

10.2 SACSIM19 Equilibrium Solution Procedure

As mentioned in Chapter 3 and 9, SACSIM19 has two important enhancements to support the modeling needs of the 2020 MTP/SCS: VOT class and pricing. SACSIM19 has three VOT classes, where previous SACSIM versions only had one during trip tables and assignment development. This enhancement increases the skimming from one class to three classes, and thus affects a traveler's choices based on its VOT class as well as road use choice when pricing is applied. The pricing modeling is included in SACSIM19 to model how pricing affect travelers' behavior and then GHG emissions.

Both enhancements increase not only the complexity of modeling but also the model run time. To make a balance between the modeling capacities and the computer running time, SACSIM19 adopts the same system equilibrium procedure as SACSIM15 but different specifications in a-iterations and da-iterations.

SACSIM19's equilibrium procedure also includes pricing optimization for tolled facilities, described in more detail in Chapter 9.

Pricing optimization in SACSIM19 is implemented after the initial assignment converges and forms an internal feedback loop of up to 5 toll iterations around each assignment. There, including toll optimization takes a much longer time to converge. After many trial runs, five loops are specified as the maximum number of iterations. In the full global model iterations, SACSIM19 run three iterations with 100% sampling rates of households and persons for each iteration.