

NORTH/WEST PASSAGE



August 16, 2016

Transportation Pooled Fund Study TPF-5(190)

FINAL Work Plan 11



North/West Passage

TRANSPORTATION POOLED FUND STUDY TPF-5(190)

BACKGROUND

Interstates 90 and 94 between Minnesota and Washington function as major corridors for commercial and recreational travel. Extreme winter weather conditions, prevalent in the northern states within this corridor, pose significant operational and travel-related challenges. Idaho, Minnesota, Montana, North Dakota, South Dakota, Washington, and Wyoming are predominantly rural and face similar transportation issues related to traffic management, traveler information, and commercial vehicle operations.

Recognizing the value of coordinated, cross-border collaboration for Intelligent Transportation System (ITS) deployment to address these issues, Minnesota initiated a meeting in 2002 with representatives from each of the states within the corridor. The group established itself as a Transportation Pooled Fund (TPF-5(093)) in 2003 through the Federal Highway Administration (FHWA). The TPF number was then changed to TPF-5 (190) when FHWA transitioned to a new reporting system.

The vision of the North/West Passage Corridor is to focus on developing effective methods for sharing, coordinating, and integrating traveler information and operational activities across state and provincial borders.

The North/West Passage Corridor has developed an ITS Integrated Strategic Plan and has successfully implemented nine work plans containing 50 projects. Currently the group is completing its tenth work plan consisting of six projects. Complete details on previous work plans and individual projects are available through the program web site at www.nwpassage.info.

AWARDS

At the Opening Session of the 2010 National Rural ITS Conference, the North/West Passage Program was recognized as the winner of the 2010 Best of ITS Rural Award. The Best of ITS Rural Awards is the only program in the world that recognizes the best and brightest of the rural ITS community.

In 2012, North/West Passage initiated the Operations and Travel Information Integration Sharing (OTIIS) project. FHWA selected OTIIS for federal funding through the Multistate Corridor Operations Management Program (MCOM) Program. The purpose of the MCOM program is to promote regional cooperation, planning, and shared project implementation for research programs and projects that improve multimodal transportation system management and operations.

Research and development during the first phase of the OTIIS project was carried out by the Western Transportation Institute (WTI). OTIIS leveraged previous North/West Passage projects to implement an enhanced corridor-wide traveler information trip planning website. Currently North/West Passage is in its second phase of the project which launched the website (roadstosafediscovery.com) and will gather feedback on the website as well as operating and maintaining the site. Phase 2 will also include an evaluation.

ACCOMPLISHMENTS

The North/West Passage has completed a number of projects since its inception in 2003, the following bullets highlight some of accomplishments of the corridor:

- North and South Dakota 511 callers can select to receive information on Minnesota's highways.
- Development of one proposal to hire a contractor to perform work in two bordering states.
- Each state uses their own phrases to describe road events. The North/West Passage defined and agreed upon a set of consistent event description phrases to use across the I-90 and I-94 corridor.
- Provided a forum for state patrol/police and DOT staff to discuss integration of systems.
- Held a workshop to create action plans for increased cross-border operation and maintenance collaboration.
- Participated in the USDOT Clarus initiative. All North/West Passage states worked together to develop a corridor Concept of Operations.
- Shared the details of Wyoming's Enhanced Citizen Assisted Reporting Program for expansion to additional states. Idaho has implemented a citizen assisted reporting system.
- Signed a Corridor-Wide Memorandum of Understanding for corridor wide coordination of traveler information.
- Created a benefit/cost spreadsheet tool for typical rural ITS projects.
- Held a webinar to open a dialogue with the freight industry.
- Evaluated traveler information tools used and coordination among the North/West Passage states during major events.
- Documented how each state plans and prioritizes ITS deployments.
- Assessed each state's conformance to SAFETEA-LU 1201 regarding real-time system management information program.
- Held peer exchanges on the development of a concept for rural TMC/TOC operations, Variable Speed Limits, and DOT Efficiencies.
- Hosted a Regional Operations Forum for the North/West Passage and select members of the Great Lake Regional Transportation Operations Coalition (GLRTOC).
- Documented if and to what extent performance measures can and should be established for the corridor.
- Created an Operations Task Force that meets monthly to strengthen coordination among the states, particularly during major events.
- Created a Freight Task Force that meets monthly to discuss freight issues and activities and better understand and address freight needs.

FINANCIAL STATUS

North/West Passage members contribute \$25,000 or more annually to the pooled fund and are reimbursed for program travel. The North/West Passage member agencies are anticipated to contribute financially to the projects included in this work plan.

PROJECTS

At the May 2016 North/West Passage Annual Meeting in Custer, South Dakota the states reviewed the North/West Passage goals, objectives, and projects completed to-date in order to gauge interest in continuing to work as a pooled fund. The states all agreed that goals are being met and the work being done is of value to warrant continuation of the pooled fund. A list of prospective projects for Work Plan 11 was then discussed in detail. The prospective projects were based on member suggestions and the [ITS Integrated Strategic Plan](#). These projects were scored at the annual meeting based on anticipated benefits to the corridor, likelihood of success, compatibility with vision and strategic plan, and timeliness of the project.

The voting results are presented in Table 1.

TABLE 1: VOTING RESULTS FOR WORK PLAN 11 PROJECTS

Project Name	Total Points Voted	Rank by Points
Operations Task Force – Year 4	542	1
Forecasting and Alerting Travelers About Critical Road Conditions	515	2
Work Zone Management Practices for I-90/I-94	513	3
Day One Activities to Prepare for Connected and Automated Vehicles	491	4
Exploring Options for Truck Platooning along the North/West Passage Corridor	478	5
Identifying Potential ITS Deployments for North/West Passage	465	6
Asset Management Practices for ITS Infrastructure	463	7
OTIIS Website	450	8
Autonomous Truck Attenuator for Work Zones	440	9
Vehicle Detection and Travel Time Approaches	438	10
TSMO Practices Peer Exchange	422	11
Pursue a “Toward Zero Deaths” CVO Safety Campaign	303	12

After discussing the voting results the states agreed to pursue as many of the projects listed in Table 1 as could be accomplished with available funding.

Table 2 provides a funding plan for Work Plan 11 that includes several other expenses in addition to the projects selected through voting. Program administration support is as an overarching contractor task to support the Program Administrator and Chair with meeting preparations, writing conference papers, preparing presentations, maintaining progress reports, etc. The states are also planning their annual meeting in the coming year and the estimated cost noted below consists of associated travel expenses.

TABLE 2: WORK PLAN 11 FUNDING PLAN

Expense	Estimated Costs	Project Champion
Project Cost		
Project 11.1 Operations Task Force – Year 4	\$25,000	Bill Legg
Project 11.2 Forecasting and Alerting Travelers about Critical Road Conditions	\$15,000	Tony Ernest
Project 11.3 Work Zone Management Practices for I-90/I-94	\$20,000	Brandon Beise
Project 11.4 Day One Activities to Prepare for Connected and Automated Vehicles	\$10,000	Bill Legg
Project 11.5 Exploring Options for Truck Platooning along the North/West Passage Corridor	\$20,000	Dave Huft Bob Koeberlein
Total Project Cost	\$90,000	
Administrative Cost		
Program Administration Support	\$ 30,000	
Program Website Maintenance (www.nwpassage.info)	\$ 5,000	
Member Travel Support (one in person meeting)	\$ 10,000	
OTIIS Website Operations and Maintenance (http://roadstosafediscovery.com/)		TBD
Total Administrative Cost	\$ 45,000	
Revenue	Estimated Revenue*	
State Contributions (6 states@ \$25,000/state)		\$ 150,000
Total (Revenue vs. Expenses)	\$ 135,000	\$ 150,000

The states will be directly involved with finalizing contractor cost estimates, scopes of work and schedules for each of the projects to ensure concurrence with the final mix of projects contracted for Work Plan 11.

The details of projects 11.1 – 11.5 are included on the following pages. For each project, a title, description, and recommended champion are provided, in addition to a prospective approach. Also provided are planning level cost estimates. This planning level information was used as the basis to develop this work plan and will be used to arrange contractor services to execute the individual projects.

Project Title	11.1 Operations Task Force – Year 4
Project Champion	Bill Legg, Washington State DOT
Project Purpose	To continue meeting as a task force for another year.
Budget	\$25,000
Background	<p>North/West Passage has supported an Operations Task Force for three years with the intent to establish relationships, enhance the scope of operations-oriented projects, support further implementation of project findings, and increase interaction among the states outside of major events.</p> <p>For 2015-16, the task force typically held 30-minute meetings on a monthly basis to discuss topics such as API use, GoogleVoice and other telecomm providers, operations project ideas, and major events. Based on recommendations from the Steering Committee and outcomes from the Regional Operations Forum, the task force also identified three topics to explore more deeply during their 2015-16 meetings:</p> <ul style="list-style-type: none"> • Third-party traveler information services and what they provide, how they obtain information and how agencies could provide better information to them • States' ITS deployments and how they have specifically benefited operations • Technicians' forum regarding challenges with installing and maintaining ITS infrastructure (and other topics yet to be determined) <p>For these three topics, longer discussions were planned, additional background information was gathered and presented, special speakers were identified as needed, and summary reports were prepared.</p> <p>This project would support continuation of the task force for another year, following a similar format.</p>
Approach	<ul style="list-style-type: none"> • Develop a task force work plan (based on member input) that identifies the operations oriented topics to be discussed during each monthly webinar. Some topics will require research and information gathering before or after the task force meetings. All meeting information and formats will be reviewed with and approved by the task force chair. • Schedule task force meeting every month for 30 minutes. Longer meetings will be scheduled as needed to facilitate more in-depth discussion about select topic. • Prepare, gather information, facilitate and conduct monthly meetings.
Goals Addressed	This project will further enhance the states' efforts to provide corridor-wide traveler information (Goal 1) and to develop and promote cross-jurisdictional coordination of operations (Goal 2) for the North/West Passage.

Project Title	11.2 Forecasting and Alerting Travelers about Critical Conditions
Project Champion	Tony Ernest, Idaho Transportation Department
Project Purpose	Research and summarize the approaches that states are using to forecast and alert travelers about critical roadway conditions.
Budget	\$15,000
Background	<p>Many transportation agencies use RWIS and MDSS data to forecast when critical roadway conditions may occur so they can make operational decisions about staffing, equipment, materials, etc. for managing transportation. Some agencies are using similar information to generate alerts for travelers of critical conditions that may impact their trips.</p> <p>The FHWA Road Weather Management Program recently released the results of work with Wyoming, South Dakota and Michigan to develop new weather responsive traffic management strategies. Wyoming developed a <u>new software application</u> that can improve the way maintenance personnel report road and weather conditions to their statewide transportation management center, recommend variable speed limit changes, and report a number of different traffic incidents including crashes and road hazards. South Dakota DOT introduced a <u>new layer to their traveler information web site</u> that includes potential road condition threats forecasted over the next 24 hours. Michigan DOT also developed a <u>new system</u> that brings together near real-time weather and environmental information collected from fixed and mobile data sources. The system processes the weather data and provides automated weather alerts and dynamic message sign message recommendations to transportation operations center (TOC) operators.</p> <p>This project will further explore how North/West Passage states are providing (or considering) forecasted road conditions and alerts to travelers. States will be asked how they are approaching the forecasting, what conditions are being targeted, how alerts are being reported, and (if available) how travelers are responding to the information.</p>
Approach	<ul style="list-style-type: none"> • Have initial discussion about states’ practices with the Operations Task Force to determine which North/West Passage states are currently providing forecasted alerts or are in the planning process to provide such alerts. • Conduct follow-up interviews with states to gather additional information about how states are approaching the forecasting, what conditions are being targeted, how alerts are being reported, and (if available) how travelers are responding to the information. • Summarize findings, identifying commonalities, challenges and benefits regarding the various approaches being used or planned by the states.
Goals Addressed	This project will further enhance the states’ efforts to support and promote traveler information (Goal 1) for the North/West Passage.

Project Title	11.3 Work Zone Management Practices for I-90/I-94
Project Champion	Brandon Beise, North Dakota DOT
Project Purpose	Identify work zone management practices that are being used among the states for road work projects that significantly impact travel along the I-90/I-94 corridor.
Budget	\$20,000
Background	<p>From 2010-2014, there were 42 fatal crashes on Interstate routes within the North/West Passage states. Work zone management practices continue to evolve, particularly those involving the use of technology to manage traffic queues, merging and traveler information. Effective work zone management improves both safety and mobility for travelers.</p> <p>This project presents an opportunity for the North/West Passage states to exchange information about current practices in place for managing work zones on Interstates, particularly I-90/I-94. Emphasis will be placed in identifying intelligent work zone applications, including queue warning systems, dynamic merge systems, alternate routes and variable speed limits in work zones as a minimum. These applications are featured in the 2014 ENTERPRISE project, <u>Synthesis of Intelligent Work Zone Practices</u>, which will serve as an initial reference for the states. Additional information will be gathered from the <u>Work Zone Intelligent Transportation Systems Implementation Guide</u> published by FHWA (January 2014).</p> <p>Information will also be gathered from the <u>National Work Zone Safety Information Clearinghouse</u>, <u>Every Day Counts Smarter Work Zones</u>, and <u>FHWA Work Zone Management Program</u> to highlight how these resources may be used by the states to stay abreast of developing work zone management practices.</p>
Approach	<ul style="list-style-type: none"> • Review and summarize national information and resources on work zone management practices from key publications and resources. • Contact states’ work zone coordinator (or equivalent) to discuss what work zone management practices have been used on Interstate routes over the past five years. • Prepare summaries of road work projects that have applied the various work zone management practices as noted by the states. • Facilitate a detailed webinar highlighting examples from each of the states. • Summarize work zone management practices among the North/West Passage states, and highlight additional practices and resources that may be explored for future use among the North/West Passage states.
Goals Addressed	This project will further enhance the states’ efforts to develop and promote cross-jurisdictional coordination of operations (Goal 2) for the North/West Passage.

Project Title	11.4 Day One Activities to Prepare for Connected and Automated Vehicles
Project Champion	Bill Legg, Washington State DOT
Project Purpose	To help North/West Passage Member agencies to prepare for the transition to full deployment of Connected and Automated Vehicles.
Budget	\$10,000
Background	<p>Connected Vehicle applications and partially or fully Autonomous Vehicles are being developed by a number of public and private sector entities. While the timeline for deployment is debatable, it is becoming increasingly clear that connected and autonomous vehicles will play a role in transportation in both urban and rural environments in the coming years.</p> <p>From the infrastructure owners and operators’ perspective, pilot deployments or operational tests are underway that will help the industry gain valuable knowledge. However, it is challenging to understand what activities a State or local DOT can begin to perform at the current time to prepare for future CV and AV deployments. While it may be preliminary to begin deploying roadside equipment or developing back-end supporting systems, there are activities that infrastructure owners and operators (e.g. State and local DOTs) can perform to help prepare for the eventual transition to CV/AV operations.</p> <p>A challenge facing State DOTs today is understanding the actions they can take today to begin to help preparing for the eventual CV AV rollout.</p>
Approach	<ul style="list-style-type: none"> • Work with North/West Passage member agencies to confirm (and define details of) the need for better guidance on what they need to do to prepare for CV/AV deployments. • Provide North/West Passage members with direction to better use the vast amount of resources that have been (and are still) being developed regarding CV/AV technologies and preparation guidance. • Develop a mechanism for North/West Passage members to share knowledge of CV/AV resources in an organized way to maximize efficient use of such material. • Identify gaps and/or needs for additional training or skills needed to make CV/AV deployments a success. • Develop a plan to help achieve the additional training and knowledge identified as missing from current sources.
Goals Addressed	This project will answer the question of “We understand CV/AV deployments are coming, what can be done today to begin to prepare for it?”

Project Title	11.5 Exploring Options for Truck Platooning along the North/West Passage Corridor
Project Champion	Dave Huft, South Dakota DOT and Bob Koeberlein, Idaho Transportation Department
Project Purpose	To help North/West Passage Members remain informed about truck platoon demonstrations on other corridors and determine the interest level in truck platooning demonstrations corridor-wide along the I-90/I-94 corridor.
Budget	\$20,000
Background	<p>One of the early adopters of Autonomous Vehicle (AV) technologies are likely to be commercial vehicle platoons, where two or more vehicles are linked by Vehicle to Vehicle (V2V) communications to maintain close distances between the trucks.</p> <p>In late 2015, it was announced that Texas would be the location of an on-highway test of commercial vehicle platooning, beginning as early as the first half of 2016, likely involving two to three fleets of vehicles.</p> <p>For North/West Passage member states, there are two considerations regarding the Texas demonstration:</p> <ul style="list-style-type: none"> • Do North/West Passage member states have an interest in a similar truck platoon project along the I-90/94 corridor? • Do North/West Passage member states have any concerns about a private led truck platooning expansion of the demonstrations in Texas. <p>The intent of this project is to assemble information about the Texas trials, and facilitate discussions among member agencies about the interest in a truck platooning demonstration and specifically whether the North/West Passage states should approach it as a corridor as opposed to individual states.</p>
Approach	<ul style="list-style-type: none"> • Identify updates and detailed descriptions of the Texas truck platoon project to educate and inform North/West Passage states on details of the trial. One option would be to possibly consider the value in one or multiple North/West Passage members attending a portion of the Texas demonstration (especially if technical or institutional issues are discussed). • Facilitate discussions among North/West Passage member agencies to understand the interest in (or concerns about) a multi-state truck platooning project along the corridor. • Identify an action plan for next steps to advance a platoon demonstration.
Goals Addressed	This project will further enhance the states' efforts to coordinate planning and deployment of ITS projects in the corridor (Goal 3).