Minnesota Department of Transportation

Office of Traffic, Security and Operations
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Subject: **ACTION:** 2004 Participation in the North/West Passage Transportation Pooled Fund Study (Solicitation #TBD)

From: Ginny Crowson, Traveler Information Program Manager

To: Federal, State and Local Interested Parties

The North/West Passage Corridor, including I-94 and I-90 from Wisconsin to Washington, is soliciting participation in a new Transportation Pooled Fund (TPF) Study focused on traveler information across state borders. Today in the North/West Passage Corridor states there are numerous systems for collecting transportation data, for processing and integrating the data, and for delivering the information to users. However, this information is not easily shared across state boarders.

The goals of this TPF study are to implement and evaluate integrated traveler information systems and coordinate maintenance operations across state borders. Using appropriate delivery systems, traveler information will be made available to internal staff and the traveling public via 511, dynamic message signs and other systems. The long-term vision of the North/West Passage Corridor states is to influence ongoing standards development; operate database systems that can transmit and receive multiple data streams; and, utilize effective methods for sharing, coordinating, and integrating traveler information across state borders.

The states of North Dakota, Wisconsin, Minnesota, Washington, Idaho, Wyoming, Montana, and South Dakota have been in contact since February 25, 2002 discussing the development of a coalition for the North/West Passage Corridor. Currently North Dakota, Minnesota and Wisconsin have secured funding for initiating the development of a North/West Passage TPF Study.

The North/West Passage TPF Study will pursue issues and proposed projects that are identified and selected by the membership. The membership will meet annually to complete the process of selecting new projects and conduct periodic telephone conferences to monitor the status of the projects. This membership driven process is intended to ensure that members benefit from their investment in the North/West Passage TPF Study. Based on initial commitment from North Dakota, Minnesota and Wisconsin, a Preliminary Work Plan has been developed. The Preliminary Work Plan focuses on integrating traveler information and coordinating maintenance operations among the three states. However, it is envisioned that commitment from other states will expand the Preliminary Work Plan across additional state boundaries.

The Minnesota Department of Transportation has taken the initial lead in the development of the coalition. Additional agencies interested in joining the North/West Passage TPF Study should have the appropriate personnel complete the online commitment form at www.pooledfund.org.

State Departments of Transportation and others may become participants at any time during the year by committing funds to the North/West Passage TPF Study. Early submission of the online commitment form is encouraged to enable participation in the process to identify and select projects to be initiated in FY 2004.

For additional information on joining the North/West Passage TPF Study, contact Ginny Crowson at 651-284-3454, ginny.crowson@dot.state.mn.us.

NORTH/WEST PASSAGE TRANSPORTATION POOLED FUND STUDY

Preliminary Work Plan - Phase I Projects Summary Worksheet – August 29, 2003

Project Number	Project Name	Project Champion	Project Cost	Comments	Action Items
1.1	Integrate ND, WI & MN 511 services	Mn/DOT, Ginny Crowson	$30,000	North Dakota is researching state deployment of 511.	Ginny Crowson – clarify project cost. Ed Ryen to clarify that ND will fund state deployment of 511.
1.2	Deploy Limited CARS application for WI	WI DOT Phil DeCabooter	$10,000		
1.3	Develop automated road condition reporting system	Mn/DOT Ginny Crowson	$00	Tabled for now, possible future project.	Revisit July 05
1.4	Provide integrated communications capabilities for ND DMS	ND DOT Ed Ryen	$00	Tabled for now, ND is developing an RFQ with funds from other sources	Revisit July 05
1.5	Deploy supporting DMS for I-94 eastbound in ND	ND DOT Ed Ryen, Mn/DOT Dennis Reding	$10,000	Cost shown is for Preliminary Design. Deployment costs from other sources	
1.6	Deploy supporting DMS for I-94 and I-90 at Tomah Wisconsin	WI DOT Phil DeCabooter	$10,000	Cost shown is for Preliminary Design. Deployment costs from other sources	
1.7	Develop a North/West Passage Program Web Site	NDSU Ayman Smadi	$4,000		
1.8	Install De-icing System on I-94 bridges at Red River	Mn/DOT Dennis Redig	$20,000	Cost shown is for communication design. Deployment costs from other sources	Dennis Redig to notify the group when a de-icing system is chosen.
1.9	Compare Requirements for CARS Deployment in Wisconsin to Meridian's System Deployment in North Dakota – Lesson's Learned Document	NDSU Ayman Smadi	$15,000	NDSU-ATAC to provide additional match funds.	Ayman Smadi to revise Project Description
Total Cost	Total Cost of Phase I Projects		$90,000	Total does not include costs for admin, travel, meetings or URS/IIII support services	

NORTH/WEST PASSAGE
TRANSPORTATION POOLED FUND STUDY

Preliminary Work Plan

August 13, 2003

This document is a Preliminary Work Plan for planning purposes. Costs shown are for discussion and are not based on RFP's or on contractors cost quotes.

Phase I Projects – Integrated Traveler Information and Maintenance Network

Purpose: The purpose of Phase I Projects is to implement and evaluate the provision of traveler information and coordination of maintenance operations across state borders for a specific geographic region. Information will be delivered via appropriate delivery systems for internal staff, and via 511 and dynamic message signs (DMS) for the traveling public. Based on initial commitments from North Dakota, Wisconsin, and Minnesota, the initial geographic focus of this project will be I-94 through WI, MN and ND. This limited geography will allow a manageable exchange of data among the states for delivery via each states' 511 service. Also included is the ability to integrate DMS and bridge deicing across state lines with installation of additional DMS/bridge deicing. Focus will also be placed on developing a web site for communication of North/West Passage information.

Status: Today in the North/West Passage states (Washington, Idaho, Montana, North Dakota, South Dakota, Minnesota, Wyoming, and Wisconsin) there are numerous systems for collecting transportation data, for processing and integrating the data, and for delivering the information to users. While the information is valuable to users, it is difficult for them to determine which system can provide the information they need and to determine how accurate and timely the information is. All the states involved have worked on various elements of an integrated traveler information network and have had significant success. However, due to many issues the current traveler information systems are not fully integrated across state boarders.

Strategy: By coordinating their efforts to develop an integrated traveler information network and coordinate maintenance operations the North/West Passage states can develop common standards, common data base systems, and common methods for sharing and coordinating information about traffic, weather, and other events. When completed the systems should be seamless to users and

maintenance operations supplying the timely and accurate traveler information they need.

On some Phase I Projects involving significant construction or equipment purchases the North/West Passage Transportation Pooled Fund (TPF) will serve as project initiator. On these projects the North/West Passage TPF will develop preliminary scoping studies, planning, scheduling, and pre-design to fully define the project, its objective, current status, strategy and benefits. Necessary multi-state memorandums of understanding or agreements will also be prepared. On these projects, funding for project construction and equipment purchases will be obtained from other sources including state/federal/local construction, operation, maintenance or equipment budgets as appropriate.

In Phase I, the participants will develop a series of independent, but closely related projects for integrating traveler information systems and for coordinating maintenance operations. They are described as follows:

Project 1.1 – Integrate ND, WI, and MN reporting systems

Project Champion: Minnesota Department of Transportation, Ginny Crowson

Project Purpose/Objective: To integrate reporting systems in ND, MN, and WI such that seamless access to traveler information, including both road conditions and weather information, will be provided via 511 and other services.

Current Status: MN and ND 511 users are unable to access road condition information from each others state because CARS is currently unable to import road condition data from ND's #SAFE system and #SAFE cannot accept CARS data. In contrast, ND's 511 system provides travelers with weather information for MN and adjacent states. MN's 511 system provides traveler weather information for MN only.

WI 511 is in its beginning planning stage and has not been deployed. Currently, WI traveler information is available by dialing 1-800-ROADWIS. Information is entered into this system from the WI State Patrol. WI does not use the CARS, however significant elements of the system are completed. Project 1.2 addresses deploying a limited version CARS in WI.

Strategy/Approach: Through deployment of a ND reporting system, a limited WI system and an existing system in MN, share traveler information among the three states. This will allow ND weather and road condition information to be shared via MN's, and eventually WI's, 511 services. It will also allow internal state staff an opportunity to observe projects on I-94 in all three states.

Modify the #SAFE system to once again accept and interpret the XML feed from CARS. This will allow the ND 511 service to convey I-94 road condition information for both MN and WI.

Benefits: Travelers will be able to readily access multi-state traveler information to improve their long distance travel planning and safe travel decisions.

Participants: Minnesota Department of Transportation
North Dakota Department of Transportation
Wisconsin Department of Transportation
University of North Dakota
Vendors

Duration: 4 – 6 months

Project Cost: $30,000

Tasks:
1.1.1 Study and planning
1.1.2 Vendor develops and tests exchange formats
1.1.3 Test import of data
1.1.4 Approval and full scale operational testing
1.1.5 Both systems operational for evaluation and assessment

Deleted: ¶

Project 1.2 – Deploy limited CARS application for Wisconsin

Project Champion: Wisconsin Department of Transportation, Phil DeCabooter

Project Purpose/Objective: To allow Wisconsin staff to input road condition, construction, incident and special event information into CARS for I-94 and to assess the results. Possibly to include Amber Alert.

Current Status: Wisconsin location routing codes were initiated in CARS through a previous project, and the state is in the midst of early planning for 511.

Strategy/Approach: Deploy a limited CARS application for I-94 in Wisconsin. The limited deployment will allow WI staff to input road condition, construction, incident and special event information affecting I-94. It will also allow them to assess the value of CARS as a statewide reporting system. The limited application will be provided at no charge to WI, with the exception of fine-tuning existing location codes for I-94 through the state.

Benefits: An operational reporting system along I-94 will provide both important traveler information, and an opportunity for Wisconsin staff to become familiar with using and to assess CARS.

Participants: Wisconsin Department of Transportation
Vendors

Duration: 4 – 6 months

Project Cost: $ 10,000

Tasks:
1.2.1 Study alternatives and size of project
1.2.2 System design and location
1.2.3 Vendors deploy CARS application for I-94
1.2.4. Training for operators
1.2.5 Full scale operational testing and approval
1.2.6 System operational for evaluation and assessment

Project 1.3 – Develop automated road condition reporting system

NOTE: This project was tabled at the July 29, 2003 Steering committee meeting, due to the separate and ongoing Maintenance Decision and Support System (MDSS) project. We will revisit the projects in 12 months to assess our role.

Project Champion: Minnesota Department of Transportation, Ginny Crowson

Project Purpose/Objective: To develop, test and evaluate automated road condition reporting that will reduce the need to manually enter situations in statewide reporting systems.
Current Status: Currently, road condition information for ND is manually entered into #SAFE and MN road condition data is manually entered into CARS. Unfortunately the time when the data is needed most by 511 travelers and users is the time when staff members are busiest with management operations. A separate project through FHWA is addressing some of these needs as part of MDSS.

Strategy/Approach: Work with, and support, the MDSS project in developing an approach to automated road condition reporting and in leveraging the results into an improved traveler information systems. Vendors to develop parameters for generating applicable good/fair/difficult road condition situations based on the weather forecasts, in an automated fashion based. This will allow for testing the reliability, accuracy and timeliness of automated road condition reporting. The automated reports should also allow for override of reports manually entered by staff in each state.

Benefits: This project will provide an operational test of automatically generated road condition reports. Automating the reports will save staff time at their busiest operational time, improve accuracy, and reduce delays on making the information available to travelers.

Participants: North Dakota Department of Transportation
Minnesota Department of Transportation
Wisconsin Department of Transportation
University of North Dakota
Vendors

Duration: 16 – 18 months

Project Cost: $00

Project tabled until 2004.

Tasks:
1.3.1 Study alternatives and planning
1.3.2 Define concept and develop preliminary parameters
1.3.3 Preliminary testing of concept
1.3.4 Develop first generation design for automated road condition reporting
1.3.5 Operational testing
1.3.6 Evaluation and assessment

Project 1.4 – Provide integrated communications capabilities for ND DMS

NOTE: North Dakota has received grant money to upgrade their signs to NTCIP compliance, and as of July 29, 2003 was preparing an RFQ. We will review this project in 12 months to look at how we can integrate with other applications.

Project Champion: North Dakota Department of Transportation, Ed Ryen

Project Purpose/Objective: To allow district border offices to communicate and remotely operate DMS by integrating central control software. Possibly including Amber Alert capabilities.

Current Status: North Dakota has a number of trailer mounted DMS, some of which are semi-permanently stationed during the winter months, but communication, and message status reporting is difficult.

Strategy: Procure and test a NTCIP compatible communication system for one or more, ND DMS that provides for integrated communications and control of DMS for messages, maintenance operations, emergencies and law enforcement. Such a system was recently demonstrated at the ITS America conference in Minneapolis. Minnesota. The use of central control software will be investigated.

Benefits: North Dakota operations staff would be able to coordinate use of the DMS and messages displayed for the traveler. Minnesota and North Dakota transportation managers could coordinate messages across state boundaries.

Participants: North Dakota Department of Transportation
North Dakota State University, Ayman Smadi
Minnesota Department of Transportation

Duration: 4 – 6 months

Project Cost: $00.

Project tabled until 2004.

Tasks:
1.4.1 Study and select site(s) and communications needs
1.4.2 Investigate relationship to other NDDOT initiatives (i.e., Amber Alert Plan)
1.4.3 Prepare RFP and acquire NTCIP compatible communication equipment
1.4.4 Acquire VTOC or other similar software system capabilities
1.4.5 Install NTCIP communications links
1.4.6 Install communications and VTOC
1.4.7 Preliminary testing
1.4.8 Operational testing & evaluation
1.4.9 Final approval and acceptance

Project 1.5 – Deploy supporting DMS for I-94 eastbound in North Dakota.

Project Champion: North Dakota Department of Transportation, Ed Ryen
Minnesota Department of Transportation, Dennis Redig

Project Purpose/Objective: To install DMS, which provide traveler information to travelers on I-94, as they approach the North Dakota/Minnesota border, both eastbound, and westbound.

Current Status: Mn/DOT has a contract for installing a DMS on westbound I-94 during this construction season. No similar project is underway in ND, however ND has a number of portable DMS they can utilize as needed.

Strategy/Approach: Mn/DOT will deploy a DMS for I-94 westbound just east of the intersection with Highway 336 during the 2003 construction season (under contract). To complement the westbound installation, a supporting DMS will be installed on I-94 eastbound in ND. The DMS shall allow for remote operation from the NDDOT facility in the central office, the Fargo district office, and the Mn/DOT district office in Detroit Lakes. Conversely, the Mn/DOT DMS should also be modified to allow for remote operation from ND. To support the mutual operation of these signs, an operations plan will also be developed.

Benefits: Travelers approaching the Minnesota/North Dakota border on I-94 will receive the latest traveler information that has been coordinated between states.

Participants: Minnesota Department of Transportation
North Dakota Department of Transportation
North Dakota State University, Ayman Smadi

Duration: 4 – 6 months

Project Cost: $10,000 for design (pooled fund project) *
$50,000 for deployment (North Dakota)
$50,000 for deployment (Minnesota already under contract)

Tasks:
1.5.1 Communications and site study
1.5.2 Preliminary Design
1.5.3 Draft Memorandum of Understanding for operations between states
1.5.4 Design and sign cooperative agreement
1.5.5 RFP
1.5.6 Procure and install DMS
1.5.7 Operational testing and approval

* Cost shown is for detail design, including plan details/engineering estimate, survey, identify communications & power, & base map development. Deployment costs from other sources.

Project 1.6 – Deploy supporting DMS for I-94 & I-90 at Tomah Wisconsin.

Project Champion: Wisconsin Department of Transportation, Phil DeCabooter

Project Purpose/Objective: To supply westbound travelers with road condition information in Minnesota, North and South Dakota so they can make early and safer decisions on route selection.

Current Status: Travelers receive only limited information via weather broadcasts.

Strategy: Deploy a DMS on I-94, I-90 southeast of Tomah Wisconsin including communication links to VTOC type software so that road condition information on I-94 and I-90 can be communicated early to travelers on these routes. This will allow long distance travelers to make early decisions on route selection.

Benefits: Long distance travelers will be able to make early decisions on route selection based on road conditions for the next 1000 miles.

Participants: Wisconsin Department of Transportation
Minnesota Department of Transportation

Duration: 10 – 12 months

Project Cost: $10,000 for design (pooled fund project) *
$50,000 for deployment (other sources)

Tasks:
1.6.1 Communications and site study
1.6.2 Preliminary Design
1.6.3 Draft Memorandum of Understanding for operations between states
1.6.4 Design
1.6.5 RFP
1.6.6 Procure and install
1.6.7 Operational testing and approval

* Cost shown is for detail design, including plan details/engineering estimate, survey, identify communications & power, & base map development. Deployment costs from other sources.

Project 1.7 – Develop a North/West Passage Program Web Site

Project Champion: North Dakota State University, Ayman Smadi

Project Purpose/Objective: To develop a web site which allows easy access to North/West Passage information and to communicate and educate users about the North/West Passage Transportation Pooled Fund study.

Current Status: No web site or information outreach, except for e-mail and voice to key persons, is available. North Dakota State University has web development capabilities. Example of a similar pooled fund site is available at http://tmcpfs.ops.fhwa.dot.gov/index.cfm.

Strategy: North Dakota State University will investigate the possibility of developing the web site.

Benefits: Developing the web site will provide easier communications for those persons working on the North/West Passage Project. Project information will be available worldwide for anyone interested and for general education purposes.

Participants: North Dakota State University
North Dakota Department of Transportation
Wisconsin Department of Transportation
Minnesota Department of Transportation

Duration: 2 – 3 months

Project Cost: $4,000
(NDSU in-kind contribution for development)

Tasks:
1.7.1 Study needs and options, and develop a test page
1.7.2 Select appropriate options
1.7.3 Prepare/write web site content
1.7.4 Operational test
1.7.5 Modifications
1.7.6 Web site operational

Project 1.8 – Install De-icing System on I-94 Bridges at Red River

Project Champion: Minnesota Department of Transportation, Dennis Redig**,**

Project Purpose/Objective: Development and deployment of automated de-icing technology on I-94 bridges over the Red River, and adjacent 5th St., in Fargo.

Current Status: De-icing is conducted by operations staff as a normal part of winter maintenance. No de-icing equipment is installed on the bridges at the Red River on I-94. However as of July 17, 2003 the states have begun meeting to discuss a bridge de-icing project.

Strategy/Approach: The bridges on I-94 over the Red River and over the adjacent 5th St. in Fargo are subject to accumulation of frost and ice, creating a hazardous condition on the bridges. Accidents on the bridges can close I-94 especially during poor driving conditions. This North/West Passage project will be responsible for the system design and the multi-state management and operational agreement, which will include local government input, visual detection options and consideration of a regional architecture. Construction and deployment of the automated deicing technology will be completed by the Minnesota Department of Transportation and the North Dakota Department of Transportation.

Benefits: Red River bridges will be de-iced when needed - automatically and continuously - providing safer driving conditions for travelers. This is especially important during situations where icing occurs unexpectedly.

Participants: Minnesota Department of Transportation, Thomas Swenson
North Dakota Department of Transportation, Ed Ryen
Local governments

Duration: 14 – 16 months

Project Cost: $20,000 for design & contract prep RFQ or RFP (pooled fund) *
$550,000 for construction (Mn/DOT share, construction or other sources)
$550,000 for construction (ND share, construction or other sources)

Tasks:
1.8.1 Communications and site planning
1.8.1.1 States meet to discuss project and project funding (July 17 2003)
1.8.1.2 Funding options selected
1.8.2 Preliminary Design
1.8.3 Draft Memorandum of Understanding for operations between states
1.8.4 Design
1.8.5 RFP
1.8.6 Procure and install
1.8.7 Operational testing and approval

* Cost shown is for detail design, including plan details/engineering estimate, survey, identify communications & power, & base map development. Deployment costs from other sources.

Project 1.9 – Compare requirements for CARS Deployment in Wisconsin to Meridian's System Deployment in North Dakota - - Lessons Learned Document

Project Champion: North Dakota State University

Project Purpose/Objective: Identify typical requirements for developing a road condition reporting system for any state, including both technical and institutional. Use information generated from pilot deployment of Minnesota's CARS to Wisconsin and SDDOT's (Meridian) system to North Dakota to provide specific requirements. The comparison will highlight cost, data, system integration, organization structure, and other relevant issues. The compatibility of the two systems will also be examined. The product of the comparison will be a Lessons-Learned document that could guide other states in deploying similar systems.

Current Status: Wisconsin is exploring the use of CARS through a limited deployment along the I-94 corridor with Minnesota. Similarly, North Dakota is looking at possibly deploying South Dakota's system developed by Meridian. Minnesota's CARS is fully operational, however, South Dakota's system is under development.

Strategy/Approach:

1) Develop general requirements for developing a road condition reporting system
   a) Conduct an inventory of available systems
      i) Quick survey of state DOTs
   b) Obtain documentation/description of systems and their implementation
      i) CARS and Meridian's systems
      ii) Other existing systems (if available)
   c) Summarize requirements (applicable to any state)
2) Illustrate system implementation requirements using Wisconsin and North Dakota as case studies.
   a) Develop a description for the two systems used by Minnesota and South Dakota
   b) Work with consultants (Castle Rocks and Meridian), the North Dakota DOT, and Wisconsin DOT to document the deployment approach in their respective states
      i) Identify compatibility (for possible coordination) between the two systems
   c) Identify agency related issues/requirements
      i) Motivation for implementation
      ii) Management support
      iii) Resources allocated to implementation
      iv) Relationships to existing systems
3) Prepare a Lessons-Learned document that may potentially be helpful to other states considering the implementation of similar systems.

Benefits: States considering the development of a statewide condition reporting system will benefit from information on the limited (test) deployment of the Minnesota and South Dakota systems.

Participants: North Dakota State University's Advanced Traffic Analysis Center
Minnesota Department of Transportation

North Dakota Department of Transportation
Wisconsin Department of Transportation
Reporting System Vendors

Duration: 12 months (depending on deployment of North Dakota and Wisconsin reporting systems)

Project Cost: $15,000 (NDSU-ATAC will contribute $5,000)

Tasks:

1.9.1. Conduct an inventory of existing systems
1.9.2. Obtain available documentation on systems
1.9.3. Develop a thorough description of systems
1.9.4. Develop a case study for limited deployment of CARS in Wisconsin and Meridian's system in North Dakota
1.9.4.1. Assess compatibility of the two systems (and possible interface requirements)
1.9.4.2. Document requirements for deployment in Wisconsin and North Dakota
1.9.4.3. Conduct interviews with key personnel
1.9.5. Develop lessons-learned
1.9.6. Write report