StreetLight and SB 743

SCAG Modeling Task Force Meeting

September 23, 2020

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Agenda

1. **SB743 Background & Challenges**

2. What's Available Today

3. Methodology to Derive New Big Data SB743 Metrics

4. Validation Study

What is California Senate Bill (SB) 743?

A TRANSFORMATIONAL CHANGE TO TRANSPORTATION IMPACT ANALSYIS

- California shifting from vehicle LOS → VMT as a measure of environmental impact

- Transition to VMT is 180-degree difference in how we think about impacts. Not "to drivers" but "of driving"

- VMT is not observed like traffic counts – it can only be estimated

- This could be coming elsewhere soon
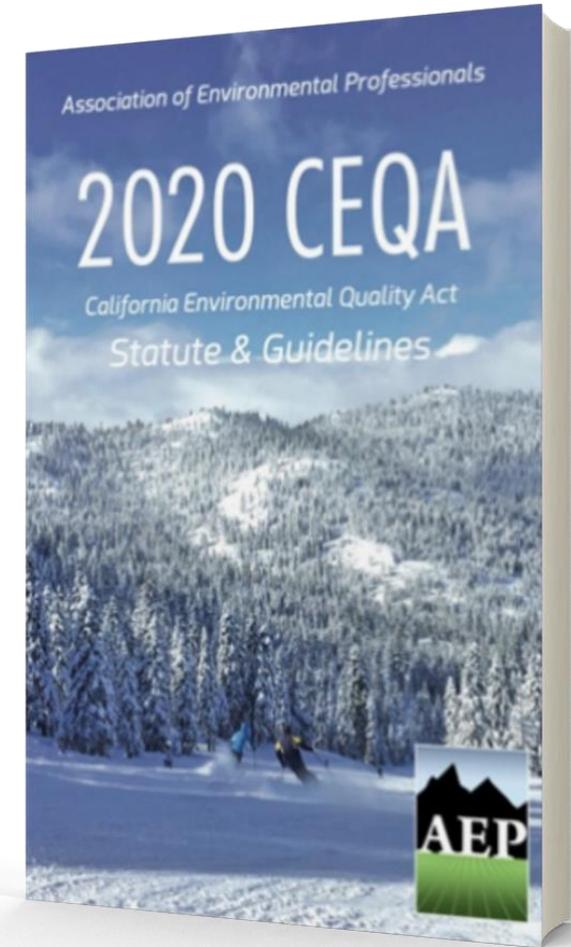
What are the challenges?

- State technical guidance focuses on VMT as an efficiency metric
  - Focuses on Automobile VMT
  - Isolates VMT for specific land uses and trip purposes
    - **Residential:** Home-based VMT per resident
    - **Office:** Home-based work VMT per employee
    - **Retail:** Total VMT

TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION IMPACTS IN CEQA

December 2018
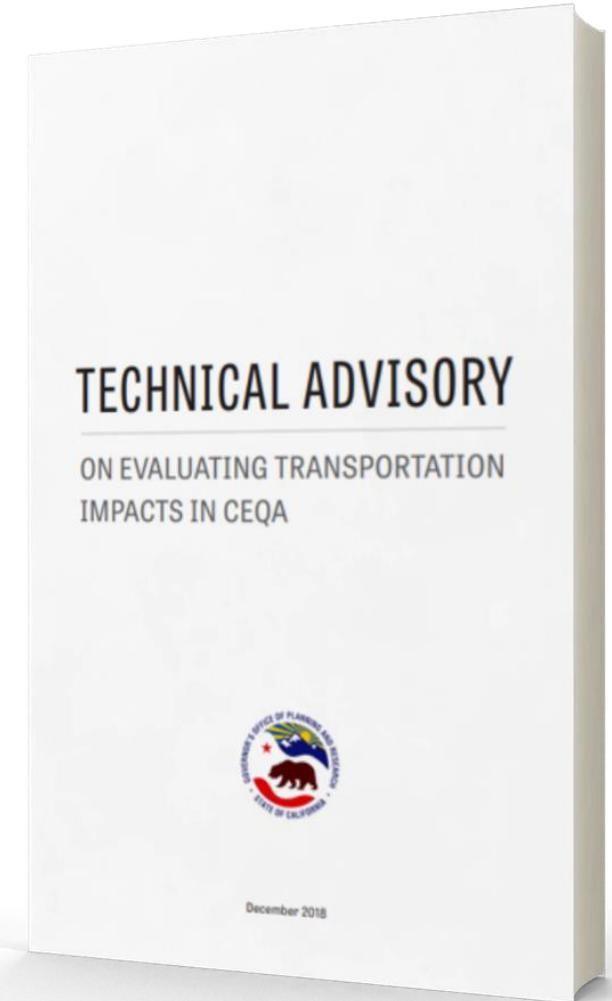
Can I always use my local travel demand model?

MODEL ESTIMATES CAN HAVE LIMITATIONS

- **Models produce 'aggregate' results for fixed time periods.**
  - CEQA requires 'Baseline' conditions, which typically require current year estimates.
  - TAZ level data may misidentify low VMT generating areas
  - Models may truncate trip lengths at their boundaries
  - Models may not produce estimates for unique land uses

- **Output gets old fast especially during disruptive times.** COVID-19 is part of it, but disruption was occurring fast even before.

- **Not using 'best in class' data can increase legal risks for CEQA compliance.**

- **StreetLight data is near real-time and can help achieve the real goals of the SB 743.**
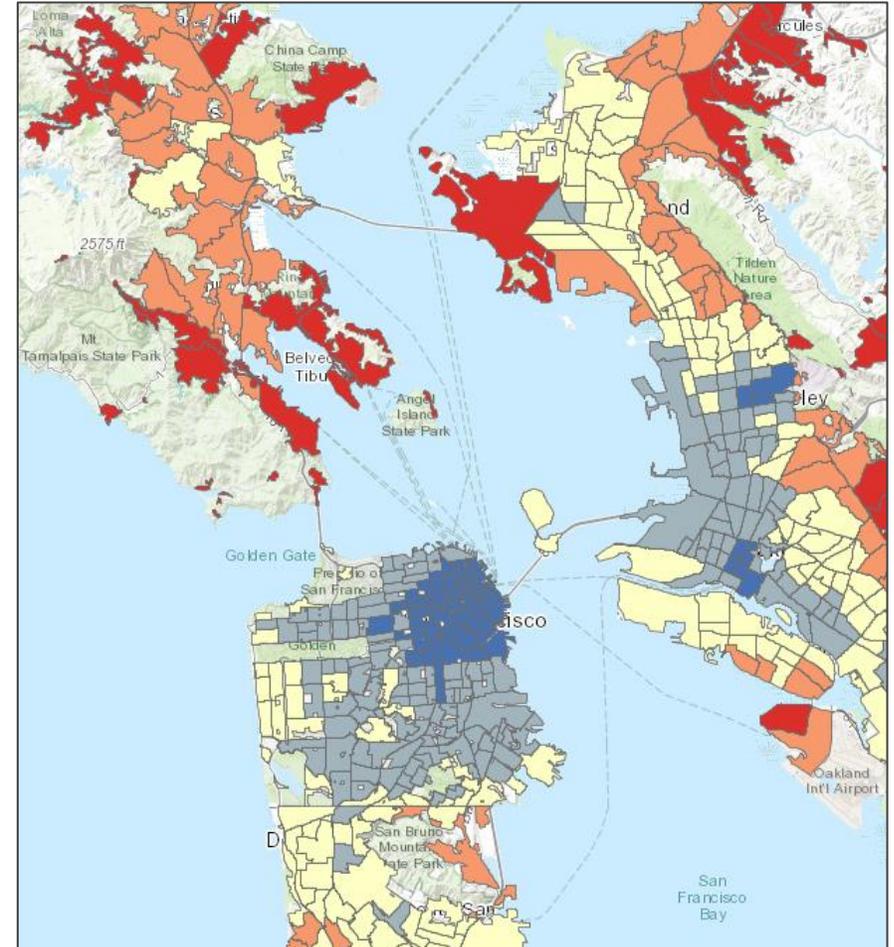
MTC 2020 ESTIMATES OF HOUSEHOLD GENERATED VMT PER RESIDENT FOR RESIDENTS THAT LIVE AND WORK IN THE MTC REGION

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We have created a special cut of our metrics for SB743

ALL METRICS FROM THE **TRIP** FRAMEWORK – WE'LL GET TO TOURS IN THE FUTURE

Resident Status / Trip Purpose	W2H	W2O	H2W	H2O	O2W	O2H	O2O
Resident	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap
Worker	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap
Visitor	NA*	Trip Vol Trip length VMT/cap	NA*	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap	Trip Vol Trip length VMT/cap

Intended Use Case #1 - Screening

HBW TRIP LENGTH – RESIDENTS VMT IMPACT SCREENING COMPARED TO COUNTY AVG

- **Screening:** streamlined review for residential and office projects located in low VMT generating areas

Legend:
- Too little data
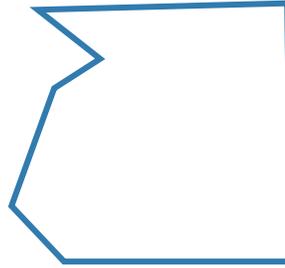- < 85% avg
- 85% to avg
- Avg to 115%
- > 115% avg
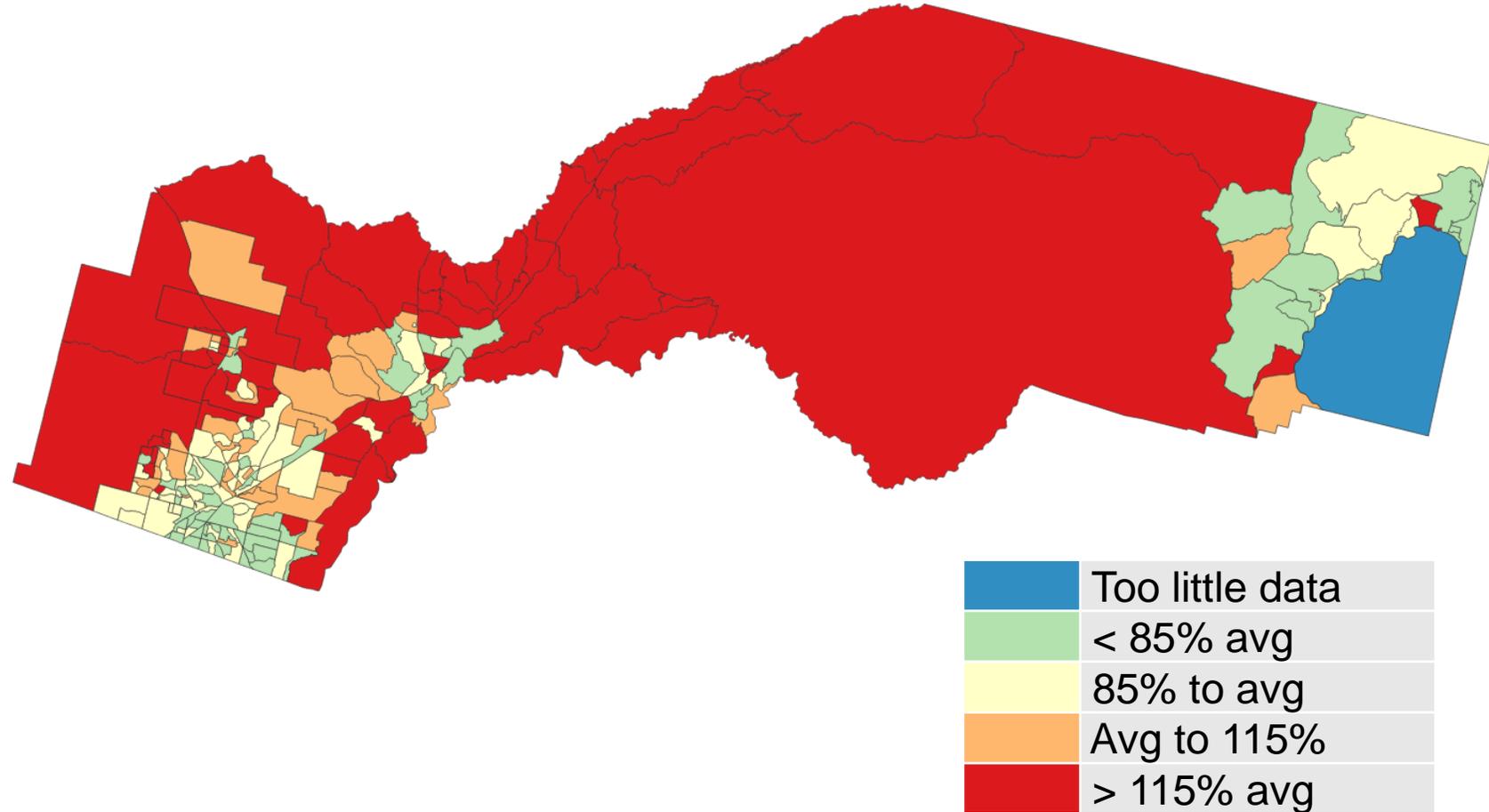
Intended Use Case #2 - Comparables

HBW TRIP LENGTH – RESIDENTS VMT IMPACT SCREENING COMPARED TO COUNTY AVG

- **Comparable sites:** trip generation, trip length, and VMT estimation for comparable sites if you want to estimate VMT generation for your own site.

Existing Local Shopping Center 1
- 12 VMT(all)/sq ft
- 16 HBW VMT/employee

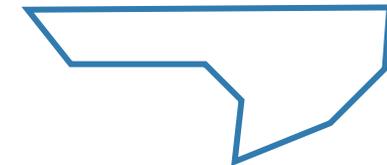Existing Local Shopping Center 2
- 15 VMT(all)/sq ft
- 19 HBW VMT/employee
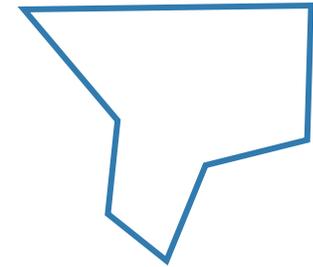
Forecast for New Shopping Center
- 13.5 VMT(all)/sq ft
- 15.3 HBW VMT/employee
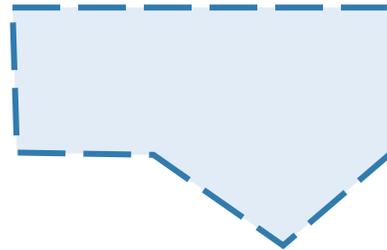
Existing Local Shopping Center 3
- 12 VMT(all)/sq ft
- 11 HBW VMT/employee

There are many more use cases – we want to hear from you…

Summary: What's available today?

OPTION 1

Metrics by blockgroup for a city, county or MPO

Screening for VMT thresholds

Choose avg 2019 weekday/weekend or monthly updates

Metrics are delivered as shapefiles + CSV

OPTION 2

Metrics for a few blockgroups

Establishing VMT gen for comparable locations

Choose avg 2019 weekday/weekend or monthly updates

Metrics are delivered as shapefiles + CSV

OPTION 3

Custom metrics

We're sure there's more. Different geographies, trip purposes, etc. What do you need?

Metrics are delivered as shapefiles + CSV

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Method step 1: who is a "resident" and "employee"?

- **Resident:** is the device's predominant nighttime location for this month in this blockgroup*?

- **Employee:** is this device's predominant daytime location a) different from nighttime and b) in this blockgroup?
    - This will undercount some workers: nightshifts, WFH, or 'moving' jobs (Uber driver, postal worker, plumber)

*Metrics for different geographies will adjust. IE – for TAZ we will look if the location is within the TAZ.

Method step 2: how to infer trip purpose

- **Home trip***: Does the trip start or end near** the device's home?

- **Work trip**: Does the trip start or end near the device's workplace?

- **Other** – every other trip
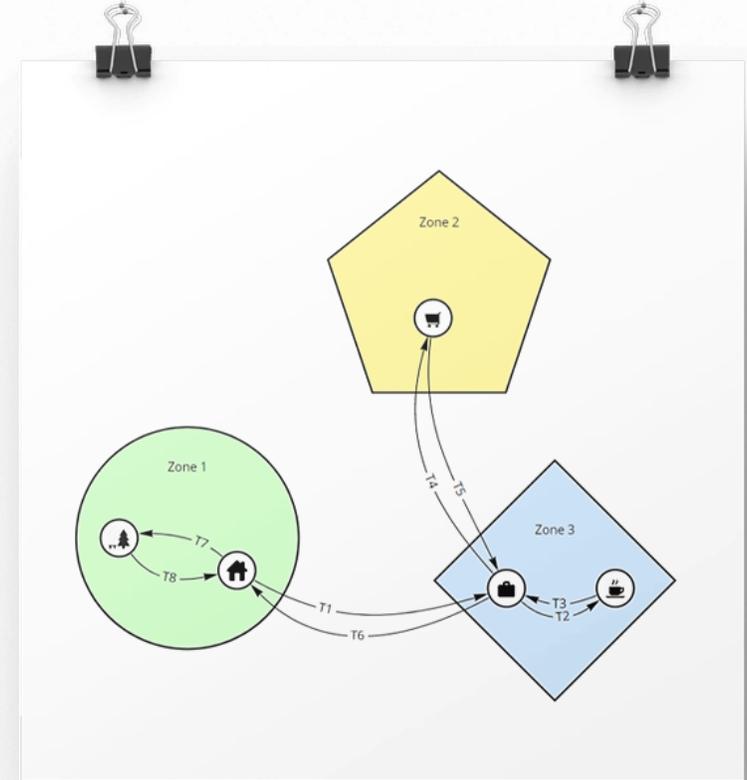
*NB Roundtrips were dropped, some special considerations for devices that "live" or "work" on the border of a blockgroup.

**"Near" varies from 100-500M depending on ping cadence
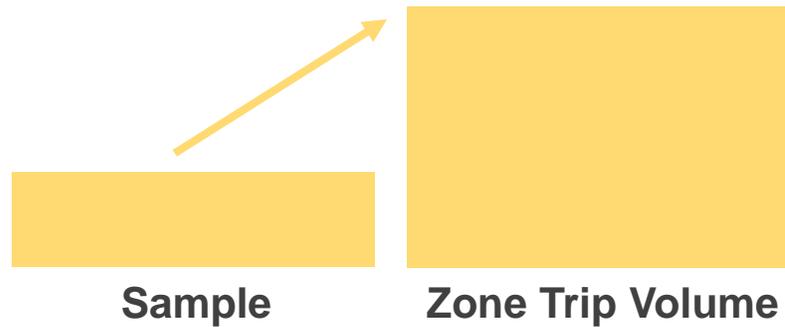
Method step 3: how to infer trip length

1 Drop trips <500m or <3min

2 Drop "hairball" trips (i.e. forklift drivers moving around a warehouse)

3 Lock to route (see image)
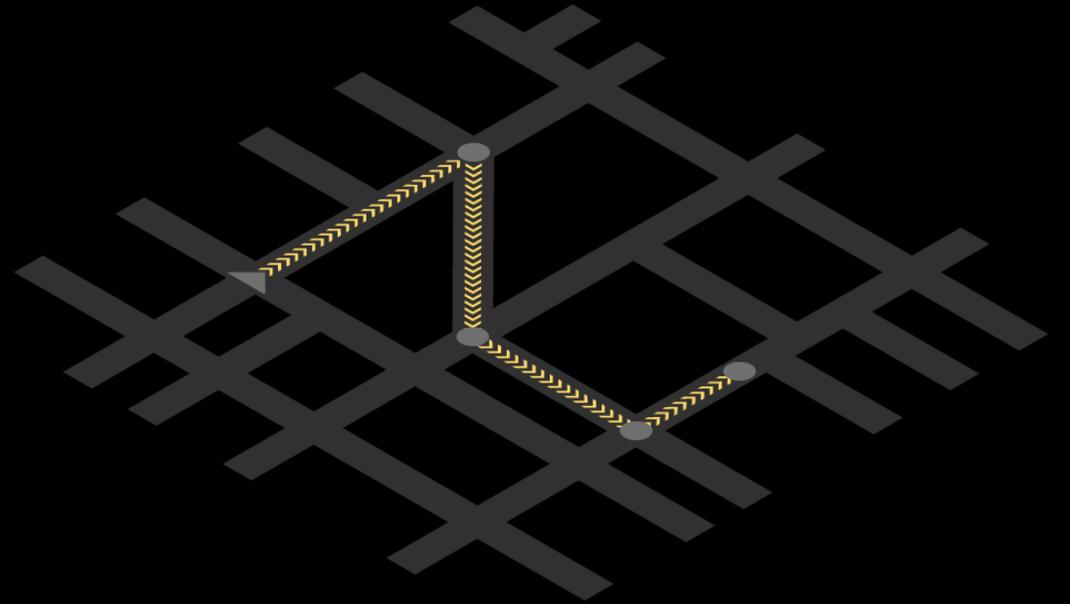
Method step 4: how to scale up to volume and VMT/capita
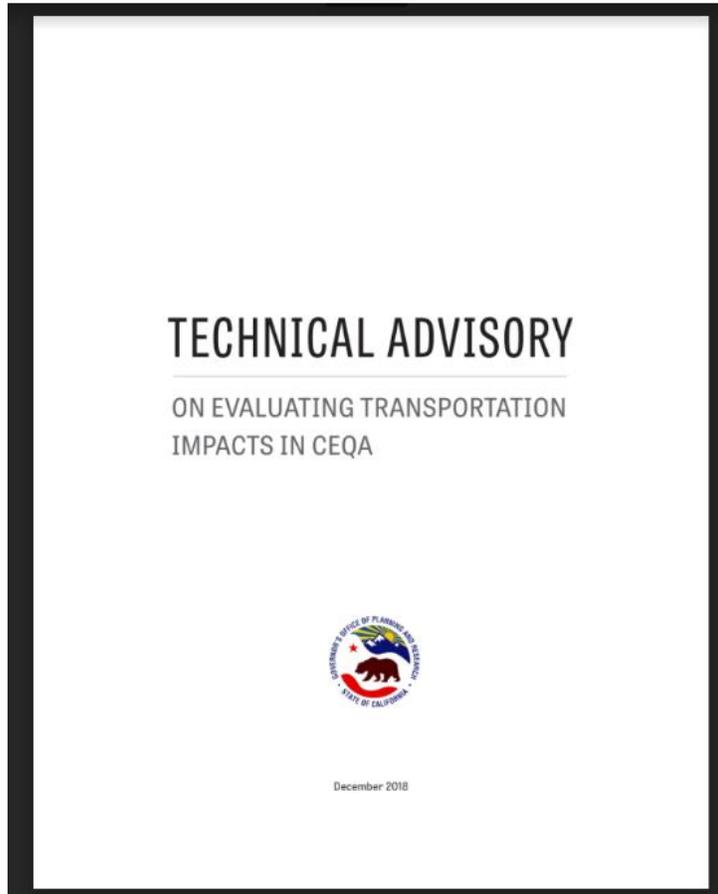
Vehicle Miles Traveled =

Trip Length x Volume

Sample

Zone Trip Volume

÷ Capita

Residents from US Census

Workers from LEHD

Our approach has more local nuance than modeled approaches

TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION
IMPACTS IN CEQA

December 2018
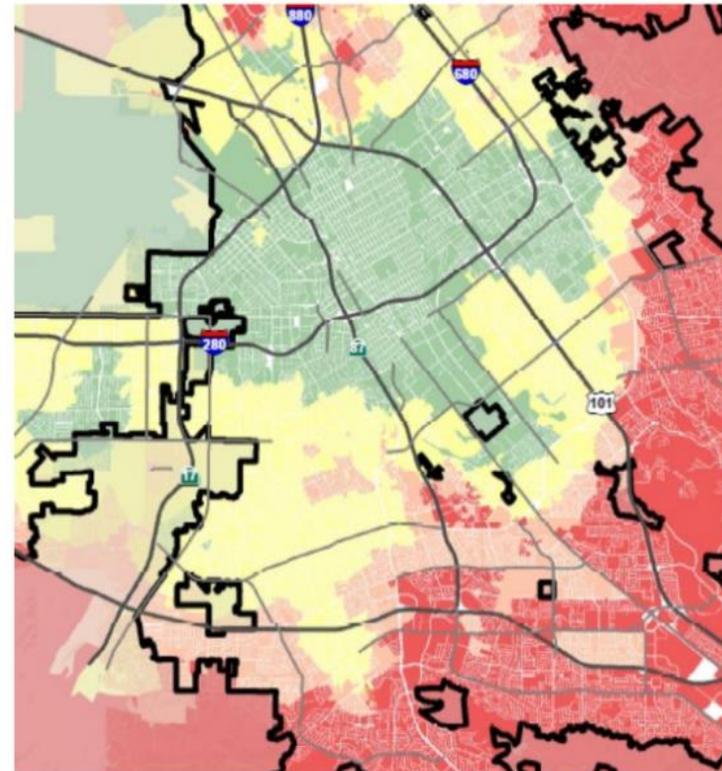
Figure 2. Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)
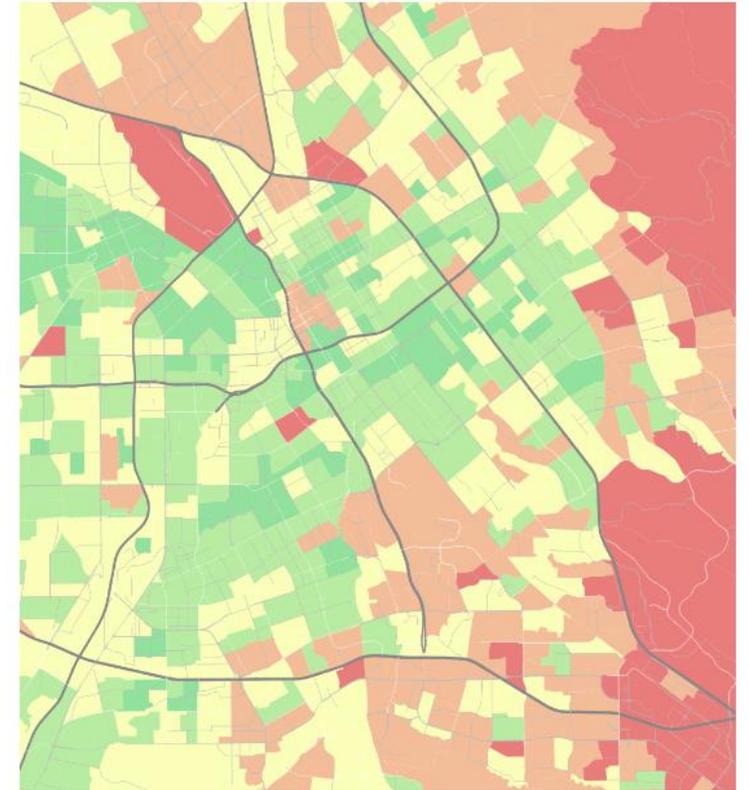
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Comparison to SACOG 2018 expanded survey

RECENT, RIGOROUS SURVEY METHODOLOGY

SACOG Survey	StreetLight Metric
2018 (7 days from respondent across two calendar months)	2019 (365 days)
App assisted survey GPS assist to normalize, expand	Big data fused with contextual data to normalize, expand
Known bias – oversampling of "towns" within Placer to get transit sample up	Known bias – under-sampling of very elderly
Time to complete: ~7 months	Time to complete: <1 day

Trip Sample Size Comparison

16222583

146000

Trips

■ SACOG 2018 Survey   ■ StreetLight 2019 SACOG Run
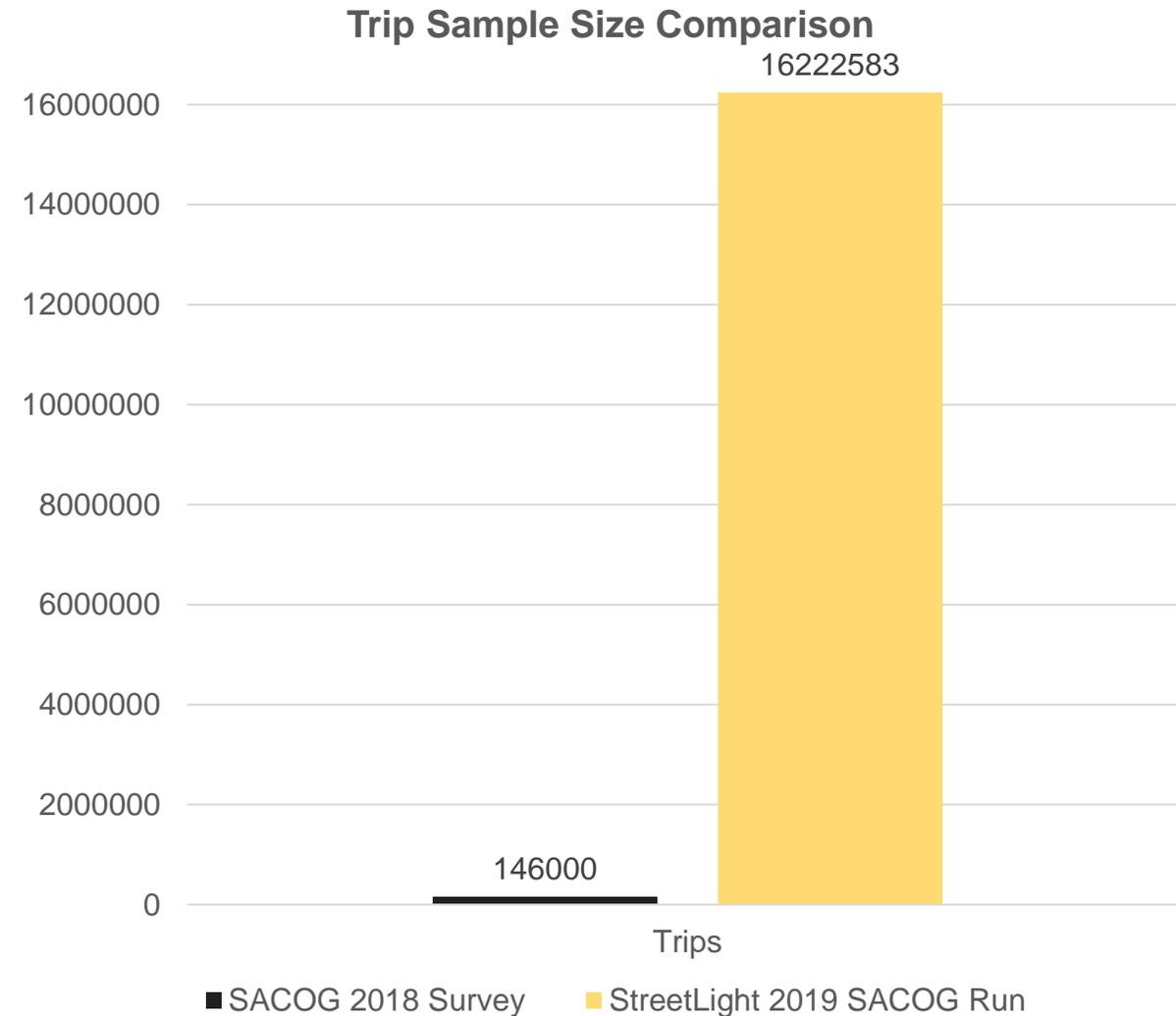
Trip volume by trip purpose x residential class for residents

Daily Trip Volume Comparison – Placer County

■ SACOG 2018 Survey ■ Streetlight 2019 Summarized Block Group Study
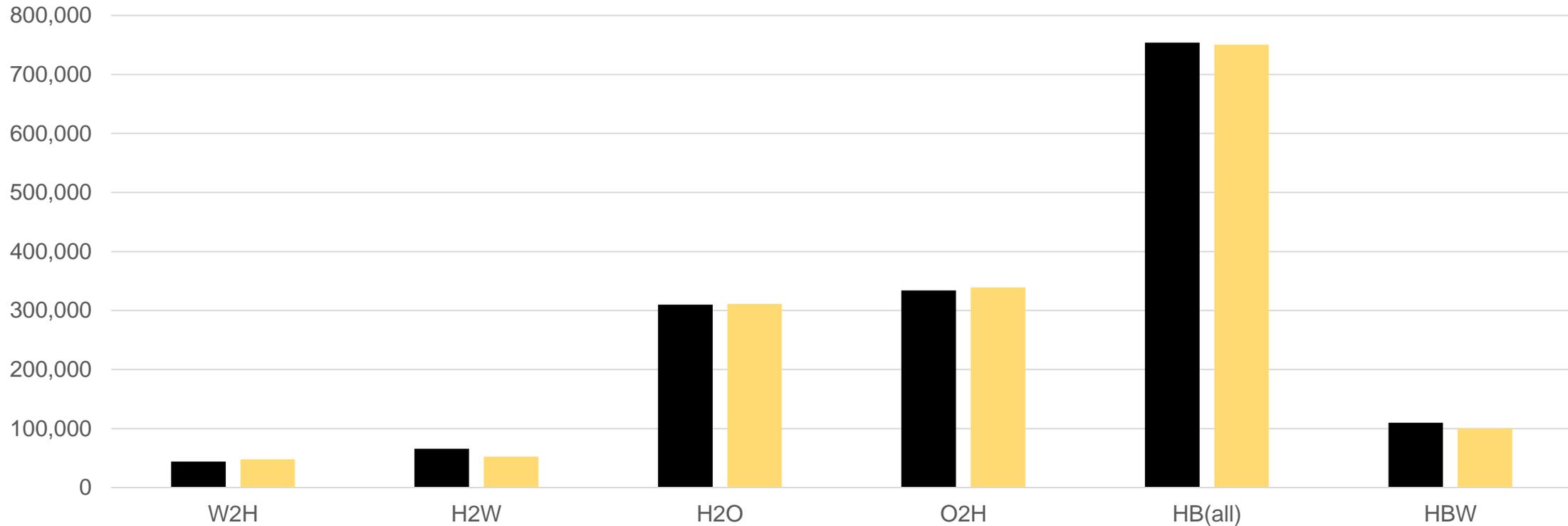
Trip length by trip purpose for residents

- H2W and W2H length match very closely
- StreetLight has longer average trip lengths for any purpose including "Other"
- This is an expected result because
  - Exclusion of Tahoe Basin
  - Under sampling of outlying parts of town and large/busy households
  - Limited sample days
  - Potential difference in trip breaking (gas stop)
  - No elimination of 500m Trips

Trip Length Comparison – Placer County
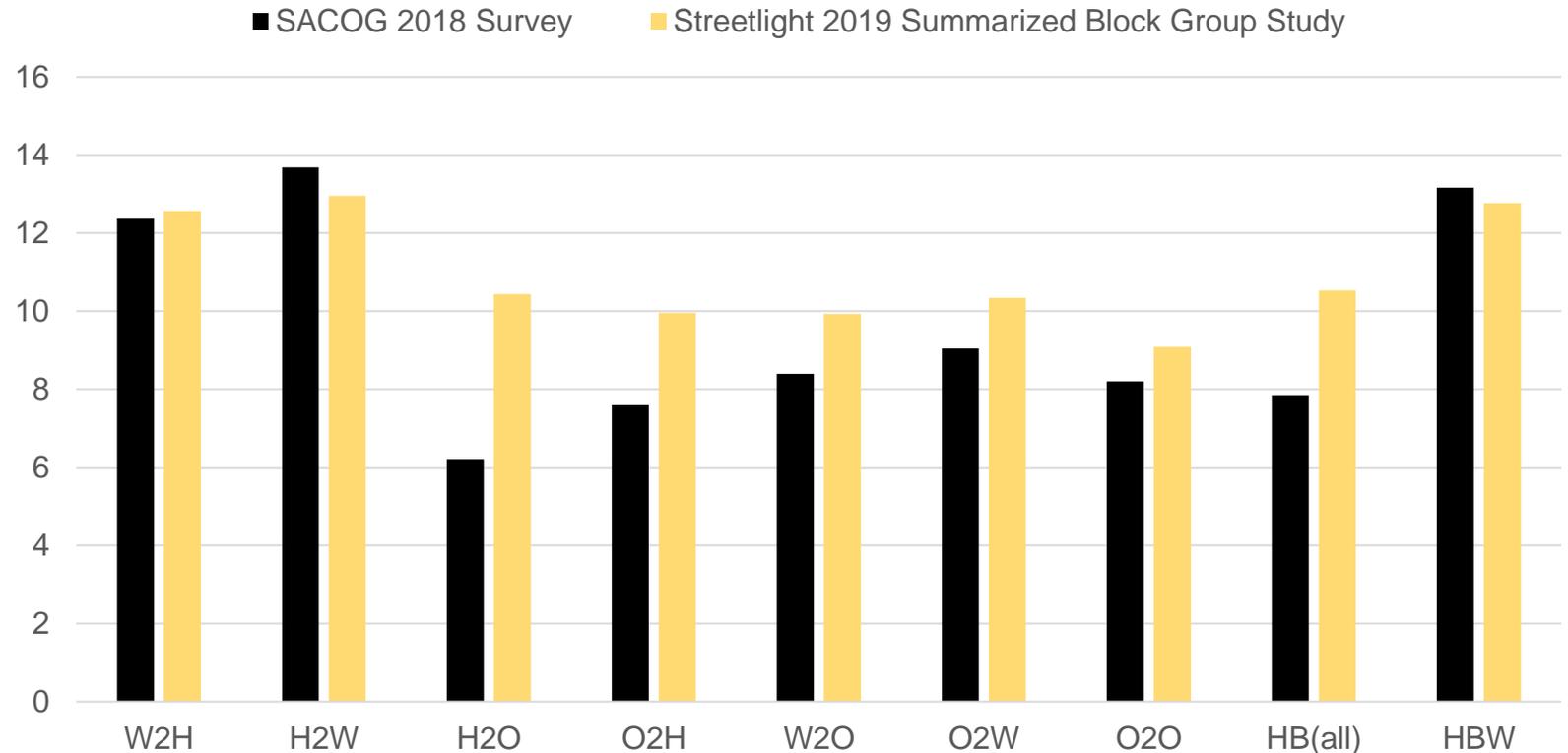
■ SACOG 2018 Survey   ■ Streetlight 2019 Summarized Block Group Study

Deep dive: Placer County case study

Materials and validation study from Fehr & Peers

REASONABLENESS CHECKING AGAINST AN ACTIVITY BASED MODEL (ABM)

Household VMT per Resident

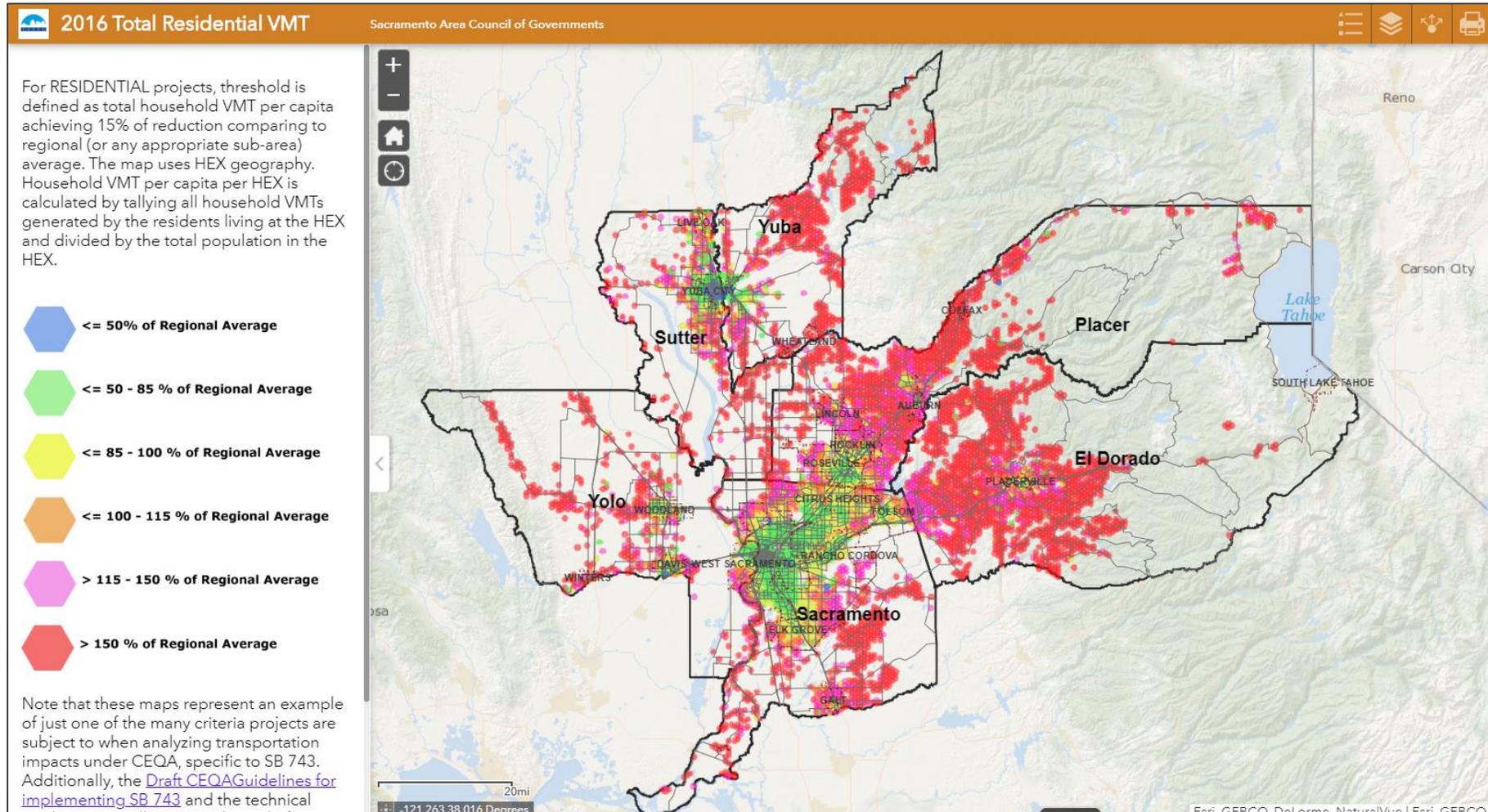| StreetLight and SACSIM VMT per Resident Comparison			
Jurisdiction	SACSIM 2016*	SACSIM 2016**	StreetLight 2019
Auburn	13.97	21.63	20.52
Lincoln	17.49	22.58	19.63
Rocklin	12.78	17.77	18.92
Roseville	12.13	17.18	16.75
Placer County	15.71	21.29	21.47

Home-Based VMT per Resident

*Excludes internal-external (IX) and external-internal (XI) trips and trip lengths outside model boundary.

** Total VMT per resident – Includes non-home-based trips plus internal-external (IX) and external-internal (XI) trips. Excludes trip length outside model boundary.

Deep dive: Placer County Case Study
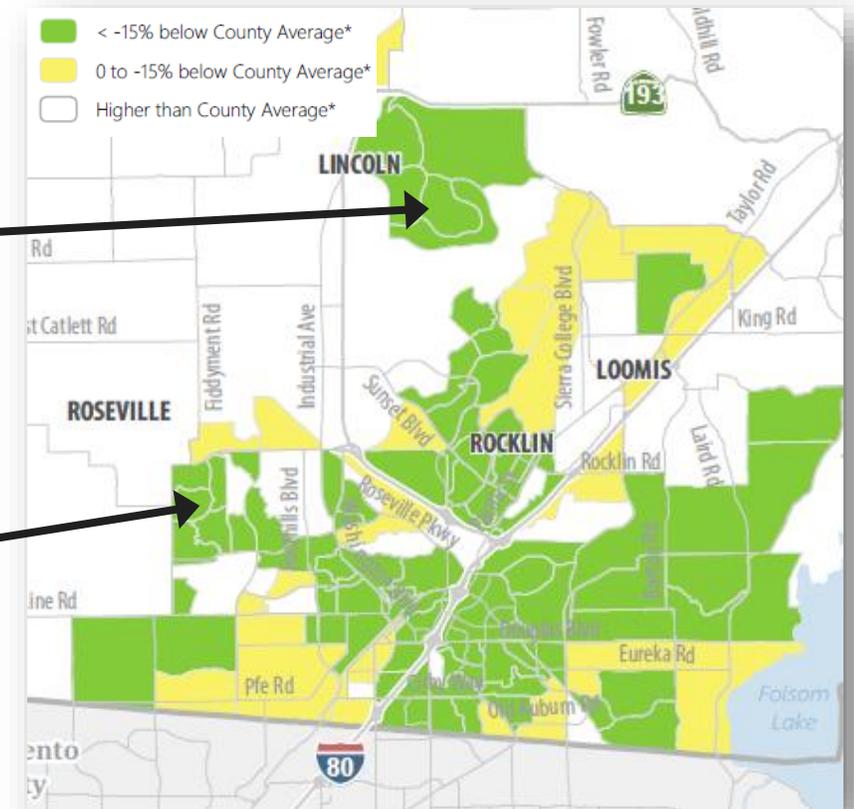
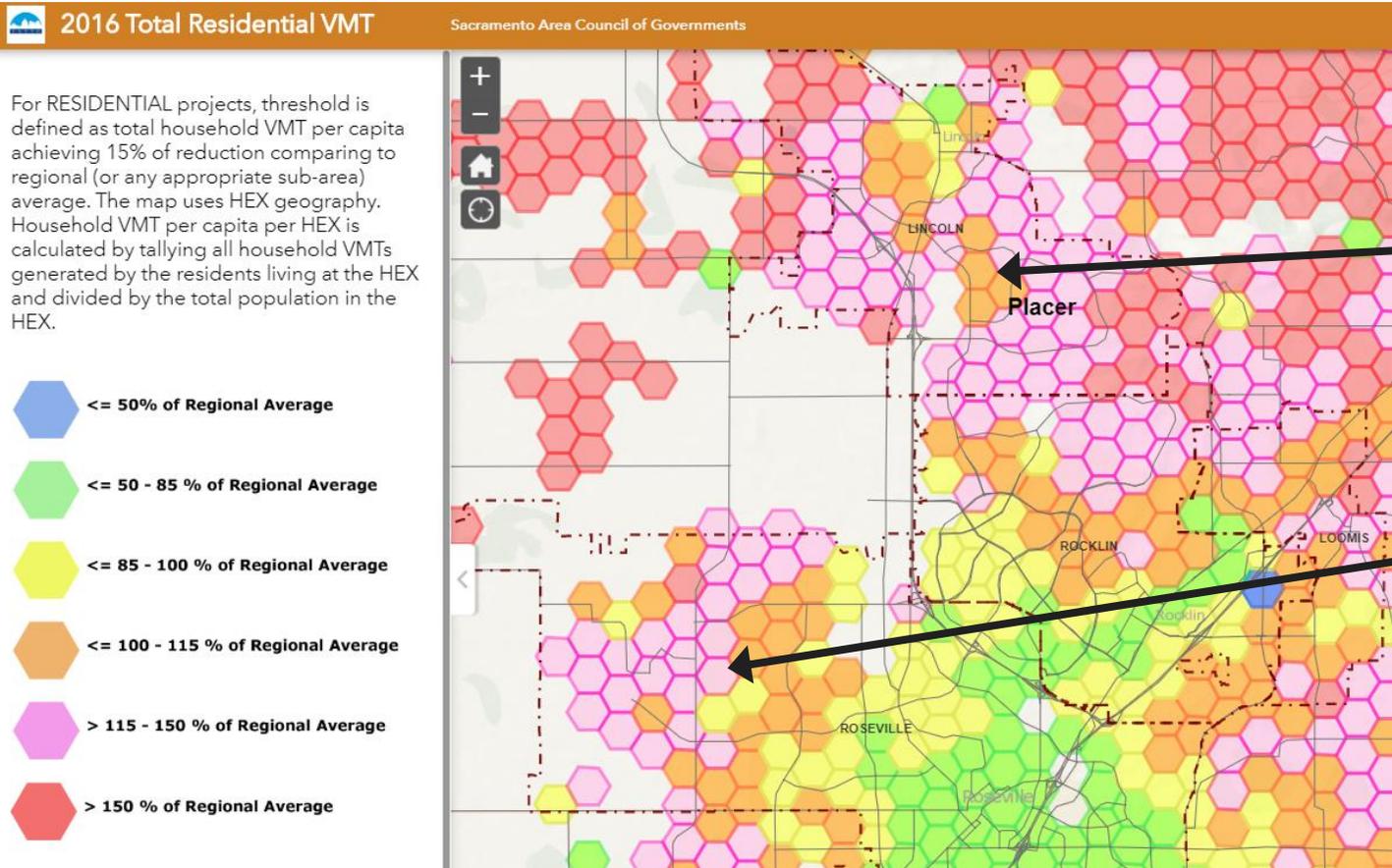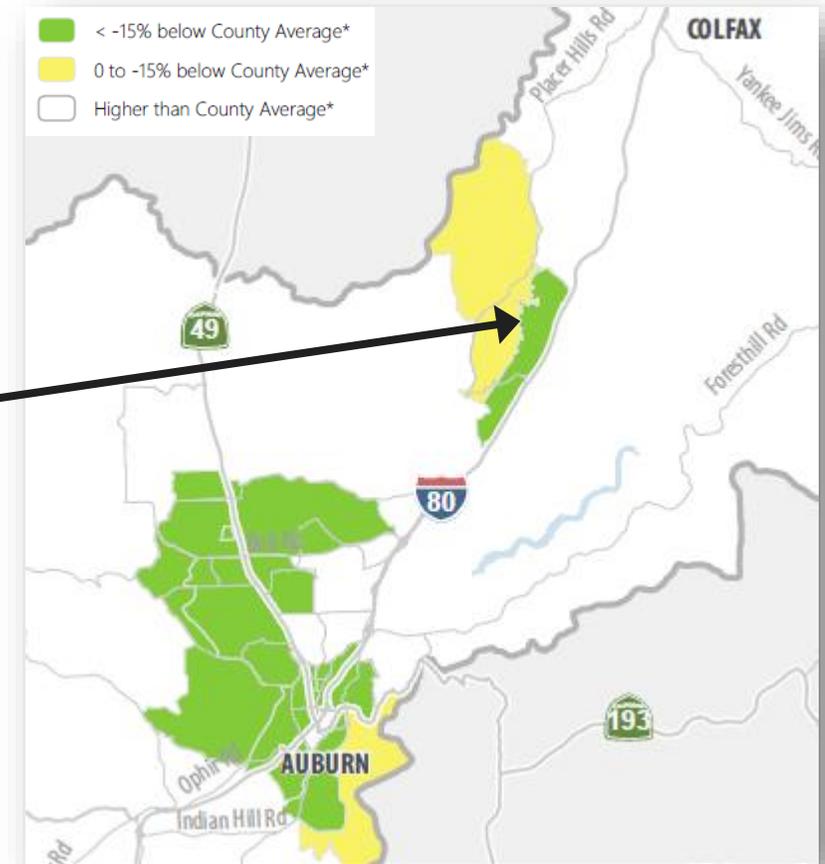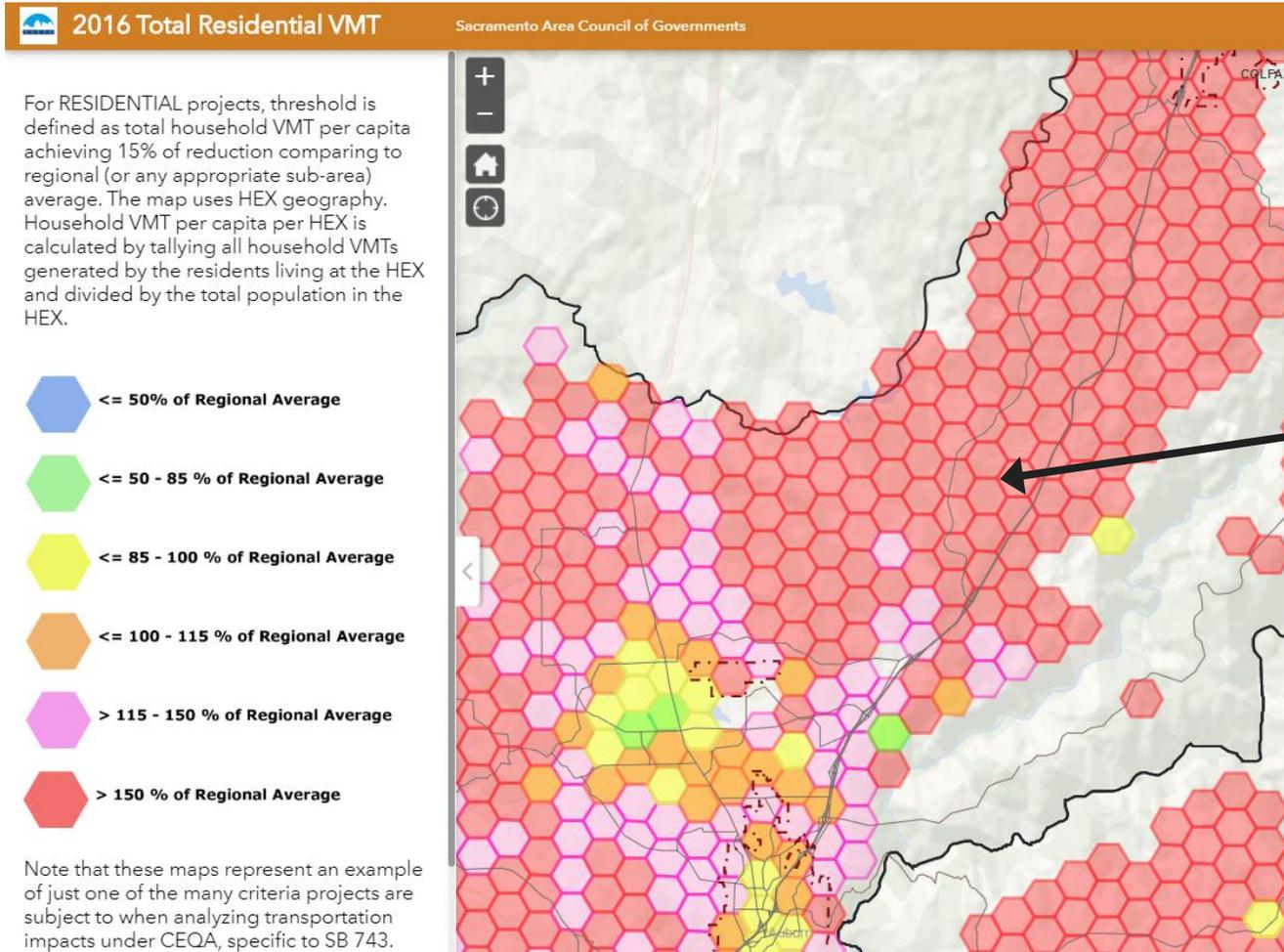Materials and validation study from Fehr & Peers

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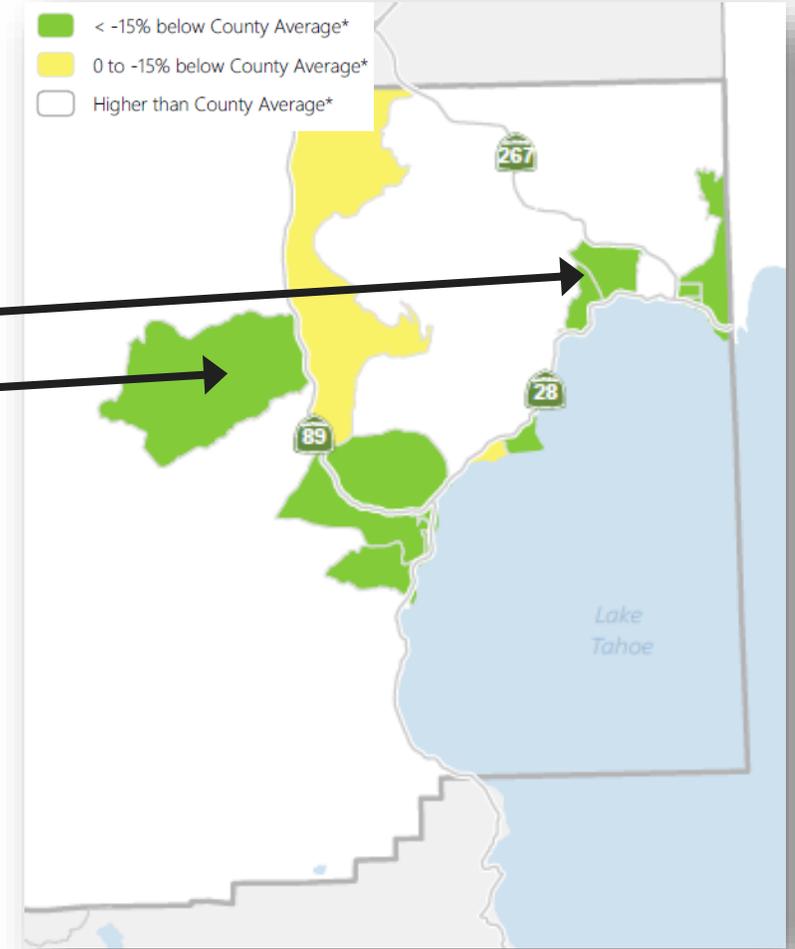
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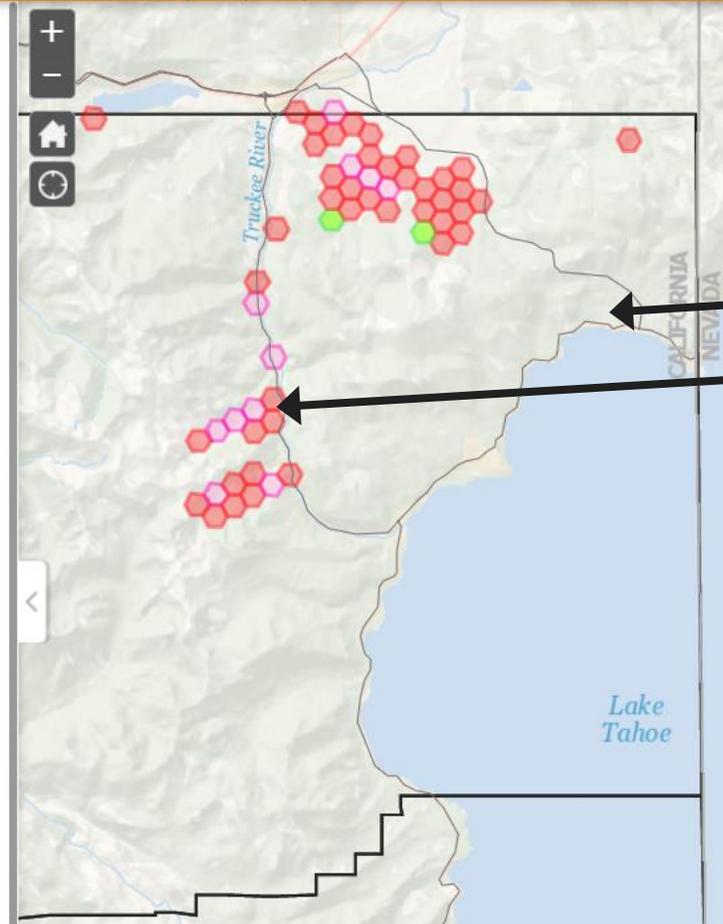
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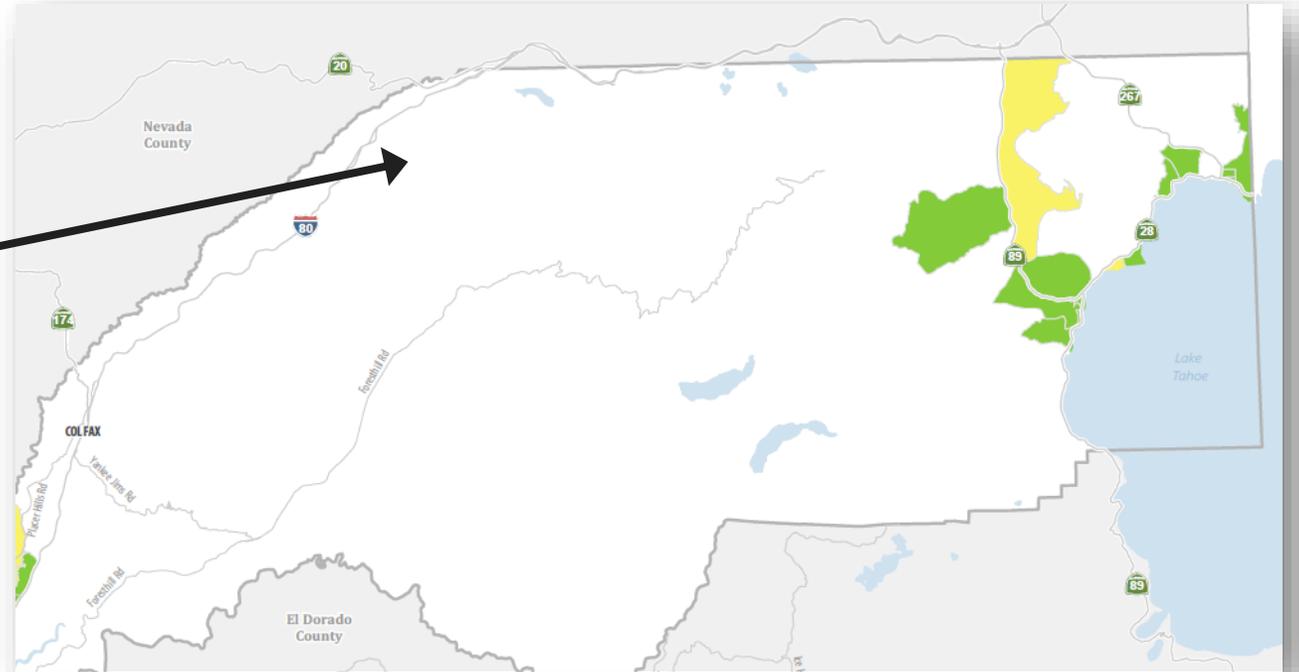REASONABLENESS CHECKING AGAINST AN ACTIVITY BASED MODEL (ABM)

Deep Dive: Placer County Case Study

Materials and validation study from Fehr & Peers

REASONABLENESS CHECKING AGAINST AN ACTIVITY BASED MODEL (ABM)

"BlockGroup ID"	"Day Type"	"Total Sample Count"	"Total Daily Volume"	ACS Population/ block group	Resident VMT/Capita (ACS)
60610220131	1: Weekdays	24,475	7,075	523	105.41
60610202003	1: Weekdays	5,422	6,973	367	102.66
60610211031	1: Weekdays	277,096	44,041	808	52.11
60610220141	1: Weekdays	27,802	8,314	172	49.66
60610202004	1: Weekdays	19,116	4,930	319	49.05
60610220132	1: Weekdays	19,104	4,276	821	46.75
60610213221	1: Weekdays	18,337	3,510	424	45.94
60610220133	1: Weekdays	20,482	5,675	1,053	43.23
60610213044	1: Weekdays	43,641	7,729	1,364	42.51

STREET**LIGHT**
DATA