

- Feed-Back on the Process -
Improving the Process for Providing Mobility and Safety in Work Zones
2013 Summary Report

Introduction

MnDOT conducted a review of our “Process for Providing Mobility and Safety in Work Zones”. The review meetings provided an opportunity for districts to feed back issues to a Team which was there to discuss the various processes the districts utilize to deliver an efficient ground transportation system through the pre-design (scoping), design, construction and maintenance operations.

Minnesota has always been on the cutting edge and leading the way in the nation to provide the safest work zones for the traveling public and the workers on the project. We have always strived to maintain traffic flow through the project and provide access to the local businesses and residents using the safest and yet practical methods available. As part of MnDOT’s Policy on Mobility and Safety in Work Zones (MS-WZ), which can be found in Technical Memorandum No. 12-03-T-02, dated February 6, 2012, and found online at:

<http://dotapp7.dot.state.mn.us/edms/download?docId=1156501> , MnDOT has documented its “Process for Providing Mobility and Safety in Work Zones” through its statewide level of commitment to the following processes and procedures:

- The usage of various active committees to continuously monitor issues within the state’s roadway construction industry, design standards, and maintenance operations to improve on our standards, practices and procedures. These committees include:
 - Statewide Work Zone Safety (WZS) Committee
 - Traffic Engineering Organization Temporary Traffic Control (TEO TTC) Committee
 - Special Provisions Review Committee
 - Resident Engineers WZS Advisory Committee
 - Maintenance WZS Committee
- Continuous monitoring of statewide crash data for various trends, patterns and issues that may be mitigated through changes in standards or practices and we implement the safety initiatives.
- Field review of active projects to maintain quality standards and adherence to TTC standards in both construction and maintenance operations.
- Developing and conducting TTC training programs for public and private workers in design standards and proper field deployment of the standards.

The policy states that the process includes the Districts providing the analysis on individual projects to mitigate mobility issues and safety conflicts. To provide additional guidance to the districts for reviewing projects early in the scoping process and providing for mitigation measures early in the planning and budgeting process, the policy included checklists of typical issues and mitigation measures. The districts are responsible for following the established standards and documenting when exceptions

must be made to the standards. The level of anticipated detail was summarized based upon the impact of the work zone on traffic mobility and safety.

Upon the adoption of the policy, MnDOT created a review of our “Process for Providing Mobility and Safety in Work Zones”. The Feedback Discussions within the districts are a major part of the process review. A Team was formed of representatives from the Offices of Traffic, Safety and Technology, Maintenance, Construction and Innovative Contracting, and from the FHWA. The team visited four of the 8 MnDOT districts last year, three of them this year, and proposes to review Metro District during 2014.

After an introduction to explain the purpose of the meetings, it became an open forum for participants to bring any issue up for discussion. All topics of concern to the participants were encouraged and are included in this report. When the participants did not have their own concerns, they were prompted with the discussion topics we focused on last year. Those were: TMP’s, WZ field reviews, Training, and crash reporting.

This report is a summary of the work zone mobility and/or safety issues and best practices discovered during the Feedback Discussions held in three districts during September, October, and November of 2013. The three districts visited were Bemidji, Willmar, and Mankato. Within the districts, staff from nearly every section attended a portion of each 2 day meeting. District staff represented Maintenance, Bridge Maintenance, Construction, Traffic, Pre-Design, Design, Permits, Public Relations, in addition to members of the State Patrol.

The Feedback Discussion Team has referred the “Issues Discovered” to the various committees listed above for their review, discussion, recommendation and action. The following report itemizes the issues discussed in at least one district and the current status and/or recommendations for further actions. Several issues (as noted) are beyond the influence of these committees and will be passed to the appropriate groups for their action. Beyond issues, the report documents several “Best Practices” which the Team felt should be highlighted such that other districts may give consideration to incorporating them into their operations or may spur thoughts for additional improvements.

Issues Discovered

District Traffic Offices:

D2, Bemidji

- They have had some complaints regarding the noise produced by rumble strip installations. Some installations have been too “deep” producing too much noise that carries especially well across water. They would like tools for inspectors to use when inspecting these installations to better stay within specifications. While they clearly understand and champion the safety benefit, they are

interested in “better” rumbles. The district has volunteered to host a test section of the new sinusoidal type.

- The bridge maintenance sections are to be getting some temporary signal systems. They do a lot of flagging and are interested in other improvements to safety and efficiency. The current AFAD research project is of great interest to them.
- Most routes do not have enough traffic to be considered a project with significant traffic impacts. Many issues are addressed and documented in scoping. Proposed layouts are presented at public information sessions. Detour choices are documented and all project information is retained in Projectwise. Crash reporting is usually informal and comes directly from State Patrol Troopers.
- There is a continuing problem with the public taking unofficial detours. This sometimes results in a county or township seeking maintenance money. A fatality occurred this summer due to a motorist driving down a closed roadway.

D8, Willmar

- Traffic gets reports of fatal crashes. Construction lets them know of WZ crashes and problem areas. Maintenance has reported close calls but they appear random and it is difficult to recognize a pattern. They thought Intrusion forms could help if kept simple.
- Along with D3, they are participating in a research project to evaluate AFAD's.

D7, Mankato

- Traffic works closely with D6 to coordinate projects on Interstate 90 so that similar strategies are used. They are interested in the Electronic Speed Limit signs to reduce the Speed Limit on a project 24/7 and then again when workers are present. They have used the WZ SL in the past with a pay item.
- State Patrol Captains provide crash notification. These most often involve impaired operators but they do seek WZ improvements if a cluster is spotted.
- Some projects are not well accepted by motorists and can produce up to 2 weeks of complaints before acceptance is achieved.
- They would like more training particularly in modeling and for construction staff.

District Permit Offices:

D2, Bemidji

Permits had various questions and comments about improving the Field Manual. The new Field Manual addresses some of these improvements. They were informed of the e-learning course that is designed for permit requesters.

D8, Willmar

Permit's was unable to meet with the review team.

D7, Mankato

Permit work can vary from farmers constructing a driveway to utilities with trained personnel. They cc the subarea supervisors as they do not do much inspection. The e-learning could be a useful tool for them.

District Public Affairs Offices:

D2, Bemidji

- Public Affairs recognizes the power of social media and encourage their friends and family to “Like” MnDOT and share stories they like.
- A Work Zone Safety Awareness Program could be telling some of the stories from maintenance – move over, pay attention, etc.
- Perhaps a communications representative should be part of this review team?

D8, Willmar

- Public Affairs finds that much more public education is needed as the public seems to be oblivious to our signs, devices, and flashing lights.
- Sometimes our message is difficult to explain, as in slow-down in WZ’s but raising the permanent speed limit on other rural roads.
- The district does participate in a speakers bureau and speaks to Drivers Ed classes and Plows to schools program. There are not enough resources but it is an important district function.
- They appreciate the media buy for the Zipper Merge but that is less of a priority in rural areas with lower volumes.
- Suggestions include an effort to reach middle aged drivers in addition to the old and young. Target social media and share film clips of work zones and other MnDOT activities.
- Very much need more resources, could TZD funds be used?

D7, Mankato

Public Affairs was unable to meet with the review team.

District Bridge Maintenance Offices:

D2, Bemidji

- Bridge Maintenance has great concern about the proposed changes to the Bridge Snooper Manual. They understand that CO Bridge will require a WZ speed limit and TMA’s to be used in all their traffic control layouts. They feel the DSD and WZ SL requirement is not reasonable in rural areas with low volume. The shops just do not have the equipment available. (The final guidance from CO Bridge did not include a WZ SL requirement but rather an advisory SL)
- Bridge crews are down to 4 persons and if 2 are needed for flagging, productivity is decreased. They would like temporary signal systems but do not currently have the funds.

D8, Willmar

- Bridge has acquired temporary signals and is very happy with them. There is some learning curve with time adjustments for speed, volume, and grade of the roadway.
- Still is a problem with inattentive drivers. A large truck blew thru a “stop-take-turns” set up and hit the PPCB since stages had been changed and the driver did not see the barrier right in front of him. As of this meeting date, they had not deployed the AFAD. One benefit they are excited about is the warning horn on the device. It can be activated remotely to warn the crew of an intrusion.
- Had some temporary rumble strips on loan from the manufacturing company but have since been returned. They were very pleased to notice a reduction in speed.
- They were shown the new layout 50, short duration WZ, and thought that would be very useful for bridge flushing.

D7, Mankato

- Bridge has a representative on the Maintenance WZ Safety committee and they are pleased to provide feedback.
- Discussed the new layout 50 and they had some concerns about the lead vehicle encroaching into the roadway when the shoulder is narrow.
- They have a DSD and have used it somewhat. It would be used more if not for a lack of crew.
- Bridge has used a 10 day closure and detour to accomplish deck repairs at an accelerated rate with increased safety to the workers.
- They do add extra signs and devices to layouts when working in the Mankato Metro area due to the increasing traffic.
- Bridge reports lots of intrusions but is interested in an intrusion form. They estimate possibly up to 12 a day on average.
- They are interested to use the directional indicator barricade due to its more positive guidance to the motorist.

District Construction Offices:

D2, Bemidji

- The District sees the advantage to closing a roadway or bridge in that the work gets done quicker, more efficiently, and with increased safety to the work crews. Signing for “road closed to thru traffic” does not seem to impact drivers though; many continue right thru and disrupt operations. They have discussed what else to do including signing as “bridge out” to express that the motorist will not get thru. This has occurred in other districts as well and the review team suggested better signing, enforcement, and buttoning up the project tight.
- MnDOT detours most often sign the best route available to trunk highway traffic. Often there exists an alternate route that light vehicles could use as a short cut. Those road authorities sometimes make claims for maintenance costs of this unofficial use. The district has had success using cooperative agreements and other strategies to provide minimum maintenance that was justified and to keep good relations with the locals.

- The review team brought up the possibility of using the A+B method to optimize the detour duration.

D8, Willmar

- Like so many others, they have had trouble with non-locals using closed roadways. They have championed the use of enforcement in the beginning weeks of a project. The Troopers often hear the same excuse, “the GPS told me to go here”.
- They have used layout #5 for cutting Centerline rumble strips. In practice, the operation moves so fast, it is difficult for the flaggers to move and keep up with the operation.
- They have a main street rebuild project in Cosmos next year. There are many disabled citizens and developing an access plan is proving difficult as the contractor may stage differently than suggested. They are balancing maintaining ped access and business access and parking.
- They do not have many projects that meet the criteria for full federal oversight. They have had some with federal visits and inspections. Often a single page TMP is used specifying expected impacts and mitigation such as detours.

D7, Mankato

- They have similarly had problems with intrusions. Motorists follow haul trucks into work areas and follow GPS instructions around Road Closed Barricades.
- Discussed an intrusion form. Who to fill out, agency or contractor? Maybe with the TC contractor daily log. Construction estimates up to 2 per hour. Have had the public drive into wet concrete 3 times last season.
- They pointed out that additional items need to be added to the 1404 extra TC items.
- They send personnel to the Traffic Control Supervisor and TC Overview classes.
- There is some concern that for post mounted signs, the proper offset and panel height makes it difficult to see. TC designers may want to oversize panels that are to be post mounted.
- There is a thought that 1404 has gotten too large. Understand that little is in the spec book so it has to be. Likes the new reorder of 1404.
- They generally do not plan night construction work. Have had some issues with certain projects continuing after sunset. Since the plans did not anticipate this, there were no provisions for the crew’s reflective pants, light plants, additional signing, or conspicuity tape on vehicles. They feel there should be a penalty for this type of work out of the contract limitations. Other safety driven penalties have prevailed.
- They are pleased with the new field manual and the additional content. They desire a micro station TPAR detail sheet, which OTST is currently working on.

District Maintenance Offices:

D2, Bemidji

- Most of the Districts roads are two lane two way. The field manual is adequate for their needs. They are interested in training for the new field manual and expressed relief that they would not need to utilize the roundabout layouts. The review team pointed out that they are missing out on one of the greatest advancements know to the traffic community. They thought there may soon be some roundabouts on local roads and that might improve their acceptance by the public.
- They use typical flagging layouts most of the time with little modification. AFADs were mentioned but the district thought they had too many narrow shoulders and obstructed vision areas to be practical.
- Intrusions are a concern and happen much more often than crashes or currently reportable incidents. State Patrol response time can be great due to the geographic size of the district. Cell phone dead zones could hamper intrusion reporting. Whatever form is developed should be kept simple.
- They are increasing their documentation of layout changes and are also concerned of reported OSHA inspections. Feel they do a good job but are concerned of non MnDOT people inspecting them.

D8, Willmar

- They do not use too many different Field Manual layouts.
- Pointed out they currently use layout 14 without cones for operations up to 3 miles. Not the intended use for this layout but much discussion of lack of crew and devices.
- Have used temporary rumble strips. Without a sign, the public thinks it is debris and drives around them. In one case a Police Officer removed them from the roadway and thru them in the ditch.
- Questioning layout 7. Could it be a short duration, up to 1 hour instead of 15 min but placing the shadow vehicle in the lane?
- Use of air horns by flaggers is moot, usually too much noise, crew will never hear it.

D7, Mankato

- They are documenting work and layout adjustments for tort claim purposes.
- In the new field manual, they like the new short duration layout 50. They have enough TMA's to use this most likely in the Mankato Metro area.
- For their new roundabouts they will develop a detour plan in advance for each so that when work is needed they have a plan "on the shelf".
- Lots of emphasis on TC for S & I cleanup. Will use crash trucks and signing to warn the public. Most plow trucks already have plenty of lighting.
- In emergencies, State Patrol starts out, then MnDOT Maintenance with a flagger, then more signing and devices as time allows.
- Could use more emergency signs positioned in various locations but must balance with the cost. Some truck stations have a stock already due to routine spring time flooding.

- The district traffic office agreed to further discuss emergency sign needs with maintenance and develop a plan for a reasonable inventory.
- Intrusion form is of great interest. There is some reluctance for another form but this is a serious safety concern.
- Distracted/Confused drivers going too fast are a big concern. Would like a fund to hire SP but needs to go thru management. Even with SP on site, they have seen intrusions.
- Would like to use some type of truck mounted WZ speed limit signing.
- Driver behavior has gotten worse in the last few years as they get desensitized to the hazards. Think the portable rumbles may help as well as CMS's as static signs seem to be ignored.

District State Patrol Offices:

D2, Bemidji

State Patrol was unable to meet with the review team.

D8, Willmar

- State Patrol came with much useful feedback. They prefer "Gang or Tandem Plowing" during S & I operations. This blocks and slows traffic reducing collisions with Plows.
- They like the opportunity to provide input to Traffic Control for a project before it is completely planned out.
- There is often work on TH 90 but it doesn't not typically cause much back up.
- Have had issue with non-locals using a closed road. Have done ID checks before.
- Like the fines double signs but think it may have lost impact. Maybe a \$125 fine is only \$30 doubled to \$155.
- Alternatively, unreasonably high fines may not be written. Reasonable fines are more likely to be enforced.
- Distracted and drowsy driving is a very serious issue. Difficult to tag. What is definition?
- Cable Median Barrier is a mixed blessing for the SP. It can prevent them from turning to chase speeders but may protect them when pulled over onto the left shoulder.

D7, Mankato

- They spoke of their open lines of communication with the District and their excellent working relationship.
- They do work extraordinary enforcement for construction and utilize different strategies. The Trooper works with the inspector to determine proper strategy. District Troopers are getting High-Viz Jackets this winter which will also help with construction OT work.
- Even with their presence, lights, and strategy, some driver behavior is so egregious that they must leave their post and pursue and evil doer.
- Most people don't know what the fine might be, so posting it on a sign may help. Perhaps an outreach or public information effort too.

District Design Offices:

D2, Bemidji

- Traffic usually does the TMP and Traffic Control Plan. In scoping, traffic impacts are considered.
- They feel they are still learning how to deal with TPAR accommodation. Will be more important in the future as they rebuild small town main streets. Many of those only have one access point from the front so it will be difficult. They also requested some TPAR typicals drawn in Microstation.
- They are interested in the “Red Flag Checklist” that metro developed. They currently use 15 min as a threshold for a significant project.

D8, Willmar – Design/ADA Coordinator

- Traffic does TCP for design as well as pedestrian control plan.
- Have done a lot of sidewalk ramp work with little guidance. Usually close alternate corners to build ramps and sidewalk paving comes later.
- Could use better TPAR in plans as contractors are too quick to detour.

D7, Mankato

Design was unable to meet with the review team.

Best Practices

Following are a few of the best practices discovered in the three districts we visited:

- Construction is concerned with motorists disregarding detours and driving thru closed roads. They have enhanced the Road Closure Signing with additional messages such as “Bridge Out” or a monetary penalty amount.
- Rumble Strip installations could use better inspection practices to avoid overly deep cuts that result in excessive noise to nearby residents. There is much interest in the research of sinusoidal rumbles since the districts do recognize the safety benefits of rumbles.
- Maintenance crews face personnel shortages so they are trying to reduce flagger use with temporary signals and Automated Flagger Assistance devices (AFAD's). There is a research project underway to discover strategies that will increase the use of AFAD's. Two districts are participating in the research and others are interested in the results.
- Neighboring Districts have cooperated on projects that affect thru routes so that similar strategies are used.
- Some Maintenance crews have used temporary rumble strips and are pleased with their performance.
- Bridge Maintenance has used a closure & detour strategy to accelerate work while also increasing safety.

- WZ intrusions by the public are a concern and there is interest in a reporting process if it is not too complicated.
-

The members of the Feedback Discussion Team wish to thank everyone who participated in the discussions for their valuable insight into the issues related to mobility and safety in work zones, as well as their willingness to share best practices and ideas with the team members and look forward to future discussions to guide MnDOT's work zone traffic control and mobility efforts.

This report was prepared by the Office of Traffic, Safety & Technology and reviewed by the Feedback Discussion Team. Copies have been distributed to Division Directors, District Engineers, and Directors of Offices and/or Chairs of Committees mentioned within the document.

Team Members for 2013:

Susan Groth,	OTST - State Traffic Engineer
Peter Buchen,	OTST - Asst. State Traffic Engineer
Ken Johnson,	OTST - State Work Zone, Pavement Marking & Traffic Devices Engineer
Ted Ulven,	OTST - Work Zone Standards Specialist
Will Stein,	FHWA - Safety Engineer, Minnesota Division
Craig Mittelstadt,	OCIC - Work Zone Safety Coordinator
Kevin Kosobud,	OCIC - Project Development Engineer
Bob Vasek,	OMS - Maintenance Operations Engineer
Sue Lorentz,	OMS - Maintenance Operations Support Specialist