

# FILLING OUT THE TMP WORKSHEETS

## A STEP-BY-STEP PROCESS

REVISED DECEMBER, 2014

## General Information about Help Guide and Spreadsheets

This guide is intended to assist users in completing the Transportation Management Plan (TMP) Data Sheet and Elements Table. The guide provides general descriptions for each element to be considered when developing a TMP for Work Zones.

For detailed descriptions of the various TMP elements, refer to *Developing and Implementing Transportation Management Plans for Work Zones, FHWA Guide 2005.*

- Link to this document in PDF format:  
[http://www.ops.fhwa.dot.gov/wz/resources/publications/trans\\_mgmt\\_plans/trans\\_mgmt\\_plans.pdf](http://www.ops.fhwa.dot.gov/wz/resources/publications/trans_mgmt_plans/trans_mgmt_plans.pdf)
- Link to this document in HTML format: [Developing and Implementing Transportation Management Plans for Work Zones – FHWA Work Zone](#)

Entering a question mark “?” on any item within the TMP Elements Table indicates the specific item will be researched. Provide a comment regarding the required research topic in the TMP Comments & Revisions section of Sheet #3.

The TMP Elements Table is broken down into the three main components: Temporary Traffic Control Plan (TCP), Transportation Operations (TO), and Public Information (PI) components. All projects require a TCP. TO and PI components are required for significant projects and may be appropriate for other projects. Items may be duplicated within the table. For example, Ramp Closure appears in both the TCP and TO Sections, as separate consideration may be given depending on the context of the worksheet section.

Remember the worksheet is a tool to help the design team develop the TMP. This is one piece of the overall TMP and not the TMP in its entirety. Items such as special provisions still need to be completed and included in the contract. The worksheet is intended to help identify all possible TMP strategies appropriate for a given project, and act as a checklist to ensure these strategies are addressed in the plans, special provisions, and cost estimate.

# Worksheet 1 – Project Information

## TMP Data Sheet

- **Project ID:** The project ID number (e.g. STPP 45-2(5)28)
- **Project Location:** The project name/location (e.g. Wheatland Co. Line – East)
- **Project Control No.:** The project control number/uniform project number (e.g. 4889000)
- **Work Type:** Work code number to describe the type of construction project (list of work codes and descriptions are available on the last tabs of the TMP workbook).
- **Background Information**
  - **Duration:** This is the estimate of how long it will take to construct the project. This should be derived using the Contract Time Calculation worksheet as well as from discussions with District Construction personnel. When entering duration, be sure to select the contract time type (i.e. working days, calendar days, etc.).
    - The type of contract time and duration are often determined via a project questionnaire sent to District personnel by Contract Plans, and may not be decided upon early in the design process.
  - **Project Cost:** The total CN cost of the project, including mobilization. Be sure you do not include an estimated cost of traffic control in this total.
  - **TMP Estimate:** This will be filled in automatically, and updated as you add costs to the TMP Elements Table.
  - **Construction Period:** The estimated start date will be based largely on the project letting date. In the preliminary stages, estimate when you think this project will be started, then add the duration to come up with the estimated end date.
- **Impact:** Place an “X” in the appropriate area (Level I, II, or III).
- **Details:** In this section, state general and unique features of the project’s anticipated traffic management. For example, “This project will utilize one lane, two-way traffic control with flaggers. For the pipe replacement at station 32+85, an on-site, offset detour/diversion will be utilized. An alternate route will be signed for motorists to avoid the construction zone completely. Due to the high traffic volumes, an aggressive public awareness program is imperative. Special consideration will be given (including potential periods of no work) for the Big Sky State Games.”
- **Prepared by:** The designer’s name and information.
- **Approved by:** Generally speaking, this will be the project manager’s name and information. In some cases, this may be different and should be discussed with the design team. It may be that a TMP Team is formed (especially for Level I projects). In this case, the approved by information will be “TMP Team”. If a TMP Team is formed, be sure to list all members in the comments section (worksheet #3).

## TMP Sections Cost Estimate Summary

- This section of the worksheet will be filled in automatically, and updated as you add costs to the TMP Elements Table. The purpose of this section is to provide a quick review of the costs of the individual components of the TMP. There is no need to add any information to this section.

## Worksheet 2 – TMP Elements Table

***This TMP presumes work is planned as follows:***

***Regular working hours:*** Work is performed during regular work hours, regardless of peak periods.

***Night work:*** Work is performed at night (end of evening peak period to beginning of morning peak period) to minimize work zone impacts on traffic and adjacent businesses.

***Weekend work:*** Construction work (all or individual phases) is restricted to weekend periods from the end of the Friday afternoon peak period to the beginning of the Monday morning peak period.

***Work hour restrictions for peak travel:*** This involves restricting work hours such that work that impacts traffic does not occur during periods of peak travel demand and congestion (e.g., peak hours, holidays).

***Work hour/day restrictions for special events - describe:*** This involves restricting work hours or days such that work that impacts traffic does not occur during special events (e.g. no work, or limited work, may be allowed during the Crow Fair Days).

***Are lane closure charts required? (Y or N):*** A lane closure chart is a summary table that defines times of the day, week, or season that flagging/shoulder/lane closure is permitted on a facility and at a specific location or segment. It also defines the type of facility and direction of travel that closure restrictions will be enforced.

***If Yes, for which of the following elements:***

***Flagging:*** This is an activity performed by authorized personnel to control traffic at defined points within a construction work zone. Flagging typically has the least impact to the capacity of the roadway and therefore can be allowed for many hours of the day.

***Shoulder:*** This strategy closes the shoulder for use by the public, making it available to accommodate the work activities. This type of closure impacts traffic capacity more than flagging but will impact less than lane closures. Shoulder closures restrictions are usually applied during peak hours when the roadway is at capacity.

***Lane:*** This strategy closes one or more existing traffic lanes to accommodate work activities. This is the most common type of closure during construction. Traffic capacity needs to be checked to identify when lane closure can be permitted.

***Street:*** This strategy closes city streets for use by the public to accommodate work activities.

***Ramp:*** This strategy closes the freeway on/off ramps for use by the public to accommodate work activities.

***Connector:*** This strategy closes a freeway to freeway connector for use by the public to accommodate work activities.

***Extended Weekend Closures:*** This strategy is used when work activities are expected to occur on Saturday and Sunday.

***Total Facility Closures:*** This strategy closes the entire roadway for use by the public to accommodate work activities.

**1 Temporary Traffic Control Plan:** Temporary traffic control strategies, devices, and contracting/construction techniques and coordination are used to facilitate traffic flow and safety through and around work zones. Standards, guidance, and other information defining the proper use of the traffic control strategies and devices are provided in MDT's Standard Specification & Detailed Drawings and Part 6 (Temporary Traffic Control) of the MUTCD and Chapter 9 (Traffic Barriers, Traffic Control Devices, and Other Safety Features for Work Zones) of the AASHTO Roadside Design Guide.

**1A Construction/Control Strategies:** This category includes various traffic control approaches used to accommodate road users within the work zone or the adjoining corridor in an efficient and safe manner, while providing adequate access to the roadway for the required construction, maintenance, or utility work to be performed.

**Sequence of Operations:** A Special Provision can be used to clarify or define construction operations sequencing necessary for work zone safety and mobility at specific locations. The TMP Team will help create these sequencing requirements which are specific to each contract. Some special considerations for sequencing are:

- If a section of the roadway is closed for construction, especially in urban areas, provide in the special a requirement that the roadway is to be opened once the riding surface and pavement markings are placed, i.e. “Once the riding surface is placed, install the pavement markings and open the roadway to traffic within \_\_\_ days.”
- Include any work hour restrictions, i.e. peak travel times.
- Use of Road User Cost Fees.

The following contract time guidelines describe sequencing when determining contract time, see pages 2 and page 10:

[ftp://ftp.mdt.mt.gov/caddstd/DOCUMENTATION/CONSTRUCTION/0804-MDT\\_CONTRACT\\_TIME.PDF](ftp://ftp.mdt.mt.gov/caddstd/DOCUMENTATION/CONSTRUCTION/0804-MDT_CONTRACT_TIME.PDF)

- **Construction phasing/staging:** Staging typically refers to how and where the contractor will store the equipment and stockpile materials. Phasing refers to the sequencing of the aspects of a project, completing portions of the project one part at a time. The impacts of a work zone on traffic may be minimized by using operationally-sensitive phasing and staging throughout the life of the project.
- **Full roadway closures:** This strategy involves complete closure of the roadway for various time periods to minimize the duration of the project and improve worker safety by reducing traffic conflicts. Full closures may be brief (e.g., intermittent), short-term (e.g., night, weekend), or long-term (e.g., continuous for more than 3 days).
- **Lane shifts or closures:** Lane shifts or closures last for varying durations of time. They may be intermittent, off-peak, night, weekend, for a single project phase, or continuous for the duration of the project. This strategy involves multiple approaches including:
  - **Reduced lane widths to maintain number of lanes (constriction):** This involves reducing the width of one or more lanes in order to maintain the existing number of lanes on the facility while permitting work access to part of the facility.
    - **Consideration:** Inform MCS when this strategy is used.
  - **Lane closures to provide worker safety:** This strategy closes one or more existing traffic lanes to accommodate work activities.
    - **Consideration:** Escape paths available for workers to avoid a vehicle intrusion into the work space. Positive protection can be provided by temporary concrete barriers.
  - **Shoulder closures to provide worker safety:** This strategy closes the shoulder for use by the public, making it available to accommodate the work activities.
    - **Consideration:** Enforcement in the work zone can be made difficult if space is not provided for safe enforcement stops.
  - **Lane shift to shoulder/median to maintain number of lanes:** This strategy involves diverting traffic onto the shoulder, or a portion of the shoulder, for use as a traffic lane.
- **One-lane, two-way operation:** One lane, two-way traffic control involves using one lane for both directions of traffic, allowing work activities to occur in the other lane that is now closed.
  - **Consideration:** If this strategy is utilized, be sure to include flaggers (most often short-term) and/or temporary traffic signals (most often long-term).
- **Two-way traffic on one side of divided facility (crossover):** This strategy involves closing one side of a divided facility to permit the work to proceed without traffic interference while both directions of traffic are accommodated on the opposing side of the roadway.

- **Consideration:** Level 1 projects, particularly mainline Interstate in and around urban areas, check peak hour flow rates to estimate potential queuing.
- **Reversible lanes:** This strategy, also known as variable lanes or contra-flow lanes, involves sharing lane(s) of travel to accommodate peak-period traffic flow. The direction of travel in the shared lane varies by time of day or day of the week.
- **Ramp closures/relocation:** Ramp closure involves closing one or more ramps in or near the work zone for specific time periods or construction phases to allow work access or improve traffic flow on the mainline.
- **Parking restrictions:** This involves the restriction of parking within the work zone.
- **Freeway to freeway interchange closures:** This strategy involves closing one or more freeway-to-freeway interchange connectors over a period of time.
- **Pedestrian/bicycle access provisions:** This strategy involves providing alternate facilities for bicyclists and pedestrians (including those with disabilities in accordance with the Americans with Disabilities Act of 1990) in places where the work zone impacts their accessibility. If sidewalk, pedestrian/bike paths, or bike lanes are present within the work zone, measures must be taken to provide safe passage through, or around, the work zone. Even if these facilities do not exist, pedestrian/bicycle safety should be considered, especially in urban areas or along signed bike routes. Closures of sidewalks and/or pedestrian/bike paths are an acceptable alternative and encouraged in construction zones to the extent of limiting ped/bike exposure to work equipment. Detours are to be signed and delineated in these cases.
  - **Consideration:** Extensive reconstruction of sidewalks and streets in an urban area may need special consideration of sequencing to maintain an adequate path of travel for pedestrians. Project-level special provisions may include limitations on the extent of sidewalk ramp closures at any given time, and/or provisions for pedestrian traffic control plans.
- **Business access provisions:** Some projects will have a direct impact on businesses, particularly to accessibility. Accessibility improvements for businesses may include signage or information to direct motorists to the business and/or relocation of access locations. This involves identifying specific measures to ensure businesses along the work zone have continued access.
  - **Consideration:** Some businesses may have regular needs for commercial vehicle access.
- **Adjust intersection operations:** When a work zone impacts an intersection, the operational characteristics of the intersection may need to be adjusted during construction. This could involve re-timing signals, prohibiting turning movements, etc. The Traffic Section should be consulted anytime intersection operations are adjusted.
- **Off-site detours/use of alternate routes:** This strategy involves re-routing some or all traffic off of the roadway under construction and to other existing roadways (e.g. for full roadway closures).
  - **Consideration:** Inform MCS when this strategy is used.
  - **Use of ramps for Interstate traffic:** This strategy may be employed for bridge work on the mainline. This involves closing the mainline and diverting all mainline traffic to the exit ramp and returning through the entrance ramp.
    - **Consideration:** Traffic control at the ramp terminal may need to be revised. Low-volume cross roads are most suitable for this application. Ramp geometrics need to be investigated for their compatibility with mainline traffic flow. In addition, consideration should be given to the effects interstate traffic has on the structure of the ramps and cattleguards, if applicable.
  - **Use of frontage road for Interstate traffic:** Under rare circumstances, interstate traffic may have to be diverted to the frontage road because there are no other viable options for removing the traffic from the work area.

- **Consideration:** Mixing interstate traffic with local frontage road traffic can cause conflicts that must be addressed with signing and other measures. Interstate traffic can include a high percentage of large trucks with heavy loads and the desire to travel at high speeds with few obstructions. Drivers from the interstate are used to one-direction, fast travel with controlled access, while the local frontage road drivers in rural settings are used to slower, easy travel with very low volumes. Both must be warned and reminded that traveling conditions have changed and to be alert to the potential conflicts. In addition, consideration needs to be given to the effects interstate traffic has on the structure of the frontage road.
  - **Alternate route detour signing:** Appropriate and clear signing of an alternate route is imperative for an alternate route detour.
    - **Consideration:** Inform MCS when this strategy is used.
  - **Parking restrictions:** This involves the restriction of parking along an alternate route detour. For example, parking along an alternate route may need to be prohibited due to width restrictions.
  - **Alternate route roadway improvements:** If a substantial amount of traffic is detoured onto an alternate route that has not been designed for the amount of detoured ESAL's, improvements to the surface may be necessary. For example, if interstate traffic is detoured onto a frontage road, it may be necessary to overlay the frontage road to increase the structural capacity.
  - **Alternate route bridge improvements:** Due to an increase in the volume and type of truck traffic detoured to an alternate route, improvements to bridges on the route may be necessary to increase their load capacity (e.g. any load-posted structure would require structural improvements).
    - **Consideration:** Inform MCS when this strategy is used.
  - **Restrictions:** Alternate routes should be reviewed to determine if any clearance (height, width) or weight restrictions exist. These restrictions may require a separate alternate route for over-sized loads.
    - **Consideration:** Inform MCS when this strategy is used.
  - **Clear Zone:** Clear zone limits may change as a result of increased traffic. A review of the alternate route should be conducted to determine if any obstacles require shielding due to the change in clear zone limits.
  - **Local street use (PSA or MOU may be required):** A PSA or MOU may be required if the alternate route detour utilizes local streets (e.g. city streets).
  - **Adjust intersection operations:** Operational characteristics of intersections along the alternate route detour may need to be adjusted due to increased traffic. The Traffic Section should be consulted anytime intersection operations are adjusted.
- **On-site, offset detour/diversion:** This strategy is typically seen for bridge replacements, and involves short, offset detour along the existing route. The terms diversion and detour in this use are interchangeable.

**1B Traffic Control Devices:** MDT's Standard Specifications & Detailed Drawings and the MUTCD provide standards, guidelines, and other information pertaining to installing, maintaining, and operating traffic control devices on streets and highways. Part 6 of the MUTCD, "Temporary Traffic Control," addresses safety, mobility, and constructability issues in work zones, and is applicable to all types of highway work from major construction on high-volume freeways to minor maintenance on residential streets, and everything in-between. Traffic control devices and other safety devices used for work zones include:

- **Temporary signs:** Several types of temporary signs can be used to provide information to road users to enable safe and efficient travel through the work zone or a detour. Temporary signs are an essential and integral part of temporary traffic control, and are used in nearly all work zones. Accepted practices for work zone signing are provided in MDT's Standard

Specifications & Detailed Drawings and the MUTCD, including Part 6 and various other references. Temporary signs typically include the following types:

- **Warning:** These signs give notice to road users of a situation that may not be readily apparent (e.g., speed reductions, road or lane narrows, etc.).
  - **Regulatory:** Regulatory signs provide notice to road users of traffic laws or regulations through the work zone (e.g., speed limits, fine notices, parking restrictions, road closed, etc.).
  - **Guide/information:** Advance signing and signing in and around the work zone area are used to notify the motoring public of the work zone and/or offer options for alternative routes. Signs may include dates and/or locations of construction and/or closures. Detour signs direct motorists onto detour routes, through the detour, and back to the route from which they were detoured. Advance notice is required so that motorists have time to choose an alternate route.
- **Variable message signs:** Both fixed and portable variable message signs are highly effective in conveying work zone information to drivers, especially when that information is subject to frequent change or it addresses a short term or current situation or condition within the work zone. These signs provide real time information to drivers concerning specific work operations, traffic patterns, and other conditions in the work zone. These devices assist drivers in avoiding conflicts and potential crashes as they travel through the work zone.
    - **Consideration:** Variable message signs are limited by MUTCD standards to two phase messages, with three lines per phase. Both phases must be readable twice at the posted speed limit. Consider whether the information demands are great enough to warrant the use of more than one variable message sign for each direction of travel or each location.
  - **Arrow panels:** Also referred to as arrow boards, arrow panels operating in flashing or sequential mode are intended to aid motorists in navigating and merging through and around the work zone.
  - **Channelization devices:** This strategy involves the use of channelizing devices such as flexible guide posts, portable vertical panels, traffic cones, drums, barricades, delineators, or tubular markers for traffic control through the work zone. The purpose is to define the intended travel path through the work zone and delineate potential work zone hazards.
  - **Temporary pavement markings:** Various types of temporary markings on the pavement are available to define travel lanes and provide guidance and information for the road user through the work zone.
  - **Flaggers:** Flaggers, and to a lesser extent police or traffic control officers, are used to direct and control road user and pedestrian traffic in work zones.
  - **Pilot cars:** Pilot cars are used to direct and control road users in work zones by guiding them through the work zone at a controlled speed.
  - **Temporary traffic signals:** This strategy involves the use of fixed or portable temporary traffic signals to improve traffic flow through and near the work zone and/or address safety concerns.
    - **Consideration:** Temporary traffic signals need adequate stopping sight distance for their placement. Guidance for the use of temporary signals can be found in a Construction Memo distributed May 5, 2005, titled “Temporary Traffic Control Signals Guidance”, found here: [www.mdt.mt.gov/business/contracting/docs/memos/05/temp\\_traffic\\_control.pdf](http://www.mdt.mt.gov/business/contracting/docs/memos/05/temp_traffic_control.pdf)
  - **Lighting devices:** A wide range of lighting devices, listed in Part 6 of the MUTCD, is available for use in work zones. Lighting strategies offer enhancement to other work zone strategies by attracting attention to the devices and improving delineation, particularly for adverse conditions. They can also be used for improved worker safety and for guiding road users through a work zone, particularly for night work.
    - **Consideration:** Flagging stations during hours of darkness must be illuminated.

- **Barricades:** A structure that creates an obstacle to prevent the flow of traffic into a work zone or closed area. The barricade forces traffic into a desired direction when used with channelizing devices.
- **Positive Protection Barriers:** A barrier designed to provide protection of workers by containing and redirecting an impacting vehicle. The barrier also prevents workers and equipment from inadvertently moving into traffic. Barriers are typically concrete or water-filled.
- **Pedestrian Devices:** These devices include barriers, fencing, and ramps. They separate and protect pedestrians from traffic and the work zone. They must also satisfy detectable edging ADA requirements.
  - **Barriers:** These barriers protect pedestrians from vehicles and the work zone. Barriers are typically concrete or water-filled.
  - **Fencing/Railing:** A system that channelizes and contains pedestrians through a work zone.
  - **Ramps:** Portable ramps to assist ADA pedestrians maneuver obstacles within the work zone and curb areas.
- **Lump Sum:** When lump sum traffic control is selected, the Contractor bids the TCP as one lump price to include all devices, set ups and moves. Generally, small, isolated projects with simple, fixed traffic control needs are best suited to lump sum bidding.

### 1C Project Coordination, Contracting and Innovative Construction Strategies

- **Project coordination:** Project coordination strategies having the potential to reduce mobility and safety impacts of work zone activities include:
  - **Coordination with other projects:** This involves coordinating, sequencing, and scheduling projects to minimize motorist delay and impacts to potentially affected businesses and communities.
    - **Consideration:** Locally funded projects and actions also have the potential to affect network operations.
  - **Utilities coordination:** This involves coordinating and scheduling utility work both within the impacted work zone area and near the project to minimize potential work disruptions or interruptions due to utility work, and reduce overall construction duration. Coordination can also reduce the recurrence of work zones by doing two jobs together. For example, the installation of a communications conduit (for traffic management, ITS, etc.) along a highway corridor may coincide with a pavement reconstruction project on that highway.
  - **Right-of-Way coordination (construction easement to accommodate traffic or ped use):** Increased consideration of potential right-of-way needs and issues may help reduce project delays and duration. Consider the possibility of acquiring a construction easement through private property to accommodate pedestrian, bike, or other traffic temporarily. This could allow full closure of a facility and lead to faster, more efficient construction. For example, concrete pavement installation in intersections or roundabouts is best suited to construction without traffic of any kind. If the corner business has a drive through facility, they may allow a temporary diversion of traffic through their property with a construction easement, especially if it means monetary compensation and shorter construction delays. Discuss the possibilities during plan reviews and make requests through the District Right-of-Way supervisor.
  - **Coordination with other transportation infrastructure:** Coordination with non-highway transportation facilities such as transit junctions, railroad crossings, and intermodal facilities can help minimize traffic disruptions.
  - **Coordination with Railroad:** Coordination with the Railroad is necessary whenever a project crosses a railroad facility or is on Railroad property. If an anticipated detour route or if traffic queues have the potential to involve a railroad facility, coordination with the Railroad is necessary. Also think about the possibility of strategizing with the Railroad

to minimize impacts to the traveling public during construction. For example, closing a railroad crossing for a short period of time may be more desirable than constructing a temporary crossing. The acceptable closure time would have to be worked out with the Railroad, and all work performed by Railroad forces would have to fit within agreed-upon timeframes.

- **Railroad flaggers:** Railroad flaggers are required whenever construction work is within 50 feet of railroad tracks. The railroad agreement will include the necessary requirements and provisions to be included in the project PS&E. Include costs for flaggers in the project cost estimate based on estimated time needed to complete work on the railroad facility.
- **Contracting strategies:** These strategies typically involve contractual agreements to reduce the project duration or traffic impacts. For more detailed descriptions of these strategies, refer to *Alternative Contracting and Innovative Construction Guide*:

[http://www.mdt.mt.gov/other/const/external/manuals\\_guidelines/innov\\_contr\\_guide.pdf](http://www.mdt.mt.gov/other/const/external/manuals_guidelines/innov_contr_guide.pdf)

Contracting strategies may include:

- **Design build:** This strategy involves the use of one contract to design and build the project thus reducing project duration by allowing construction to begin prior to design completion.
- **A+B bidding:** A+B bidding encourages contractors to minimize construction impacts by reducing construction time. Part A refers to the contractor's bid for the actual items of work, and Part B is the total of the number of days bid to complete the project multiplied by the daily road user cost stipulated in the contract. The combined values of the A and B portions determine the winning bid. The contractor's payment is based on both Part A and the actual number of days used under Part B.
- **Lane rental:** Lane rental involves a charge assessed to the contractor when a portion of the roadway is obstructed and unavailable to traffic. The lane rental charge can vary according to time of day, day of week, number of lanes impacted, and duration. The contractor's bid includes an estimate of the number of hours that closures will be in place, with the actual payment to the contractor based on the actual use of closures.
- **Incentive/disincentive clauses:** This strategy reduces construction time by providing a monetary bonus for early completion or a penalty for late completion of the project or some part of the project.
- **Warranty:** Warranties in highway construction are defined as a guarantee of the integrity of a product and make the contractor responsible for repair or replacement of deficiencies. The goal of a warranty in highway construction is to effectively transfer any risks controlled by the contractor to the contractor.
- **Innovative construction techniques:** These strategies involve the use of special materials such as quick curing concrete or precast items (e.g., culverts, bridge deck slabs, and pavement slabs) to minimize the duration of construction or maintenance activities where traffic restrictions need to be minimized (e.g., roadways with high volumes), and when work activities need to be completed during night or weekend periods to allow reopening travel lanes for normal weekday travel.
  - **Describe:** A description of the innovative construction technique, where it is to be used, and the advantages of its use is required.
- **Accelerated schedule:** This strategy reduces construction time by providing a set schedule or milestones for all, or specific portions, of the project. The cost associated with this technique can be difficult to estimate since the risk placed on the contractor usually results in increased unit bid prices throughout the project bid.
- **Lump sum:** This contracting method for traffic control should only be used on projects with a simple and straight-forward sequence of operations and traffic control plan. In most cases, this will be for a Level III project, and will be the only item checked under the Temporary Traffic Control Plan Component. In some cases, lump sum may be considered for specific elements of the TCP (i.e. crossovers, two-way traffic situations).

## 1D Pedestrian, Bicycle, and ADA accommodations:

- **Signed detours:** This strategy involves re-routing pedestrian and other non-motorized traffic away from the construction zone and onto other existing facilities (e.g. for full sidewalk closures). Special considerations for sight impaired pedestrians may be appropriate, and the detour route should be at least as ADA accessible as the existing closed route.
  - **Consideration:** If temporary facilities for movement of pedestrians are provided, they must meet accessibility standards for new construction. Check detour routes for obstacles and determine if minor improvements are needed.
- **Adjust intersection operations:** When a work zone impacts an intersection, the operational characteristics of the intersection may need to be adjusted during construction. This could involve re-timing signals, installing temporary pedestrian crossing push buttons, etc. Pedestrian and vehicular traffic may be affected quite differently during phased intersection construction and traffic control plans for each will therefore be different.
- **Temporary ramps:** Where pedestrian traffic is rerouted for construction, temporary wheelchair ramps may be necessary along the detoured path to provide ADA access across curbs and other barriers.
  - **Consideration:** If temporary facilities for movement of pedestrians are provided, they must meet accessibility standards for new construction.
- **Dedicated/protected detours (barrier):** This strategy involves the use of channelizing devices for pedestrian traffic control through or around the work zone. The purpose is to define the intended travel path for areas where alternate existing facilities and signing is not appropriate (e.g. pedestrians re-routed onto a street or parking lot). Delineation and detectable edging for sight impaired pedestrians and temporary ramps may be appropriate. R/W construction easements may also be required.

**2 Transportation Operations Component:** Transportation operations strategies are used to mitigate work zone impacts through the use of improved transportation operations and management of the transportation system. TO strategies typically include demand management, corridor/network management, work zone safety management strategies, and traffic/incident management and enforcement strategies.

**2A Demand Management Strategies:** Demand management strategies include a wide range of techniques intended to reduce the volume of traffic traveling through the work zone by such means as diverting travelers to alternate modes, shifting trips to off-peak hours, or shifting vehicles to alternate routes. These strategies include:

- **Ridesharing/carpooling incentives:** This strategy involves the use of various incentives to reduce the number of vehicles traveling through a work zone, and may include:
  - **Park-and-ride promotion:** This involves the creation, expansion, and/or promotion (advertising) of park-and-ride lots to encourage ridesharing or transit use, thus reducing the number of vehicles traveling through the work zone.
  - **Carpool/vanpool:** This strategy involves the use of carpool/vanpool incentives to reduce the number of vehicles traveling through a work zone. Incentives may include preferential parking for carpools, provision of vanpool vehicles, etc.
- **Transit services improvements:** Where appropriate, transit service improvements may include the modification of transit schedules and/or routes, increases in frequency, or the establishment of transit service in the corridor.
- **Shuttle services:** Shuttles and charter buses can reduce traffic volumes through a work zone if a sufficient number of users along the corridor are anticipated to use the service.
- **Variable work hours:** This strategy involves encouraging motorists who typically travel through the work zone during periods of high demand to work variable hours (off-peak) in order to reduce travel demand during peak periods.

- **Telecommuting:** Telecommuting means working at home, or at a telecommuting center near home, either full or part time. Motorists who normally travel through the work zone would be encouraged to telecommute for the duration of the project to reduce the demand.

**2B Corridor/Network Management Strategies:** This category includes strategies to optimize traffic flow through the work zone corridor and adjacent roadways using various traffic operations techniques and technologies, including:

- **Signal timing/coordination improvements:** This involves retiming traffic signals to increase throughput of the roadway(s), improve traffic flow, and optimize intersection capacity in and around the work zone. The Traffic Section should be consulted anytime signal operations are adjusted.
  - **Temporary traffic signals:** The installation of temporary traffic signals can be used to improve traffic flow through and near the work zone. At a corridor or network level, using temporary traffic signals is more effective than stop signs or flaggers for providing mobility through the work zone area. These temporary traffic signals may also be coordinated with existing signals.
    - **Consideration:** Be sure to emphasize to the locals that temporary traffic signals will be removed when the detour is discontinued and traffic operations return to pre-construction states. Alternatively, if a permanent traffic signal is warranted, work with the Traffic and Safety Bureau to install a permanent signal prior to or as a part of the proposed project. Note that a signal warrant study should be requested by a local governing body for consideration of a permanent signal.
- **Street/intersection improvements:** Improvements on streets and intersections for the roadway and/or alternate routes may be necessary to provide increased capacity to handle the traffic through the work zone or within the adjacent corridor. This may include improvements to the mainline and intersections, including roadway and/or shoulder widening and additional through and/or turn lanes.
- **Bus turnouts:** This involves the construction of bus stop areas that are recessed from the travel lanes. This strategy may be helpful in work zones or on detour routes with a high occurrence of bus traffic and stops.
- **Enforcement turnouts:** This involves the construction or delineation of an area for traffic enforcement stops. Work zones or detour routes may not have adequate room for enforcement stops, and consideration should be given to provide safe turnouts.
- **Turn restrictions:** This involves restricting turn movements for driveways and/or intersections to increase roadway capacity, reduce potential congestion and delays, and improve safety. Restrictions may be applied during peak periods or all day.
- **Parking restrictions:** This strategy involves the elimination of parking in all or part of the work zone and/or alternate routes, or parking restrictions during work hours or peak traffic periods. Parking restrictions can be used to increase capacity by converting the parking lane to an additional travel lane, reduce traffic conflicts, or provide improved access to the work area.
- **Truck/heavy vehicle restrictions:** This strategy, which imposes restrictions on truck travel through the work zone either during specific periods or at all times, can increase passenger vehicle capacity of the roadway when a facility normally has a high truck volume. When using this strategy, the requirements of 23 CFR Part 658.11 (d) (1) and (g) must be followed.
  - **Consideration:** Inform MCS when this strategy is used.
- **Separate truck lanes:** This strategy involves the provision of a separate truck lane through the restricted use of an existing lane, use of the shoulder or median, or construction of a new lane.
- **Dynamic lane closure system:** Also called dynamic lane merge system. This system uses dynamic electronic signs and other special devices to control vehicle merging at the approach to lane closures.

- **Temporary ramp metering:** Ramp meters are traffic signals located on on-ramps or freeway connectors to maintain safe and smooth freeway operations by controlling the entry of vehicles onto the roadway. This strategy serves both to decrease demand on a facility by controlling the entrance of vehicles, and to improve flow by matching entering vehicles to gaps in the traffic stream. Various strategies for ramp metering include pre-set timing, traffic actuated (metering changes based on mainline traffic), or centrally controlled. Ramp metering may be used during peak periods or all day.
- **Ramp closures:** Ramp closure involves closing one or more ramps in or around the work zone. The ramp closure may be necessary to provide work access within the work space or can be used to improve traffic flow on the mainline.
- **Railroad crossings controls:** When a rail crossing is located within a work zone and/or on a detour or diversion route, traffic control improvements at the crossing may become necessary for safety purposes, especially if work zone delays and congestion have the potential to force vehicles to stop on the tracks or between the crossing gates. Improvements may include advanced warning signs, railroad crossing signs, pavement markings, flashing lights, gate arms, flaggers or police officers, and possibly closure of the crossing to traffic during work periods.
- **Coordination with adjacent construction sites:** This involves combining or coordinating projects within a specific corridor to minimize the combined impacts on the motoring public and community. Coordination typically involves scheduling projects within a corridor to ensure that adequate capacity remains available to accommodate the anticipated travel demand within the corridor by not implementing work zones on adjacent or parallel highways at the same time. This may entail communicating about the timing of lane closures and occurrence of incidents, and coordinating diversion routes. It may also involve the completion of needed capacity and safety improvements on a highway prior to its use to carry traffic diverted or detoured from another project.

**2C Work Zone Safety Management Strategies:** This category includes devices, features, and management procedures used to address traffic safety concerns in work zones. Work zone safety management strategies include:

- **Speed limit reduction/variable speed limits:** A reduced speed limit may improve traffic safety in a work zone and help protect workers. Speed limit reductions may be implemented through an entire work zone, or only in active work areas or adjacent to workers. Reduced speed limits may also be appropriate on detours where traffic volumes and conflicts are increased.
- **Enforcement turnouts:** This involves the construction or delineation of area for traffic enforcement stops. Work zones or detour routes may not have adequate room for enforcement stops, and consideration should be given to provide safe turnouts. These turnouts can also provide an area for vehicles to safely pull over for breakdowns.
- **Temporary traffic signals:** This involves the installation of temporary traffic signals to address safety concerns. In some work zones, temporary traffic signals can be used in place of traffic control officers or flaggers, which can increase safety by removing these personnel from the roadway.
- **Temporary traffic barrier:** Temporary traffic barriers provide positive physical separation between travel lanes and the adjacent work space, or between opposing travel lanes.
- **Movable traffic barrier systems:** This system consists of a mechanical transfer machine, which quickly shifts temporary barrier laterally up to the full width of a travel lane while both the transfer operation and traffic in the work zone are protected. This system permits the rapid and safe reconfiguration of the traffic barrier system, allowing daily opening and closing of lanes for reversible lane operations and to provide additional space for the contractor to work during off-peak conditions.
- **Crash-cushions:** Also known as an impact attenuator, a crash cushion is a fixed or mobile barrier used to protect a temporary hazard or prevent vehicle intrusion into the workspace or

other hazardous area. It works by gradually decelerating the vehicle to a stop or by redirecting the vehicle away from the hazard.

- **Temporary rumble strips:** Rumble strips are grooves or raised strips placed across or adjacent to a travel lane to alert motorists to a change in roadway conditions, or that they have strayed out of the travel lane.
- **Intrusion alarms:** This strategy involves the use of various types of sensors to detect vehicles that stray out of the travel lane approaching or adjacent to the workspace and into the work area. When an intrusion is detected, a loud siren and/or flashing lights provide a warning to workers.
- **Lighting:** Temporary lighting can be used to illuminate unexpected changes in roadway conditions or potentially hazardous locations during low visibility hours. Care should be given to ensure the lighting structures do not create a hazardous condition and the lighting is directed such that it illuminates the roadway and minimizes glare for the motorists.
- **Warning lights:** Various types of warning lights, as described in the MUTCD, are available to alert drivers and pedestrians and draw attention to critical signs, channelizing devices, and other work zone features.
- **Automated Flagger Assistance Devices (AFADs):** AFADs are portable traffic control systems that assist a flagger operation for short-term lane closures, on two-lane highways. For a typical flagging operation with AFADs, one or both flaggers can be positioned a short distance away from the roadway and moving traffic. A flagger(s) can operate an AFAD(s) by using a radio control unit or an attached cable.
- **Project task force/committee:** This strategy creates a project task force/committee to address safety and/or traffic control within the work zone and adjacent corridor.
- **Construction safety supervisors/inspectors:** Daily inspection and supervision of safety and/or traffic control operations is an integral part of project management, and can be provided by various contractor and/or agency personnel, as appropriate to their specific project responsibilities.
- **TMP monitor/inspection team:** This strategy involves the establishment of a team (or person) to monitor and inspect implementation and monitoring of the work zone transportation management strategies.
- **Team meetings:** This involves conducting project team meetings on a regular basis to discuss TMP strategies, implementation, and monitoring, particularly related to safety concerns.
- **Project on-site safety training:** This strategy provides on-going safety training to ensure that workers are familiar with safety procedures and specific risks associated with the project, and to maintain a high level of safety awareness.
- **Safety awards/incentives:** This strategy involves the use of awards or incentives for innovations that reduce the safety impacts associated with the work zone.
- **Windshield surveys:** This strategy involves a designated DOT employee and/or contractor driving through the work zone area to conduct a firsthand assessment of safety and/or traffic flow. This strategy provides periodic assessments of the effectiveness of project safety features.

**2D Traffic/Incident Management and Enforcement Strategies:** This category includes various strategies to manage work zone traffic operations. Work zone traffic management strategies involve monitoring traffic conditions and making adjustments to traffic operations based on changing conditions. Some of those changing conditions involve traffic incidents, so this category also looks at management strategies that have specific applicability to traffic incidents. These strategies involve improved detection, verification, response, and clearance of crashes, mechanical failures, and other incidents in work zones and on detour routes. This category also includes strategies to provide adequate enforcement of traffic regulations in work zones. Strategies in this area include:

- ***ITS for traffic monitoring/management:*** ITS can be used in work zones to identify areas where traffic flow is impeded so that traveler information can be provided and/or adjustments to the work zone can be made. A work zone ITS deployment uses sensors to detect traffic conditions and can automatically feed this information to motorist information outlets such as VMS and websites. Monitoring traffic cameras can help detect places where drivers are having difficulty negotiating a work zone and then the layout can be adjusted.
- ***Surveillance:*** This strategy involves the use of surveillance equipment, such as detector stations or cameras, to help identify traffic problems and to detect, verify, and respond to incidents in the work zone.
  - ***Closed-circuit television:*** This is a system utilizing cameras to send pictures/video via dedicated lines to an operator who watches for incidents and determines the proper response.
  - ***Loop detectors:*** A device that detects vehicles by measuring change of inductance in a loop of wire installed under the pavement.
  - ***Radar/Microwave detection:*** Devices that transmit energy toward the roadway and measures the energy that is reflected back to determine vehicle presence, speed, etc.
  - ***VMS signs:*** This is a board that measures vehicle speed and displays it for the driver to see. (e.g. your speed is XX). Another term is “Dynamic Speed Board.”
- ***Traffic screens:*** Traffic screens help prevent driver distractions in work zones, which can help to keep traffic moving and enhance safety. Screens may be mounted on the top of temporary traffic barriers to discourage gawking and reduce headlight glare.
- ***Call boxes:*** Temporary or permanent call boxes may be installed through the work zone to provide motorists with a means to contact incident response personnel, thus expediting the response and clearance times for crashes and breakdowns.
- ***Mile post markers:*** Mile-post markers consist of a sign located in the median or shoulder, which lists location information (direction, route, mile, and tenths of a mile). Some areas may refer to these as location reference markers, since they can be used to mark direction; route, bridge or overpass names; intersection names; etc. in addition to mileage information.
- ***Tow/freeway service patrol:*** This strategy involves the use of dedicated or on-site (or near site) towing services to reduce the time required to remove vehicles involved in an incident (breakdown or crash). Towing service is almost always contracted, while freeway service patrols might be contracted but are more likely to be publicly operated.
- ***Total station survey units:*** This involves the use of survey equipment for documenting/mapping major incidents (e.g., fatal crashes, HAZMAT conditions, etc.) in order to reduce the clearance time. In some locations, total station units are being replaced by laser measuring units.
- ***Coordination with the media:*** This strategy involves working with local news media to publicize traffic delays, incidents, and incident management. Working with media contacts in advance to establish procedures to be followed in the event of a major delay or incident can facilitate the dissemination of specific information upon the occurrence of a major delay or incident.
- ***Local detour routes:*** Advance identification and approval/authorization for use of local detour routes in the event of an incident is an especially useful strategy to address major traffic delays and incidents, particularly for high volume and incident prone work zones.
- ***Contract support for incident management:*** This strategy provides additional contract support for incident management and response beyond that available from the construction contractor or within the agency. Contracts may include entities such as police agencies, towing/recovery providers, engineering consultants, or others, depending on the support needed for a project.
- ***Incident/emergency management coordinator:*** This strategy provides a designated individual with overall responsibility for incident and emergency management on a project. Responsibilities may include developing incident and/or emergency response plans,

overseeing implementation and monitoring of the work zone management strategies, and overall management of incidents or emergencies.

- **Incident/emergency response plan:** This involves the development of a plan with information needed to respond to an incident. This information typically includes roles and responsibilities, response agencies, processes/procedures, actions to take for various incident types and levels, contact information, alternate routes, personnel and equipment information, staging area locations, and other information as appropriate to the individual project.
- **Uniformed Law Enforcement:** In general, the need for law enforcement is greatest on projects with high traffic speeds and volumes. The use of law enforcement can also be used where substantial disruption to or changes in normal traffic patterns due to the work zone is expected.
  - **Consideration:** Enforcement turnouts through the construction area may be needed for traffic enforcement stops.

**3 Public Information Component:** The inclusion of a public information component in the TMP has the potential to reduce work zone impacts by providing specific information concerning road projects to road users and the community to alert them to potential impacts and available means to avoid them, as well as more general information concerning appropriate driving and travel behavior and travel options associated with the work zone. Early public involvement, particularly by the impacted communities and businesses, in the development of the TMP and keeping them informed throughout the project, is essential both to identify potential impacts and to ensure that effective mitigation strategies are developed and implemented. Coordination with the agency's public information office will help to ensure success, particularly for significant projects. These strategies include both public awareness strategies and motorist information strategies.

**3A Public Awareness Strategies:** Public awareness strategies include various methods to educate and reach out to the public, businesses, and the community concerning the road project and work zone. On a case by case basis, MDT utilizes numerous contract Standard Special Provisions that serve to inform stakeholders (i.e. Public Information and Public Advisory).

- **Brochures and mailers:** Brochures and mailers are printed material containing project-related information such as advanced notice of the project's start date, schedules, pictures/graphics of the project, a description of the need for the project, alternative routes, etc. These may be passed out to motorists at key locations (e.g., large employers in the project area, rest stops, travel information centers, hotels/motels, restaurants), via automobile associations, mailed to affected businesses or communities, sent home with school kids, or hand delivered to those in the vicinity of the project.
- **Press releases/media alerts:** This strategy provides project-related information to the news media, affected businesses, and other affected or interested parties using print and/or electronic media.
- **Paid advertisements:** Paid announcements of an upcoming major project may use newspaper, radio, and television ads, as well as billboards. Paid advertisements can also be used for progress updates or to provide information regarding major changes to the work zone configuration and management approach.
- **Public information center/kiosk/wireless hot spot:** This is a facility typically located on or near the project site that contains such materials as scale model displays, maps, brochures, videos, etc. describing the project, its potential impacts, and available alternatives to minimize the impacts.
- **Telephone hotline:** This traveler information system provides traffic or travel information for the work zone using a toll-free telephone number. It can include prerecorded messages and/or real-time interactive request and response information. This is a project specific hotline.

- ***Planned lane closure web site***: This strategy is typically not for one specific project, but is usually implemented for an entire State, district, or geographic region. The web page summarizes planned lane closures for public information, listing the routes involved as well as the closure start and end dates, both in text and graphical form.
- ***Project web site***: This tool can be used during design as a method to convey information regarding a proposed project and to solicit input, and should be maintained by the design entity (MDT, Design Consultant, City or MPO). The tool can also be used as a stand-alone site during construction, generally maintained by the Contractor, as a traveler information system. This traveler information system provides traffic or travel information for the work zone via the web/Internet. It can include both long term static information and/or real-time interactive information.
- ***Public meetings/hearings***: This strategy involves the presentation of project information to the public, community, and/or businesses by the MDT Design Project Manager with the District Administrator and District Preconstruction staff, with support from the public relations staff, and solicitation of input concerning potential concerns, impacts, and management strategies. Other options include presenting information at local meetings, such as the monthly City or County Commission meetings, or using the local Chamber of Commerce.
- ***Community task forces***: This strategy involves the development of community task force(s), which includes various stakeholders from the community likely to be impacted by the work zone (businesses, neighborhood groups, interested individuals, public officials, or other representatives). Task forces can be a means of both providing information and receiving input related to a road project.
- ***Notification/coordination with stakeholders/targeted groups***: This strategy involves coordinating with various community, business, and media groups that are likely to be impacted by the work zone, or that can disseminate needed information. Various mechanisms such as fax, e mail, phone message, mailings, etc. can be established to communicate project-related information including start dates, project schedules, significant traffic pattern changes, and traffic crashes and incidents within the work zone. These groups may include:
  - ***Media***
  - ***Schools***
  - ***Businesses***
  - ***Emergency services***
  - ***Rideshare organizations***
  - ***Organizations representing people with disabilities***
  - ***Bicycle organizations***
  - ***Commercial trucking industry***
  - ***U.S. Postal Service***
  - ***Local agencies***
  - ***Tribal governments***
  - ***Public land agencies***
  - ***Motorcycle organizations***
  - ***Sanitation services***
  - ***Others***
- ***Work zone education and safety campaigns***: This strategy involves improving the awareness of motorists and/or increasing worker training in order to reduce the number of fatalities and injuries in work zones. This can be accomplished through brochures, web sites, media campaigns (radio, television), and videos. Some MDT Districts maintain Outreach Programs whose activities include working with school bus driver education programs, sending material home with school children, and working with local AARP and high school Driver Education Programs.
- ***Work zone safety highway signs***: This strategy involves the use of signs placed strategically at work zone approaches to increase driver awareness to work zone safety concerns.

- **Rideshare promotions:** This strategy involves the marketing of an existing rideshare program or creation of a new program through signage, advertisements, brochures, and events.
- **Visual Information (videos, slide shows, etc.) for meetings and web:** This involves the use of videos, slides, and presentations to supplement public meetings, public information center displays, or press releases.

### 3B Motorist Information Strategies

- **Traffic radio:** Project-related information is disseminated via the regularly scheduled traffic reports on commercial radio stations.
- **Variable message signs (stationary) - list general locations:** These are fixed message boards placed along roadways to notify road users of lane and road closures, work activities, incidents, potential work zone hazards, queues and slowed or stopped traffic ahead, and travel time or delay information, as well as alternate routes in or around the work zone. VMS can be placed at key locations before potential diversion points to give motorists an opportunity to divert to an alternate route or take other appropriate measures based on the information provided. As an enforcement tool, these signs can be used to inform drivers of speed limit reductions and enforcement activities in a work zone.
- **Variable message signs (portable) - list general locations:** These are portable message boards placed along roadways to notify road users of lane and road closures, work activities, incidents, potential work zone hazards, queues and slowed or stopped traffic ahead, and travel time or delay information, as well as alternate routes in or around the work zone. VMS can be placed at key locations before potential diversion points to give motorists an opportunity to divert to an alternate route or take other appropriate measures based on the information provided. As an enforcement tool, these signs can be used to inform drivers of speed limit reductions and enforcement activities in a work zone.
- **Temporary motorist information signs:** Temporary conventional signs mounted in the ground, overhead, or on vehicles to provide traveler information to guide motorists through the work zone and warn of potential hazards.
- **Dynamic speed message sign:** This portable system can be mounted as a fixed sign or located on a portable trailer. Radar measures the speed of approaching vehicles, which is displayed on the sign along with or near the work zone speed limit. The objective of this system is to enhance safety by reducing speeding and speed variations.
- **Highway advisory radio:** Longer, more detailed messages than can be provided using signage may be necessary for some work zone situations. HAR involves the dissemination of information to motorists while en route over wide-area wireless communications directly to in-vehicle radios. Signs are used to inform motorists of the radio frequency where the information is available.
- **Extinguishable signs:** Extinguishable signs are typically associated with highway advisory radio (HAR) systems where the sign indicates how to obtain information on roadway conditions (e.g., tune in to 1610 AM). These signs turn on and off depending on when the HAR has a message available.
- **Highway information network (web-based):** A highway information network is a web site where multiple stakeholder groups can place information related to the roadway. The web site is shared among the various stakeholder groups, each with their own data storage areas (including control of functionality, security, data quality, etc.).
- **511 traveler information systems (wireless, handhelds):** This strategy provides motorists with work zone-related information, static (e.g., project dates) and/or real time (e.g., potential delays), using such technology as cell phones, pagers, in-vehicle systems, and e mail notifications.
- **Freight travel information:** This strategy may be appropriate when there is a moderate to high percentage of freight movement through the work zone. It involves coordination with the freight community (trucking companies, truck drivers, etc.) to identify work zone

information considered useful (e.g., truck restrictions, occurrences of incidents, planned closures, etc.) and development of a mechanism to disseminate that information to freight stakeholders. The information can be disseminated to central locations (e.g., via a fax or email distribution list to trucking companies) or to truckers as they approach the work zone (e.g., via CB communications tools such as the CB Wizard Alert System.).

- **Consideration:** Inform MCS when this strategy is used.

- **Bicycle and pedestrian information:** In addition to notification of the project to these users, information, such as detour maps, may be provided.
- **Motorcycle Advisory:** MDT staff responsible for project design and construction should include in the contract the motorcycle advisory sign for projects that will require travel over an unpaved surface (i.e. embankment, traffic gravel, base course, etc.) on the following listed routes:

|             |            |
|-------------|------------|
| US 2        | US 87      |
| US 12       | US 93      |
| US 20       | US 89      |
| US 191      | US 212     |
| US 287      | US 310     |
| Montana 41  | Montana 72 |
| Montana 200 | Montana 83 |
| Montana 257 |            |

If a decision is made not to use the advisory sign, document the reasons (e.g. very short unpaved surface, such as one mile or less combined with an impractically long alternate route, short work duration, etc.).

For projects that are located in an area with high motorcycle use, the project construction team may have to be prepared to take special measures to remind the motorcyclists of potentially hazardous conditions. For example, flaggers may have to be reminded daily to talk to each motorcyclist at the flagging station to tell them about sections of loose gravel, potential wet conditions, etc.

**3C Special Events:** A traffic management plan includes strategies for managing event-generated and background traffic within the local and regional area impacted. The plan also specifies techniques to provide site access for all modes of travel, parking, and pedestrian access, including ADA accommodations as necessary. Pedestrian accommodations involve handling pedestrians arriving to a planned special event venue via all available modes of travel. To ensure the dissemination of credible traveler information, the traffic management planning team should include methods to provide accurate and up-to-date information.

The traffic management plan objectives are as follows:

- Provide safe and quick travel to and from the event site for spectators and participants, including ADA accommodations as necessary.
- Utilize transportation system capacity, including all modes of travel.
- Maximize efficiency of parking operations.
- Accommodate pedestrians.
- Provide guidance for traffic control.
- Provide useful and credible traveler information.
- Minimize impact on affected residents and businesses.

To ensure the successful management of a special event, it is vital to communicate with travelers to inform them of anticipated and current traffic conditions. One goal is to provide the information to en-route travelers so they may alter their route. A second goal is to inform the public of the event well enough in advance to allow intended travelers, whether event attendees or not, to change their travel habits prior to the event. Various means and technologies are used to provide information to

the public. Pre-trip travelers can be informed via websites and media broadcasts. En-route travelers can be reached with roadside devices such as variable message signs and by advisory radio announcements. While all stakeholders may be aware of recurring events, less prominent events may not gain notice until just before the event. Research to identify these types of special events is necessary. Coordinate this research with District staff, as some maintain a listing of annual or special events by city.

#### **4 Other Strategies**

- **Application of new technology:** This strategy involves applying new or other technologies not normally used by MDT but are being used or tested by other states or agencies may be using or testing (e.g. automated road construction information system for real time to mitigate traffic congestion and automobile incidents).
- **Innovative products:** This strategy involves using new or different products not normally used by MDT but are being used or tested by other states or agencies (e.g. temporary rumble strips to alert motorist when they are approaching a short term work zone).

### Worksheet 3 – Comments & Revisions

Major revisions to the TMP should be documented in this section. At the minimum, the TMP will be updated at the various milestones of the project (AGR, SOW, PIH, etc.). In addition, anytime a major element is added or removed, this should be documented as a revision. Specific cost/estimate updates do not need to be documented, but it should be noted when the TMP is updated. Some examples:

- “06/21/2008, Initial TMP developed for Alignment and Grade Review.”
- “06/21/2008, TMP Team developed. Team members: .....
- “07/12/2008, TMP revised based on AGR comments. Added Variable Message Signs element (under 1B). Also added numerous minor elements throughout TMP.”
- “01/18/2009, TMP updated to reflect updated costs for TMP elements.”

### Worksheet 4 – TMP Issues & Action Items

Worksheet 4 is a table that allows you to track issues, solutions, and action items. This format can be used at any stage of a project to keep track of how issues were solved and to ensure that the solution is enacted. The table may be especially useful for projects in the late stage of development for which the TMP elements table was not completed, and for meetings with the local governments and emergency response teams.

### Worksheet 5 – Options Analysis

The Options Analysis and Decision Documentation Worksheet is a simple way to compare various work zone options and help guide discussions to a conclusion. Additional options can be tracked and compared by copying the cells and labeling them appropriately (Option C, Option D, etc.). Documentation is essential when making important decisions; this table may be invaluable when questions come up during construction.

### Worksheets 6 and 7 – Project Work Type Codes and Definitions

Worksheet 6 is a listing of project work type codes; Worksheet 7 contains the standardized project work type definitions.