

TMP Development Guidelines

The most important purpose/objective of a Transportation Management Plan (TMP) is to take a conscious look at project construction activities required base upon a project's scope of work. The most effective method to perform these construction activities needs to be determined while at the same time minimizing the impacts to traffic and the surrounding community.

TMP's have been classified by Type, ranging from 1 (highest impact) to 4 (lowest impact). The attached table describes the TMP levels and the associated roadway criteria/parameters. A particular TMP level is not met as a result of meeting only one criteria shown, but multiple factors. For example, a high volume roadway with an AADT of 35,000. While the volume threshold is met, the more important criteria is that shown highlighted in yellow in the "TMP Level Guidance" document found on the Metro Traffic Work Zone website at

http://www.dot.state.mn.us/metro/trafficeng/work_zones.html

The most impactful project is one with a lane(s) closure duration greater than 30 days on a roadway with an AADT volume greater than 35,000. Considering these factors together, this project would require a Level 1 TMP. In addition to the impact on the mainline roadway, there would also be expected impact to the local roadway systems as not all traffic will divert to other Metro highways or follow a planned detour route. An extra level of effort is required to analyze the impacts to the mainline and local roadway systems to determine what measures may need to be taken to reduce or minimize impacts. Metro does not undertake very many projects that fall into the Level 1 category. Many Metro projects fall into the Level 2 category and others fall into Level 3 or 4.

Considering the variable nature of projects, discussion should be had early on with the Metro Traffic work zone (WZ) staff (the East or West Metro Work Zone Supervisors and/or Metro Work Zone Engineer) who can help with determining the extent of effort and level of documentation needed for each project.

Important considerations:

Need to determine project scope. While it important to get Metro WZ involved early during project scoping, changes of scope can have minimal to dramatic impacts to project staging. Bridge and drainage needs are two of the more significant work activities that can impact mainline staging and its duration. The project scope needs to be defined before meaningful staging and traffic control can be developed and assessed for impacts. Functional groups need to be encouraged to perform background information gathering early so that the project scope can be confirmed during the early part of the project scoping phase.

Determine staging alternatives. Once the scope for the project has been determined, all project partners involved, including but not limited to, MnDOT functional groups (Metro WZ, Construction, Resources, Drainage, Bridge, Materials, etc) need to provide input to project staging discussions.

Analyze staging alternatives. Based upon the viable alternatives identified, the appropriate level of traffic modeling needs to be undertaken to determine the impacts of

the each alternative. If external sources are performing modeling, the MnDOT Metro Work Zone Modeling Engineer should be consulted prior to undertaking modeling to coordinate appropriate modeling tool selection and procedure. Modeling input and results will need to be reviewed by the MnDOT Metro Modeling Engineer.

The impacts of each alternative will be analyzed to determine the potential mitigation to help alleviate these impacts. Cost estimates would then be assigned to mitigation options for each alternative.

Coordination with appropriate partner, both internal functional groups and external stakeholders will select the preferred staging alternative.

Preferred Staging Alternative. Once selected, the preferred alternative will need to undergo further analysis, as appropriate, to determine the mainline and local roadway impacts. Mitigation measures will need to be investigated and analyzed for effectiveness and benefit/cost. All appropriate mitigation measures will need to be agreed upon by all project stakeholders and detailed cost estimates performed.

Construction staff involvement is critical to staging discussions and selection. They can provide important real-world input relating to the appropriateness of project construction and need to be involved with all discussions from early on to aid in the project moving in the appropriate direction. At times, project engineers are not assigned early in project scoping, but Resident Engineers can provide valuable insight into the process as well.

Changes in work scope

It is important to note that should functional group needs change and result in a change to a project's scope of work, project staging will need to be reanalyzed for any potential impacts. Changes in project staging will likely affect previous work performed including traffic impact modeling and mitigation measurements that may have been identified and planned for. In turn, this will impact the project schedule and potentially affect other tasks in the project development process. Any of these work scope changes will need to be addressed in the TMP process.

TMP Levels

(see TMP Level Guidance, http://www.dot.state.mn.us/metro/trafficeng/work_zones.html)

Level 1: Large scale projects require a Level 1 TMP. These are long term projects on high volume roadways with long term lane closures or total roadway closures. Durations longer than 30 days on such roadways mandate this level of consideration. A Level 1 TMP requires a look at multiple staging alternatives and traffic modeling to determine impacts of each alternative for both mainline and local roadways. The preferred alternative will need to be modeled in detail to determine operational impacts to mainline and local roadways and consideration of measures to minimize impacts. Modeling will include the Activity Based Model (ABM) and secondary refined operational modeling such as CORSIM, VISSIM, Synchro. Modeling efforts need to be coordinated with the

Metro Work Zone Modeling Engineer. Once the modeling results are obtained, discussion needs to occur to determine potential mitigation measures needed to minimize impacts to both the mainline and local roadways systems. Mitigation measures need to be coordinated with appropriate MnDOT functional groups as well as project partners (ie local agencies, FHWA, etc). Approved mitigation measures need to be included with the project scope of work and costs estimate. This level requires completion of the TMP Scoping Worksheet, TMP Worksheet and the “formal” TMP Template is required.

Level 2: This level includes larger scale projects that do not meet the thresholds of Level 1. These are typically long term projects on high volume roadways with lane closures or total roadway closures with durations less than 30 days. A Level 2 TMP requires a look at multiple staging alternatives and traffic modeling to determine impacts of each alternative for both mainline and local roadways. The preferred alternative may need to be modeled in detail to determine operational impacts to mainline. Local roadway impacts may also need to be modeled, but this is only a possibility and the Metro Work Zone Modeling Engineer needs to be consulted. Mainline mitigation measures may be necessary and while local roadway mitigation should be investigated, mitigation is usually not required. This level requires completion of the TMP Scoping Worksheet and TMP Worksheet. While completion of the “formal” TMP Template is not required, there is valuable information contained within that will be helpful in project development and the outreach efforts needed.

Level 3: This level includes projects that will require daily lane closures that are not allowed by the Metro Lane Closure Manual on non-freeway roadways. While impactful, the short duration of these closures usually does not warrant extensive modeling. The ABM model may be necessary or at least recommended to verify anticipated impacts and aid in project outreach and notification. The TMP Scoping Worksheet needs to be completed.

Level 4: This level includes projects on lower volume roadways and the lane closure impacts occur during off-peak times according to the Metro Lane Closure Manual. No modeling is required. Normally, completion of the first sheet of the TMP Scoping Worksheet is all that is required.

Traffic Modeling

As discussed above, various levels of TMP require different modeling effort. While all modeling needs should be coordinated with the Metro Modeling Engineer, below is a brief discussion of commonly used modeling tools and some of their attributes (such as: origin/destination, traffic diversion, traffic queue lengths, travel times, travel delay, Road User Cost (RUC):

- High level estimate
 - o StreetLight Data– trip origin & destination for a specific location (Typical Modeling Process in Metro)
 - **Info obtained:** travel patterns, potential traffic diversion routes
 - **Time to process:** approx. 2 hrs

- Regional level analysis
 - o Activity Based Model (ABM) – Project freeway segment and surrounding local roadway system (Typical Modeling Process in Metro) – Most commonly used
 - **Info obtained:** traffic diversion, system RUC. This modeling needs to be validated to the area of study, combined with CORSIM/VISSIM to obtain more realistic delay and queueing information.
 - **Time to process:** Approx. 1 month
 - o Dynamic Traffic Assignment (DTA) – Most closely replicates real-world driver behavior and decision making. (Only apply to significant impact project)
 - **Info obtained:** Traffic diversion, delay, queueing, system RUC
 - **Time to process:** intensive (6+ months to develop)
- Corridor level analysis
 - o CORSIM/VISSIM – Uses input obtained from the ABM, specifically the work zone diversion rate, model project corridor. (To be implemented in Metro Work Zone)
 - **Info obtained:** Delay, maximal queue, average queue, corridor RUC
 - **Time to process:** 2 to 3 months
 - o Synchro – Specifically used on signalized corridors (To be implemented in Metro Work Zone)
 - **Info obtained:** Intersection delay, traffic queue lengths, travel time
 - **Time to process:** 3 to 4 weeks
 - o FREEVAL-WZ – HCM based analysis, user defined diversion rate as input, applied on freeway only within the project area. (Applied on low impact projects with limited diversion route(s))
 - **Info obtained:** traffic queue lengths, travel time, corridor RUC
 - **Time to process:** approx. 3 weeks

It important to note: For more impactful projects, a combination of modeling will be necessary to complete. Given the approximate durations listed, combined with other Metro projects occurring, it is important to coordinate with the Metro Modeling Engineer so that project modeling can be scheduled. Depending on Metro’s workload, it may be necessary to enlist a consultant to perform this activity.

Also, a Metro Work Zone Model Request form needs to be filled out so a project gets added to the work task queue. This can be found on the Work Zone website at:

http://www.dot.state.mn.us/metro/trafficeng/work_zones.html

TMP Documentation Location

For consistency purposes, ALL TMP documentation and supporting material should be placed in the project's ProjectWise folder in the TransMgmtPlan subfolder to the Design folder.

TMP Development Timeline

It is expected that the TMP process will begin at the beginning of the project scoping process and extends thru the entire project development process with the final documentation submitted at project turn-in. That said, there are a number of intermediate TMP milestones that are found on the Metro Traffic Work Zone website at

<http://www.dot.state.mn.us/metro/trafficeng/files/Project%20Timeline%20-%20TMP%20Development.pdf>

Much of the TMP work and effort needs to be undertaken and completed by the 30% final design plans milestone.

TMP Responsibility

The Project Manager will assemble a TMP team to assist in preparation of the project Transportation Management Plan. The Project Manager will be responsible for development of the appropriate TMP documentation with assistance from other functional groups as appropriate. This documentation is expected to begin at the onset of the project and carry through until the project turned in. The project documentation required depends upon the level of TMP. The Metro Work Zone staff can assist with the amount and types of documentation required. More information can be found on the Metro Traffic Work Zone website at

http://www.dot.state.mn.us/metro/trafficeng/work_zones.html.