TULARE COUNTY ASSOCIATION OF GOVERNMENTS

Workshop

Monday, May 18, 2015
Lindsay Wellness Center
860 N. Sequoia Avenue
Lindsay, CA 93247

TRAVEL DEMAND MODELING UPDATE

Background

Regional Travel Demand Model

- Typical Definition:
  - A computer program that runs mathematical equations using input data to replicate travel choices that individuals make.

$$T_{ij} = P_i \times \left(\frac{A_j \times F_{ij} \times K_{ij}}{\sum_{j=1}^{n} A_j \times F_{ij} \times K_{ij}} \right)$$

- The output is a measure of future travel demand that is expressed in terms of present or future traffic volumes.
- Simply: A forecast of future travel.
  - Where are people traveling to and from.
  - What routes are they choosing to get there.

Regional Travel Demand Model

- TCAG Model - Most recently updated to 2010 base year. Completed validation/calibration in 2013.

- . What did we need to do the update?
- DATA!
  - Population/Households (DOF/The Planning Center)
  - Employment (EDD, InfoUSA, Woods & Poole, Government Sources.)
  - Schools (Department of Education, employment and enrollment)
  - Travel Information (California Household Travel Survey)
  - Roadway Network (Existing attributes, current and future capacity improvement projects, gateway volumes, screenlines)

Regional Travel Demand Model

; TAZ	RU1	RU2	RU3	RU4	RU5	RU6	RU7	RU8	RU9	RU10	AGRICULTUR	MINING	UTILITIES	CONSTRUCTN	MANUFACTUR	WHOLESALE	RETAIL	WAREHOUSE	INFORMATN	FINAN_INSR	REALESTATE	SVC_PROF	SVC_MNGMNT	SVC_ADMIN	EDUCATION	HEALTH	ENT_REC	ACCOMODTNS	FOOD SVC	OTHER	PUBLIC	ELEM	HS	COLLEGE
101	75	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	67	0	0	0	0	0	0	0	0	0	12	0	0	0	11	0	2	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0
103	76	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	49	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	5	0	0	0	0	1	0	0	3	0	0	0	0	0	0	241	81	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	8	0	9	0	0	0	0	0	0	0	0	0	0	0	900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	308	0	179	0	0	0	0	0	0	0	0	0	0	0	50	0	12	0	0	0	0	66	0	0	1	12	0	0	0	0	0	0	0	0
113	81	0	98	0	0	0	0	0	0	0	2	0	0	0	12	0	3	0	0	0	0	21	0	0	182	0	0	0	0	0	0	716	11	0
114	111	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	6	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	4	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	10	0	43	0	0	0	0	0	0	0	0	0	0	0	32	0	31	0	0	0	0	3	0	0	0	0	0	0	0	0	6	0	0	0
118	233	0	4	0	0	0	0	0	0	0	4	0	0	0	1	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
119	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	5	0	0	0	0	0	0	0	0	0	3	0	0	0	164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	35	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	97	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	6	0	0	60	0	0	0	0	0	0	595	0	0
133	127	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	1	0	0	0	0	20	0	0	0	1	0	0	0	0	0	0	0	0

Regional Travel Demand Model

Roadway Network

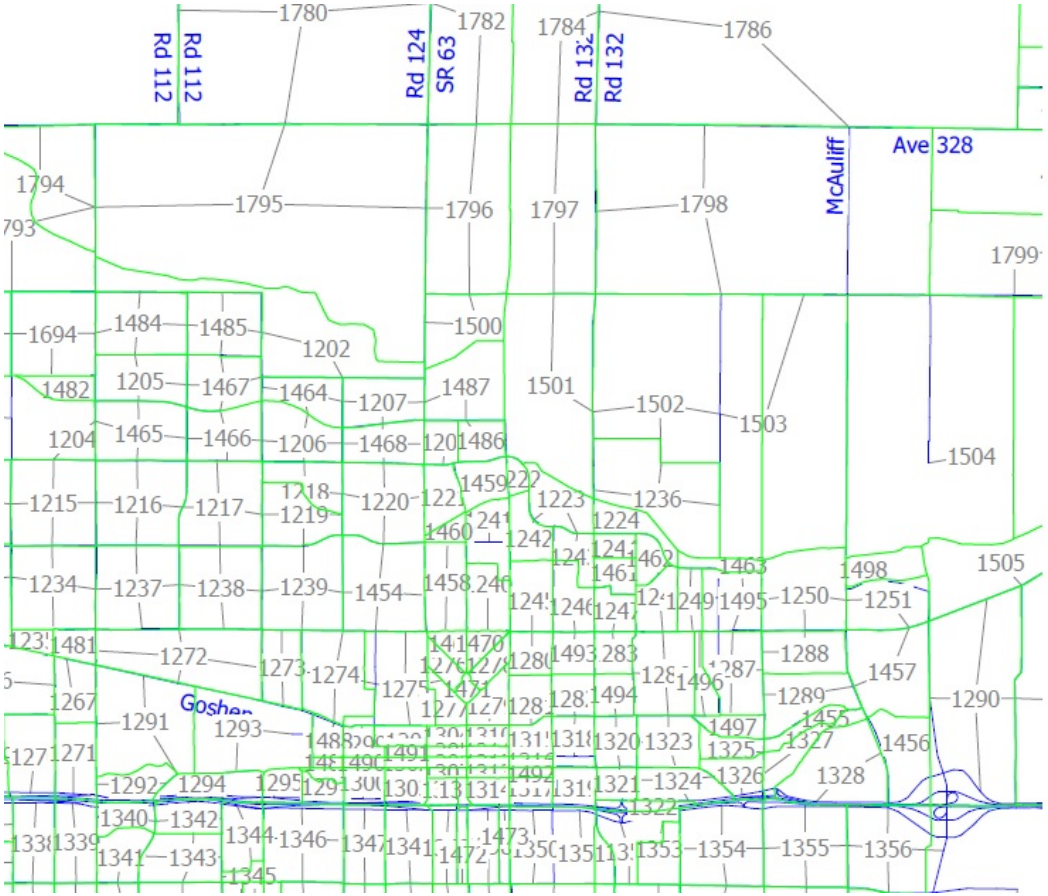
A system of nodes, links, and centroids that describe a transportation system.

1. Node: intersections of roadway links.

2. Links: Used to represent the street network (local roads are not included.

3. Centroids: special node representing origin and destination of all trips for TAZ.

4. Centroid connectors: special links that represent local roads and provide access between centroids and the network.



Regional Travel Demand Model

Network Attributes

- Speed
- Capacity
- Direction
- Travel Time
- Facility Type
- Traffic Counts (screenlines)

Regional Travel Demand Model

The Four Steps:

- Trip Generation - How many trips?
- Trip Distribution - Where are they going?
- Mode Choices - By what mode?
- Trip Assignment - What path are they taking?

Regional Travel Demand Model

Model Output's

;SpeedBin	Year	Summary Area	AM_II_VMT	AM_IX_VMT	AM_XI_VMT	AM_XX_VMT	MD_II_VMT	MD_IX_VMT	MD_XI_VMT	MD_XX_VMT	PM_II_VMT	PM_IX_VMT	PM_XI_VMT	PM_XX_VMT	EV_II_VMT	EV_IX_VMT	EV_XI_VMT	EV_XX_VMT
00.00-07.50	2010	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07.51-12.50	2010	1	7.29	0.05	0.23	0	16.02	0.29	0.43	0	11.55	0.22	0.35	0	6.09	0.03	0.21	0
12.51-17.50	2010	1	73.2	1.82	0.7	0	2.19	0.02	0.02	0	77.06	2.71	0.5	0	0.88	0.01	0.01	0
17.51-22.50	2010	1	97218.36	5360.5	7644.51	175.81	193598.75	9536.38	9651.74	254.83	116816.24	7415.51	5567.44	180.65	66571.23	3963.99	3924.87	120.17
22.51-27.50	2010	1	9031.55	917.27	1186.03	269.17	23043.66	1524.6	1470.21	538.42	10561.63	1137.07	862.61	283.73	4056.16	556.99	484.02	99.22
27.51-32.50	2010	1	33359.54	1174.63	1503.95	332.07	65333.35	1756.53	1759.45	422.19	38220.84	1392.58	1233.49	296.98	15995.59	639.79	706.88	113.04
32.51-37.50	2010	1	122342.07	5772.54	6931.61	999.01	261154.31	9023.42	9201.66	1481.64	147676.26	6673.02	5851.21	914.51	70095.01	3173.24	3124.38	373.54
37.51-42.50	2010	1	116371.74	7927.29	9565.41	2102.17	238384.65	12460.97	12279.97	3239.04	130802.72	9117.72	7727.45	2065.31	79034.64	5907.8	5739.36	1762.81
42.51-47.60	2010	1	214659	18890.48	22657.24	7342.85	420294.02	29748.28	29334.16	13923.73	255849.32	22773.7	18790.18	7905.8	153904.6	13569.95	13380.54	3830.48
47.61-52.50	2010	1	359133.14	39580.16	47578.52	15210.89	689047.94	61867.12	61227.99	23772.43	411650.19	46341.46	39476.62	15203.44	251084.2	28431.56	27150.35	9986.66
52.51-57.50	2010	1	186216.12	28336.8	29001.57	8285.01	358009.16	39015.95	39141.33	14303.91	209484.23	28294.47	27961.9	8689.57	140371.8	21126.01	21162.7	5874.68
57.51-62.50	2010	1	19247.42	3301.31	4011.91	17271.5	36681.59	4936.66	4767.98	22992.04	22682.06	4231.76	3215.55	16812.02	10282.34	2854.83	2757.24	10635.67
62.51-67.50	2010	1	106593.69	9163.12	17077.11	4800.66	222550.93	18237.82	18097.79	5372.79	124637.07	15894.79	10262.37	5383.46	64749.31	8222.34	7642.05	1577.83
67.51-72.50	2010	1	93021.25	50945.95	52337.05	346947.58	182776.25	65996.37	66886.08	658967.49	109763.8	52007.48	50991.6	367880	69207.71	37010.01	36921.1	220375.1
Total	2010	1	1357274.35	171371.92	199495.83	403736.7	2690892.8	254104.41	253818.8	745268.52	1578232.99	195282.5	171941.3	425615.5	925359.6	125456.6	122993.7	254749.2

;Facility_Type	Year	StudyArea	AM_VMT	MD_VMT	PM_VMT	NT_VMT
Freeway	2010	1	681474.07	1235632.67	737075.04	441387.05
Highway	2010	1	833977.89	1496793.89	930266.3	561188.12
Expressway	2010	1	80517.1	146880.44	91541.7	59735.44
Arterial	2010	1	341636.35	682053.01	386381.3	236714.52
Collector	2010	1	71664.2	143669.1	82077.54	45883.98
Local	2010	1	102892.13	201677.17	121576.32	71154.17
Freeway-Freeway	2010	1	1769.26	2613.41	1973.24	1055.68
Slip	2010	1	16076.49	31409.49	18050.43	10003.79
Loop	2010	1	1910	3420.1	2171.47	1461.75
Total	2010	1	2131917.5	3944149.28	2371113.34	1428584.49

Regional Travel Demand Model

Legislation:

- California Clean Air Act (CCAA) of 1988
- Federal Clean Air Act Amendments of 1990
- Senate Bill No. 375 (SB 375)

Regional Travel Demand Model

Funding:

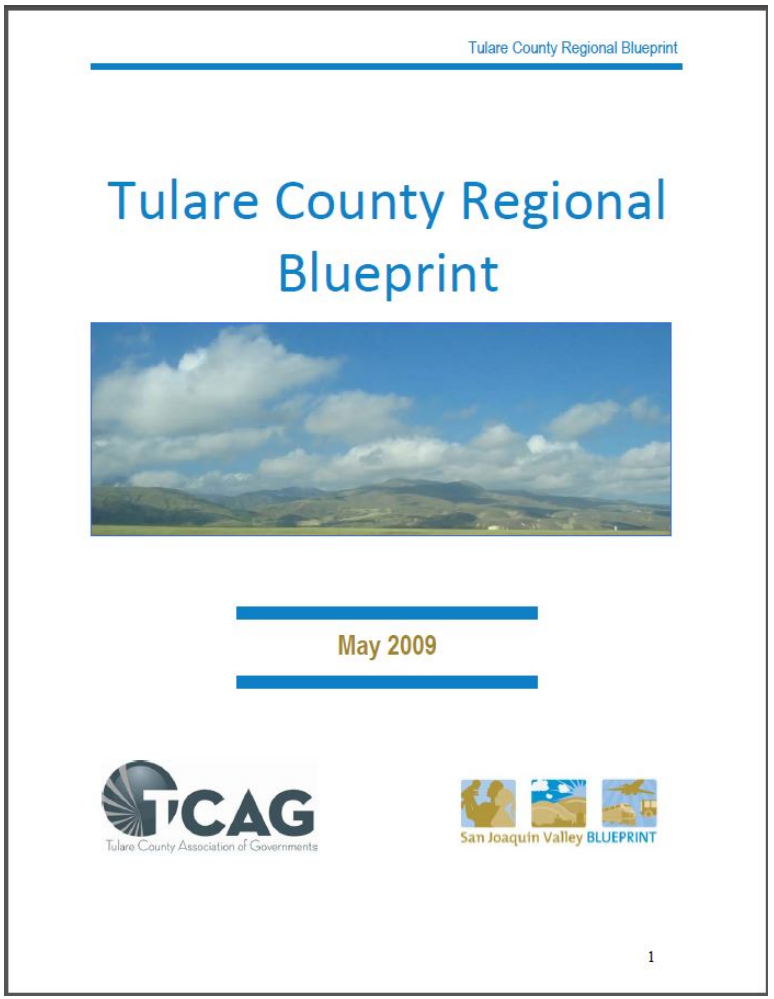
- Local Contribution
- FHWA PL
- Prop. 84 Grant

TRAVEL DEMAND MODELING UPDATE

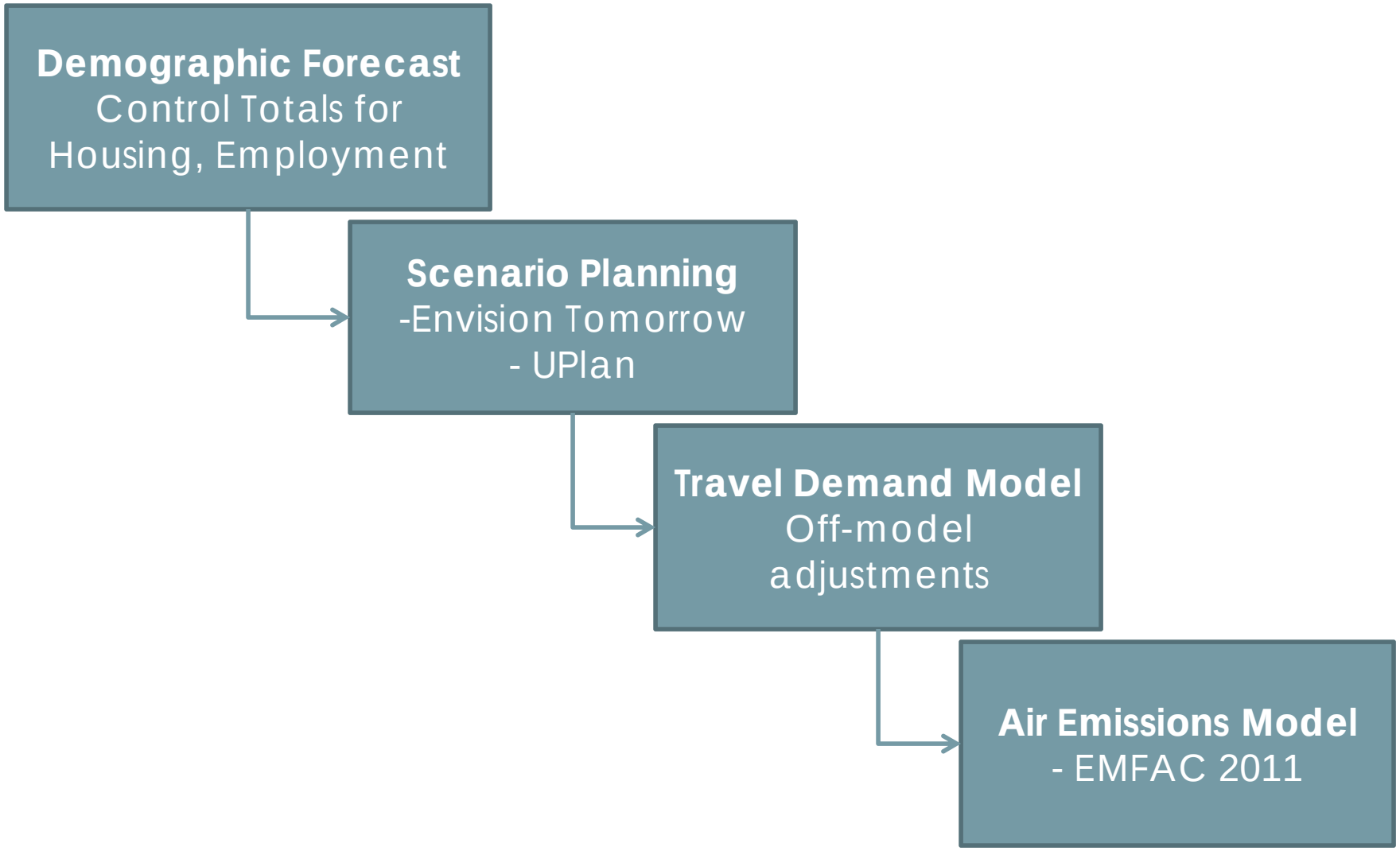
Update and Looking Forward

2014 Regional Transportation Plan

- Adopted June 30, 2014
- TCAG's first RTP to include a Sustainable Communities Strategy (SCS) in conformance with SB 375
- SCS land use scenario based on 2009 Tulare County Regional Blueprint



TCAG Modeling Tools for RTP/SCS



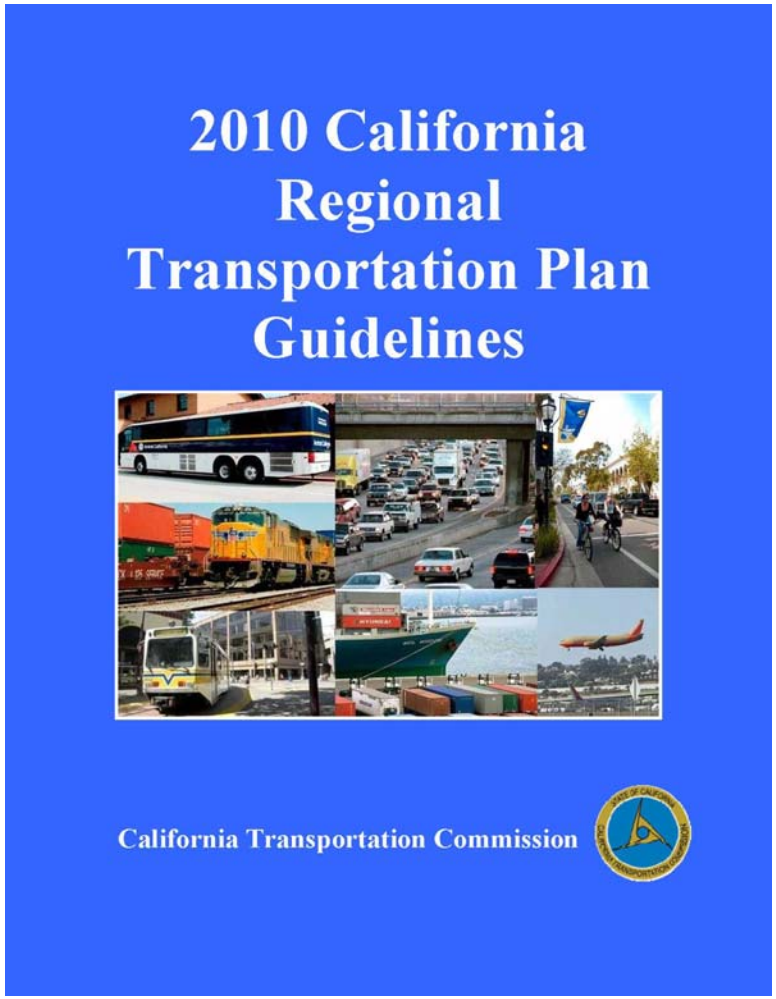
ARB Review of SJV RTP/SCSs

- Fresno COG, January 2015
- San Joaquin COG, May 2015
- Kern, Kings, Tulare COGs, July 2015 (est.)
- Madera, Merced, Stanislaus

- Increase model sensitivity to land use and transportation policies
- Work on static and dynamic validation
- Enhance Traffic Analysis Zone (TAZ) Structure
- Refine Auto Ownership and Auto Operating Cost inputs

RTP/SCS Update in 2018

- "D. Regions that are nonattainment in ozone or CO, with a metropolitan planning area containing a population over 200,000."
- "Each MPO should develop a multi-year program of improvements needed to address any needed modeling capabilities…"



Model Improvement Program (SJVMIP2)

Purpose

- Acquire new data, enhance and revalidate each of the 8 SJ Valley MPO traffic models using the newly acquired data.

Data Updates

- Cell Phone – Trip Origination/Destination Flows
- GPS – Traffic Speed Data
- 2010 Census/ACS Demographic and Commute Data
- 2010-12 CA Household Travel Survey (CHTS)
- CoStar – Housing Affordability, Employment, Rent Data
- Statewide Model – SJ Valley Interregional Trip Consistency

Upgrades

- Full GIS Network Integration
- CUBE Land Module
- Mode Choice Tool
- Extensive MPO Staff Training

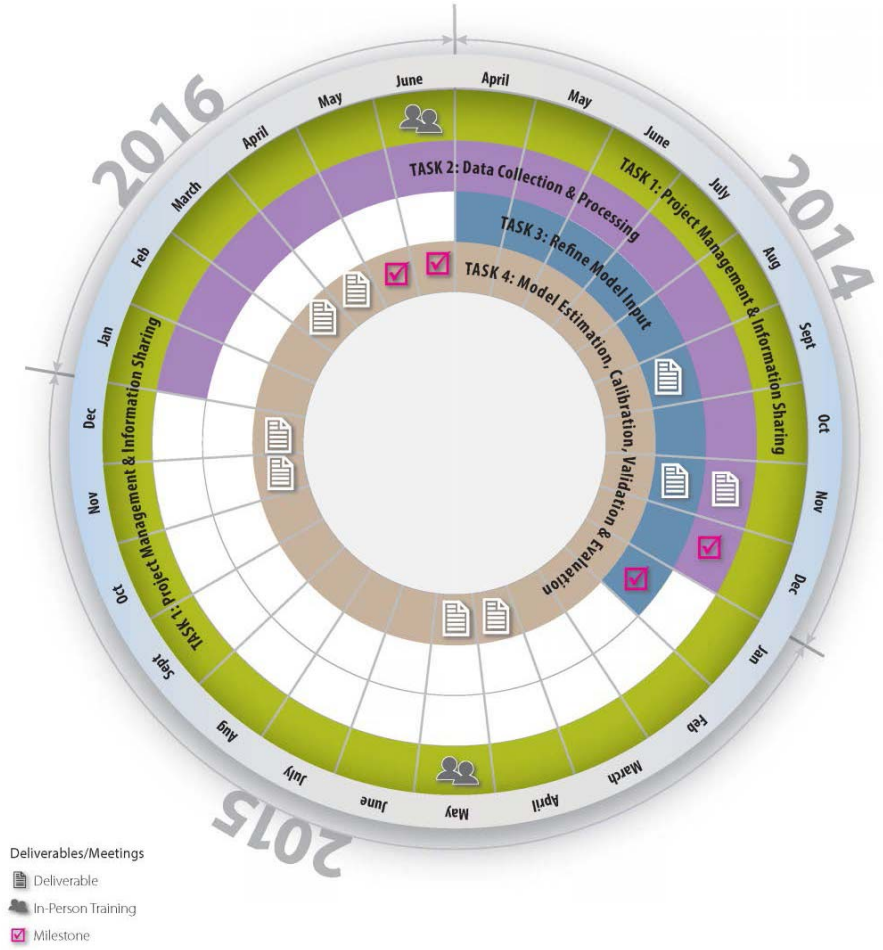
SJMIP2 Schedule

Progress

- Data Collection 2014
- Refine Model Inputs 2014
- Model Estimation, Calibration, Validation, & Evaluation 2015-2016
- Staff Training 2015 & 2016

TCAG SJVMIP2 Model Delivery

May 2016



Goods Movement Update and Looking Forward

San Joaquin Valley Interregional Goods Movement Plan (Plan) concluded in late 2013.

- Identified Interstate 5 and State Route 99 as major freight movement corridors
- Also identified both corridors as part of DOT's National Primary Freight Network.

Valley MPOs recently awarded an Emerging Priorities Planning Grant to fund the San Joaquin Valley I-5/SR-99 Corridor Goods Movement Study.

Study tentatively scheduled to begin in August 2015 with final report due in February 2017.

The Study will look at:

- Safe Truck-Only Toll (TOT) Lanes
- Triple Trailers and Heavier Loads
- Intelligent Transportation System (ITS) Technology
- Diversion of Truck Shipments to Rail
- Will also include a modest pilot demonstration project for moving strategies forward towards implementation.

Mode Choice Tool

Purpose

- Provide greater capability to analyze the regional transportation system impacts of public transportation projects and policies.

What it is

- "Off-model", GIS-based, quick response tool
- Overlays actual transit network on model network.
- Incorporates transit characteristics that affect choice of mode.
  - Transit center & bus stop locations, fares, schedule, on-board amenities, etc.
- Can be used in different combinations to balance the need for feedback on different planning and operational scenarios to suit particular studies or projects.

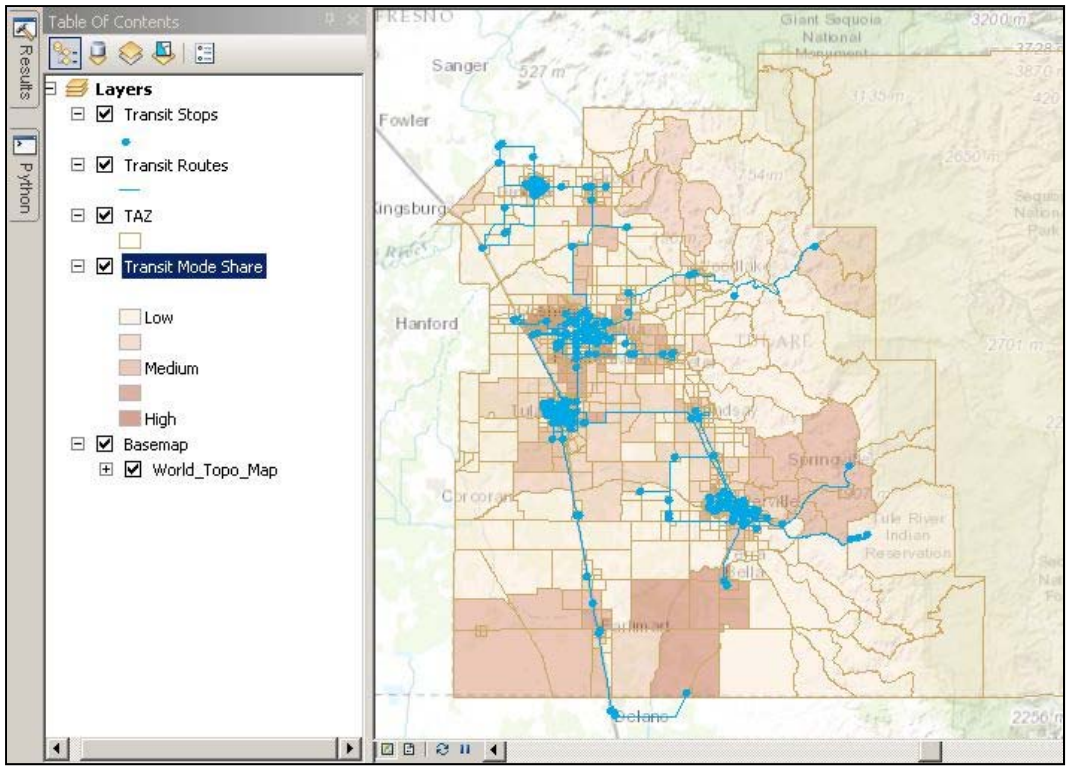
Mode Choice Tool – Looking Forward

Current Projects

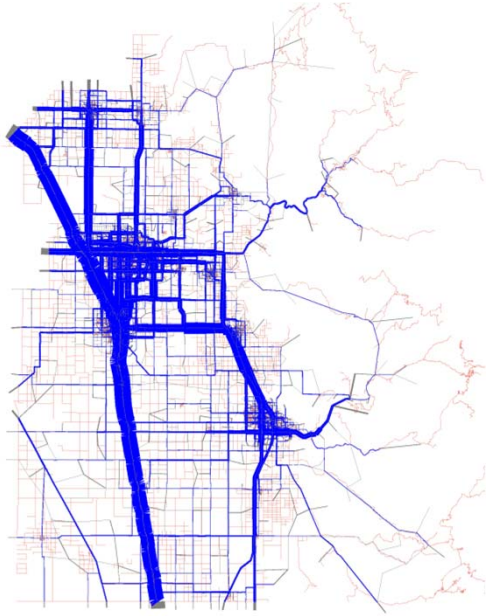
- Being used to test future transit scenarios for the *Tulare County Long Range Transit Plan (LRTP)*

Full Implementation

- In concert with updating and recalibration of model; 2015-2016
- Will be used for the development of the next RTP/SCS



TCAG Board - TFMTAC



Transportation Forecasting Model Technical Advisory Committee

Purpose

- The TFMTAC reviews, considers, investigates, advises and reports to the TCAG Policy Board on highly technical matters in the development and use of the transportation forecasting model, recognizing that technical and policy matters are not always distinct and separable.

Established September 2014

- Membership Includes Tulare County Area City/County Engineers and Caltrans District 06

TFMTAC Meeting Scheduled May 28, 2015

- Agenda – TCAG Travel Demand Model Overview

THANK YOU

Questions?