

NORTH/WEST PASSAGE



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North/West Passage TPF-5(190)

Final Report

Prepared by: Athey Creek Consultants



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16. Abstract Since North/West Passage was established as a Transportation Pooled Fund (https://www.pooledfund.org/) in 2003, the members (Idaho Transportation Department, Minnesota DOT, Montana DOT, North Dakota DOT, South Dakota DOT, Washington State DOT, Wisconsin DOT, and Wyoming DOT) have completed research projects to support the unique aspects prevalent in these northern states along the I-90 and I-94 corridors. The member states are predominantly rural, and face similar transportation issues related to maintenance and operations, traveler information, integrating emerging transportation technologies, and commercial vehicle operations. This final report describes the activities of North/West Passage technical activities, performed between 2007 to 2018 which includes projects completed in Work Plan 3 through Work Plan 12. Collectively, the North/West Passage members identified, prioritized, and oversaw the research activities of 60 individual projects that all contributed to the objectives of the program.			
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The cover image is provided courtesy of the Minnesota Department of Transportation.

Administrative State

The lead state for North/West Passage is the Minnesota Department of Transportation. The lead state is responsible for controlling project financing (obligating funds, tracking expenses, paying invoices, and returning unused funds to participating entities) from inception through final closeout for TPF-5(190).

North/West Passage Members

The North/West Passage members for TPF-5(190) consisted of the following agencies.

- Idaho Transportation Department
- Minnesota Department of Transportation
- Montana Department of Transportation
- North Dakota Department of Transportation
- South Dakota Department of Transportation
- Washington State Department of Transportation
- Wisconsin Department of Transportation
- Wyoming Department of Transportation

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1. INTRODUCTION

Interstates 90 and 94 between Washington and Wisconsin 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, Wisconsin, and Wyoming are predominantly rural, and face similar transportation issues related to maintenance and operations, traveler information, integrating emerging transportation technologies, and commercial vehicle operations. Recognizing the value of coordinated, cross-border collaboration, the Minnesota Department of Transportation (MnDOT) initiated a meeting in 2002 with representatives from each of the states within the corridor. The group established itself as a Transportation Pooled Fund in 2003 as *North/West Passage* through the Federal Highway Administration (FHWA). FHWA serves as a monitoring body, providing strategic and technical input. MnDOT serves as the Program Administrator and a Steering Committee consists of one representative from each of the states that have financially contributed to the effort. The Steering Committee meets annually in person, monthly by webinar or as necessary to provide overall program direction.

North/West Passage members contributed \$25,000 or more annually to the pooled fund and were reimbursed for program travel. A work plan is developed and approved annually by the Steering Committee. This final report describes the activities of North/West Passage technical activities, performed between 2007 to 2018 which includes projects completed in Work Plan 3 through Work Plan 12 under Transportation Pooled Fund (TPF)-5(190). Work Plan 1 and 2 were funded under TPF-5(093) and Work Plan 13 through Work Plan 17 are funded under TPF-5(376). North/West Passage will be closing out TPF-5(376) in 2023 and establishing a new TPF number. See Table 1. Collectively during TPF-5(190), the North/West Passage members identified, prioritized, and oversaw the research activities of 60 individual projects that all contributed to the vision of the program. To view each work plan and project results, visit the program website at: <http://www.nwpassage.info/about/workplan.php>

This final report highlights projects completed by North/West Passage in Work Plan 3 through Work Plan 12 performed between 2007 and 2018.

Table 1: North/West Passage TPF Numbers and Corresponding Work Plans and Timeframe

TPF Number	Work Plans	Timeframe
TPF-5(093)	Work Plan 1 – Work Plan 2	2003-2007
TPF-5(190)	Work Plan 3 – Work Plan 12	2007-2018
TPF-5(376)	Work Plan 13 – Work Plan 17	2018-2023
TBD	Work Plan 18 – Work Plan 22	2023-2028

It is also important to note that at the Opening Session of the 2010 National Rural Intelligent Transportation System (ITS) Conference, North/West Passage was recognized as the winner of the 2010 Best of ITS Rural Award under the category Best New Practice. The Best of ITS Rural Awards recognized the best and brightest of the rural ITS community.

The sections of this report include:

- [2. Members and Benefits to Members](#) – Provides a list of members and highlights key benefits members have received from participation in North/West Passage.
- [3. Strategic Plan](#) – Describes the components of the North/West Passage ITS Integrated Corridor Strategic Plan produced in 2007 and the subsequent updates. Also describes the focus areas and the vision of North/West Passage.
- [4. Corridor Documents](#) – Provides a summary of key corridor documents that were produced by the members.
- [5. Work Plan Projects](#) – Provides a listing of the 60 projects completed during TPF-5(190) and key results, outcomes, and implementation from each project.
- [6. Task Forces](#) – Describes the efforts of the Operations Task Force and the Freight Task Force that were established during TPF-5(190).
- [7. Outreach](#) – Provides a summary of tools developed by North/West Passage for members to utilize when discussing North/West Passage program efforts. A listing of conferences where North/West Passage presented is also included.
- [8. Summary](#) – Includes an overall summary of the North/West Passage efforts completed during TPF-5(190).

2. MEMBERS AND BENEFITS TO MEMBERS

This section notes the North/West Passage members that participated in TPF-5(190) and highlights of the overall benefits received by the members from participation.

2.1 Members

The participating agencies that contributed financial resources as well as technical input and program leadership to North/West Passage during Work Plan 3 through Work Plan 12 included the following.

- Idaho Transportation Department
- Minnesota Department of Transportation
- Montana Department of Transportation
- North Dakota Department of Transportation
- South Dakota Department of Transportation
- Washington State Department of Transportation
- Wisconsin Department of Transportation
- Wyoming Department of Transportation

2.2 Benefits to Members

In addition to specific project benefits members have received that are further identified in [Section 5](#), the North/West Passage member states have identified many benefits they have gained overall from participating in the pooled fund. Following are a few key benefits:

- Important contacts in member states.
- Issues for submitted topics were addressed before moving forward with a project.
- Exchange of traveler information with neighboring states.
- Peer exchanges of information that shared ITS experiences as well as operation and maintenance experiences.
- Data sharing between state agencies and public safety.
- Closer working efforts with border states.
- Program website resource that shows decision makers the benefits for continued financial contribution to the program.
- Opportunity for increased participation during monthly and annual meetings with quality, focused meeting agendas and topics.
- Webinars that allowed other staff to get involved in program and project efforts (e.g., workshops), expanding knowledge of other state efforts as well as extending networks internally.
- Project ideas for consideration and the technical resources and contacts to pursue them.

3. STRATEGIC PLAN

Efforts during North/West Passage Work Plan 2 produced a North/West Passage ITS Integrated Corridor Strategic Plan (2007). The plan outlined transportation issues within the corridor and established a vision with corresponding goals and objectives for the pooled fund. An ITS architecture and an inventory of ITS devices deployed along I-90 and I-94 were also included in the plan. The inventory was completed to help the states understand what had been deployed and to provide insight into the states' experiences with various technologies, technology preferences, and the potential for further deployment. The Strategic Plan also included a series of prospective projects based on the inventory and corridor goals. The focus areas, issues, vision, goals, and objectives from the plan are reviewed and updated periodically. Additional information on the Strategic Plan is available at: <https://www.nwpassage.info/about/strategicplan/>.

3.1 Focus Areas

The focus areas of North/West Passage have been modified based on changes to the transportation environment and the focus of projects through the years. Currently the North/West Passage is focusing on six different areas: Traveler Information, Maintenance and Operations, Planning and Program Management, Freight, Staffing and Resources, and Integrating Emerging Transportation Technologies. See Figure 1. For each focus area there are corresponding issues, problems, or needs as well as goals and objectives which are identified and available at: <https://www.nwpassage.info/about/strategicplan/>

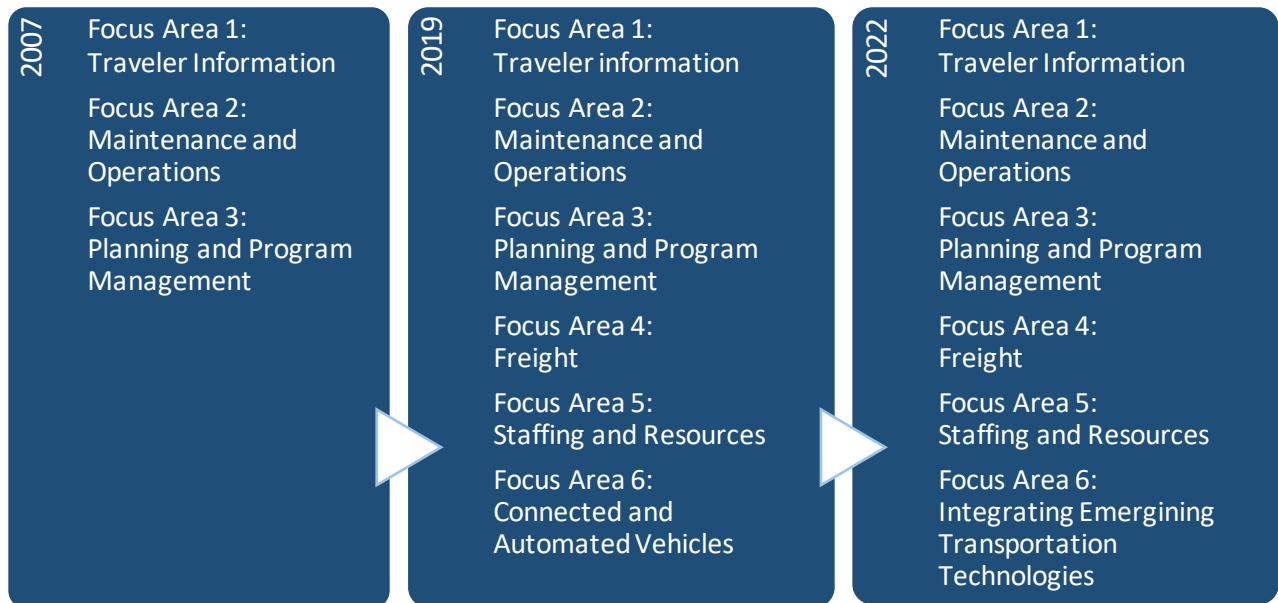


Figure 1: Timeline of Updates to the North/West Passage Focus Areas

3.2 Vision

During the development of the North/West Passage ITS Strategic Plan in 2007 the members developed a stated vision for the program. The vision is used as a reference to ensure projects selected annually align with the vision. The vision was updated in 2010 and then again in 2022. See Figure 2.



Figure 2: Timeline of Updates to the North/West Passage Vision

4. CORRIDOR DOCUMENTS

North/West Passage has developed an organization charter, Memorandum of Understanding (MOU) for Traveler Information Coordination, and Operational Guidelines for Coordinating Traveler Information with Other States Along I-90/I-94. These documents are resources used by the members.

4.1 Organization Charter and Operating Rules

An [Organization Charter and Operating Rules](#) document was developed as North/West Passage was initially established as a pooled fund in 2003. The charter provides overall guiding principles and program administration. The operating rules describe voting and contracting procedures as well as travel support.

4.2 MOU for Traveler Information Coordination

In 2011, the Operations Task Force created a MOU that was signed by all eight member states. The purpose of the MOU was to establish a framework for cooperation and coordination of traveler information among the state departments of transportation. The MOU was reviewed in 2018 by the members and it was agreed that the content was still relevant.

4.3 Operational Guidelines for Coordinating Traveler Information

Operational guidelines were identified in 2011 to help Traffic Management Center (TMC)/Traffic Operations Center (TOC) operations staff coordinate with other states when a major event occurs. The guidelines, *Operational Guidelines for Coordinating Traveler Information with Other States Along I-90/I-94*, were developed to be used in conjunction with other relevant operational guidelines governing transportation management in each state. The guidelines are periodically reviewed and updated by the Operations Task Force.

5. WORK PLAN PROJECTS

Annually the North/West Passage Steering Committee meets to discuss in detail a list of prospective projects for the upcoming year. The prospective projects are based on member suggestions and the [ITS Integrated Strategic Plan](#) and corresponding updates. These projects are 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.

This section includes a listing of the projects completed from Work Plan 3 through Work Plan 12 and summarizes a few key overall efforts completed over multiple phases.

5.1 Work Plan 3 through Work Plan 12 Projects

North/West Passage completed 60 projects identified in Work Plan 3 through Work Plan 12 under TPF-5(190).

- [Work Plan 3](#)
- [Work Plan 4](#)
- [Work Plan 5](#)
- [Work Plan 6](#)
- [Work Plan 7](#)
- [Work Plan 8](#)
- [Work Plan 9](#)
- [Work Plan 10](#)
- [Work Plan 11](#)
- [Work Plan 12](#)

Table 2 provides a listing of the projects and notes key results, outcomes, and implementation for each project.

North/West Passage also applied for and was selected for a Multistate Corridor Operations and Management Program (MCOM) federal grant in 2012. North/West Passage, through the funding provided by the federal grant, leveraged previous North/West Passage projects to implement an enhanced corridor-wide traveler information website. See [Section 5.2.1](#).

Additional details for each project and work plan are available at:

<https://www.nwpassage.info/about/workplan.php>

Table 2: North/West Passage TPF-5(190) Projects with Corresponding Results, Outcomes, and Implementation

Project (Year Completed)	Results, Outcomes, and Implementation
Work Plan 3	
Project 3.1 (2008) Corridor-Wide Consistent Major Event Descriptions	<ul style="list-style-type: none"> • First step to define a set of consistent event description phrases to be used when sharing messages corridor-wide. • An implementation plan was also completed to identify next steps for using the consistent event description phrases.
Project 3.2 (2008)	<ul style="list-style-type: none"> • A ConOps was developed to demonstrate an integrated surface transportation weather observing, forecasting, and data management system and to establish a partnership to create a

Project (Year Completed)	Results, Outcomes, and Implementation
Clarus Regional Demonstration Concept of Operations (ConOps)	nationwide surface transportation weather observing and forecasting system. <ul style="list-style-type: none"> This was an example of all North/West Passage states working together to develop a ConOps.
Project 3.3 (2008) CAD to Reporting System Integration – Workshop	<ul style="list-style-type: none"> The workshop provided the opportunity to discuss future working relationships between public safety agencies and DOTs. Resource for members to identify the next steps to integrate their CAD and reporting system.
Project 3.4 (2008) North/West Passage Traveler Information Web Site – Phase 1	<ul style="list-style-type: none"> One website to provide comprehensive corridor information (camera images, weather conditions, rest area locations, links to commercial vehicle restriction information, and truckstop information). Member states provided a link from their traveler information website to the North/West Passage corridor-wide site. A second phase of the website was completed in Work Plan 4 (Project 4.1). North/West Passage submitted and received a federal grant to continue the traveler information website with the North/West Passage Operations and Travel Information Integration Sharing (OTIIS) Multistate Corridor Operations and Management (MCOM) project. In Work Plan 6 (Project 6.5) funds were used to support the OTIIS project. Project 10.1 from Work Plan 10 documented an operations and maintenance structure for the website to support decisions about continued funding.
Project 3.5 (2008) Cross Border Operation and Maintenance Collaboration Workshop	<ul style="list-style-type: none"> This workshop provided the opportunity to discuss potential collaboration benefits corridor-wide (efficiency of maintenance operations, seamless travel for motorists, reduced duplication of equipment and system deployments, improved traveler information, and reduced overall costs). Each North/West Passage state created an action plan for improving operations and maintenance collaboration with bordering states.
Work Plan 4	
Project 4.1 and Project 4.3 (2010) Traveler Information Website Phase 2 and Center-to-Center Communications Concept of Operations	<ul style="list-style-type: none"> Developed a ConOps, designed and then implemented a second generation corridor-wide traveler information website that built upon the first generation website (Project 3.4). The second generation beta website added the ability to acquire active event reports posted by member agencies and display active corridor events. A technical document was also developed to describe the data feeds available and provided a recommendation for enhanced data exchanges to support web and phone integration. North/West Passage submitted and received a federal grant to continue the traveler information website with the North/West Passage Operations and Travel Information Integration Sharing (OTIIS) Multistate Corridor Operations and Management (MCOM) project. In Work Plan 6 (Project 6.5) funds were used to support the OTIIS project. Project 10.1 from Work Plan 10 documented an

Project (Year Completed)	Results, Outcomes, and Implementation
	operations and maintenance structure for the website to support decision about continued funding.
Project 4.2 (2009) Call Forwarding and Evaluation of Cross Border Information	<ul style="list-style-type: none"> Summarized the potential to implement access to adjacent states' information between the 511 phone systems operated in each state. The final report outlined the current status of 511 access to adjacent states' information and the options each North/West Passage state has with their current systems and included a set of recommendations for implementation.
Project 4.4 (2010) North/West Passage Regional Permitting – Phase 1	<ul style="list-style-type: none"> Identified and recommended feasible approaches to implementing a regional oversize/overweight permitting process for the North/West Passage states. The outcome of this project provided additional information to allow North/West Passage states to continue to consider the options for regional permitting. Work Plan 5 (Project 5.5), Work Plan 6 (Project 6.6), and Work Plan 7 (Project 7.4) included additional phases to support regional permitting efforts.
Project 4.5 (2010) Traveler Information Dissemination to Commercial Vehicle Operators	<ul style="list-style-type: none"> Produced a document that summarized the truck parking status in the corridor as well as summarized the experiences, challenges, and successes disseminating traveler information to truckers.
Work Plan 5	
Project 5.1 (2011) Citizen-Assist Reporting – Phase 1	<ul style="list-style-type: none"> Shared details of Wyoming's Enhanced Citizen-Assisted Reporting (ECAR) project with other members, explored ways in which Wyoming's program could be improved upon for maximized success in future implementations, and explored the feasibility of the citizen reporting system expanding to additional NWP States. Work Plan 6 (Project 6.3) included a project enhancing Wyoming's system and expanding the program into Idaho.
Project 5.2 (2012) Cost/Benefit ITS Tool Evaluation – Phase 1	<ul style="list-style-type: none"> Completed the first phase of a cost/benefit spreadsheet tool (focusing on DMS, traffic detection, RWIS, and CCTV) to help agencies determine whether the benefits of a project outweighed the associated costs (especially in rural areas). The tool was developed for use in rural and urban areas and did not require a Metropolitan Planning Organization model to use the spreadsheet. The final report presents the results of the New York DOT Evaluation Model for Freeway ITS Scoping (EMFITS) evaluation, the approach used, an overview of the tool developed for North/West Passage, and a recommendation for further enhancement of the tool. Work Plan 6 (Project 6.4) included a second phase to enhance the tool.
Project 5.3 (2011) Consistent and Coordinated DMS Use	<ul style="list-style-type: none"> Conducted a workshop for states to discuss all traveler information dissemination methods, not just DMS, for sharing information across states.

Project (Year Completed)	Results, Outcomes, and Implementation
	<ul style="list-style-type: none"> • Developed Operational Guidelines for Coordinating Traveler Information with Other States along I-90/I-94. • Created a web page to map out the traveler information tools along the corridor. • Signed a corridor-wide Memorandum of Understanding for cooperation and coordination of traveler information among the states.
Project 5.4 (2013) Use of Mobile Sensors and Maintenance Decision Support for Automated Road Condition Reporting	<ul style="list-style-type: none"> • Performed a synthesis of the best practices of mobile sensors. The synthesis documented successful deployments that remain in operation today and what can be learned by the approaches that did not succeed. • Explored the current state of the Maintenance Decision Support System (MDSS) initiatives and researched whether MDSS is a viable option for automating road condition reporting systems.
Project 5.5 (2012) North/West Passage Regional Permitting – Phase 2	<ul style="list-style-type: none"> • Continued to facilitate discussions among the member states to improve movement of overweight/oversized loads in the corridor by making permitting easier, making regulations more harmonious, and improving communications between agencies and the industry. • Based on this project’s research, the key is states agreeing on the functionality that is to be expected from the interface system and dedicating the needed resources. • Survey respondents provided a list of suggested improvements to web-based information. • Work Plan 4 (Project 4.4), Work Plan 6 (Project 6.6), and Work Plan 7 (Project 7.4) included additional phases to support regional permitting efforts.
Project 5.6 (2012) Facilitating the Use of Open Source Software Throughout the Corridor	<ul style="list-style-type: none"> • Conducted a workshop to advance the concept of open source software throughout the corridor and helped each North/West Passage state reduce the costs of developing and maintaining software systems.
Work Plan 6	
Project 6.1 (2012) Corridor-wide Traveler Information Coordination – Operational Test	<ul style="list-style-type: none"> • Several North/West Passage projects have developed guidelines for reporting consistent traveler information. This project tested the effectiveness of these guidelines during actual major events that occur along the NWP Corridor by conducting an operational test.
Project 6.2 (2013) 23 CFR 511 Final Rule	<ul style="list-style-type: none"> • This project assessed each state’s conformance to SAFETEA-LU Section 1201 regarding the real-time system management information program.
Project 6.3 (2013) Citizen Assisted Reporting – Phase 2	<ul style="list-style-type: none"> • Expanded Wyoming’s ECAR system discussed in Phase 1 from Work Plan 5 (Project 5.1) by: <ul style="list-style-type: none"> ○ Developing an ECAR web entry tool for the Wyoming DOT ECAR Program. ○ Defining consistent citizen-assisted road and weather phrases. ○ Deploying a citizen web-entry tool in Idaho based on Wyoming’s ECAR system.

Project (Year Completed)	Results, Outcomes, and Implementation
	<ul style="list-style-type: none"> Created a summary report that identified consistent phrases to be used by the Idaho and Wyoming citizen assisted reporting programs.
Project 6.4 (2012) Cost/Benefit Tool Evaluation – Phase 2	<ul style="list-style-type: none"> This project enhanced the Cost/Benefit Tool developed in Work Plan 5 – Phase 1 (Project 5.2) by: <ul style="list-style-type: none"> Adding 'MetaData' to the tool which would explain deployment parameters for cited references, descriptions of how each device is used, and conditions for deployment. Adding additional ITS devices to the four developed in Phase 1. Continuing to expand/improve the tool based on input from the North/West Passage states as well as the ITS community.
Project 6.5 (2012) NWP Traveler Information Website – Phase 3	<ul style="list-style-type: none"> Due to the proposed scope of the project which included potentially enhancing the North/West Passage corridor wide traveler information website the Steering Committee approved to move Phase 3 funds from this project to support the North/West Passage Operations and Travel Information Integration Sharing (OTIIS) Multistate Corridor Operations and Management (MCOM) project. In Work Plan 6 (Project 6.5) funds were used to support the OTIIS project. Project 10.1 from Work Plan 10 documented an operations and maintenance structure for the website to support decision about continued funding.
Project 6.6 (2013) North/West Passage Regional Permitting – Phase 3	<ul style="list-style-type: none"> Continued the goal of increasing the efficiency of trucking in the corridor by reducing the confusion in regulations and requirements for oversize/overweight trips and by providing a single mechanism for obtaining permits for oversize/overweight loads moving over the corridor.
Project 6.7 (2012) Corridor-Wide Marketing and Outreach to CVOs	<ul style="list-style-type: none"> Commercial vehicle operators identified traveler information communication channels and existing gaps.
Work Plan 7	
Project 7.1 (2013) NWP Goal Assessment and Planning for ITS Corridor Deployment	<ul style="list-style-type: none"> Identified how North/West Passage projects met the corridor's vision, goals, and objectives and identified gaps. Summarized how each member state planned and prioritized ITS deployments along the I-90 and I-94 Corridor. Assessed existing ITS deployments for potential gaps that could lead to future deployments.
Project 7.2 (2013) Corridor-Wide Traveler Information Coordination Operational Test – Phase 2	<ul style="list-style-type: none"> Determined the threshold of when multi-state coordination is needed for planned and unplanned events along the corridor. Expanded the roadwork map display website developed by the Great Lakes Regional Transportation Operations Coalition (GLRTOC) to include the North/West Passage states. Extended evaluation of coordination during major events.
Project 7.3 (2013) Truck Parking Projects along the North/West	<ul style="list-style-type: none"> Summarized the work of other projects that have identified the issues of truck parking in each North/West Passage state and nationwide.

Project (Year Completed)	Results, Outcomes, and Implementation
Passage Corridor and Evaluate Third Party Data for Truck Parking Availability	<ul style="list-style-type: none"> Conducted preliminary research on the potential use of third party data to provide truck parking availability. Provided a list of recommendations to the Freight Task Force for consideration when identifying future North/West Passage project ideas.
Project 7.4 (2013) CVO Regional Permitting – Phase 4	<ul style="list-style-type: none"> The Steering Committee recommended and approved that the funds from Project 7.4 be used to fund the initiation of a Freight Task Force (Project 8.3). Recommendations from the three regional permitting efforts (Project 4.4, Project 5.5, and Project 6.6) will be reviewed by the Freight Task Force for consideration to continue to move efforts from the project team forward.
Project 7.5 (2013) North/West Passage Freight Industry Webinar	<ul style="list-style-type: none"> Provided the opportunity to share existing traveler information sources from public agencies along the I-90/I-94 corridor and provided the opportunity to learn about the freight industry needs related to traveler information through a webinar. Webinar feedback was presented to the Freight Task Force (Work Plan 8, Project 8.3) for consideration as freight related projects and outreach efforts continued along the I-90 and I-94 Corridor.
Project 7.6 (2013) Multistate Coalition Coordination	<ul style="list-style-type: none"> Facilitated coordination among the North/West Passage program and the Great Lakes Regional Transportation Operations Coalition.
Work Plan 8	
Project 8.1 (2014) Operations Task Force – Year 1	<ul style="list-style-type: none"> Provided more in-depth expertise on the states' individual operating procedures and on the approaches that North/West Passage could pursue to strengthen and maintain coordination among the states, particularly during major events.
Project 8.2 (2013) Concept for Rural TMC/TOC Operations	<ul style="list-style-type: none"> Supported a peer exchange among the North/West Passage states on the development of a concept for rural TMC/ TOC operations.
Project 8.3 (2014) Freight Task Force – Year 1	<ul style="list-style-type: none"> Established a Freight Task Force designed to assess the value of an ongoing, dedicated group focused on North/West Passage freight related activities and projects. The Freight Task Force completed an assessment of the feasibility of a corridor-wide CVO web portal.
Project 8.4 (2014) Winter Road Condition Map Aggregation	<ul style="list-style-type: none"> Extended the multistate winter road condition aggregate map to the remaining four North/West Passage states (Washington, Idaho, Wyoming and Montana) for complete North/West Passage coverage.
Project 8.5 (2014) Member Outreach Support	<ul style="list-style-type: none"> Developed materials for and provided outreach support to the steering committee members as they shared information about North/West Passage with other staff in their agencies. Assessed the existing outreach tools that the North/West Passage has developed and continues to update. Recommended that

Project (Year Completed)	Results, Outcomes, and Implementation
	<p>members continue to use each of the tools and that the tools continue to be maintained.</p> <ul style="list-style-type: none"> • Developed additional outreach material and prepared summary documents with background on the overall program, state-specific financial benefits, and information on previous and current projects with state-specific results. • Conducted two peer exchange efforts and funded travel for these outreach opportunities.
<p>Project 8.6 (2014) Major Event Operations Coordination Support</p>	<ul style="list-style-type: none"> • This project temporarily extended major event coordination with the intent to strengthen the relationships among operations staff in states so that coordination will occur without the need for a central point of contact and organization.
<p>Project 8.7 (2014) Corridor-wide Commercial Vehicle Portal (CVOP) Feasibility Study</p>	<ul style="list-style-type: none"> • The project conclusion was that implementation of the CVOP throughout the corridor is feasible from a technical perspective, however doing so would require all member states to provide forecasting services at the same level as WYDOT to populate the CVOP.
Federal Grant: Multistate Corridor Operations and Management Program (MCOM)	
<p>Operations and Travel Information Integration Sharing (OTIIS) (2018)</p>	<ul style="list-style-type: none"> • Promoted regional cooperation, planning, and shared project implementation for research programs and multimodal transportation management system management and operations. • Leveraged previous North/West Passage projects (Project 3.4, Project 4.1, Project 4.3, Project 6.5, and Project 10.1) to implement an enhanced corridor-wide traveler information website.
Work Plan 9	
<p>Project 9.1 (2015) Operations Task Force – Year 2</p>	<ul style="list-style-type: none"> • Developed and completed a task force work plan, provided guidance and input to North/West Passage operations-related efforts, and provided an opportunity for peer exchange. • Hosted a North/West Passage Regional Operations Forum to provide practitioners along the corridor with new and innovative approaches for managing and operating the highway system, especially across state boundaries.
<p>Project 9.2 (2015) Peer Exchange</p>	<ul style="list-style-type: none"> • Hosted two webinars on member-identified topics of interest (Variable Speed Limits (VSL) and DOT Efficiencies).
<p>Project 9.3 (2015) Virtual Scanning Tour of "On the Road Technologies"</p>	<ul style="list-style-type: none"> • Two virtual scanning tours, one featuring Washington State DOT and the other featuring Utah DOT, were conducted with Montana DOT. Participation in the scanning tours included North/West Passage Steering Committee members. All participating agencies engaged several panelists and participants to share experiences and dialogue about all aspects of Variable Speed Limit systems, from planning and design to construction, operations, and maintenance of the systems. • Overall, the interaction and discussion during the virtual scanning tour was beneficial to the North/West Passage members considering the implementation of Variable Speed Limit systems.

Project (Year Completed)	Results, Outcomes, and Implementation
Project 9.4 Freight or Operations Related Projects	<ul style="list-style-type: none"> This project was a funding placeholder for projects selected by the Operations Task Force (Project 9.1) and Freight Task Force (Project 8.3).
Project 9.5 (2015) Research Need for Corridor Performance Measures	<ul style="list-style-type: none"> Documented performance measures in general, corridor specific performance management, and practices among other groups. Presented potential performance measures for North/West Passage to further consider as a corridor.
Work Plan 10	
Project 10.1 (2016) Operations and Traveler Information Integration Sharing (OTIIS) Website Operations and Maintenance	<ul style="list-style-type: none"> A first phase of the website was developed in Work Plan 3 (Project 3.4). A second phase of the website was completed in Work Plan 4 (Project 4.1). North/West Passage submitted and received a federal grant to continue the traveler information website with the North/West Passage Operations and Travel Information Integration Sharing (OTIIS) Multistate Corridor Operations and Management (MCOM) project. In Work Plan 6 (Project 6.5) funds were used to support the OTIIS project. Project 10.1 documented the ownership and structure of the OTIIS website to a level that would enable the North/West Passage members to support future decisions about funding operations and maintenance.
Project 10.2 (2016) Operations Task Force – Year 3	<ul style="list-style-type: none"> Discussed many topic areas including the use of an open Applications Protocol Interface (API) to share traveler information content with third-party traveler information service providers, options and approaches for establishing single points of telephone contact within each state, upcoming state ITS deployments, and coordination for planned major events. Conducted a Technician’s Forum to provide operations field and office staff with best practices on parking management systems and selecting pavement sensors.
Project 10.3 (2016) Evaluate Effectiveness of Citizen Reporting	<ul style="list-style-type: none"> Evaluated the benefits, costs, and lessons learned of agencies using citizen reporters by examining Citizen Reporting Systems in Minnesota, Wyoming, Utah, Idaho, and Oregon.
Project 10.4 (2016) Freight Task Force – Year 2	<ul style="list-style-type: none"> Conducted outreach and education webinars on freight data, truck parking, and connected vehicle trucks. Also, identified freight funding opportunities and outreach opportunities. Additional efforts included developing a paper on identifying truck parking availability systems corridor-wide that provide near real-time information to commercial vehicle drivers. A paper exploring truck platooning technology was also developed.
Project 10.5 (2016) Winter Performance Management Practices	<ul style="list-style-type: none"> Gathered and summarized information regarding the North/West Passage states' current practices surrounding winter performance measures. Identified measures and the associated data being used, as well as targets that have been established.

Project (Year Completed)	Results, Outcomes, and Implementation
Project 10.6 (2016) Multistate Assessment of Interstate Speed Limit Impacts	<ul style="list-style-type: none"> Reviewed the North/West Passage states that had increased their speed limits but because it did not include data from all member states and only a couple years of data were available since the speed limit changes, results were limited.
Work Plan 11	
Project 11.1 (2017) Operations Task Force – Year 4	<ul style="list-style-type: none"> Topic area discussion included color DMS use, law enforcement relationships with the DOT, interpreting DMS guidelines, and ITS asset management.
Project 11.2 (2017) Forecasting and Alerting Travelers about Critical Road Conditions	<ul style="list-style-type: none"> Researched and summarized the approaches used by North/West Passage states to forecast and alert drivers about crucial roadway conditions.
Project 11.3 (2017) Work Zone Management Practices for I-90/I-94	<ul style="list-style-type: none"> Researched and documented current work zone management practices in the North/West Passage states including intelligent work zone (IWZ) strategies. Presents the findings based on interviews conducted in January/February 2017 with the North/West Passage states and a review to identify IWZ practices in other states. Held a webinar on April 26, 2017, to summarize the interviews as well as highlight IWZ experiences in Minnesota and Iowa.
Project 11.4 (2017) Day One Activities to Prepare for Connected and Automated Vehicles	<ul style="list-style-type: none"> Developed a list of available resources related to connected and automated vehicles. Other efforts included discussions on the resources needed for states to prepare for the transition of connected and automated vehicles.
Project 11.5 (2017) Exploring Options for Truck Platooning along the North/West Passage Corridor	<ul style="list-style-type: none"> Project results are available under Project 10.4.
Work Plan 12	
Project 12.1 (2008) Operations Task Force – Year 5	<ul style="list-style-type: none"> Monthly webinars discussed operations-oriented topics including protest management and camera placement/integration/maintenance experiences. A technician’s forum was held on fiber communication and ITS/Signal/Signage/Sign Structures condition rating dashboard.
Project 12.2 Freight Task Force – Year 3	<ul style="list-style-type: none"> Supported the active engagement of Task Force members on emerging freight operations issues in the corridor and nationally. Conducted research on and recommended criteria for regulations in the corridor to support truck platooning. Recommended guidance for selecting virtual weigh station deployments in the North/West Passage states.
Project 12.3 NWP Corridor Large Scale ITS Deployment Development	<ul style="list-style-type: none"> This project led member states through a process to determine the most appropriate large scale ITS deployment by prioritizing the technologies to be deployed and the location. The project identified focused on enhancing each state’s 511 system to provide work zone alerts to travelers.

Project (Year Completed)	Results, Outcomes, and Implementation
Project 12.4 Evaluation of Rural 511 Phone Service	<ul style="list-style-type: none"> Examined the state of practice and trends in 511 phone usage to determine the potential future role in effectively satisfying travelers' needs. Kentucky, Missouri, and North Carolina were studied to understand why they moved away from delivering traditional 511 phone services.
Project 12.5 Interstate Speed Limits	<ul style="list-style-type: none"> Due to project scheduling, it was approved by the North/West Passage Steering Committee to include the intent of Project 10.6 and Project 12.5 as appropriate and needed with the efforts of Project 13.3 – NWP Corridor Safety and Mobility Assessment.
Project 12.6 Asset Management Practices for ITS Infrastructure	<ul style="list-style-type: none"> Summarized the states' asset management practices regarding ITS infrastructure in order to understand the extent to which ITS devices are recognized and the state of asset management for establishing life-cycles, preventative maintenance, etc.
Project 12.7 (2018) Plow Camera and Location Sharing Practices	<ul style="list-style-type: none"> Using phone interviews and a peer exchange webinar, this project gathered information to summarize the current practices some states use to share plow cameras and locations for traveler information.
Project 12.8 TSMO Practices Peer Exchange	<ul style="list-style-type: none"> Facilitated a webinar to gather information about NWP states' TSMO organizational practices and where they are at in establishing TSMO practices.

5.2 Key Project Results

North/West Passage completed a variety of projects under TPF-5(190) to support the focus areas, vision, and goals of the program. This section highlights a few key overall project results completed over multiple phases during TPF-5(190). In addition, North/West Passage also successfully submitted a project statement to the National Cooperative Highway Research Program (NCHRP) that is described in this section.

5.2.1 Corridor-Wide Traveler Information Website

In 2008, a North/West Passage corridor-wide traveler information website was designed and deployed that contained an aggregation of traveler information data from each state relieving the need to check each state’s website ([Project 3.4: North/West Passage Traveler Information Website](#)). This first version provided users with camera images and weather conditions along the corridor. The website also identified rest areas and provided links to each state’s commercial vehicle restriction information as well as truck stop information. See Figure 3. [Project 4.1 North/West Passage Traveler Information Website Phase 2 and Project 4.3 Center to Center Communications Concept of Operations](#) continued the efforts of Project 3.4 by assimilating corridor event data from the eight member states and expand the existing traveler information website to include these data feeds. The website was developed and created as a beta site to the traveler information website.

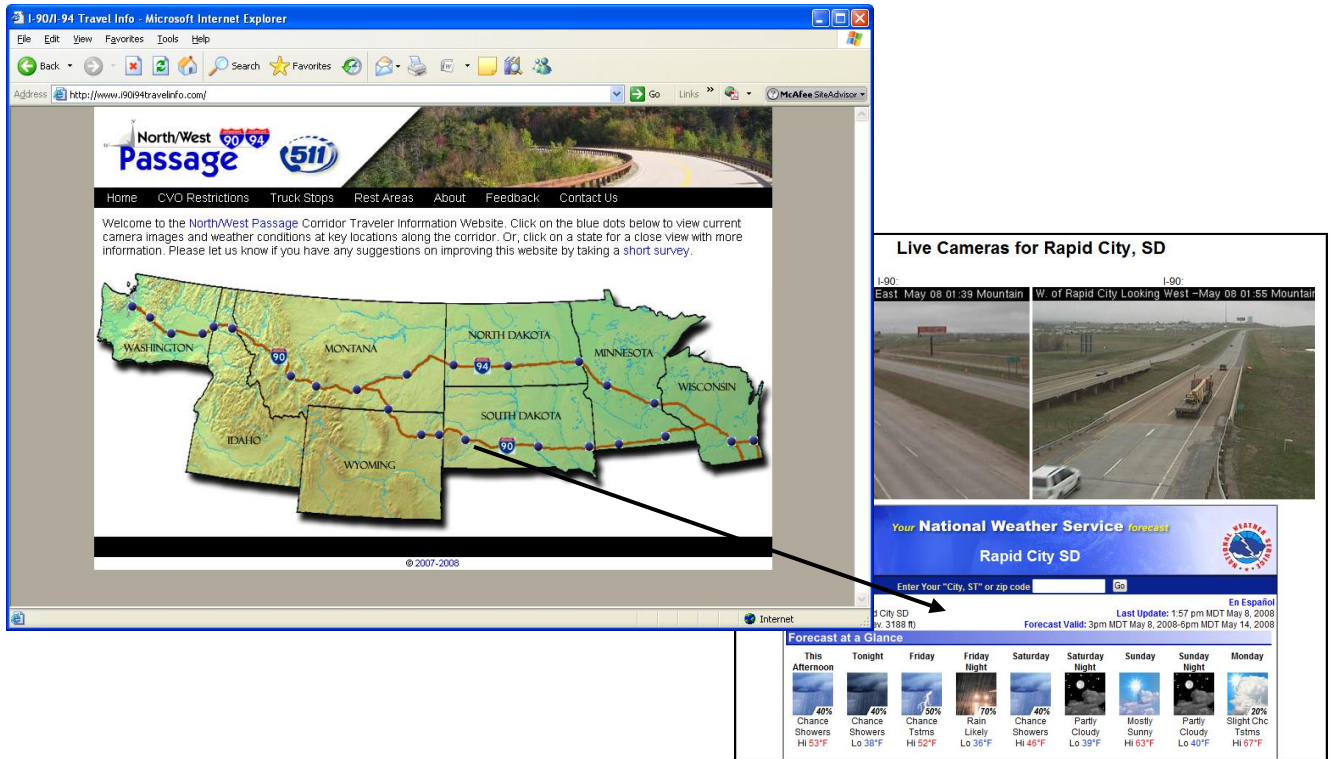


Figure 3: Example of Camera Images and Weather Information provided on the first generation corridor wide traveler information website

In 2012, North/West Passage initiated the Operations and Traveler Information Integration Sharing (OTIIS) project. FHWA selected OTIIS for federal funding through the Multistate Corridor Operations and Management (MCOM) Program. The purpose of the MCOM program was to promote regional cooperation, planning, and shared project implementation for research programs and projects that improve multimodal transportation system management and operations. OTIIS leveraged the previous North/West Passage traveler information website projects to enhance the website. Enhancements included road conditions corridor wide and the ability to plan a trip and understand any trip delays. Figure 4 illustrates how one project continued to enhance the initial efforts through a series of phases.



Figure 4: Corridor Wide Traveler Information Website Enhancements by Phase

The OTIIS website provided users with the option to enter their starting and ending city along I-90 and I-94 for a selected date and time period. Based on the information entered a summary and duration of trip information (e.g., road work, weather alerts, road closures) was provided. See Figure 5.



Figure 5: Example of Trip Planning Information Provided on the North/West Passage Roads to Safe Discovery Website

The initial traveler information website was operational from 2008 with an initial web address until the OTIIS website was launched. At that time the website address was transitioned to a new web address.

In 2016, Project 10.1 [Operations and Traveler Information Integration Sharing \(OTIIS\) Website Operations and Maintenance](#), documented the ownership and structure of the OTIIS website to a level that would enable the North/West Passage members to support future decisions about funding operations and maintenance. The website was discontinued in 2018 due to the funds available to continue operation and maintenance of the website.

5.2.2 Consistent Event Descriptions and Citizen Reporting

In 2008, North/West Passage completed a project (Project 3.1: [Corridor-Wide Consistent Major Event Descriptions](#)) that documented current event phrases used by each member state and then recommended consistent event phrases for the corridor. For example, states may use high winds, strong wind, or gusty winds to describe a condition. The phrase agreed by North/West Passage was strong wind with a definition of winds greater than 30 miles per hour.

Road/Weather Phrases Currently Used by NWP States								Recommended NWP Phrase and Definition
Typical Phrase Structure: [interstate location description], [road surface condition], [weather condition], [other qualifiers] [optional duration]								
Wisconsin	Minnesota	North Dakota	South Dakota	Montana	Wyoming	Idaho	Washington	
Weather Phrases								
	- Rain	- Rain	-Rain	-	- Rain	- Rain - Heavy rain	- Rain	Rain Continuous or near continuous non-freezing precipitation that has potential to make the road surface wet. Conditions beyond isolated showers or precipitation that does not wet the pavement.
	- Freezing Rain	- Freezing Rain	-Freezing Rain	- Freezing Rain		- Freezing Rain		Freezing Rain Rain that falls as a liquid but freezes into glaze upon contact with the ground.
	- Light Snow - Snow - Heavy Snow	- Snow - Snow/Rain - Sleet	- Snow	- Snowing	- Snow	- Light Snow - Snow - Heavy Snow - Rain and Snow mixed	- Snow - Rain and Snow mixed - Ice	Snow Precipitation in the form of snowflakes that may or may not accumulate on the road surface.

Figure 6: Example of Recommended North/West Passage Road/Weather Phrases

Wyoming DOT had successfully developed and deployed a system that allowed authorized citizens to report driving conditions. Their efforts and results of exploring the feasibility to expand the program were shared with North/West Passage during Work Plan 5 ([Project 5.1 Citizen Assisted Reporting – Phase 1](#)). A next phase of the project ([Project 6.3 Citizen Assisted Reporting – Phase 2](#)) focused on coordinating Idaho DOT’s efforts implementing a citizen reporting system modeled after Wyoming DOT. Wyoming DOT and the Idaho Transportation Department worked together in Project 6.3 to identify consistent phrases for their citizen reports to use to describe conditions based on the previous Project 3.1 work completed by North/West Passage.

In 2014, under [Project 8.5: Member Outreach Support](#) a citizen reporting peer exchange was conducted. The purpose of the peer exchange was to discuss the member states continued interest in citizen reporting and to review the experiences from Wyoming and Idaho.

In 2016, North/West Passage completed a project (Project 10.3 [Evaluate Effectiveness of Citizen Reporting](#)) to document the experiences, benefits, costs, and lessons learned of State DOT operated citizen reporting programs and State DOT data sharing with Waze for citizen reporting.

5.2.3 Cost/Benefit Tool

North/West Passage developed a Benefit/Cost Spreadsheet Tool over two project phases ([Project 5.2 Cost/Benefit ITS Tool Evaluation](#) and [Project 6.4 Cost/Benefit Tool Evaluation – Phase 2](#)). The purpose was for members to use the tool when one or more ITS devices are being considered and a cost/benefit calculation was needed for the deployment. See Figure 7.

5.2.4 Workshops and Peer Exchanges

As stated previously, a benefit of participating in North/West Passage noted by all members is the quality and relevant topics of meetings, workshops, and peer exchanges. This information sharing happens during the Steering Committee, Operations Task Force, and Freight Task Force activities but also through specific projects. Following are a few key workshops and peer exchanges conducted during TPF-5(190).

- CAD to Reporting System Integration ([Project 3.3](#))
- Operations and Maintenance Cross Border Collaboration ([Project 3.5](#))
- Traveler Information Tool Coordination ([Project 5.3](#))
- Open Source Software ([Project 5.6](#))
- Rural TMC/TOC Operations ([Project 8.2](#))
- Citizen Reporting ([Project 8.5](#))
- Variable Speed Limits ([Project 9.2](#) and [Project 9.3](#))
- DOT Efficiencies ([Project 9.2](#))
- Plow Camera and Location Sharing Practices ([Project 12.7](#))
- TSMO Practices ([Project 12.8](#))

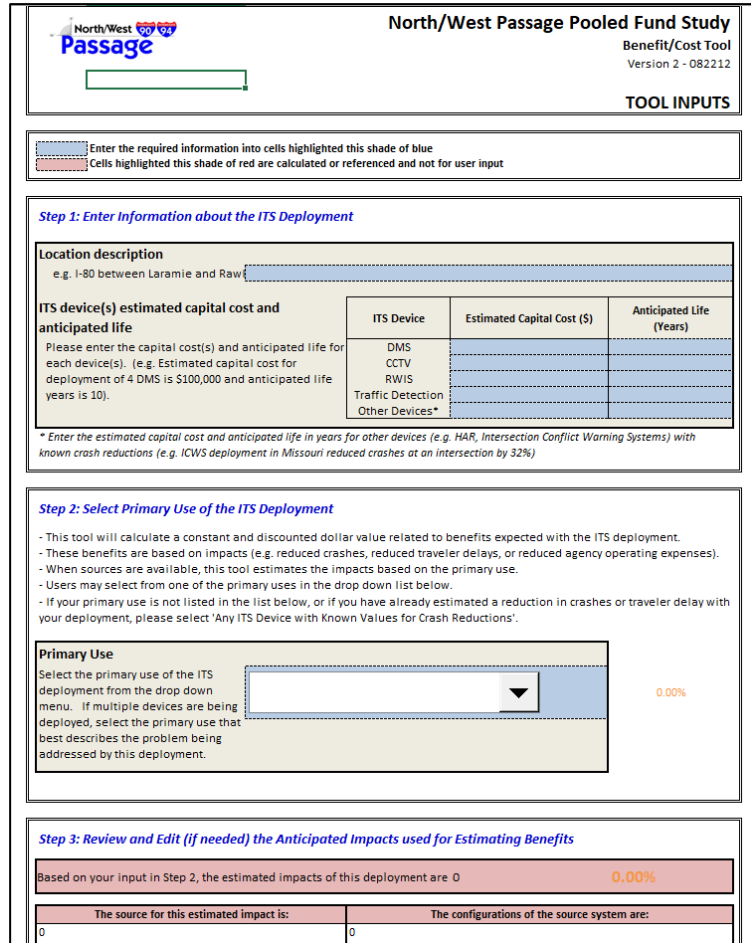


Figure 7: Screenshot of Cost/Benefit Tool

5.2.5 NCHRP 08-120 – Initiating the Systems Engineering Process for Rural CV Corridors

In 2017, North/West Passage submitted a project statement to NCHRP. The objective of the project statement was to help agencies anticipate the needs of connected vehicles on rural freeway corridors, including the anticipated roles and responsibilities of agencies in deploying, operating, and maintaining equipment and the associated needs related to staffing and resources.

The project, [NCHRP 08-120 Initiating the Systems Engineering Process for Rural Connected Vehicle Corridors](#), was selected for funding and completed in 2021. *The research aimed to identify connected vehicle applications most relevant on rural corridors and how they may be integrated into transportation agencies' traffic operations and management plans. This research adopted a systems engineering approach to develop model Concept of Operations and Systems Requirements documents to aid agencies responsible for rural corridors as they begin to assess their needs, operational concepts, scenarios, and requirements for connected vehicle technology deployment. Final deliverables include a final report; Concept of Operations and high level functional requirements document; as well as recommendations for future research. Source: <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4557>*

North/West Passage engaged in the project through participation in periodic webinar updates.

6. TASK FORCES

During efforts of TPF-5(190), North/West Passage established two task forces. The purpose was ongoing, dedicated groups focused on North/West Passage operations and freight activities and projects.

6.1 Operations Task Force

In 2013 an Operations Task Force was established to:

- Maintain relationships among operations staff in member states,
- Enhance operations-oriented, maintenance operations, and transportation system management and operations (TSMO) related topics,
- Support implementation of project findings; and
- Increase interaction during major events.

In addition, the Operations Task Force annually discusses and submits project ideas for consideration by the Steering Committee for annual work plan projects.

This section highlights key activities of the task force from 2013 through 2018.

6.1.1 Webinar Topics and Technician’s Forums

The Operations Task Force met periodically throughout the years to hear presentations and discuss a variety of topics. In addition, starting in 2017 the Operations Task Force began hosting an annual technician’s forum. The purpose of the forum is to provide technicians with the opportunity to talk with each other and learn about practices on different areas from other states. The forum is modeled after the [Western States Rural Transportation Technology Implementors Forum](#) that was established in 2006.

Table 3 provides a list of key webinar topics from 2013 – 2018.

Table 3: Operations Task Force Key Webinar Topics

Webinar Topics	Year	NWP Project
Standard operating procedures	2013	8.1
Approaches to 24/7 staffing	2014	9.1
Planned ITS deployments for operations	2016	10.2
Third party data providers	2015	10.2
Color dynamic message sign (DMS) use and interpreting DMS guidelines	2016	11.1
ITS asset management practices	2017	11.1
Working with law enforcement on transportation operations	2017	11.1
Using iPads for field data collection*	2017	11.1
Alternate power sources for rural deployment*	2017	11.1
Protest management experiences	2018	12.1
Camera placement, integration, and maintenance experiences	2018	12.1
ITS, signal, signage, and sign structures condition rating dashboard*	2018	12.1
Fiber communications for Minnesota DOT ITS Systems*	2018	12.1

*Technician’s Forum Presentations

6.1.2 Regional Operation Forum

The Operations Task Force supported a [Regional Operations Forum](#) in 2015. Developed by the second Strategic Highway Research Program (SHRP2) and the Transportation Research Board (TRB), the forum provided practitioners with new and innovative approaches for managing and operating the highway system, drawing from the cutting-edge work being carried out under the SHRP2 program and other national programs. A summary of the North/West Passage Regional Operations Forum is available at: <https://www.nwpassage.info/projects/downloads/9-1-regional-operations-forum-summary.pdf>.

6.1.3 TMC/TOC Operations Coordination Webpage

The Operations Task Force developed a password protected TMC/ TOC Operations Coordination web page. This page provides agency staff with access to operational guidelines, maps, contact information, and other resources that may be needed to manage major events among the North/West Passage states. Events requiring coordination or sharing of information among the states are best determined by the state where the event occurs.

6.1.4 Seasonal Webinars

The Operations Task Force hosted a seasonal webinar annually for operations staff in the North/West Passage member states to provide and make staff aware of the resources available from North/West Passage. Resources noted included the TMC/TOC Operations Coordination web page, MOU, and operational guidelines discussed above as well as any new items to note from each member state.

6.2 Freight Task Force

North/West Passage completed a number of freight related projects before establishing a Freight Task Force in 2014. The purpose of the Freight Task Force is to enhance North/West Passage activities with the freight community and efforts. See Table 4 for freight related projects completed during TPF-5(190).

Table 4: North/West Passage Freight Relate Projects Completed during TPF-5(190)

Project	Results, Outcome, and Implementation
Project 4.4 (2010) North/West Passage Regional Permitting – Phase 1	<ul style="list-style-type: none"> Identified and recommended feasible approaches to implementing a regional oversize/overweight permitting process for the North/West Passage states. The outcome of this project provided additional information to allow North/West Passage states to continue to consider the options for regional permitting.
Project 4.5 (2010) Traveler Information Dissemination to Commercial Vehicle Operators	<ul style="list-style-type: none"> Produced a document that summarized the truck parking status in the corridor as well as summarized the experiences, challenges, and successes disseminating traveler information to truckers.
Project 5.5 (2012) North/West Passage Regional Permitting – Phase 2	<ul style="list-style-type: none"> Continued to facilitate discussions among the member states to improve movement of overweight/oversized loads in the corridor by making permitting easier, making regulations more harmonious, and improving communications between agencies and the industry. Based on this project’s research, the key is states agreeing on the functionality that is to be expected from the interface system and dedicating the needed resources.

Project	Results, Outcome, and Implementation
	<ul style="list-style-type: none"> • Survey respondents provided a list of suggested improvements to web-based information. • Work Plan 4 (Project 4.4), Work Plan 6 (Project 6.6), and Work Plan 7 (Project 7.4) included additional phases to support regional permitting efforts.
Project 6.6 (2013) North/West Passage Regional Permitting – Phase 3	<ul style="list-style-type: none"> • Continued the goal of increasing the efficiency of trucking in the corridor by reducing the confusion in regulations and requirements for oversize/overweight trips and by providing a single mechanism for obtaining permits for oversize/overweight loads moving over the corridor.
Project 6.7 (2012) Corridor-Wide Marketing and Outreach to CVOs	<ul style="list-style-type: none"> • Commercial vehicle operators identified traveler information communication channels and existing gaps.
Project 7.3 (2013) Truck Parking Projects along the North/West Passage Corridor and Evaluate Third Party Data for Truck Parking Availability	<ul style="list-style-type: none"> • Summarized the work of other projects that have identified the issues of truck parking in each North/West Passage state and nationwide. • Conducted preliminary research on the potential use of third party data to provide truck parking availability. • Provided a list of recommendations to the Freight Task Force for consideration when identifying future North/West Passage project ideas.
Project 7.5 (2013) North/West Passage Freight Industry Webinar	<ul style="list-style-type: none"> • Provided the opportunity to share existing traveler information sources from public agencies along the I-90/I-94 corridor and provided the opportunity to learn about the freight industry needs related to traveler information through a webinar. • Webinar feedback was presented to the Freight Task Force (Work Plan 8, Project 8.3) for consideration as freight related projects and outreach efforts continued along the I-90 and I-94 Corridor.
Project 8.3 (2014) Freight Task Force – Year 1	<ul style="list-style-type: none"> • Established a Freight Task Force designed to assess the value of an ongoing, dedicated group focused on North/West Passage freight related activities and projects. • The Freight Task Force completed an assessment of the feasibility of a corridor-wide CVO web portal.
Project 8.7 Corridor-wide Commercial Vehicle Portal (CVOP) Feasibility Study	<ul style="list-style-type: none"> • The project conclusion was that implementation of the CVOP throughout the corridor is feasible from a technical perspective, however doing so would require all member states to provide forecasting services at the same level as WYDOT to populate the CVOP.
Project 9.4 Freight or Operations Related Projects	<ul style="list-style-type: none"> • This project was a funding placeholder for projects selected by the Operations Task Force (Project 9.1) and Freight Task Force (Project 8.3).
Project 10.4 (2016) Freight Task Force – Year 2	<ul style="list-style-type: none"> • Conducted outreach and education webinars on freight data, truck parking, and connected vehicle trucks. Also, identified freight funding opportunities and outreach opportunities.

Project	Results, Outcome, and Implementation
	<p>Additional efforts included developing a paper on identifying truck parking availability systems corridor-wide that provide near real-time information to commercial vehicle drivers. A paper exploring truck platooning technology was also developed.</p>
<p>Project 11.5 (2017) Exploring Options for Truck Platooning along the North/West Passage Corridor</p>	<ul style="list-style-type: none"> • Project results are available under Project 10.4.
<p>Project 12.2 Freight Task Force – Year 3</p>	<ul style="list-style-type: none"> • Supported the active engagement of Task Force members on emerging freight operations issues in the corridor and nationally. • Conducted research on and recommended criteria for regulations in the corridor to support truck platooning. • Recommended guidance for selecting virtual weigh station deployments in the North/West Passage states.

7. OUTREACH

Outreach efforts both to internal North/West Passage members as well as external audiences is important. Following are tools that are used for communication.

- [North/West Passage Brochure](#) – Two page overview of the history, vision, member benefits, and accomplishments of the corridor.
- [North/West Passage Progress Report](#) – At the end of each year, a progress report is updated to document the progress of the overall program including results from each work plan.
- [Work Plans](#) – Approved work plans and corresponding projects are updated annually to provide a history of work completed by the program.
- [Program Website](#) – The North/West Passage website was created to provide easy access to North/West Passage information and to communicate and educate users about the pooled fund study.

In addition, as projects are completed each year, appropriate results are submitted to conferences and presented. See Table 5 for presentations completed during 2008 – 2018. A list of all presentations is provided at: <https://www.nwpassage.info/outreach/>.

Table 5: North/West Passage Conference Presentations During TPF-5(190)

Presentation	Date	Location
2018 National Rural ITS Conference - Plow Camera and Location Sharing Practices	Oct. 23, 2018	Fort McDowell, AZ
2018 National Rural ITS Conference - Major Event Management in the North/West Passage States	Oct. 22, 2018	Fort McDowell, AZ
2018 National Rural ITS Conference - The Future of 511 Phone in the North/West Passage States	Oct. 22, 2018	Fort McDowell, AZ
2016 National Rural ITS Conference - Winter Performance Management Practices in the North/West Passage States	Oct. 2, 2016	Chattanooga, TN
Working Together to Enhance Coordination across State Borders	Aug. 11, 2015	Snowbird, UT
2012 National Rural ITS Conference: Use of Mobile Sensors and Maintenance Decision Support for Automated Road Condition Reporting	Sep. 17, 2012	Biloxi, MS
2011 National Rural ITS Conference: Cost/Benefit ITS Tool – Results of Testing To-Date	Aug. 31, 2011	Coeur d'Alene, ID
2011 National Rural ITS Conference: Enhancing and Expanding Citizen Assisted Reporting	Aug. 30, 2011	Coeur d'Alene, ID
2010 National Rural ITS Conference: NWP Regional Permitting	Aug. 4, 2010	Huntington, WV
2010 National Rural ITS Conference: NWP Corridor-Wide Traveler Information Website	Aug. 2, 2010	Huntington, WV
Nevada DOT: I-80 Corridor	Jan. 27, 2010	Reno, NV

Presentation	Date	Location
<u>2009 National Rural ITS Conference: NWP Regional Permitting</u>	Aug. 25, 2009	Seaside, OR
<u>511 Deployment Coalition Working Group</u>	Dec. 16, 2008	Irvine, CA
<u>15th ITS World Congress and ITS America's Annual Meeting</u>	Nov. 20, 2008	New York, NY
<u>2008 ITS Heartland Annual Meeting</u>	Apr. 7-9, 2008	Springfield, MO

8. SUMMARY

North/West Passage from 2007 to 2018 accomplished 60 projects from Work Plan 3 to Work Plan 12. Figure 8 groups the projects into six areas. For example, there were 16 projects completed related to traveler information. Overall freight, operations, and traveler information projects were largely the focus of the projects completed.

Workshops and peer exchanges were a critical effort in sharing information among the member states. This happened through specific projects as well as during Steering Committee meetings, Operations Task Force meetings, and Freight Task Force meetings.

There was only one CAV focused project during TPF-5(190), however several projects noted efforts related to CAV. In addition, working on this project led as a basis of additional CAV projects that were considered in Work Plan 13 and beyond (not described in this report).

North/West Passage members continue to utilize project results from TPF-5(190). For example, Project 8.2: [Concept for Rural TMC/TOC Operations](#), as well as discussions with North/West Passage member states during meeting, was used as a resource as the Montana Department of Transportation deployed a TMC in 2020. In addition, North Dakota Department of Transportation, as of 2022, was in the initial planning stages for a TMC.

A few overall key accomplishments from TPF-5(190).

- 2010 Best of ITS Rural Award Winner
- MOU for Traveler Information Coordination signed by all member states
- Operations Guidelines for Coordinating Traveler Information
- MCOM Federal Grant Recipient
- Successfully Submitted a Project Statement to NCHRP
- Established an Operations Task Force
- Established a Freight Task Forces
- Hosted a Regional Operations Forum
- Created a TMC/TOC Operations Coordination Webpage
- Deployed a Corridor-Wide Traveler Information Website
- Conducted Numerous Workshops and Peer Exchanges on Topics of Interest to North/West Passage Members
- Presented Project Results at Conferences
- Developed North/West Passage Outreach Material

North/West Passage member participation in the program has not declined since its inception. The key members from each state take an active role in participating in monthly meetings and inviting other staff from their agency as topics or projects are identified and discussed. This interest and growing interest in the efforts of North/West Passage will continue to make the program successful.

Operations (15 projects)

- 7.6: [Multistate Coalition Coordination](#)
- 8.6: [Major Event Operations Coordination Support](#)
- 9.4: [Operations Related Projects](#)

Operations Task Force

- 8.1: [Operations Task Force – Yr 1](#)
- 9.1: [Operations Task Force – Yr 2](#)
- 10.2: [Operations Task Force – Yr 3](#)
- 11.1: [Operations Task Force – Yr 4](#)
- 12.1: [Operations Task Force – Yr 5](#)

Operational Test

- 6.1: [Corridor-wide Traveler Information Coordination - Operational Test](#)
- 7.2: [Corridor-Wide Traveler Information Coordination Operational Test – Phase 2](#)

Interstate Speed Limits

- 10.6: [Multistate Assessment of Interstate Speed Limit Impacts](#)
- 12.5: [Interstate Speed Limits](#)

Work Zones (WZ)

- 11.3: [WZ Management Practices for I-90/I-94](#)

Performance Measures

- 9.5: [Research Need for Corridor Performance Measures](#)
- 10.5: [Winter Performance Management](#)

CAV (1 project)

- 11.4: [Day One Activities to Prepare for CAV](#)

Workshops /Peer Exchanges

(10 projects)

- 3.3: [CAD to Reporting System Integration – Workshop](#)
- 3.5: [Cross Border Operation and Maintenance Collaboration Workshop](#)
- 5.3: [Consistent and Coordinated DMS Use](#)
- 5.6: [Facilitating the Use of Open Source Software Throughout the Corridor](#)
- 8.2: [Concept for Rural TMC/TOC Operations](#)
- 8.5: [Member Outreach Support](#)
- 9.2: [Peer Exchange](#)
- 9.3: [Virtual Scanning Tour of "On the Road Technologies"](#)
- 12.7: [Plow Camera and Location Sharing Practices](#)
- 12.8: [TSMO Practices Peer Exchange](#)

Freight (13 projects)

- 4.4: [NWP Regional Permitting – Phase 1](#)
- 4.5: [Travel Info Dissemination to CVO](#)
- 5.5: [NWP Regional Permitting – Phase 2](#)
- 6.6: [CVO - Regional Permitting – Phase 3](#)
- 6.7: [Corridor-Wide Marketing and Outreach to CVOs](#)
- 7.3: [Truck Parking Projects along the NWP Corridor and Evaluate Third Party Data for Truck Parking Availability](#)
- 7.4: [CVO Regional Permitting – Phase 4](#)
- 7.5: [NWP Freight Industry Webinar](#)
- 8.3: [Freight Task Force – Year 1](#)
- 8.7: [Corridor-wide Commercial Vehicle Portal Feasibility Study](#)
- 10.4: [Freight Task Force – Year 2](#)
- 11.5: [Exploring Options for Truck Platooning along the NWP Corridor](#)
- 12.2: [Freight Task Force – Year 3](#)

Traveler Information (16 projects)

- 3.1: [Corridor-Wide Consistent Major Event Descriptions](#)
- 3.2: [Clarus Regional Demonstration Concept of Operations](#)
- 5.4: [Use of Mobile Sensors and Maintenance Decision Support for Automated Road Condition Reporting](#)
- 6.2: [23 CFR 511 Final Rule](#)
- 8.4: [Winter Road Condition Map Aggregation](#)
- 11.2: [Forecasting and Alerting Travelers about Critical Road Conditions](#)

511 Phone

- 4.2: [Call Forwarding and Evaluation of Cross Border Info](#)
- 12.4: [Evaluation of Rural 511 Phone Service](#)

Citizen Reporting

- 5.1: [Citizen-Assist Reporting – Phase 1](#)
- 6.3: [Citizen Assisted Reporting – Phase 2](#)
- 10.3: [Evaluate Effectiveness of Citizen Reporting](#)

Corridor-Wide Traveler Information Website

- 3.4: [NWP Traveler Information Web Site – Phase 1](#)
- 4.1 and 4.3: [Traveler Information Website Phase 2 and Center-to-Center Communications Concept of Operations](#)
- 6.5: [NWP Traveler Information Website – Phase 3](#)
- 10.1: [OTIS Website Operations and Maintenance](#)

Planning (5 projects)

Goal Assessment

- 7.1: [NWP Goal Assessment and Planning for ITS Corridor Deployment](#)

Large Scale ITS Deployment

- 12.3: [NWP Corridor Large Scale ITS Deployment Development](#)

Asset Management

- 12.6: [Asset Management Practices for ITS Infrastructure](#)

Cost/Benefit Tool

- 5.2: [Cost/Benefit ITS Tool Evaluation – Phase 1](#)
- 6.4: [Cost/Benefit Tool Evaluation – Phase 2](#)

Figure 8: TPF-5(190) Projects by Focus Area