
SACSIM Annual User Conference: Session 4

Work Smarter Not Harder

- Pete Atwood: Open Data Portal
- Tina Glover: Data Information Center
- Kyle Shipley: MTP Modeling Data
- Darren Conly: Additional Data and Tools
- Q & A 1
- Shengyi Gao: Replica: Insights for Transportation Planning
- Q & A 2

SACOG Open Data Portal

<https://data-sacog.opendata.arcgis.com/>



March 10, 2021

Pete Atwood, GIS Research Analyst

patwood@sacog.org



Open Data Portal based on ESRI technology

- Data Resources
 - SACOG data (search, browse by tag)
 - Federated data sources (search by agency)
 - Download or reference
- SACOG Project Sites and Web Apps

What's Next?

- SACOG is adding additional data and resources
- Contact Info
 - data@sacog.org
- Questions?

SACOG Info Center

Tina Glover

SACOG Travel Model Users Conference
March 2021



SACOG Info Center



Regional Census State Data Center (SDC) / Census Bureau activities



2020 Census updates



Expertise in more than Census datasets



Data Requests

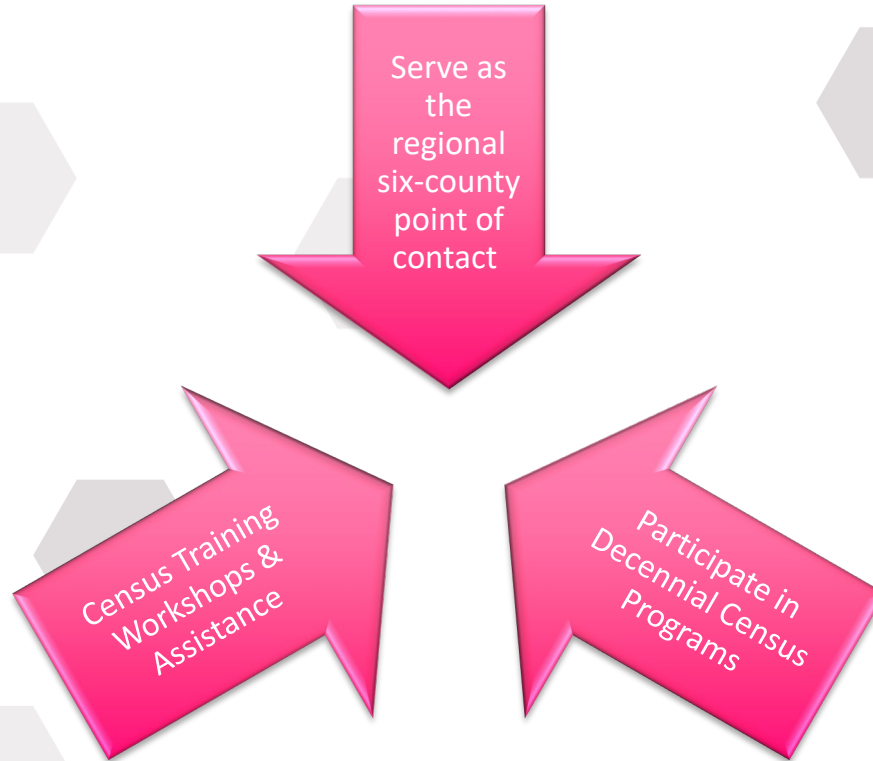


Regional Progress Report (2014, 2017, 2021)



Resources for questions we can't answer

Census Bureau Activities



2020 Census Release Updates

Apportionment -
April 30, 2021

Redistricting block
files -
September 30, 2021

Final 2020 Census
geographic boundaries
(no data) released
January 25, 2021

Expertise in More than Census Datasets

- CA Dept. of Finance, Demographic Research Unit (DOF/DRU)
- State & Federal Employment Data
- Local, State & Federal health metrics, vital statistics, etc.

Data Requests & Special Projects

- Fill between 100-150+ requests per year
- Service is available to all
- SACOG member jurisdictions and consultants working with member jurisdictions
- Special Projects

Data Request Examples

SACOG
MTP/SCS static
projections

Population and
Housing
estimates

Census ACS
variables

Labor market
statistics

Homelessness
data

Special Project Examples



HOUSING ELEMENT
DATA



AFFORDABLE
HOUSING



REGIONAL
PROGRESS REPORT

Regional Progress Report

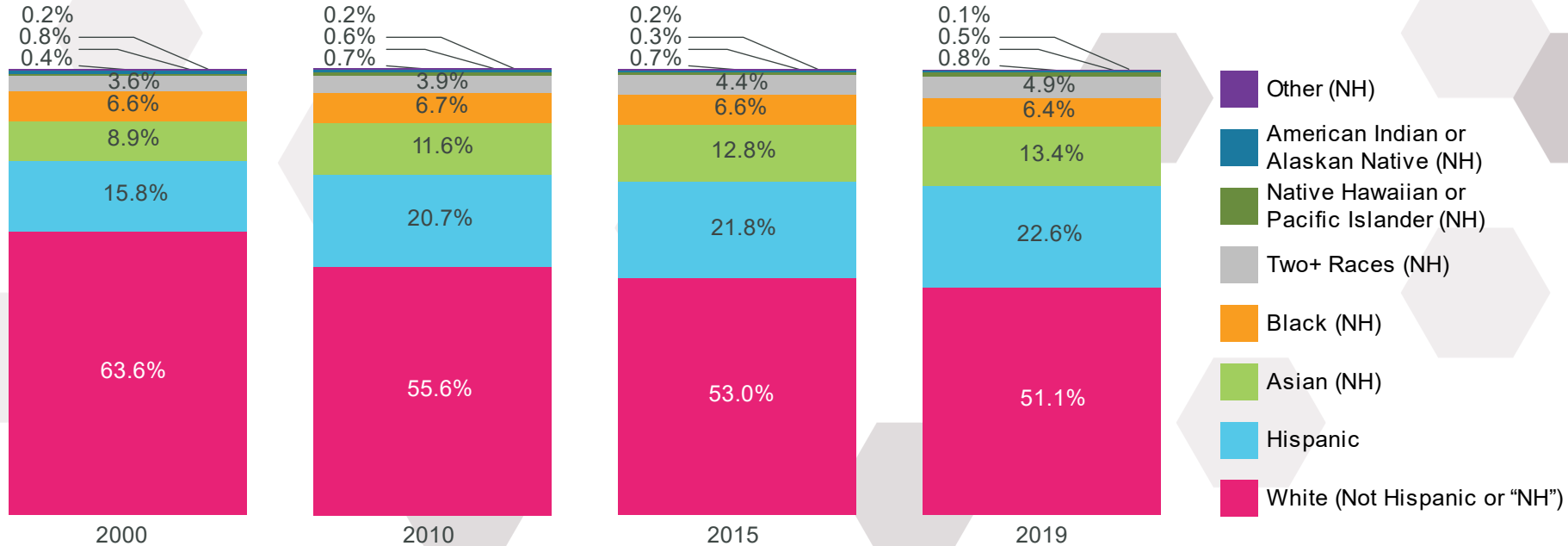
Who We Are

Economic Prosperity

Vibrant Places

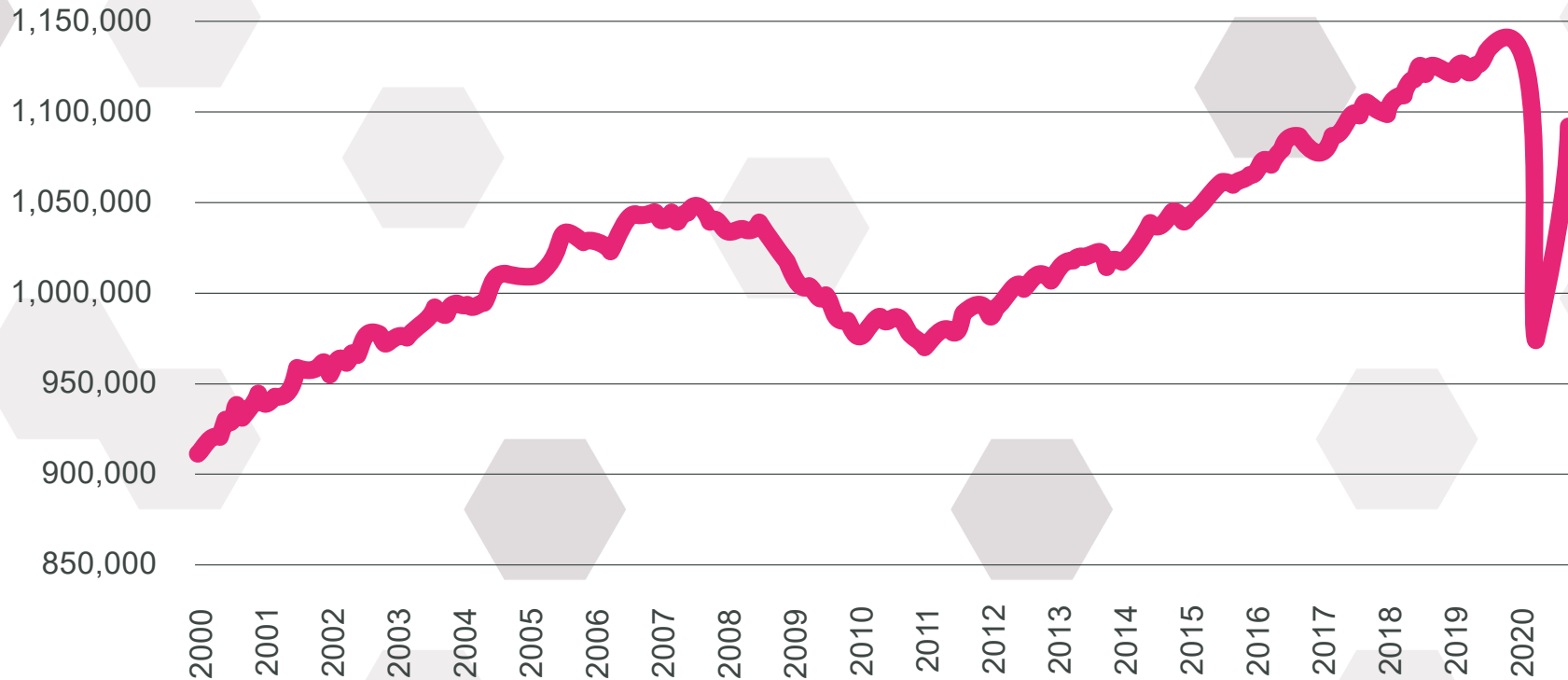
Connected Communities

Regional Progress Report – Population by Race/Ethnicity 2000 to 2019



Regional Progress Report – Total jobs

Jan 2000 – Oct 2020



Links

- New Census Bureau Data Dissemination Platform – <https://data.census.gov/cedsci/>
- 2020 Census Geographic Boundary Files – [TIGER/Line Shapefiles \(census.gov\)](https://www.census.gov/geographies/mapping-files/tiger.html)
- CA DOF/DRU - [California Demographics](https://www.dof.ca.gov/Programs/California-Demographics)
- SACOG 2021 Regional Progress Report - [2021 regional progress report 020421.pdf \(sacog.org\)](https://www.sacog.org/2021-regional-progress-report-020421.pdf)

Tina Glover

tglover@sacog.org

SACSIM Files and Data Summaries Available



SACOG

Modeling Data Requests

https://www.sacog.org/modeling

SACRAMENTO AREA COUNCIL OF GOVERNMENTS



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TOOLS & DATA

Form-Based Codes Handbook

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Open Data Portal

Travel Modeling

Analysis Tools

Travel Model Users Conference

Travel Model Documentation

SacRegion511.org

Technical Assistance

Transit Oriented Development Resources

Videos

SACOG TRAVEL DEMAND MODEL

To make plans that will shape how people will live, work, and play, we need to understand how people travel today and think about how they will travel in the future. SACOG uses the travel demand model to understand how people move and the information gained from the models help create plans for the future.

> What is SACOG's travel demand model?

> Why does SACOG have a travel demand model?

> What information does the travel model use to predict travel behavior?

> How do I request data files?

For travel modeling, land use, and other data related requests, SACOG staff can help assist by filling out the [Data Request Form](#).

Sign up to receive email notifications at <https://www.sacog.org/pod/sign-notifications> check "Transportation Modeling and Data Analysis"

Also check out the [Open Data Portal](#) for access to GIS data layers readily available. For travel modeling support contact sacsim@sacog.org



SACSIM Version and Model Files

SACSIM Version and Model Files

Version

Current

SACSIM19.02.01: Released for 2020 MTP/SCS MTIP Amendment version 1

Previous SACSIM19

- *SACSIM19 Beta: Released at 2019 Model User Conference to Beta Testing Group, Spring 2019*
- *SACSIM19.01.01: Released for 2020 MTP/SCS adoption, Fall 2019**
- *SACSIM19.01.02: Released with minor update of adopted of 2020 MTP/SCS, Spring 2020***
 - ** Originally releases as V1*
 - ***Originally released as V2*

Scenario(s) Release

- SACSIM19.02.01_2027_Baseline

Welcome to Cube 6.4

SACSIM19_02_01_masternet.net (Q:\SA...)

Legend

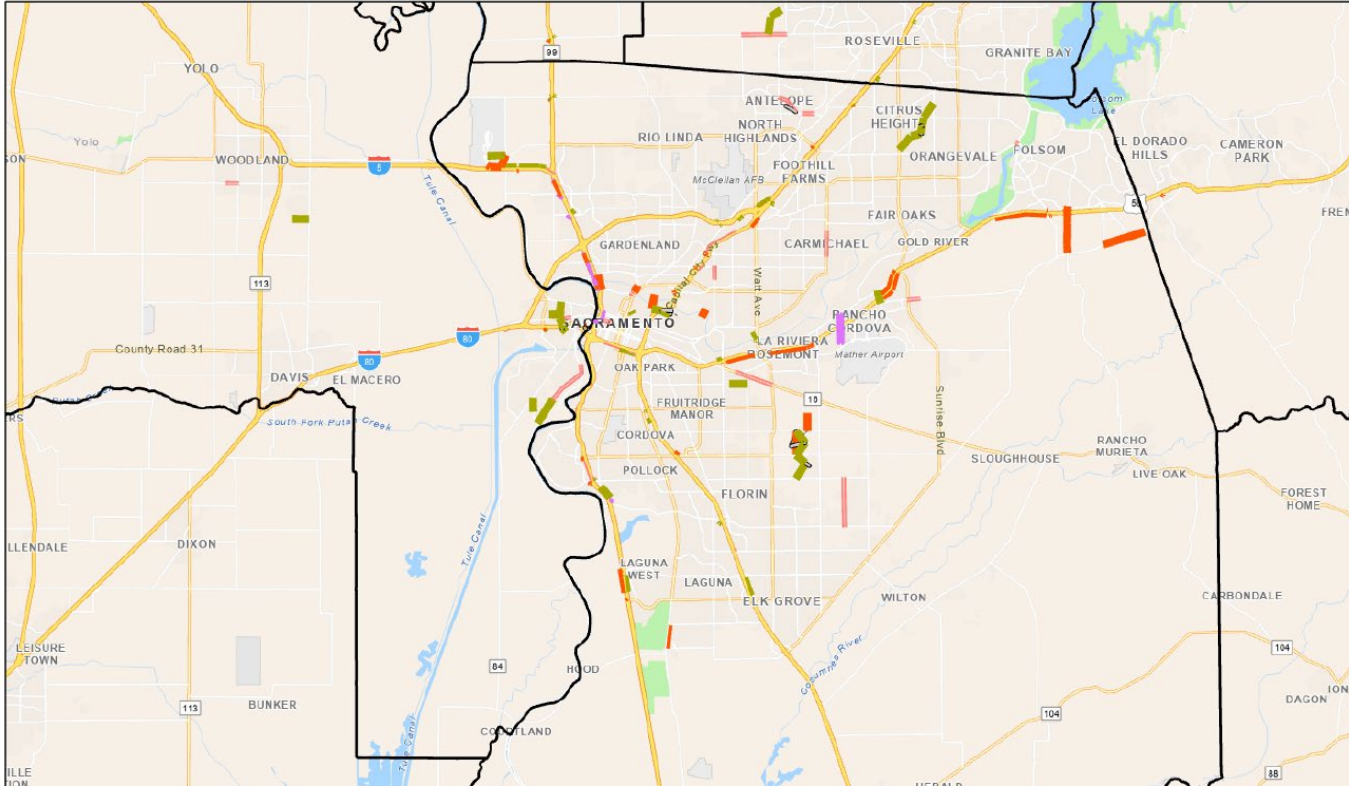
Highway Links

AX/BX	6728800.0002	6728780.6382	
AY/BY	1974184.8747	1975818.4135	
A	3263	8282	
B	8282	3263	
TOLLID	0	0	
GPID	0	0	
AUXID	0	0	
TRAV_DIR	0	0	
CAPC16	3	3	
LANE16	3	3	
SPD16	40	40	
BIKE16	0	0	
CAPC27	3	3	
LANE27	3	3	
SPD27	40	40	
BIKE27	2	2	
USECLASS16B	0	0	
USECLASS27B	0	0	
CAPC35	3	3	
LANE35	3	3	
SPD35	40	40	
BIKE35	2	2	
USECLASS35B	0	0	
USECLASS35P	0	0	
CAPC40	3	3	
LANE40	3	3	
SPD40	40	40	

Search...

SACSIM Version and Model Files

2040 Capacity Changes (Pricing), Sacramento County



Model Documentation

SACRAMENTO AREA COUNCIL OF GOVERNMENTS



SACOG

About **Regional Plans** **Funding** **Projects** **Tools & Data** **News**



Handbook

Information Resources
Center

Open Data Portal

Travel Modeling

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The links below provide SACOG's travel model documentation, updated to reflect the SACSIM19 travel demand model used for the 2020 MTP-SCS.

Please send any questions or comments to sacsim@sacog.org

 [Full Model Documentation](#)

> **Overview and Introduction**

> **Model Structure**

> **Land Use**

> **Networks**

> **Auto Operating Cost, Fares, and Pricing**

> **Calibration and Validation**

✓ **Appendices**

 [Appendix A DAYSIM Reference Guide](#)

 [Appendix B SACSIM Tolling Enhancements Memo \(By RSG\)](#)

 [Appendix C Year 2000 SACOG Household Travel Survey Report](#)

 [Appendix D Fuel Tax and Mileage Fee Report](#)

 [Appendix E Caltrans 2019 Validation Memos Prepared by DKS Using SACSIM19 for SR 51 and I-5 Studies](#)

 [Appendix F Circuity Surface Data Preparation Memo](#)

 [Appendix G Run POPGEN](#)

 [Appendix H SACOG Travel Behavior Report](#)

 [Appendix I SACSIM VMT Calculation Procedures](#)

Land Use/ Transportation Summaries

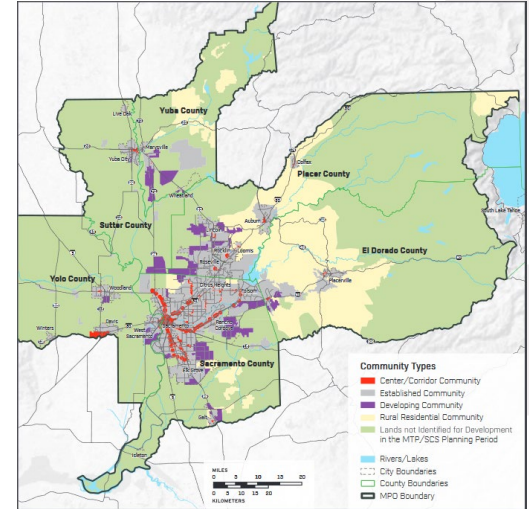
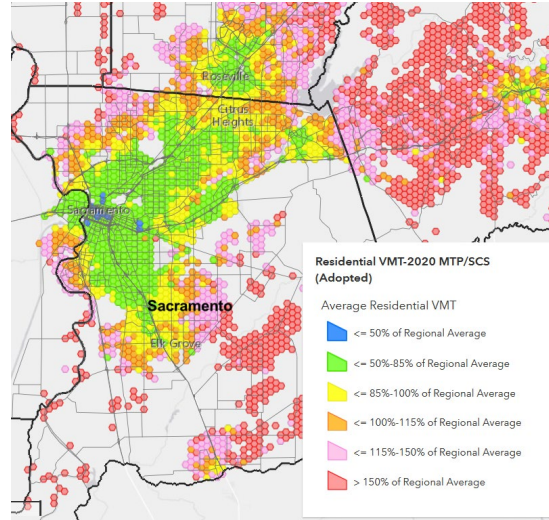
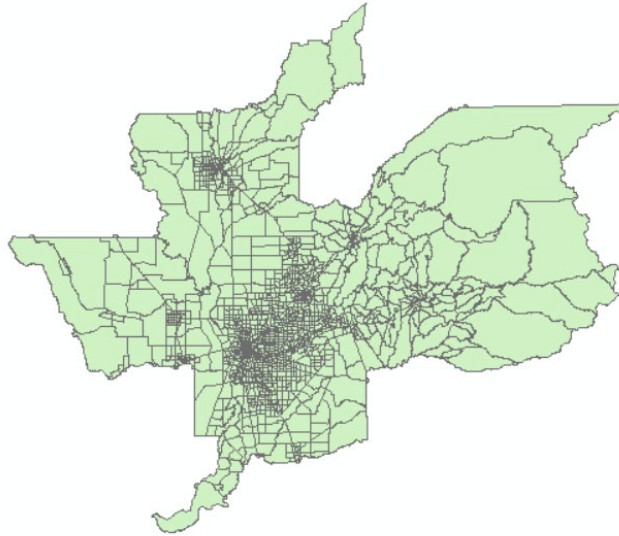


Land Use/ Transportation Summaries

A	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
		Residential VMT per Capita	Vork VMT per Job		HBB Job	Total	Modeled	DU	diff (mod)	diff (total Job)	diff (DU)	
	Region	17.91	18.33									
	County											
	El Dorado	29.24	26.00									
	Placer	21.29	20.05									
	Sacramento	15.91	17.40		68,723	679,818	611,095	568,121	(9,445)	(9,079)	(2,239)	
	Sutter	14.58	15.42									
	Yolo	17.79	18.77									
	Yuba	23.04	21.77									
	Jurisdiction				68,723	679,818	611,095	568,121				
	Auburn	21.63	25.87		-	-	-	-	-	-	-	
	Citrus Heights	15.90	16.21		4,074	20,338	16,264	35,515	(92)	(98)	(69)	
	Colfax	33.23	30.23		-	-	-	-	-	-	-	
	Davis	17.27	14.06		-	-	-	-	-	-	-	
	El Dorado County	30.12	26.00		-	-	-	-	-	-	-	
	Elk Grove	18.26	14.70		8,818	44,974	36,156	53,364	603	658	(267)	
	Folsom	17.57	18.88		4,316	37,961	33,645	27,701	(7,485)	(7,464)	159	
	Galt	21.05	18.03		751	4,848	4,097	7,949	(92)	(93)	17	
	Isleton	28.31	20.11		4	162	158	426	1	1	2	
	Lincoln	22.58	22.06		-	-	-	-	-	-	-	
	Live Oak	18.56	15.79		-	-	-	-	-	-	-	
	Loomis	20.99	25.33		-	-	-	-	-	-	-	
	Marysville	11.07	16.11		-	-	-	-	-	-	-	
	Placer County	28.52	24.73		-	-	-	-	-	-	-	
	Placerville	16.46	26.01		-	-	-	-	-	-	-	
	Rancho Cordova	16.09	19.90		2,887	58,864	55,977	26,726	(657)	(639)	(133)	
	Rocklin	17.77	20.56		-	-	-	-	-	-	-	
	Roseville	17.18	17.12		-	-	-	-	-	-	-	
	Sacramento	14.25	16.78		20,334	310,774	290,440	194,745	1,886	2,050	348	
	Sacramento County	16.11	17.86		27,539	201,897	174,358	221,695	(3,609)	(3,494)	(2,296)	
	Sutter County	23.45	25.57		-	-	-	-	-	-	-	
	West Sacramento	15.73	20.57		-	-	-	-	-	-	-	
	Wheatland	30.70	26.85		-	-	-	-	-	-	-	
	Winters	21.25	18.83		-	-	-	-	-	-	-	
	Woodland	15.69	18.87		-	-	-	-	-	-	-	
	Yolo County	26.65	20.09		-	-	-	-	-	-	-	
	Yuba City	11.23	12.93		-	-	-	-	-	-	-	
	Yuba County	25.11	25.18		-	-	-	-	-	-	-	



Land Use/ Transportation Summaries



Contact:

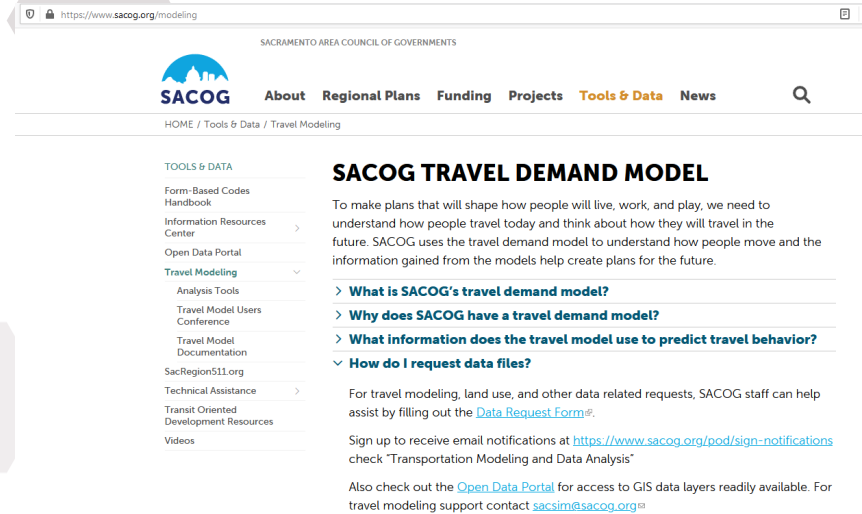
SACSIM@sacog.org

Information:

www.sacog.org/modeling

Data Request:

Form:sacogca.seamlessdocs.com/f/DataRequest



The screenshot shows the Sacramento Area Council of Governments (SACOG) website. The browser address bar displays <https://www.sacog.org/modeling>. The website header includes the SACOG logo and navigation links: About, Regional Plans, Funding, Projects, Tools & Data (highlighted in orange), and News. A search icon is also present. Below the header, the breadcrumb trail reads: HOME / Tools & Data / Travel Modeling. A left-hand sidebar menu lists various resources under the heading 'TOOLS & DATA': Form-Based Codes Handbook, Information Resources Center, Open Data Portal, Travel Modeling (which is expanded to show Analysis Tools, Travel Model Users Conference, Travel Model Documentation, and SacRegion511.org), Technical Assistance, Transit Oriented Development Resources, and Videos. The main content area is titled 'SACOG TRAVEL DEMAND MODEL'. It contains a paragraph explaining the purpose of the model and a list of four links: 'What is SACOG's travel demand model?', 'Why does SACOG have a travel demand model?', 'What information does the travel model use to predict travel behavior?', and 'How do I request data files?'. The 'How do I request data files?' link is expanded, showing a paragraph about assistance with data requests, a link to the 'Data Request Form', a sign-up for email notifications, and a link to the 'Open Data Portal' for GIS data.

https://www.sacog.org/modeling

SACOG

About Regional Plans Funding Projects **Tools & Data** News

HOME / Tools & Data / Travel Modeling

TOOLS & DATA

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Additional Data Tools

Darren Conly

SACOG Travel Model Users Conference
March 2021



Section 1

NPMRDS VEHICLE SPEED DATA

About the NPMRDS Data Set

- Archived vehicle travel times at 5-minute increments for over 7,000 roadway segments in SACOG region.
- Comes from in-vehicle GPS systems and mobile devices with location-tracking apps enabled



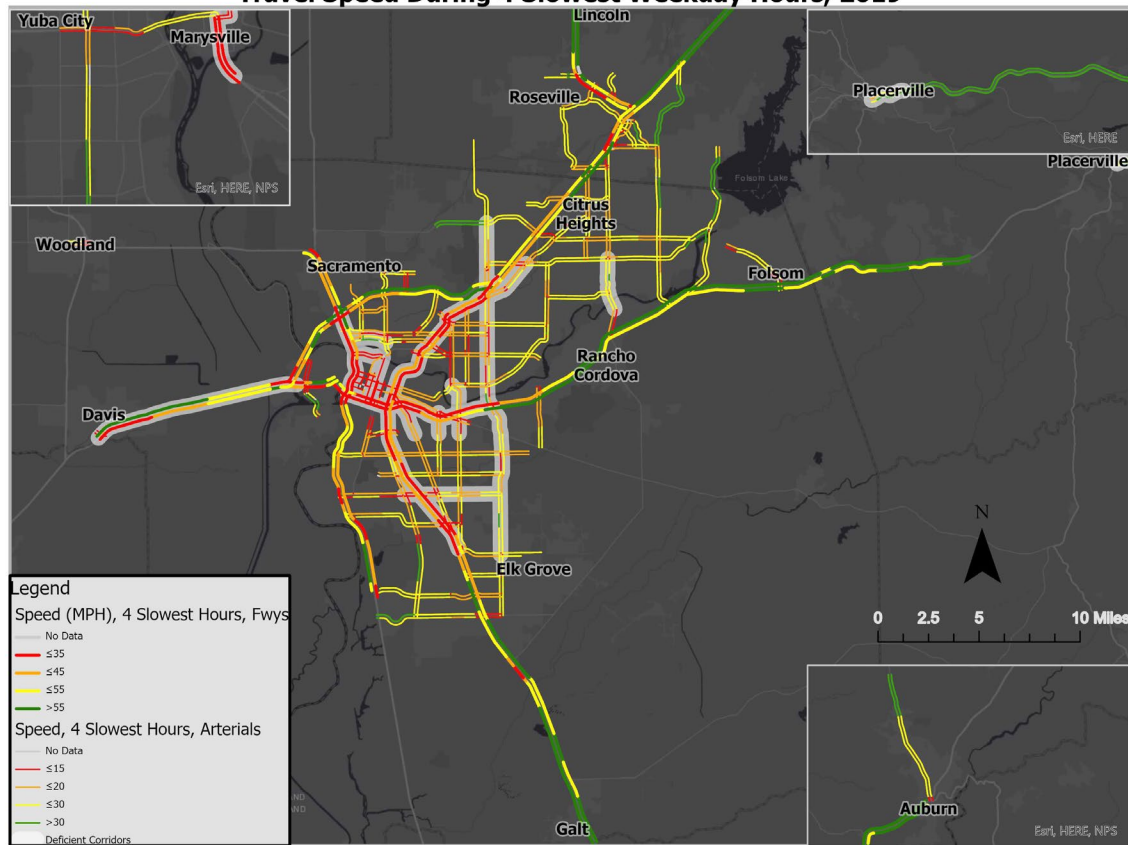
NPMRDS USE CASES

Congestion Management Process (CMP)

- Updated every 4 years with MTP
- Provides updated regional congestion metrics
- Outlines strategies for addressing congestion

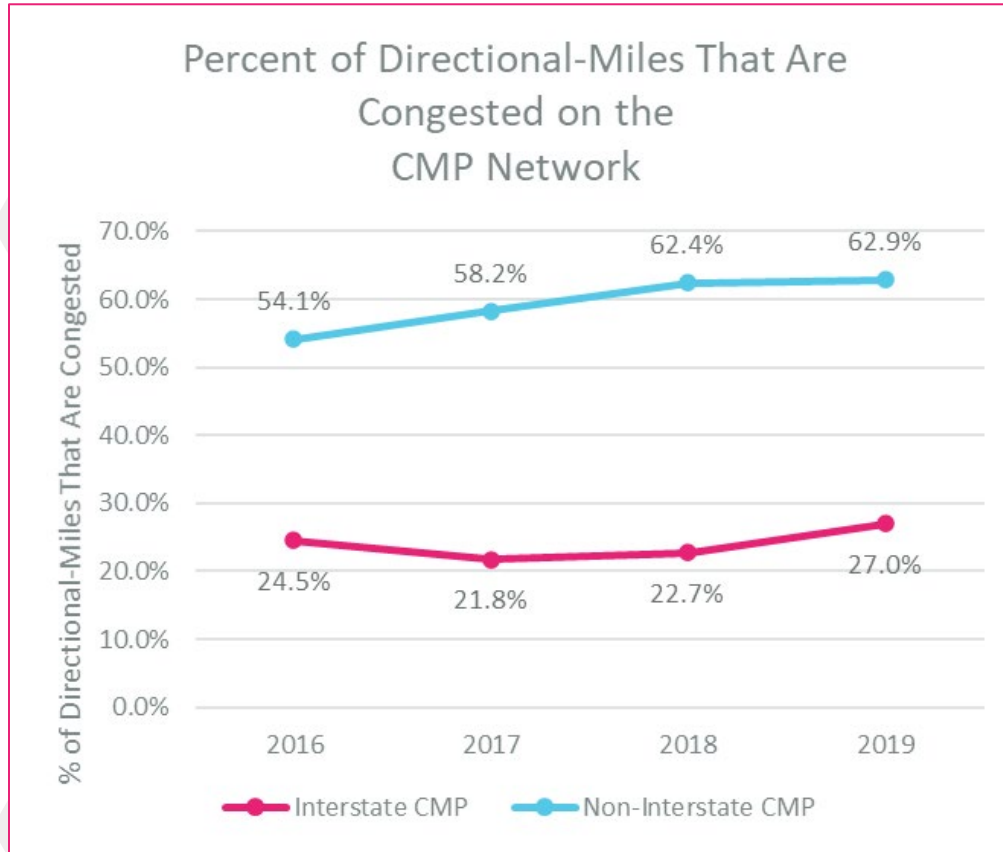
CMP Speed Map, CY 2019

Travel Speed During 4 Slowest Weekday Hours, 2019



Speeds shown represent the average speed during the 4 slowest hours for weekdays.

CMP Congestion Tracking



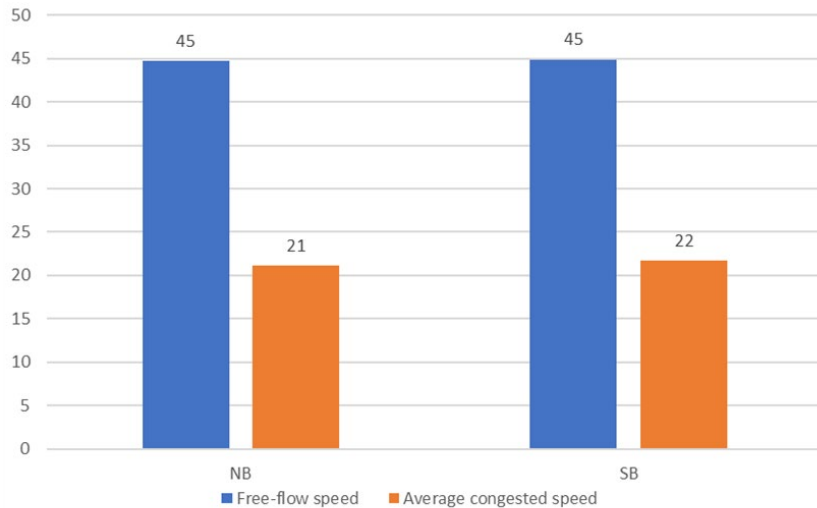
SACOG Funding Round

- Occurs every two years
- Awards funding to smaller projects on competitive basis
- Many evaluation criteria used, one of which is congestion and travel time reliability

Funding Round Example Charts

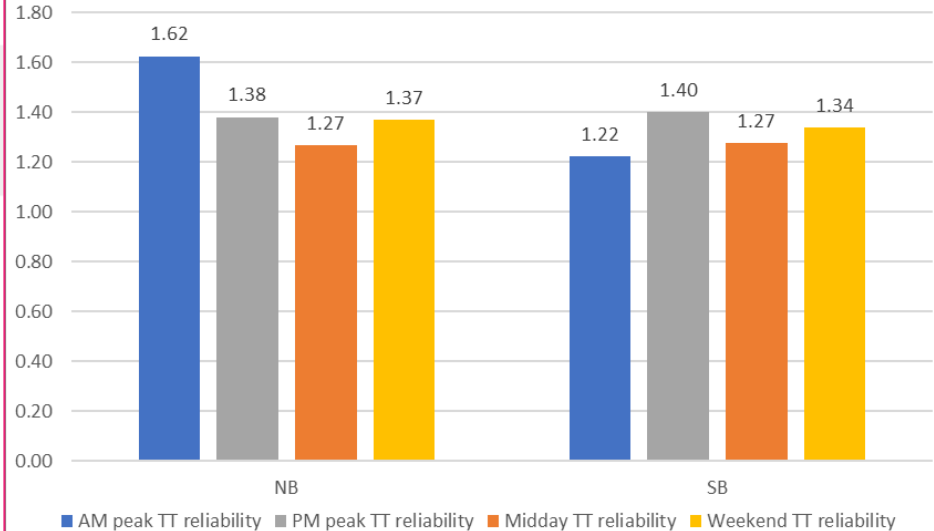
Example segment: South Watt Avenue between Jackson Rd and Fruitridge Rd, CY 2019

Free-flow vs. Congested Speeds (MPH)



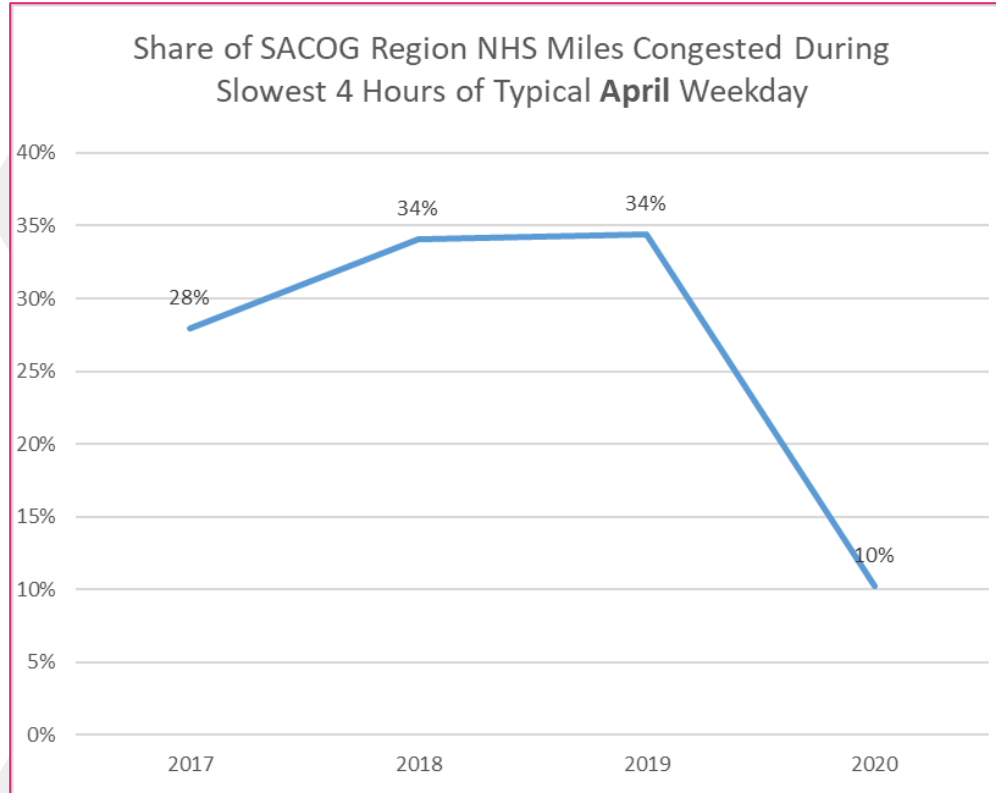
Congested speed is the average speed during the slowest four hours of a typical weekday and for most project segments is during the AM and PM peak periods.

Travel Time Reliability Index



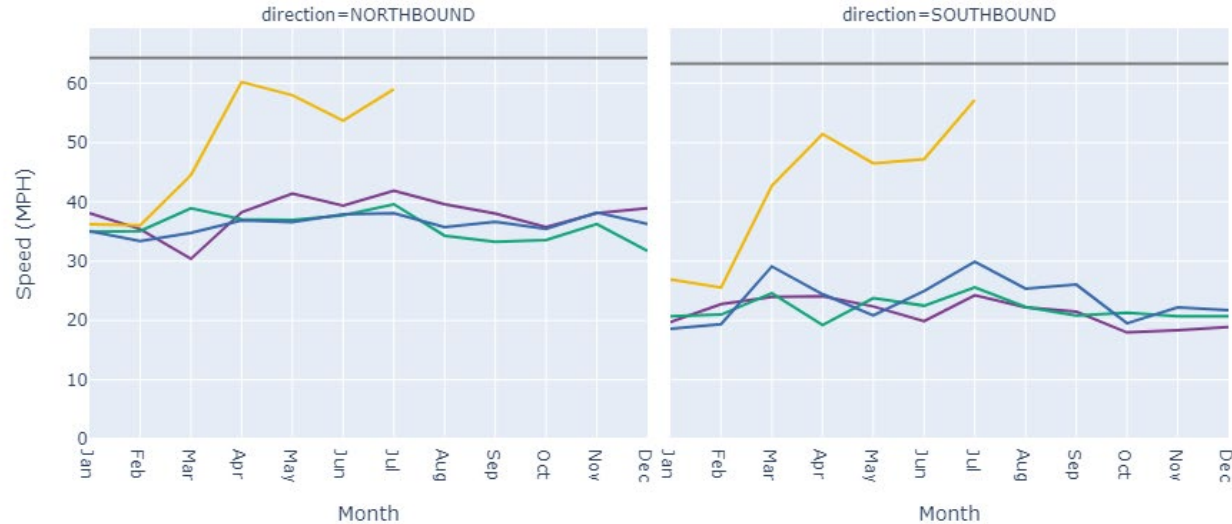
*Travel time reliability (TTR) = 80th percentile travel time / 50th percentile travel time.

Regional Progress Report – Example 1



Regional Progress Report – Example 2

I-5 American River Bridge



Speed during slowest weekday hour

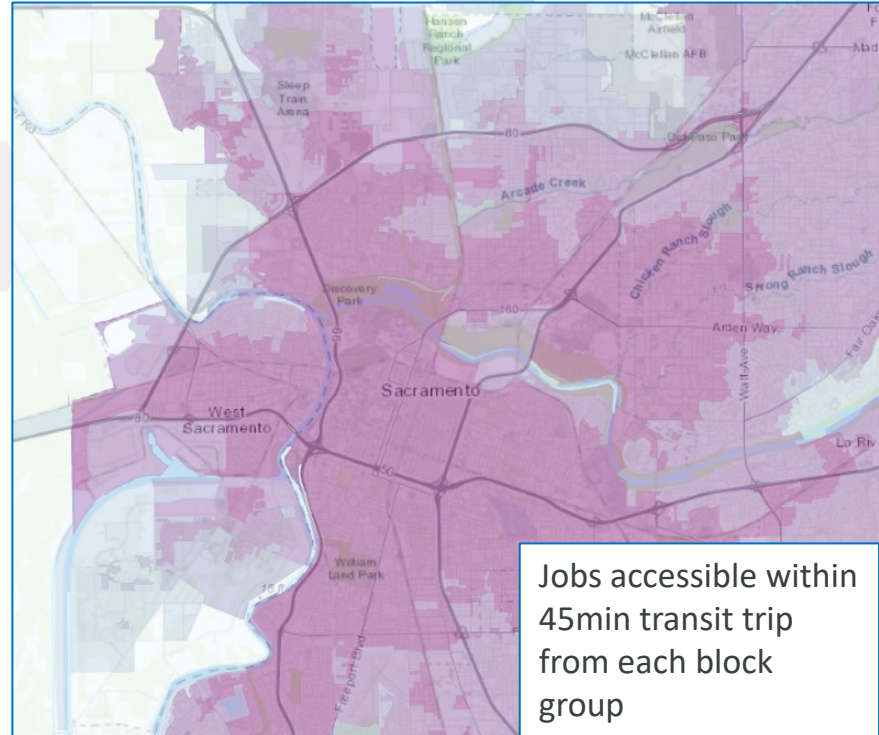
- 2017
- 2018
- 2019
- 2020
- 2019 Free-Flow Speed

Section 2

CUBE ACCESS

CUBE Access Overview

- Provided by Bentley Systems
- Measures access to a variety of destination types with various modes

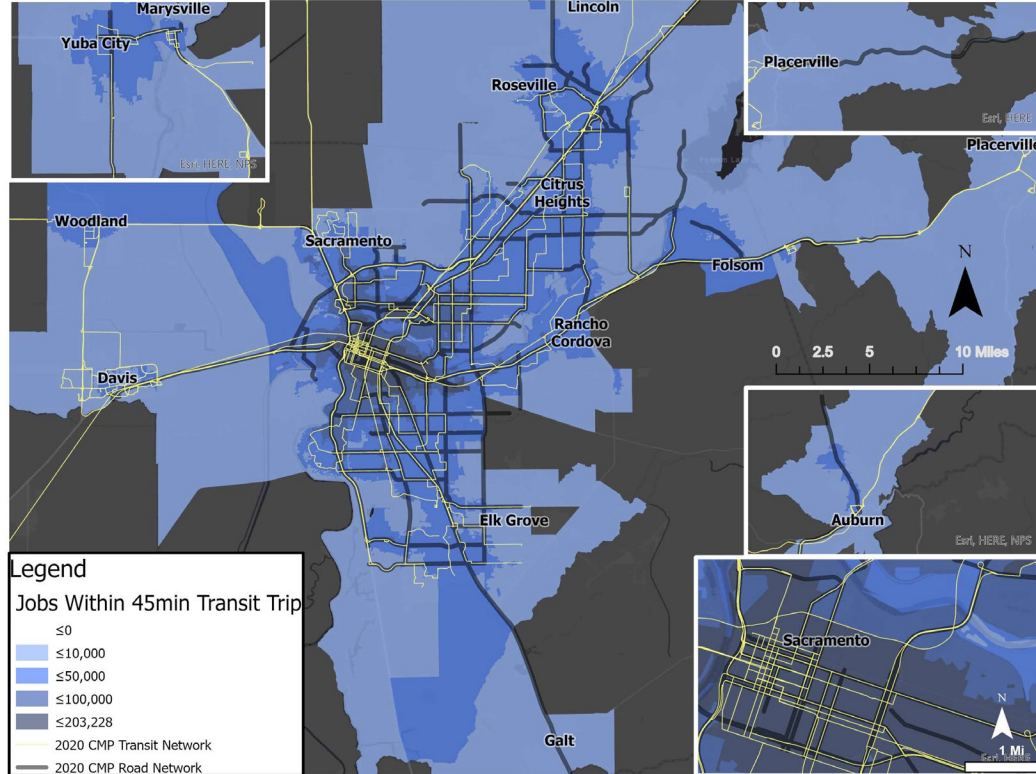




CUBE ACCESS USE CASES

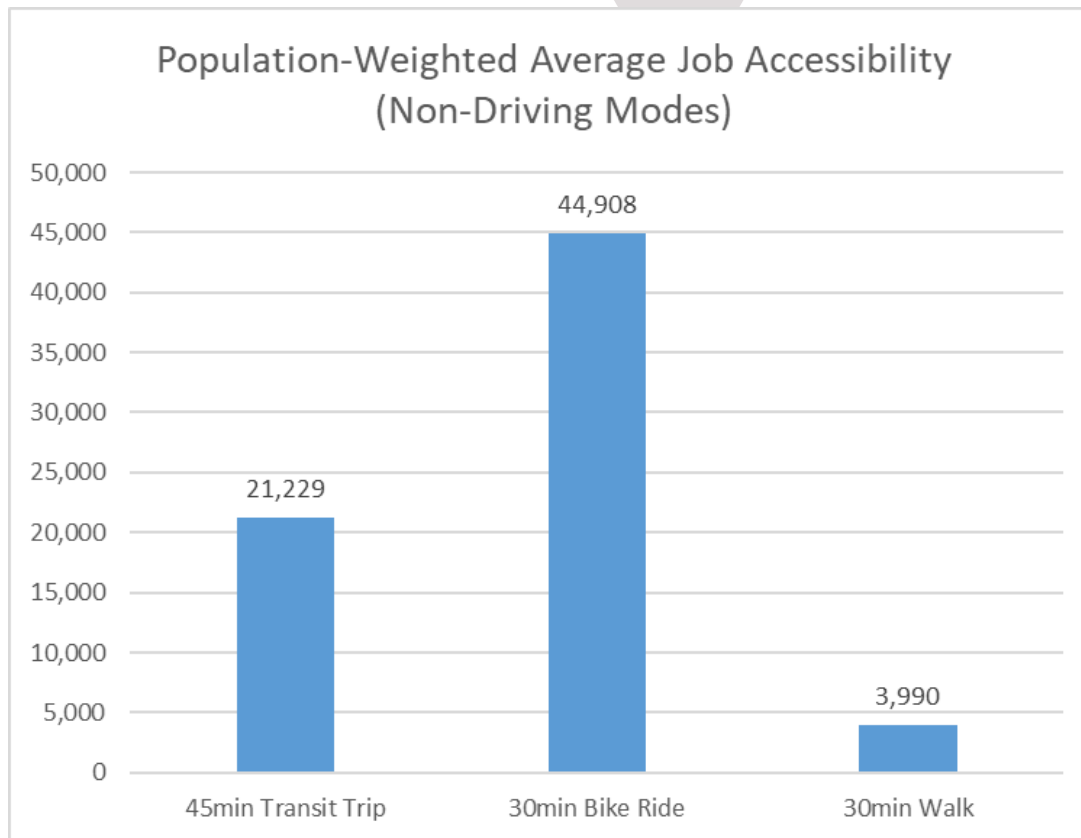
CMP – Transit Accessibility Map

Jobs Accessible Within 45-Minute Transit Trip

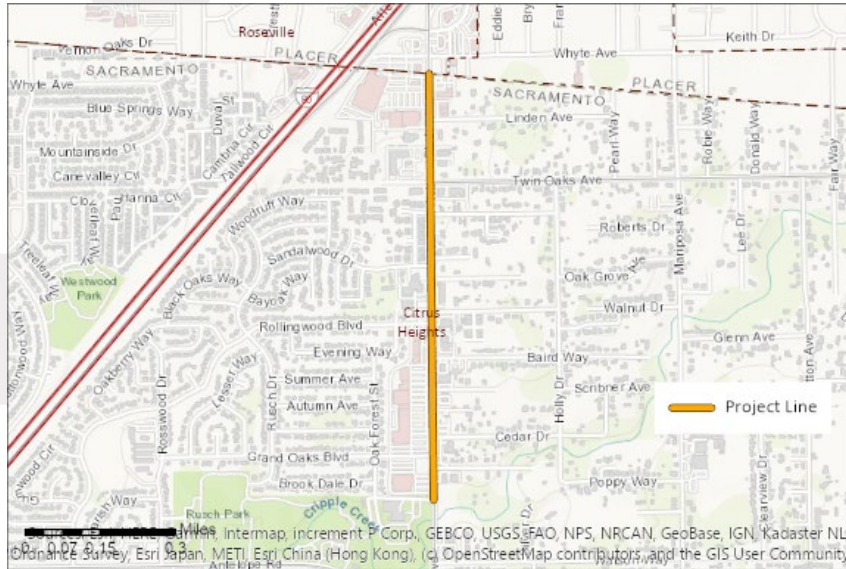


Based on Fall 2019 GTFS Transit Data. Accessibility scores represent all transit service both on and off CMP transit network, while lines shown only represent transit within the CMP transit network. Assumes trip occurs between 7am-9am on a weekday.

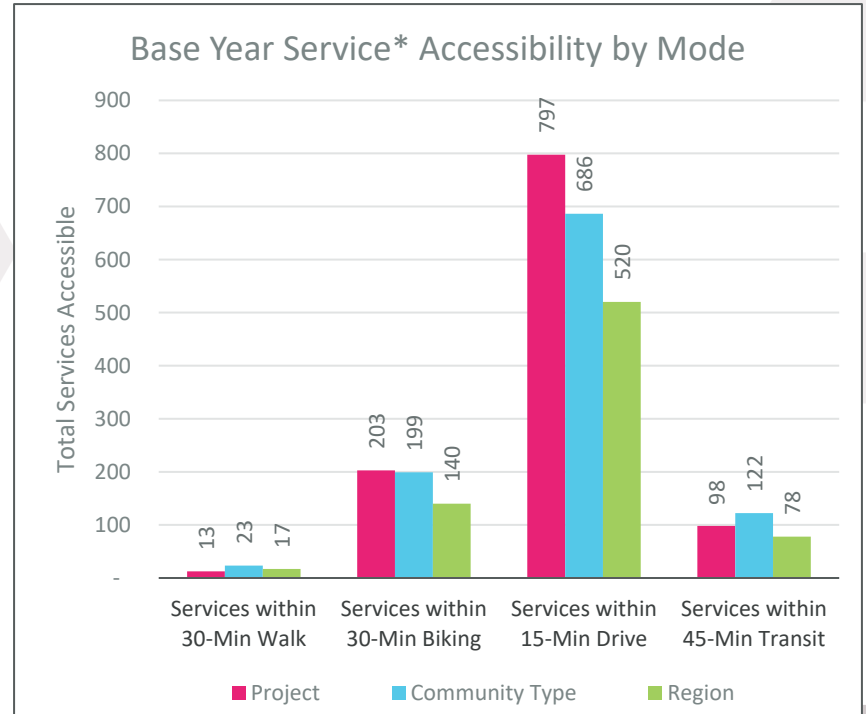
CMP – Accessibility Summary



SACOG Funding Round – Project-Level Accessibility



*Services are regular non-work destinations (e.g. grocery stores, schools, medical services, retail stores, etc.)



Potential Future Use Cases

- Before-After accessibility changes
 - How much does a new road or path increase accessibility?
- Social equity analyses
 - Does access to services or jobs vary across income or ethnic groups?

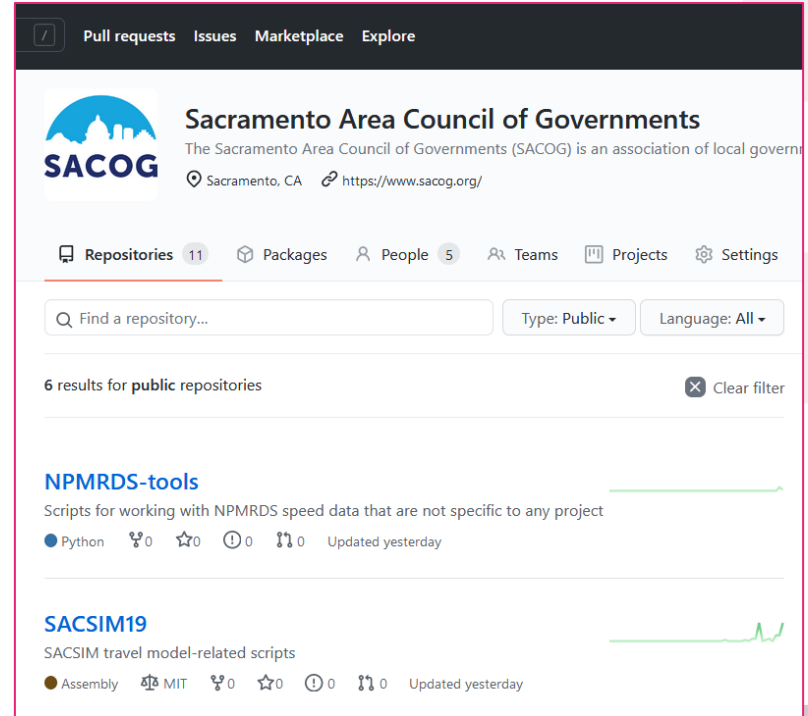


SACOG GITHUB

SACOG GitHub Now Available

- Platform for sharing source code for travel model and other SACOG data tools

- <https://github.com/SACOG>



More Information

- NPMRDS - <https://npmrds.ritis.org/analytics/tutorials/>
- Cube Access – <https://www.bentley.com/en/products/product-line/mobility-simulation-and-analytics/cube-access>
- GitHub - <https://github.com/SACOG>

Darren Conly

dconly@sacog.org

Replica: Insights for Transportation Planning

Shengyi Gao

Sacramento Area Council of Governments

sgao@sacog.org



What Is Big Data?

- **Big data:** large, fast, and complex data that is difficult or impossible to process using traditional methods.

Why Is Big Data Important?

- Cost reduction
- Time reduction
- New product development
- Smart decision making

Big Data for Transportation Planning Pilot Project

- Big Data has been used in commerce for year—its potential application in transportation is relatively new and evolving
- Caltrans, CARB, SACOG and others—informal working group in 2018 to explore different vendors
- Pilot was launched in 2019 to "test the market" for Big Data platforms targeted for transportation planning

What Is Replica?

- A web platform
- Big data based
- Personal travel snapshot
- Commercial travel snapshot

Nationwide Trends: Mobility

- Geography: state, county, and census tract
- Weekly snapshot of consumer spending
- Weekly snapshot of mobility
 - Trips by mode
 - Trips by purpose
 - Trip start time
 - Residential VMT

Nationwide Trends: Spending

- Retail
- Grocery Stores
- Restaurants & Bars
- Gas Stations, Parking, Taxis, Tolls
- Airline, Hospitality, & Car Rental
- Entertainment & Recreation

Replica Place

- Sampling rate: 5 to 30% of population at BG
- Geography: county, CT, BG, TAZ
- Personal and commercial travel: Quarterly snapshots from Fall 2018 to Fall 2020
- Day of week: Sun. to Mon.

Population

- **Synthetic:** based on ACS 2013-2017 and 2014-2018
- **No seasonal adjustment**
- **Household attributes:** income group, vehicles, size, residence location (BG), tenure
- **Person attributes:** age group, gender, race, ethnicity, school grade attending, employment status, education, industry, commute mode, household role, locations of residence, school, and work

Personal Travel

- Individual trip diary
 - Origin (within and outside SACOG), start time, mode, origin purpose, trip duration, trip distance, destination purpose, arrival time, destination (within and outside SACOG)
 - Mode: walk, biking, driving, passenger, school bus, transit
 - Purpose: home, work, shopping, eat, lodging, maintenance, recreation, social, other, stage (pass-through)

Commercial Trips

- Individual trip
 - Origin, start time, trip duration, trip distance, arrival time
- Future improvements
 - Truck size, cargo type

Transit

- Individual transit line
- Individual transit trip
- Linked to individual traveler

Road Network

- Open Street Map
 - Directional
 - No separate geometry for lanes (including HOV)
- Loaded vehicle trips
 - Individual vehicle trip
 - Linked to individual traveler

User Interface

- Create origin-destination sheds and flows
- Select link analysis
- Transit line analysis
- Mapping and data download

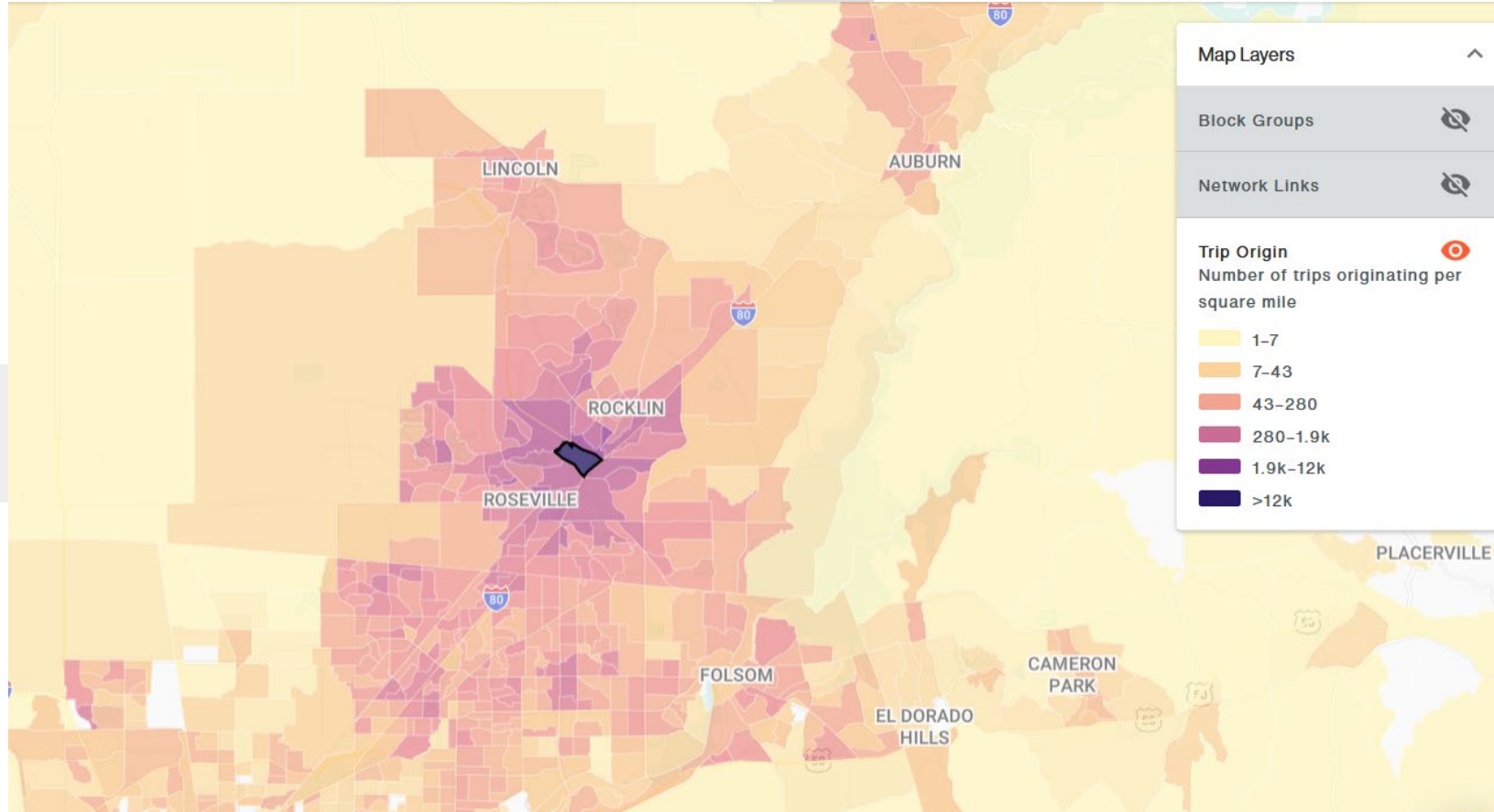
What We Can Do With Replica

- Inbound and outbound trips of a selected geography
- VMT analysis (by residence, origin, or destination)
- Demographics of the travelers from/to a selected geography (linked to the trips)
- Trips made by SACOG residents within and outside SACOG (This is critical to SB 743 analysis in which no trips will be truncated.)
- Link volume and route information
- Transit route information
- Commercial vehicle travel
- Day-to-day variation (Mon. to Sun.) and seasonal variation (Yanmei will show the difference of travel before and in pandemic)

Examples of Applications

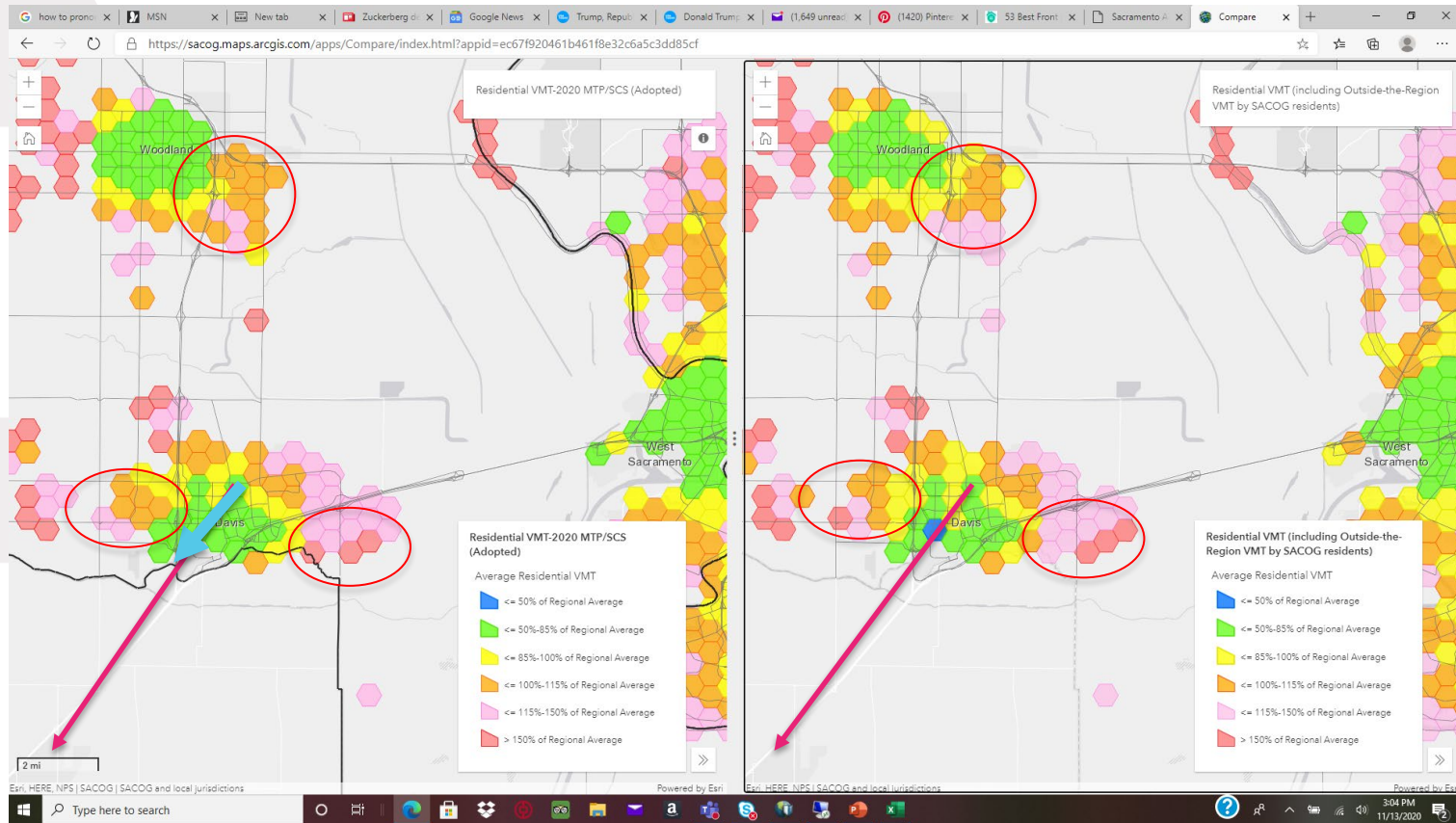
- Creating travel shed for project performance assessment
- Quantifying IXXI trip distance for the purpose of SB 743 analysis
- Corridor traveler demographics
- US 50 Corridor Action Plan

Example 1 – Where do travelers come from?



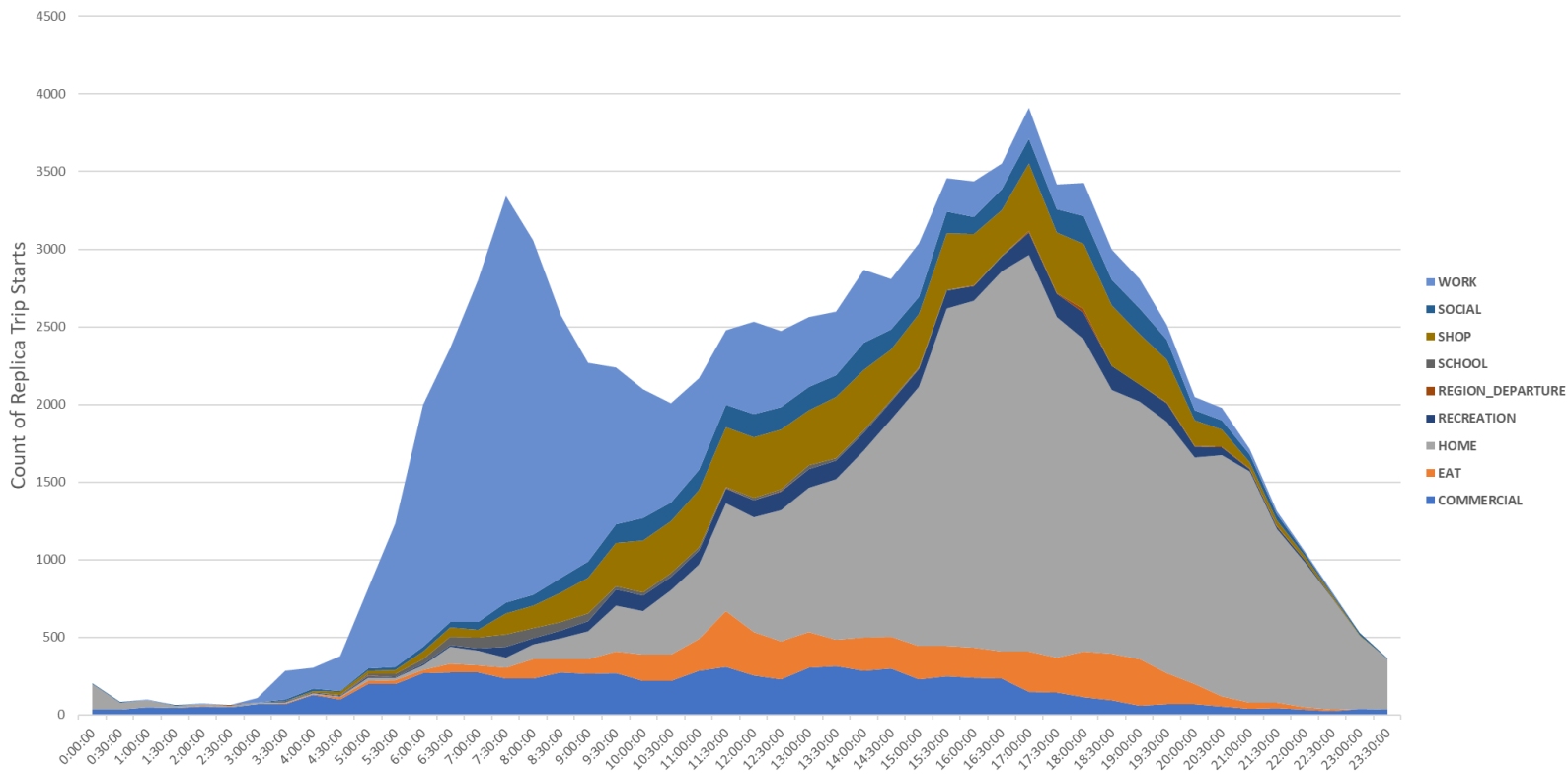
Example 2: SB743 Implementation Support

Account for Outside-Region-VMT – SB743 on Open Data Portal



Example 3: Congestion Analyses

Trip starts by purpose and time of day, SR-51 NORTHBOUND at American River,
Thursdays, Sep-Nov 2019



Strength

- Good temporal and spatial granularity
- Disaggregate travelers and trips
- No trip truncation at SACOG border
- Pass-through traffic volume
- Visitors' trips (including non-SACOG resident workers)
- Can ground truth major roadway and transit volumes

Weakness

- Small temporal and spatial granularity (margin of error)
- Disaggregate travelers and trips (margin of error)
- No ground truth to validate walk, biking, and commercial trips
- Shared bikes and scooters were not included

-
- Live demo of Replica platform
 - Trends
 - Place
 - Northern California

Session 5 Nuts and Bolts

