|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reviewer, please email completed form to:** |  | 1st Review | 2nd Review | 3rd Review |
| To: | Project Manager & Region Contact | Date Reviewed (m/d/yyyy): |       |       |       |
| CC: | DOT Traffic Model Peer Review | Reviewed By: |       |       |       |
| Subject: | DT2340 for Project ID; Traffic Model Name | Model Completion/Revision Date(m/d/yyyy): |       |       |       |
| **CONTACT INFORMATION** |
| **Lead****Reviewer** | Name (First, MI, Last)      | **Lead****Analyst** | Name (First, MI, Last)      | **Region****Contact** | Name (First, MI, Last)      |
| Organization/FirmWisDOT Traffic Forecasting Section | Organization/Firm      | Region/Bureau      |
| (Area Code) Telephone Number      | (Area Code) Telephone Number      | (Area Code) Telephone Number      |
| Email Address      | Email Address      | Email Address      |
| **TRAFFIC MODEL DESCRIPTION** |
| Project ID(s)      | Project Name/Description      | Region:       | Highway(s)      |
| Traffic Model Name/Description      | Analysis Scenario/Alternative      | Analysis Year(s)      |
| Analysis Time Period (s) |
| [ ]  Weekday AM Peak Hours:       | [ ]  Weekday Midday PeakHours:       | [ ]  Weekday PM Peak Hours:       | [ ]  Fri Peak Hours:       | [ ]  Sat Peak Hours:       | [ ]  Sun Peak Hours:       | [ ]  Other:        Hours:        |
| Analysis Tool(s) Utilized |
| [ ]  Paramics - Version:       | [ ]  Vissim - Version:       | [ ]  Other:       - Version:       |  |
| **SCOPE AND EXTENT OF PEER REVIEW** |
| *Purpose & Scope of Review* |
|       |
| *Description/Limit of Model* |
|       |
| *Traffic Forecast* |
| Traffic Forecast Source & Date/Version: |  |  |  |
|       |  |  |  |
| Other:       |       |
| *Were any changes to the model made by the review team? If yes, please describe.* |
|       |

|  |
| --- |
| **DIRECTIONS** |
| This form is applicable for the review of all microsimulation traffic models, regardless of the traffic software program utilized to develop the traffic model. However, this form focuses on Paramics and Vissim microsimulation software packages.When noting problems or concerns, identify the severity of the issue and the revisions recommended using the following scale: Minor, Moderate, or Major. Check the appropriate box associated with each review (the blue box for the 1st review, the green box for the 2nd review and the purple box for the 3rd review).If more than one review of the traffic model is required, use different color text to distinguish the comments associated with each review (e.g., comments from the 1st review should be in blue text, comments from the 2nd review should be in green text, and comments from the 3rd review should be in purple text). Provide any supporting tables, screenshots, or additional images in a separate attachment to this form. |
| REVIEW ITEMS |
| Traffic Volumes | Volume Targets | *Traffic volume targets describe what volume should be simulated at a particular location. The targets are either developed using existing volumes or forecasted volumes. This review checks the development and reasonableness of the target volumes.** *For an existing conditions model, balanced volume targets will be checked against field traffic counts.*
* *For future year / alternative scenarios, balanced design hour volume targets will be compared to the traffic forecast.*
 |
| As a whole,the volume targets are:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Observations/Comments: | Analyst Response |
| 1st Review      | 1st Review      |
| 2nd Review      | 2nd Review      |
| 3rd Review      | 3rd Review      |

|  |  |  |
| --- | --- | --- |
| Traffic Volumes | Link and Turn VolumeGrowth Rates | For future year / alternative scenarios, link and turning movement hourly volume growth rates will be checked for reasonableness against being too high, low, or negative based on expected trends from the traffic forecast. |
| As a whole,the link growth rates are:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Observations/Comments: | Analyst Response |
| 1st Review      | 1st Review      |
| 2nd Review      | 2nd Review      |
| 3rd Review      | 3rd Review      |

|  |  |  |
| --- | --- | --- |
| Traffic Volumes | Time Periods and Demand Profile | The traffic flow profile describes how volumes entering the network fluctuate during the timeframe simulated. This includes the relative amounts of traffic in the warm-up, peak, and cool-down hours of the simulation, as well as sub-hourly flow rates within each simulated hour. This review checks the traffic flow profile for reasonableness against either observed existing trends or expectations from the traffic forecast. |
| As a whole,the flow profile is:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Observations/Comments: | Analyst Response |
| 1st Review      | 1st Review      |
| 2nd Review      | 2nd Review      |
| 3rd Review      | 3rd Review      |

|  |  |  |
| --- | --- | --- |
| Origin-Destination (OD) | OD Development | OD matrices may be developed using a variety of data sources (synthetic methods, field observations, and travel demand models). This review checks that the OD matrix was developed in a consistent manner across all scenarios and time periods and is documented appropriately. |
| As a whole, the OD was developed in a manner that was:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Observations/Comments: | Analyst Response |
| 1st Review      | 1st Review      |
| 2nd Review      | 2nd Review      |
| 3rd Review      | 3rd Review      |

|  |  |  |
| --- | --- | --- |
| Origin-Destination (OD) | OD Growth | For future year / alternative scenarios, this review checks that the OD matrix was appropriately adjusted from the base condition. This review also checks that changes in traffic (increases or decreases) at origin and destination zones reflect the traffic forecast. |
| As a whole, the OD growth is:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Observations/Comments: | Analyst Response |
| 1st Review      | 1st Review      |
| 2nd Review      | 2nd Review      |
| 3rd Review      | 3rd Review      |

|  |  |  |
| --- | --- | --- |
| Origin-Destination (OD) | OD Pattern | The OD pattern refers to trip making trends within the OD matrix. For example, trends may include the directionality of traffic flow (ex. inbound AM peak, outbound PM peak), or relative relationship between origin and destination zones (ex. the relative % of ramp-to-ramp traffic in a weave). This check inspects the OD pattern for reasonableness against field observations or expected trends from the traffic forecast. |
| As a whole, the OD pattern is:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Observations/Comments: | Analyst Response |
| 1st Review      | 1st Review      |
| 2nd Review      | 2nd Review      |
| 3rd Review      | 3rd Review      |

|  |  |  |
| --- | --- | --- |
| Vehicle Composition | Vehicle Composition | The microsimulation model should include all relevant vehicle types and characteristics for the scenario being modeled (passenger cars, heavy vehicles, high-occupancy vehicles, etc). This review checks that the percentages of each vehicle type and origin destination patterns reflect observed trends or expectations from the traffic forecast. |
| As a whole, the vehicle composition is:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Observations/Comments: | Analyst Response |
| 1st Review      | 1st Review      |
| 2nd Review      | 2nd Review      |
| 3rd Review      | 3rd Review      |

|  |  |  |
| --- | --- | --- |
| Congestion | Congestion | For future year scenarios, this review checks that the microsimulation model is representative of congestion expected from the traffic forecast and travel demand model (if a travel demand model was used for forecasting). |
| As a whole, the simulated volumes reflect existing or forecasted congestion in a manner that is:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Observations/Comments: | Analyst Response |
| 1st Review      | 1st Review      |
| 2nd Review      | 2nd Review      |
| 3rd Review      | 3rd Review      |

|  |
| --- |
| SUMMARY OF REVIEW |
| Overall Traffic Model | As a whole, the microsimulation model reflects existing or forecasted traffic volumes and origin-destination patterns:[ ] [ ] [ ]  Acceptable[ ] [ ] [ ]  Conditionally Acceptable[ ] [ ] [ ]  UnacceptableExtent of Revisions Required:[ ] [ ] [ ]  None[ ] [ ] [ ]  Minor[ ] [ ] [ ]  Moderate[ ] [ ] [ ]  Major | Summary of the review team’s findings and recommendations |
| 1st Review      |
| 2nd Review      |
| 3rd Review      |
| REVIEWER’S CONCULSION (Check One) |
|  |  |  |
|  | [ ]  | [ ]  | [ ]  | It is the opinion of the review team that the model as reviewed and tested is an accurate and reasonable representation of the traffic volumes in the study area for the analysis year, time period, and scenario/alternative indicated in the title block of this document. |
|  |  |  |
|  | [ ]  | [ ]  | [ ]  | It is the opinion of the review team that the model as reviewed and tested requires correction of       errors before it can be regarded as a reasonable representation of the traffic volumes in the study area for the analysis year, time period, and scenario/alternative indicated in the title block of this document. (Indicate the type of errors (volume, OD, vehicle composition, and/or congestion) as well as severity of errors: Minor, Moderate, or Major). |
|  |
| Prepared By (Signature) | DateClick here to enter a date. | Contact InformationPhone:      Email:       |
| Prepared By (Signature) | DateClick here to enter a date. | Contact Information (Phone, Email)Phone:      Email:       |
| Prepared By (Signature) | DateClick here to enter a date. | Contact Information (Phone, Email)Phone:      Email:       |

**Traffic Forecasting – Microsimulation Review Guidance**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **General Considerations** | **Existing Year** | **Future Year** |
| **Traffic Volumes** | **VolumeTargets** | * TEOPS 16-20-8.3 Table 8.1 could be used to compare forecasts volume to balanced target volumes.
* When making comparisons, consider the peak direction and importance of the volume. Higher deviations may be acceptable for off-peak directions and non-critical locations.
* Check critical locations such as weaves, merges, and high volume intersections.
* Are there any problematic trends when comparing volume sets? (i.e. large downtrend or uptrend in raw vs balanced, simulated vs balanced)
* If there are any adjacent studies, are the volume targets consistent between all studies?
 | * Are the balanced volumes comparable to the observed (raw) counted volumes?
* Are the simulated volumes comparable to the balanced volumes?
 | * Do the balanced design hour volume targets (“targets”) reflect the traffic forecast?
* Were the targets developed appropriately?
	+ If targets were based on applying K‑values to forecasted AADT (i.e. “AADT x K”), was the process reasonable?
		- K-values are often, but not always, between 5% and 10%. K-values also tend to decrease from existing values as AADT increases.
	+ If targets were developed from a TDM, was this accomplished in a reasonable manner?
* Are the simulated volumes comparable to the targets?
 |
| **Link and TurnVolumeGrowth** | * Identify critical locations to check. For example, major weaves, merges, and intersections.
	+ Work with the project team to help identify critical areas and project objectives.
* Review the general methodology for determining growth. (absolute growth, percentage growth, or average of absolute and percentage). Look for outliers that may have resulted from the methodology.
 | (Growth Check Does not Apply to Existing Year) | * Are the growth rates on critical links consistent with the traffic forecast?
	+ Check both high growth (>3%) and low growth (< 0.5%).
	+ Check for negative growth. Is negative growth explained and acceptable?
		- For example, negative growth may be due to an alternative removing or restricting access.
* If there are critical intersections, is the growth in turning volume consistent with the traffic forecast?
	+ Consider the same checks as the link volumes.
 |
| **Time Periods and Demand Profile** | * Make sure all necessary time periods are being modeled.
	+ Are the peak periods (AM, PM, etc) appropriate given the project’s purpose?
	+ Are the times (6-9 AM, 3-6 PM, etc) within the peak periods appropriate?
 | * Are the peaking characteristics within the peak hour consistent with existing data? (i.e. is the peak hour factor appropriate?)
 | * How did the flow profile change from the existing year?
* If the future / alternative flow profile is the same as the existing scenario, is this assumption reasonable based on the traffic forecast and expected congestion?
 |
| **Origin-Destination (OD)** | **ODDevelopment** | * The method and data sources used to develop the OD matrix should be documented.
* Microsimulation typically deals with whole-number vehicle trips. For large models, rounded values can add up to a significant number of trips. How were fractional trips handled? (i.e. round decimals up or down).
 | * Was appropriate data used to develop the origin-destination matrix for critical movements?
	+ Potential ways to develop an OD matrix include: synthetic/manual estimation methods, Bluetooth studies, and travel demand models (TDM).
 | * Was the future year OD developed in a reasonable manner?
	+ Typically, synthetic/manual estimation and TDM’s are used. Growth factors could also be applied to the existing year matrix.
 |
| **ODPattern** | * A large OD matrix should be condensed into a smaller, manageable, matrix in order to review overall patterns.
	+ Work the project team to identify major OD pairs. Consider reviewing the top 10% highest volume OD pairs in each time period.
* If a TDM was used to develop the OD matrix, is the microsimulation OD matrix consistent with the TDM OD matrix?
	+ If not, are the differences explained and reasonable?
* Check for symmetric and asymmetric patterns. For example, inbound AM peak and outbound PM peak symmetry for commuting areas.
* The OD pattern is very important for weaving analysis in microsimulation. Check for “unusual” patterns, such as high ramp-to-ramp weaving percentages, or unexpected patterns based on land use.
* Does the microsimulation uses multiple routes for a single OD, or dynamic traffic assignment?
	+ If yes, obtaining the percent of traffic using multiple routes within microsimulation can be complex. Work with the project team to identify critical locations and have them provide the necessary data.
 | * Are the OD percentages travelling from major origins to major destinations consistent with existing data?
	+ Check for OD pairs that are too high or low compared to existing data
* Is the overall directionality of traffic consistent with existing data?
* If the microsimulation uses multiple routes for a single OD, or dynamic traffic assignment, do the routes and trip percentages for each route seem logical?
	+ If a travel demand model was used, are the simulated routes consistent with the TDM?
 | * Are the OD percentages travelling from major origins to major destinations consistent with the traffic forecast?
* Are there any major changes to the pattern compared to the existing year?
* Typically, large changes in OD pattern only occur when major traffic generators are introduced or new routes are introduced into the transportation network.
* Is the overall directionality of traffic consistent with the traffic forecast?
* If the microsimulation uses multiple routes for a single OD, or dynamic traffic assignment, did the routes and trip percentages change significantly from the existing year? Is the future year consistent with the traffic forecast?
	+ If a travel demand model was used, are the simulated routes consistent with the TDM?
 |
| **ODGrowth** | * A large OD matrix should be condensed into a smaller, manageable, matrix in order to review growth.
* Review the general methodology for determining growth. (absolute growth, percentage growth, or average of absolute and percentage). Look for outliers that may have resulted from the methodology.
 | (Growth Check Does not Apply to Existing Year) | * Are the growth rates from zones consistent with the traffic forecast?
* Check for reasonableness of high growth (>3%), low growth (< 0.5%), and negative growth compared to the existing year OD matrix, similar to the link volume growth check.
* Check growth rates for zones as origins and as destinations
* Is the total growth in the matrix reasonable compared to the forecast?
* Check for symmetric and asymmetric growth patterns. For example, do any time periods grow more than others?
* If a TDM was used, are the changes between the existing and future OD consistent with the changes in the comparable TDM OD matrices?
 |
| **Vehicle Composition** | **VehicleComposition** | * Consider the characteristics of the area when reviewing vehicle composition. For example, residential areas with little heavy vehicles, or warehouses with many heavy vehicles.
 | * How are heavy vehicle (HV) volumes incorporated into the model? Uniform traffic percentage? Separate OD matrix?
	+ Is the selected method appropriate for the model’s purpose?
	+ Are the HV volumes and OD patterns consistent with expectations and any available traffic data?
* Are any “special vehicle types” being modeled, such as HOV?
	+ If yes, are the volumes and OD patterns consistent with expectations and any available traffic data?
 | * Is the growth in heavy vehicles reasonable compared to the traffic forecast?
* If any “special vehicle types” are being modeled, such as HOV, is the growth reasonable compared to the traffic forecast?
 |
| **Congestion** | **Congestion** | * The simulation should reflect congestion either based on existing data, or expected data from the forecast. Because congestion is often highly variable, consider the project’s purpose and critical areas to ensure that the model is useful for decision making.
 | * Are the bottleneck locations within the model consistent with existing traffic data?
* Are there any known bottlenecks outside of the simulation area that might affect the congestion in the network?
 | * Are the bottleneck locations within the model consistent with expectations from the traffic forecast?
* Are there any future bottlenecks outside of the simulation area that might affect the congestion in the network?
* If a TDM was used, are bottleneck locations in the microsimulation analysis consistent with the TDM?
	+ If not:
		- Work with the project team to identify if differences are due to the microsimulation, TDM, or both.
		- Are the differences in critical areas of concern that would affect conclusions or project decisions, especially for critical areas?
 |