

Connected Vehicle Pooled Fund Study

Partnership and Operating Policies

August 2018

Background

A connected vehicles environment 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 (through static signing, vehicle presence detectors, etc.), connected vehicle technologies will allow the components to “work” actively together – creating a fully connected vehicles and infrastructure environment. This provides the potential for reduction in congestion and improvement in safety and environment, resulting in improved traveler services. In order to realize this potential, a connected vehicles system and environment will require unprecedented collaboration between the private and public sectors, on a scale not required in the current loosely coupled system.

To date, the national United States Department of Transportation (USDOT) Connected Vehicle initiative has focused largely on “how” to technically accomplish the integration. A considerable amount of solid technical work at the local, state and national level has been devoted to developing communications standard (e.g., Dedicated Short Range Communications (DSRC)), developing and deploying field equipment for small-scale prototype/proof-of-concept testing, and high-level conceptual development. As this work has progressed, it has become increasingly clear that there will not be a single way to implement connected vehicle technologies. For example, the recent trend is that various wireless technologies in addition to DSRC should be considered when exploring deployment of connected vehicles applications. In addition, there has also been considerable focus in developing automated vehicles and providing supporting infrastructure. Those vehicles will initially, and potentially in the long-term, need a connected environment to fully realize all the safety, mobility and societal benefits.

As owners and operators of the nation’s surface transportation infrastructure, state and local transportation agencies are at the core of the connected vehicle infrastructure. 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 connected vehicle deployments, AASHTO developed a Strategic Plan and Connected Vehicle Field Infrastructure Footprint Analysis to aid the owners and operators in the nationwide deployment of the connected vehicle infrastructure. USDOT has also produced guidance documents for deploying and supporting connected vehicle technology. While great strides have been made over the last decade, it is clear that additional research is still needed to develop, test, and deploy applications that will make full use of the connected vehicle environment.

I. Vision

To support state, local, and international transportation agencies as well as vehicle Original Equipment Manufacturers (OEMs) in preparing for the deployment of connected vehicle infrastructure and to provide support for the AASHTO Connected and Automated Vehicle working group, USDOT Connected Vehicle Program and other national initiatives.

II. Mission

To establish a multi-phase program to facilitate the field demonstration, deployment and evaluation of connected vehicle infrastructure, vehicles and applications.

III. Purpose

To aid transportation agencies and OEMs in justifying and promoting the large scale deployment of connected vehicle environment and applications through modeling, development, engineering and planning activities.

IV. Scope

The Pooled Fund Study will focus on the following:

- Development, deployment and evaluation of connected vehicle applications;
- Supporting AASHTO's Connected Vehicle initiatives;
- Supporting USDOT's Connected Vehicles Programs, Pilots and other initiatives;
- Documenting and sharing deployment best practices and guidelines;
- Providing input into emerging standards;
- Identifying additional requirements within the Connected Vehicle Program to enable the deployment of connected vehicle technology by transportation agencies and OEMs; and
- Coordinating with OEMs on infrastructure and vehicle deployments, application development and standards development.

V. Membership

The membership will consist of Core Members, Associate Members, Liaisons, Auto Manufacturers and Industry Experts.

The ***Core Members*** are the primary stakeholders of the Pooled Fund Study. These are the infrastructure owners and operators. Core Members are representatives from federal, state, local, and international transportation agencies that contribute funding to the study. Each member agency receives one vote and travel reimbursement for one member to attend each in-person meeting. The Core Members have the decision-making authority for the Pooled Fund Study activities. As of July 2018, Core Members include the following agencies: Virginia DOT as lead state, California DOT, Colorado DOT, Connecticut DOT, Delaware DOT, Federal Highway Administration (FHWA), Florida DOT, Georgia DOT, Maricopa County DOT in

Arizona, Maryland DOT, Michigan DOT, Minnesota DOT, New Jersey DOT, New York DOT, Ohio DOT, Pennsylvania DOT, Tennessee DOT, Texas DOT, Transport Canada, Utah DOT, Washington DOT, and Wisconsin DOT. Refer to the official Pooled Fund Study website (<http://www.ets.virginia.edu/cvpfs/>) for membership status, as new members may be added during the study period. Any agency interested in joining the Pooled Fund Study is invited to observe monthly calls and participate on a trial basis.

To ensure a thorough perspective, the Core Members identified the need to include a wider range of transportation agencies in the discussion, particularly local transportation agencies. A local or international transportation agency can join the study as an *Associate Member* without contributing financially. These members are invited to join meetings and provide input; however, they will not be included in official votes or receive travel reimbursements. Those local agency Associate Members that have parent states as a Core Member will work with those states to stay abreast of information gathered through trips. If a local agency wishes to formally join, they may do so by making a smaller contribution depending on their budget availability. Associate Members include the following DOTs and Road Commissions: Metropolitan Transport Commission (MTC), North Texas Toll Authority, Oakland County Road Commission, Los Angeles County Metropolitan Transportation Authority (Metro), West Palm Beach County, San Diego Association of Governments (SANDAG), and the Rijkswaterstaat Center for Transportation & Navigation (Netherlands).

It is imperative that the Pooled Fund Study participants collaborate with other organizations and studies to ensure program consistency. Representatives from these organizations are invited to participate as a *Liaison*. These members are invited to join meetings and provide input; however, they will not be included in official votes or receive travel reimbursements. Core Members may occasionally identify additional Liaisons that should be invited to join to provide additional perspectives to the program. AASHTO and the Transportation Research Board/National Academy of Sciences NCHRP/SHRP2 Programs are current Liaisons to the Pooled Fund Study.

Representatives from various agencies and programs within the *USDOT* (e.g., ITS-JPO, FMCSA, FTA, etc.) will be invited to participate in the Pooled Fund Study to provide input into the program and project selection to ensure their specific program goals are being supported.

Various *Auto Manufacturers* and consortiums, such as the Crash Avoidance Metrics Partnership (CAMP), have been invited to participate in project panels and specific meetings. In order for the connected vehicle environments to be successful, close coordination with Auto Manufacturers is required for standards development, infrastructure deployments and application development.

Industry Experts may be invited to participate in high-level discussions on project selection and direction of the Pooled Fund Study. Once these discussions begin to detail specific projects, the Industry Experts and their employers must disengage if they wish to compete on project procurement. Core Member state universities and research institutions may be given preference over non-member universities and research institutions when evaluating proposals for candidate applications.

VI. Roles and Responsibilities

The ***PFS Team*** is the decision-making authority for the Pooled Fund Study and oversees activities of the program. The PFS Team is comprised of the various members described above. Core Members are the only voting members on the PFS Team. The representative from each Core Member organization shall be of sufficient management level in their organization to make decisions regarding the resources of the program. The PFS Team will meet in-person approximately two times per year, typically in conjunction with other events, such as the ITS America Annual Meeting, in order to reduce travel costs. Other PFS Team discussions and information exchanges will take place via teleconference and email. The Associate Members and Liaisons will have a representative in PFS Team discussions, but will not have voting privileges.

The ***Administrative Team*** consists of the Virginia DOT (lead state), an AASHTO representative, and the University of Virginia Center for Transportation Studies (UVA CTS) through a contract with Virginia DOT to provide technical oversight, procurement and administrative support. In this role, UVA CTS or any other contractor performing administration functions on behalf of the Pooled Fund Study is ineligible to compete and perform work for projects within the Pooled Fund Study.

The Administrative Team will:

- Facilitate the Pooled Fund Study in identifying and prioritizing project needs;
- Develop project scopes of work;
- Develop and distribute Requests for Letters of Intent (RFLI);
- Establish contracts with the selected subcontractor;
- Review deliverables;
- Publish and disseminate deliverables;
- Manage budget resources;
- Process travel reimbursements; and
- Coordinate meetings and after actions.

Project Panels are formed on a project basis; to select, guide, and advise specific projects. These panels can be comprised of representatives from the Core Members, Associate Members, Liaisons, representatives from USDOT, Auto Manufacturers and/or Industry Experts. The Administrative Team will work with the Project Panels to prepare project statements, project scopes and an RFLI. The Project Panels will provide technical guidance and oversight throughout the life of the project. Core, Associate or Liaison Members may be part of one or more Project Panel(s), but there must be at least one Core Member on each Project Panel to serve as the champion. Universities and research institutions may participate on a Project Panel on a volunteer basis; however, in this case, they will not be eligible to bid on the project.

VII. Yearly PFS Program Procedure

The Pooled Fund Study program will run through a series of yearly programs. The proposed yearly process is presented below, with the PFS 2020 Program as an example.

2018	2019				2020				2021
Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Contribution and Payments for FY 2019				PFS 2020 Contract Establishment	PFS 2020 Program				Grace Period
			Project Selection Scoping and RFLI Preparation	Proposal Solicitation Evaluation Subcontractor Selection	Subcontract Establishment	Project Execution			

The yearly program of the current calendar year (e.g. PFS 2020 Program) is funded by the contributions made in the previous federal fiscal year (e.g. FY 2019). Detailed steps are explained below:

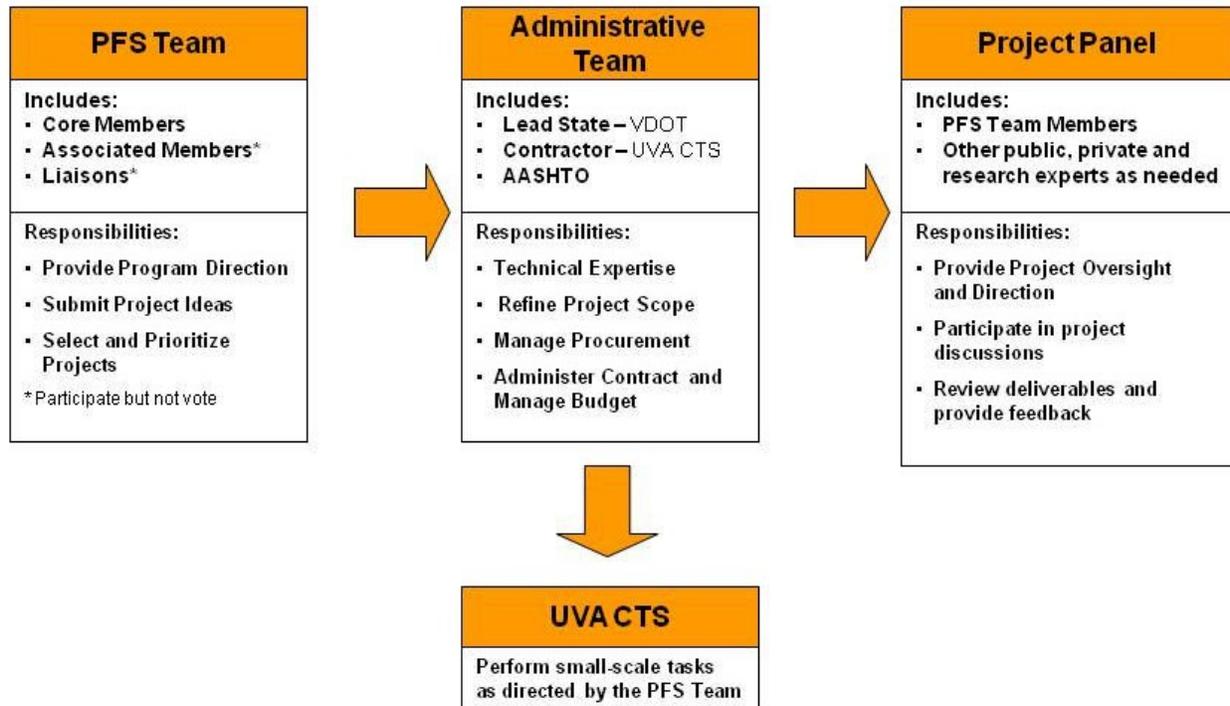
1. Core Members make commitments and payments by the end of the previous federal fiscal year (e.g. FY 2019), which is the end of the 3rd quarter.
2. The Administrative Team then establishes a contract between VDOT and UVA CTS for the current calendar year program (e.g. PFS 2020 Program).
3. The current calendar year program runs from January to December.
4. A 3 to 6-month grace period without funding is added at the end to account for the delays in project execution and other administrative tasks.

During each yearly PFS program, a few research projects will be selected and funded. A brief description of the overall steps is provided below:

1. A few project topics for the current year research program are selected and an RFLI document is prepared for each selected topic.
2. Proposals are solicited and a subcontractor is selected through evaluations by the PFS team.
3. A subcontract between UVA CTS and the selected subcontractor is established.
4. The project is executed.

VIII. Selection of Projects

In this section, a detailed procedure and members' roles for project selection are provided, as illustrated in the figure below.



The detailed descriptions for each step are presented here:

1. The PFS Team decides on the program direction and the types of projects to be pursued. Outside participants such as USDOT, Auto Manufacturers, and Industry Experts may provide input into this discussion; however, final decision-making authority resides with the PFS Team.
2. The PFS Team members will be asked to submit project ideas to the Administrative Team for consideration. Project ideas shall be submitted in a provided proposal form that includes project background, key goals and objectives, benefits to deployment, and project cost. The PFS Team member who nominated a project idea will present task scopes to the PFS Team for consideration.
3. The PFS Team will discuss and rank all projects, and the overall top projects will be pursued. The number of projects will be based on the amount of funding available.
4. The Administrative Team will then refine the scopes and begin the procurement process. If project ideas require further research or are small in scope, the PFS Team may charge the Administrative Team with those tasks.
5. Project Panels (if determined to be needed) will be formed and responsible for providing oversight and direction to the subject project, e.g. leading project discussions, and reviewing and commenting deliverables. If the PFS Team determines a Project Panel is not needed due to the size of the scope, the PFS Administrative Team will perform the responsibilities of the Project Panel.

6. The Administrative Team will oversee and manage projects, manage budgets, administer contracts and handle travel reimbursements. The Administrative Team will also plan and coordinate meetings, provide meeting notes, and follow up on action items as needed.
7. During each project selection process, all parties must disclose any potential conflicts of interest. This disclosure should occur once projects have been presented to the PFS Team or once contractors have been selected. If a conflict of interest is identified, that party will not be eligible to be involved in the project.

IX. Conflict of Interest

During each project selection process, all members (voting and non-voting) shall identify any potential conflicts of interest. It is essential that the work of the Pooled Fund Study not be compromised by a conflict of interest, or in some circumstances, the significant appearance of conflict of interest, on the part of any member of the Pooled Fund Study or anyone associated with the work on the Pooled Fund Study (e.g., consultants, staff). For this purpose, the term “conflict of interest” means any financial or other interest that conflicts with the service of an individual because it (1) could impair the individual’s objectivity, or (2) could create an unfair competitive advantage for any person or organization. This Conflict of Interest will be administered based on an honor system. Determining a conflict of interest can occur when a project idea has been presented to the PFS Team or once subcontractors have been selected. If a conflict of interest is identified, that party will be disqualified from involvement in that project development, selection or management. For example:

- Universities and/or research teams may determine they wish to bid on a project. If this is identified during the high-level discussions and that party disengages from the project, then that party may still bid on the project.
- Members may have a close or financial relationship with one of the contractors bidding on a project. The member can opt out of reviewing specific proposals.
- One member may identify a conflict of interest for another member if they feel it will impact the team or project.

X. Travel

Since this topic of research is of national importance and requires collaboration among experts from various states, some travel will be involved. All attempts will be made to combine program meetings with other conferences or meetings so that a maximum pool of program participants can be consulted with minimum travel cost. Travel costs estimated within this proposal cover transportation expenses, per diem, and other miscellaneous items. Travel support is available for one person from each Core Member (paying members) to travel to approximately two meetings per year. These travel expenses will be paid out of the contribution that each Core Member makes to the Pooled Fund Study.

XI. Funding Requirements

Core Members will be asked to contribute \$50,000 per year. State DOT’s who find that the full \$50,000 contribution from their State Planning and Research (SP&R) allocation is not

achievable or have other financial limitations, may submit a request to the CV PFS Team to join by contributing at a “fair share” rate of \$25,000 per year. This "fair share" tier of membership would be determined based on the percentage of the annual SP&R funds for the state or other related factors. Requests will be reviewed on a case by case basis and when approved the member will have full Core Member benefits.

In addition, in response to project solicitation from other funding organizations such as USDOT, additional funding may be solicited from other sources and Pooled Fund Study members.