

## **630-5 Maintenance of Traffic Alternative Analysis**

As noted in **Section 630-1, Section 1400 of the L&D Manual** indicates that a Maintenance of Traffic Alternative Analysis will be performed. This analysis shall be submitted for review and approval for any projects following the Major Plan Development Process (PDP) during Step 6.

A Maintenance of Traffic Alternative Analysis shall also be performed for any project following the Minor Plan Development Process during step 3. For Minor PDP projects, however, only work zones on the Interstate or Interstate look alike system need to be analyzed.

The Maintenance of Traffic Alternative Analysis shall be submitted concurrently to the **District, Central Office Multi-lane Coordinator and the Office of Traffic Engineering.**

1. For Non-Interstate Work Zones (Major PDP only):
  - a. Investigate maintenance of traffic for each alternative.
  - b. Include an evaluation of maintenance of traffic for ramps, local roads and cross streets.
  - c. For each alternative determine:
    - i. Number of lanes to be maintained.
    - ii. Type of maintenance of traffic (i.e., signalized, detoured, part-width, runaround, crossover, etc.).
    - iii. Lane widths.
    - iv. Typical sections.
2. For Interstate and Interstate look alike Work Zones, the alternative analysis shall incorporate all of the following requirements (Both Major and Minor PDP's):
  - a. Provide a stick drawing (schematic or sketch) covering the entire project length for the following two work zone alternatives:
    - i. Part-width construction.
    - ii. Crossover construction.
  - b. Include on each stick diagram (schematic or sketch) the following information:
    - i. Arrows showing lane use including merging and diverging ramps in relation to work areas and barriers.
    - ii. All bridges.
    - iii. Cross sections between every interchange; on every bridge; at each merge & diverge point (ramps); where overpass piers are present. Where bridge widths vary, show the narrowest part of the bridge.
    - iv. Existing toe-toe bridge width; proposed final bridge toe-toe widths (if available); required toe-toe bridge widths necessary for maintenance of traffic. This may be in the form of a table if necessary.
  - c. The following shall be used to create the cross/transverse sections in 2b (iii) above:
    - i. The number of lanes provided during construction will satisfy **ODOT's** work zone policy titled "Traffic Management in Work Zones Interstate and Other Freeways" (Work Zone Policy). Note: the number of lanes required by the Work Zone Policy

is a starting point for the analysis. It is not meant to imply that a Work Zone Policy exception will never be needed; in fact, ability to meet the Work Zone Policy is one of the constraints that will be specifically examined per section 2d. "The permitted lane closure times" application on ODOT's web page defines what hours a lane reduction is allowed on any segment of Ohio's Interstate and Interstate look alike system. Any work zone that violates these permitted lane closure times will require a detailed queue analysis per the Work Zone Policy and an exception request if necessary depending on the outcome of the queue analysis. "The permitted lane closure times" application can be found at:

[https://dotaw100.dot.state.oh.us/plcm/plcm\\_web.jsp](https://dotaw100.dot.state.oh.us/plcm/plcm_web.jsp)

- ii. Typically show 11 foot lanes unless a narrower lane(s) provides significant benefits in terms of mitigating maintenance of traffic constraints as discussed below. It is permissible to utilize a 10 foot lane(s) on bridges where insufficient space cannot provide for all lanes to be 11 foot, however, ODOT prefers the wider lanes whenever feasible.
  - iii. All exit and entrance ramps will be maintained with the same number of lanes during construction as pre-construction.
  - iv. Show a minimum 1.0 foot clearance between lanes and barrier toes.
  - v. Show existing beam spacing on bridge decks (transverse sections).
  - vi. Show bridge deck cut lines in relationship to existing beams (transverse sections).
  - vii. Show a 2 foot paved shoulder where possible. Indicate locations where this is not possible.
- d. The following should be considered when looking for an alternative's (both part width and crossover scenarios) possible maintenance of traffic constraints:
- i. Ability to comply with work zone policy.
  - ii. Ability to maintain all accesses.
  - iii. Ability to provide required on-ramp merge decision sight distance (**TEM Section 607**).
  - iv. Right-of-way impacts.
  - v. Environmental impacts.
  - vi. Final bridge widths.
  - vii. Significant impacts to construction duration and construction costs .
  - viii. Significant impacts to earthwork, retaining walls, pier clearances, profile differences; etc.
  - ix. Ability to maintain existing drainage and lighting systems.
  - x. Constructability and construction equipment access.
  - xi. Location of crossovers (e.g., Can crossovers be located near the project?).

It is not the intent of the Maintenance of Traffic Alternative Analysis to require a detailed design of each alternative's work zone. It is intended to identify and compare major potential functional faults of the two most common work zone alternatives: part width and cross over construction. This is accomplished by examining the impacts of the standard cross/transverse section provided in 2c at the locations required in 2b(iii). The impacts (constraints) the designer should be looking at are provided in section 2d. This process should be done for all phases of both a part width and crossover scenario.

Should both the part-width and crossover alternatives prove to have significant maintenance of traffic constraints, prove impractical or otherwise not possible to construct; ODOT may require an additional analysis using a contra-flow technique to maintain traffic. Contra-flow is a hybrid design where one or more lanes are crossed over to the opposing directional lanes while maintaining one or more lanes on their normal directional side of the facility.

The Maintenance of Traffic Alternative Analysis may be a factor in choosing the preferred alternative and will serve as the basis for scoping the project's work zone design. The analysis should be a comparison of alternatives that documents maintenance of traffic constraints. It should address the benefits and problems between the two alternatives and should include the design team's recommendation on the preferred type of maintenance of traffic.

#### Submission Content

A. The Maintenance of Traffic Alternative Analysis should contain a project description indicating the type of work. In addition to the project description, the following shall be provided:

1. Non-Interstate Work Zones (Major PDP only) - The information as required in Sections 1a to 1c above.
2. Interstate and Interstate Look Alike Work Zones -
  - (i.) The below table shall be completed and included. The content of each box should indicate if a work zone constraint will be an issue with that alternative (part width or cross over). Where a constraint is identified, it should be clear which phase of construction (or all phases) the constraint will be present.
  - (ii.) Where a constraint is identified it should be footnoted and an explanation should be provided after the table in the analysis report. The explanation should provide sufficient information for ODOT to determine the magnitude of the constraint.
  - (iii.) Footnote examples - The following are some possible examples of constraint foot noted information. They are not meant in anyway to be all inclusive nor are they intended to be an indication of verbatim responses expected. It is expected the engineering team will use judgement and provide sufficient information to allow ODOT to make an informed decision when selecting between alternatives.

**Crossover Construction Will Impact R/W** - The explanation should state the project ramifications of overcoming this constraint (example - buy R/W or use retaining walls). Included should be the cost and/or schedule impacts.

**Bridge Widths** - In order to provide the Work Zone Policy required number of lanes existing structures will have to widened (either temporarily or permanently). For consistent cost estimating purposes, an amount of \$30/sf should be used for temporary decking (when proposed beams and substructure can be utilized) or \$100/sf where all new support and substructure will have to be used solely for maintenance of traffic. Project specific cost estimating numbers may be used for unusual circumstances, however when used, the new values should be plainly provided in the report.

**Ability to Provide Required On-Ramp Merge Decision Sight Distance** - An existing ramp cannot provide adequate merge distance due a physical constraint such as a bridge pier or parapet. Costs should be provided to remove these obstructions. In addition information should be provided to indicate the extent (how many feet) the merge condition will be from being standard.

**Environmental Impacts** - Crossover construction will require significant amounts of fill material that could introduce stream impacts. Project cost and schedule impacts should be provided.

**Ability to Meet Work Zone Policy** - A long structure on the project will not allow for the Work Zone Policy required number of lanes to be provided. Information should give an estimated cost to widen the structure to provide the required cross/transverse sections required in 2c(i). Note - the actual decision to widen the bridge would be made via a maintenance of traffic exception request if authorized by the District.

**Construction Costs** - A best available engineering estimate should be provided for each alternative. MAJOR cost differences between alternatives should be noted (example - additional PCB and temporary pavement; requires widening bridge decks; requires purchase of additional R/W, etc.)

**Ability to Maintain Existing Lighting and Drainage Systems** - Median mounted highway lighting will have to be removed to accommodate Maintenance of Traffic or proposed alternative cross section will require temporary wedging to allow for drainage. Cost information should be provided.

Constraint	Work Zone Alternatives	
	Part Width Construction	Crossover Construction
Ability to meet Work Zone Policy		
Ability to maintain all accesses		
Ability to provide required on-ramp merge decision sight distance.		
Right-of-way impacts		
Environmental impacts		
Final bridge widths		
Significant impacts for construction duration and/or construction costs		
Significant impacts to earthwork, retaining walls, pier clearances, profile differences; etc.		
Ability to maintain existing drainage and lighting systems		
Constructability and construction equipment access		
Location of crossovers (e.g., Can crossovers be located near the project?)		

(iv.) Stick Diagrams and Cross/Transverse Sections - Stick diagrams (schematic or sketch) for the entire project length. Included with the stick diagrams should be the cross/transverse sections as required in 2b and 2c above. Location of the cross/transverse sections to be provided is given in 2b(iii).

B. Summary and Conclusion - A summary shall be provided that includes a recommendation on alternatives (part width or crossover) based upon the constraints identified. It is NOT the responsibility of the design team to determine if one alternative is not feasible and therefore should not be analyzed. Both alternatives should be analyzed and reported. ODOT will determine, based upon the analysis, which is the preferred alternative.