Connected Vehicle Pooled Fund Study

Vehicle to Everything (V2X) Pooled Fund Study

May 6, 2025
Overview

Noah Goodall
Virginia Department of Transportation

Brian Smith
University of Virginia

Alan Davis
Georgia Department of Transportation

Seungmo (Mo) Kim
Georgia Southern University

Connected Vehicle Pooled Fund Study
Vehicle to Everything Pooled Fund Study

- **The Connected Vehicle Pooled Fund Study (CV PFS) / Vehicle to Everything Pooled Fund Study (V2X PFS) is a long term partnership of transportation agencies established facilitate the development and evaluation of CV/V2X applications.**
    - **Program begin in 2009**

- **The program prepares state, local, and international transportation agencies for the deployment of CV/V2X 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

Connected Vehicle 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 2023.

Vehicle to Everything PFS
TPF 5(555)

- Successor to the CV PFS

- Georgia DOT lead state
  - Commitment Start Year: 2025
  - Commitments to Date: Alaska, California, Connecticut, Delaware, FHWA, Florida, Georgia, Maryland, Michigan, New York, Ohio, Texas, Utah, Virginia, Washington

- 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.

Program Transition

- VDOT/UVA TPF-5(389) Leads Full Program Through 2025
  - Member Meetings
  - Manage Current Projects
  - Scope and Procure New Projects

- GDOT/Georgia Southern TPF-5(555) Leads Full Program Beginning 2026
  - Member Meetings
  - Manage Projects Initiated 2026 and beyond
  - Scope and Procure New Projects 2026 and beyond
  - VDOT/UVA will complete management of projects initiated pre-2026

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

  - Model Connected Vehicle Procurement Documentation

- **Projects Being Initiated**

  - Public Fleet Onboard Unit (OBU) Deployment Guidance and Prototype Deployment

    - Letters of Intent Due May 5

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

- **Contacts**
  - **Noah Goodall - Noah.Goodall@VDOT.Virginia.gov**
  - **Brian Smith – briansmith@virginia.edu**
  - **Mallory Artusio – martusio@virginia.edu**

  - **Alan Davis - aladavis@dot.ga.gov**
  - **Mo Kim - seungmokim@georgiasouthern.edu**