SCAG Activity-based Model Update

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SCAG Modeling Task Force
March 29, 2018
Objectives

The Model for 2020 RTP/SCS
Software enhancement and update
Model validation to year 2016

MTF meeting, March 29, 2018
SCAG ABM

- Based on past works and analyses
- More than 40 sub-models
- Adopt CT-ramp platform and software
  - *Coordinated Travel - Regional Activity Modeling Platform*
- Integrate with TransCAD static assignment
  - *ABM will generate OD matrices as input for assignment procedure*
- Rich output data for policy analysis
SCAG ABM Framework

- Population synthesis
- Long-term location & arrangements
- Mid-term mobility attributes
- Day-level activity, tour & time
- Tour-level details
- Trip-level details
## Project Plan and Schedule

<table>
<thead>
<tr>
<th>Phase</th>
<th>Tasks</th>
<th>Dates</th>
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</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Software enhancement and update, Initial sub-model calibration and tests</td>
<td>03/17 ~ 12/17</td>
</tr>
<tr>
<td>Phase 2</td>
<td>System validation &amp; calibration, Optimize model run (hardware &amp; software)</td>
<td>01/18 ~ 06/18</td>
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<tr>
<td>Phase 3</td>
<td>Peer review workshop, Final improvement</td>
<td>07/18 ~ 12/18</td>
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Phase 1 Development (03/17 ~ 12/17)

✓ Completed on schedule
✓ Software development
✓ Initial sub-model calibration and validation
✓ Software test with 20% sample
✓ Scenario test with 10% sample
✓ Initial test results are reasonable
Software testing

- Exposing and resolving run-time errors
- Testing model with:
  - different household samples
  - different random number seeds
  - different hardware environments
  - different scenario inputs
Run Time for One Loop with 10% Sample

**TransCAD UI for RegMod v7.1**
- Init
- Skim (hot start)
- Logsum
- Accessibility
- CTRAMP
  - Java

**TransCAD UI RegMod v6.3**
- Swap trips in master OD
- Traffic Assign
- Emission

**Time Breakdown**
- 13 Hr (12 Hr for tran skim)
- 4.3 Hr
- 15 Hr
  - 20%
  - 7.5 Hr
  - 10%
- 4 Hr

**Total**
- 36.3 Hours (20%)
- 28.8 Hours (10%)

One pass. Not include time for HDT model (0.5 hr)
Scenario Tests

- Test whether the model generates reasonable output
- 2016 RTP/SCS scenarios: 2012, 2040 baseline, 2040 plan
- 2020 RTP/SCS scenario: 2016 (draft SED)
- Model output comparison: ABM vs. TBM
  - Regional VMT, VHT
  - Vehicle Trips, OD between SCAG counties
  - Average speeds
Scenario test results* – Vehicle Trips

Total vehicle trips within 4% of trip-based model estimate

Model results are preliminary and the model used from Phase I work for the runs requires further calibration and validation
Scenario test results* - VMT

Vehicle-miles travelled for light and medium-duty vehicles

- 2016 – within 10%
- 2040B – within 2%
- 2040P – within 6%

* Model results are preliminary and the model used from Phase I work for the runs requires further calibration and validation
Scenario test results* - VHT

Vehicle-hours travelled for light and medium-duty vehicles:

- 2016 – within 20%
- 2040B – within 5%
- 2040P – within 10%

Deviation due to incomplete time of day model calibration

* Model results are preliminary and the model used from Phase I work for the runs requires further calibration and validation
Scenario test results* - Speed

Average speed

- 2016 – 12% difference
- 2040 – within 5%

* Model results are preliminary and the model used from Phase I work for the runs requires further calibration and validation
**Scenario test results** - OD

### ABM - 2016

<table>
<thead>
<tr>
<th>CNTY</th>
<th>IM</th>
<th>LA</th>
<th>OR</th>
<th>RV</th>
<th>SB</th>
<th>VC</th>
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* Model results are preliminary and the model used from Phase I work for the run requires further calibration and validation.
### Phase 2 (01/2018 ~ 06/2018)

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<td>• Run-time optimization</td>
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<td>• Automated error checking and model output reporting</td>
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<td>• 2017 RTP Guideline</td>
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<td>• Highway &amp; Transit</td>
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<th>Model documentation and user training</th>
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Phase 3 (07/2018 ~ 12/2018)

- Peer review workshop
  Fall, 2018
- Continue model enhancement and testing
- Continue model software enhancement
Thank you.

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