

Work Zone Safety & Mobility Process Review 2012

Michigan Department of Transportation



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Executive Summary

On May 2, 2008, the Michigan Department of Transportation (MDOT) established a Work Zone Safety & Mobility Policy in accordance with 23 CFR 630 Subpart J. MDOT also made modifications to policies, procedures, and contract documents in accordance with 23 CFR 630 Subpart K on February 22, 2010. This process review is in response to 23 CFR 634 630.1008(e). The process review is required to be conducted every two years to examine the progress MDOT has made implementing these rules and identifying best practices, and areas that need further development to improve the safety and efficiency of Michigan work zones for motorists, workers and pedestrians.

The review resulted in 11 topics of concern; the five listed below were selected as the main areas of focus for MDOT as part of this process review.

Topic #1: Determination of a significant project: MDOT is in the process of revising all relevant documents and getting approval for the changes. This revision is currently underway. A status update will be given during the next work zone safety and mobility process review.

Topic #2: Additional training for determining user delay and writing TMPs: A pilot training session was created and took place on August 27, 2012 in Metro Region. Feedback from this session, along with feedback from the LSRT, will be used to create a training course. A status report will be given as part of the next process review on the course's progress.

Topic #3: Revision of the Mobility Documents: Clarification and revisions to the *Work Zone Safety and Mobility Manual* are currently taking place. A report of all the major changes will be provided with the next process review.

Item #4: Crash Mitigation Matrix: A crash reduction table will be created and added to the *Work Zone Safety and Mobility Manual* to provide operations engineers with a list of common strategies used to reduce crashes. An update on the status of this matrix will be provided with the next policy review.

Item #7: TMP Best Practices: A file will be created to track best practices used on TMPs. It will be located on MDOT's internal file sharing system (Project Wise). This will be an ongoing effort by the Statewide Peer Review Team.

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Mobility Process Review Report

Background

On September 9, 2004, the Federal Highway Administration (FHWA) published the Work Zone Safety and Mobility Rule, updating and renaming the former regulation: “Traffic Safety in Highway and Street Work Zones” in 23 CFR Part 630 Subpart J. The Rule was updated to address the issues of an increase in the number of work zones, growing traffic volumes and congestion, little growth in roadway capacity, safety concerns, more work being performed under traffic, and public frustration with work zones. The updated Rule establishes requirements and provides guidance for systematically addressing the safety and mobility impacts of work zones and developing strategies to help manage these impacts on Federal-aid highway projects.

The former rule called for an annual review of selected projects. The current requirement calls for a comprehensive process review to be conducted every two years.

The Temporary Traffic Control Devices Rule (Subpart K) was published in the Federal Register (72 FR 68480) on December 5, 2007 with an effective date of December 4, 2008. This rulemaking is in response to section 1110 of the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)* and supplements FHWA's Work Zone Safety and Mobility Rule (Subpart J) to address conditions for the appropriate use of, and expenditure of funds for, uniformed law enforcement officers, positive protective measures between workers and motorized traffic, and installation and maintenance of temporary traffic control devices during construction, utility, and maintenance operations.

***Process Review.** In order to assess the effectiveness of work zone safety and mobility procedures, the States shall perform a process review at least every two years. This review may include the evaluation of work zone data at the State level, and/or review of randomly selected projects throughout their jurisdictions. Appropriate personnel who represent the project development stages and the different offices within the State, and the FHWA should participate in this review. Other non-State stakeholders may also be included in this review, as appropriate. The results of the review are intended to lead to improvements in work zone processes and procedures, data and information resources, and training programs so as to enhance efforts to address safety and mobility on current and future projects.*

Purpose and Objective

The process review will examine MDOT’s progress implementing the Work Zone Safety and Mobility Rule; it will identify best practices and areas that need further development to improve the safety and efficiency of Michigan’s work zones for motorists, workers and pedestrians.

The object of the review was to determine if the mobility policy was functioning as an effective program whose practices and procedures are being used successfully to carry out MDOT’s operational processes at an effective and efficient level. This review will also help determine areas that are not functioning at an optimal level and determine what improvements should be made to address the shortfalls.

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Scope and Methodology

MDOT and FHWA met on November 30, 2011 to determine a plan for the process review. At this meeting, the individuals listed below helped determine the areas we wanted to focus on.

Process Review Team

Kurt E. Zachary	Local Program Engineer and Area Engineer for North Region	FHWA
Dave Morena	Safety and Traffic Operations Engineer	FHWA
Hilary Owen	System Operations Engineer	MDOT
Angie Kremer	Traffic Incident Management Engineer	MDOT
Chris Brookes	Work Zone Delivery Engineer	MDOT

From this meeting, the group developed a questionnaire to send around to MDOT employees who work with the mobility policy to help determine where we stand as a department and help us focus our efforts on an effective and feasible process review. The questionnaire (Appendix 1) was used to help facilitate the listening sessions.

The second step was to receive feedback from all seven MDOT regions to make sure that we captured everything occurring in the department. We didn't want to overlook any areas affected by the Work Zone Safety and Mobility Rule. To do this, we set-up a series of listening sessions across the state and used the questionnaire as an agenda/topics to help facilitate discussion.

Prior to the listening sessions, MDOT and FHWA had an idea of what the expected results would be. The main areas the group thought needed to be addressed were the criteria by which MDOT makes the determination whether a project is significant, the amount of time that it takes to complete a TMP and the amount of money that is added to maintaining of traffic (MOT) costs on projects. These were the main topics that MDOT's Traffic Incident and Work Zone Management Unit had received feedback on in the past. To avoid having our meeting focus on known issues, the team developed a list of solutions or ideas for these topics beforehand. Presenting the known topics to the listening sessions directed the focus on determining what else needed to be revised and where the team needs to further focus our efforts.

The first known area was the determination of a significant project. When MDOT originally set the criteria, a determination was made by the Mobility Policy Team to capture all projects with a high impact on the motoring public. The current policy states:

“During the scoping phase, if the approved project capacity analysis yields a volume to capacity ratio greater than 0.80, an increase in travel time greater than 10 minutes or the LOS drops below the threshold outlined in the Work Zone Safety and Mobility Policy, the project is deemed “significant” and a transportation management plan (TMP) must be developed.”

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Mobility Policy Team 2008

Team Sponsors

John Friend	Director, Bureau of Highway Delivery
Roger Safford	Region Engineer, Grand Region

Team Members

Brian Zimmerman	Bureau of Highway Delivery	Construction & Technology
Dave Schade	Bureau of Transportation Planning	Data Collection Unit
Andy Irwin	Bureau of Transportation Planning	Project Planning
Brad Winkler	Bureau of Transportation Planning	Statewide Planning
Dave Calabrese	Federal Highway Administration	Planning & Program Development
Dave Morena	Federal Highway Administration	Engineering & Operations
Dennis Kent	Grand Region	Region Office
Steve Stramsak	Metro Region	Oakland TSC
Matt Smith	Metro Region	Region Office
Andy Zeigler	Metro Region	Region Office
Rob Morosi	Metro Region	Region Office
Jay Gailitis	North Region	Region Office
Craig Innis	Bay Region	Cass City TSC
Dave Van Stensel	Southwest Region	Region Office
Paul Steinman	University Region	Lansing TSC
Stephanie Palmer	University Region	Region Office

The Traffic Incident and Work Zone Management Unit and FHWA determined this was something that needed to be reviewed. Knowing the policy was open for change, we asked for individuals to come up with what they thought the policy should be based on if they were a road user. From the feedback we received, it was determined that MDOT should look at revising these numbers to focus solely on the 10 minutes of additional user delay. This indicator of significance was deemed to be the most understandable to the public and best represents what an everyday motorist considers reasonable. A road user couldn't tell you what the volume to capacity ratio (V/C) or the level of service (LOS) of a roadway was, but knows when a work zone adds an additional 20 minutes to a trip. It was determined by the review team that we are a public agency and we need to keep the public's interest at the forefront. Making this change will allow us to focus our resources in such a way that this is accomplished.

The second area we felt would be another topic of concern was the amount of time it was taking offices to complete TMPs for smaller projects. This issue was brought up a few times. We believed that updating the criteria would eliminate a number of the projects that were cumbersome. One example was a project submitted with a TMP for a 1.2-minute increase in delay because the V/C was over 0.8. The project office felt that for a smaller project with minimal impact to road users, the TMP shouldn't require the amount of resources that other major projects did. It was agreed that updating the determination of significance projects would help alleviate the major concerns relating to the amount of time that is required for each significant project.

The third topic we assumed would come up as a perceived issue was the additional cost that was being spent on the MOT. There have been discussions in the past regarding the funding spent on mobility and the Traffic Incident and Work Zone Management Unit has received a number of comments stating that road miles are being sacrificed for mobility. This, however, did not come up in the listening sessions. The focus was more on the constructability aspects of the MOT. The overall constructability and quality of

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work was discussed. The main issue was whether MDOT piecing new roads together because we have to build them in a number of stages. Some construction engineers question whether MDOT is losing overall service life of our roadways due to staging designs. This is a valid concern that will be reviewed in the future to better quantify the impact. In the short term, project reviews by the Statewide Peer Review Team will continue to focus on making sure MDOT chooses correct alternatives not only for mobility but for completing the work in a way that still allows for an effective fix.

Listening Session Review Team (LSRT)

Angie Kremer	Traffic Incident Management Engineer	MDOT
Chris Brookes	Work Zone Delivery Engineer	MDOT

The Listening Session Review Team (LSRT) scheduled four sessions for Northern Michigan, Western Michigan, Southeast Michigan (Metro area) and one in Central Michigan for anyone that couldn't make the other three. At all of the sessions, the LSRT attempted to have a cross-section of employees participate so that everyone's voice were heard. This gave different areas a chance to talk to each other about the successes or downfalls of the Work Zone Safety and Mobility Rule and allowed everyone to hear concerns that other areas have been coming across, either in the field from construction staff or in the office from the design and planning staff. It also allowed the groups to talk and discuss what was useful and what could be done by each group to assist the other. (A list of attendees at each meeting is attached in Appendix 2.)

At the start of each listening session, the LSRT briefly covered the items above that we already had flagged as known areas of concern. We did this to focus on other areas and bring up other issues that the Traffic Incident and Work Zone Management Unit may not have been aware of.

Observations and Recommendations

Similar topics were discussed at all four meetings, but each had a different atmosphere due to the types of roadways common for that location. The summary below lists the 10 main topics at each session, positives and negatives, and associated comments and issues. With the listening sessions spread out across the state, all types of traffic and roadways were covered. To see a specific summary from each session, please refer to the notes in Appendix 3.

Topic #1: Determination of a significant project.

When determining a significant project, the current policy is: *“During the scoping phase, if the approved project capacity analysis yields a volume to capacity ratio greater than 0.80, an increase in travel time greater than 10 minutes or the LOS drops below the threshold outlined in the Work Zone Safety and Mobility Policy, the project is deemed “significant”*

LSRT Feedback: The LSRT received feedback related to smaller projects, traffic regulators and the Metro Region. All of the comments related back to the public perception of how motorists were affected. The motoring public doesn't understand V/C of a roadway or LOS, but they fully understand the concept

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of time and how much additional time they have to wait to travel on their normal route. This is what we as MDOT, a public agency, should be focused on to provide the safest, quickest and most cost effective traffic plan for all construction projects. If we are spending additional time and effort on projects that have only a one minute work zone travel delay, we aren't getting a maximum return on investment.

Recommendation: References to LOS and V/C be removed from the policy and MDOT focuses solely on the additional travel time that is caused by work zones on MDOT roadways. The determination of a significant project will solely be based on 10 minutes of additional travel time.

Topic #2: Additional training for determining user delay and writing TMPs.

A wide variety of numbers and methods are currently being used to determine the user delay for a project. There are new employees and no formal training.

LSRT Feedback: LSRT learned there is a lack of training options for the CO3 and Synchro. These two programs are used for determining travel time and user-delay costs on MDOT construction projects. Across the department, there is a lack of education and guidelines for using both CO3 and Synchro.

Recommendation: Revise the Traffic and Safety Notes and create a clear guide for determining work zone capacities of roadways. The revised guide will be created from the old Traffic and Safety Notes which are all being relocated will be placed within the *Work Zone Safety and Mobility Manual*. Additionally, a training course will be offered around the state to provide training on the TMP process. This course needs to be created and made available on request.

Topic #3: Revision of the Mobility Documents

The *Work Zone Safety and Mobility Manual* and associated documents should be revised to correct errors, eliminate items that are obsolete due to the updated Standard Specifications for Construction, the Michigan Manual on Uniform Traffic Control Devices (MMUTCD), and make modifications to items to provide clarity.

LSRT Feedback: The Traffic Incident and Work Zone Management Unit received many comments about information in the manual that requires updating since the last process review. The Process Review Team also received additional items for updating.

Recommendations: Review the manual and guidance documents and make the changes that are necessary to improve the overall quality of the material.

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Item #4: Crash Mitigation Matrix

The Process Review Team noticed the lack of crash mitigation strategies being used by offices. In-depth crash reviews are being completed. At times a crash pattern is found, but a solution is not suggested. The pattern is just stated.

LSRT Feedback: It was brought up that whenever a crash pattern is found, there is a lack of information on how to mitigate the crashes based on work zone type. Some offices do not have the knowledge on what type of mitigation strategies to use.

Recommendations: Develop a best practice crash reduction matrix for work zones. This list will be created and kept up to date by the Traffic Incident and Work Zone Management Unit to provide a document for operations engineers to locate reduction methods. Having this information in one location will allow it to be incorporated into TMPs.

Item #5: Selection of the correct MOT method/alternative

MDOT currently has no written guidance regarding how to select the best MOT strategy for a project. The decision lies with the project team, who must then explain the proposed alternative and research behind their selection to the Statewide Peer Review Team.

When a MOT method is determined, it is left to the project office to determine what method is best for that specific project. MDOT currently does not have a set process for determining the best method. It is up to the project office to explain their choice in the TMP to the Statewide Peer Review Team.

LSRT Feedback: The question was raised: “Are we (MDOT) sure that we are selecting the best, safest, cheapest, smartest and fastest method of construction for our projects?” This was followed up with questions regarding constructability, duration, exposure, cost and safety.

1. Is the MOT taking into account the methods that are being used and factoring in the overall service life of the construction method required?
2. Is the extended duration of a project being considered correctly?
3. How much is the extra exposure time worth to the public? One bad month of construction compared to a year of minor closures?
4. Is MDOT weighing the additional cost correctly when looking at the overall project? Should we be looking at a longer cost benefit than just a year? What is the correct duration to look at when comparing methods? Are we looking at the project’s future worth value or just the current value?
5. What is the true safety difference between working at night and during the day? Is setting up and removing a closure daily/nightly, which leads to increased worker exposure, being factored into the overall decision?

Recommendation: These are all very important issues that should be addressed to make sure that MDOT is truly getting the highest return on the public’s investment on Michigan’s roadways. MDOT can create a

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tool to compare different types of fixes and construction methods, taking into account constructability, duration, exposure, cost and safety. This will allow for a true value comparison of projects across the board. MDOT currently has a research project with a stated objective to “Establish guidance on the appropriate level of investment in temporary measures to maintain mobility in work zones.”

Item #6: After completion requirements for TMPs

What follow-up should be done after a project is completed, and if a similar project was taking place is a new TMP required?

LSRT Feedback: Three of the four listening sessions brought up this topic. It was found that a number of offices were not pulling the crash reports and reviewing what happened during construction. Only a few offices were doing this. As for the duplication of TMPs, there were quite a few questions regarding reusing a TMP for a project in a different location if the fix type is the same. Project offices claimed they felt like they were “recreating the wheel” by not being able to reuse a TMP.

Recommendations: The Process Review Team sensed this area may need to be improved but is going to defer to take any action due to the Post Construction Review Process just being revised, which is a very similar process. In addition, the team determined that using a duplicate TMP may be something that MDOT can look into in years to come. However, it was decided that the sample size was not large enough, so doing this may limit project innovation. The Process Review Team recommends looking at the effectiveness of the new post construction reviews to determine what is being found and then taking another look at this issue with that information.

Item #7: TMP Best Practices

Every Statewide Peer Review currently includes a list of any best practices used on that specific TMP.

LSRT Feedback: There has been a lack of information sharing when it comes to best practices for TMPs and there is no formal process of sharing best practices across the state.

Recommendations: Create an informational page listing all the past best practices noted by the Statewide Peer Review Team. It should be posted at a location that everyone in the department has access to such as the intranet or MDOT’s internal file-sharing system (Project Wise).

Item #8: Measuring Project delay

Table 13.1 in the *Work Zone Safety and Mobility Manual* should be used.

LSRT Feedback: Offices had questions specifically how the times should be measured. There was a question of when to start the measurements - at the slow down or at the start of the work zone? Another question raised was can we get a program that does this statewide?

Recommendations: The I-94 Corridor Operation group has purchased a program, Regional Integrated Transportation Information System (RITIS), to measure user delay. The Travel Time Delay section in the *Work Zone Safety and Mobility Manual* will be revised. The Operations Field Services Division needs to evaluate RITS.

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Item #9: Value Engineering Change Proposal (VECP) on a TMP

Contractors will submit VECPs to change the staging of projects that affect mobility.

LSRT Feedback: Offices have received VECP requests to change staging to reduce construction time, but increase user-delay cost. There isn't a set requirement for a VECP and it puts a lot of pressure back on the project office to provide a quick turnaround.

Recommendations: Construction Field Services and Operations Field Services Divisions are working on creating a boiler plate MOT Special Provision (SP). The recommendation is to add information in the MOT SP relating to time frames and requirements for a VECP submittal. It is also recommended that this topic be readdressed in the next review to determine if additional verbiage in the MOT SP has solved the problem.

Item #10: Pedestrian Traffic Control

MDOT currently has limited guidance on how to handle pedestrian traffic in work zones.

LSRT Feedback: Designers and project engineers are looking for additional information on how to handle typical situations. The MMUTCD doesn't list the details needed for projects.

Recommendations: The Traffic Incident and Work Zone Management Unit is working on a *Pedestrian Traffic Control Manual*. It is still in the review stages and won't be complete before this year's process review is complete. The manual will be distributed when it's complete and a section referencing the manual will be added to the *Work Zone Safety and Mobility Manual*.

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Evaluate current work zone practices, problems, concerns, issues and best practices

The FHWA has developed the Work Zone Mobility and Safety Self-Assessment (WZ SA) tool to help agencies evaluate work zone practices and help assess work zone practices nationally. The WZ SA tool consists of a set of 46 questions designed to assist those with work zone management responsibilities in assessing their programs, policies and procedures with many of the good work zone practices in use today. The questions are scored on a 0 to 15 scale. Beginning in 2003, FHWA division offices have worked in partnership with their respective states to complete a WZ SA each year to assess each state's work zone practices and program. The goal of the 2011 WZ SA was to evaluate the progress made since the last WZ SA in 2010 and to reassess program initiatives at both the local and national levels.

The WZ SA asked respondents to rate the extent to which a particular policy, strategy, process, or tool, has been adopted into the agency's way of doing business. The adoption process consisted of five progressive levels on a scale from 0 to 15, based on the quality improvement process model used by industry: initiation (0-3), development (4-6), execution (7-9), assessment (10-12), and integration (13-15).

Table 1 presents the overall score for Michigan on the WZ SA. In calculating the overall score on the WZ SA, a weighting scheme has been applied to reflect the relative importance of each section on the overall score. This scheme assigns the following weights to each section:

1. Leadership and Policy: 10%
2. Project Planning and Programming: 15%
3. Project Design: 25%
4. Project Construction and Operation: 25%
5. Communications and Education: 15%
6. Program Evaluation: 10%

After applying the weighting scheme, the Michigan overall WZSA score for 2011 is 12.9. The national average score for 2011 is 10.3.

Table 1. Overall Self-Assessment Score (0 to 15 scale)

	2010 Weighted Score	2011 Weighted Score	Percent Change from 2010 to 2011
Michigan	13.1	12.9	-1.5%
National Average	10.0	10.3	3.0%

Unweighted scores are also provided, in Table 2, since these values indicate the average score for each section on the 0 to 15 WZ SA scoring scale. The individual section weights are applied to each of the unweighted section scores and the resulting six values are added to obtain the final overall/weighted score.

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Table 2. Mean Scores for Each Section

Section	2010 Michigan Unweighted Score	2011 Michigan Unweighted Score	Net Percent Change 2010-2011	2011 National Unweighted Average
Section 1 – Leadership and Policy	12.3	12.3	0.0%	10.0
Section 2 – Project Planning and Programming	14.3	14.3	0.0%	8.9
Section 3 – Project Design	14.6	14.3	-2.1%	10.5
Section 4 – Project Construction and Operation	12.6	12.6	0.0%	10.8
Section 5 – Communications and Education	12.4	11.2	-9.7%	12.6
Section 6 – Program Evaluation	11.0	11.0	0.0%	7.5

Note: Individual section averages and overall scores have been rounded for presentation purposes.

Leadership and Policy

Table 3 presents the Michigan scores for the questions in the Leadership and Policy Section. Leadership support should drive overall policymaking in an agency. The direction provided by this support fosters an environment that is conducive to developing an effective work zone program. Consideration and management of work zone mobility and safety impacts should be part of project planning, design and construction and maintenance activities. Agency management should facilitate and encourage a multidisciplinary approach to traffic management throughout all phases in the life of a project. Senior managers should be personally, visibly and proactively involved in efforts to minimize work zone delay and enhance the safety of motorists and workers in work zones.

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Table 3. Leadership and Policy Scores

Item	Question	2010 Michigan Score	2011 Michigan Score	2011 National Average
4.1.1	Has the agency developed a process to determine whether a project is impact Type I, II, III or IV?	15	14	10.7
4.1.2	Has the agency established strategic goals specifically to reduce congestion and delays in work zones?	14	14	9.3
4.1.3	Has the agency established strategic goals specifically to reduce crashes in work zones?	14	14	9.8
4.1.4	Has the agency established measures (e.g., vehicle throughput or queue length) to track work zone congestion and delay?	13	13	8.3
4.1.5	Has the agency established measures (e.g., crash rates) to track work zone crashes?	12	12	10.5
4.1.6	Has the agency established a policy for the development of Transportation Management Plans to reduce work zone congestion and crashes?	13	13	11.5
4.1.7	Has the agency established work zone performance guidance that addresses maximum queue lengths, number of open lanes, maximum traveler delay, etc.?	13	13	10.2
4.1.8	Has the agency established criteria to support the use of project execution strategies (e.g., night work and full closure) to reduce public exposure to work zones and reduce the duration of work zones?	14	14	11.8
4.1.9	Has the agency developed policies to support the use of innovative contracting strategies to reduce contract performance periods?	10	11	11.6
4.1.10	Has the agency established formal agreements, such as Memoranda of Understanding (MOU), with utility suppliers to promote the proactive coordination of long-range transportation plans with long-range utility plans, with the goal of reducing project delays and minimizing the number of work zones on the highway?	5	5	6.7

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Project Planning and Programming

Table 4 presents the Michigan scores for the questions in the Project Planning and Programming Section. While transportation planning and implementation processes differ significantly from state to state, they all focus on developing increased capacity and efficiency in the transportation system. They do this with the development of long-range transportation plans (LRTPs), transportation improvement program plans (TIPs), unified planning work programs (UPWPs), and in some cases, congestion management system (CMS) plans. Although the role of the planner in the development of project-specific criteria has not been universally defined, it is clear that the complexity of our transportation systems and the impact of congestion on our nation necessitate input from planners during the project development process in order to better assess and manage work zone impacts.

Table 4. Project Planning and Programming Scores

Item	Question	2010 Michigan Score	2011 Michigan Score	2011 National Average
4.2.1	Does the agency's planning process actively use analytical traffic modeling programs to determine the impact of future Type I and II road construction and maintenance activities on network performance?	13	13	8.6
4.2.2	Does the agency's regular planning process analyze the network to develop adequate alternate options for routing traffic in anticipation of various needs for future road construction and maintenance?	14	14	8.6
4.2.3	Does the agency's planning process manage the transportation improvement program to eliminate network congestion caused by poorly prioritized and uncoordinated execution of projects?	14	14	8.9
4.2.4	Does the agency's transportation planning process include a planning cost estimate review for Types I, II and III projects that accounts for traffic management costs (e.g., incident management, public information campaigns, positive separation elements, uniformed law enforcement and Intelligent Transportation Systems [ITS])?	15	15	9.0
4.2.5	Does the agency's transportation planning process include active involvement of planners during the project design stage to assist in the development of congestion mitigation strategies for Type I and II projects?	15	15	9.0
4.2.6	Does the agency's transportation planning process engage planners as part of a multidisciplinary/multiagency team in the development of Transportation Management Plans involving major corridor improvements?	15	15	9.2

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Project Design

Table 5 presents the Michigan scores for the questions in the Project Design Section. Project designers, working in concert with other functional experts, should consider work zone maintenance of traffic issues early in the design process. Designers should examine the use of different project execution strategies that can accelerate construction, thereby reducing construction time and minimizing the exposure of travelers to work zones and workers to traffic. In addition, designers should actively lead the preparation of Transportation Management Plans, including Traffic Control Plans, to mitigate the impact of work zone activities.

Table 5. Project Design Scores

Item	Question	2010 Michigan Score	2011 Michigan Score	2011 National Average
4.3.1	Does the agency have a process to estimate road user costs and use them to evaluate and select project strategies (full closure, night work, traffic management alternatives, detours, etc.) for Type I and II projects?	15	15	10.7
4.3.2	Does the agency develop a Transportation Management Plan that addresses all operational impacts focused on project congestion for Type I and II projects?	15	15	11.2
4.3.3	Does the agency use multidisciplinary teams consisting of agency staff to develop Transportation Management Plans for Type I and II projects?	15	15	11.4
4.3.4	Does the agency perform constructability reviews that include project strategies to reduce congestion and traveler delays during construction and maintenance for Type I and II projects?	15	15	12.1
4.3.5	Does the agency use independent contractors or contractor associations to provide construction process input to expedite project contract times for Type I and II projects?	13	13	9.3
4.3.6	Does the agency use scheduling techniques that are based on time and performance, such as the critical path method or parametric models, to determine contract performance times for Type I and II projects?	15	15	11.2
4.3.7	Does the agency have a process to evaluate the appropriate use of ITS technologies to minimize congestion in and around work zones for Type I, II and III projects?	15	10	9.1
4.3.8	Does the agency use life-cycle costing when selecting materials to reduce the frequency and duration of work zones for Type I, II and III projects?	15	15	10.7
4.3.9	Does the agency have a process to assess projects for the use of positive	15	15	12.5

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Item	Question	2010 Michigan Score	2011 Michigan Score	2011 National Average
	separation devices for Type I and II projects?			
4.3.10	Does the agency anticipate and design projects to mitigate future congestion impacts of repair and maintenance for Type I, II and III projects?	15	15	10.2
4.3.11	When developing the Traffic Control Plan for a project, does the agency involve contractors on Type I and II projects?	13	14	7.8
4.3.12	When developing the Traffic Control Plan for a project, does the agency use computer modeling to assess Traffic Control Plan impacts on traffic flow characteristics such as speed, delay and capacity for Type I and II projects?	14	14	9.8

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Project Construction and Operation

Table 6 presents the Michigan scores for the questions in the Project Construction and Operation Section. A roadway construction or maintenance site can be a very complex orchestration of activities impacting the public in many ways. There are many pieces to the project delivery process and everyone has a critical role, but what the public mostly sees and experiences is the construction end of the process. The use of letting strategies, quality-based contractor selection, time-sensitive bidding, efficient operations, traffic management, aggressive contract management and timely public information can help transportation agencies improve the execution and public perception of transportation improvements.

Table 6. Project Construction and Operation Scores

Item	Question	2010 Michigan Score	2011 Michigan Score	2011 National Average
4.4.1	Is the letting schedule altered or optimized to reflect the available resources and capabilities of the construction industry?	13	13	10.2
4.4.2	Is the letting schedule altered or optimized to minimize disruptions to major traffic corridors?	13	13	11.0
4.4.3	When bidding Type I and II projects, does the agency include road user costs in establishing incentives or disincentives (e.g., I/D, A+B or lane rental) to minimize road user delay caused by work zones?	15	15	11.6
4.4.4	When bidding Type I, II and III projects, does the agency use performance-based criteria to eliminate contractors who consistently demonstrate their inability to complete a quality job within the contract time?	15	15	7.8
4.4.5	When bidding Type I and II project contracts, does the agency use incident management services (e.g., wrecker, push vehicles and service patrols)?	14	14	11.2
4.4.6	When bidding contracts, does the agency use flexible starting provisions after the Notice to Proceed is issued?	3	3	10.6
4.4.7	During Type I, II and III projects, does the agency use uniformed law enforcement?	15	15	13.3
4.4.8	Does the agency provide/require training of contractor staff on the proper layout and use of traffic control devices?	12	12	12.6
4.4.9	Does the agency provide training to uniformed law enforcement personnel on work zone devices and layouts or ensure law enforcement personnel receive proper training elsewhere?	13	13	8.8

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Communications and Education

Table 7 presents the Michigan score's for the questions in the Communications and Education Section. To reduce public anxiety and frustration regarding work zones, it is important to sustain effective communications and outreach with the public regarding road construction and maintenance activity, and the potential impacts of the activities. This also increases the public's awareness of such activities. The lack of information is often cited as a key cause of frustration for the traveling public. Agencies should identify and consider key issues from public information and outreach perspective.

Table 7. Communications and Education Scores

Item	Question	2010 Michigan Score	2011 Michigan Score	2011 National Average
4.5.1	Does the agency maintain and update a work zone website providing timely and relevant traveler impact information for Type I, II and III projects to allow travelers to make effective travel plans?	15	15	13.2
4.5.2	Does the agency sponsor National Work Zone Awareness Week?	3	3	12.0
4.5.3	Does the agency assume a proactive role in work zone educational efforts?	15	9	12.8
4.5.4	During Type I, II and III project construction, does the agency use a public information plan that provides specific and timely project information to the traveling public through a variety of outreach techniques, (e.g., agency website, newsletters, public meetings, radio and other media outlets)?	15	15	13.6
4.5.5	During Type I, II and III projects, does the agency use ITS technologies to collect and disseminate information to motorists and agency personnel on work zone conditions?	14	14	11.1

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Program Evaluation

Table 8 presents the Michigan scores for the questions in the Program Evaluation Section. Evaluation is necessary to identify successes and analyze failures. Work zone performance monitoring and reporting at a nationwide level can increase the knowledge base on work zones and lead to the development of better tools to help agencies better plan, design and implement road construction and maintenance projects. At the local level, performance monitoring and reporting provides an agency with valuable information on the effectiveness of congestion mitigation strategies, contractor performance and work zone safety.

Table 8. Program Evaluation Scores

Item	Question	2010 Michigan Score	2011 Michigan Score	2011 National Average
4.6.1	Does the agency collect data to track work zone congestion and delay performance in accordance with agency-established measures? (See Section 1, item 4.1.4)	15	15	6.6
4.6.2	Does the agency collect data to track work zone safety performance in accordance with agency-established measures? (See Section 1, item 4.1.5)	12	12	9.2
4.6.3	Does the agency conduct customer surveys to evaluate work zone traffic management practices and policies on a statewide/area-wide basis?	7	7	6.7
4.6.4	Does the agency develop strategies to improve work zone performance on the basis of work zone performance data and customer surveys?	10	10	7.6

2011 Work Zone Mobility and Safety Self-Assessment Summary

The overall work zone program for Michigan is 2.6 points above the national average but there is still room for improvement. After reviewing the results it was determined that there was a clear drop in the communication and education of work zones safety and mobility over the past year. This falls in line with what was determined from the listening sessions, and “Topic #2: Additional training for determining user delay and writing TMPs.” As a department, this is something that could be handled by working with American Traffic Safety Services Association (ATSSA) and FHWA on a plan for Work Zone Awareness Week to educate and increase awareness. Holding events around the state will allow for a forum for educating staff on facts and statistics about work zones.

Successful Best Practices

Work Zone Enforcement

MDOT, in partnership with FHWA, has re-established guidelines to address the use of both state and local uniformed law enforcement on federal-aid highway projects. These guidelines are outlined in the MDOT Guidance Document 10202, attached in Appendix 3, and are in response to the Work Zone Safety and Mobility Final Rule regarding Temporary Traffic Control Devices Section 630.1106 of Subpart K.

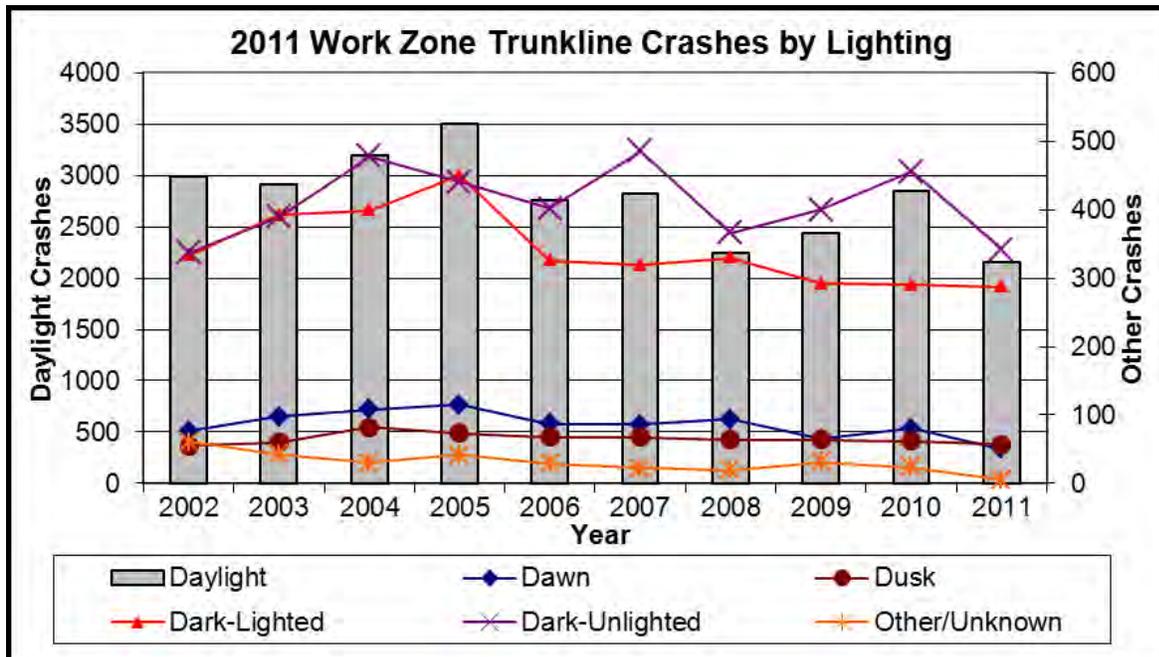
Internal Traffic Control Plan Requirements

With the revision to the MDOT Standard Specifications for Construction 2012, a section was added to improve work zone safety and increase mobility by requiring the submittal of an internal traffic control plan. This plan is required to outline the contractor's haul routes, work zone access points and the maintenance of the temporary traffic-control devices. The plan must ensure the work zone traffic control plan minimizes conflicts between construction vehicles and motorists, and maintains overall safety and mobility within the work zone.

Lighting specifications

In response to the increased amount of night work being performed to increase mobility on MDOT roadways MDOT and FHWA provided education on lighting requirements based on the existing Michigan Occupational Safety and Health Administration (MIOHSA) General Rule R408.40133. Section 812.03.H of the 2012 Standard Specifications for Construction covers General Rule R408.40133 and what is required from the contractor to be able to safely perform work at night.

Figure 1: State Trunk Line Work Zone Crashes by Lighting

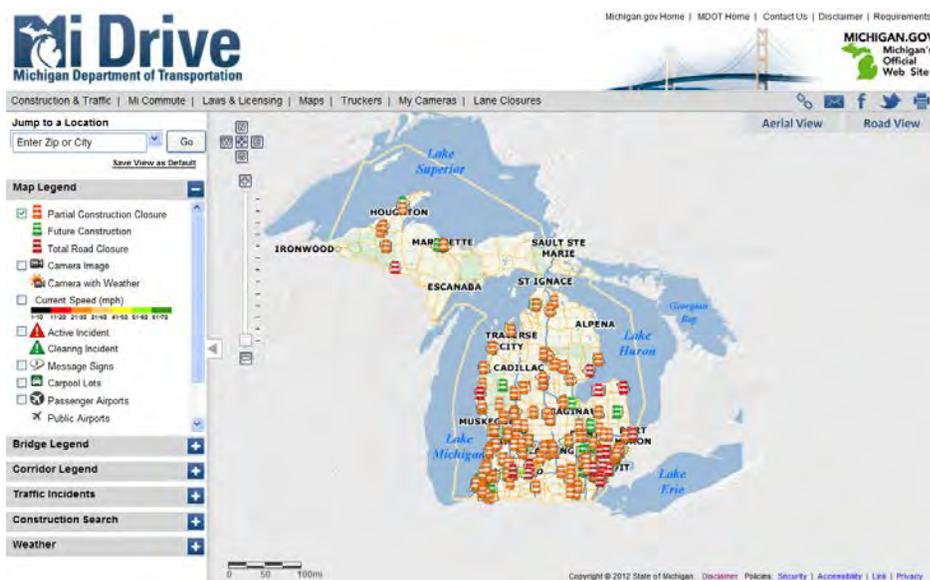


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Mi Drive Interactive Map

Originally introduced in 2007, the Mi Drive site has been revised several times and has proved to be popular with motorists with more than 225,000 individual page views in May 2012. The site is maintained by the Department of Technology, Management and Budget, the state's Center for Shared Solutions & Technology Partnerships, and MDOT. On June 27, 2012, MDOT unveiled upgrades to the Mi Drive traffic data Web site, including a corridor dashboard to display road and traffic conditions on busy I-94, a major route for both commercial and passenger traffic. Both the Web and mobile-based versions of Mi Drive have the same address: www.michigan.gov/drive.

Figure 2: Screen shot of the MI Drive Home Page



I-94 Corridor Operations Partnership

MDOT was recognized with the President's National Performance Excellence Award at the 2011 American Association of State Highway and Transportation Officials (AASHTO) Annual Meeting for the work that is being done on the I-94 corridor. MDOT organized into four key teams and collaborated to successfully achieve two major outcomes: Safe Reliable Travel on I-94 and Reduced User-Cost Delays. The team focused on Weather Travel Impacts, Speed Reliability and Single Trip Delay, and Traffic Incident Management. ([Detailed report](#) in Appendix 4.)

Rollover crash reduction methods

In the past, MDOT has seen a number of rollover crashes in work zones. To counteract this, MDOT developed some innovative tools that have been used around the state to improve safety. The Traffic Incident and Work Zone Management Unit is currently developing a system operations advisory to provides information on when to consider using these tools in a work zone. The first tool is a safety edge (or "safety shoe") used during the paving process. It adds a 30-degree angle to the edge of a road to help a motorist who drives off the pavement to steer their vehicle back onto the road more easily. A road with a typical 90-degree edge makes getting all four tires back on the road more difficult.

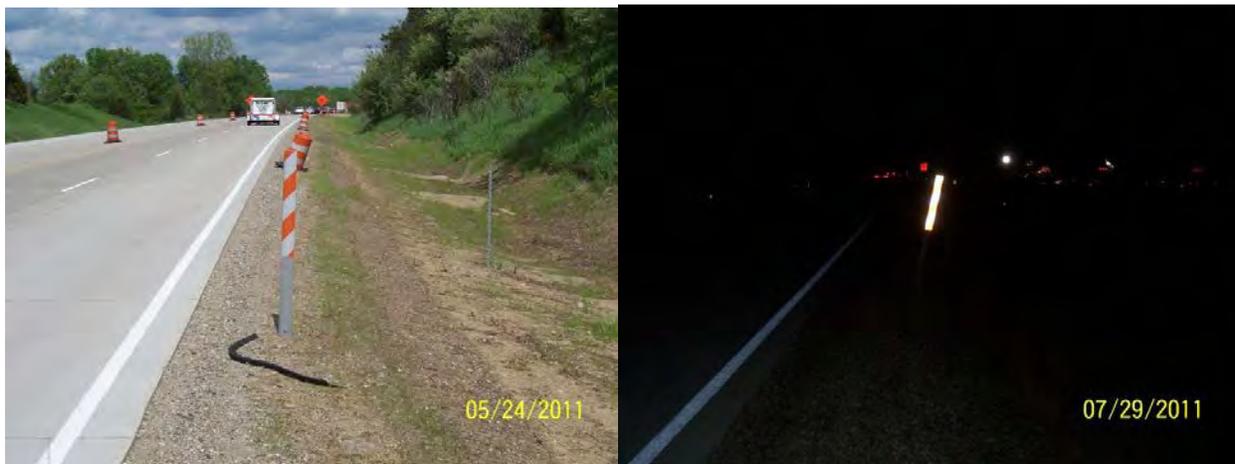
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Figure 3: Safety Shoe Attached to a Paver (left) and the Result (right).



The second tool is a variation of a roadside delineator. Flexible delineators are shown in Figure 4. Delineation has been used in a number of projects. The goal is to provide additional edge line delineation along an open shoulder.

Figure 4: Flexible Delineators used by MDOT



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Work Zone ITS Systems

MDOT has the ability to post timely incident management response messages, current and accurate construction scheduling messages, or real-time traveler information utilizing National Transportation Communications for ITS Protocol (NTCIP) compliant Portable Changeable Message Boards (PCMS). The NTCIP system is only considered for use on high profile projects where there is a need to post real-time information, areas with historically high crash rates or high impact roadways. The recommendation for use should be considered and documented during the development of the Transportation Management Plan in accordance with the department's Work Zone Safety & Mobility Policy.

Figure 5: NTCIP Portable Changeable Message Boards in use.



Temporary Sign Storage

In 2012, MDOT updated the guidelines for storing and covering temporary sign on the roadway. The new language in the 2012 Standard Specifications for Construction states the following:

“For shoulders with no barrier walls, if removing temporary signs on portable supports, remove the sign stands from the uprights. Lay the sign flat, off the shoulder, and place the uprights facing downstream from traffic. Remove support stands and ballasts from the shoulder.

For shoulders with barrier walls, if removing temporary signs on portable supports, remove the sign stands from the uprights, and place against the barrier wall. Place the uprights facing downstream from traffic and place support stands and ballasts close to the barrier wall. Do not place sign covers on temporary sign systems on portable supports located on shoulders with no barrier walls.

Cover temporary signs on portable supports that straddle barrier wall, required to remain on the project while not in use. Remove sign covers from the roadway, or store against the barrier wall, when not in use.

For locations with guardrail, if conditions require temporary removal of temporary signs on portable supports, remove the sign stands from the uprights. Lay the sign behind the guardrail, and place support stands and ballasts close to the guardrail.

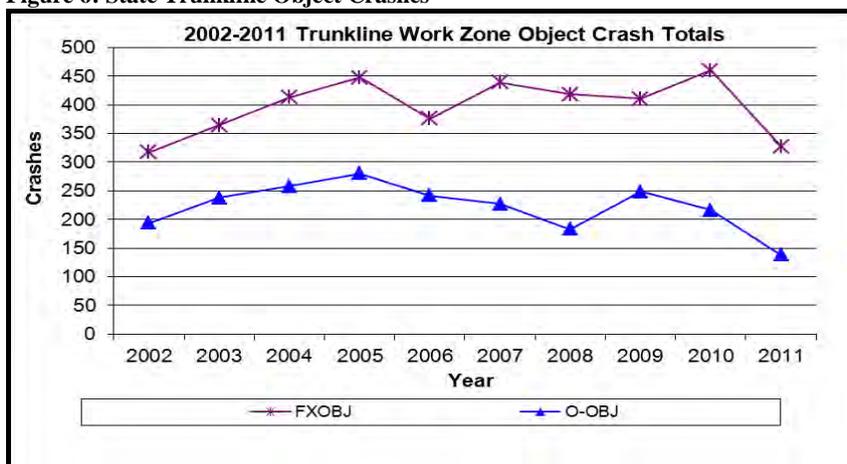
Do not obstruct or interfere with attenuation devices when storing temporarily removed temporary signs on portable supports.

Do not use burlap or similar material to cover Department owned signs. The Contractor may use soft covers on other temporary signs.”

This additional guidance on the placement and storage of signs has improved the safety of MDOT roadways as shown by Figure 6 below. There was a reduction of object crashes during the 2011 construction season, the first season the guidelines were enforced.

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Figure 6: State Trunkline Object Crashes



Peer Review Implementation Team (PRIT)

On August 7, 2012, the Peer Review Implementation Team (PRIT) was assembled to help determine what areas should be focused on for this process review and what areas should be tabled for future reviews. The goal was to take the LSRT topics and feedback and turn them into an action plan. The focus of the action plan was determined based on a combination of feasibility and effectiveness. The PRIT (listed below) was tasked with taking all of the information gathered during the Process Review and develop a feasible and effective plan. The results from the PRIT are shown below in the PRIT Action Plan.

Peer Review Implementation Team (PRIT)

Jen Foley	Assistant Delivery Engineer	University Region
Hilary Owen	System Operations Engineer	Operations Division
Angie Kremer	Traffic Incident Management Engineer	Operations Division
Chris Brookes	Work Zone Delivery Engineer	Operations Division
Aaron Raymond	Assistant Traffic, Safety and Operations Engineer	Metro Region
Garrett Dawe	Traffic, Safety and Operations Engineer	North Region

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Action Plan

Topic #1: Determination of a significant project: MDOT is in the process of revising all the relevant documents and getting approval for the changes. This revision process is currently underway and a status update will be given during the next work zone safety and mobility process review.

Topic #2: Additional training for determining user delay and writing TMP's: A pilot training session was created and took place on August 27, 2012 in the Metro Region. Feedback from this session, along with feedback from the LSRT, will be used to create a training course; a status report will be given as part of the next process review on the courses progress.

Topic #3: Revision of the Mobility Documents: Clarification and revisions to the Work Zone Safety and Mobility Manual are currently taking place. A report of all the major changes will be provided with the next process review.

Item #4: Crash Mitigation Matrix: A crash reduction table will be created and added to the *Work Zone Safety and Mobility Manual* to provide operations engineers with a list of common strategies used to reduce crashes. An update on the status of this matrix will be provided with the next policy review.

Item #5: Selection of the correct MOT method/alternative: A research project has been advertised that will gather information that will be used to improve the MOT selection process in the future. This item will be addressed in the next process review after more information and research has been gathered.

Item #6: After completion requirements for TMPs: No further action will be taken at this time. The topic will be revisited in a future review pending on the effectiveness of Post Construction Review meetings.

Item #7: TMP Best Practices: A file will be created tracking best practices used on TMPs and will be located on MDOT's internal file sharing system (Project Wise). This will be an ongoing effort by the Statewide Peer Review Team.

Item #8: Measuring project delay: Table 13.1 will still be used but some clarification will be added as part of Item #3. This topic will be looked at again with the next review to determine if the Operations Field Services Division has found an acceptable computer program to provide project delay information.

Item #9: Value Engineering Change Proposal (VECP) on a TMP: This topic is being handled by the Construction Field Services Division and will be incorporated into projects with MOT special provisions. The effectiveness of this will be reported on in the next process review.

Item #10: Pedestrian Traffic Control: This item is being worked on within MDOT but will not be complete as part of this process review. This will be looked at again in a future review.

Item #11: Work Zone Awareness: MDOT will become an active member in Work Zone Awareness Week in 2013 so that education and awareness can be increased. Statewide events will provide a forum for educating staff on facts and statistics about work zones.

APPENDICES

Appendix 1: Mobility Policy Review Listening Session Questionnaire

Appendix 2: Listening Session Attendance Lists

Appendix 3: Work Zone Enforcement MDOT Guidance Document 10202

Appendix 4: I-94 Corridor Operations Partnership

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Appendix 1: Mobility Policy Review Listening Session Questionnaire

Name: _____ Region: _____ TSC: _____
Position: _____ Date: _____

- 1) How has the Mobility Policy affected the way that you approach projects, and what are the positive and negative affects? Please provide specific examples if possible.

Positive: _____

Negative: _____

- 2) What is the most beneficial part of the mobility policy?
a. Any items that could change or be addressed to improve or clarify the policies purpose?

- 3) What are the most ineffective parts of the mobility policy?
a. Any items that could change or be addressed to improve or clarify the policies purpose?

- 4) How are you determining a capacity and a diversion rate for analysis of significant construction project? (Traffic and safety notes, lane configuration, project duration, Planning, TTC lay out, location, prior diversion, alt routes)
a. For Diversion rates are you using assumed values, or values found from similar projects in the area, have you checked your assumptions during construction?

- 5) How are you quantifying projects in terms of being significant and should there be any changes to the current methods in place (CO3)? Are you looking at delays on detour or alternate routes?
a. Provide example of anticipated delay vs. actual delay, if you have any.

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- 6) List work zone issues that have been found on projects from post construction meetings, and solutions to go with them. (Example: the joint location and condition when using temp widening and its location relative to the wheel path in the traveled lane)
-
-

a. How many post construction meetings have you had?

b. What has been the best value to come out of these meetings, and or do you have any suggestions to improve these meetings?

- 7) Are there any new or additional methods that are being used that are not currently in the policy? (i.e., new technology, improvements to PIP, safety influence factors, additional traffic control methods, outside the box solutions, etc.)
-
-

- 8) Have you been reviewing crash data after a project has been complete, and comparing the before during and after numbers? Send crash data files to brookesc@michigan.gov if you have them.
-

a. If yes, are there any trends or findings that are of value to other regions or TSCs? (Night vs. Day, different types of lanes closures cause more of one certain type of crash, shy distance X feet creates issues, etc.)

b. For your projects, please provide the list of shy distances you have used to different types of TCDs and the peak hour volumes.

- 9) How has the 25% threshold for MOT cost played into your projects, has it changed a MOT method, and what is a ball park average that you think you are spending on MOT compared to project cost for a significant project?

a. Provide example projects where this has created an issue.

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10) From a corridor stand point, (I-94, I-75, I-69, I-96, US-127, US-131, US-2 etc.) what steps are currently being taken to make sure you don't run into multiply project delays? Is there currently communication between TSCs in different regions, and what is an acceptable delay?

a. Are there any best practices on how to qualify the importance roadway segments?

b. If there already is communication what have you found to be the most successful method of communication?

c. What changes if any would you make to the communication that is already taking place to improve it?

11) What methods are you using to measure your delay on projects? (OpsTrac, Navteq, field measurements, etc.)

a. Please provide your delay measurements you have taken for significant projects? (send files to brookesc@michigan.gov)

b. Do you have any suggestions and/or comments on the way delay should be measured?

c. Is there any method that you are using to determine the frequency in which you are taking measurements?

12) Please provide any additional comments or concerns that have not been addressed above.

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Appendix 2: Listening Session Attendance Lists

Southeast Michigan Meeting Attendees – Held at the Oakland TSC

1. Keith Brown – Operations Engineer
2. Mike Budai – Traffic and Safety Engineer
3. Linda Burchell – Davison TSC Manager
4. Cedric Dargin – Region Construction Engineer
5. Larry Dropiewski – Operations Engineer
6. Jennifer Foley – Region Assistant Delivery Engineer
7. Jack Hofweber – Bay City TSC Manager
8. Armando Lopez – Construction Engineer
9. Rob Morosi – Communications Specialist
10. Eric Mueller – Region Traffic Safety and Operations Engineer
11. Gerard Pawloski – Construction Engineer
12. Thomas Pozolo – Operations Engineer
13. Wendy Ramirez – Traffic and Safety Engineer
14. Adam Rivard – Operations Engineer
15. Phil Sekela – Construction Engineer
16. Maria (Mia) Silver – Associate Region Operations Engineer
17. Scott Singer – Operations Engineer
18. Tim Smith – Civil Technician Supervisor
19. Willie Souaid – Local Agency Project Engineer
20. Steve Stramsak – Traffic Operations Engineer
21. Paige Williams – Region System Manager
22. Paul Wisney – Projects/Contracts Engineer
23. Harold Zweng – Region Construction Engineer

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Northern Michigan Meeting Attendees (North Region Office)

1. Brian Atkinson – Operations Engineer
2. Steve Cadeau – Transportation Engineer Traffic and Safety
3. Patrick Casey – Assistant Construction Engineer
4. Stephen Conradson – Traffic and Safety Engineer
5. Garrett Dawe – Traffic, Safety, and Operations Engineer
6. Jeff Hunt – Transportation Maintenance Coordinator
7. Aaron Johnson – Traffic and Safety Engineer
8. Patricia Johnson – Operations Engineer
9. Daniel Kari – Construction Engineer
10. Mary Lajko – Utility/Permit Technician
11. Dan Lund – Traffic and Safety Engineer
12. Jay Maufort – Region Construction Engineer
13. Ryan McDonnell – Assistant Traffic and Safety Engineer
14. Jonathan Myers –Traffic and Safety Engineer
15. Gary Niemi – Operations Engineer
16. Kevin Schaedig – Operations Engineer
17. Margaret Szajner – Transportation Engineer
18. Brian Ulman – Construction Engineer
19. Bill Wahl – Associate Region Engineer Operations
20. Justin Wing – Utility and Permit Engineer
21. Kim Zimmer – Region Traffic and Safety Engineer

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Western Michigan Meeting Attendees (Grand Region Office)

1. Paul Arends – Operations Engineer
2. Michael Bippely – Traffic, Safety and Operations Engineer
3. Pamela Blazo – Traffic and Safety Engineer
4. Stephen Brink – Region Traffic, Safety and Operations Engineer
5. Dave Brinks – Transportation Maintenance Coordinator
6. Janine Cooper – Associate Region Engineer/Operations
7. Art Green – Muskegon TSC Manager
8. Richard Hassenzahl – Region Maintenance Superintendent
9. Kenneth Hildebrand – Transportation Maintenance Coordinator
10. Jeremy McDonald – Region Construction Engineer
11. LeighAnn Mikesell – Operations Engineer
12. Suzette Peplinski – Traffic, Safety and Operations Engineer
13. Curtis Perkins – Maintenance Superintendent
14. Timothy Terry – Traffic/Permits Engineer
15. Erick Kind – Grand Rapids TSC Manager
16. Tim Little – Associate Region Engineer
17. Gary Loyola – Traffic, Safety and Operations Engineer
18. Jeremy Wiest – Assistant Operations Engineer
19. Andrea Wilcox – Region Design Engineer

Central Michigan Meeting Attendees (Horatio S. Earle Learning Center)

1. Dave Morena – FHWA
2. Stephanie Palmer – Region Traffic & Safety Engineer
3. Harold Zweng – Region Construction Engineer
4. Jim Daavettila – Delivery Engineer
5. Tom Simpson – Transportation Maintenance Coordinator
6. Roslyn Hagood – Traffic and Safety Engineer
7. Kelby Wallace – Delivery Engineer
8. Kitty Rothwell – Associate Region Engineer for Development
9. Kurt Fritz - Transportation Maintenance Coordinator
10. Gregg Zack – Construction Engineer
11. Andy Strupluis – Construction Engineer
12. Stephen Shaughnessy - Traffic and Safety Engineer
13. Alissa Hubbell – Operations Engineer
14. Kari Arend – Communications Representative
15. John Engle – Traffic and Safety Engineer
16. Robert Welch – Construction Engineer
17. Greg Losch – Construction Engineer

Appendix 3: Work Zone Enforcement MDOT guidance document 10202

<http://apps.mdot.state.mi.us/interchange/guidocs/files/10202.pdf>

Appendix 4: I-94 Corridor Operations Partnership

http://michigan.gov/mdot/0,4616,7-151-9620_11057-264192--,00.html

MDOT team gets national award for making improvements to busy I-94 corridor

Contact: Jeff Cranson, MDOT Director of Communications, 517-335-3084

Agency: Transportation

FAST FACTS:

- MDOT team partnered along the I-94 corridor to keep the series of work zone delays to under 40 minutes. Projects were reconfigured prior to and during construction to keep delays to under 40 minutes.
- For southwest Michigan, all 2010 delays due to winter weather, work zones, and incidents were measured and a user-delay cost of \$13.4 million was calculated. An ambitious maximum user-delay cost goal of \$10 million was established for 2011.
- Between Jan. 1 and June 13, 2011, user-cost delays amounted to \$4.21 million, which was under the \$4.50 million in user-cost delays targeted for that time period.
- Between Jan. 1 and Oct. 10, 2011, user-cost delays amounted to \$7.47 million, which was under the \$7.77 million in user-cost delays targeted for that time period.

October 18, 2011 -- The Michigan Department of Transportation (MDOT) has received a prestigious national award for creating a partnership that improved traffic operations and system reliability along the I-94 corridor that links Port Huron and Detroit to Chicago and Toronto. The department's I-94 Corridor Operations Partnership was recognized by the American Association of State Highway and Transportation Officials' (AASHTO) President's National Performance Excellence Award at the AASHTO Annual Meeting in Detroit on Oct. 16.

"This award recognizes this team's focus on achieving its objectives," said State Transportation Director Kirk T. Steudle. "Approximately 35 employees from three different MDOT regions along the corridor organized themselves into four key teams and successfully achieved two major outcomes, safe and reliable travel on I-94 and reduced user delay costs. I-94 is a major international trade corridor and also is a major route for passenger vehicles. The team has worked hard to identify solutions and measure results to ensure safe and reliable travel on I-94 within Michigan and between Chicago and Toronto."

The I-94 corridor moves a high volume of commercial and passenger vehicle traffic seven days a week, and traffic tie-ups and weather delays jeopardize many industries, particularly those supporting automobile manufacturing, agriculture, and tourism. The Corridor Operations Partnership team prepared for the 2011 construction season by setting travel-time delay goals, measures and strategies to account for the corridor's

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work zone performance. A 40-minute travel-time delay was established for I-94 travelers between the Indiana state line at New Buffalo, Mich., and the Canadian border at Port Huron, Mich. Plans for two Metro Detroit construction projects were reconfigured to reduce unacceptable predicted delays.

The next outcome was to reduce delays and costs associated with winter weather, work zones and incidents along I-94. A maximum user-delay cost goal of \$10 million was established for I-94 in Michigan between New Buffalo and Albion. The goal was benchmarked against a measured \$13.4 million in delays in 2010. Between Jan. 1 and June 13, 2011, \$4.21 million was expended in user delay costs, which came in under the \$4.5 million maximum that was targeted for this timeframe. Between Jan. 1 and Oct. 10, 2011, \$7.47 million was expended by users due to delays, which was less than the \$7.77 million maximum that was targeted for this time frame.

MDOT focused these efforts with three customer groups: I-94 travelers, emergency responders along the corridor and snow plow operators responsible for winter operations along I-94. Customer expectations were benchmarked for the corridor. Collaborative efforts with emergency responders to quickly and safely clear crashes occurred. Snow plow operators measured each winter event's "regain time," which is the time it takes the freeway to return to good condition.

User-delay costs were measured weekly and posted in a performance graphic format and closely monitored. Process maps were developed and accountability software was used for documentation. Throughout the process, the team used a variety of communication strategies to ensure the clarity and consistency of messages to travelers. These ranged from mile marker and exit number standards, usage of standard left-lane closures, and messages posted to Mi Drive, the department's traffic data Web site, and MDOT social media sites, as well as with traditional media outlets.

"As a result of this focused approach, user-delay costs were greatly reduced, providing improved mobility and economic opportunities for moving people and goods on I-94," said MDOT Southwest Region Engineer Roberta S. Welke. "We are committed to meeting the needs of our customers, and working together to achieve our goals was very important to the entire team."

MDOT says: Construction work zones need your undivided attention.