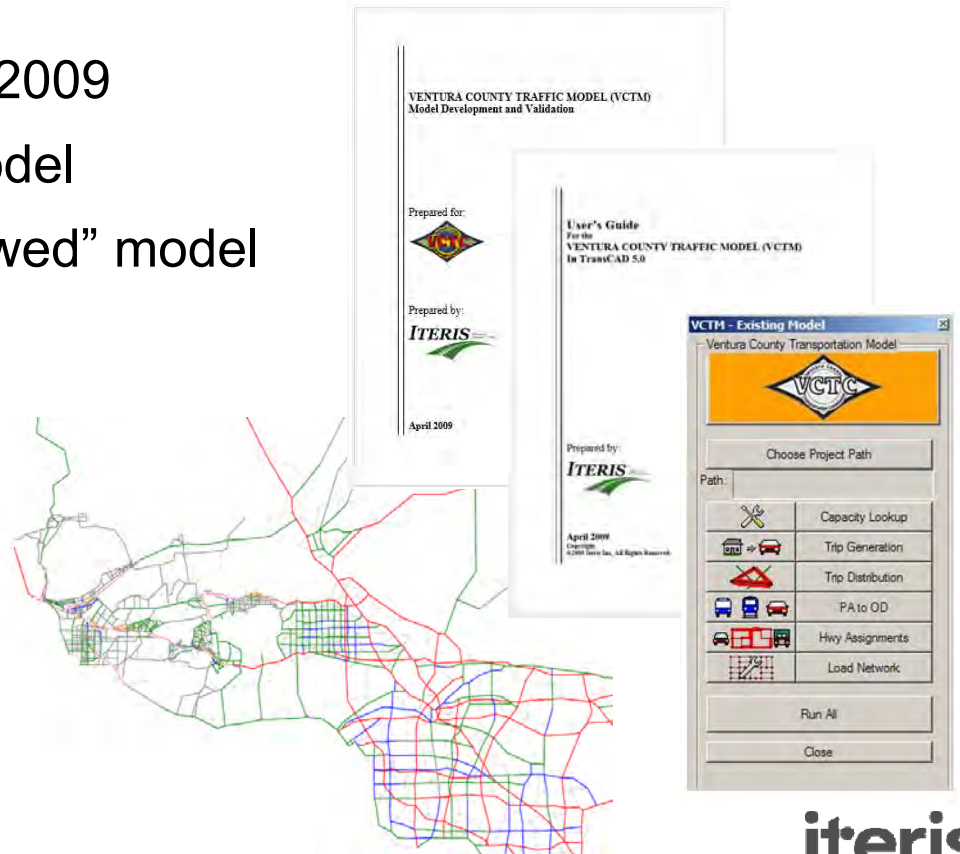# Ventura County Traffic Model
# SCAG Modeling Task Force Meeting

May 24, 2017

# 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

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# 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

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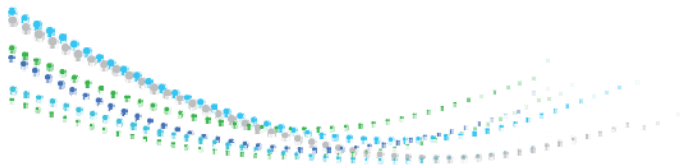
# What's in the Model?

- **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.

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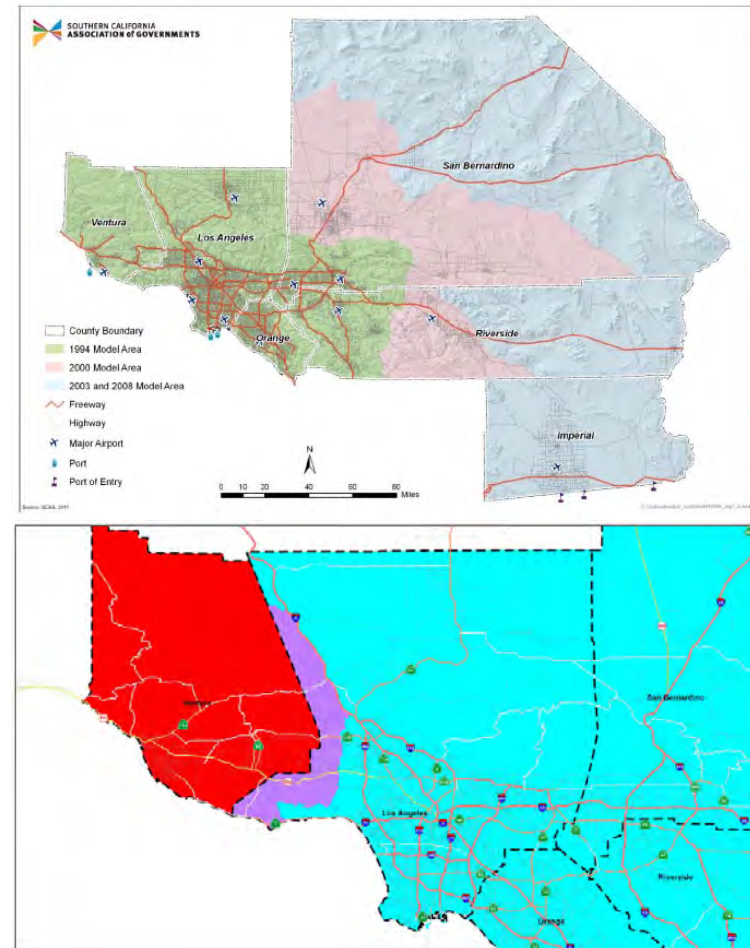
# Improvements Customized to Local Needs

- 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

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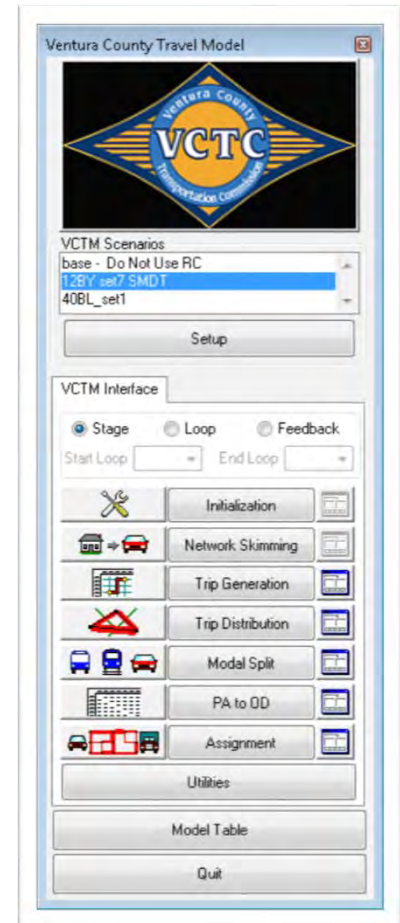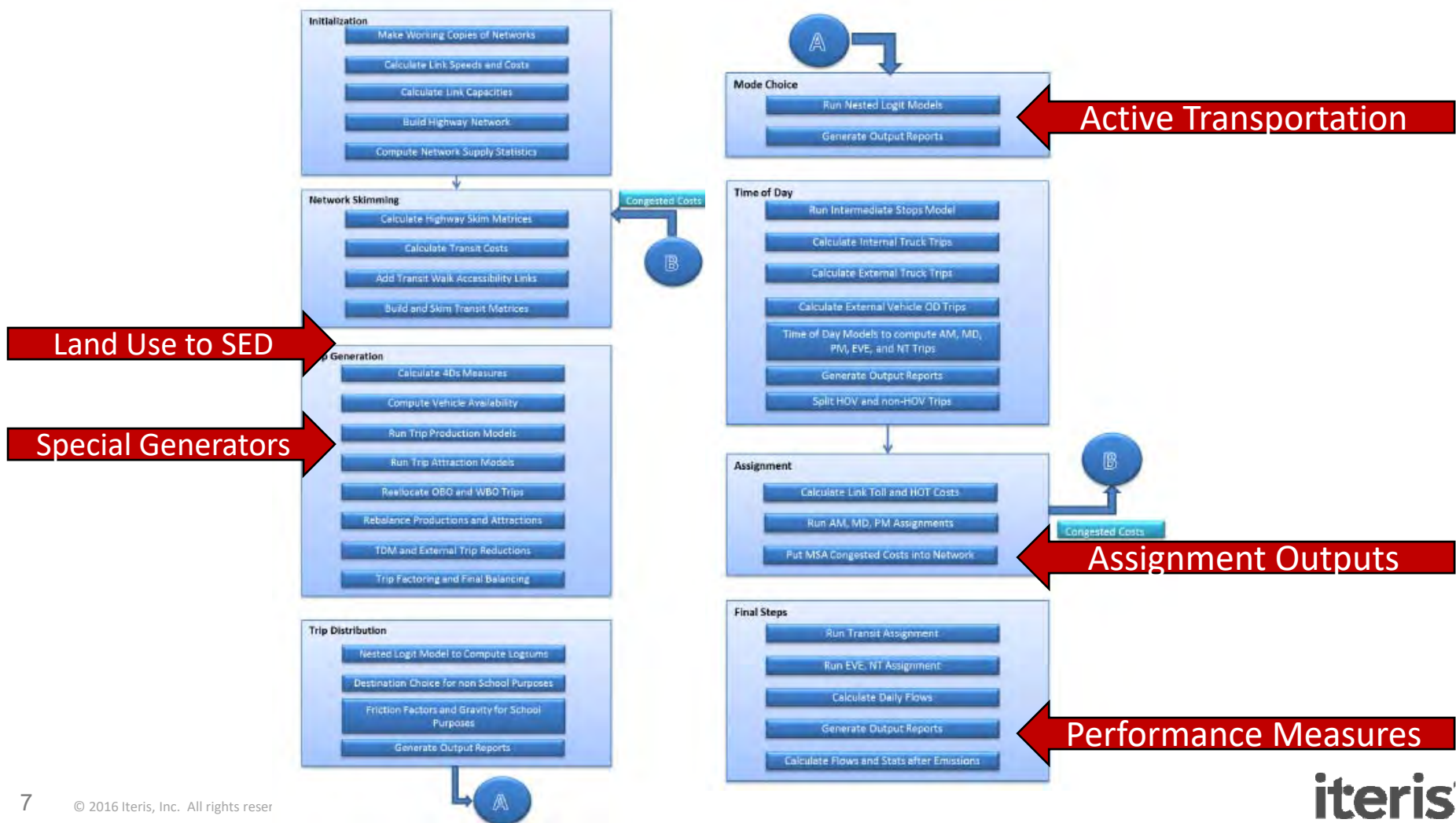
# Added Features for Practical Applications

- **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**
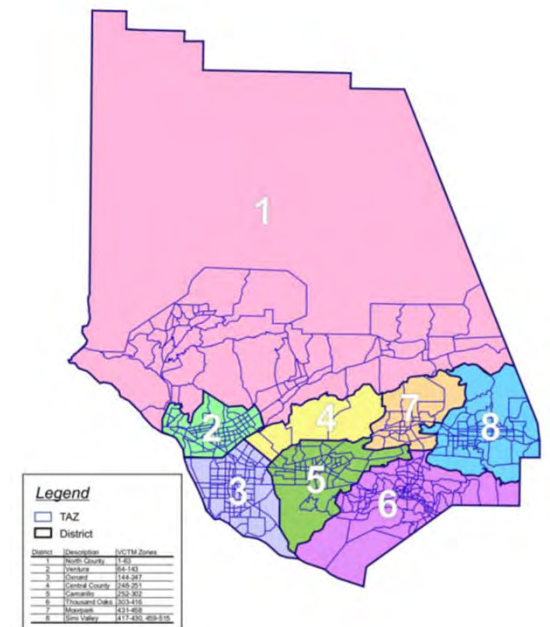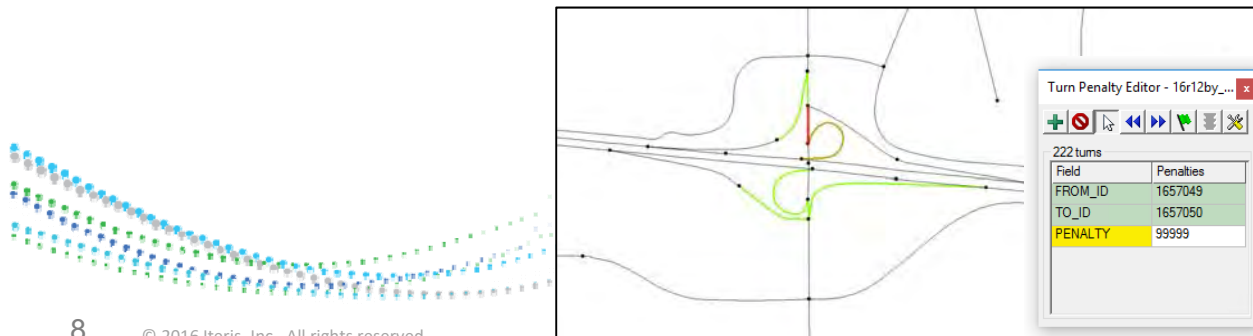
# Land Use Model

- 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 to SED**

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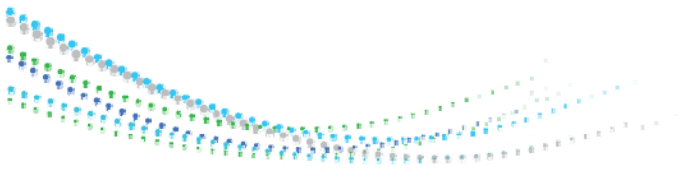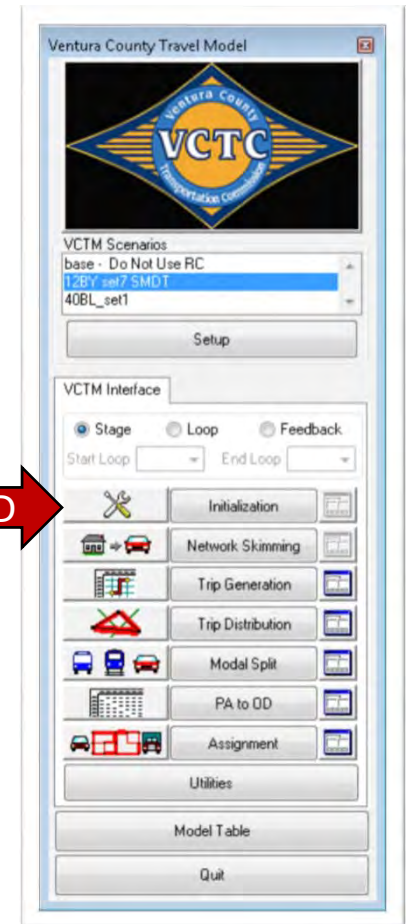
# Land Use Conversion Rates

- 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

| Land Use Code | 2012 SCAG Existing Land Use Category | Validated Land Use to SED Rate |
|---|---|---|
| 1200 | General Commercial | 2.57 |
| 1210 | General Office Use | 1.14 |
| 1220 | Retail Stores and Commercial Services | 2.00 |
| 1221 | Regional Shopping Center | 2.21 |
| 1230 | Other Commercial | 2.57 |
| 1233 | Hotels and Motels | 1.38 |
| 1240 | Public Facilities | 5.42 |
| 1250 | Special Use Facilities | 5.42 |
| 1260 | Educational Institutions | 7.67 |
| 1265 | Colleges and Universities | 20.67 |
| 1270 | Military Installations | 33.70 |
| 1300 | Industrial | 1.93 |
| 1310 | Light Industrial | 5.97 |
| 1311 | Light Manufacturing, Assembly, and Industrial Services | 1.89 |
| 1320 | Heavy Industrial | 7.82 |
| 1321 | Heavy Manufacturing | 24.54 |
| 1340 | Wholesaling and Warehousing | 4.41 |
| 1410 | Transportation | 50.33 |
| 1420 | Communication Facilities | 432.12 |
| 1430 | Utility Facilities | 432.12 |
| 1500 | Mixed Commercial and Industrial | 2.25 |
| 1600 | Mixed Residential and Commercial | 37.58 |
| 1800 | Open Space and Recreation | 6,434.73 |
| 2000 | Agriculture | 1,668.37 |
| 3000 | Vacant | 0.00 |
| 4000 | Water | 0.00 |
| 8888 | Undevelopable or Protected Land | 0.00 |
| 9999 | Unknown | 0.00 |
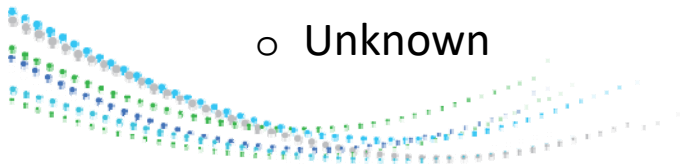
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# Special Generators

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

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



Special Generators



Ventura County Travel Model

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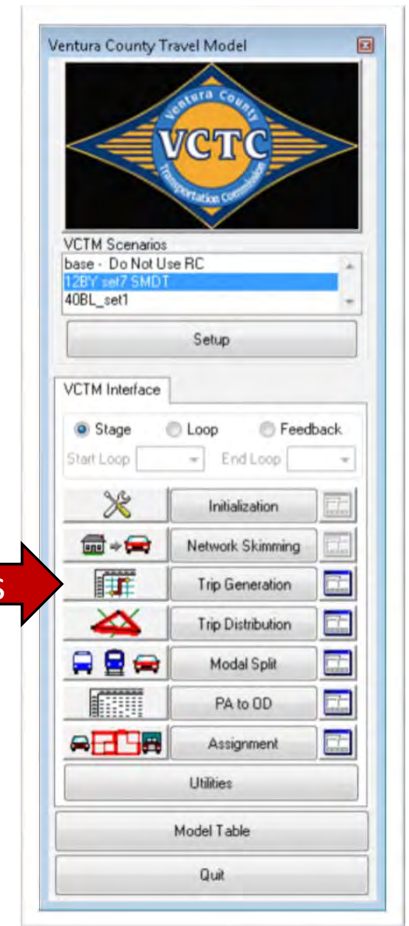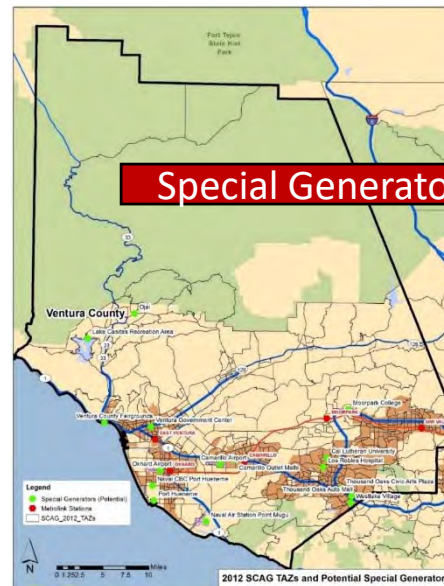
# Model Calibration

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

- Currently in process!
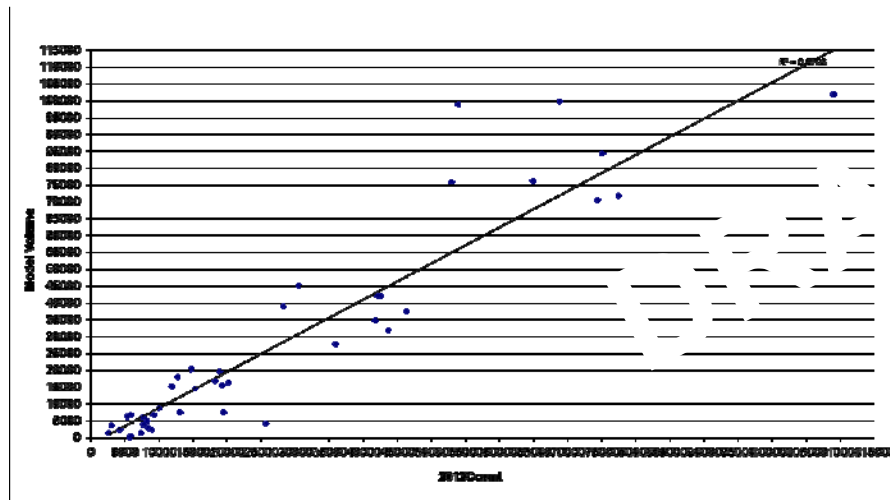
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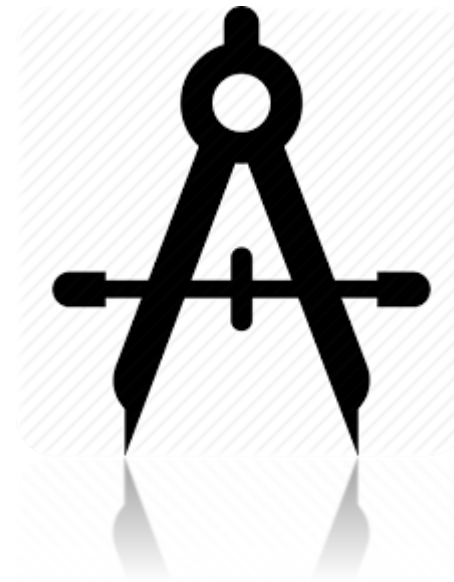
# Model Validation



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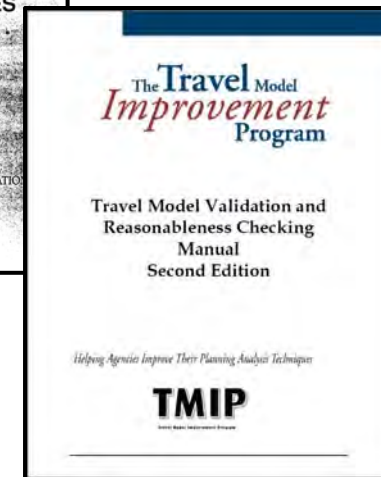
❖ *Caltrans Criteria from the Caltrans Travel Forecasting Guidelines, November 1992*
❖ *FHWA Criteria from the TMIP Model Validation and Reasonableness Checking Manual*

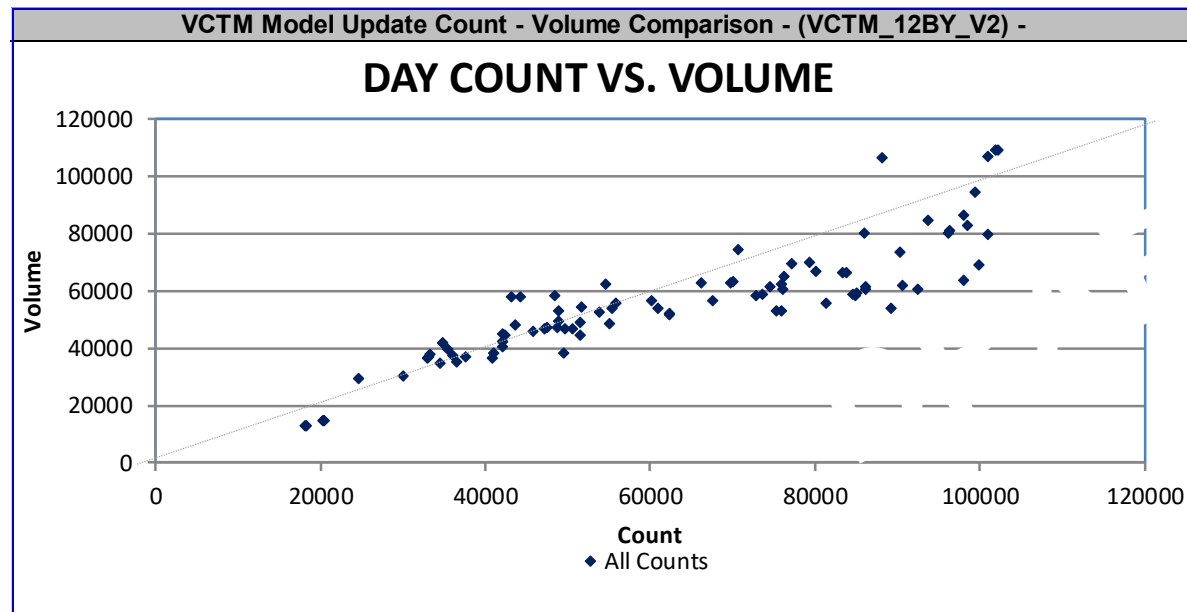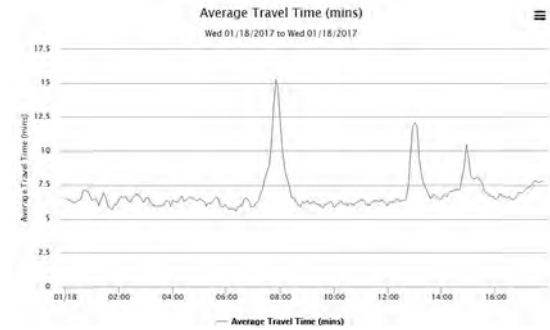**iteris**

# Model Validation

- Screenlines

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# Model Validation

- Freeway and Arterial Street Networks

- Use of PeMS & Big Data Analytics



Average Travel Time (mins)
Wed 01/18/2017 to Wed 01/18/2017



VCTM Model Update Count - Volume Comparison - (VCTM_12BY_V2) -

DAY COUNT VS. VOLUME

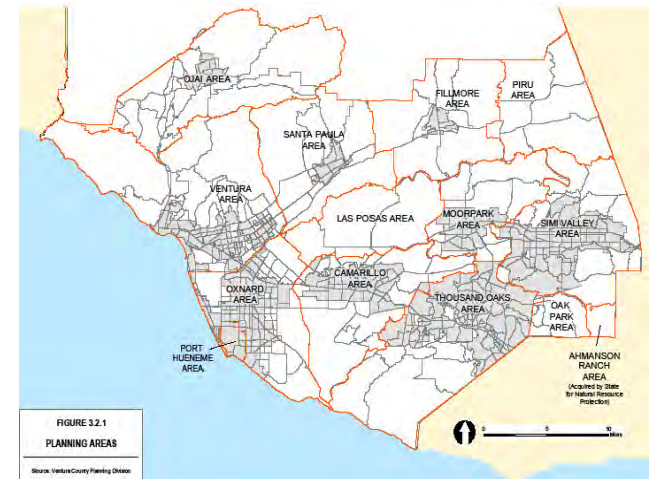**iteris**

# Performance Measures

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

Performance Measures

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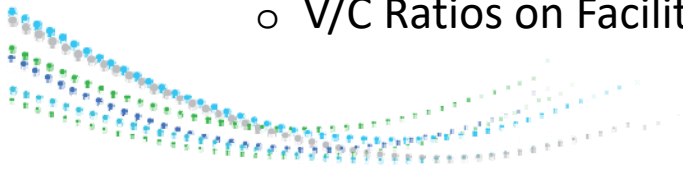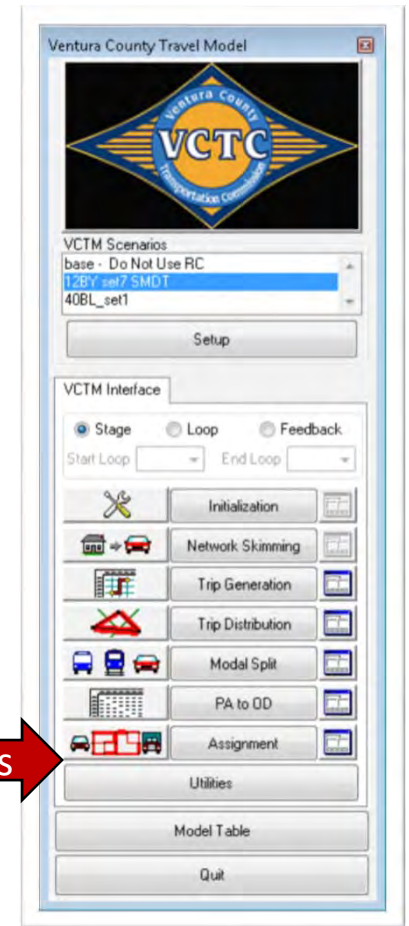
# Next Steps



- 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



FIGURE 3.2.1
PLANNING AREAS

Source: Ventura County Planning Division

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# Thank You!

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