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# Imperial County Transportation Model (ICTM)

*Update and Enhancement*

*presented to*

*SCAG Modeling Task Force*

*presented by*

*Cambridge Systematics, Inc.*

*Sean McAtee*

July 25, 2018

# Outline

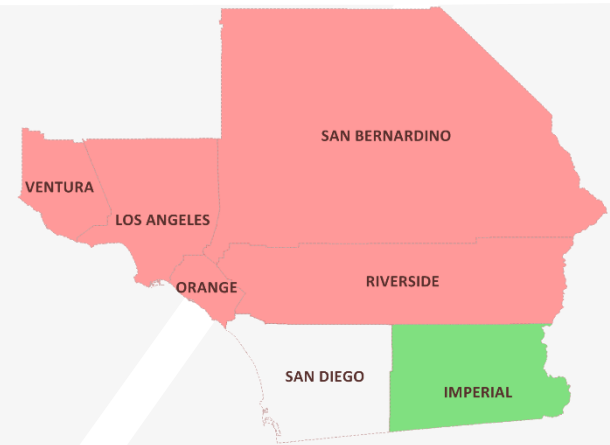
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- Imperial County Overview
- Subregional Model Development Tool (SMDT) Application
- Calibration and Validation
- Added Modules and Tools
- Conclusions and Lessons Learned

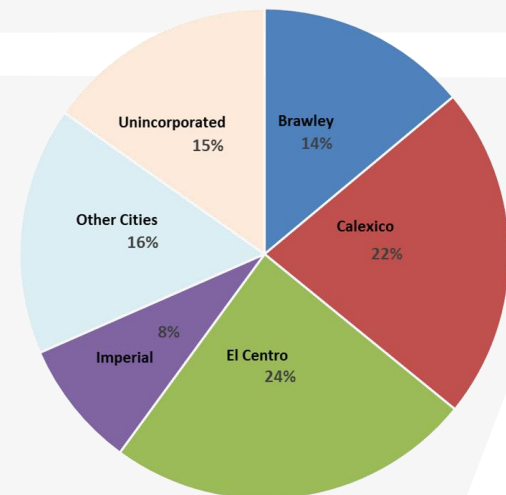
# Imperial County Overview

➤ About **1%** of the SCAG population

	Imperial County	SCAG
Population	183,309	18,705,638
Households	49,630	5,944,448
Employment	67,100	8,052,142



- Adjacent to Mexicali, Population ~700K – 1M
- Heavy agricultural Influence
- Population grouped in small communities



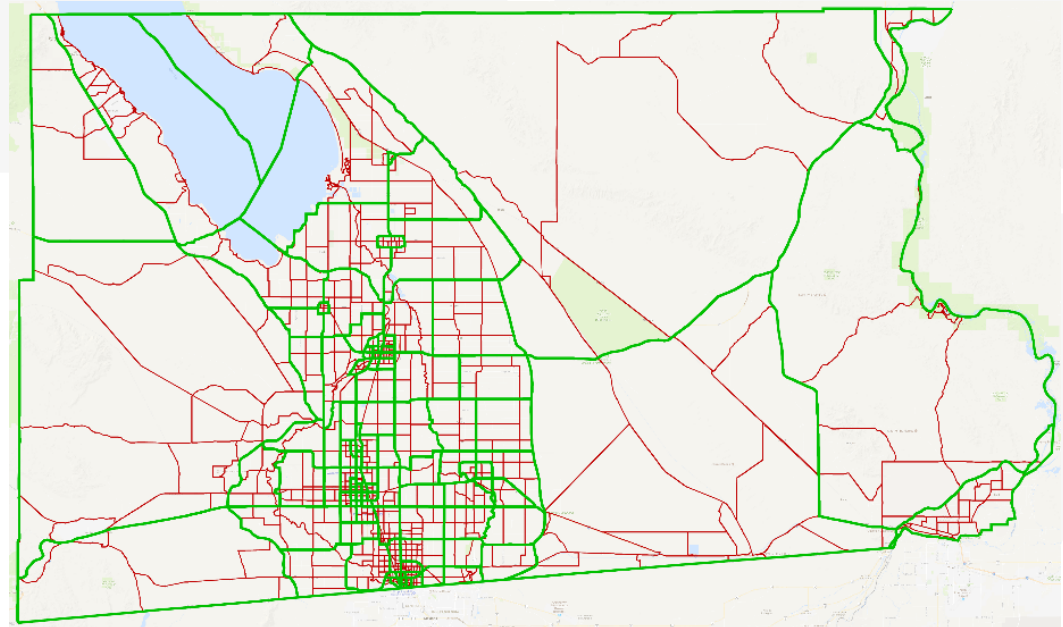
# SMDT Application

## ➤ Zone disaggregation **+7x**

	Tier 1	Tier 2	ICTM
Imperial County	110	239	745
SCAG	4,109	11,267	1,128

*Total internal zones*

- Manual centroid connector placement
- Build on 2008 ICTM
- Coordinate refinements with SCAG and Caltrans District 11



# SMDT Application

- Network refinement **+60%** more roadways

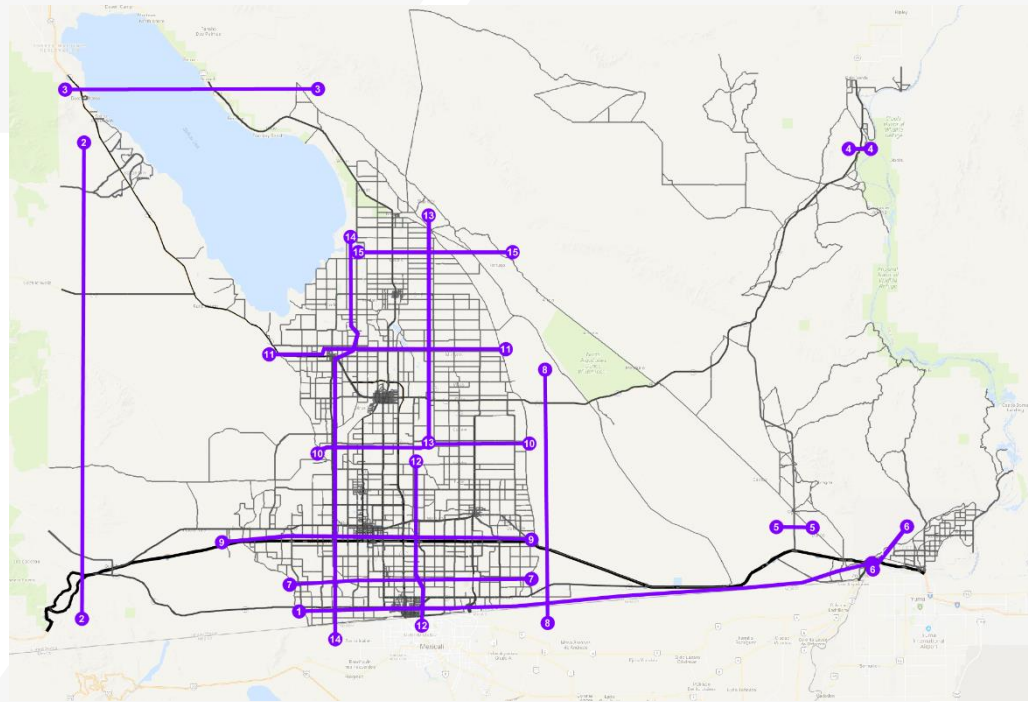
	SCAG	ICTM	Addition
Centerline Miles	1,989	3,228	1,239
Lane Miles	4,034	6,511	2,477

*Non-centroid connector highway links*

- Thorough network review
  - » Combine SCAG 2012RTP Network and 2008 ICTM Network
  - » Recent projects and attribute/alignment review
- Node consolidation
  - » Retain extra nodes only where key variables change

# Calibration and Validation

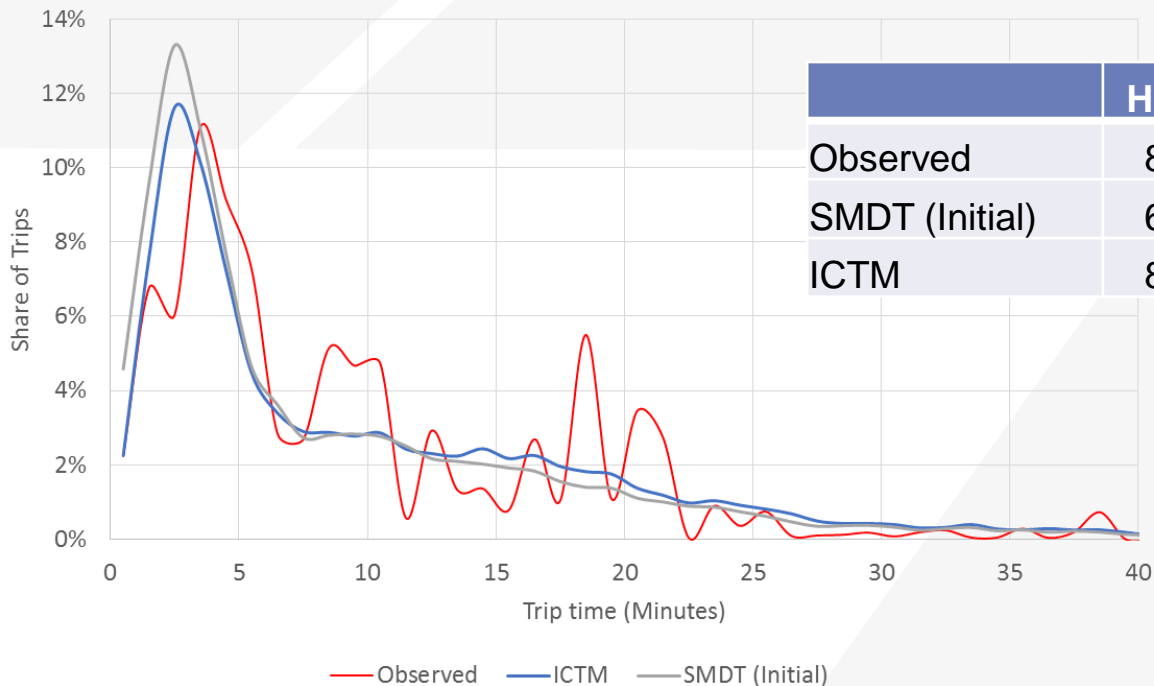
- Household Travel Survey (2012 – 2010)
  - » 347 Households, ~5000 Trips
- Traffic Count Data – Screenlines
  - » 15 Screenlines, 160 Counts (some estimated)
  - » Data collection coordinated with SCAG Regional Screenlines
- Transit Data
  - » About 3,200 daily boardings
- Calibrate and validate **each** model step



# Trip Distribution

- Calibration of the Destination Choice distance decay function
- Maintain interaction with Riverside County

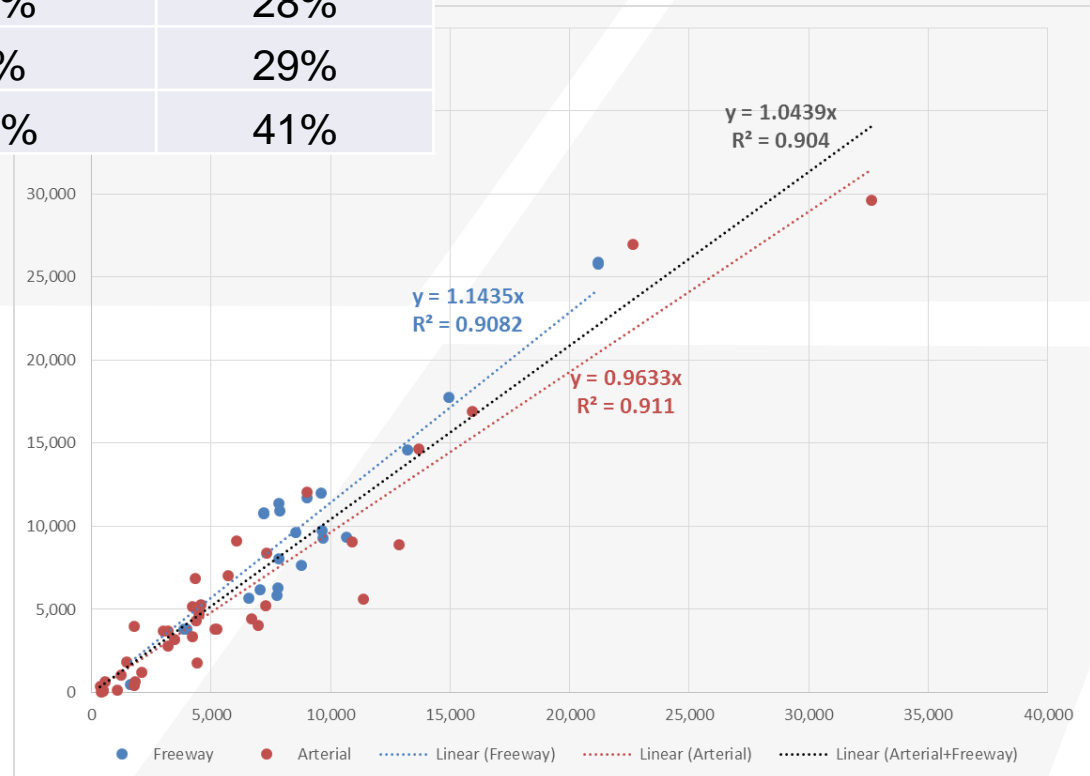
Trip Length Frequency Distribution (HBW)



	HBW	HBNW	NHB
Observed	8.1	7.1	4.4
SMDT (Initial)	6.9	3.9	3.4
ICTM	8.1	6.7	5.2

# Traffic Assignment

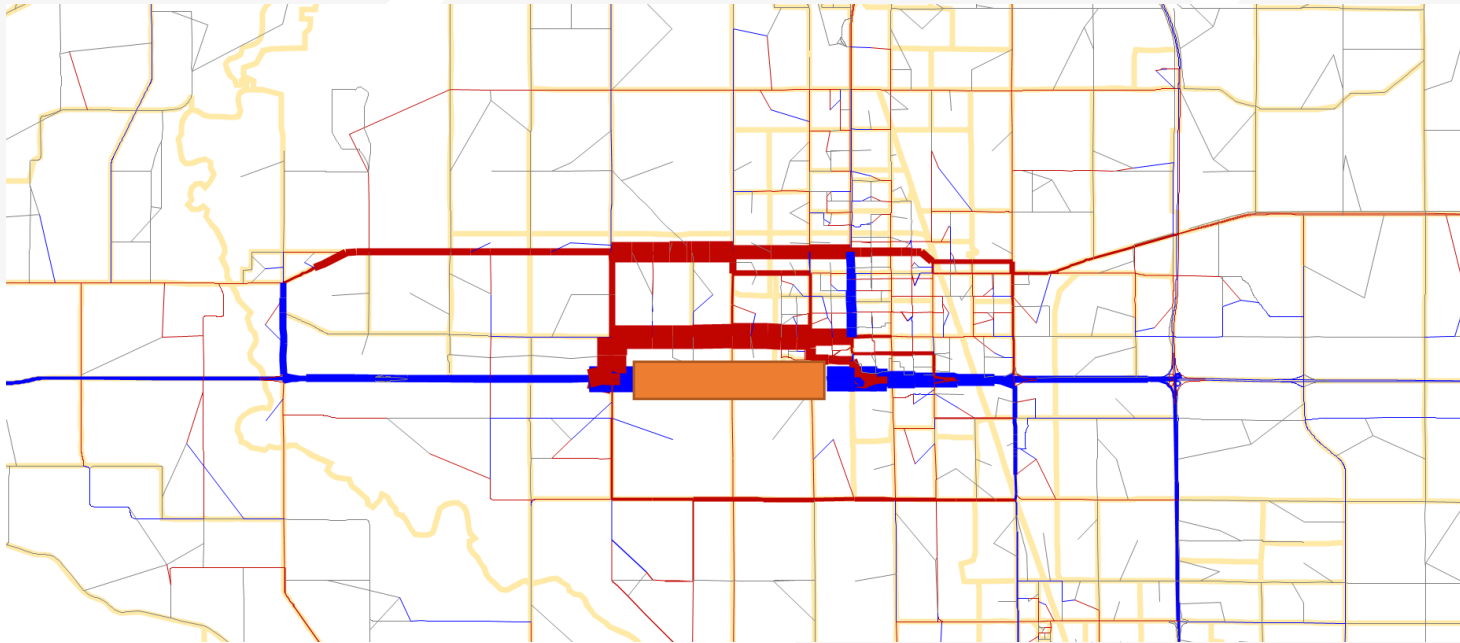
	Volume / Count	% RMSE
Freeway	110%	24%
Expressway/Parkway	113%	28%
Principal Arterial	93%	29%
Minor Arterial	100%	41%





# Sensitivity Testing

- Close a section of I-8 near El Centro
  - » Verify reasonable results with and without running feedback



# Through Travel

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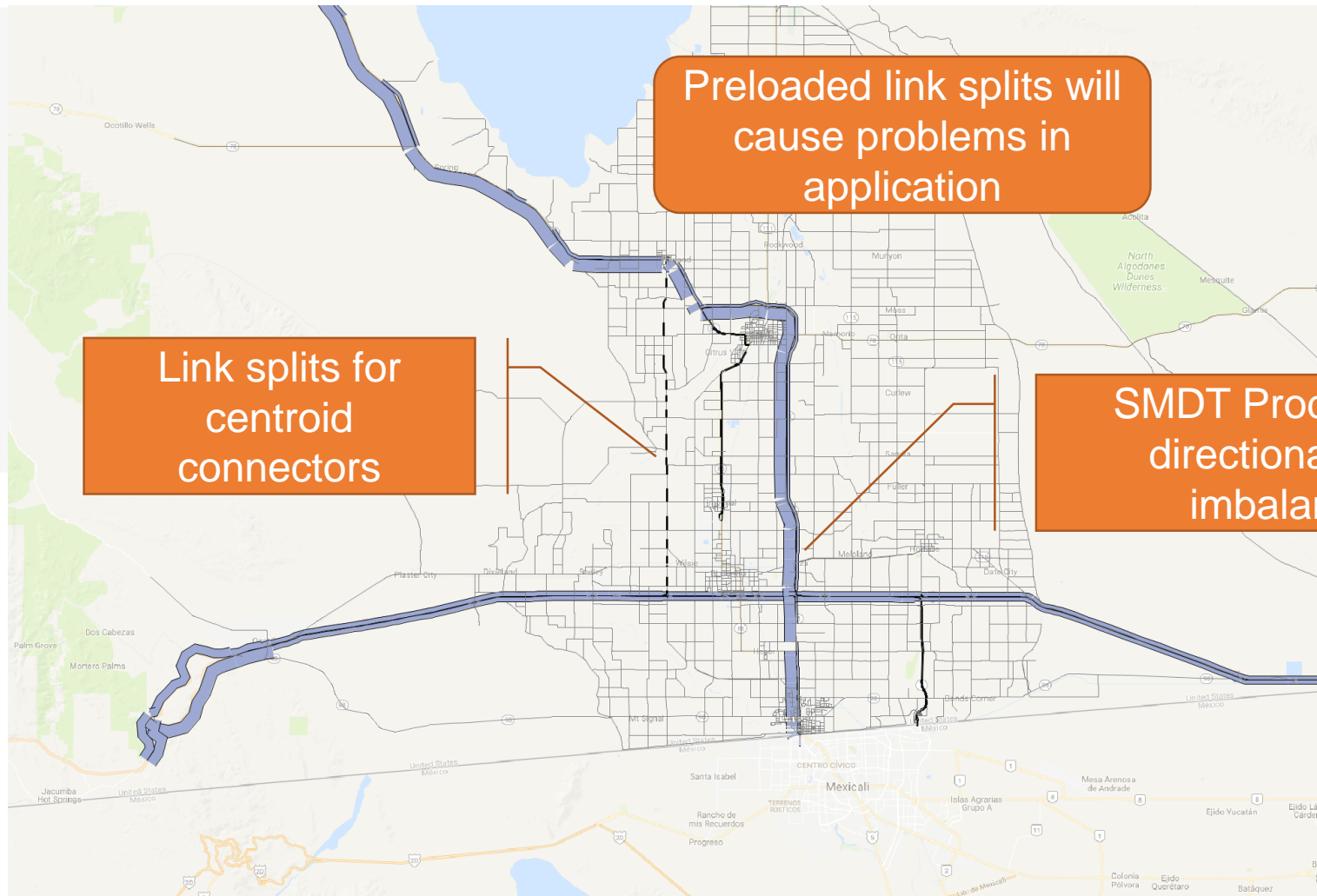
## Problem

- The SMDT ***preloads*** all non-county traffic.
- This includes traffic passing through

## Symptom:

- Discontinuous volumes
- No sensitivity to through travel (e.g., to network changes)

# Through Travel - Discontinuities



# Through Travel

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## Option 1

- Add a "Preload ID" field to the network
- Update ICTM to preload using this field

## Option 2 (Selected)

- Remove all Imperial County preload values
- Generate a new through trip table
- Add through trips to the OD tables for assignment

# IE/EI Travel – Mexicali, San Diego, New Mexico

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## Problem

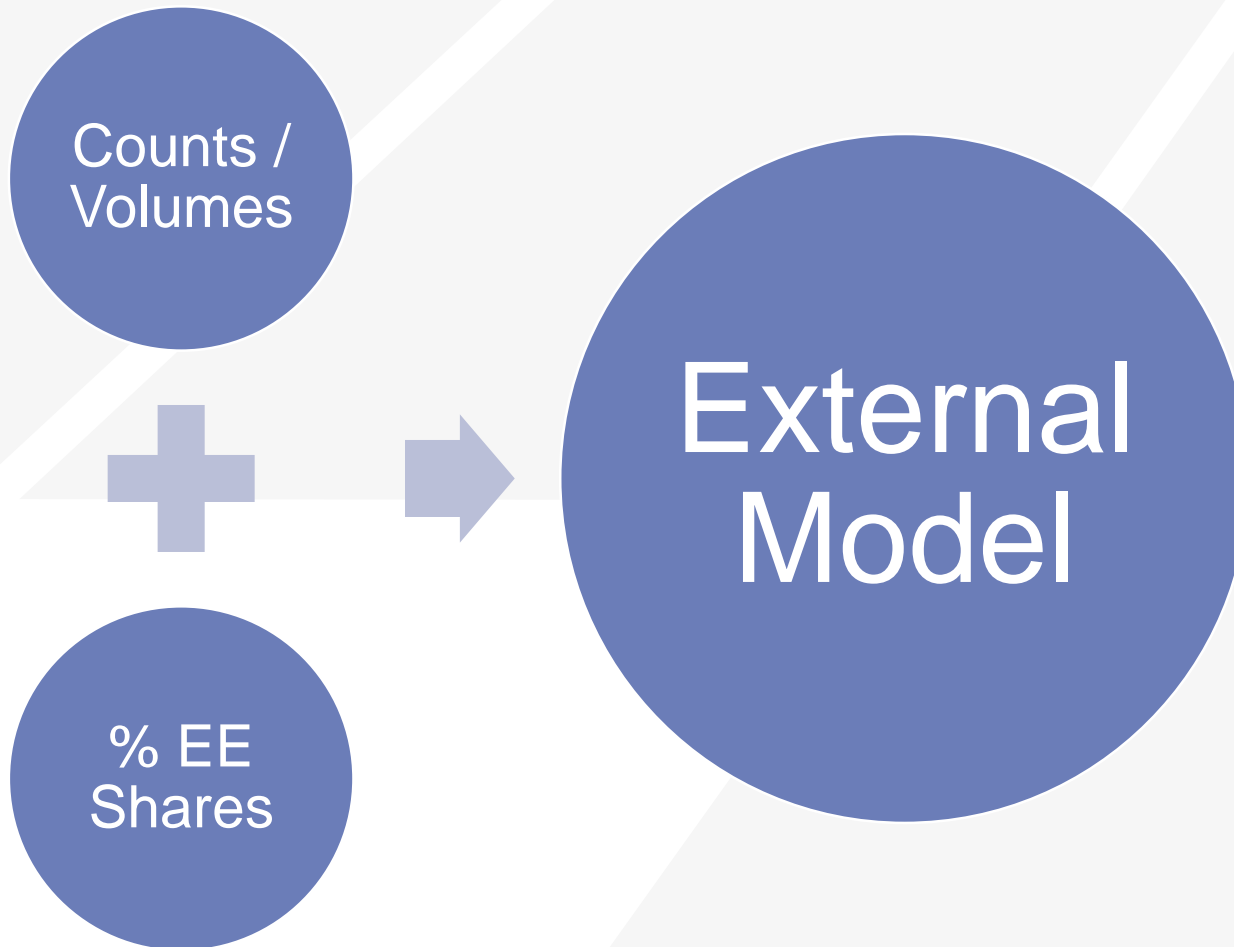
- SMDT volumes inconsistent with counts
- SMDT distribution unrealistic (calibrated regionally)
- Lack of sensitivity to network and SED changes

## Solution

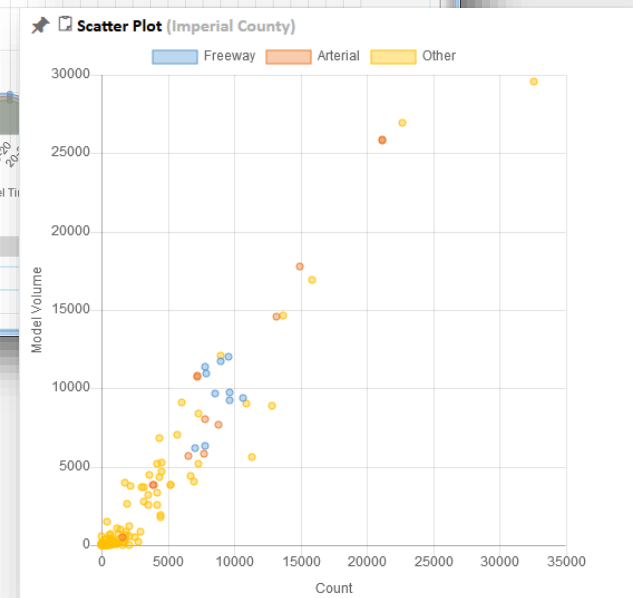
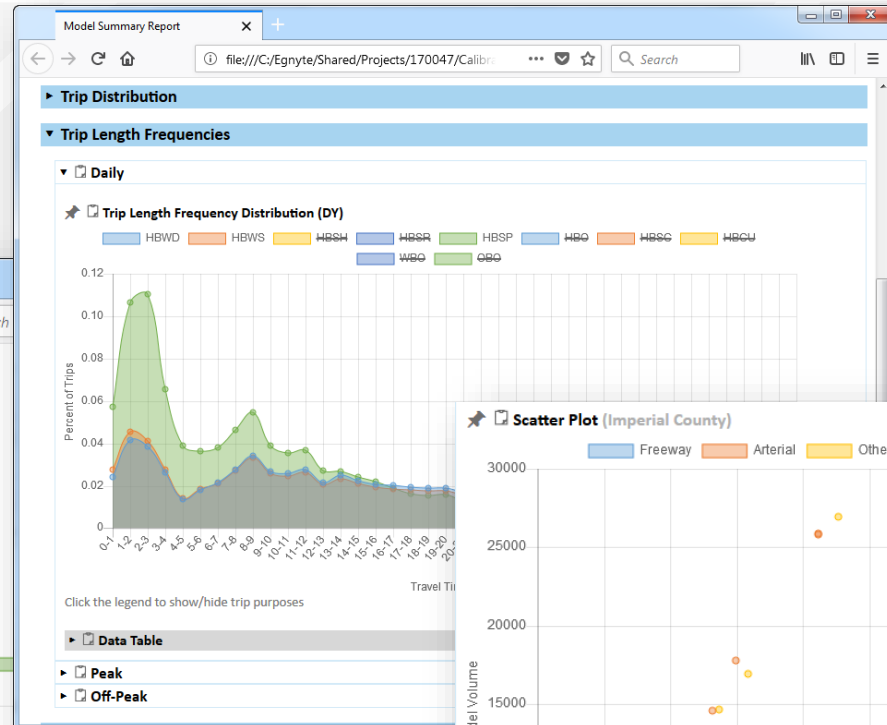
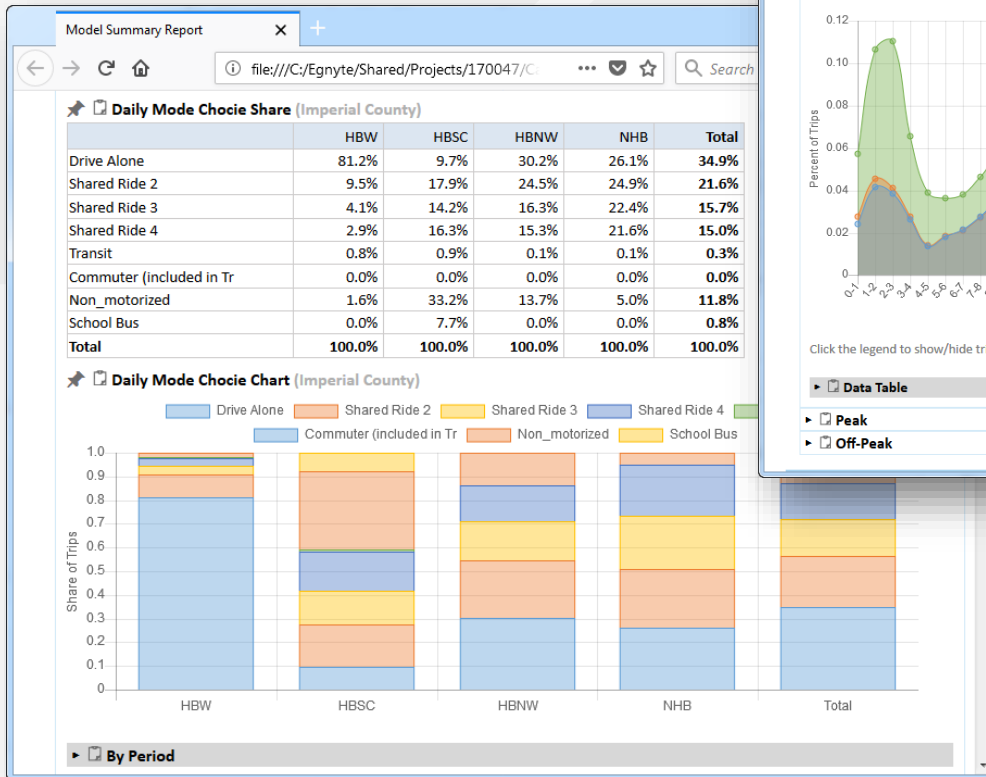
- Completely replace IE/EI model
- Input traffic count data directly
- Singly constrained gravity model
- Calibrated based on the 2007 cross-border survey

# External Travel

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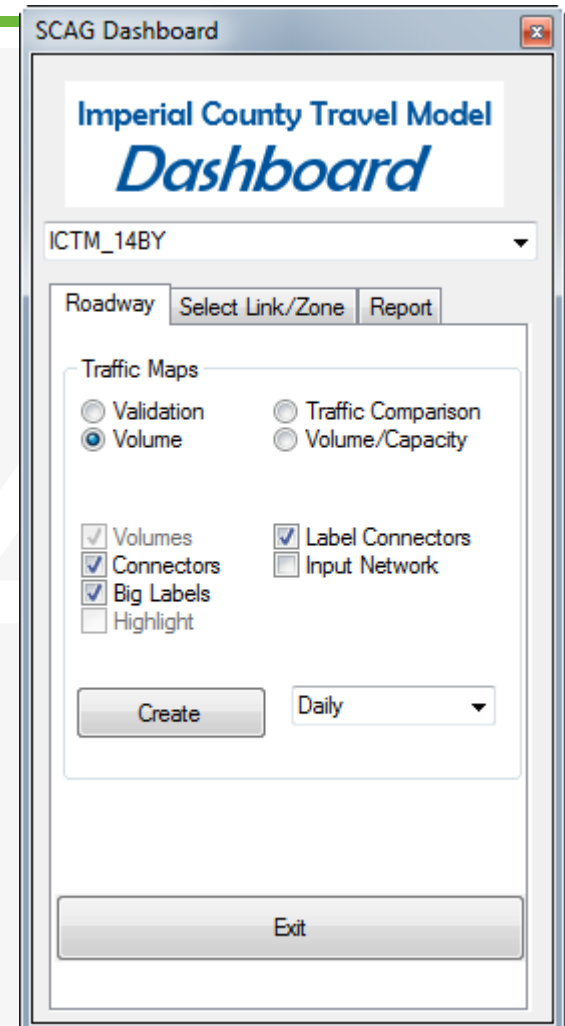


# Model Dashboard – Summary Report



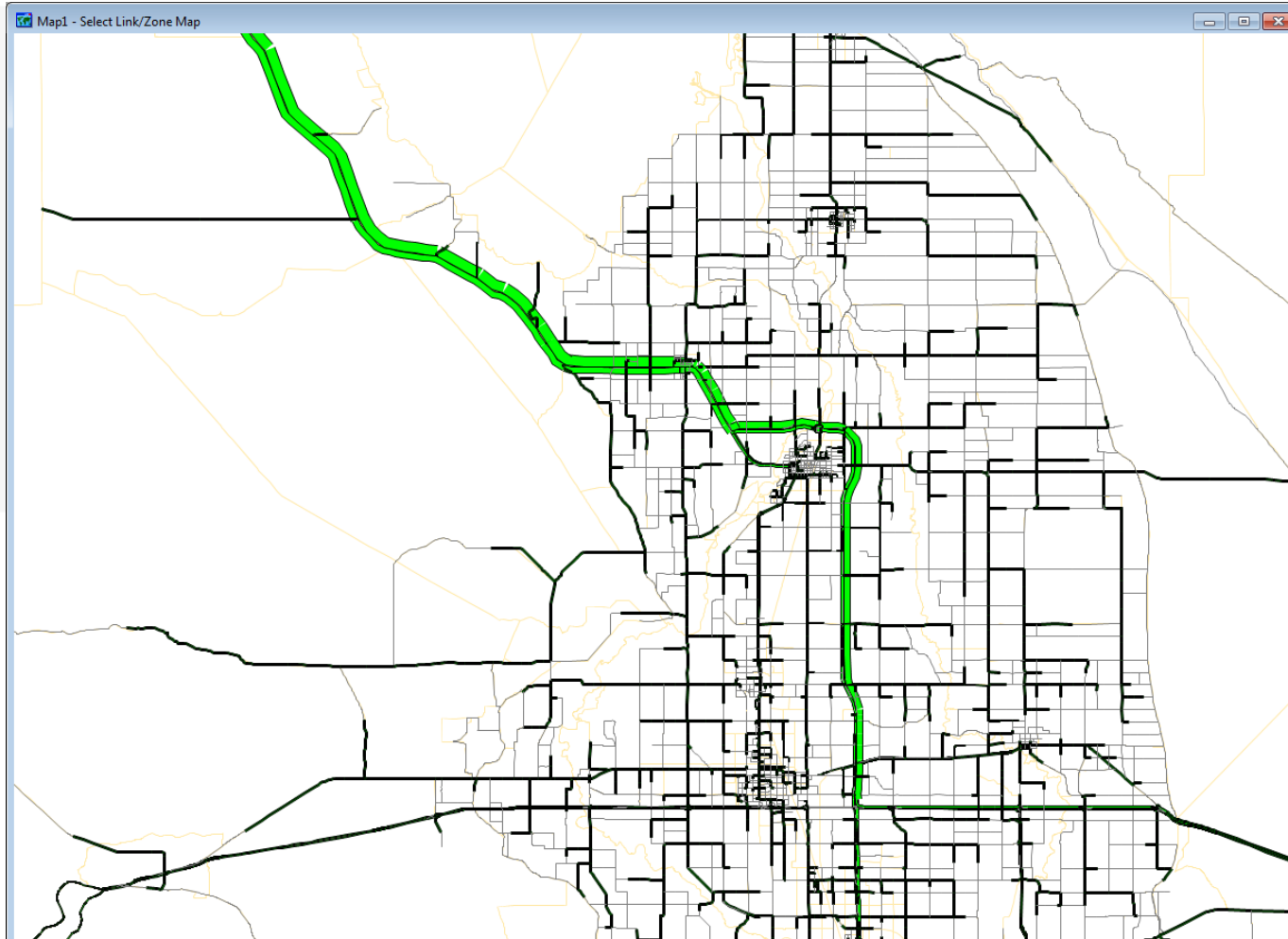
# Model Dashboard - Mapping

- Quickly produce daily and peak period volume maps
- Compare two similar model runs
- Interactive select link and zone review





# Model Dashboard - Mapping



The figure shows a software window titled "SCAG Dashboard". The main heading is "Imperial County Travel Model Dashboard". Below this, it says "ICTM\_14BY". There are three tabs: "Roadway", "Select Link/Zone", and "Report". The "Select Link/Zone" tab is active. It contains a "Select Query:" dropdown menu with "110" selected. Below this is a "Period:" dropdown menu with "AZ\_8\_EB" selected. There is a "Display Type:" section with three radio buttons: "Link" (selected), "Origins", and "Destinatio". Below this are two checkboxes: "Connectors" and "Labels", both of which are unchecked. At the bottom of the window are two buttons: "Create" and "Exit".

# Model Dashboard - Mapping

The screenshot displays the SCAG Dashboard interface for the Imperial County Travel Model. The main window, titled "Map1 - Select Link/Zone Map", shows a map of the region with a network of roads and zones. A specific route is highlighted in red, and a central area is highlighted in blue. The right-hand panel, titled "SCAG Dashboard", contains the following controls:

- Imperial County Travel Model Dashboard**
- Model ID: ICTM\_14BY
- Buttons: Roadway, Select Link/Zone, Report
- Select Query: 110
- Period: Daily
- Display Type:
  - Link
  - Origins
  - Destinations
- Connectors
- Labels
- Buttons: Create, Exit

# Conclusions and Lessons Learned

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## SMDT

- A great tool. Requires careful attention to detail and QA/QC

## Don't re-invent the wheel

- Build on past work, don't start from scratch

## Border crossing

- Requires direct attention to model correctly

## Traffic Counts

- Plan, coordinate and get permits early!

# Thank You!

## SCAG

Hao Cheng – Project Manager, SMDT Application

KiHong Kim – Count Database, Network assistance

## Caltrans

Hanwen Yi and Maurice Eaton

## Cambridge Systematics

Chao Wang, Haiyun Lin, Michelle Bina, Eric Bierce

## Count Collection

Traffic Research & Analysis (TRA)