Connected Vehicle Pilot Deployment Independent Evaluation

Stakeholder Survey/Interview Guide—Wyoming

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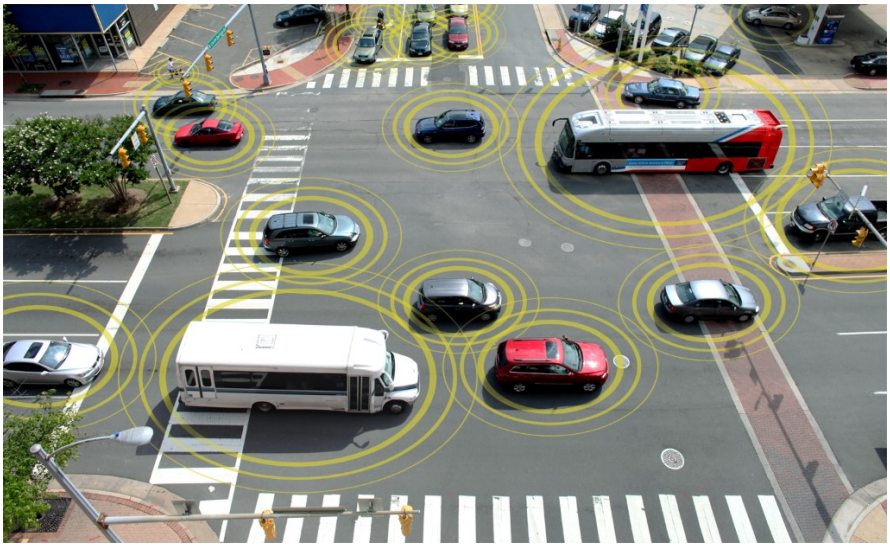

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16. Abstract

This report is intended to guide the Texas A&M Transportation Institute Connected Vehicle Pilot Deployment (TTI CVPD) Evaluation Team in collecting information to assess the stakeholder acceptance of the Wyoming Connected Vehicle Pilot Deployment. It contains the protocols and procedures the TTI CVPD Evaluation Team will use to conduct the Stakeholder Acceptance surveys and interviews. The TTI CVPD Evaluation Team will be using several techniques to collect stakeholder acceptance evaluation data, including qualitative interviews, online surveys, and a post-deployment workshop. This guide contains the questions that the TTI CVPD Evaluation Team using each of these evaluation techniques.

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Chapter 1. Introduction

The purpose of the stakeholder acceptance evaluation is to gather information to assess whether and how the three Connected Vehicles Pilot Deployments (CVPD) achieved the vision, goals, and desired mobility, environmental, and public agency efficiency (MEP) impacts. The US Department of Transportation (USDOT) Intelligent Transportation Systems Joint Program Office (ITS-JPO) is sponsoring the implementation of CVPD in New York City, Tampa, and Wyoming:

- The New York City (NYC) pilot aims to improve the safety of travelers and pedestrians in the city through a reduction in crash frequency and severity, management of vehicle speeds, and evaluation of CV implementation benefits in a dense urban environment. Applications to be tested include: 1) vehicle-to-vehicle (V2V) safety applications, 2) vehicle-to-infrastructure (V2I) safety applications, and 3) V2I pedestrian applications. The New York City Department of Transportation (NYCDOT) will be deploying these applications in Manhattan and Brooklyn. The pilot will equip taxis, MTA buses, UPS vehicles, NYCDOT fleet vehicles, NYC Department of Sanitation vehicles, and pedestrians.
- The Tampa pilot aims to improve the safety and mobility of automobile drivers, transit riders, and pedestrians in downtown Tampa through crash prevention and enhanced traffic flow. Applications to be tested include: 1) V2V safety application, 2) V2I safety applications, and 3) V2I pedestrian applications. The pilot will equip privately owned vehicles, buses, streetcars, and pedestrians.
- The Wyoming pilot aims to improve driver safety along I-80 by using V2V and V2I applications to provide advisories, roadside alerts, and dynamic travel guidance. The pilot will equip approximately 400 fleet vehicles and commercial trucks.

The Wyoming Connected Vehicle Pilot Deployment

The goal of the Wyoming CVPD is to improve driver safety, particularly for commercial vehicle operators, on I-80 (*1*). I-80, which runs the entire length of the southern edge of the state, is susceptible to multivehicle collisions and roadway closures during winter weather due to icy roads and low visibility from blizzard conditions. These events can result in fatalities, extended closures, and significant economic loss. The Wyoming CVPD includes various applications to support a range of existing and new services, including traveler information, roadside alerts, and dynamic travel guidance for freight and passenger travel. These applications include the following (*1*):

- **Forward Collision Warning** – Using V2V communications, this application alerts drivers if a rear end crash is imminent with a connected vehicle ahead.
- **Infrastructure-to-vehicle (I2V) Situational Awareness** – This application allows connected vehicles to receive information about downstream conditions that may impact their travel. This application would provide drivers with information about downstream road conditions, weather alerts, speed restrictions, vehicle restrictions, incidents, parking, and road closures.

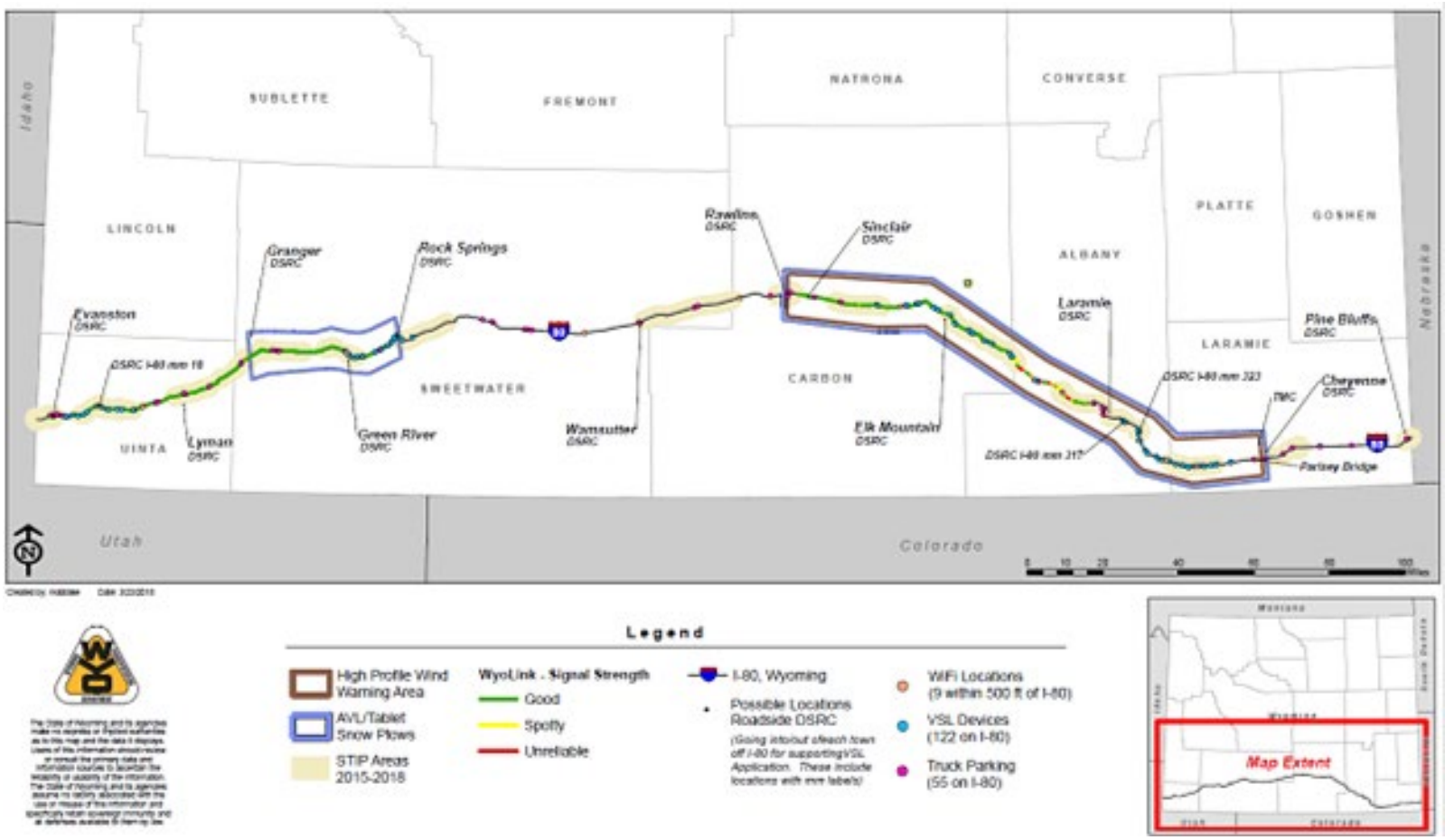
- **Work Zone Warning** – This application extends the I2V Situational Awareness application to provide information to vehicles approaching work zones. The approaching connected vehicle will receive information about work zone conditions, including obstructions in the travel lane, lane closures, lane shifts, speed reductions, and vehicles entering and exiting work zones.
- **Spot Weather Impact Warning** – This application broadcasts localized road condition information to drivers. The purpose of this application is to alert drivers of fog and icy roads that may exist only at isolated locations on I-80.
- **Distress Notification** – This application enables connected vehicles to communicate a distress message if the vehicle's sensors detect an event that might require assistance from other or if the driver initiates a distress request.

To support this pilot, the Wyoming Department of Transportation (WYDOT) is deploying 75 roadside units in various sections of I-80 that can receive and broadcast messages using dedicated short range communication (DSRC). WYDOT will install these roadside units at locations upstream of identified hotspot areas. Through their collaboration partners, WYDOT will also equip 400 vehicles that regularly use I-80 with onboard equipment designed to provide connected vehicle information and to receive alerts and advisories issued by WYDOT. A portion of the equipped vehicle will have additional capabilities to collect and transmit environmental and road weather conditions information through mobile weather sensors (*1*). Figure 1 shows the deployment corridor.

Wyoming CVPD Stakeholders

As described in the *Connected Vehicle Pilot Deployment Program Independent Evaluation: Stakeholder Acceptance Evaluation Plan* (*2*), the TTI CVPD Evaluation Team has identified six target stakeholder groups:

1. **Deployment managers** are those individuals associated with the lead deployment agency and decision makers for each CVPD. For the Wyoming CVPD, WYDOT Geographic Information Services/Intelligent Transportation Systems group is the lead stakeholder.
2. **Deployment team members** are those individuals/agencies responsible for planning, development, and/or implementation of the applications and technologies. They include private sector technology partners and universities. There are six deployment team entities involved in the Wyoming CVPD.
3. **Operating agencies** are involved in pre-deployment planning and development activities, as well as day-to-day operations of the pilots once started. These include the Wyoming State Highway Patrol and WYDOT traffic management center. They may also include agencies involved in pass-through of funding. The TTI CVPD Evaluation Team has identified six operating agencies involved with the Wyoming CVPD.
4. **Fleet operators** are those agencies that will be installing and operating CV technologies in multiple vehicles. They include WYDOT snow plow operators and commercial freight operators in Wyoming. The Wyoming CVPD Team has listed seven commercial freight stakeholders. This number may change as the pilot nears deployment.



Source: WYDOT (*3*)

Figure 1. Wyoming CVPD Deployment Area

5. **Supporting agencies** may interact with or have their operations impacted by the pilot deployments. These agencies include law enforcement, state and local government, relevant associations, and special interest groups. There are many supporting agencies in each CVPD.
6. **Policy makers** are in a position to have influenced the selection of the pilot site or to make decisions about the deployment in the future. The WYDOT Commission and state legislators are in this stakeholder group.

Table 1 shows the list of stakeholders from which the TTI CVPD Team will solicit input in conducting the stakeholder analysis

Table 1. Wyoming CVPD Stakeholders

Stakeholder Category	Agency/Entity
Deployment Manager	• Wyoming Department of Transportation (WYDOT)
Deployment Team Members	• ICF • Trihydro • University of Wyoming • McFarland Management • Vital Assurance • National Center for Atmospheric Research (NCAR)
Operating Agencies	• WYDOT Highway Patrol • WYDOT Traffic Management Center (TMC) • WYDOT Geographic Information Systems/Intelligent Transportation System (GIS/ITS) • WYDOT Telecomm • WYDOT GIS/ITS Contractors • WYDOT Maintenance

Fleet Operators	• WYDOT Snowplow Operators
	• Freight Operators
	  ○ Dooley Oil
	  ○ North Park Transportation
	  ○ Double D Distribution
	  ○ Sinclair Oil

Supporting Agencies	• Wyoming Trucking Association • County Emergency Management • Adjacent State DOTs
Policymakers	• Transportation Commission • State legislators

Chapter 2. Stakeholders Acceptance Evaluation Goals and Objectives

Goals and Objectives

The TTI CVPD Evaluation Team identified the following key evaluation objectives for the Wyoming Pilot Deployment (*4*):

- Reduce the number of truck-related crashes and incidents (including secondary incidents) due to adverse weather conditions along the I-80 corridor to improve safety and reduce incident-related delays.
- Improve emergency management on the I-80 corridor through early identification of conditions and improved messaging and communication.
- Improve freight driver's ability to locate truck parking locations along the corridor. This objective is safety related as it allows drivers to find safer parking locations in designated areas and to better meet hours of service regulatory requirements.
- Improve freight traveler information on construction activities in the corridor. This objective is related to both the safety of the construction zones and the increased efficiency of the freight logistics through improved information for the scheduling of freight movements through the corridor.
- Improve mobility for connected trucks and for all traffic while reducing negative environmental impacts along I-80 during adverse weather through reductions in truck-related crashes and incidents by deploying connected vehicles, improved freight traveler information, and weather-responsive variable speed limits.
- Improve freight reliability through improved freight traveler information.
- Improve decision-making by transportation managers.
- Improve customer satisfaction of connected truck drivers.

The objectives above do not include the financial and institutional evaluation objectives that will be finalized in Task C deliverables: 1) Financial Evaluation Plan and 2) Institutional Evaluation Plan. This document will be updated when these plans are finalized. The objective of the stakeholder analysis is to assess the perceptions of the stakeholders as to whether these objectives have been met by the deployment.

Analysis Approach

The stakeholder acceptance evaluation will use a multipronged approach for the data collection that includes qualitative interviews, an online survey, and workshops (*2*):

- The interviews will be used to gather in-depth information from those stakeholders most invested and involved in the CV pilot deployments. Interviews will take place at three points in time: pre-deployment, post-deployment near-term, and post-deployment long-term.
- The online survey will be used to gather information from stakeholders less involved in the day-to-day pilot and execution.
- The workshops will be used to foster additional cross-stakeholder dialogue to confirm interview findings and surface additional insights.

Draft instruments for each of these activities are presented in this document. These draft instruments have been developed as part of Task Area B, and they will be refined as part of Task Area C, based upon the financial and institutional evaluation plans that are developed in that task. These instruments only collect qualitative input from stakeholders on safety impacts as the Volpe National Transportation Systems Center will conduct the safety evaluation. Table 2 shows the distribution of data collection activities across stakeholder types.

Table 2. Data Collection Method by Stakeholder Type

Stakeholder Type	Pre-Deployment Interviews	Post-Deployment Interviews Near-Term[1]	Post-Deployment Interviews Long-Term[2]	Survey	Workshop
Deployment Managers	X	X	X		X
Deployment Team	X	X			X
Operating Agencies	X		X		X
Fleet Operators				X	
Supporting Agencies				X	
Policymakers[3]	X		X		

Notes
1 Near-term post-deployment is 2–3 months after activation.
2 Longer-term post-deployment is 9–12 months after activation.
3 If the Champion is no longer in office post-deployment, the TTI CVPD Evaluation Team will interview the incumbent instead.

Chapter 3. Institutional Review Board Approval Process

TTI's Policies and Procedures require TTI researchers to comply with applicable laws related to human subject research (See TTI Rule 15.99.01.I1). TTI has entered a Memorandum of Understanding with Texas A&M University (TAMU) to use TAMU's Institutional Review Board (IRB) to approve all research, whether funded or unfunded, involving human subjects. TAMU's IRB has the authority to review, approve, require modifications in, or disapprove all human subject research activities that fall within its jurisdiction.

To that end, all individuals engaged in human subjects research must submit an application to the IRB prior to commencement of any research activities if that research is sponsored by TAMU; conducted by or under the direction of any faculty, staff, student, or agent of Texas A&M in connection with his or her institutional responsibilities; conducted by or under the direction of any employee or agent of Texas A&M using any property or facility of Texas A&M; or involved in the use of Texas A&M's non-public information to identify or contact human research participants or prospective participants.

TAMU IRB Application Process

The jurisdiction of TAMU's IRB is defined by its Federal-wide Assurance document (FWA #00000092) with the Department of Health and Human Services (DHHS) and by Texas A&M's institutional policies. Therefore, TTI will use TAMU's IRB for assuring the safety and well-being of human subjects participating in evaluation experiments, protecting personally identifiable information (PII), gaining concept on the participation of those individuals, and establishing the conditions under which the data from such experiments can be shared. Figure 2 overviews the steps involved in securing approval through TAMU's IRB. All research involving human subjects and/or human subject data where TTI is involved in the collection and/or analysis of any participant data must follow this internal process.

Figure 2. TAMU IRB Approval Process.

The first step in the TAMU IRB review process involves submitting all the required documentation needed by the IRB to approve the research plan. For this project, these documents are likely to include, but are not limited to, the following:

- Material used to recruit human subjects involved in testing.
- Informed consent information.

- Data collection methodologies and protocols.
- Procedures to protect confidentiality.
- Plans for retention and/or destruction of linkages and PII.
- Process and procedures for storing and managing data once collected.
- Costs and risks to participants.
- Plans for communicating results of human subject studies.

Application Submittal

TAMU maintains an online portal for submitting and managing IRB approvals that all TTI PIs can access. This online portal is fully automated, and applications are required to address specific questions related to how studies will be performed, the protection of PII, and other critical elements of the survey.

Once an IRB application has been submitted to the TAMU Human Subjects Protection Program office, the protocol is assigned an IRB number and reviewed by administrative staff to confirm completion of submission requirements. Once the application is determined to be complete, the IRB reviews projects by one of three methods, which are explained below:

- **Exempt from full board review**: in general, exempt research poses little, if any, risk to the subject and only a limited number of procedures for data collection are permitted under exempt review. For the purposes of this project, any application involving the analysis of existing data, documents, or records that are recorded by the original investigator in such a manner that subjects cannot be identified (i.e., PII information is removed) is likely to be indicated as an exempt application. In particular, this designation would include any analysis activities undertaken by the TTI team with data collected by the deployment sites under their individual IRB protocols. In these cases, the TAMU application does not go through full board review.
- **Expedited review**: expedited research, by definition, must pose no more than minimal risk to the subject and must fit in one of nine defined categories of data collection. For expedited reviews, the review may be completed by one IRB member rather than the full board.
- **Full board review**: A full board review is conducted by the convened IRB for any research presenting more than minimal risk to subject or any research using data collection techniques not explicitly authorized under exempt or expedited review. The full TAMU board meets monthly.

TTI and the TAMU IRB have agreed to timelines related to IRB application processing. Table 3 shows these timelines.

Table 3. TAMU IRB Application Process Times.

Step	Appropriate to contact IRB liaison
Confirm completeness of submission	5 working days after submission
Determination of review requirement (exempt, expedited, full board)	5 working days after submission complete
Status of Exempt Review	10 working days after submission complete or stipulations complete
Status of Expedited Review	15 working days after submission complete or stipulations complete
Status of Full Board Review	25 working days after submission complete or stipulations complete

Given the three categories of IRB application designations, applications can be processed in a timely fashion if they are designated as exempt or expedited. Working to ensure that applications fall into either of these categories will minimize delay risks to the evaluation program. Processing times for these applications vary depending on the complexity of the application and its completeness, but they are typically approved within 2–3 weeks. In the event that a full board review will be needed, the Evaluation Team will need to plan accordingly and time the application to coincide with the next scheduled meeting of the full board so as not to delay the processing of the application more than 1 month.

Research staff can expect to spend 8–16 hours preparing an initial IRB protocol application and submitting required paperwork and documentation. After approval, research staff can expect to spend four hours each preparing an IRB protocol, continuing documentation review, and completing the documentation, as necessary.

Additionally, even if data sets collected by the original deployment sites are void of PII and members of the Evaluation Team will be handing and/or analyzing that data, an IRB application must still be submitted by TTI with TAMU IRB prior to undertaking that activity. Furthermore, TTI rules require each TTI PI and division head to be responsible for ensuring that all research involving human subjects (including protocols that may be exempt, as defined in federal regulations) is submitted to IRB for review and approval prior to commencement of any research activities. Therefore, it is critical that the research team engage TAMU's IRB early in each task order. TTI's rules apply to all subcontractors who perform work under the contract to TTI. To ensure that all TTI rules are followed by the research team and TAMU IRB rules and approvals are secured in a timely fashion, the PM has assigned Beverly T. Kuhn, Ph.D., P.E., PMP, to be the TTI IRB Coordinator for each task order. Dr. Kuhn will ensure that all the appropriate documentation has been submitted and approval obtained from TAMU's IRB.

Dr. Kuhn will also be responsible for ensuring the coordination between the TAMU's IRB and any other IRBs as appropriate. Upon initial completion and approval of TAMU IRB applications and protocols, the full application(s) will be provided to the other IRB(s) as required or requested to ensure appropriate processes and procedures are being followed that meet the requirements of the other IRBs. Prior to an initial application being approved by TAMU, Dr. Kuhn will notify the other IRB(s) to indicate that an approved application will be forthcoming to ensure timely review and coordination. Additionally, if documentation related to the certified training of study personnel is required by the other IRBs, she will provide this documentation and other requested information as appropriate.

To ensure that IRB rules and procedures are followed by the Evaluation Team and in consultation with the TAMU IRB, TTI has developed a draft IRB Approval Process as illustrated in Figure 3. As noted in the diagram, the research efforts that might involve human subjects fall into one of four categories according to the nature of the data and the existence of an IRB internal to Evaluation Team members. These categories are:

- CV Pilot Deployment: human subject research conducted by the CV Pilot deployment sites as part of their individual contracts;
- CV Pilot Deployment Evaluation – Internal Research Lead: all human subject research conducted directly by TTI research staff as part of the evaluation task orders;
- CV Pilot Deployment Evaluation – External Research Lead with No IRB: human subject research lea by an Evaluation Team partner that does not have an IRB internal to the organization for governing human subject research; and
- CV Pilot Deployment Evaluation – External Research Lead with IRB: human subject research led by an Evaluation Team partner that has an IRB internal to the organization.

It is likely that other potential external parties (e.g., USDOT, Volpe/USDOT contractors) may be involved in the analysis of data collected as part of these evaluation activities. As such, individuals who will be part of the evaluation and/or have access to the research data will need to comply with the IRB rules as set forth by the governing IRB. For example, for any involvement with data collected as part of a TAMU IRB application, the personnel will need to be appropriately trained, provide documentation of their training to Dr. Kuhn, and be included as external personnel on the IRB application. It is anticipated that similar requirements will need to be met by the other IRBs.

The involvement of external parties in the analysis of data collected in the evaluation activities will be addressed in individual IRB protocol applications as required.

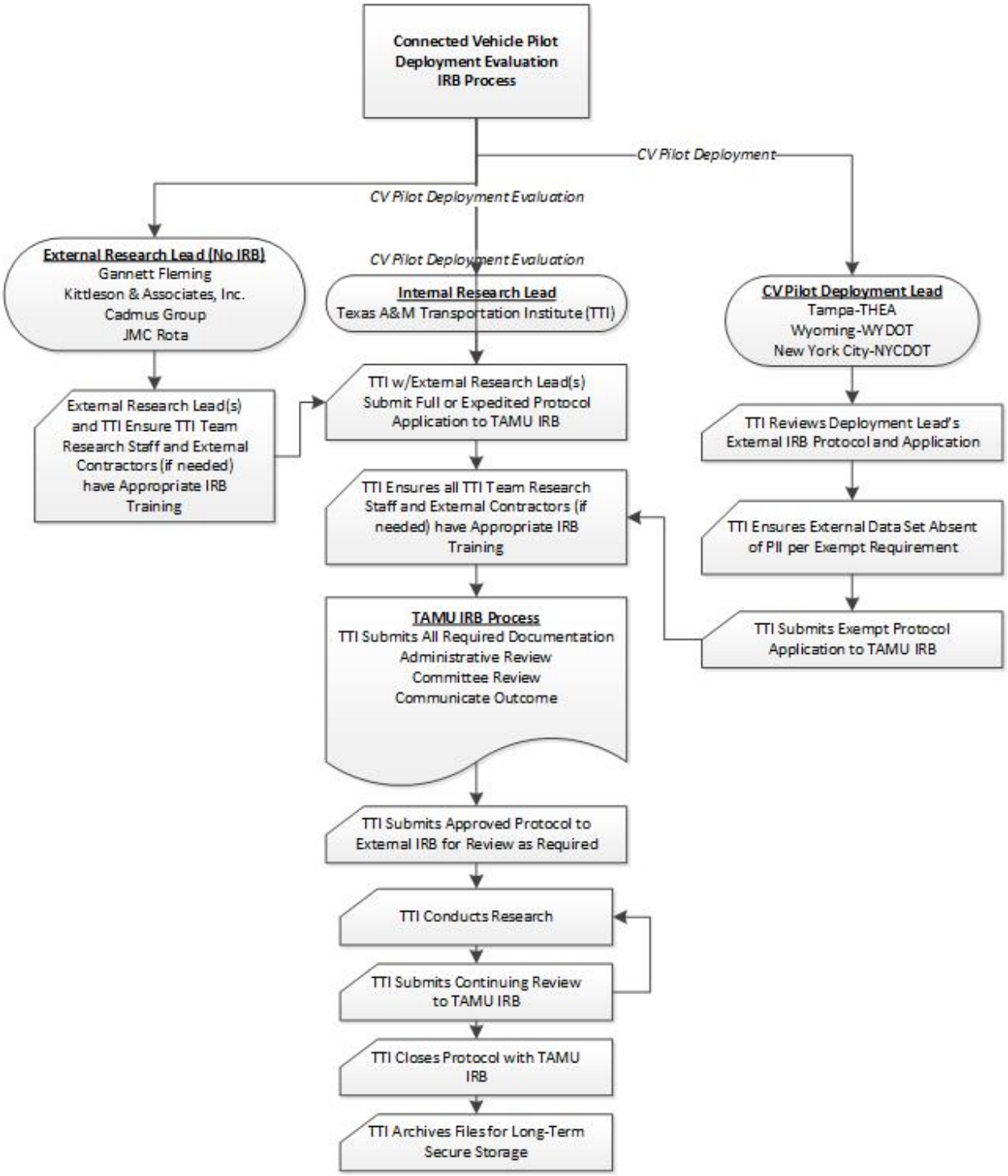


Figure 3. CV Pilot Deployment Evaluation IRB Approval Process

Chapter 4. Qualitative Interviews

The TTI CVPD Evaluation Team plans to conduct three types of Interviews:

- **Pre-deployment interviews —**These interviews will elicit vision, goals, and expectations and gather information on financial and institutional preparedness. The TTI CVPD Evaluation Team plans to execute these interviews just before activation of the test CV applications.
- **Near-term post-deployment interviews —** These interviews will capture early deployment experiences, challenges, and solutions. The TTI CVPD Evaluation Team plans to conduct these 1–3 months after activation of the deployment.
- **Long-term post-deployment interviews —** These interviews will gather opinions as to whether the deployments achieved the desired vision, goals, and MEP impacts. The TTI CVPD Evaluation Team also plans to collect observations and experiences about challenges (e.g., technical, institutional, financial), adopted solutions, and lessons learned. The TTI CVPD Evaluation Team will also use these interviews to measure stakeholder levels of satisfaction with pilot outputs/outcomes and the long-term sustainability of the CVPD. The team will conduct these interviews about 9–12 months after activation of the applications.

Information about how the interviews will be implemented can be found in the *Stakeholder Acceptance Evaluation Plan* (*2*).

As noted below, the target stakeholders for the qualitative interviews are deployment managers, deployment team members, operating agencies, and policy makers. The TTI CVPD Evaluation Team will interview at least one but not more than three individuals from each stakeholder group:

- **The TTI CVPD Evaluation Team identifies deployment managers** as the lead deployment agency and decision makers for each CVPD. TTI plans to conduct interviews with individuals from these agencies in the pre-, near-term post-, and long-term post-deployment time periods. Respondents will be executive management or project managers. Deployment managers will have integral roles in planning and implementation, so they are interviewed at all three points in time.
- **The TTI CVPD Evaluation Team identifies deployment team members** as those individual/agencies responsible for planning, development, and implementation of the applications and technologies. The CVPD Evaluation Team plans to interview these individuals in the pre-deployment because they have developed applications and near-term post-deployment time periods because they will have been the ones troubleshooting the applications during the pilot implementation. Respondents will be project managers and key technical leads (operations, development, engineering, and IT) from these team member entities.
- **The TTI CVPD Evaluation Team identifies operating agencies** as those individuals involved in the pre-deployment planning and development activities as well as day-to-day operations of the pilots once started. The TTI CVPD Evaluation Team plans to interview these individuals in the pre-deployment and long-term post-deployment time periods because they will have been involved in

setting goals and objectives for the pilots. Respondents will be the key technical leads from these agencies.

- **The TTI CVPD Evaluation Team defines Policymakers** as those individuals in a position to influence the selection of the pilot site or to make decisions about the deployment in the future. The TTI CVPD Evaluation Team will interview policymakers in the pre-deployment and long-term post-deployment time periods for the same reason as above for operation agencies. The respondents will be the champion for the CVPD within the policymaking entity.

The TTI CVPD Evaluation Team will select interview respondents using a purposeful sampling methodology. This methodology involves selecting individuals or groups of individuals from stakeholder groups that have specific knowledge about or a history with the CVPD. Once identified, these individuals will receive an email inviting them to participate in the interviews. The emails will contain the informed consent document as an attachment. To the extent possible, the team will interview the same persons from an organization in across all relevant interviews types. If this is not possible, the team will substitute an individual from the same organization who is both knowledgeable and experienced with the CVPD to participate in the post-deployment interviews. If such an individual is not available, then no substitute will be used.

All three types of interviews will have a rolling pilot in which the first five interviews for each pilot site will contain questions to elicit feedback from respondents on the clarity and efficacy of the interview questions. The TTI CVPD Evaluation Team will ask the interviewees these evaluative questions after they have completed the interview. Example questions include the following:

- How relevant were these questions?
- Were the questions clear and understandable?
- Were there any biased questions?
- What questions should I have asked (that is, possibly missed questions)?

Pre-Deployment Interview Guide

This section contains questions that the TTI CVPD Evaluation Team will use when conducting pre-deployment interviews. The projected length of the interview is 45–60 minutes depending on the number of questions asked. The interviewer will send the questions to interviewees in advance to facilitate discussion. Probes in the interview guides will be removed prior to sharing with the interviewees. Individuals performing the interviews will be knowledgeable about the deployment and receive proper training through TTI's IRB.

TTI will assign questions to stakeholder groups based upon assumptions of their knowledge and interest levels. It may be necessary to tweak some words based on who is being interviewed.

Preamble

Good morning (afternoon) and thank you for participating in this interview. I am (name here), a member of the CV Pilot Deployment Independent Evaluation Team. Our job is to assess the mobility, environmental, and public agency efficiencies associated with the CV Pilot Deployments. The USDOT ITS Joint Program Office is sponsoring this evaluation. The purpose of this interview is to gather information on the vision, goals, and expectations for the CV Pilot and to gather information on financial and institutional

preparedness before the deployment activation. We are conducting this interview under the human subjects' protection requirements of Texas A&M University's Institutional Review Board. The information that you provide in this interview is confidential, and we will not attribute responses to any specific individuals. As part of this interview, I will be asking a series of questions that pertain specifically to your perceptions and experiences regarding the planning, development, and upcoming implementation of the CV pilot applications.

Interview Questions

Questions to be asked of deployment managers, deployment team members, operating agencies, and policymakers:

1. What is your agency's role in the CV pilot deployment?
2. What is your role in the CV pilot deployment in Wyoming?
    - Probe if not addressed: In what stage are you most involved? (planning, development, implementation, all)
    - Probe if not addressed: In what specific activities are you most involved?
3. To the best of your knowledge, what are your agency's goals/reasons for participating in the CV pilot?
4. In your opinion, what constitutes success for your pilot deployment?
    - Probe: What are the positive outcomes that your agency is hoping will result?

Policy Challenges

Questions to be asked of deployment managers, deployment team members, operating agencies, and policymakers:

5. Are there specific policies or political issues that had to be addressed to deploy the CV applications?
    - Probe: How were they addressed? [note issue by issue]
    - Probe: What are the gaps in state and local laws? [note issue by issue]
    - Probe: Did you encounter issues related to compliance with standards and regulations? [note issue by issue]
6. Are there any policy issues that your agency still needs to address in the future regarding deployment of this type of technology?

Institutional Challenges

Questions to be asked of deployment managers, deployment team members, operating agencies, and policymakers:

7. Did you encounter institutional issues associated with the public partnership arrangements?
    - If Yes: What issues/concerns arose? [note issue by issue] [do not ask policymakers]
    - Probes: roles and responsibilities, communication patterns, MOUs

8. Are there any specific institutional issues that surfaced during the planning for implementation?
    - Probes: completeness of ConOps, private involvement and related procurement issues, assessment of site design and deployment approach, enforcement/compliance, staff training level
    - Probe: What solutions were put forth to address these challenges? [note challenge by challenge] [do not ask policymaker]

Culture

Questions to be asked of deployment managers, deployment team members, operating agencies, and policymakers:

9. Does your organization as a whole support the CV Pilot Deployment?
    - If Yes: In what way has this benefitted the deployment?
    - If No: What kinds of issues/concerns has this created for the deployment?

Collaboration

Questions to be asked of deployment managers, deployment team members, and operating agencies:

10. In your opinion, does consensus exist among the various stakeholders regarding CV goals, expectations, and priorities or is each stakeholder participating in the pilot program according to its priorities?
11. To your knowledge, what types of formal processes have been put in place to facilitate collaborative planning/programming among CV pilot stakeholders?
12. How do key stakeholders participate in the decision process for CV system operations and management?
13. Moving into implementation, what kind of business processes and procedures have you enacted to facilitate your operational decision making?

Financial Issues

Questions asked of deployment managers, deployment team members, and operating agencies:

14. In your opinion, is there a shared commitment among stakeholders as to the financial stability of CV pilot and how to achieve it?
    - If Yes: What are the shared commitments (including cash contributions) from the various stakeholders? How were these shared commitments achieved?
    - If No: Discuss why not.
15. Are you familiar with the long-term plan for funding/financing the CV pilot?
    - If Yes: Please describe.
16. Are you aware of the existence of a business plan or business planning process for the CV pilot?
    - If Yes: Please describe.

17. Have projections for future market participation, revenue, and cost associated with the CV pilot been developed?
    - If Yes: Can you provide detail on that process? Outcomes?
    - If No: Are there plans to do this in the future?

Business Processes

Questions asked of deployment managers, deployment team members, and operating agencies:

18. In a typical DOT-centric manner, the pilots would be organized such that the public sector is expected to assume responsibility for the infrastructure aspects of the system and the private sector the installation of vehicle equipment. Was this general structure followed?
    - If Not: what structure was used?
19. Has the CV pilot program been reflected in the overall multimodal transportation and business plans of all participating public agencies?
    - Probe: Have multiyear budgets been developed for pilot implementation?
    - Probe: Is there a plan for ongoing operation of the CV deployment including actions defined and business models for expansion of the existing pilot and transition to support long-term deployment?
20. To what extent are your business processes changing as a result of deploying the pilot? Can you provide an example?

Performance Measures

Questions to be asked of deployment managers, deployment team members, operating agencies, and policymakers:

21. What impacts do you foresee when you (your agency) decided to participate in the CV pilot?
    - Probe specifically on individual mobility, environmental, and efficiency impacts.
    - If efficiency impacts are expected, ask about availability of data to evaluate resource savings.

Questions to be asked of deployment managers:

22. Your agency identified a number of performance measures to monitoring performance of the deployment. How will these data be used during the pilot deployment?
    - Probe: Directly for after-action debriefings and improvements, displayed in dashboards, only after the fact for overall evaluation purposes.
23. During the deployment period, will these performance measures be reported internally to the deployment team only or externally as well?
24. In what way will performance measures be related to financial stability measures – in other words, used to support business decisions related to future CV pilot activities?

Systems and Technology

Questions to be asked of deployment managers, deployment team members, and operating agencies:

25. What do you think are the most significant technical or technology-related challenges related to the CV pilot?

- Probe: How has your agency coped with the challenges? What kind of solutions has your agency put forth? [note challenge by challenge]
- Probe: What kind of issues/challenges to you encounter with standards and specifications?
- Probe: Do you feel the applications are mature enough for deployment?
- Probe: If no, what needs to be done to solidify the applications?
- Probe: Do you feel the test plans and procedures are sufficient?

26. What kinds of security challenges did you face in planning and implementing your deployment?
    - Probe: Does your system design address hacking and privacy concerns? Please explain.
    - If Yes: Does the CV program include adequate infrastructure to ensure timely issuance of security certificates to participants?

Questions asked of deployment managers and deployment team members:

27. Does the system design incorporate maintenance monitoring for both vehicles and field equipment that permits rapid identification of system degradations or failures?
    - If Yes: Is emphasis placed on seamless monitoring across jurisdictional boundaries?
    - If Yes: How will you deal with maintenance issues of equipment installed on vehicles?
    - Probe: Who will maintain the field equipment?
    - Probe: Has your agency developed a maintenance management system that captures maintenance actions, cost, inputs, and outputs for both field equipment and vehicles?

Workforce Development

Questions asked of deployment managers and operating agencies:

28. Are sufficient people trained to manage, operate, and maintain the CV system through both in-house work and outsourcing?
    - Probe on any challenges encountered.
29. For the in-house staff, were these individuals added on to units with the existing structure and staffing or was a CV-specific operational unit developed?
    - Probe: If added to existing structure: Do you foresee CV responsibilities being consolidated into an operational unit with a manager and defined budget?
30. How do you see staffing evolving to meet the demands of future technologies and a mix of modes?

Outreach

Questions asked of deployment managers and operating agencies:

31. What outreach activities, if any, has your agency planned to engage other stakeholders, policymakers, or the public in the CV deployment?

Final Question

32. Do you have any additional thoughts or concerns to share that may not have come up during the interview?

Near-Term Post Deployment Interview Guide

This section contains questions that the TTI CVPD Evaluation team will use when conducting the near-term post-deployment interview. The TTI CVPD Evaluation Team will conduct these interviews 2–3 months after the initial activation of the applications. This interview serves as a quick-check-in with deployment managers and deployment team members shortly after activation of the CV applications and should be no longer than about 30 minutes in length. The TTI CVPD Evaluation Team will interview the same individuals from the stakeholder entities interviewed previously. Questions that are identical to the pre-deployment instrument are identified with the code (I) and those that are a follow-up to a question asked in the pre-deployment interview are identified with the code (F). Questions will be sent to interviewees in advance of the interviews to facilitate discussion. Probes in the interview guides will be removed prior to sharing with the interviewees.

TTI will assign questions to stakeholder groups based upon assumptions of their knowledge and interest levels. It may be necessary to tweak some words based on who is being interviewed.

Preamble

Good morning (afternoon) and thank you for participating in another [this] interview. I am (name here), a member of the CV Pilot Deployment Independent Evaluation Team. Our job is to assess the mobility, environmental, and public agency efficiencies associated with the CV Pilot Deployments. The sponsor of this evaluation is the USDOT's ITS Joint Program Office. The purpose of this interview is to gather initial perceptions and experiences relating to the activation of the CV applications. The interview is being conducted under the human subjects' protection requirements of Texas A&M University's Institutional Review Board. The information that you provide in this interview is confidential and responses will not be attributed to any specific individual.

Interview Questions

Role, Vision, Goals

1. IF PREVIOUSLY INTERVIEWED: Can you confirm that your role in the CV pilot deployment was [from the pre-deployment interview]? (F) IF NOT PREVIOUSLY INTERVIEWED: What was your role in the pre-deployment stage?
2. Has your role in the CV pilot deployment changed in any way from the pre-deployment stage? (F)
    - If Yes: What specific activities are you most involved in now?
3. Have expectations about the positive impacts of the CV applications changed at all during the early activation period? (F)
    - If Yes: What has changed and why?

Pilot Effectiveness

4. In a pre-deployment interview, you stated that your agency's objectives in participating in the pilot were [list]? How well is your experience thus far meeting those stated goals? (F)
5. You also mentioned that [list] would constitute success? Has the early experience in the activation of the applications altered your view of what would constitute success? (F)

Institutional Challenges (Placeholder until Institutional Evaluation Plan Is Finalized)

6. Were there any unforeseen institutional issues that needed to be addressed during initial implementation?
    - Probe: What solutions to these challenges were identified? Have they been implemented yet? [note challenge by challenge]
    - Probe: Are there any lessons learned so far?

Financial Issues (Placeholder until after Initial Interviews and Financial Evaluation)

7. How has the experience thus far with activation of the CV applications influenced your perceptions of whether or not your agency has the resources to deploy and manage the V2X applications?

Performance Measures

8. A number of performance measures have been developed for your site (have list). How are you using these data during the pilot deployment? (F)
    - If Yes: How are you or your agency using these performance metrics?
    - Probe: Are these performance measures reported internally to the deployment team only or externally as well?
    - Probe: Are the performance measures being used to assess financial stability measures? In other words, are data being compiled or analyzed to support business decisions related to future CV pilot activities?

Systems and Technology

9. What have been the most significant technical or technology-related challenges since the deployment started, X months ago?
    - Probe: Are there solutions to these challenges that have been put forth? [note challenge by challenge]
    - Probe: Are there any lessons learned so far?
10. In your opinion, have appropriate levels of cyber security been incorporated into system design?
    - Probe: Does system design address hacking and privacy concerns? (I)
    - If Yes: Are security certificates being issued to participants in a timely manner? (F)
11. Is the system operating as expected with regards to maintenance monitoring for both vehicles and field equipment to permit rapid identification of system degradations or failures? (I)
    - Probe on: What is working well? What needs some tweaking? Are there any lessons learned so far?

Deployment and Communications Management

12. In general, how satisfied are you with the pilot roll-out so far (i.e., activation of the CV applications)?
    - Probe: What is working well? What needs some tweaking?

- Probe: Are there any lessons learned so far?

13. From your perspective on the deployment team, how effective is the training for drivers who are users of the CV applications?
    - Probe: What is working well? What needs some tweaking? Are there lessons learned so far?
14. How would you describe the communications among stakeholders implementing the pilot?
    - Probe: What is working well in terms of communication among stakeholders? What needs to be improved?
15. What outreach activities, if any, is your agency conducting with policy makers, the public, or other stakeholders to facilitate a successful pilot deployment? (I)

Final Question

16. Do you have any additional thoughts or concerns to share that may not have come up during the interview? (I)

Long-Term Post Deployment Interview Guide

This section contains questions that the TTI CVPD Evaluation team will use when conducting the long-term post-deployment interview. The TTI CVPD Evaluation Team will conduct these interviews 9–12 months after activation of the applications. This interview will gather information on stakeholder perceptions as to whether and how the pilot deployments achieved their goals and objectives. Using qualitative methods of data collection will provide insight into unintended consequences and lessons learned. The interview respondents are deployment managers, operating agencies, and policy makers. The same individuals from the stakeholder entities should be interviewed as were in previous interviews. Interview lengths should range between 45 minutes for policymakers to 90 minutes for the other two stakeholder groups.

Questions have been assigned to stakeholder groups based upon assumptions of their knowledge and interest levels. It may be necessary to tweak some words based on who is being interviewed. Questions that are identical to the pre-deployment instrument are identified with the code (I) and those that are a follow-up to a question asked in the pre-deployment interview are identified with the code (F).

The questions will be shared with interviewees prior to the interview. Probes in the interview guides will be removed prior to sharing with the interviewees.

Preamble

Good morning (afternoon) and thank you for participating in another [this] interview. I am (name here), a member of the CV Pilot Deployment Independent Evaluation Team. Our job is to assess the mobility, environmental, and public agency efficiencies associated with the CV Pilot Deployments. The USDOT ITS Joint Program Office is sponsoring this evaluation. The purpose of this interview is to gather information on your perceptions of the outcomes of the pilot deployments. The interview is being conducted under the human subjects' protection requirements of Texas A&M University's Institutional Review Board. The information that you provide in this interview is confidential, and responses will not be attributed to specific individuals.

Interview Questions

Role, Vision, Goals

Questions to be asked of deployment managers, operating agencies, and policymakers:

1. Has your role in the CV pilot deployment changed in any way over the past 6 months? (F)
    - If Yes: What specific activities are you most involved in now?
2. What activities were you most involved in prior to the past 6 months? (F)
3. Have expectations about the positive impacts of the CV applications changed at all based on your experiences during the early activation period? (F)
    - If Yes: What has changed and why?

Pilot Effectiveness

Questions to be asked of deployment managers, operating agencies, and policymakers:

4. In your opinion, how successful was your deployment at achieving the goals and objectives initially defined for your deployment, which were [X] based on information collected in previous interviews? (F)
5. You also mentioned that [list] would constitute success? Has your experiences with the applications altered your view of what would constitute success? (F)

Questions to be asked of deployment managers and operating agencies:

6. Your deployment included a number of CV applications [list applications]. Which of those applications achieved the desired outcomes and how? Which fell short and why?
7. How satisfied are you with your pilot deployment experience?
8. Would you do this again given the opportunity?
9. Would you recommend it to other agencies?

Policy Challenges

Questions to be asked of deployment managers, operating agencies, and policymakers:

10. Were there any lingering policy issues that created challenges during the pilot deployment?
11. What policy challenges, if any, will influence the long-term sustainability of the CV program?

Institutional Challenges (Placeholder questions until the Institutional Evaluation Plan Is Finalized)

Questions to be asked of deployment managers, operating agencies, and policymakers:

12. Previously, you identified some institutional issues that needed to be addressed during implementation [list]. Were these issues addressed and how?
13. Were there unforeseen institutional issues that needed to be addressed during implementation?
    - If Yes: What were these issues and how were they addressed?
    - If Yes: What are lessons learned for future deployments?

14. Were deployment plans sufficient to manage the implementation efficiently?
    - If No: What necessary modifications did you encounter?
15. Thinking about future CV application deployment, what institutional issues, if any, need to be considered to ensure successful implementation?

Culture

Questions to be asked of deployment managers, operating agencies:

16. Does your organization as a whole support the CV pilot? (I)
17. Has your organizational culture changed as a result of your experiences with the deployment? If Yes: please explain.
18. Has senior management solidified a CV business case?
    - Probe: Is this being communicated to policymakers and the public?

Collaboration

Questions to be asked of deployment managers and operating agencies:

19. Was consensus reached among the various stakeholders in terms of CV goals, expectations, and priorities or was each stakeholder participating in the pilot program according to its own priorities? (F)
20. Was the pilot deployment implemented through a formal process for collaborative planning/ programming among CV pilot stakeholders? (F)
21. Has a formal agreement been put in place for long-term relationships among stakeholders?
    - Probe to address funding responsibilities, business models, future CV system operation, expansion, and replication.

Financial Issues (Placeholder until after Initial Interviews and Financial Evaluation)

Questions asked of deployment managers and operating agencies:

22. In your opinion, was there a shared commitment among stakeholders to the financial stability of the CV pilot and how to achieve it?
    - If Yes: discuss what the shared commitments are (including cash contributions) from various stakeholders and how the shared responsibility was achieved.
    - If No: discuss why not.
23. What were the lessons learned in terms of equipment costs (vehicle and field) to inform future deployments?
24. Previously you identified [list] as the cost categories that you would include in a cost/benefit analysis of the pilot deployment? Would you now add any others?
25. Do you have the data to provide cost estimates for these categories?

Business Processes

Questions to be asked of deployment managers and operating agencies:

26. Is there a plan among stakeholders for ongoing operation of the CV deployment?
    - Probe: Business model for expansion, transition plan
27. To the best of your knowledge, has CV been included as a formal, visible, sustainable line item in your agency's budget?
    - If No: What are the hurdles in doing so?
28. To what extent have your business processes changed as a result of deploying the pilot? Can you provide an example of how they changed?
    - If any change: Were these developed by a single agency or were they done in an integrated way across various agencies? Have these been shared with other stakeholders?
    - If No change: Why not?

Performance Measures

Questions to be asked of deployment managers, operating agencies, and policymakers:

29. Previously, you mentioned the following mobility, environment, and public agency efficiency impacts [list] as important in your agency's decision to participate in the pilot. To your knowledge, which were successfully achieved? (F)
    - Probe: Specific probes for SMEP impacts, if interviewee does not mention them when responding to Q. 3.

Questions to be asked of deployment managers:

30. A number of performance measures have been developed for your site (have list). What was the most efficient use of these data during the pilot deployment?
    - Probe on specifics using information gathered in the pre-deployment interview.
31. During the deployment period, will these performance measures only be reported internally to the deployment team or externally as well?
32. Have outcome MEP measures been monetized for cost-benefit analysis and to inform financial sustainability? (Placeholder until Financial Evaluation Plan is finalized)

Systems and Technology

Questions to be asked of deployment managers, operating agencies, and policymakers:

33. What were the most significant technical or technology-related challenges related to the CV pilot?
    - Probe: What are the lessons learned from addressing these challenges?
34. Do you think that the current CV applications are mature enough for widespread development?
    - Probe: Are you considering or prefer alternatives to CV?

Questions asked of deployment managers and operating agencies:

35. Were the regional ConOps developed for CV system implementation followed as designed or were adjustments to the ConOps made as needed?
    - Probe: Can you describe those adjustments and why made?
36. In your opinion, were appropriate levels of cyber security incorporated into system design? (F)
37. Did any hacking and privacy incidents occur? (F)
    - If Yes: How were these handled?
38. Did the CV program include adequate infrastructure to ensure timely issuance of security certificates to participants? (I)
    - If No: Why not? What was the work around?
39. Did the system design adequately incorporate maintenance monitoring for both vehicles and field equipment to permit rapid identification of system degradations or failures? (I)
    - If No: Why not? What adverse outcomes, if any, resulted from not having a maintenance monitoring system?
    - If Yes: What lessons were learned for future applications?
    - If Yes: Was vehicle maintenance performed on an as-needed basis (fire-fighting) or was it performed by technicians in the vicinity of the CV applications? Were original equipment manufacturers (OEM) dealerships or service centers involved in vehicle maintenance?
    - Probe: Who maintained the field equipment?
    - Probe: Was a maintenance management system developed that captures maintenance actions, cost, inputs, and outputs for both field equipment and vehicles?

Workforce Development

Questions asked of deployment managers and operating agencies:

40. In hindsight, were sufficient people trained to manage, operate, and maintain the CV system through both in-house work and outsourcing? (I)
    - Probe on any challenges encountered.
41. Have position descriptions for CV responsibilities been institutionalized to support activities going forward?
42. Are sufficient people trained to manage, operate, and maintain the CV system going forward? (F)
43. Do you foresee CV responsibilities being consolidated into an operational unit with manager and defined budget? (F)
44. Is staffing capable of evolving to meet the demands of future technologies and a mix of modes?

Outreach

Questions asked of deployment managers and operating agencies:

45. What outreach activities, if any, did your agency use to engage other stakeholders, policy makers, or the public in the CV deployment? (I)
    a. Probe: Which was most effective?

46. How would you characterize current public and policy maker acceptance of a CV program?

User Experience/Satisfaction

47. How have users responded to the CV applications?
    - Probe: What feedback have you received from the surveys?
48. Have you received other feedback from users (e.g., emails, informal comments)?

Conclusion

49. Are there other things you feel USDOT or other agencies should be aware of when considering a similar deployment?

Chapter 5. Online Survey Questionnaires

Introduction

This section contains the draft questions that will comprise the online surveys. These surveys will be administered to fleet operators and support agencies 9–12 months after activation to gather their perceptions of the outcomes of the pilot deployments:

- **Fleet operators** are those agencies that will be installing and operating CV technologies in multiple vehicles. The TTI CVPD expect the respondents to be the fleet managers.
- **Supporting agencies** include those agencies that may interact with or whose operations may be impacted by the pilot deployments. These agencies include law enforcement, state and local government, relevant associations, and special interest groups. Respondents will be persons from these entities that were active in implementation activities or meetings.

The TTI CVPD Evaluation Team has developed separate questionnaires to reflect the distinct knowledge and interests of fleet operators versus supporting agencies. The team also anticipates that respondents will require 10–15 minutes to complete the questionnaire. The TTI CVPD Evaluation Team will refine the survey questions in a later stage through a review of the pre-deployment qualitative interviews. So as not to overburden fleet operators, the TTI CVPD Evaluation Team will coordinate the administration of the online survey with the Wyoming Deployment Team. This coordination will consist of when, where, and how the Wyoming Deployment Team will administer the online survey, and could potential involve combining this survey with other surveys already planned by the Deployment Team.

A purposeful sampling strategy will be used to identify survey respondents. This sampling strategy involves working with deployment managers to identify up to 10 individuals that are knowledgeable about or have experience with the CVPD from each stakeholder group. This list of individuals will serve as the sampling frame for the survey. An email will be used to invite individuals to participate in the survey. The email will contain a link to the survey questionnaire. It will also have the informed consent document as an attachment. The survey will have a rolling pilot in which the evaluative questions identified on pages 28 and 29 of this document will be added to the end of the questionnaire for an initial 10 individuals from each pilot site to elicit feedback on the clarity and efficacy of the survey questions.

Online Survey Instruments

The following represents the design of the online survey instruments that will be used to collect input form the fleet operator and support agency stakeholders. There are separate instruments for fleet operators and support agency stakeholders. Respondents are managers in these agencies.

Welcome to the Wyoming Connected Vehicle (CV) Pilot Deployment Evaluation Survey. The goal of this survey is to collect information on perceptions and experiences of stakeholders involved in or interacting with the pilot deployments. The survey findings will be used to draw conclusions about the outcomes of the pilot and to draw insights for future deployments. Your participation in this survey is much appreciated. This survey is being conducted under the human subjects' protection requirements of Texas A&M University's Institutional Review Board. The information that you provide in this survey is confidential, and responses will not be attributed to specific individuals. This survey should take about 10 minutes to complete.

Fleet Operators Questions

Question	WYDOT Snow Plow Operation	Commercial Fleet Operator	Other
1. For what type of organization do you work?	☐	☐	☐

Question	Very	Moderately	Slightly	Not at all
2. How concerned are you about your drivers' roadway safety (i.e., that they would experience a crash) during the winter season?	☐	☐	☐	☐
3. What about your concern for drivers' mobility (ability to move about freely and easily) during winter storms?	☐	☐	☐	☐

Question
4. What benefits of the CV system were experienced? (check all that apply) ☐ Fewer traffic crashes and increased roadway safety ☐ More timely information on weather and roadway conditions ☐ Easier for drivers to locate parking when needed ☐ More accurate information on weather and roadway conditions ☐ Other (specify)_____ ☐ Not aware of any demonstrated benefits

Question	Extremely Effective	Moderately Effective	Slightly Effective	Not at all Effective	Don't Know
5. In your opinion, how effective was the training provided to you on the CV system?	☐	☐	☐	☐	☐
6. How effective was the training provided to drivers in your fleet on the CV system?	☐	☐	☐	☐	☐

Question	Extremely Helpful	Very Helpful	Moderately Helpful	Slightly Helpful	Not Helpful at All	Don't Know
7. Based on your knowledge, how helpful were the following information/alerts provided by the CV system during a weather event?						
• Icy Road Condition Information	☐	☐	☐	☐	☐	☐
• Snowy Road Condition Information	☐	☐	☐	☐	☐	☐
• Speed Restrictions	☐	☐	☐	☐	☐	☐
• Wind Advisories	☐	☐	☐	☐	☐	☐
• Traffic incidents/crashes	☐	☐	☐	☐	☐	☐
• Road Closures	☐	☐	☐	☐	☐	☐
• Parking Information	☐	☐	☐	☐	☐	☐
• Work Zone Information	☐	☐	☐	☐	☐	☐

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know
8. Based on your knowledge, to what extent do you agree or disagree with the following statements?	☐	☐	☐	☐	☐	☐
• The alerts/warning provided by the applications increased roadway safety on I-80 during the winter season.	☐	☐	☐	☐	☐	☐
• The alerts/warning provided by the applications were sufficient to allow my drivers to react to unsafe situations.	☐	☐	☐	☐	☐	☐
• The alerts/warning provided by the applications increased roadway safety on I-80 during winter storms	☐	☐	☐	☐	☐	☐
• My expectations were completely met as a result of this deployment.	☐	☐	☐	☐	☐	☐
• I would like to see more of my fleet vehicles equipped with this type of technology.	☐	☐	☐	☐	☐	☐
• I would like to see the applications expanded to other areas in the state.	☐	☐	☐	☐	☐	☐
• I will continue to support the devices in fleet vehicles.	☐	☐	☐	☐	☐	☐
• I would recommend the CV system to other agencies with the same winter season conditions as occur in Wyoming.	☐	☐	☐	☐	☐	☐

Question
9. Do you have any of the following concerns about the CV technologies that were deployed in Wyoming? (check all that apply) ☐ Cost ☐ Safety ☐ Privacy ☐ Trust in technology ☐ Too many alerts or warnings ☐ False alerts or warnings ☐ Driver distraction ☐ Other (specify)_____ ☐ No concerns ☐ Don't know enough about the technology

Question	Positive	Negative	No Impact	Don't know
10. What type of impact did CV system have on how you perform your job?	☐	☐	☐	☐

Question	Response Space
11. Please explain:	[Text response—limited to 200 characters]

Question	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
12. Overall, how satisfied are you with your CV pilot experience	☐	☐	☐	☐	☐

Question	Response Space
13. What was the biggest challenge in participating in the CV pilot deployment?	[Text response—limited to 200 characters]
14. Did you or your drivers have any issues with the CV system that you would like to report?	[Text response—limited to 200 characters]
15. Are there any lessons learned that you would like to share?	[Text response—limited to 200 characters]
16. Do you have any other comments/feedback you would like for us to consider?	[Text response—limited to 200 characters]

Thank you for your participation and comments!

Supporting Agency Questions

Question	Industry/ Private Sector	Public Sector Agency	Other
1. For what type of organization do you work?	☐	☐	☐

Question	Very	Moderately	Slightly	Not at All
2. How knowledgeable are you about the CV pilot deployment on I-80 in Wyoming? If not at all skip to Q14.	☐	☐	☐	☐
3. Prior to the CV pilot, how concerned were you about truck drivers' roadway safety on I-80 in Wyoming (i.e., that they would experience a crash) during the winter season?	☐	☐	☐	☐
4. What about your concern for truck drivers' safety on I-80 in Wyoming during winter storms?	☐	☐	☐	☐

Question
5. Based on your awareness, what demonstrable benefits did participants in the CV pilot experience? (check all that apply) ☐ Fewer traffic crashes and increased roadway safety ☐ More timely information on weather and roadway conditions ☐ Easier for drivers to locate parking when needed ☐ More accurate information on weather and roadway conditions ☐ Other (specify)_____ ☐ Not aware of any demonstrated benefits

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know
6. Based on your knowledge, to what extent do you agree or disagree with the following statements?						
• The alerts/warning provided by the applications increased roadway safety on I-80 during the winter season.	☐	☐	☐	☐	☐	☐
• The alerts/warning provided by the applications were sufficient to allow drivers to react to unsafe situations.	☐	☐	☐	☐	☐	☐
• The alerts/warning provided by the applications increased roadway safety on I-80 during winter storms.	☐	☐	☐	☐	☐	☐
• I would like to see more fleet vehicles equipped with this type of technology.	☐	☐	☐	☐	☐	☐
• I would like to see the applications expanded to other areas in my state.	☐	☐	☐	☐	☐	☐

Question	Positive	Negative	No Impact	Don't know
7. What type of impact did the CV system have on how you perform your job?	☐	☐	☐	☐

Question	Response Space
8. Please explain:	[Text response—limited 200 characters]

Question
9. Do you have any of the following concerns about the CV technologies that were deployed in Wyoming? (check all that apply) ☐ Cost ☐ Safety ☐ Privacy ☐ Trust in technology ☐ Too many alerts or warnings ☐ False alerts or warnings ☐ Driver distraction ☐ Other (specify)_____ ☐ No concerns ☐ Don't know enough about the technology

Question	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
10. Overall, how satisfied are you with your CV pilot experience?	☐	☐	☐	☐	☐

Question	Response Space
11. What was the biggest challenge in participating in the CV pilot?	[Text response—limited to 200 characters]
12. How did the CV pilot affect your organization if at all?	[Text response—limited to 200 characters]
13. Are there any lessons learned that you would like to share?	[Text response—limited to 200 characters]
14. Do you have any other comments/feedback for us to consider?	[Text response—limited to 200 characters]

Thank you for your participation and comments!

Chapter 6. Workshop Guide

Introduction

The TTI CVPD Evaluation Team will conduct a workshop in each site at the conclusions of deployment period. The purpose of the workshops is to foster additional dialog among the deployment managers, deployment teams, and operating agencies concerning the lessons learned and major takeaways from planning and implementing the deployments. The common themes identified in the post-deployment interviews will be used to frame the group discussion, which will explore these and other topics in more detail. These workshops will also be used to gather information needed to conduct the Financial and Institutional Assessments (see Task C scope of work).

Workshop participants will represent the deployment managers, deployment team members, and operating agencies from each site. It is expected that 15–20 persons will participate in workshops per site. Some, but not all, will be individuals who have participated in the interviews. The TTI CVPD Evaluation Team will coordinate with the deployment managers in identifying persons to be invited to the workshops.

Workshop Format

The proposed format for these workshops is presented below. Core members of the TTI CVPD Evaluation Team will lead these workshops in-person. Other TTI CVPD Evaluation Team members will participate via web conference.

Workshop Questions

Without knowing the information that will result from the post-deployment interviews, the following are types of questions that will be used in the workshop:

Participant Introductions: Name, affiliation, role in pilot (specific activities)

Expectations and Satisfaction

1. What is your agency's objective(s) in participating in the pilot?
2. How well did the CV pilot meet the stated objectives?
3. When initially implemented, how did the pilot meet the stated objectives?
4. How well did the pilot implementation match what was initially proposed?
5. Were there unanticipated changes to scope, cost, schedule, or safety?

6. How were these managed? How well were you or others in your organization involved in the risk identification and mitigation planning?
7. What is your overall assessment of the success of this pilot?
8. Has your view of what constitutes success changed during the deployment and operation of the various projects? If so, in what way and why?
9. In what ways are you satisfied with the outcomes? Any ways in which you are not satisfied?
10. Would you do it again?
11. Would you recommend to other agencies?

Technical Challenges

12. What do you think were the three biggest technical or technology-related challenges in pilot implementation?
13. Were these challenges effectively addressed?
14. How were they addressed?
15. What lessons learned can be drawn from these challenges?

Institutional Arrangements

16. In what ways have the capabilities of your organization (related to CV applications) matured because of the pilot?
17. What were the two biggest institutional challenges?
18. Were these challenges effectively addressed?
19. How were they addressed?
20. What lessons learned can be drawn from these challenges?
21. With what other stakeholders did your organization most collaborate during the pilot?
22. Do you expect continued collaboration with these organizations? For what purposes?

Financial Arrangements

23. What were the biggest financial or cost-related challenges for your organization during deployment? How were these addressed?
24. In what ways has the experience with the CV applications influenced your perceptions of whether or not your agency has the resources to deploy and manage the V2X applications?
25. Have you begun any kind of cost-benefit analysis of the pilot deployment? Describe the cost and benefit categories.
26. What are your preliminary assessments?
27. In your opinion, is there a shared commitment among stakeholders to the financial sustainability of CV pilot and how to achieve it?

Lessons Learned

28. What are the three most important lessons learned? List and compare/contrast.

Sustainability

29. Has your organization developed a strategy for sustainability that you are willing to share here?
30. Do you foresee CV as a formal, visible, sustainable line item in your agency's budget?

Expectations for Future Operations

31. Are sufficient people trained to manage, operate, and maintain the CV system going forward?
32. Do you foresee CV responsibilities being consolidated into an operational unit with a manager and defined budget?
33. Is staffing capable of evolving to meet the demands of future technologies and a mix of modes?
34. Has senior management solidified a CV business case? Is this being communicated to policy makers and the public?
35. What is the level of acceptance of a CV program among policy makers and the public?

Chapter 7. References

1. *Connected Vehicle Pilot Deployment Program: Wyoming.* Factsheet. US Department of Transportation, ITS Joint Program Office. Available at https://www.its.dot.gov/factsheets/pdf/WyomingCVPilot_Factsheet_020817.pdf. Accessed August 13, 2017.
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3. *Connected Vehicle Pilot Deployment Program:* Wyoming (WY) DOT Pilot. Web Site. Available at https://www.its.dot.gov/pilots/pilots_wydot.htm. Accessed August 13, 2017.
4. *Connected Vehicle Pilot Deployment Program Independent Evaluation: Mobility, Environmental, and Public Agency Efficiency (MEP) Refined Evaluation Plan— Wyoming.* FHWA-JPO-18-653. US Department of Transportation, ITS Joint Program Office. Washington, D.C., July 2017.

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