

**Advanced
Research****February 2026****Project Title:** Support for Research and Deployment of System Ops Applications of VII; TPF-5(206)**Task Number:** 2061**Start Date:** March 31, 2009**Completion Date:** June 30, 2020**Task Manager:**Melissa L. Clark
Transportation Engineer (Electrical)
melissa.clark@dot.ca.gov

Support for Research and Deployment of System Ops Applications of VII; TPF-5(206)

Research Program to Support the Research, Development, and Deployment of System Operations Applications of Vehicle Infrastructure Integration (VII)

WHAT WAS THE NEED?

Cooperative Transportation Systems holds the potential to support a fundamental advance in surface transportation. While the vehicle component and infrastructure component of the transportation system have traditionally been only loosely coupled, connected vehicle technology will allow the components to “work” actively together – creating Cooperative Transportation Systems. This provides the potential for reduction in congestion, safety improvements, and improved travel services. To realize this potential, Cooperative Transportation Systems will require unprecedented collaboration between the private and public sectors, on a scale not required in the current loosely coupled system.

As owners and operators of the nation’s surface transportation infrastructure, state and local transportation agencies are at the core of Cooperative Transportation Systems. While automakers and device manufacturers will dictate availability of vehicular equipment, transportation agencies will control the deployment and operation of roadside infrastructure and the incorporation of connected vehicle technologies into infrastructure applications (such as traffic signal control).

To guide transportation agency involvement in Cooperative Transportation Systems deployment, American Association of State Highway and Transportation Officials (AASHTO) developed a strategic plan. It identified a need to develop a deployment plan and business plan that will aid the owners and operators in the nationwide deployment of the connected vehicle infrastructure. It also identified the need for infrastructure providers to conduct research to develop applications that will make full use of Cooperative



DRISI provides solutions and knowledge that improves California’s transportation system.

Transportation capabilities.

With this background, the pooled fund study entitled "Program to Support the Development and Deployment of Cooperative Transportation Systems Applications" was created by a group of state and local transportation agencies and the Federal Highway Administration to provide a means to conduct the work necessary for infrastructure providers to play a leading role in advancing the Cooperative Transportation Systems.

WHAT WAS OUR GOAL?

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WHAT DID WE DO?

Through a set of pooled fund studies, federal, state and local departments of transportation, to establish a multi-phase program to facilitate the field demonstration, and deployment of Connected Transportation Systems infrastructure applications. In Phase I, the participants are focused on modeling, development, engineering and planning activities that will aid transportation agencies in justifying

and promoting the large-scale deployment of Connected Transportation Systems. Phase 2 of the programs will continue research and development to prepare agencies to deploy connected vehicle environments.

WHAT WAS THE OUTCOME?

Projects that were conducted during TPF-5(206) include:

- 5.9 GHz DSRC Vehicle-Based Road and Weather Condition Application
- Basic Infrastructure Message Development and Standards Support
- Surveying/Mapping Roadways and Intersections for CV Applications – Best Practices
- Traffic Management Centers in a Connected Vehicle Environment
- Aftermarket On-Board Equipment for Cooperative Transportation Systems: Enabling Accelerated Installation
- Certification Program for Cooperative Transportation Systems
- Connected Traffic Control System (CTCS): Research Planning and Concept
- V2I Queue Advisory/Warning
- Using Third Parties to Deliver I2V
- Multi-Modal Intelligent Traffic Signal System (MMITSS)

WHAT IS THE BENEFIT?

This project will add to the potential for reduction in congestion, safety improvements, and improved travel services.

LEARN MORE

Project reports can be accessed at the link below:
<https://engineering.virginia.edu/cvpfs-public-access-materials>

IMAGES

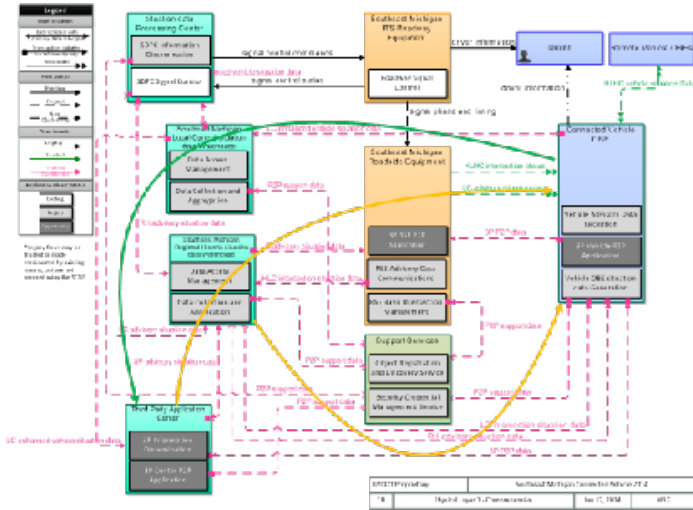


Image 1: Various data flows in the vehicle infrastructure communication environment

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