

12.2 Model Calibration

12.2.1 DAYSIM Model Calibration

As described in Chapter 3, DAYSIM is the core of SACSIM and is consisted of two modules: long term and short term choices. Both modules are consisted of a series of nested choice models. In operation, given the households' residence, DAYSIM runs long term module first and simulates people's long term choices such as usual work and school locations, and auto ownership, and then run short term choice module such as day pattern, main destination, tour mode, trip mode etc. With this hierarchical or nested choice structure, the lower level choices were affected or constrained by upper choices. For example:

- Choices of usual locations for work and school affect the choices of work and tour destinations, since the usual locations are the most likely destinations.
- Auto ownership affects both day pattern and tour (and trip) mode choice, by generating auto ownership market segments used in the model.

In SACSIM19, all DAYSIM choice models were re-estimated using the 2008 parcel level landuse data, skim data and the expanded 2000 survey in 2008 travel conditions. All initial re-estimated coefficients and standard error are listed in Appendix A-DAYSIM User Reference Guide. Table 12-3 lists the choice models and variables calibrated based on 2016 landuse/demographics and travel conditions with ACS 2012-2016 5 year data and 2018 Household Travel Survey:

Table 12-3 DAYSIM Choice Model Coefficients

| 1. WorkLocation - WorkLocationCoefficients_SACOG-v1.5 | | | |
|--|-------------|--|--|
| Item# | Name | Description | Ratio variable Description |
| 6 | Beta00006 | workAwayFromHomeFlag * IsFulltimeWorkerFlag * [One-way drive dist--0-3.5 mi (10s of mi)] | % of full time workers with to usual-work-place distance < 3.5 mile |
| 7 | Beta00007 | workAwayFromHomeFlag * IsFulltimeWorkerFlag * [One-way drive dist--3.5-10 mi (10s of mi)] | % of full time workers with to usual-work-place distance >=3.5 and <= 10 mile |
| 8 | Beta00008 | workAwayFromHomeFlag * IsFulltimeWorkerFlag * [One-way drive dist--10+ mi (10s of mi)] | % of full time workers with to usual-work-place distance >= 10 mile |
| 41 | Beta00041 | workAtHomeFlag | % of workers working at home |
| 2. SchoolLocation - SchoolLocationCoefficients_SACOG-v1.8 | | | |
| Item# | Name | Description | Ratio variable Description |
| 7 | Beta00007 | schoolAwayFromHomeFlag * IsChildUnder5Flag * [One-way drive dist--0-1 mi (10s of mi)] | % of under 5 year old kids with to usual-school- place distance < 1 mile |
| 8 | Beta00008 | schoolAwayFromHomeFlag * IsChildUnder5Flag * [One-way drive dist- -1-5 mi (10s of mi)] | % of under 5 year old kids with to usual-school- place distance >= 1 and < 5 mile |
| 9 | Beta00009 | schoolAwayFromHomeFlag * IsChildUnder5Flag * [One-way drive dist- -5+ mi (10s of mi)] | % of under 5 year old kids with to usual-school- place distance >= 5 mile |
| 10 | Beta00010 | schoolAwayFromHomeFlag * IsChildAge5Through15Flag * [One-way drive dist--0-1 mi (10s of mi)] | % of 5-15 year old kids with to usual-school- place distance < 1 mile |
| 11 | Beta00011 | schoolAwayFromHomeFlag * IsChildAge5Through15Flag * [One-way drive dist--1-5 mi (10s of mi)] | % of 5-15 year old kids with to usual-school- place distance >= 1 and < 5 mile |
| 12 | Beta00012 | schoolAwayFromHomeFlag * IsChildAge5Through15Flag * [One-way drive dist--5+ mi (10s of mi)] | % of 5-15 year old kids with to usual-school- place distance >= 5 mile |
| 3.AutoOwnerShip - AutoOwnershipCoefficients_SACOG-v1.5 | | | |

| Item# | Name | Description | Ratio variable Description |
|-------|--------------|--|--|
| 1 | 1 Beta00001 | 0 autos--household.Has1Driver.ToFlag(); | % of households has 1 driver with 0 auto |
| 2 | 2 Beta00002 | 2 autos--household.Has1Driver.ToFlag(); | % of households has 1 driver with 2 auto |
| 3 | 3 Beta00003 | 3 autos--household.Has1Driver.ToFlag(); | % of households has 1 driver with 3 auto |
| 4 | 4 Beta00004 | 4+ autos--household.Has1Driver.ToFlag(); | % of households has 1 driver with 4+ auto |
| 5 | 5 Beta00005 | 0 autos--household.Has2Drivers.ToFlag(); | % of households has 2 driver with 0 auto |
| 6 | 6 Beta00006 | 1 auto--household.Has2Drivers.ToFlag(); | % of households has 2 driver with 1 auto |
| 7 | 7 Beta00007 | 3 autos--household.Has2Drivers.ToFlag(); | % of households has 2 driver with 3 auto |
| 8 | 8 Beta00008 | 4+ autos--household.Has2Drivers.ToFlag(); | % of households has 2 driver with 4+ auto |
| 9 | 9 Beta00009 | 0 autos--household.Has3Drivers.ToFlag(); | % of households has 3 driver with 0 auto |
| 10 | 10 Beta00010 | 1 auto--household.Has3Drivers.ToFlag(); | % of households has 3 driver with 1 auto |
| 11 | 11 Beta00011 | 2 autos--household.Has3Drivers.ToFlag(); | % of households has 3 driver with 2 auto |
| 12 | 12 Beta00012 | 4+ autos--household.Has3Drivers.ToFlag(); | % of households has 3 driver with 4+ auto |
| 13 | 13 Beta00013 | 0 autos--household.Has4OrMoreDrivers.ToFlag(); | % of households has 4+ driver with 0 auto |
| 14 | 14 Beta00014 | 1 auto--household.Has4OrMoreDrivers.ToFlag(); | % of households has 4+ driver with 1 auto |
| 15 | 15 Beta00015 | 2 autos--household.Has4OrMoreDrivers.ToFlag(); | % of households has 4+ driver with 2 auto |
| 16 | 16 Beta00016 | 3 autos--household.Has4OrMoreDrivers.ToFlag(); | % of households has 4+ driver with 3+ auto |
| 18 | 18 Beta00018 | 0-4+--household has at least as many cars as workers | % of households has at least as many cars as workers |

4. IndividualPersonDayPattern - IndividualPersonDayPatternCoefficients_SACOG-v1.8

| Item# | Name | Description | Ratio variable Description |
|--------|--------|--------------------|---|
| work | | | |
| 100 | W-TASC | tour constant(FTW) | % of full time workers taking 1+ work tours |
| 101 | W-SASC | stop constant | % of work tours with 1+ stops |
| 102 | W-PTW | PartTimeWorker | % of part time workers taking 1+ tours |
| school | | | |
| 200 | S-TASC | tour constant | % of people taking 1+ school tours |
| 201 | S-SASC | stop constant | % of school tours with 1+ stops |
| 205 | S-UNI | UniversityStudent | % of university students taking 1+ school tours |
| 206 | S-DAS | DriveAgeKid | % of driving school kids taking 1+ school tours |

| | | | |
|---------------|-----------|----------------|---|
| 207 | S-PAS | 5-15 kids | % of 5 to 15 year old kids taking 1+ school tours |
| 208 | S-CU5 | under 5 | % of 5 to 5 year old kids taking 1+ school tours |
| Escort | | | |
| 300 | E-TASC | tour constant | % of people taking 1+ escort tours |
| 301 | E-SASC | stop constant | % of escort tours with 1+ stops |
| Personal Bus | | | |
| 400 | P-TASC | tour constant | % of people taking 1+ personal bus tours |
| 401 | P-SASC | stop constant | % of personal bus tours with 1+ stops |
| shop | | | |
| 500 | H-TASC | tour constant | % of people taking 1+ shopping tours |
| 501 | H-SASC | stop constant | % of shopping tours with 1+ stops |
| meal | | | |
| 600 | M-TASC | tour constant | % of people taking 1+ meal tours |
| 601 | M-SASC | stop constant | % of meal tours with 1+ stops |
| Social | | | |
| 700 | D-TASC | tour constant | % of people taking 1+ social tours |
| 701 | D-SASC | stop constant | % of social tours with 1+ stops |
| TourStopCombo | | | |
| 1311 | NT/NS-1/1 | 1 tour/1 stop | % of people taking 1 tour with 1 stop |
| 1312 | NT/NS-1/2 | 1 tour/2 stop | % of people taking 1 tour with 2 stop |
| 1313 | NT/NS-1/3 | 1 tour/3+ stop | % of people taking 1 tour with 3+ stop |
| 1321 | NT/NS-2/1 | 2 tour/1 stop | % of people taking 2 tour with 1 stop |
| 1322 | NT/NS-2/2 | 2 tour/2 stop | % of people taking 2 tour with 2 stop |
| 1323 | NT/NS-2/3 | 2 tour/3+ stop | % of people taking 2 tour with 3+ stop |
| 1331 | NT/NS-3/1 | 3 tour/1 stop | % of people taking 3 tour with 1 stop |
| 1332 | NT/NS-3/2 | 3 tour/2 stop | % of people taking 3 tour with 2 stop |

5. PersonExactNumberOfTours - PersonExactNumberOfToursCoefficients_SACOG-v1.5

| Item# | Name | Description | Ratio variable Description |
|--------------|-----------|-------------|---------------------------------|
| work tours | | | |
| | 0&1 Tours | | |
| 152 | WC-2Tours | | % of people take 2 work tours |
| 153 | WC-3Tours | | % of people take 3 work tours |
| school tours | | | |
| | 0&1 Tours | | |
| 252 | SC-2Tours | | % of people take 2 school tours |
| 253 | SC-3Tours | | % of people take 3 school tours |
| escort | | | |

| | | | |
|-----------------|-----------|--|--|
| | 0&1 Tours | | |
| 352 | EC-2Tours | | % of people take 2 escort tours |
| 353 | EC-3Tours | | % of people take 3 escort tours |
| person business | | | |
| | 0&1 Tours | | |
| 452 | PC-2Tours | | % of people take 2 Personal Business tours |
| 453 | PC-3Tours | | % of people take 3 personal business tours |
| shopping | | | |
| | 0&1 Tours | | |
| 552 | HC-2Tours | | % of people take 2 shopping tours |
| 553 | HC-3Tours | | % of people take 3 shopping tours |
| meal | | | |
| | 0&1 Tours | | |
| 652 | MC-2Tours | | % of people take 2 meal tours |
| 653 | MC-3Tours | | % of people take 3 meal tours |
| social/Rec | | | |
| | 0&1 Tours | | |
| 752 | RC-2Tours | | % of people take 2 social/Rec tours |
| 753 | RC-3Tours | | % of people take 3 social/Rec tours |

6. WorkBasedSubTourGeneration - WorkbasedSubtourGenerationCoefficients_SACOG-v1.5

| Item# | Name | Description | Ratio variable Description |
|-------|-----------|------------------------|---|
| 1 | Beta00001 | work stop | % of work based tours with work purpose stop |
| 3 | Beta00003 | school stop | % of work based tours with school purpose stop |
| 4 | Beta00004 | escort stop | % of work based tours with escort purpose stop |
| 6 | Beta00006 | personal business stop | % of work based tours with personal business purpose stop |
| 8 | Beta00008 | shopping stop | % of work based tours with shopping purpose stop |
| 10 | Beta00010 | meal stop | % of work based tours with meal purpose stop |
| 13 | Beta00013 | social/rec stop | % of work based tours with social/rec purpose stop |

7. WorkTourMode - WorkTourModeCoefficients_SACOG-v1.5 - Copy.F12

| Item# | Name | Description | Ratio variable Description |
|-------|----------|---------------------------|----------------------------|
| 10 | dt-const | Drive to Transit Constant | Drive to Transit Tours |
| 20 | wt-const | Walk to Transit | Walk to Transit Tours |
| 30 | s3-const | Shared Drive 3 Constant | Shared Drive 3+ Tours |

| | | | |
|----|----------|-------------------------|----------------------|
| 40 | s2-const | Shared Drive 2 Constant | Shared Drive 2 tours |
| 50 | da-const | Drive Alone Constant | Drive Alone Tours |

8. Other home based tour mode - OtherHomeBasedTourModeCoefficients_SACOG-v1.5.F12

| Item# | Name | Description | Ratio variable Description |
|-------|----------|--------------------------|----------------------------|
| 20 | wt-const | Walk to Transit Constant | Walk to Transit Tours |
| 30 | s3-const | Shared Drive 3 Constant | Shared Drive 3+ Tours |
| 40 | s2-const | Shared Drive 2 Constant | Shared Drive 2 tours |
| 50 | da-const | Drive Alone Constant | Drive Alone Tours |
| 60 | bi-const | Bike Constant | Bike tours |

9. TripMode - TripModeCoefficients_SACOG-v1.5.F12

| Item# | Name | Description | Ratio variable Description |
|-------|----------|--------------------------|----------------------------|
| 20 | wt-const | Walk to Transit Constant | Walk to Transit Trips |
| 30 | s3-const | Shared Drive 3 Constant | Shared Drive 3+ Trips |
| 40 | s2-const | Shared Drive 2 Constant | Shared Drive 2 Trips |
| 50 | da-const | Drive Alone Constant | Drive Alone Trips |
| 60 | bi-const | Bike Constant | Bike Trips |