A Long History

- Previous Model completed in 2009
- Older generation of SCAG Model
- Based on older 1990s “windowed” model
- No Transit
- No Active Transportation
- Limited special generators
- Good TAZ size
- Useable parameters
Focus on the Goals

- Meet Key Application Needs
  - VCTC’s Highway Program Development
  - County’s Multi-Modal Planning
  - Ventura County’s General Plan Update
  - SB 743 Needs
  - Compatibility with CMP
  - Impact Fee/Fair Share Analyses
  - Next Generation of Local Models
    - Leverage Current Model’s Features
    - Consistency with SCAG
Collaboration is the Key!

- Working Closely with SCAG Modeling Staff
- Collaboration with all local agencies through VCTC and TTAC
- Data exchange and review
- Centroid connection locations (link mid-points)
- Local street link additions during SMDT
- Running of model add-ins for initialization
- Potential uses of the model for other agencies
What’s in the Model?

- **SCAG 2016 Regional Transportation Plan (RTP)/Sustainable Communities Solutions (SCS) Regional Travel Model**
  - Subarea Model Development Tool (SMDT)
  - Ventura County Subarea Model

- **SCAG**
  - 11,000+ zones – Used for trip distribution and mode choice
  - Full Model run time upwards of 7-10 days

- **VCTM**
  - 663 Ventura County zones
  - 1,021 total zones
  - Full Model run time 13-15 hours.
Improvements Customized to Local Needs

- Land Use to Socio-Economic Data Conversion
- Special Generator Trip Generation
- Enhanced Active Transportation in Mode Choice
  - Previous Model did not include a Mode Choice component
- Additional Assignment Output Capabilities
- Specialized and Standardized Performance Measure Outputs for VCTC and local needs
Land Use to SED

Special Generators

Active Transportation

Assignment Outputs

Performance Measures
Added Features for Practical Applications

• Updated UI Format
• Turn Penalties & Turn Movements: Turn penalties have been added into the model stream. Turn movements are now reported for flagged model nodes.
• Specialized District & City-level Reporting
Land Use Model

- Obtained raw land use for 2012 and 2040 from SCAG
  - Converted to Square Feet (SCAG Maintains Square Meters)
  - Adjusted some of inputs (water, undevelopable, etc.)
- Developed local factors for Land Use to SED
  - Based on Representative Zones
  - Developed for Total Employment & Total Households
- Currently Collecting Feedback from TTAC on Land Use Data
Land Use Conversion Rates

- Households are Raw Model Inputs
  - No land use inputs for Residential
  - Mixed Residential and Commercial Remains
- Employment
- No Employment Categories:
  - Vacant
  - Water
  - Undevelopable or Protected Land
  - Unknown

<table>
<thead>
<tr>
<th>Land Use Code</th>
<th>2012 SCAG Existing Land Use Category</th>
<th>Validated Land Use to SED Rate</th>
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<tr>
<td>1200</td>
<td>General Commercial</td>
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<td>General Office Use</td>
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<td>Retail Stores and Commercial Services</td>
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<td>Other Commercial</td>
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<td>1233</td>
<td>Hotels and Motels</td>
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Special Generators

• Facilities with Unique Trip Making Characteristics
  o Examples: Universities, Military Bases, Airports
  o Based on ITE Trip Rates or Special Local Surveys/Research

• Areas Under Review for Employment Development/Trip Generation
  o Ventura Oil Fields
  o Point Mugu
  o San Buenaventura Light Industrial
  o Port of Hueneme
  o Oxnard High Density Light Industrial
  o Los Robles Hospital
Model Calibration

• What needs calibration?
  o Trip Generation Rates
  o Regional Boundaries (External Stations)
  o Special Generator Rates
  o Agriculture Trip Rates
  o Transit Trips
  o Mode Choice Coefficients
  o Trip Distribution

• Currently in process!
Model Validation

- Freeway and Arterial Street Networks
  - Count/Volume Comparison (FHWA & Caltrans)
    - Freeways +/- 7%
    - Major Arterials +/- 10%
    - Minor Arterials +/- 15%
  - Percent Root Mean Squared Error (%RMSE)
    - Caltrans = 40
    - FHWA = 30
  - Coefficient of Determination ($R^2$) (FHWA & Caltrans)
    - 0.88
  - Caltrans Standard Deviation
    - >0.75

- Caltrans Criteria from the Caltrans Travel Forecasting Guidelines, November 1992
- FHWA Criteria from the TMIP Model Validation and Reasonableness Checking Manual
Model Validation

- Screenlines
Model Validation

- Freeway and Arterial Street Networks
- Use of PeMS & Big Data Analytics
Performance Measures

• Specialized Outputs for Various Stages of Model Run
• Compatibility with CMP
• Standardized Model Outputs For Each Model Loop
  o Network Outputs
  o Assignment Loading (Volumes and Speeds)
  o Screenline Outputs
  o Internal/External Origins and Destinations By District
  o Air Quality Outputs
  o Vehicle Miles Traveled/Vehicle Hours of Travel/Vehicle Hours of Delay (VMT/VHT/VHD)
  o V/C Ratios on Facilities
Next Steps

• Collect Feedback from TTAC regarding Land Use Data
• Complete Special Generator Determination and Inclusion into the Model
• Complete Model Calibration and Validation
• Finalize Standardized Performance Measures
• Modify and Refine Active Transportation Model
• Coordination with General Plan
Thank You!

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