**MoDOT Methods and Assumptions Report Template for Traffic Impact Analyses**

June 2020

The Missouri Department of Transportation (MoDOT) may require a Methods and Assumptions (M&A) Report to be drafted and agreed upon by MoDOT, and shared with stakeholders for all traffic impact analyses (TIAs). A Methods and Assumptions Report serves as a record of the decisions and agreements made by the advisory team at the outset of a project; however, it is also subject to revision as a project evolves.

This template is meant to aid consultants and other parties submitting work to MoDOT in their production of Methods and Assumptions Reports. Written below are several guidelines which should be considered when using this template:

* *Do not delete any sections in the template*. Instead, if a section does not apply to a given project, write “N/A” and give a brief explanation for why that section does not apply.
* *If additional information is needed, attach as an Appendix*
* Blue text represents information which should be replaced with project specific information.
* Red text represents information which has been included in the template to better explain what each section of the report should include. This text should be deleted before submitting the report to MoDOT.
* *Green / Italicized text* represents content, usually in the form of a table or list, which has been included to serve as an example of a way to communicate information. This content should either be modified or removed before submitting the report to MoDOT.
* Because each report will have a unique number of tables and figures, the List of Figures and List of Tables below the Table of Contents has been left for the writer of the report to format.
* *Do not alter the format of the template* before submitting to MoDOT.

*Title of Traffic Study*

Draft/Final/Revised Method and Assumptions Report

Date of Completion

Prepared for:



Missouri Department of Transportation

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Jefferson City, MO 65102

Prepared by:

Name of Firm

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A list of appendices may be included as necessary.

# 1.0 Stakeholder Acceptance

The following project stakeholders were consulted and made aware of the plan of work set forth in this *Method and Assumptions Report* for the Title of Traffic Study.

The list of stakeholders shown below is not meant to be exhaustive. Stakeholders from other agencies and groups may be added as is appropriate. **Note:** If revisions are jointly made to this *Method and Assumptions Report*, then please update the “Date Approved” entry on both this page and in Section 10 (“Record of Revisions”).

*FHWA – Missouri Division*

*East-West Gateway*

*City of St. Louis*

# 2.0 Introduction

This section and the following subsections should be used to provide background information on the location of the project, factors driving the need for the project, project history, a high-level schedule with major deliverables identified, and the project team.

## 2.1 Need for Study

## 2.2 Previous Studies

## 2.3 Study Schedule

* *Start of Analysis Date*
* *Data Collection Initiation, Processing, and Finalizing Dates*
* *[If Applicable] Traffic Forecasting Initiation and Submittal Dates*
* *Traffic Operations and Safety Analysis Existing and Future Year “No-Build” Submittal Dates*
* *Additional Traffic Operations and Safety Analysis Year, Periods, Design Alternative Scenario Submittal Dates*
* *Review Periods for Stakeholders*
* *Final Submittal Date*

## 2.4 Key Project Staff and Stakeholders

This section should include a staffing plan, especially of the traffic staff and who can be contacted if the reviewers have questions.

# 3.0 Definition of the Study Area

This section should be used to define the study area of the project. This might include a list of interchanges, intersections, and/or corridors which will be considered, as well as one or more supporting figures. The project study area may differ from the traffic operations or safety analysis study area.

# 4.0 Analysis Years/Periods

Operational analysis may include AM and PM peak hours for the years listed below. All of the analysis years listed should be included in the project analysis, unless otherwise justified and discussed with the appropriate MoDOT representatives. For all projects, it is important that the “Existing Base Year” be included due to its importance for model calibration to existing year traffic conditions. Refer to **Table 6** in MoDOT’s *TIA Guidance Manual*.

* Existing Base Year: 2020
* Assumed Interim/Opening Year: 2025
* Horizon/Design Year: 2045
* Horizon Year for Safety Analysis: 2045

For certain project types, peak hours may not be sufficient and lengthier peak periods may be necessary. If the specific peak periods/hours are already known, this section may include that information with a reference to the traffic count data which supports the use of the given peak periods/hours. Including a discussion of any required seasonal factors in this section would also be appropriate.

# 5.0 Design Alternatives

This section should be used to list and describe all known design alternatives the study is considering. **Note:** It is important that at least one “No-Build” scenario (especially an existing year scenario) be included because of its importance for model calibration. At least one “Build” scenario (where project assumed completed) should typically be provided to compare and contrast to the “No‑Build.” There could be some exceptions, such as if there was a new rail grade separation near an intersection that triggered an analysis, but does not change volume diversions, and could be analyzed using joint “No-Build / Build” scenarios. Descriptions of the future alternatives (including the “No-Build”) should include any other planned projects (e.g. STIP or LRTP projects) that will be incorporated into the alternatives.

# 6.0 Traffic Forecast

This section should be used to summarize traffic forecasting procedures and should specify either what regional model will be used or how an appropriate forecasting model will be developed. This section should also contain a list of scenarios for which model runs are planned.

## 6.1 Selection of Traffic Forecast Measures of Effectiveness (MOEs)

If traffic forecasts or the forecasting process are used to compare alternatives, this section should be used to list the MOEs agreed upon by the project support team and should justify the reasoning which was used in selecting those MOEs.

These MOEs focus on quantifying the achievement of traffic forecasting / traffic demand objectives. Traffic operations and safety MOEs are discussed in **Section 7.2**. Traffic forecasting MOEs could include, but are not limited to daily traffic volumes, peak hour traffic volumes, vehicle hours traveled, vehicle miles traveled.

# 7.0 Traffic Operations and Safety Analysis

## 7.1 Minimum Levels of Service, Mobility, and Safety Targets

This section should be used to establish minimum levels of service or specific mobility and/or safety targets for the project. These minimums or targets may be defined individually for each interchange, intersection, or corridor, or they could be defined generally for all locations within the study area. If the target is simply to improve over future no-build conditions, that can be documented here.

Shown below is an example of a table that might be used to communicate several mobility and safety targets that are specific to individual intersections in a study area.

*Table 1: Study Intersection Mobility and Safety Targets*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Number*** | ***Location*** | ***Intersection Control*** | ***Mobility Target (MoDOT)*** | ***Mobility Target (Municipality)*** | ***Safety MOEs  of Focus*** |
| *1* | *21st Street* | *Signalized* | *0.90 v/c* | *LOS D* | *Crash Reductions* |
| *2* | *30th Street* | *Un-signalized* | *Highway approaches 0.90 v/c; Side street approaches 0.95 v/c* | *LOS D* | *Crash Reductions, Benefit / Cost, Lives Saved, Serious Injuries Reduced* |

## 7.2 Measures of Effectiveness and Data Collection

This section should be used to communicate what MOEs (with focus on quantifying the achievement of traffic operations and safety objectives) will be used and what data will need to be gathered before software analysis can begin. For general background information, definitions, and the typical usage of MOEs, refer to the [*FHWA Traffic Analysis Toolbox Volume VI: Definition, Interpretation, and Calculation of Traffic Analysis Tools MOEs*](https://ops.fhwa.dot.gov/publications/fhwahop08054/index.htm).

This section should also establish how these parameters will be collected, i.e. field observations, existing data bases and reports, photos and video, etc. Using a table like the one shown below is an efficient way to communicate this information.

*Table 2: Analysis Parameters*

|  |  |  |
| --- | --- | --- |
| ***Parameter*** | ***Description*** | ***Source*** |
| *Intersection/ Roadway Geometry* | *Number of lanes, lane configuration, cross-sectional information* | *Field work, Highway inventory report, digital video log, aerial photos, TSP* |
| *Operational Data* | *Posted speeds, intersection control* | *Field work, digital video log, aerial photos, TSP* |
| *Peak Hour Factor* | *Peak hour factor* | *Calculated from traffic counts* |
| *Number of Crashes* | *Number of Crashes* | *MoDOT inventory of crash data* |

MOEs that will be used for calibration should be considered in addition to MOEs that will be used to compare alternatives. These MOEs will likely overlap, but may not be exactly the same.

## 7.3 Calibration Targets

This section should be used to communicate what MOEs will be used during the calibration of the model (if applicable). Section 5.3.2.3 of the *TIA Guidance Manual* contains more information regarding calibration and setting targets. A table like the one below may be a good way to summarize the calibration targets.

*Table 3: Calibration Items and Target*

|  |  |  |
| --- | --- | --- |
| ***Simulated Measure*** | ***Calibration Threshold*** | ***Field Data Source*** |
| ***Simulated Traffic Volume for Peak Hour***   * *At intersections, difference targets must be met for at least 85% of approaches.* * *For freeways, difference targets must be met for at least 85% of freeway mainline segments and ramps.* | *Within ± 20% for <100 vph*  *Within ± 15% for ≥100 vph to <300 vph*  *Within ± 10% for ≥300 vph to <1,000 vph*  *Within ± 5% for ≥1,000 vph* | *Balanced peak hour traffic counts [Insert date of counts]* |
| ***Simulated Travel Time for Peak Period***  *Difference targets must be met for a minimum of 85% of travel time routes. Four arterial routes and three freeway routes were used for calibration.* | *Within ± 1 minute for routes with observed travel times that are less than 7 minutes*  *Within ± 15% for routes with observed travel times that are greater than 7 minutes* | *Primary: Google Maps API [Insert Source Date]*  *Secondary: Travel Time Runs [Insert Source Date]* |
| ***Maximum Simulated Queue Length for Peak Period***  *Calibration target must be met for a minimum of 85% of the critical locations. Queue impacts were used to justify calibration.* | *Modeled queues qualitatively reflect impacts of observed queues in the following area:*   * *Spillback to adjacent intersections* * *Spillback from ramp intersection to freeway mainline and vice versa* * *Spillback from turn lanes* | *Field observations –  [Insert Field Date]* |

## 7.4 Traffic Analysis Software Programs to be Used

The checklist below should be used to communicate the traffic analysis software program(s) that will be used to carry out the study. If using a program not listed below, specify the name of the program in the “Other” option.

Highway Capacity Software (HCS)

VISSIM

Synchro

SimTraffic

SIDRA

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Enter the version and/or build number of the software program to be used in the analysis:

**Tool Version / Build:** VISSIM 10.3, Build 122

This section may also be used to justify the given software selection, or in the case of multiple programs being selected, to explain what task each software program will be used to complete.

## 7.5 Safety Analysis Software Programs to be Used

Similar to the checklist used to communicate selection of traffic analysis software programs, this checklist should be used to communicate selection of safety analysis software programs and the reasoning for the selection.

Highway Safety Manual (HSM) Spreadsheets

ISATe

IHSDM

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Enter the version and/or release date of the software program to be used in the safety analysis:

**Tool Version / Build:** ISATe October 2018 Release Version

# 8.0 Conclusion

This section should be used to provide a brief summary of the study’s intent and methods.

# 9.0 Record of Revisions

|  |  |  |
| --- | --- | --- |
| Revision # | Date of Revision | Content which was Revised |
| 0 | Jan X, 20XX | Original Content |
|  |  |  |
|  |  |  |