carries over 60,000 veh/day with busy transit routes
Current California CV Testbed
Ongoing CV Research

- **Multi-modal Intelligent Traffic Signal System**
  - Supports emergency vehicles, transit, freight and pedestrians at intersections

- **CV Pilot Deployment Project**
  - Expansion and upgrade to 17 intersections (new RSUs provided by USDOT)
  - Connection to USDOT’s Security Credential Management System
  - Broadcast position correction messages
  - Enhanced CV applications including transit signal priority and eco-approach and departure
  - Partner with VTA to equip buses and test applications
Testbed Maintenance and Support

• Provided by PATH through multi-year Caltrans contract
  • Web-based monitoring tool
  • User guide
  • Connection to National CV Data Warehouse
• Eligible for USDOT tools and support as a member of Affiliated Testbeds
Future Plans

- Prospect Silicon Valley partnership
- AV Testing
- Regional CV Testbed (pending funding)
  - 35 miles, over 150 intersections