Update on SCAG Modeling & Forecasting Projects

SCAG Modeling Task Force Meeting

September 27, 2017

SCAG Modeling & Forecasting Staff
Agenda

- Overview & Priority: Hsi-Hwa Hu
- Projects:
  - Model Update/Validation: Bayarmaa Aleksandr
  - SPM: Jung A Uhm
  - HDT: Mana Sangkapichai
  - Screenline counts: Kihong Kim
  - ICTM: Hui Deng
  - HTS: Yang Wang
Year 2016 Model Update and Validation for 2020 RTP/SCS
Objectives

- Update and validate SCAG ABM to the base year 2016 for the 2020 RTP/SCS
- The model will be used for the analysis of SCAG 2020 RTP/SCS
- Team
  - WSP: model framework review/update, model estimation, model implementation, model calibration/validation and sensitivity test
  - SCAG: supporting model estimation, data analyses, model validation and model testing
2-Stage Approach

Stage 1 – Core Model Implementation and Testing
- Apr – Sep, 2017: Implementation
- Oct – Dec, 2017: Scenario testing

Stage 2 – Integration and Refinement
- Specification refinements
- Integration with ancillary models and travel time equilibration
- Training
Stage 1 Tasks & Deliverables

- Software and Scenario Tests:
  - Preliminary validation of all sub-models for 10% sample
  - Some 100% runs for debugging and verification
  - Preliminary 2016 validation
  - Test and analyze 2016 RTP/SCS scenarios
Stage 2 Tasks & Deliverables

- Further Model Refinement and Fine Tuning
  - Update/Enhance selected Sub-models
  - Software fine tuning
- SCAG ABM software and User’s Guide
- Staff Training
Scenario Planning Model (SPM) Project Update
Introduction

- A web-based land use sketch planning tool for data management, scenario development and modeling
- Built on ‘UrbanFootprint’ modeling platform developed by Calthorpe Analytics
- Customized with collaboration with other major Metropolitan Planning Organizations (MPOs) in California
- Built from bottom-up with SPM Working Group
Objectives

- Building an improved linkage between local and regional planning
- Improving the region’s ability to address complex issues and evolving challenges
## Progress

<table>
<thead>
<tr>
<th>Manage, Review, &amp; Update Data</th>
<th>Serve as a common platform for accessing local, regional and statewide data with options to review and edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create Alternative Scenarios</td>
<td>Transform existing local and regional plans into a common language of building and place types</td>
</tr>
<tr>
<td>Analyze Scenarios</td>
<td>Measure the fiscal, environmental, transportation, and public health of future plan and policy</td>
</tr>
</tbody>
</table>

### Data Management System
- 100% Open Source
- Web-Based

### Scenario Development & Analysis System
Utilities and Timeline

- Local review/input of key planning datasets in the development of Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)
  - Will be released to all local jurisdictions in November 2017
- Development of a comprehensive existing condition and growth scenarios for plan horizon
- Analysis of the impacts of scenarios on water and energy use, public health, fiscal impacts, regional vehicle miles traveled (VMT) and others
Heavy Duty Truck Model Update
Background

- **Current model structure:**
  - **Internal HDT model:**
    - Truck trips inside the SCAG region (II)
  - **External HDT model:**
    - Truck trips that passing through, coming into & leaving the SCAG region (IE, EI and EE)
  - **Port HDT model:**
    - Entering or exiting the POLA/POLB

- **Last major updated: 2012**
Objective & Expectation

- Focus on External HDT model only
- Supply Chain Model
  - Longer term model structure update
  - Further enhancements to the model forecasting sensitivity
  - Improve ability to understand and evaluate truck related policies, e.g. role of warehousing & distribution center or environmental impacts
Model Integration
Proposed Schedule

- Model Development Plan: Oct 2017
- Model Estimation and Implementation: Dec 2017
- Model Calibration, Validation and Testing: Mar 2018
- Final Report and Workshop: Jun 2018
Screenline Counts
Objectives

- 24-hour traffic counts of freeways and non-freeways by time period and vehicle type on SCAG’s all screenline and external cordon locations
- Used for update and validation of SCAG’s Regional Travel Demand Model for 2020 RTP/SCS

Consultant Team
- Cambridge Systematics (Prime consultant)
- National Data and Surveying Services (Sub-consultant)
Main Task: Field Traffic Counts Survey

- Non-Freeway Locations
  - Collect all 526 non-freeway locations (95% done as of 9/22)
  - Tube counters
  - 15-min time intervals and 13 FHWA vehicle classifications

- Freeway Locations
  - Collect only 27 out of 125 freeway locations
  - Combination of Wavetronix and video
  - 15-min time intervals and 4 vehicle classifications
  - For remaining freeway locations, rely on PeMS, TAMS and WIM

- Collect on Tue, Wed and Thu in Spring and Fall of 2017
Next Steps

- Complete and review field traffic counts
- Develop procedures for
  - Annual and seasonal adjustments
  - Data expansion to 15-min detail and 13 vehicle classifications
- Design database to house raw and processed data
- Integrate in SCAG’s 2016 Base-Year network
- Present to MTF in March 2018
Imperial County Transportation Model (ICTM) Update
ICTM: Background

- **Objective:** Develop and validate an Imperial County Transportation Model.
- **Consultant:** Cambridge Systematics, Inc.
- **Expectations:**
  - SCAG provides a draft version of ICTM using the Subregional Model Development Tool (SMDT); and provides initial model network, socioeconomic data, and other needed data or information to Cambridge Systematics.
Project Schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Meetings and Presentations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Work Plan Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Data Collection and Analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Model Modification, Calibration, and Validation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Sensitivity Testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Model Documentation, Workshop, and Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Kickoff Meeting
- TRC Meeting
- Count Collection
- MTF and Policy Committee
Highway Network

- Updated Highway Network based on:
  - New 2016 RTP regional network
  - Previous 2008 sub-regional network

Changes between 2008 and new 2014 base year
Observed Data

- Coordination between regional and subregional screenline counts
  - 65 Counts on Regional Screenlines
  - 99 Counts on local sub-region screenlines
- Comparison to Previous (2008) Counts
  - Many counts very similar
  - Overall 3.3% Growth from 2008 to 2017
- Household Survey
  - 347 households in the county
  - About 5,500 trip-ends in the county
Current Activity

- Stepwise Calibration

  - Trip Generation
    - Trips by District
    - Trips per Pop, HH, Employee

  - Trip Distribution
    - Trip Length Distributions
    - District-to-District Patterns

  - Mode Choice
    - Transit Share
    - Route Group Boardings

  - Assignment
    - Time of Day Factors
    - Volume / Count Comparisons
California MPO Cooperative Household Travel Survey

Yang Wang
Household Travel Survey

- **Background:** SCAG is currently working with other three MPOs in California for the next household travel survey.
  - SCAG, MTC, SANDAG, SACOG
- **Objective:** Four MPOs cooperate survey development phase; share methodology on survey design, sampling, and data collection.
- **Status:** Currently SACOG; SCAG 2010-2011.
Thank You