



Fargo-Moorhead Alternate Route & Traffic Incident Management Guidebook Project

Final Report

Fargo-Moorhead Metropolitan Council of Governments

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Introduction

The Fargo-Moorhead Metropolitan Council of Governments (Metro COG), which represents the communities of Fargo and Moorhead along with several others in the surrounding bi-state region, has developed the Alternate Route & Traffic Incident Management Guidebook for the region through the cooperation of many stakeholder agencies and professionals. Over the summer and fall of 2017, several meetings were held with stakeholders and Metro COG to develop the alternate route maps contained in the current version of the electronic guidebook.

The primary goal of the Alternate Route & Traffic Incident Management (TIM) Guidebook is to assist officials and emergency responders in streamlining response times to emergency situations where the diversion of traffic to alternate routes is required. The Guidebook allows responders to confidently divert traffic along pre-approved routes that will be devoid of obstacles or impediments to large volumes and types of traffic, including trucks. The Guidebook is an electronic resource and is a series of interactive maps that help to quickly identify alternate routes to be used based on the incident or event location. It also provides a list of responders in the region, contact data, actions to be taken and traveler information to be provided to motorists.

Additional goals of the Fargo-Moorhead Metropolitan Council of Governments (Metro COG) for this project included:

- Faster incident response times
- Safer conditions and incident scenes for first responders
- Quicker clearance of accidents
- Better management of large events in the region
- Greater cooperation amongst first responders and public transportation agencies
- Faster initiation of alternate routes when closures occur
- Be prepared for longer term closures due to weather and flooding in the area
- Reduce secondary accidents resulting from incident based congestion
- Creation of a permanent TIM Committee in the region

Major incidents and events where alternate routes are required to be employed do not occur often in the Fargo-Moorhead region. In an informal survey of project stakeholders, no one could recall the last time either Interstate 94 or Interstate 29 had been shut down due to an incident or event, other than winter storms. Measuring the benefits of having established alternate routes is therefore difficult, but having established alternate routes is helpful if a major incident does occur. Transportation agencies and first responders in the region can be confident that the alternate routes designated in this Guidebook will support the initial diversion of traffic. Quickly diverting traffic can result in fewer secondary incidents, a safer incident scene for first responders and less driver frustration overall.

This report will provide background on the process used to develop the Guidebook along with background information on project stakeholder involvement, training and TIM planning recommendations for the future.

TIM Stakeholders

Over the course of the project, a stakeholder list was created and a representative project committee was gathered in order to obtain input on the alternate route development process. All stakeholders were invited to attend project meetings and turnout was good. The list of stakeholders was developed in cooperation with Metro COG representatives and supplemented with stakeholders who expressed interest in participating in the project. The stakeholders listed below participated in the process by attending the project meetings. We wish to thank them for their participation.

First Name	Last Name	Agency/Position
Adam	Altenburg	Fargo-Moorhead Metropolitan Council of Governments
Jonathan	Atkins	City of Moorhead Traffic Engineer
Jason	Baker	City of Fargo Traffic Engineering
Steve	Bertsch	Hector International Airport Fire Rescue
Julie	Bommelmann	Fargo-Moorhead Metropolitan Area Transit (MATBUS)
Brian	Cheney	Minnesota State Patrol
Bill	Christian	Fargo-Moorhead Metropolitan Council of Governments
Steve	Dirksen	City of Fargo Fire Chief
Craig	Faul	North Dakota Department of Transportation
Dan	Fuller	West Fargo Fire Chief
Jeremy	Gorden	City of Fargo Traffic Engineer
Michael	Johnson	North Dakota Department of Transportation
Shawn	Kuntz	North Dakota Department of Transportation
Gary	Lorenz	City of Fargo Fire Department
Robb	Matheson	City of Moorhead Police Department
Diomo	Motuba	NDSU - Upper Great Plains Transportation Institute
Matt	Peterson	Fargo-Moorhead Metropolitan Area Transit (MATBUS)
Mary	Phillippi	Red River Regional Dispatch Center
Ryan	Sherbrooke	F-M Towing
Kohl	Skalin	Minnesota Department of Transportation
Mohammad	Smadi	NDSU - Upper Great Plains Transportation Institute
Bob	Walton	North Dakota Department of Transportation

Figure 1 – Alternate Route & TIM Guidebook Project Stakeholders



Figure 2 – Alternate Route Guide Stakeholder Meeting on May 25, 2017 in Fargo

Alternate Route Guidebook Development Process

Developing the Alternate Route Guidebook was a major portion of the work under this project. The Guidebook contains a series of maps that highlight which alternate/detour routes are to be initiated in the event of a closure for an identified section of highway or road. Items such as traffic signals, railroad crossings, stop-controlled intersections and other items of note along the alternate route are identified on the maps along with where personnel should be posted to assist drivers.

As part of the process for determining the best alternate route to use in the event of a full or partial roadway closure, a checklist of items to avoid, utilize, or be aware of when creating alternate routes was developed to guide the project team.

- **Avoid:**
 - ✓ **Railroad Crossings** – Try to avoid routing heavy traffic through a railroad crossing as this will cause delays if a train is passing through and could create a dangerous situation if vehicles get stopped on the tracks or a truck gets high centered on a track. Low use crossings are the exception, but should be carefully evaluated. Railroad crossings are difficult to avoid in this region.
 - ✓ **Schools** – Don't route heavy diverted traffic past schools where children may be present and where there is high peak AM and PM traffic of school buses and parents dropping off/picking up children.

- ✓ **Hospitals** – Don't route traffic past hospitals where, in the case of a mass casualty event, ambulances and emergency vehicles may be trying to get to the hospital location as well as medical personnel reporting for duty.
- ✓ **Geometric Restrictions** – Avoid routes that do not have the capacity to serve the detoured traffic, have tight turns, width restrictions, no pavement (gravel roads) or poor pavement conditions.
- ✓ **Low Bridges/Rated Bridges** – Avoid underpasses or bridges that are noted as low or with a height less than 15 feet. If the bridge is load rated, it should be avoided for any traffic other than passenger vehicles and light trucks.



Figure 3 – Example of Low Clearance Underpass

- ✓ **High Traffic Signal Density** – Avoid corridors with numerous traffic signals as they can impede the progress of detoured traffic and require extra manpower to either direct traffic through the intersection or manually change the signal phasing from the controller cabinet.
- **Utilize:**
 - ✓ **State Highways/Major Arterials** – The route should provide for easy access from the main highway, preferably a right turn off the blocked roadway, be multi-lane with shoulders or have the capacity for the anticipated traffic, have good geometrics and turning width for trucks, and minimal traffic signals that require personnel to direct traffic or change phasing manually.
 - ✓ **Highway Interchanges with Good Geometrics** – Tight turns will slow down truck traffic going through an intersection and cause increased congestion behind the incident. Large turning radii make truck movements easier and maintain speeds.



Figure 4 – Example of Interchange with Good Geometrics and Capacity

- ✓ **Direct Routes** – Keep the alternate route simple and straightforward. Minimize turns and get traffic back to the main highway quickly. Longer detours require more personnel and more temporary/permanent signage to control.
- **Be Aware Of:**
 - ✓ **Traffic Signals** – They are useful as a traffic control device, especially if they can be manually controlled at the cabinet or from a Transportation Management Center. This minimizes exposure of emergency responders to traffic.
 - ✓ **Stop Controlled Intersections** – Stop controlled intersections are not very efficient if not manned by law enforcement and traffic directed through without stopping. Note them and note to have personnel directing traffic.
 - ✓ **Roundabouts** – Most modern roundabouts are designed to handle trucks through the use of low profile curbs and edges that can be driven over if need be. Depending on the cross traffic flow, personnel may need to be deployed to direct traffic.

Based on discussions with the project stakeholders, the project team developed alternate routes for full roadway closure segments on Interstate 94, Interstate 29, and portions of US Highway 10 (in Minnesota) in the event of major accidents, weather events, flooding or special events. The north to south extent of the mapping is from Harwood, ND (Cass County Route 22) on the north side of the region to 100th Avenue South on the south side of the region. The east to west extent of the mapping is from Glyndon, MN on the east side of the region to Casselton, ND on the west side of the region.

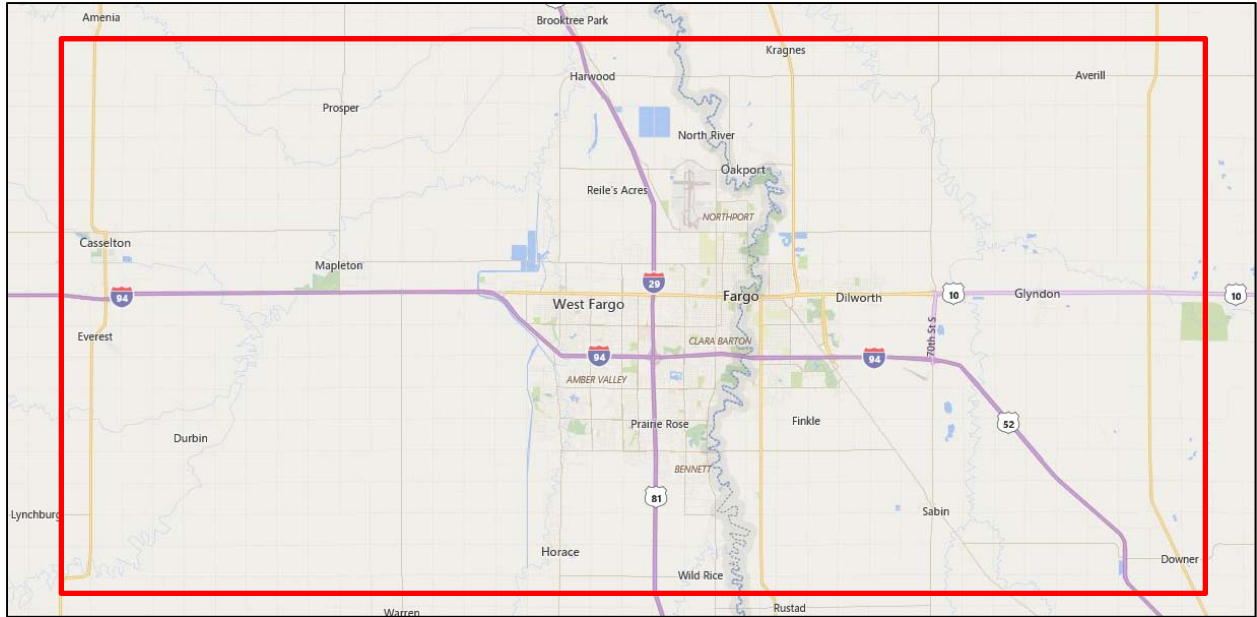


Figure 5 – Extent of the Alternate Route Development Boundaries

It should be noted here that the project stakeholders recommended that no alternate route maps be created for flooding conditions or winter closures. The reasoning provided for not including flooding closures is that these alternate routes are highly variable and dependent on the availability of river crossing points, which can change daily. The Emergency Management offices in the region would prefer to maintain control over designated flood routes and manage these as needed. For winter closures, it was widely agreed amongst all stakeholders that to promote the use of alternate routes during winter storm conditions where interstates may be closed was counterproductive to their mission. The preference of first responders and transportation officials is to have motorists not travel if conditions are such that interstate closures are being implemented.

The final electronic alternate route maps developed are an interactive, clickable PDF based format with active buttons linking the maps to additional data regarding the alternate route. An example alternate route map is below.

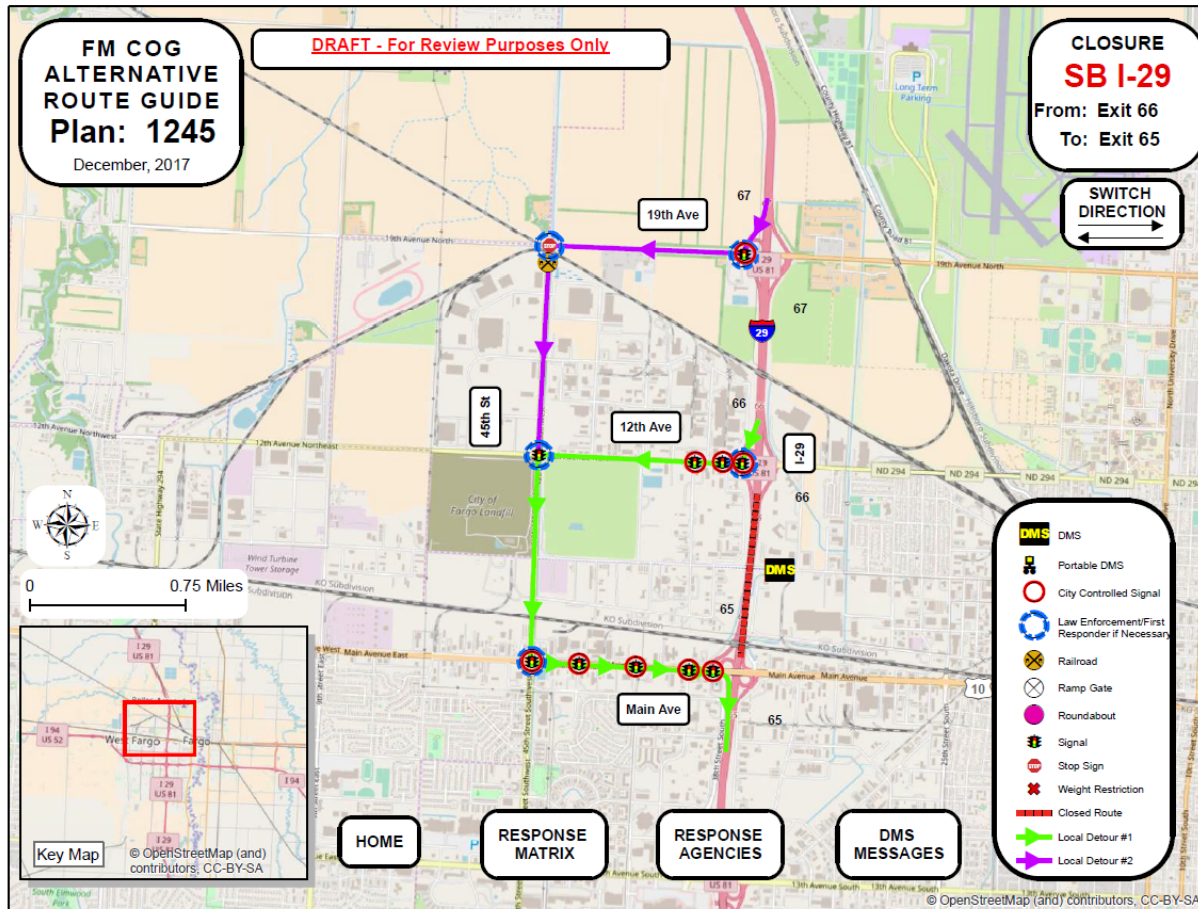


Figure 6 – Example of an Alternate Route Map for the Fargo-Moorhead Region

Each map has several buttons that can be used to access additional data about the suggested response to incidents, contact information for regional first responder agencies, and the messages to be posted to local dynamic message signs in the event of an incident at the specified locations. Each map also has an overview map to show the location of the detour relative to the Fargo-Moorhead region, a legend and a button that allows the user to switch between directions of the detour (i.e., Northbound versus Southbound or Eastbound versus Westbound directions).

During the course of the project, the project steering committee also requested **Global Detour Routes** to be developed as part of the project. Global detour routes are alternate routes that originate and end extensive distances away from the metropolitan region. The purpose of the global detour routes is to allow for re-routing of interstate traffic away from or around a metropolitan area in the event of a major disaster where all traffic must be kept away from the affected area. An example of this type of situation would be a train derailment and subsequent chemical spill that formed a large vapor cloud requiring avoidance. Another example may be the major failure of an interstate bridge where repairs/replacement may take several days or weeks. In these events, a global detour route can be initiated that will keep traffic away from the Fargo-Moorhead metropolitan area yet still allow for the through movement of interstate traffic

across the region, albeit with some delay. In the case of the global detour routes developed for Fargo-Moorhead, at least two global detour routes were established for both Interstate 94 and Interstate 29. Some routes stay 10 to 20 miles away from the center of the metropolitan region while other routes stay 20 to 50 miles away from the center. The use of one global detour route or another is dependent on the need to stay a certain distance away for safety reasons. More than one global detour can also be established if traffic volumes warrant opening another designated detour route. An example of a Global Detour Route map for the Fargo-Moorhead region is below.

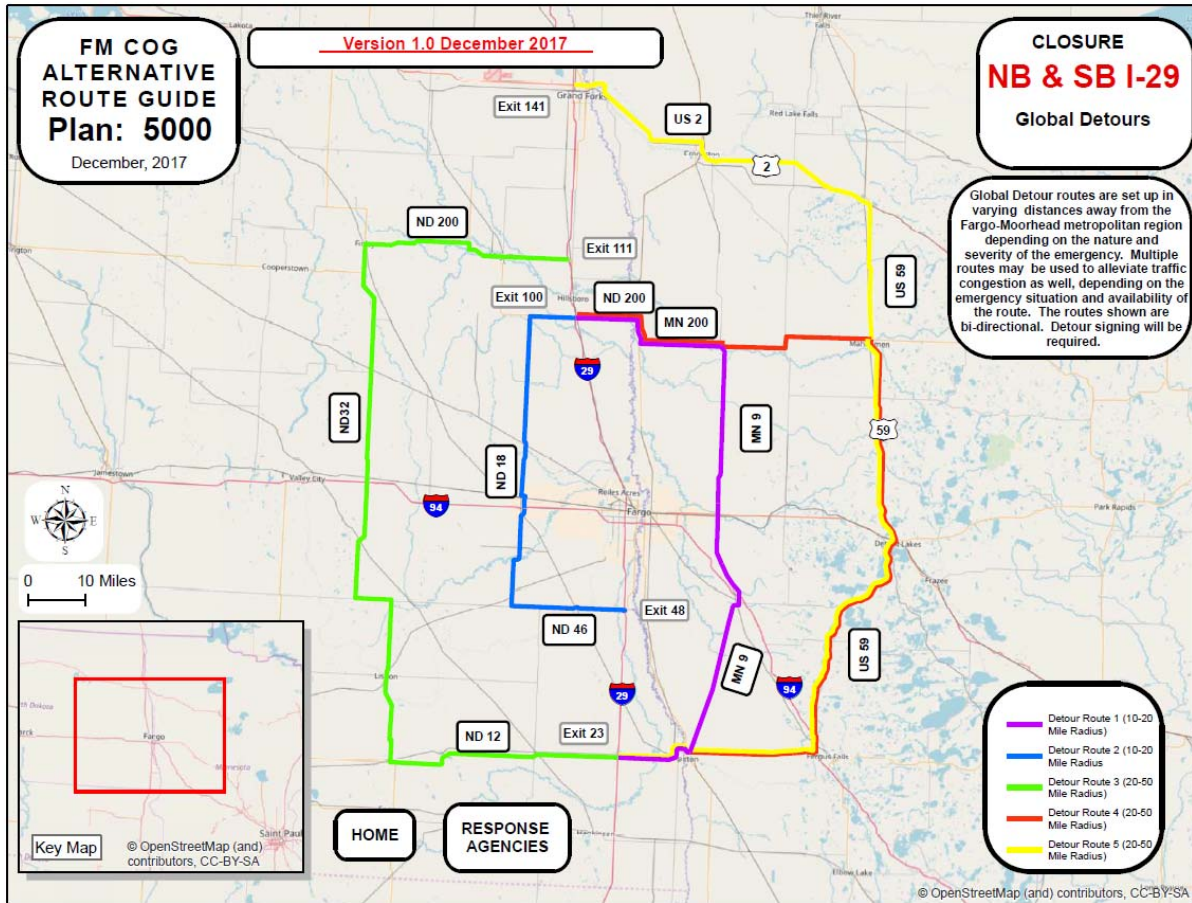


Figure 7 – Global Detour Route Map for the Fargo-Moorhead Region

Finally, all of the alternate routes maps and the global detour maps, along with the associated data, have been delivered as one electronic PDF file for use by regional first responders and stakeholders. The file is an interactive PDF that allows the user to access any of the alternate route maps simply by clicking near the section of roadway affected by a closure on the regional overview map. That action brings up a detailed map of the closure area and the suggested alternate routes. The regional overview map is shown below.

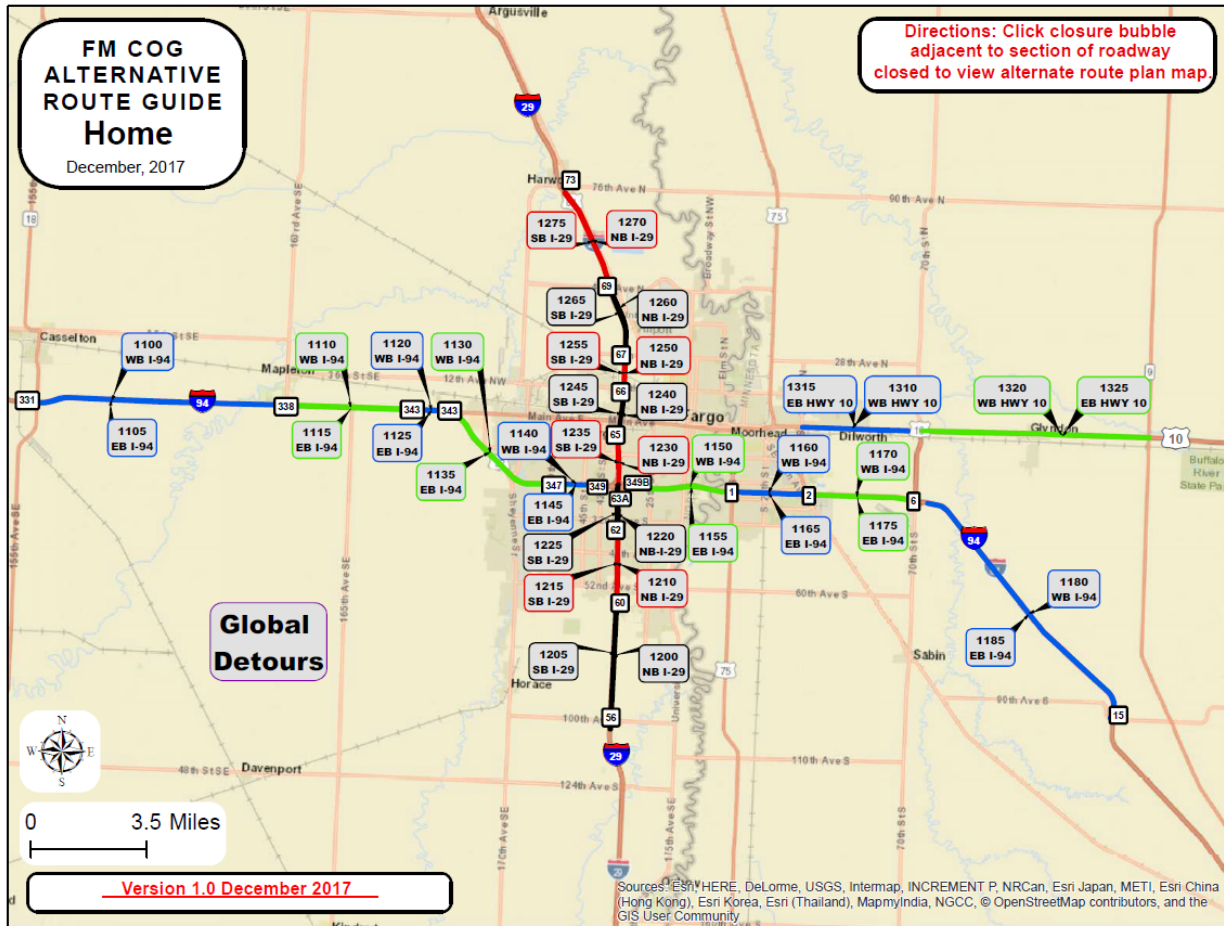


Figure 8 – Interactive Regional Overview Map of the Alternate Route Guide

TIM Training

During the course of the project, two TIM training sessions were conducted. The first was an introduction to TIM principles as part of the National TIM Responder Training Program and was held in conjunction with the first project stakeholder meeting on May 25, 2017. Rusty James of Gannett Fleming, certified TIM Training Professional and retired police officer, provided the training. Topics covered included:

- TIM Fundamentals and Terminology
- Notification and Scene Size-Up
- Safe Vehicle Positioning
- Scene Safety
- Command Responsibilities
- Traffic Management
- Special Circumstances
- Clearance and Termination

On October 24, 2017, the project team conducted the SHRP2 National TIM Responder Train-the-Trainer program for local first responders and transportation professionals. The goal of this training program is to provide the tools and training necessary for participants to feel comfortable presenting the National TIM Responder Training Program to their own agencies, departments or companies. Rusty James of Gannett Fleming along with retired Kansas City Fire Academy instructor Jeff Gardner and towing professional Andrew Wicks presented the training. A total of 22 representatives from the Fargo-Moorhead region participated in the training including several representatives from the towing industry. A list of the participants is below.

First Name	Last Name	Agency/Position
Adam	Altenburg	Fargo - Moorhead Metro COG
Brenden	Bleess	Minnesota State Patrol
William	Brown	North Dakota Highway Patrol
Lance	Burda	Burda's Towing
Andrew	Cashin	North Dakota Highway Patrol
Brian	Cheney	Minnesota State Patrol
Ron	Gardas	Twin Cities Transport and Recovery
Nick	Grossman	Ed's Towing
Robert	Higden	Ed's Towing
Jerrett	Hoscheid	Ed's Towing
Brett	Letourneau	Citywide Service / Minnesota Professional Towing Association
Joe	Lomsdal	Aggressive Towing and Recovery
Al	Milbradt	Minnesota Department of Transportation
Diomo	Motuba	NDSU - UGPTI
Eric	Ouellette	Minnesota State Patrol
Leon	Schlafmann	City of Fargo - Emergency Management
Jed	Schoon	Minnesota Department of Transportation
Kshitij	Sharma	NDSU - UGPTI - ATAC
Ryan	Sherbrooke	Fargo - Moorhead Towing / Harwood Fire
Shawn	Skager	Traill County Sheriff's Office
Jon	Skalicky	North Dakota Highway Patrol
Jay	Thompson	Lake City Towing

Figure 9 – SHRP2 TIM Responder Train-the-Trainer Participants October 24, 2017

Note - An additional training session to present the 4-hour SHRP2 TIM Training introductory course was to be conducted on August 8, 2017 in the morning prior to the project stakeholder meeting that afternoon. That training session was cancelled due to a lack of responses received from potential attendees. It was suggested by the project stakeholders that future training be conducted during a time period that doesn't overlap with summer vacation time in the region or with fall activities such as hunting season and during months with potentially severe winter weather. The next TIM training session was therefore scheduled in October 2017 and was well attended.



Figure 10 – National TIM Responder Training in Moorhead on October 24, 2017

Project Recommendations

As part of the overall process to develop the Alternate Route & TIM Guidebook, several recommendations to enhance the TIM environment were put forward by the stakeholders for future action in the Fargo-Moorhead region. In addition, some recommendations come from previous engineering studies in the region and are still considered applicable to this project recommendation list. None of these recommendations are considered binding. They are presented here for further consideration by the key individuals and agencies responsible for Traffic Incident Management in the Fargo-Moorhead region.

Recommendation #1 – The ownership and responsibility to maintain the Alternate Route & TIM Guidebook maps and documents should rest with the Safety Committee of the Fargo-Moorhead Metropolitan Council of Governments. Consideration had been given to creating a new, independent TIM Committee within the region, but after discussions with TIM stakeholders, it was noted that there are already some informal committees that gather to resolve TIM issues and plan for major events in the region. To create another committee would be redundant. The Safety Committee at Metro COG has many of the same members as the steering committee for this project and so it was felt that the Safety Committee would be the best vehicle for continued TIM activities in the region including:

- Retain ownership of the Alternate Route and TIM Guidebook project documentation and base files. The Metro COG's GIS personnel will retain the base files and update as necessary (maintain on an annual basis at a minimum).
- Be responsible for coordination of TIM training and exercises in the region for first responders and transportation professionals.

- Conduct after-action debriefing and reports following major incidents in the region as soon as possible or at their next regularly scheduled meeting.
- Conduct a TIM Capability Maturity Self-Assessment for the region (see Recommendation #9).
- Make recommendations for items to include in the TIP related to further enhancing TIM capabilities in the region.
- Include TIM as a regular agenda item at each meeting of the Safety Committee and include discussion of the above subjects.

Cost: \$

Recommendation #2 – Develop and monitor TIM performance measures in the Fargo-Moorhead region. Measuring and monitoring TIM performance measures will allow the region to track improvements in regional TIM procedures and quantify the benefits of TIM investments. The recommended performance measures to be measured in the region include:

- Roadway clearance time (including detection, response and clearance times)
- Number of secondary incidents
- Amount of time first responders are on scene (and exposed to traffic)

There are other performance measures which can be tracked related to traffic incident management, but these three measures are recommended by the National TIM Network as a starting point for areas where performance measures have not been collected previously.

Cost: \$\$

Recommendation #3 – Engage the Fargo-Moorhead region’s vehicle towing industry in to TIM exercises, event planning and regional safety committees. Tow operators can be the most important link in the TIM process, but are often forgotten about until needed at the incident scene. Their knowledge and experience can assist with event planning and TIM exercises in the Fargo-Moorhead region and will lead to greater cooperation at the incident scene as well as knowledge of tow equipment available in the region and when it should be requested.



Figure 11 – Heavy Duty Towing Vehicle

Cost: \$

Recommendation #4 – Install alternate route signage along key designated alternate routes in North Dakota, similar to signage installed in Minnesota. The Minnesota DOT has recently installed alternate route designation signage for the Interstate 94 alternate routes. Similar signage should be installed along the most frequently used alternate routes in North Dakota.



Figure 12 – Alternate Route Signage Example

Cost: \$\$\$

Recommendation #5 – Identify locations for future Dynamic Message Signs (DMS) that provide for increased notice to drivers of interstate closures and alternate route availability.

In the 2011 Traffic Operations Incident Management Strategy document, it was noted that there were seven existing DMS in the Fargo-Moorhead region and eight DMS proposed. As of this report, five of the eight proposed DMS have been installed for a total of twelve full size or medium size DMS currently operating in the region (DMS operated by Minnesota DOT are medium sized DMS). It is still recommended to install additional DMS at locations along I-29 and I-94 that are 10 to 15 miles outside of the metropolitan area to provide increased notification to motorists and awareness of incidents and/or stopped traffic ahead in the Fargo-Moorhead region. Current locations of DMS are documented in the Alternate Route Guide, but recommended future locations for regional DMS further outside the metropolitan area include:

- (ND) I-94 Eastbound – West of Casselton
- (ND) I-29 Northbound – South of 124th Avenue (Oxbow/Davenport)
- (ND) I-29 Southbound – North of Argusville
- Note: Minnesota DOT DMS on I-94 are located at points roughly 5 miles and 20 miles outside of the metropolitan area and are located to provide sufficient notification to motorists of incidents, events or closures in the Fargo-Moorhead region.

In addition, DMS are typically located prior to the intersection of major interstates as these are critical decision points for motorists to take action if there is an incident ahead. The DMS approaching the I-29 and I-94 interchange are located several miles away from the interchange in the Fargo-Moorhead region. Consideration should be given to installing permanent DMS within 1 to 1.5 miles of the I-29/I-94 interchange along the approaching interstates.

Cost: \$\$\$\$



Figure 13 – Typical Minnesota DOT DMS on I-94



Figure 14 – Typical North Dakota DOT DMS on I-94 and I-29

Recommendation #6 – Develop a regional traffic operations center/transportation management center or coordinate operations regionally between individual traffic and transportation management centers. Recommended in two previous studies of ITS and incident management strategies in the region (Traffic Operations Incident Management Strategy, 2011; Fargo-Moorhead ITS Deployment Strategy, 2014), the region should develop a joint bi-state traffic operations center (TOC) and/or share data and video feeds and coordinate traveler information between the various transportation and traffic operations centers in the region. Moorhead and MnDOT have already taken steps to share information and video feeds as part of a Hybrid TOC, in which Fargo, West Fargo, NDDOT, and 'MnTOC' have direct control over field devices but would share info with each other as well as with MATBUS and emergency management centers (RRRDC, ND Highway Patrol, MN State Patrol).

Cost: \$\$\$\$\$



Figure 15 – Example of Traffic Operations Center Interior

Recommendation #7 – Develop MOUs and partnership agreements between agencies, cities, counties and states that allow for shared use of first responder resources and the use of local roads as an alternate route for interstate traffic. Consideration should be given to the repair of damage to the roadway or structures that results from the diversion of interstate level traffic to the local roadways as well as providing budget for upgraded striping and signing of local roads that are designated alternate routes. If not covered through existing mutual aid agreements, MOUs should be developed to allow for the use of specialized equipment and resources for major incidents and special events. Resources such as foam pumper trucks, mobile command centers and traffic control equipment are some examples.

Cost: \$\$



Figure 16 – Specialized Equipment Example

Recommendation #8 – Enhance the coverage of CCTV cameras and vehicle detection capability throughout the Fargo-Moorhead region. This recommendation has been included in previous studies (Traffic Operations Incident Management Strategy, 2011; Fargo-Moorhead ITS Deployment Strategy, 2014) and is still a top priority for the region. CCTV provides an invaluable tool to first responders for detection of the incident and the initial assessment of an incident scene to determine resources required and exact location. Vehicle detectors can provide another detection capability by identifying slow downs or incident induced congestion as well as document traffic data related to alternate route diversions. Both of these technologies are also a valuable tool for special event management in the region for events at the FargoDome, airshows, fairs and concerts. Key to this strategy is the sharing of the data across the bi-state region through the use of a joint transportation management facility or hybrid TOC as noted in Recommendation #6.

Cost: \$\$\$\$

Recommendation #9 – Engage in a TIM Capability Maturity Self-Assessment exercise.

Recently developed by the Federal Highway Administration (FHWA) with input from state DOTs, first responders and other TIM responders, the TIM Capability Maturity Self-Assessment will provide the Fargo-Moorhead region with a benchmark of where their TIM capabilities exist today and actions that can be taken to enhance the region's TIM capability. It is recommended that the Metro COG's Safety Committee take this on as an action at a future meeting or conduct a workshop with the region's TIM responders to perform the self-assessment. Further information on this tool can be found at <https://ops.fhwa.dot.gov/publications/fhwahop16027/index.htm>. The online self-assessment tool can be found at <https://atri.checkboxonline.com/TIM-CMSA-2017.aspx>.

Cost: \$\$

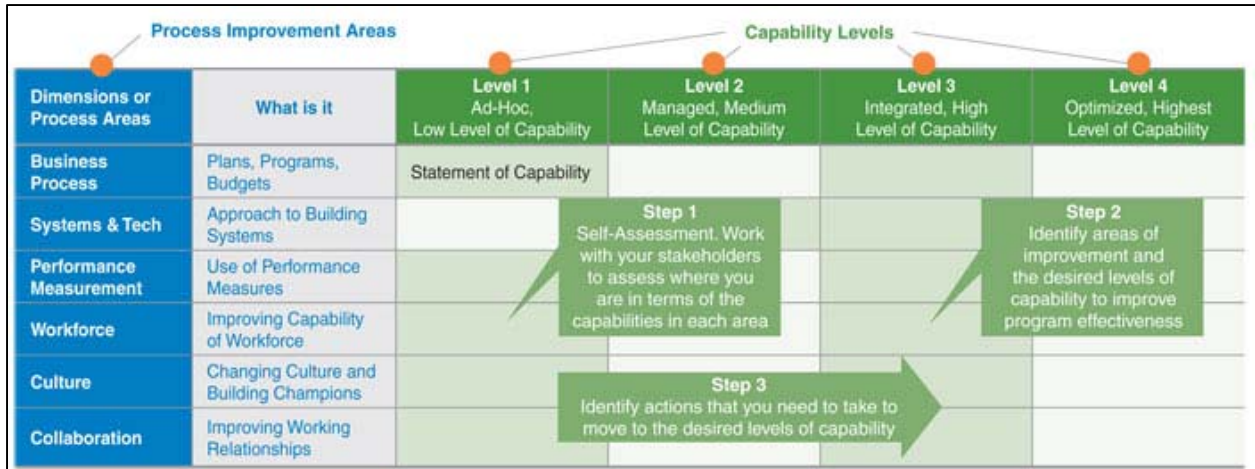


Figure 17 – TIM Capability Maturity Self-Assessment Process

Next Steps

With the completion of this Alternate Route and TIM Guidebook (Version 1.0), the next steps for the TIM community with the Fargo-Moorhead region will be to actively utilize the alternate routes suggested and make use of the electronic Alternate Route Guide when a major incident arises. Keeping the electronic or paper document in locations for easy access when a crisis arises is very important. Preferred locations include the CAD workstations at the Red River Regional Dispatch Center, in the Emergency Management Offices of Cass and Clay Counties, with the fire and police commanders throughout the region, in the offices of the North Dakota and Minnesota DOT District Engineers and Maintenance Supervisors, and with TIM specialists located at agencies within the region.

The interactive PDF file that allows for easy navigation through the alternate route maps for I-94, I-29, US-10 (MN side) and the Global Detours in the region is being supplied to all stakeholders who wish to have a copy. USB drives with the interactive Alternate Route Guide PDF have been provided to the Metro COG for distribution to stakeholders and Safety Committee member agencies. A limited number of hard copies are being provided, but for those wishing to have a hard copy, they are easily printed from the PDF on the USB drive. Please contact Adam Altenburg with Metro COG at (701) 232-3242 or Altenburg@fmmetrocog.org if you would like an electronic copy of the Alternate Route Guide.

Key to the longevity and usefulness of this type of Alternate Route Guide is maintenance of the document and updating of the preferred alternate routes when necessary. It is common for decisions made previously on what alternate routes to use to change as conditions change, roadway alignments are modified, and if the alternate route does not operate as expected when utilized. It is recommended that the Safety Committee of the Metro COG undertake a review and maintenance exercise on the Alternate Route Guide at least once per year as part of their committee duties.

Finally, the stakeholders involved in this project and the members of the Metro COG Safety Committee should look for opportunities to engage in ongoing TIM training for the region's TIM professionals, including first responders, transportation department representatives, local agency representatives, and the local towing companies.

Conclusion

The HDR and Gannett-Fleming project team wishes to thank the stakeholders who participated in this project over the past 8 months by providing insight, observations, recommendations, training participation and review of the alternate routes developed. Their cooperation is greatly appreciated. The TIM community within the Fargo-Moorhead region is somewhat unique in that there is a great amount of cooperation across the bi-state area, open lines of communication between first responders and transportation professionals, and minimal need for the employment of alternate routes for large-scale events over the past several years. However, when they are necessary, it is good to have them pre-planned, documented and available at the fingertips of the incident commanders for quick and easy implementation. This will reduce congestion if implemented quickly, reduce secondary accidents behind the primary incident and create a safer overall incident scene for first responders to be able to complete their tasks.

Appendices