Connected Vehicle Pooled Fund Study

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Connected Vehicle Pooled Fund Study

- **The Connected Vehicle Pooled Fund Study (CV PFS) is a partnership of transportation agencies who have established a program to facilitate the development and evaluation of Connected Vehicle applications.**
  - **Program begin in 2009**

- **The program prepares state, local, and international transportation agencies for the deployment of Connected Vehicle technologies.**

- **The program focuses on the following outcomes:**
  - Development and demonstration of connected vehicle technology, algorithms, tools and applications
  - Preparation for field deployments
  - Development and deployment documentation
  - Lessons learned and identification of challenges from field deployments

CV PFS
TPF-5(389)

Members

VDOT is lead agency with technical/administrative support from the University of Virginia

Alaska, Arizona, California, Colorado, Connecticut, Delaware, FHWA, Florida, Georgia, Illinois, Maricopa County, Maryland, Michigan, Minnesota, New Hampshire, New Jersey, Ohio, Pennsylvania, Tennessee, Texas, Transport Canada, Utah, Virginia, and Wisconsin

TPF-5(389) concluded in FY23. Balance of funds will allow program to operate through Calendar Year 2025

Vehicle to Everything (V2X) PFS
TPF Solicitation 1615

- Successor to the CV PFS

- Georgia DOT lead state
  - Commitment Start Year: 2025

- The Pooled Fund Study will focus on the following high-level tasks:
  - Research, development, and evaluation of connected vehicle applications.
  - Improved technology transfer to state and local agencies through:
    - Documenting and sharing deployment best practices and guidelines
    - Providing input into emerging standards
    - Identifying additional requirements within the Connected Vehicle Program to connected vehicle technology by transportation agencies and OEMs; and
    - Coordinating with OEMs on infrastructure and vehicle tests, application development, and standards development.

VDOT Team is working with GDOT Team to enable smooth transition

Operating Principles

- Program driven directly by infrastructure owner-operators (IOOs)
- Focus on gaining experience and sharing experience to drive towards interoperability
  - Complement and enhance national efforts
  - Creation of guidance materials
- Projects
  - Identified and selected by CV PFS members
  - CV PFS Member Project Panels guide projects
  - Full membership kept up-to-date and engaged in monthly meetings and bi-annual meetings
- Bi-Annual Meetings
  - National Updates & Discussion
  - Member Updates
  - Project work sessions
  - Program planning

CV PFS Completed Projects
2009 - 2012

All reports can be found on the research page of the CV PFS Website at https://engineering.virginia.edu/cvpfs-public-access-materials.

- **Connected Vehicle Traffic Signal Control Algorithm**
  - Developed and evaluated a new traffic signal control algorithm using connected vehicle data

- **Pavement Maintenance Support Algorithm**
  - Determined the benefits of using CV probe data to develop IRI estimates and detect and map potholes

- **Evaluation of Signal Phase and Timing Data**
  - Developed CONOPS and benefits assessment for use cases of SPaT data

- **Connected Vehicle Certification Program**
  - Educated PFS members on potential issues related to a future connected vehicle certification program

- **Aftermarket On-Board Equipment**
  - Identified requirements for a Multi- Communications enabled OBE and provided recommendations for rapid introduction of equipment

CV PFS Completed Projects
2012 - 2016

- **Traffic Management Centers in a Connected Vehicle Environment**
  - Investigated how the Connected Vehicle environment will change the TMC of the future, both technically and the role of TMC operators/managers

- **5.9GHz DSRC Vehicle Based Road and Weather Condition Application**
  - Developed and tested a 5.9GHz DSRC application that is used on fleet vehicles for road and weather condition data.

- **Surveying/Mapping for CV Applications**
  - Analyzed and documented the surveying and mapping requirements for expected connected vehicle applications and determine best practices

CV PFS Completed Projects
2016 - 2019

- **Basic Infrastructure Message Development and Standards Support for Connected Vehicles Applications**
  - To develop a Basic Infrastructure Message (BIM); and
  - To establish a means to collaborate with the relevant standards development organizations

- **5.9 GHz Dedicated Short Range Communication Vehicle Based Road and Weather Condition Application, Phase 2**
  - Building on work performed in Phase 1, to deploy a DSRC based Road Weather application in New York and Michigan
  - To evaluate and interface with existing back office systems, including New York's INFORM, Michigan's DUAP, and FHWA Weather Data Environment (WxDE)

PFS FHWA Sponsored Projects

- **Connected Traffic Control Systems (CTCS)**
  - Completed December 2019

- **Multi-Modal Intelligent Traffic Signal System Program**
  - Phase 1 – Complete
  - Phase 2 – Complete
  - Phase 3 – Complete

- **V2I Queue Advisory/Warning Program**
  - Phase 1 – High-level Design - Complete
  - *Phase 2 – System Development – Ongoing*
    - *Enabling Deployment of Connected Work Zones*

Current CV PFS Program

- **Projects Currently Underway**
  - Guidance Document for MAP Messaging
  - Connected Intersections Program
  - Connected Intersections Message Monitoring
  - Enabling Deployment of Connected Work Zones

Additional Information

- **Connected Vehicle Pooled Fund Study Website**
  - **Main Page & Monthly Meetings:**
    - https://engineering.virginia.edu/labs-groups/cvpfs
  - **Research & Resources:**
    - https://engineering.virginia.edu/cvpfs-public-access-materials
  - **Annual Conference:**
    - https://engineering.virginia.edu/cvpfs-annual-meeting-materials

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