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Think Forward

Southern California Association of Governments
2016 Regional Screenline Count Database

presented to

SCAG Modeling Task Force

presented by

Cambridge Systematics, Inc.

SCAG

May 23, 2018

Discussion Items

- Motivation for the study

- Data Collection Approach

- Data Assimilation and Data Analysis

- Database Development

- Quality Control and Quality Assurance

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Motivation and Background

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Motivation and Background

➤ SCAG's Regional Travel Demand Model for 2020 RTP/SCS (Base Year 2016)

➤ Model validation and update
  » 35 screenlines and 40 external cordons

➤ Detailed classification data required:
  » AAWT (Annual Average Weekday Traffic)
  » 5 time periods (AM, MD, PM, EVE, NT)
  » 4 vehicle types (LM, LHDT, MHDT, HHDT)

➤ Leverage existing data to the extent possible

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Data Collection Approach

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Three-step Approach

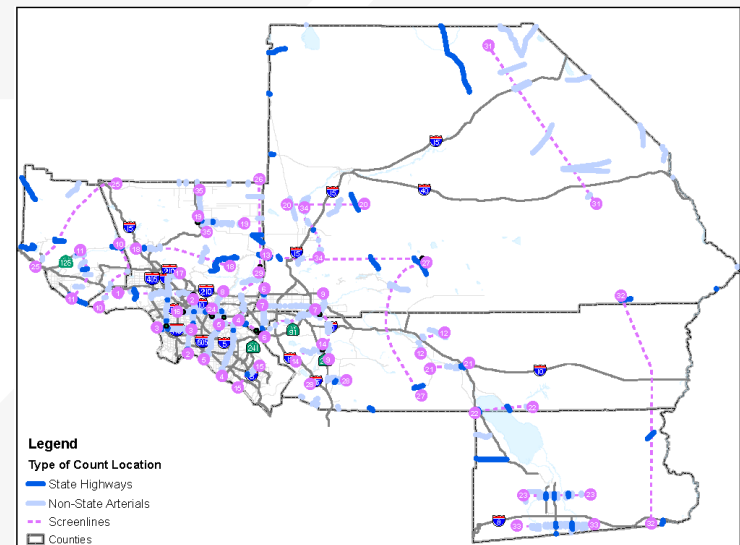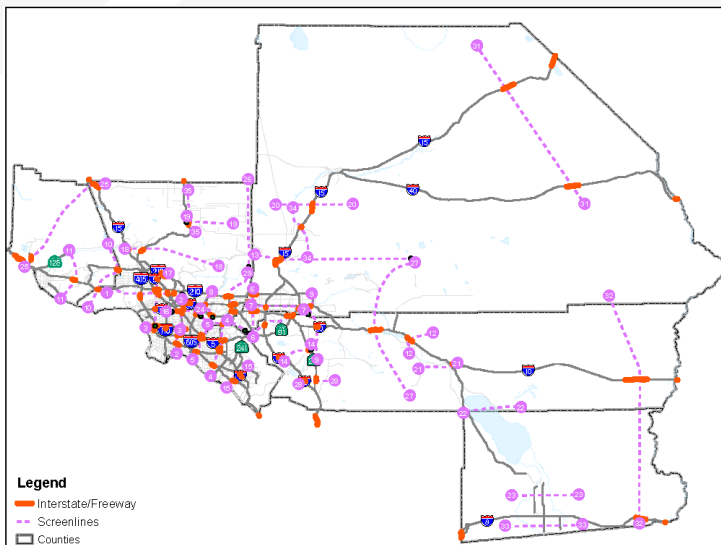| Primary Data Collection	Secondary Data from Caltrans	Local Data Collection
• Freeways • Non-Freeways	• PeMS • TAMS • Caltrans Counts	• County/city data

- Data collected on Tuesday-Wednesday-Thursday
- No data collected on Holidays & Days after Holirdays
- No data collection around Universities during Spring Break

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Primary Data Collection

- Includes screenlines and external cordons

- Includes freeways and arterials

- 2012 locations used as starting point

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Primary Data Collection

Phase 1

- Design of a quality control plan

Phase 2

- Obtains permits from Caltrans for data collection on State Highways and Freeways

Phase 3

- Conduct traffic count data collection

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Primary Data Collection

➤ Locations identified by SCAG

Screenline/Cordon	Freeways	Non-Freeways	Total
Screenline	231	547	**778**
External Cordons	20	33	**53**

➤ Dropped low volume roadways

➤ Final list of locations

Screenline/Cordon	Freeways	Non-Freeways	Total
Screenline	248	526	**774**
External Cordons	18	32	**50**

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Primary Data Collection

➤ Non-Freeway locations
  » All locations counted using tubes
  » Data obtained in 15-minute intervals
  » Includes all 13-FHWA classes of vehicles

➤ Freeway locations
  » Primary data collected at 30 locations
  » Used a combination of Wavetronix and video
  » Remaining locations obtained using existing data from Caltrans
  » One-day data collection at all locations

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Primary Data Collection

➤ Collection Periods:

» Spring 2017 and Fall 2017

➤ Number of Sites Counted during each Month

| Month	Tube Data Collection	Wavetronix Data Collection
February	25	NA
March	76	NA
April	180	NA
May	110	NA
June	21	6
September	98	12
October	2	20
November	8	34

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Secondary Data Collection

- ➤ PeMS data
  - » Comprehensive coverage
  - » Historical data
  - » Detailed time slices
  - » No vehicle classification

- ➤ Major steps
  - » Assign station to screenline
  - » Evaluate data quality
 - » Drop poor performing stations

Secondary Data Collection

➤ TAMS Data

» Truck Activity Monitoring System

» Developed by UC Irvine Researchers

» Captures vehicle classification

» Subset of PeMS

➤ Detailed vehicle classification
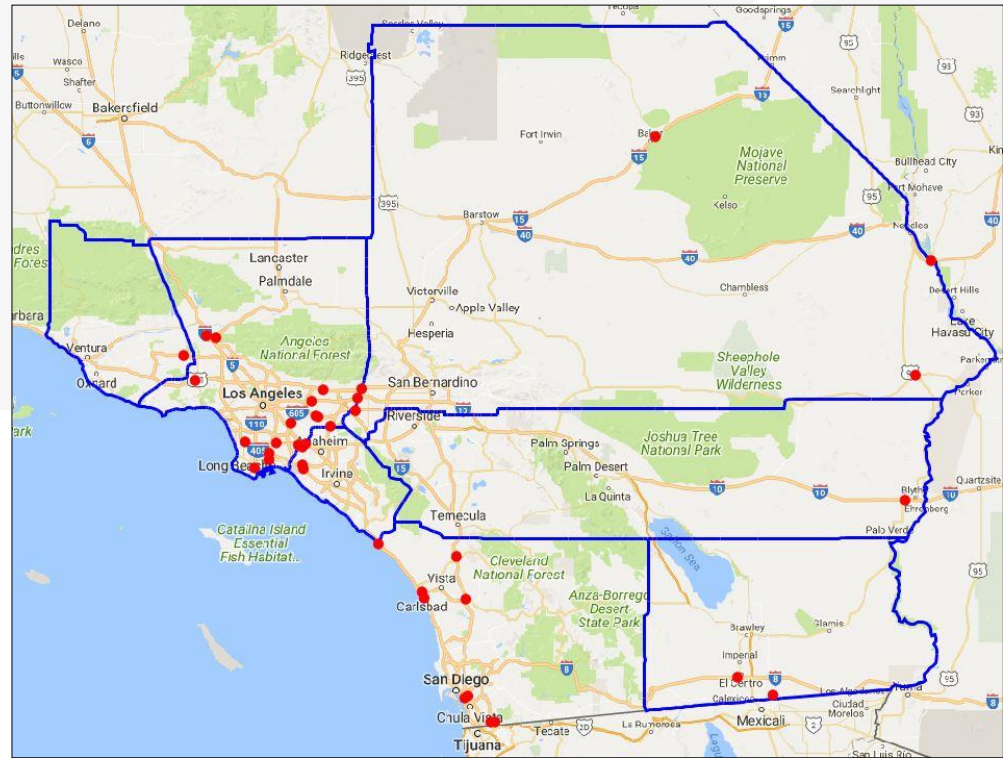
City-County Data Assimilation

➤ Imperial County Count Database

» Collected in May and early June 2017

» 15-minute increments for 13-vehicle classifications

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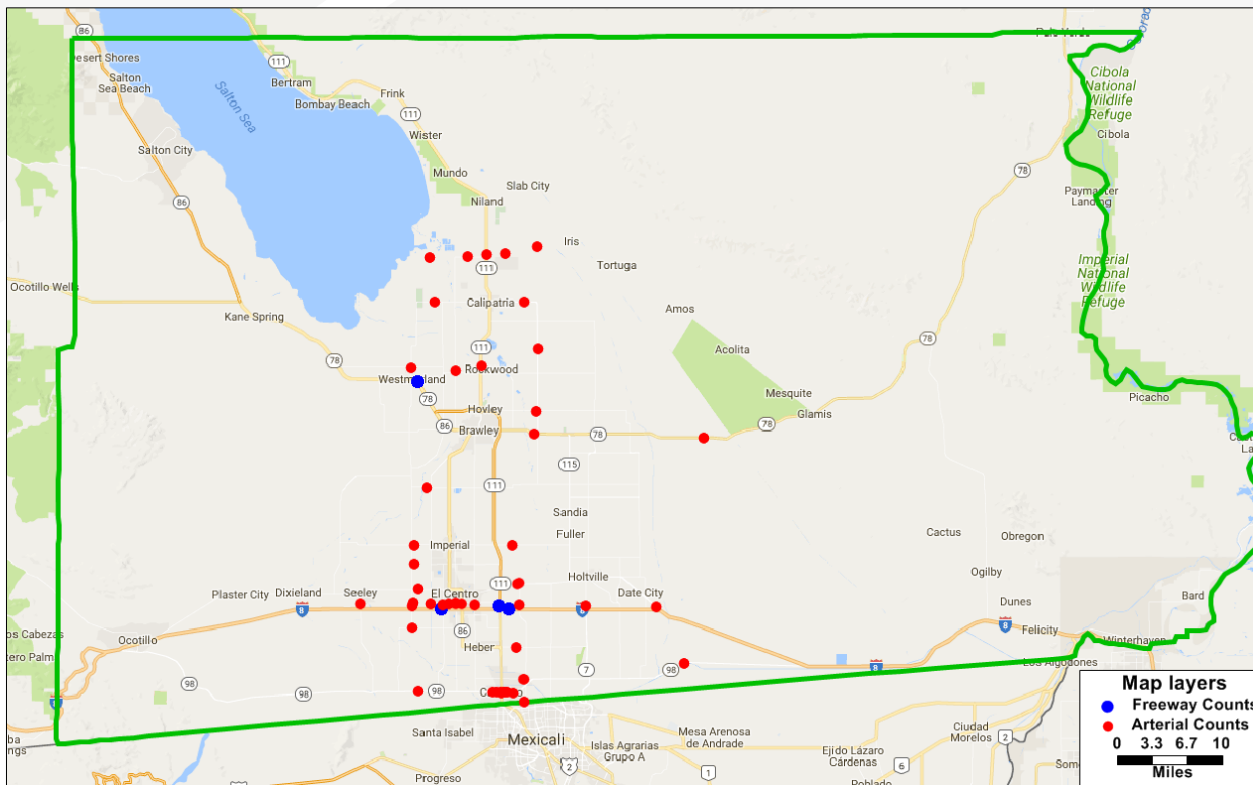
City-County Data Assimilation

➤ **LA Metro Arterial Count Database**

- » Over 600 locations in LA County
- » Conducted by LA Metro
- » With latitude and longitude info for count locations
- » Only hourly counts are available

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Data Assimilation and Data Analysis
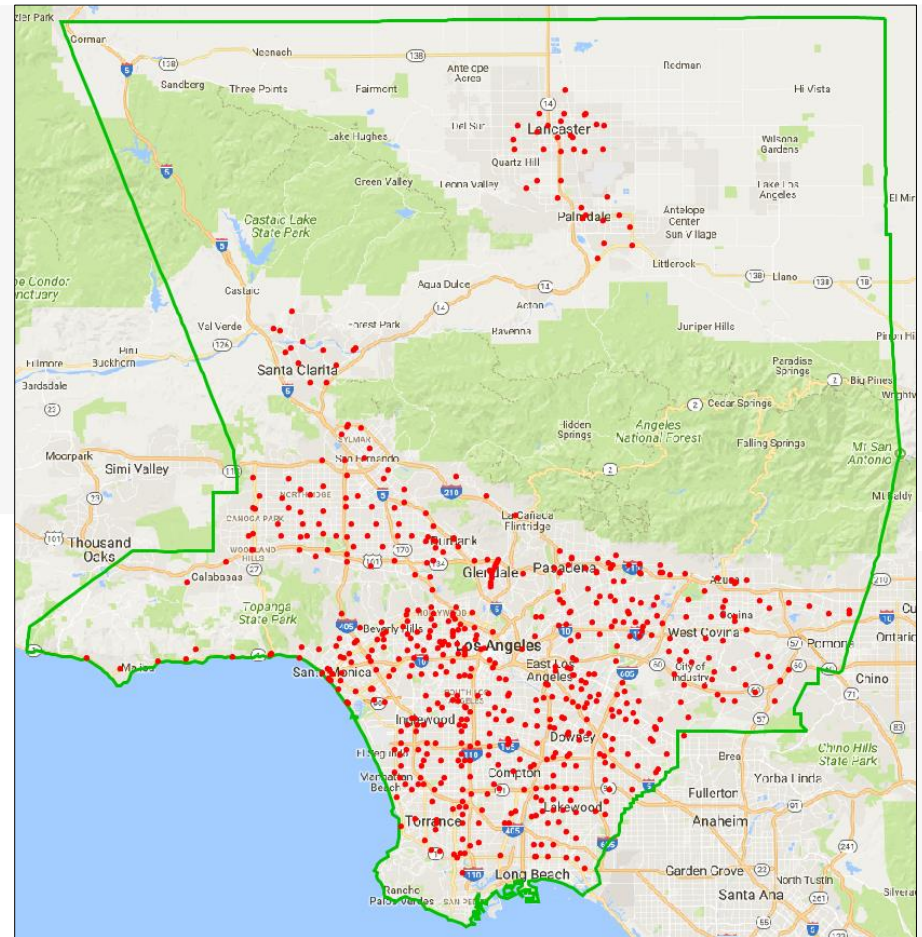
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Three sub-tasks

Data Assimilation

Data Processing

Quality control checks

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Data Assimilation

➤ Assimilate data from different sources into one database with consistent variables and formats

➤ Key features of Individual Count Databases

Data Source	Seasonality	Vehicle Classification	Time-of-Day Dimension	Essential for Model Calibration
Primary Data Collection	No	Yes	Yes	Yes
California PeMS	Yes	No	Yes	Yes
TAMS	Yes	Yes	Yes	Yes
LA Metro Arterial Count Database	No	No	Yes	No
Imperial County Traffic Database	No	Yes	Yes	No

Data Processing

- Adjust counts to account for seasonal and monthly variations

- Three rounds of adjustments were implemented:
  - » Annual Adjustment Factors
  - » Monthly Adjustment Factors
  - » Vehicle Class Distribution Disaggregation

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Database Development

Master Database

» Raw data collected from all sources:

- Primary Data Collection
- PeMS
- TAMS
- LA Metro Arterial Count Database
- and the Imperial County Traffic Database

Validation Database

» Processed counts for all screenlines:

- Daily directional counts
- Directional counts for five time periods
- Daily directional counts by four SCAG vehicle classes
- Directional counts for five time periods by four SCAG vehicle classes

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Quality Control
2012 Screenline Counts Comparison

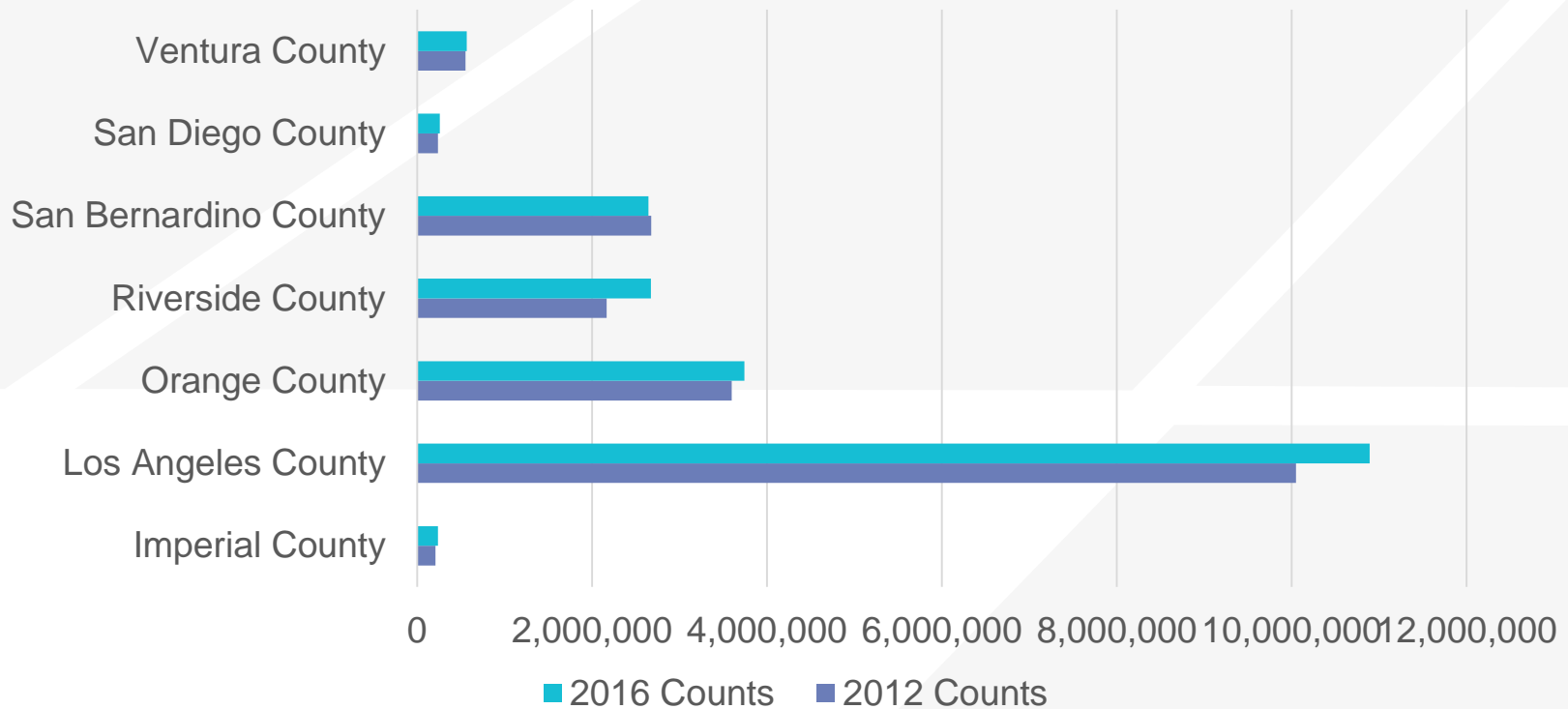**Comparison of 2012 and 2016 Screenline Counts by Screenline**
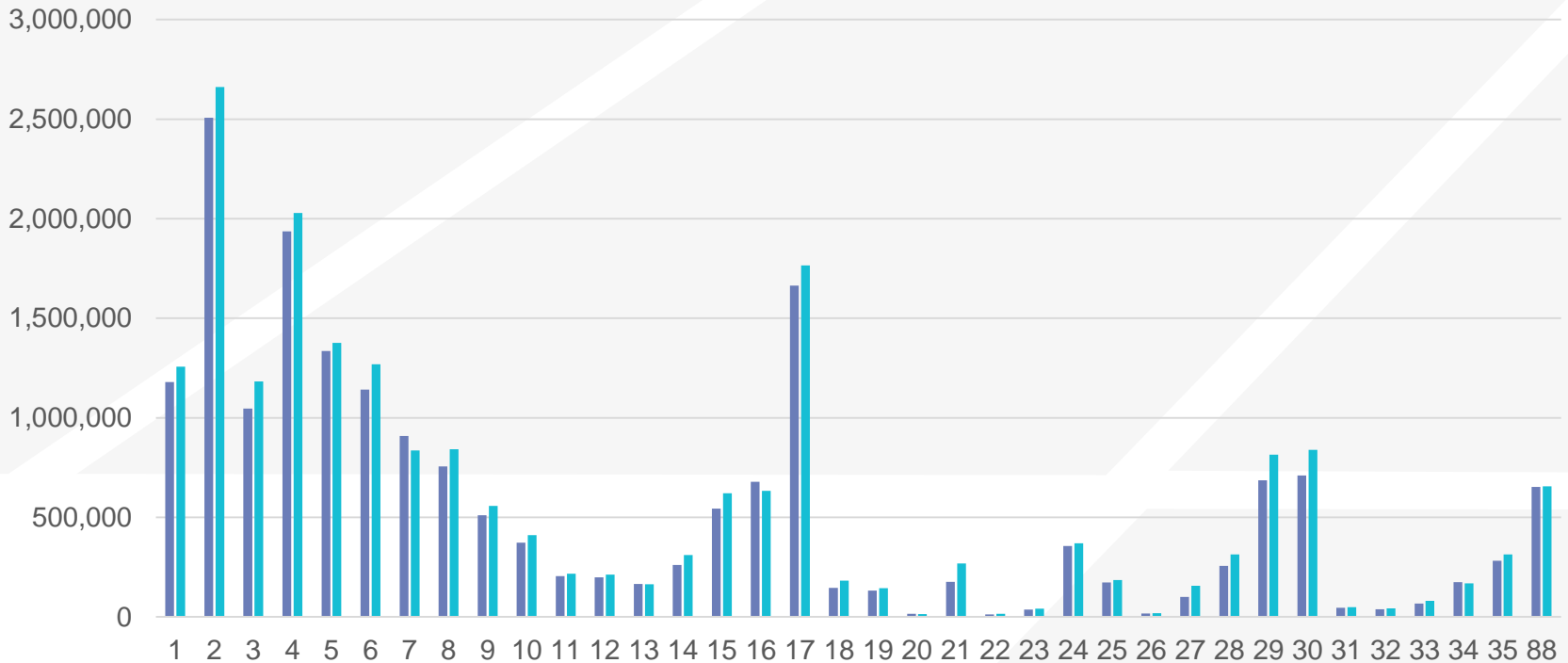
- Over all traffic increase 8% (19.5 million to 21.0 million) from 2012 to 2018
- Consistent with 7.4% employment increase, 3 percent population increase and 3.4% vehicle ownership increase (SCAG 2016 RTP model)

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Quality Control
2012 Screenline Counts Comparison

Comparison of 2012 and 2016 Screenline Counts by County

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Quality Control
Temporal Distribution

TEMPORAL DISTRIBUTION OF COUNTS BY COUNTY

Legend: AM, MD, PM, EV, NT

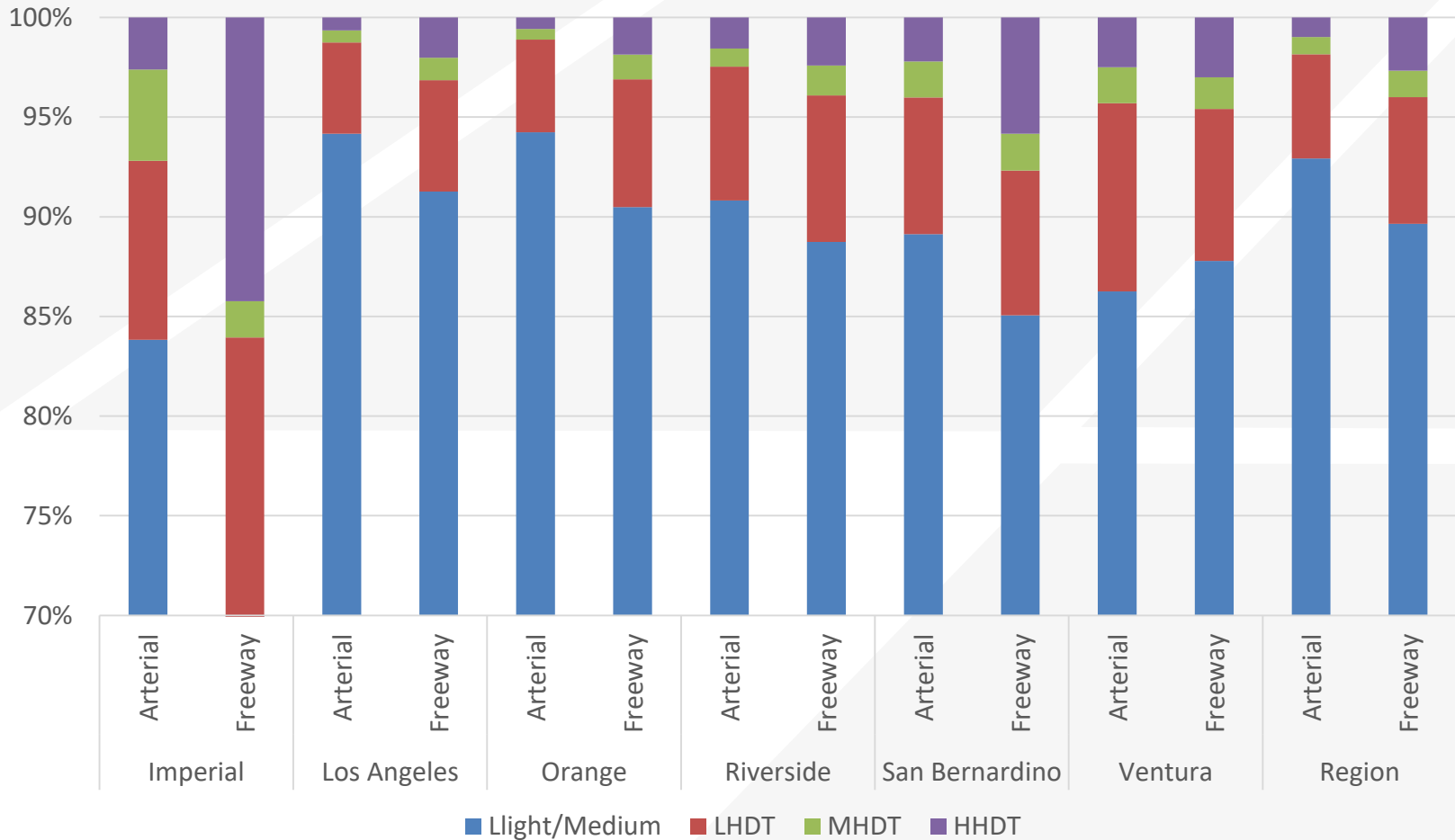| County	AM	MD	PM	EV	NT
IMPERIAL	14%	36%	25%	8%	16%
LOS ANGELES	17%	32%	25%	9%	17%
ORANGE	18%	33%	27%	9%	13%
RIVERSIDE	16%	32%	26%	8%	17%
SAN BERNARDINO	17%	33%	26%	8%	17%
VENTURA	20%	32%	29%	7%	12%
REGION	17%	32%	26%	9%	16%
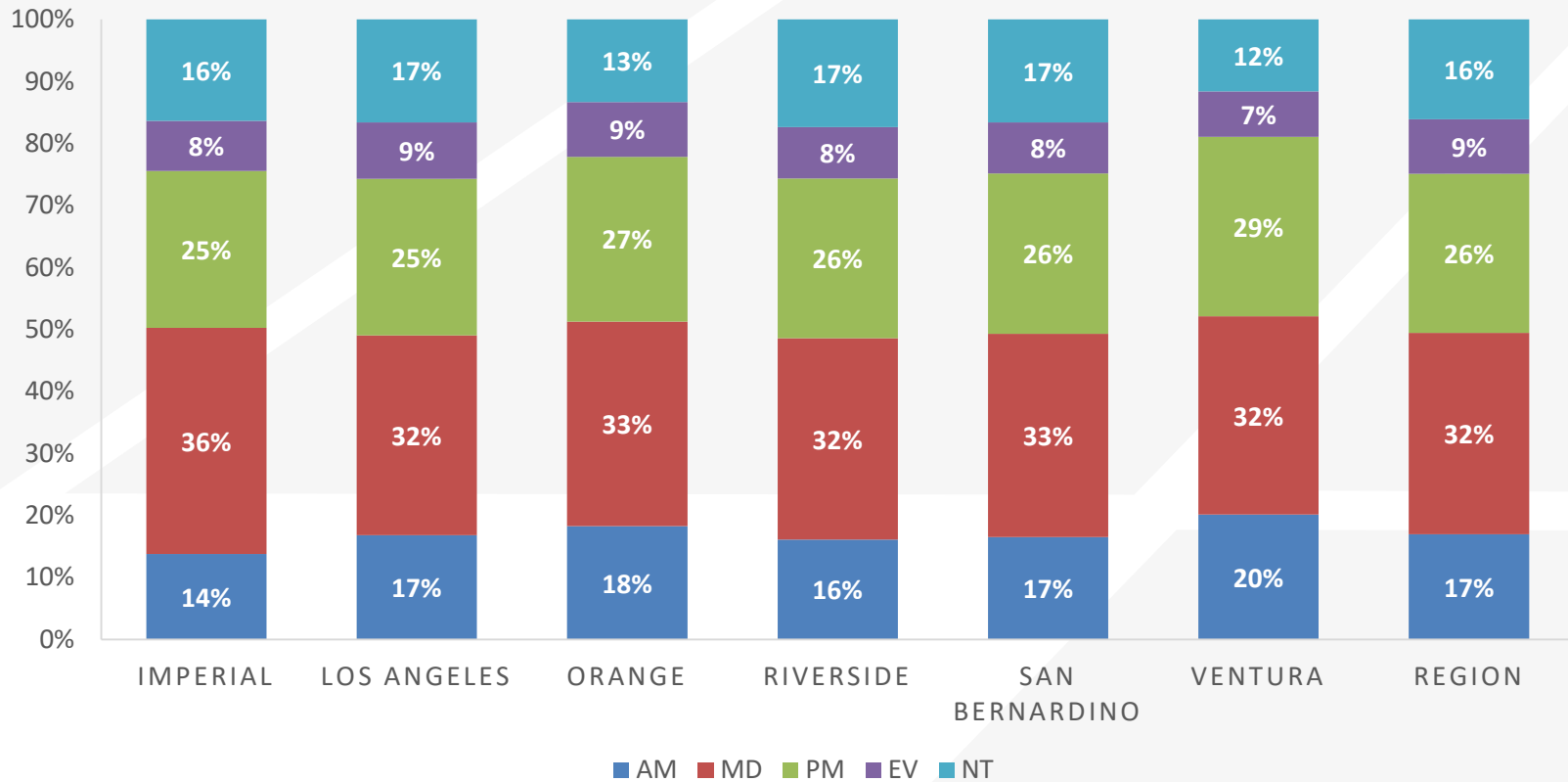
The temporal patterns were relatively consistent across all the counties and were also consistent when compared to the 2012 count database.

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Quality Control
Vehicle Classification

Vehicle Classification by County and Freeway Type

Legend: Light/Medium, LHDT, MHDT, HHDT

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CS and SCAG Team

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Thank You

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