**MoDOT Reviewer’s Checklist for Transportation Impact Analyses**

June 2020

Every Synchro/SimTraffic model submitted to MoDOT will be reviewed by a member of MoDOT staff using the following checklist. The purpose of sharing this checklist is to assist those submitting models to MoDOT in reviewing their own work prior to submitting.

When using this checklist to review a model, a checkmark () should be used to signify items the reviewer deems acceptable. If an item does not apply to the model being reviewed, the reviewer should leave a checkmark in the “N/A” column. If an item applies to the model being reviewed but is deemed unacceptable or in need of adjustment, the reviewer should leave the check boxes next to that item blank and should address the issues with that item in their comments at the end of the checklist.

The items in this checklist accompany **Sections 2.4.1**, **5.2.3**, **5.3.2**, and **Appendix D** in MoDOT’s *TIA Guidance Manual*. Modelers and reviewers should refer to these sections if they need clarification on MoDOT’s best practices regarding Synchro and SimTraffic. The checklist assumes that the basic guidance from the manual is followed; however, if deviations from the guidance were agreed upon by the project team, these supersede what is written in the checklist.

**MoDOT Synchro/SimTraffic Model Reviewer’s Checklist**

Project Name: Click or tap here to enter text.

Modeler/Agency-Consultant: Click or tap here to enter text.

Model Reviewer/Agency-Consultant: Click or tap here to enter text.

Date of Model Submittal/Review: Click or tap here to enter text.

|  |  |  |  |
| --- | --- | --- | --- |
| **Synchro Review** | | | |
| **Model Element** | **Description** | **Check** | **N/A** |
| Coding | If applicable, check that Scenario Manager settings are correct (analysis year, peak hour, scenario, etc.) |  |  |
| Check that signalized node numbers match signal ID numbers, which should range from 1xxx to 8xxx. Unsignalized node numbers are in the 9xxx range. (**Note:** This is a best practice; not a requirement) |  |  |
| Check that zones are defined and reasonable if needed |  |  |
| Laneage, geometry, and storage lengths should match signal plans, design files, or field conditions |  |  |
| Background image (if not using Bing imagery) should be scaled correctly to a defined coordinate system |  |  |
| Cardinal directions (e.g., north, south, east, and west) are used for intersection approaches. Note that exceptions are allowed for intersections with more than four approaches. |  |  |
| All approach speeds represent the speed limit or safe, legal speed anticipated at the approach (use 25 mph for driveways and loop ramps and 35 mph for typical ramps) |  |  |
| Use field data, signal plans, and/or MoDOT TMS data to ensure that all grades are reasonable |  |  |
| All external links should extend at least 1,000 feet |  |  |
| Analysis period is set to a default value of 15 minutes. |  |  |
| Check that traffic volumes match count data or has been balanced (depending on what has been agreed upon for the project) |  |  |
| Check that PHF either matches traffic data or uses 0.92 |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Synchro Review (Continued)** | | | |
| **Model Element** | **Description** | **Check** | **N/A** |
| Coding | Heavy Vehicle Percentage: Use field data or heavy vehicle estimates from the [MoDOT AADT Map](https://www.modot.org/traffic-volume-maps) **1**. Otherwise, use the HCM recommended default of 3%. |  |  |
| Lane utilization factors are set at the default values, and have been changed only to account for where the lane utilization would be impacted (e.g., lane merges beyond an intersection or an advanced left turn at a diamond interchange). |  |  |
| Use “Error Check” to identify all coding errors and warnings by location. |  |  |
| If a median-controlled facility where each bound is coded as a separate link, then left turns or U-Turns should be coded on separate links and the link speed for left turns should be 10 mph below the speed limit. |  |  |
| Traffic Control | Verify intersection control type and data are properly coded. |  |  |
| Check that signal phasings, timings, and other parameters match signal plans |  |  |
| Overlaps between conflicting traffic movements are avoided |  |  |
| Check ramp meter control type and data |  |  |
| Report Settings | Ensure that the printer is set to creating PDF documents. |  |  |
| Check that the HCM methodology is used for unsignalized intersections. |  |  |
| Check that the appropriate methodology (HCM or Synchro) is used for signalized intersections (as determined based on project needs and discussions with MoDOT project engineers). Refer to the Methods and Assumptions document and **Section 5.2.3** in the MoDOT *TIA Guidance Manual* for more information. |  |  |
| Check that the appropriate report inputs and outputs for display (as determined based on project needs and discussions with MoDOT project engineers) are selected. |  |  |

**1** **Disclaimer:** MoDOT’s interactive AADT map shows volumes at some locations that are associated with actual count data and some data that are estimated volumes (not based on count data). If the analyst has any data concerns, then please contact the MoDOT TMS unit.

|  |  |  |  |
| --- | --- | --- | --- |
| **SimTraffic Review** | | | |
| **Model Element** | **Description** | **Check** | **N/A** |
| Error Check | Run SimTraffic briefly to ensure there are no errors (default parameters of 3 minutes seeding, 10 minutes recording are acceptable for quick error checking) |  |  |
| Use “Coding Error Check” to view any errors |  |  |
| Intervals & Volumes | Ensure that the seeding time duration is 15 minutes and that the seeding start time is 15 minutes before the peak hour. |  |  |
| The recording interval duration should be 60 minutes. |  |  |
| It is advised to break the recording duration into 15‑minute intervals with one of the middle intervals set to “PHF Adjust” of “Yes.” The other intervals should be set to “AntiPHF Adjust” of “Yes.” |  |  |
| Animation | Review reasonableness of the model against data coding, route assignment, and lane utilization |  |  |
| Compare model animation to field characteristics |  |  |
| Verify that all turn bays are being fully utilized and are not blocked by vehicles in adjacent through lanes |  |  |
| Verify there are no vehicles turning at inappropriate locations |  |  |
| Review reasonableness of the vehicle mix/traffic composition |  |  |
| Vehicles & Drivers | **Drivers Settings:** When vehicles are created, they are randomly assigned a driver type between 1 and 10. Each driver type represents 10% of the driving population with driver type 1 being most conservative and driver type 10 most aggressive. ***Use default values unless documented*** |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **SimTraffic Review (Continued)** | | | |
| **Model Element** | **Description** | **Check** | **N/A** |
| Vehicles & Drivers | **Vehicles Settings:** This setting can be used to view and edit the vehicle characteristics. Note that the total proportion of heavy vehicles (among all vehicles) is determined in Synchro and that the vehicle occurrence percentages on this page are among the total number of heavy vehicles established already. To simulate a higher proportion of certain heavy vehicle types on known freight corridors, the proportions of the “Truck SU,” “SemiTrk1,” “SemiTrk2,” “Truck DB,” and/or “Bus” could be adjusted higher (while lowering another, lesser occurring heavy vehicle type). ***Use default values unless documented*** |  |  |
| Model Runs | Ensure that 5 to 9 model runs are completed for each peak hour scenario. Refer to **Section 5.3.1** for additional information on determining the appropriate number of SimTraffic model runs to complete. |  |  |
| Report Settings | Ensure that the printer is set to creating PDF documents. |  |  |
| Ensure the checkbox for multiple runs is checked |  |  |
| Select all “Delay” and “Network” report options. Under “Other,” select “Total Travel Distance,” “Total Travel Time,” and “Average Speed.” |  |  |
| For a queueing and blocking report, select the “Queuing Information” checkbox |  |  |

**Reviewer’s comments:**