

NORTH/WEST PASSAGE



August 15, 2017

Transportation Pooled Fund Study TPF-5(190)

FINAL Work Plan 12

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 ten work plans. Currently the group is completing its eleventh work plan consisting of five 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.

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. North/West Passage recently completed the second phase of the project which launched the website (roadstosafediscovery.com) and gathered feedback on the website. Phase 2 also included 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:

- Development of one proposal to hire a contractor to perform work in two states.
- Each state uses their own phrases to describe road events. 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. The result of the project was an example of all North/West Passage states working together to develop a corridor Concept of Operations document.
- Shared the details of Wyoming's citizen reporting program for expansion to additional states. Idaho and Minnesota have implemented a citizen assisted reporting system.
- Signed a Corridor-Wide MOU 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 members
- Summarized North/West Passage winter performance measures practices
- Summarize North/West Passage approaches for forecasting road conditions

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 2017 North/West Passage Annual Meeting in Bismarck, North 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 12 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 12 PROJECTS

Project Name	Total Points Voted	Rank by Points
Operations Task Force – Year 5	555	1
Freight Task Force – Year 3	540	2
NWP Corridor Large Scale ITS Deployment Development	529	3
Evaluation of Rural 511 Phone Service	510	4
Truck Platooning Regulations	510	5
Interstate Speed Limits	501	6
Asset Management Practices for ITS Infrastructure	494	7
Plow Camera and Location Sharing Practices	488	8
TSMO Practices Peer Exchange	477	9
Connected Vehicle (CV) Deployment and Evaluation for Rural Interstates	468	10
IWZ Deployment and Evaluation for Rural States	464	11
Vehicle Detection and Travel Time Approaches	332	12

After discussing the voting results, the states agreed to the following approach to Work Plan 12.

1. The top nine highest ranking projects in Table 1 would be pursued as Work Plan 12.
2. Projects 1-6 would be initiated during the summer of 2017 and contractual agreements arranged for these six initial projects.
3. Projects 7-9 will commence following the completion of 1-6, with start dates most likely in the summer of 2018, pending contribution levels and verification of carry-over funds. This delayed start (and staggering of projects) will enable members to actively participate in all projects without requiring too extensive of a time commitment.
4. The members also agreed to include the Truck Platooning Regulations Project as an effort within the Freight Task Force – Year 3, as a result the nine projects will be reduced to a total of eight projects.

Table 2 provides a funding plan for Work Plan 12 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 12 FUNDING PLAN

Expense	Estimated Costs	Project Champion
Project Cost		
Project 12.1 Operations Task Force – Year 5	\$25,000	Brandon Beise
Project 12.2 Freight Task Force – Year 3	\$50,000	Bob Koeberlein
Project 12.3 NWP Corridor Large Scale ITS Deployment Development	\$15,000	Cory Johnson
Project 12.4 Evaluation of Rural 511 Phone Service	\$20,000	Tony Ernest
Project 12.5 Interstate Speed Limits	\$10,000	Dave Huft
Project 12.6 Asset Management Practices for ITS Infrastructure	\$20,000	Bruce Hunt
Project 12.7 Plow Camera and Location Sharing Practices	\$15,000	Tony Ernest
Project 12.8 TSMO Practices Peer Exchange	\$10,000	Brandon Beise and Ron Vessey
Total Project Cost	\$165,000	
Administrative Cost		
Program Administration Support	\$ 30,000	
Program Website Maintenance (www.nwpassage.info)	\$ 5,000	
Member Travel Support (one in person meeting)	\$ 10,000	
TPF Transition*	\$40,000	
Total Administrative Cost	\$ 85,000	
Revenue		Estimated Revenue
Carry Over Funds		\$100,000
State Contributions (6 states@ \$25,000/state)		\$ 150,000
Total (Revenue vs. Expenses)	\$ 250,000	\$ 250,000

**It is anticipated that the current TPF Number (5-190) will be closed out in the coming year and a new TPF number will be assigned to support Work Plan 13 and future work plans. Funding in Work Plan 12 includes an estimate (\$40,000) to support program activities during any lag between closing out the old number and transitioning to the new TPF number.*

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 12.

The details of projects 12.1 – 12.8 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	12.1 Operations Task Force – Year 5
Project Champion	Brandon Beise, North Dakota 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 four years with the intent of establishing relationships, enhancing the scope of operations-oriented projects, supporting further implementation of project findings, and increasing interaction among the states outside of major events.</p> <p>This project would support continuation of the task force for another year.</p>
Approach	<ul style="list-style-type: none"> • Develop a task force plan that identifies the operations oriented topics to be discussed during each monthly webinar. Topics could include: <ul style="list-style-type: none"> – Road condition reporting practices – Update coordination guidelines and MOU – Camera placement, integration, and maintenance – Technician’s Forum – Protest management – OTIIS for operational use – Autonomous truck attenuators • Schedule task force meetings every month for 30 minutes. Longer meetings will be scheduled as needed to facilitate more in-depth discussion about select topics. • Prepare, gather information, facilitate, and conduct monthly task force meetings.

Project Title	12.2 Freight Task Force – Year 3
Project Champion	Bob Koeberlein
Project Purpose	To continue meeting as a task force for another year.
Budget	\$50,000
Background	North/West Passage has supported a Freight Task Force for two years where the intent of the task force is to enhance NWP activities with the freight community and efforts.
Approach	<ul style="list-style-type: none"> • Schedule task force meetings periodically throughout the year. • Prepare, gather information, facilitate, and conduct task force meetings. • Develop and execute a task force work plan. The focal points of the work plan will be two efforts. <p>Truck Platooning Regulations</p> <ul style="list-style-type: none"> ○ Research state codes/regulations that affect the legality of allowing truck platooning in each of the seven North/West Passage states. Include examining any references to minimum following distance, total vehicle length, and environmental limitations in the research. ○ Develop a location selection criterion for permitting truck platooning. Produce interstate highway maps of each NWP state indicating suggested highway segments that meet the criteria proposed. ○ Prepare a draft Request for Information (RFI) that is intended to receive feedback from companies interested in performing a truck platooning test across two states in the NWP. ○ Prepare a report (draft and final) of the findings along with recommendations for state codes or regulations that would support truck platooning. Include suggested criteria for selecting and designating truck platooning corridors, considering terrain, proximity to urban areas, highway geometrics, crash rates, road weather conditions and other factors. ○ Conduct two webinars, one for summarizing the state code/regulations research, and a second one to present the final report. <p>Virtual Weigh Station</p> <ul style="list-style-type: none"> ○ Research the deployment of virtual weigh stations by state DOTs. Summarize the functionality of example deployments. Review the rationale for investing in virtual weigh stations with state DOTs that have deployed them. ○ Develop a high-level concept of operations that describes how the virtual weigh station should be connected to a state DOT’s commercial vehicle monitoring infrastructure. ○ Prepare a report (draft and final) of findings and recommendations for state DOTs to use to plan deployments of virtual weigh states. Included in the

	<p>recommendations will be guidance on selecting locations for deployment that will provide the desired benefits.</p> <ul style="list-style-type: none"> ○ Conduct a webinar for presenting the final report.
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Project Title	12.3 NWP Corridor Large Scale ITS Deployment Development
Project Champion	Cory Johnson
Project Purpose	To enable NWP members to determine the most appropriate corridor deployment, and prepare a funding application for deployment funds.
Budget	\$15,000
Background	<p>Activities in the NWP Operations Task Force have identified interest from NWP members in deploying technologies throughout the corridor to accomplish the goals of the NWP members. At the 2017 Annual Meeting, members discussed interest in continuing to exchange data and enhancing traveler information collection and dissemination through various approaches that might include:</p> <ul style="list-style-type: none"> - Connected Vehicle deployments - Integration with Maintenance Decision Support Systems - Data sharing between Road Condition Reporting Systems and Traveler Information Systems. <p>The intent of this project is to dedicate some NWP funding to enable members to step through a planning process to determine the most appropriate deployment, location, and technologies to be deployed, and to prepare the proposal materials.</p> <p>The overall concept would be to follow a process to prioritize both the technologies to be deployed, the location, and finally the funding proposal.</p>
Approach	<ul style="list-style-type: none"> ● Schedule 2-3 project webinars (or time slots on the Steering Committee webinars) to follow a structured process of identifying, prioritizing and selecting a corridor deployment. ● Support one or more members who agree to be ‘lead state’ for the planned project in presenting material to others within their state, helping to identify locations and/or planned projects to associate the NWP deployment with. ● Prepare materials describing the scope, costs, funding source, cost share, etc. for the project idea. ● Prepare the proposal for funding opportunities.

Project Title	12.4 Evaluation of Rural 511 Phone Service
Project Champion	Tony Ernest
Project Purpose	Identify the state of practice and trends in usage to determine the potential future of 511 phone service. With the increased use of mobile web devices, applications, and in-vehicle navigation, many states are exploring the elimination, modification, or rebranding of 511 phone services.
Budget	\$20,000
Background	<p>In the past several years, traveler information dissemination approaches have changed in many ways:</p> <ul style="list-style-type: none"> • Many state DOTs publish traveler information data that is ingested by third-party private sector data providers who disseminate information to travelers using mobile applications, websites, or in-vehicle devices; • Many state DOTs now operate their own mobile applications or traveler information websites suited to be accessed from mobile devices; • There are a number of additional information sources, both roadside (e.g. travel time displays) and through other media to inform travelers of conditions. <p>Many agencies are also experiencing a decrease in 511 phone calls, and questioning whether to continue the services. Feedback from some DOTs suggest that 511 phone call volumes are typically high during major weather events (e.g. snow, flooding), suggesting that travelers are using the phone services for specific purposes. As a result, DOTs may decide to adjust the dialogs and content disseminated on 511 to support major events as opposed to daily driver requests for incidents.</p>
Approach	<ul style="list-style-type: none"> • Identify 511 phone usage over the past five years in each North/West Passage state. Characterize the information and features offered by each states’ 511 service to provide context. Outline actions taken or planned by the states to modify their service. • Identify any trends in usage, costs and actions taken by North/West Passage states to modify their 511 services. • Gather information from states outside North/West Passage that have eliminated 511 phone services. Information gathered will focus on key factors (e.g. usage, cost) that influenced elimination of service. • Identify the implications and considerations associated with elimination or modification of 511 phone services.

Project Title	12.5 Interstate Speed Limits
Project Champion	Dave Huft
Project Purpose	Summarize speed limit countermeasures and safety impacts.
Budget	\$10,000
Background	<p>Project 10.6: Multistate Assessment of Interstate Speed Limit Impacts documented history of interstate highway speed limits for the North/West Passage states’.</p> <p>This project would continue the efforts of Project 12.5 and focus on documenting speed limit countermeasures and safety impacts by reviewing light and heavy vehicle crash data attributed to speed along I-90/I-94.</p>
Approach	<ul style="list-style-type: none"> • TBD

Project Title	12.6 Asset Management Practices for ITS Infrastructure
Project Champion	Bruce Hunt
Project Purpose	Summarize the states’ asset management practices regarding ITS infrastructure. Information would be gathered about the extent to which ITS devices are recognized and included as assets to be actively managed, as well as the active application of asset management for establishing life-cycles, preventive maintenance, etc.
Budget	\$20,000
Background	<p>Agencies struggle to address maintenance and reconstruction needs with limited funding. On April 19, 2017, the North/West Passage Operations Task Force held a discussion on ITS Asset Management to respond to the MAP-21 requirement that all state DOTs must develop risk-based asset management plans for pavements and bridges on the National Highway System.</p> <p>The FHWA Asset Management Program has developed a number of resources and tools to support the agencies in meeting this requirement. AASHTO has also developed a key resource to support agencies – AASHTO Transportation Asset Management Guide, A Focus on Implementation.</p> <p>This project would explore how North/West Passage states are approaching asset management as it relates to their ITS infrastructure. The project would allow NWP states to share their practices with applying asset management for understanding life-cycle costs, developing preventing maintenance schedules, budgeting for maintenance and replacement, addressing end-of-life/obsolescence, and other issues.</p>
Approach	<ul style="list-style-type: none"> • Review and summarize national information and resources on transportation asset management practices from key publications and resources. This review will focus on how these sources address ITS infrastructure. • Clarify with NWP members which aspects of applying asset management they are most interested in learning about. • Contact states’ asset management contacts to discuss asset management practices as they relate to ITS infrastructure and the states’ interests. Information from the April 19, 2017 NWP Ops Task Force meeting will feed into this. • Facilitate a detailed webinar highlighting practices from each of the NWP states. • Summarize practices for applying asset management among the NWP states and highlight additional practices and resources that may be explored for future use among the states.

Project Title	12.7 Plow Camera and Location Sharing Practices
Project Champion	Tony Ernest
Project Purpose	Summarize current practices to share plow cameras and locations for traveler information. Identify how services are being delivered, performance, and public response.
Budget	\$15,000
Background	<p>Many states are using plow cameras to provide traveler information and support winter maintenance operations. The following states are noted as currently using plow cameras in this fashion.</p> <ul style="list-style-type: none"> – Minnesota – Iowa – Pennsylvania – Montana <p>States are also starting to provide plow location, using AVL systems, as another form of traveler information. Plow locations allow travelers to see where plows are actively maintaining roads and travelers may combine this information with road condition reports and camera images to make travel decisions.</p> <p>In Iowa, for example, as web visitors click on an incident or event on the map, the system will display cameras recently captured by snow plows (if they exist), effectively expanding the camera views to include any image captured by plow cameras.</p>
Approach	<ul style="list-style-type: none"> • Interview representatives from NWP and other states to document how they capture and use plow camera images and location information for traveler information purposes. Focus information gathering on technology used for both gathering and processing, parameters for when video/AVL is on and transmitted, and other details identified by the NWP states. • Share practices found in a peer exchange webinar. • Develop a summary report of practices and webinar exchange.

Project Title	12.8 TSMO Practices Peer Exchange
Project Champion	Brandon Beise and Ron Vessey
Project Purpose	Gather information about and prepare a peer exchange webinar regarding NWP states' transportation system management and operations (TSMO) organizational practices.
Budget	\$10,000
Background	<p>Many agencies are still trying to understand what TSMO will mean within the context of their daily and long-term operations. A number of resources are available to support agencies in this effort including the AASHTO TSMO Guidance which can be used to evaluate agency capabilities in key areas of process and institutional arrangements and to prepare a formal action plan.</p> <p>Some agencies are also starting to develop customized plans to identify their desired TSMO framework and the specific actions necessary to implement TSMO practices. South Dakota DOT, for example, has completed a TSMO plan.</p> <p>This project will facilitate a peer exchange discussion among NWP states to identify where they are at in their thinking and process of establishing TSMO practices.</p>
Approach	<ul style="list-style-type: none"> • Summarize information about NWP states' TSMO practices that has been presented in previous forums. For example, SDDOT has previously shared their TSMO activities in a 2017 TRB session and NOCoE webinar. • Gather information about NWP states' TSMO practices shared during the AASHTO STSMO Annual Meeting taking place in Rapid City, SD in September 2017. • Determine most appropriate peer exchange format with Project Champions. Options may include sharing information via a dedicated project webinar or incorporating discussion into the NWP Operations Task Force as a more in-depth topic.