

**Evaluation On SACSIM19 2020 MTP/SCS Scenarios Based on Caltrans TAC Travel Model Checklist**

TAC "Table 4. A Checklist for Evaluating Adequacy of Travel Demand Models for Estimating Induced Travel"	SACSIM Evaluation	SACSIM Evaluation Description	Reference Documentation
1	X	SACSIM passes check 1 based on 1b.	
1 a	Yes*	Land use is developed as an iterative process for the MTP/SCS. Quantity and type of housing and employment to forecast is based on an analysis of policy, regulatory, and market factors. These factors include a consideration of job proximity, market demand and saturation (which depend in part on accessibility to jobs and services), transportation infrastructure and funding mechanisms for such infrastructure, and other infrastructure needs. In addition, employment location is sensitive to travel time and travel cost in the travel demand model.  *If project specific land use assumptions are not consistent with land use developed through the MTP/SCS process, further calibration may be required to qualify 1a requirements.	<ul style="list-style-type: none"> <li>SACSIM19 Model Documentation (Section: 11.3.3 Land Use-Transportation Sensitivity Testing with SACSIM) <a href="https://www.sacog.org/travel-model-documentation">https://www.sacog.org/travel-model-documentation</a></li> <li>MTP/SCS Appendix D <a href="https://www.sacog.org/post/adopted-2020-mtpsc">https://www.sacog.org/post/adopted-2020-mtpsc</a></li> </ul>
1 b	Yes	MTP/SCS land use forecasts are developed through an iterative process that analyzes outcomes from multiple scenarios to determine final plan assumptions.	<ul style="list-style-type: none"> <li>MTP/SCS Appendix D <a href="https://www.sacog.org/post/adopted-2020-mtpsc">https://www.sacog.org/post/adopted-2020-mtpsc</a></li> </ul>
1 Notes		[1] Any TDM used to assess induced travel must be paired, or iterated, with an approach for predicting changes in land use caused by the project. OPR's Technical Advisory (Appendix 2, Induced Travel Mechanisms, Research, and Additional Assessment Approaches, p. 34) lists options for incorporating land use effects in a travel model-based assessment.	<ul style="list-style-type: none"> <li>SACOG 2020 MTP/SCS Appendix E Plan Performance (Section Travel Demand Forecasting Model pg. 49-76)</li> </ul>
2	X		
2 a	Yes	SACSIM19 is sensitive to all travel time and travel costs listed.	<ul style="list-style-type: none"> <li>SACSIM19 Model Documentation (Chapter: 11 Sensitivity Testing)</li> <li>SACSIM19 Model Documentation Appendix D Fuel Tax and Mileage Fee Report</li> </ul>
2 b	Yes	<ul style="list-style-type: none"> <li>3 Global Iterations Feedbacks to land use demand</li> <li>up to 300 convergence assignment iterations per global feedback</li> </ul>	<ul style="list-style-type: none"> <li>SACSIM19 Model Documentation:                             <ul style="list-style-type: none"> <li>Chapter: 10 Model Equilibration</li> <li>Chapter: 11 Sensitivity Testing</li> <li>Chapter: 12 Validation and Calibration</li> </ul> </li> </ul>
2 c	Yes	Calibration based on SACOG 2018 and 2000 Household Travel Survey travelers' responses	<ul style="list-style-type: none"> <li>2018 Household Travel Survey: <a href="https://www.sacog.org/post/2018-sacog-regional-household-travel-survey">https://www.sacog.org/post/2018-sacog-regional-household-travel-survey</a></li> <li>2000 Household Travel Survey SACSIM19 Model Documentation Appendix C</li> </ul>
2 Notes		[2] If the trip generation sub-model is not sensitive to travel time, then the analyst will need to provide for a manual intervention in the trip generation stage of the model to adjust the trip generation rates in the model for off-line computed induced travel effects of the project, its alternatives, and potential mitigation measures. The analyst can employ activity based travel model parameters that are available from a similar region to manually estimate off-model the effects of the project, its alternatives, and potential mitigation measures on trip generation with and without the project for the desired forecast years (with the land use linkage described above activated) and noting the predicted percentage change in trip generation by purpose predicted by the activity based TDM parameters. These percentages, which will vary by project alternative, may then be applied to the output of the trip generation stage of the trip-based model.	
3	X		
3 a	Yes**	Roadway network coded to down to major collectors classification, SACSIM does not include neighborhood roads and uses centroid connectors to load onto collectors streets.  **For project use determination, sufficient level of detail may vary depending on project infrastructure type. For example, a neighborhood roadway would not be suitable under 3a base network and therefore may require further network refinement and calibration before used for project evaluation.	
3 b	Yes	SACOG provides off model adjustment methodology to estimate travel outside the region	<a href="#">SACOG Outside the Region VMT Estimation</a>
3 Notes		[3] In cases where the project would lead to induced travel that extends beyond the model's boundary, the model should either be modified to incorporate that geography (e.g. by adding "halo zones") or an off model assessment should be made to capture the additional travel (e.g. where that travel is destined for a population center outside the model area, multiply gateway volumes by distance from the gateway to that population center). For sufficiency of geographical coverage, the analyst should use select link analysis to check whether links that run up to the model's edge show increased volumes as a result of the project. If they do, VMT increases likely continue outside the model's boundary. Where that is the case, one of three approaches can be used to capture that VMT. First, "halo zones" can be added to capture the additional VMT within the model. Second, a reasonable assumption can be made about length of the missing portion of the trip (e.g. use the distance to next major jobs or population center, if trips are likely allocated there), and that distance can be multiplied by the volume. Third, a model with greater coverage, such as the California Statewide Travel Demand Model (CSTDM), can be used. For temporal coverage, the analyst should examine the peaking of traffic flows in the area served by the project to determine the needed temporal coverage of the model (weekday peak hours, peak periods, daily, weekends and holidays, recreational seasons, full year), and then check to ensure the model assesses those time periods.	
4	X		
4 a	Yes	SACSIM uses network assignment convergence principles' described in FHWA (Cambridge Systematics, 2008, 2010) document(s).	<ul style="list-style-type: none"> <li>SACSIM19 Model Documentation:                             <ul style="list-style-type: none"> <li>Chapter: 10 Model Equilibration</li> <li>Chapter: 11 Sensitivity Testing</li> <li>Chapter: 12 Validation and Calibration</li> </ul> </li> <li>Appendix E Validation Memos Prepared for Studies using SACSIM19</li> </ul>
4 Notes		[4] For static roadway assignment, a relative gap between model runs of 0.001 is a good safe harbor.	SACSIM19 uses relative gap of 0.0002
5 a	X		
5 Notes	Yes	[5] In order to preserve sensitivities, alternative specific constants shall not deviate substantially in overall magnitude relative to the other variables unless the resulting sensitivity is validated based on observed data.	<ul style="list-style-type: none"> <li>SACSIM19 Model Documentation:                             <ul style="list-style-type: none"> <li>Chapter: 10 Model Equilibration</li> <li>Chapter: 11 Sensitivity Testing</li> <li>Chapter: 12 Validation and Calibration</li> </ul> </li> <li>Appendix E Validation Memos Prepared for Studies using SACSIM19</li> </ul>

\*\*Checklist from Caltrans Document: Transportation Analysis under CEQA, First Edition. Evaluating Transportation Impacts of State Highway System Projects, September 2020

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	Check List	Pass "X"
1	Land use response	X*
2	Sensitivity	X
3	Coverage	X*
4	Assignment	X
5	Calibration and Validation	X
	Score	5/5
	Required	5/5
		PASS
<p><i>*SACSIM19 passes Caltrans TAC Travel Model assessment checklist using 2020 MTP/SCS land use scenarios. For project specific evaluation with revised land use assumptions or for small scale projects, further model refinements such as network and zonal detailing and project specific calibration may be required.</i></p>		
<p><i>**Checklist from Caltrans Document: Transportation Analysis under CEQA, First Edition. Evaluating Transportation Impacts of State Highway System Projects, September 2020</i></p>		
		SACOG, 2021