

Template Date October 2015

WSDOT Methods and Assumptions Template for Interchange Justification Reports

Create a Methods and Assumptions Document (M&A) at the beginning of the study phase of an Interchange Justification Report (IJR). The M&A document will serve as a historical record of the processes, dates, and decisions made by the support team. By signing the M&A the support team endorses all of the methods and assumptions used in the IJR. It is anticipated that some IJR M&A documents will need to be amended as adjustments to the project purpose and need, funding, data, or other variables change. In this event, obtain new signatures.

Notes and Instructions:

- Provide sufficient detail in the M&A document so that someone not familiar with the project would understand it. Clarify with graphics, tables, maps, analyses, and supporting documentation.
- Do not delete any sections of this template. If a section does not apply enter N/A and briefly describe why it doesn't apply.
- New sections may be added if desired (example: table of contents, list of figures, list of tables, list of acronyms, list of appendices, schedule, etc.)
- **Blue Text** should be replaced with project appropriate information.
- **Red text** is provided to better describe what is expected in a section and should be deleted before submitting the draft M&A.
- *Italicized text* is provided to help summarize the section and should not be deleted
- Try not to alter the formatting of this template.

Acronyms

- M&A – Methods and Assumptions Document
- IJR – Interchange Justification Report
- HCM – Highway Capacity Manual (latest version adopted by WSDOT)
- MOE – Measures of Effectiveness
- HSM – Highway Safety Manual
- DM – Design Manual

Cover Page must include:

- Title with project name and state route and/or Interstate
- Date
- Indicate draft or final
- Prepared by

Stakeholder Acceptance

“The undersigned parties, including all members of the support team from WSDOT, FHWA and the Local Agencies, concur with the Interchange Justification Report Methods and Assumptions for the **Title of Project** as presented in this document.” **Provide a signature block for each party, formatted similar to below (DM Ch 300, Exhibit 300-3 mandates approval and concurrence roles):**

WSDOT HQ Access

Signature

Title

Date

WSDOT – HQ ASDE

Signature

Title

Date

FHWA (if applicable)

Signature

Title

Date

Traffic Representative see DM 320.01

Signature

Title

Date

Additional signatories should be discussed with HQ Access Office.

The following notes, if agreed by the stakeholders, may go at the bottom of the signature page:

- (1) Participation on the Stakeholders Committee and/or signing of this document does not constitute approval of the **Title of Project** Interchange Justification Report.
- (2) All members of the Stakeholder Committee will accept this document as a guide and reference as the study progresses through the various stages of project development. If there are any agreed upon changes to the methods or assumptions in this document a revision will be created, endorsed and signed by all the stakeholders.

At the time this Methods and Assumptions document was signed, the latest and controlling version of the WSDOT Design Manual Chapter 550 was dated: **example – July 2015**

Policy Point #1 – Need For the Access Point Revision

Introduction

Suggested points to include:

- A list of project leads, proponents, and other support team members
- Location of the project (county, city, route, city streets, etc.)
- Background information
 - Brief mention of the history of the area pertinent to the project that has led to the need for the project (example: population growth, recent/future development, etc.), understanding that this will be discussed in more detail in the Project Description.
 - Any previous traffic studies, VE studies, IJR's, etc. (include the date of completion)
 - Recent projects in the area (state or local) that are relevant to this project
- Facilities that will be affected by the project, including local system

Project Description

Describe the purpose of the project, the needs being addressed, and define the current problem or deficiency that the project is looking to address or overcome.

Some elements to consider when developing a project's need(s):

- Establishes evidence of current or future transportation problem or deficiency
- Is factual or quantifiable or practical
- Justifies commitment of resources and impacts to the environment
- Identifies a problem that is fixable/solvable
- Establishes and justifies logical termini (23 CFR 771.111(f))

Some elements to consider when developing a project's purpose:

- Presents objectives to address the need
- Can be used to develop and evaluate potential solutions
- Is achievable
- Is unbiased
- Is comprehensive enough to allow for a reasonable range of alternatives, and specific enough to limit the range of feasible alternatives
- Allows for a range of alternatives that are in context with the setting (including the local context)
- Focuses on multi-modal transportation system and safety

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How do you plan to demonstrate that the local transportation system and the existing interchanges cannot be improved to satisfactorily accommodate the design year travel demands?

Example: Analysis will be completed on existing conditions for all intersections/segments in the study area for the opening year and design year. A Local Improvements Only scenario will include the following reasonable local improvements that may improve the existing or future deficiencies (possibly provide a list? Or reference Policy Point 3, if a list is already provided there). This Local Improvements Only alternative will be analyzed for both the opening year and design year (possibly provide a list of improvements that would be assumed to be completed by opening year and design year, or reference Policy Point 3, if a list is already provided there).

Describe the local and regional traffic that would be affected either positively or negatively by the proposal.

Briefly describe the major traffic generators and their movements: developments, schools, housing developments, etc...

Policy Point #2 Reasonable Alternatives

Describe the process that will develop alternatives, determine if they are viable, and assess the viable alternatives in order to determine the preferred alternative. If viable alternatives have already been assessed, describe the reasonable alternatives that have been evaluated.

These include the design options, locations, project phasing, and transportation system management-type improvements such as ramp metering, public transportation, and HOV facilities that have been assessed and that meet the proposal's design year needs.

After describing each of the alternatives that were proposed, explain the method of assessing the reasonable alternatives.

Policy Point #3 Operational and Collision Analysis

Analysis Years and Analysis Periods

Current year: Current year, or year of count information

Year of Opening: Estimated year of construction completion

Add any interim years here.

Design Year: For IJR's that require FHWA approval, use a minimum 20 years after opening year or the year available in a Travel Demand Model

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For IJR's not requiring FHWA approval, use 20 years where reasonable (Practical Design may give rise to a design year less than 20 years after opening year)

Analysis Period(s): examples – years of crash data, AM peak hour(s), PM peak hour(s), Midday peak hour(s), peak weekend hour(s), etc.

Study Area and Project Limits

Describe and map both the study area and project area (DM 550 discusses how to determine study area and project area).

Include a written description of affected freeway, interchanges, intersections and streets, cities and counties with State Route impacts, and local agency improvements.

Document, to what level, each intersection, roadway segment, freeway segment and interchange in the study area will be analyzed. It is helpful to provide a map for reference.

The study area for the operational analysis and safety analysis is usually the same but it is possible that they may be different. If they are different document the differences and the reason(s) they are different.

Traffic Operations Analysis

Methodology: example – 2010 Highway Capacity Manual

Software: include name, version, anticipated usage, any early agreed upon settings and parameters

NOTE: if Vissim is proposed, an Analysis Methods and Assumption Document will be required for this M&A (the document should be attached to the M&A as an appendix). The contents of an Analysis Methods and Assumption Document is outlined in the WSDOT Vissim Protocol (September 2014), in Section 2.8 (Analysis Methods and Assumption Document).

Results to be reported: This is not MOE's, which is in another section; this section is to list out the overall scenarios. Example – no build alternative (which years), local improvements only alternative (which years), build alternatives (list alternatives if known).

Travel Forecast

Document what regional traffic model or trend line analysis will be used to take into account historical/projected growth rate, describe the methodology and process (DM 320.06 details 4 forecasting methods) to be used in developing the forecast and the calibration/validation efforts that will be used (including benchmarks). Also, describe if these models are in the process of being updated at the time of publication of the methods and assumptions document. Document the assumptions that may be required if any of the regional models are in transition.

Network Assumptions

Describe/list assumed network changes for each analysis year. This should include both highway and local network assumptions.

Volume Development

Describe/list traffic volumes sources that will be used to for current year analysis or model calibration (include when volumes were/or will be collected).

If there will be any post-processing of volumes, describe what methodology will be used (currently industry standards is to use NCHRP 765, which has replaced NCHRP 255).

Selection of Measures of Effectiveness (MOEs)

In this section, document which MOEs will be used to demonstrate how the proposal will accomplish the objectives. The MOE's chosen should align with the purpose and need of the project. Also take into account the reliability of the information available.

Examples of typical MOE's:

- LOS as defined by HCM, or other approved guidance
- Average speed and density
- Average delay and volume/capacity (v/c) ratio
- Safety Analysis Results
 - Current Year Analysis
 - Difference Between Current Expected Fatal and Injury Crashes per year and Current Predicted Fatal and Injury Crashes per year
 - Difference Between Current Expected Property Damage Only (PDO) Crashes per year and Current Predicted PDO Crashes per year
 - Opening and Design Year Analyses
 - Difference Between the Predicted Fatal and Injury Crashes per year of each Alternative including No-Build
 - Difference Between the Predicted Property Damage Only (PDO) Crashes per year of each Alternative including No-Build

Examples of Supplemental MOE's:

- Average Queue Length (use caution if choosing this MOE as its difficult to forecast future queues reliably)
- Maximum Queue Length (use caution if choosing this MOE as its difficult to forecast future queues reliably)
- Accessibility of community resources such as hospitals or special generators.
- Travel Time on Network (vehicle-hours)
- Average trip length (vehicle/hours per trip)
- Duration of Congestion (hours at defined density, speed or flow rate)
- Extent (segment miles congested)
- Reliability (buffer index)
- Variability in Travel Time
- Travel Time to Interstate (Minutes)

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- Schedule Adherence of Transit
- Number of Phase Failures on Major Arterial
- % of demand served
- % of demand served in peak hour
- % of capacity used on signalized ramp terminals
- Safety Analysis Results
 - Current Year Analysis
 - Difference Between Current Expected (Crash Type) Crashes per year and Current Predicted (Crash Type) Crashes per year
 - Opening and Design Year Analyses
 - Difference Between the Predicted (Crash Type) Crashes per year of each Alternative including No-Build

Collision Analysis

The safety performance of the existing freeway system and local transportation system, as well as future no build and proposed alternatives, will be analyzed within the safety analysis study area. The following methodology and assumptions will be followed:

Methodology: example – Obtain crash data from WSDOT for I-5 MP to MP for 5 years. Use the traffic volumes from the operational analysis. Use the HSM Freeway Model to determine the existing safety performance of the freeway / interchanges and the HSM models for the city streets and intersections. etc.

List all Assumptions: examples

- 5 years of crash data (2010-2014) best represents the existing safety performance.
- The safety analysis study area is the same as the operational study area except for the intersection of SR 528 and first street because...

Software: include name, version, anticipated usage, any early agreed upon settings and parameters

Policy Point #4 Access Connections and Design

Possible assumptions of this policy point that should be documented are:

- That the new or modified interchange(s) will be fully directional: Document this or explain why it is not fully directional.
- That the new or modified interchange(s) will be spaced according to guidelines: Document this or explain why it is not spaced according to guide lines.

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- That the new or modified interchange(s) will be designed so that there are no variances from standards: Document this or list and explain the known potential variances, why standards cannot be met, and justification for their use.
- If there are no assumptions needed regarding access or design, state “No assumptions for this policy point.”

Policy Point #5 Land Use and Transportation Plans

Possible assumptions of this policy point that should be documented are:

- The preferred alternative is consistent with land use plans (local, regional, state). List the land use plans. Document that the preferred alternative is consistent with the land use plans or explain any inconsistencies and how they will be addressed.
- The preferred alternative is consistent with transportation plans (local, regional, state). List the transportation plans and any previous traffic studies for the area that may mention the proposal. Document that the preferred alternative is consistent with the transportation plans or explain any inconsistencies and how they will be addressed.

Policy Point #6 Future Interchanges

Search out comprehensive network plans and other planning studies from local agencies. List any found comprehensive plans or other planning studies that addresses future interchanges and other forms of access in the area and review them for consistency with the preferred alternative. Document that the preferred alternative is consistent with future interchange plans or explain any inconsistencies and how they will be accommodated or mitigated.

Policy Point #7 Coordination

List all agencies, groups, etc that will be contacted regarding potential projects.

Some examples are:

- Cities
- Counties
- Environmental groups
- Tribes
- Bike groups
- Special interest groups

List any past or already planned public outreach.

Policy Point #8 Environmental Processes

Briefly describe the assumed environmental document type for the proposal.

State whether the environmental documentation will be conducted concurrent with IJR. If not, state that the IJR team is only seeking Operational and Engineering Acceptability at this time and that the team is aware the full IJR approval is contingent on the completion of the environmental documentation.

Conclusion:

If the stakeholders group agrees, the following note can be added in this section.

From time to time, ideas or suggestions arise late in the evaluation or documentation process. Some of these late emerging ideas may have merit and added benefits to the project, but be difficult to incorporate in the on-going process. It is understood that new ideas may bring value to the final outcomes and therefore should not be automatically dismissed because of the sequence of events and timing of the information. Specific protocols will be in place to allow new ideas and information to be “vetted” and reviewed for consideration, as follows:

If new ideas and information are brought forward, they will be first discussed by the [WSDOT Project Management Team](#) who will determine its merits. If they decide that the new idea has merit it will be referred to the [Project Stakeholders Group](#) to decide how the new idea should be addressed in the IJR and environmental review process. If the [WSDOT Project Management Team](#) decides that the idea has little merit, it will be documented and addressed, if appropriate, in the IJR or environmental document.

For ideas that have already been considered and dismissed, but there is new interest in re-consideration, the [WSDOT Project Management Team](#) will determine if reintroducing the idea has merit. If they decide that the new idea has merit, it will be referred to the [Project Stakeholders Group](#) to decide how the revised idea should be addressed in the IJR and environmental process.

If new ideas and/or prior information are brought forward during a [stakeholder meeting](#), the content of this information will not be fully discussed if it impacts the scheduled agenda. The [WSDOT Project Management Team](#) will note the comments and content of the information and will assure that review of the new information will follow the approved protocols for consideration.

Date	Revision Number	Comment / Need
		Ex: draft, date signed, or assumption change

Project Name

Date

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