

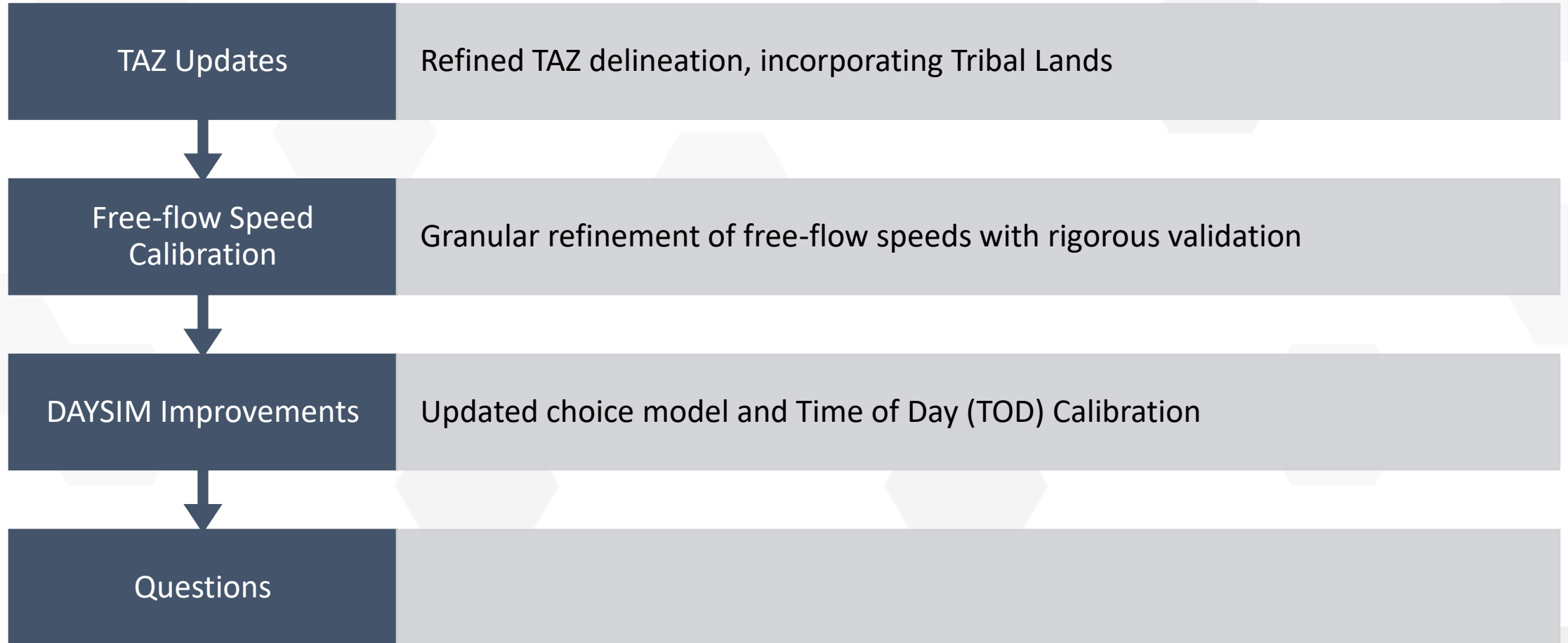
TAZ Updates, Free-flow Speed Calibration, and DAYSIM Improvements

Presenter: Eason Zhang, Ph.D.

Date: September 25th, 2025



Outline



Traffic Analysis Zone (TAZ) Updates

Principle: reflect land use, census data, and boundaries



Reference data for TAZ boundary delineation

Block group	Jurisdiction (city/county boundaries, SOI)	Land use data (parcel)	Major roadways	Natural geographical boundaries	Federally Recognized Tribal Lands
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Traffic Analysis Zone (TAZ) Updates

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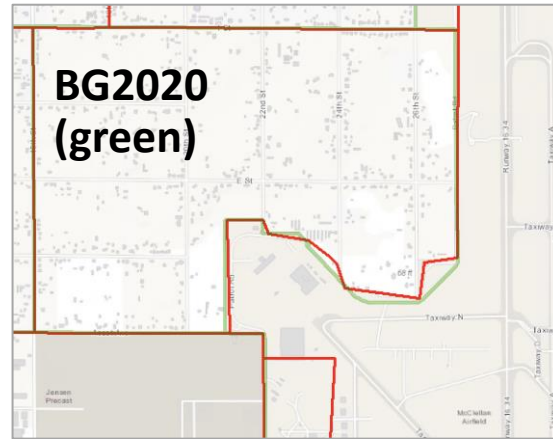


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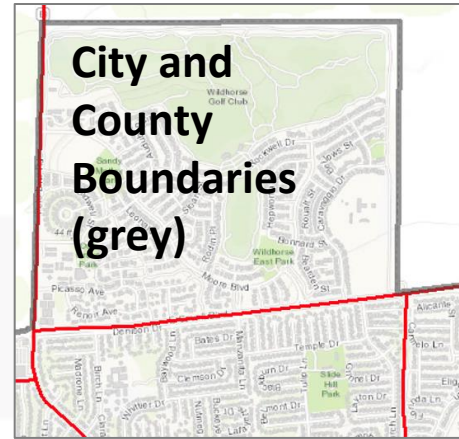
TAZ21 boundaries are better aligned with Block Group boundaries and jurisdiction boundaries

TAZ07 (red)



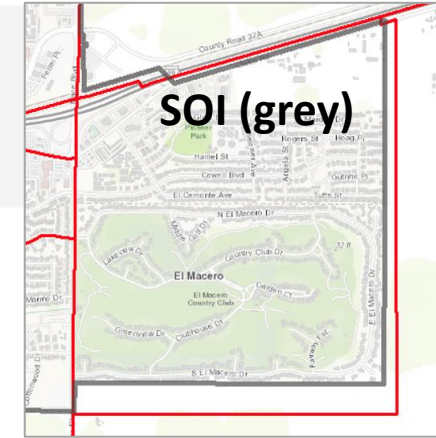
Example in North East Sacramento

City and
County
Boundaries
(grey)



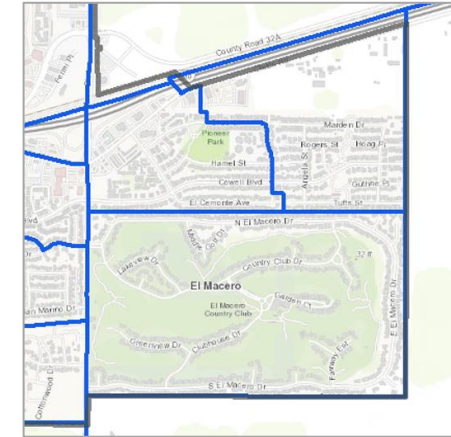
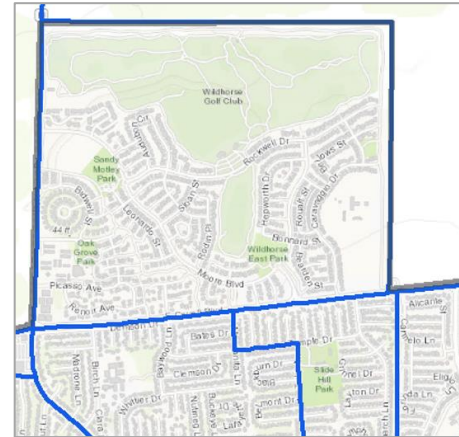
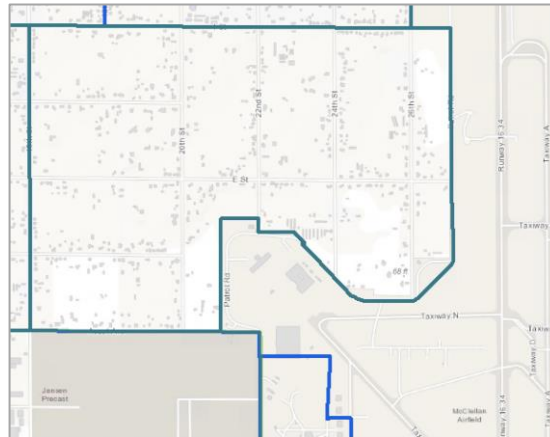
Example in Davis

SOI (grey)



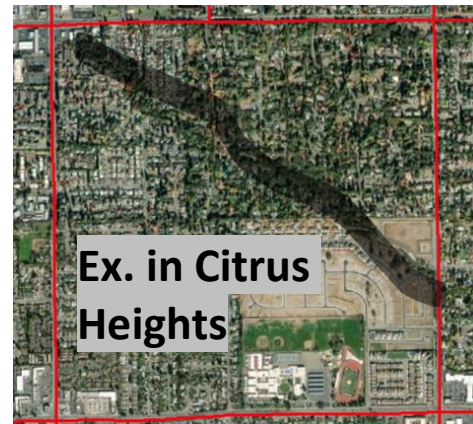
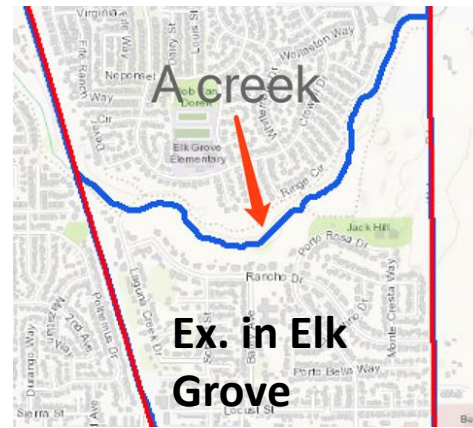
Example in Davis

TAZ21 (blue)

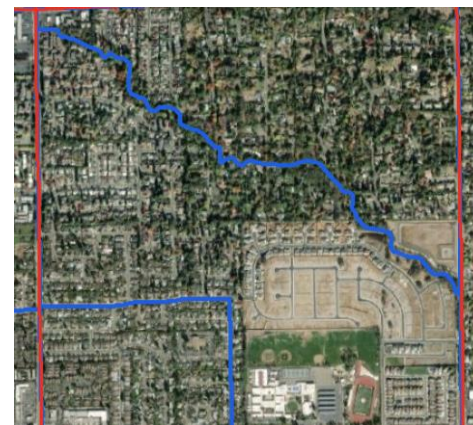


TAZ21
boundaries
incorporate
geographical
boundaries and
major roadways
to better
realistic travel

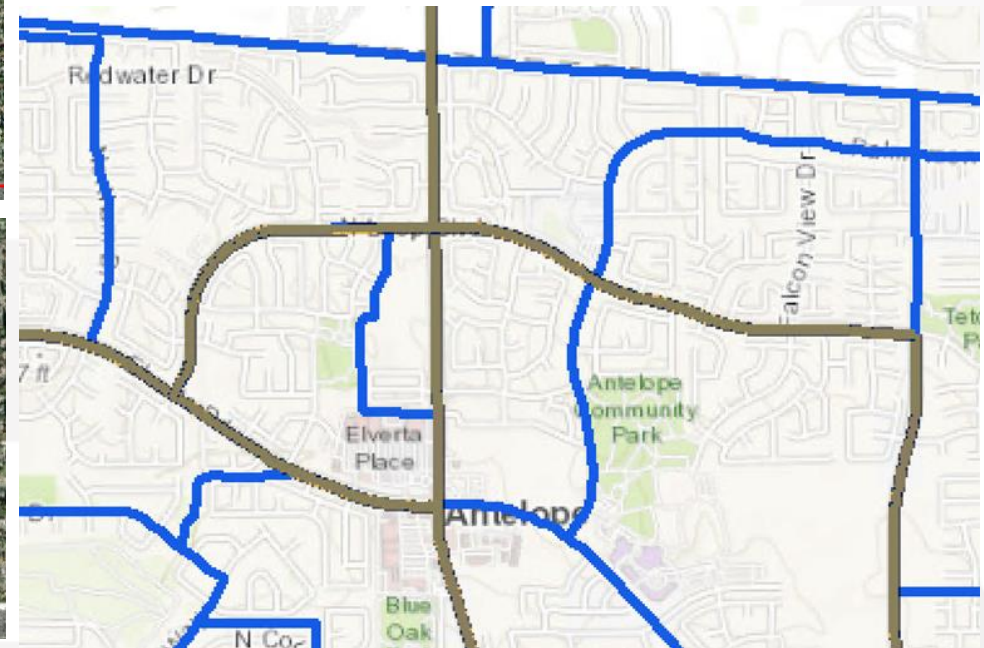
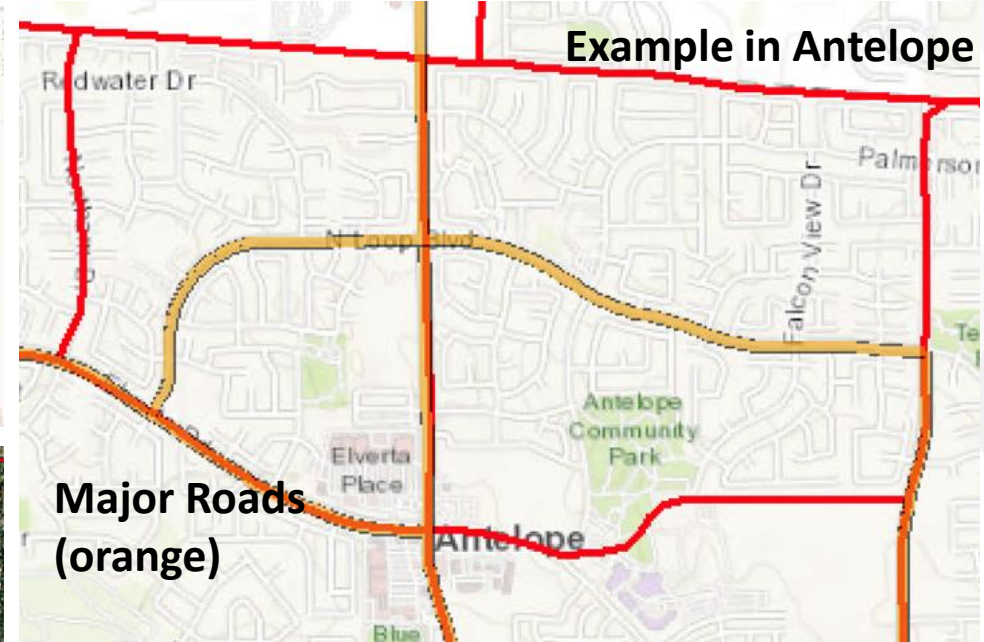
TAZ07 (red)



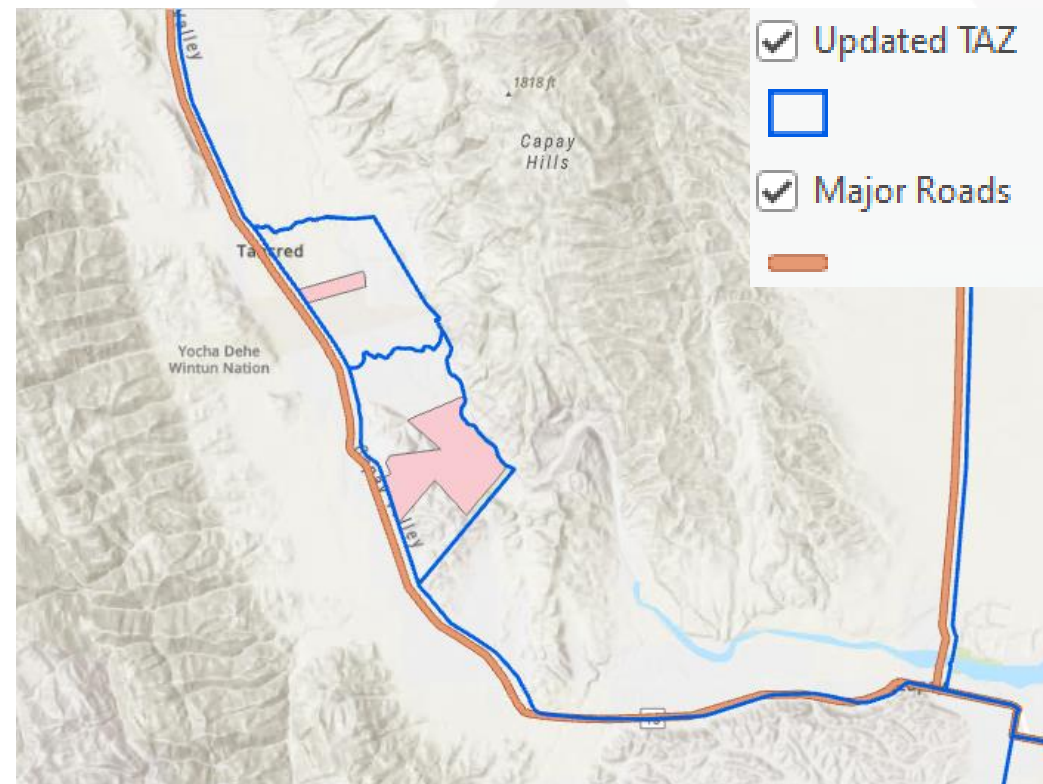
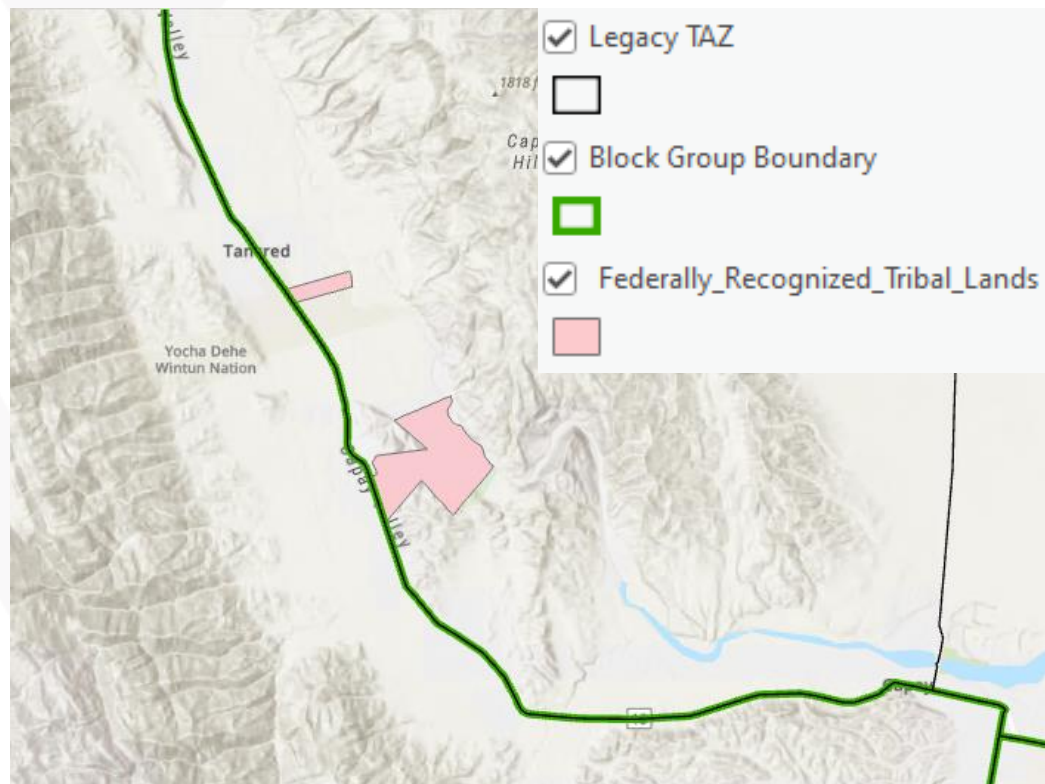
TAZ21 (blue)



Example in Antelope



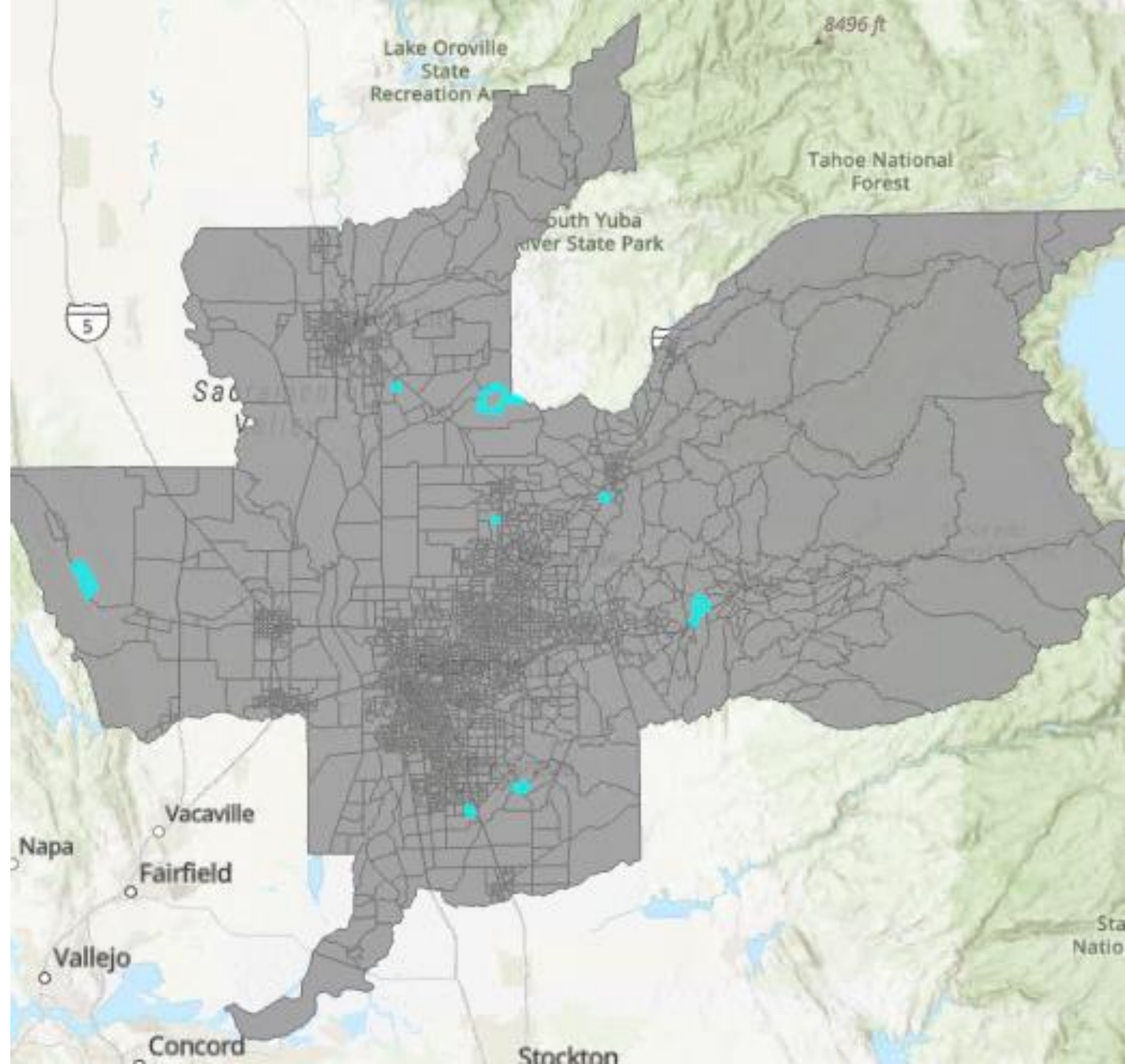
TAZ21 boundaries incorporate Tribal Lands



An example: Yocha Dehe Wintun Nation

TAZ07: 1,503

TAZ21: 2,315 (TAZs
representing Tribal
areas highlighted)



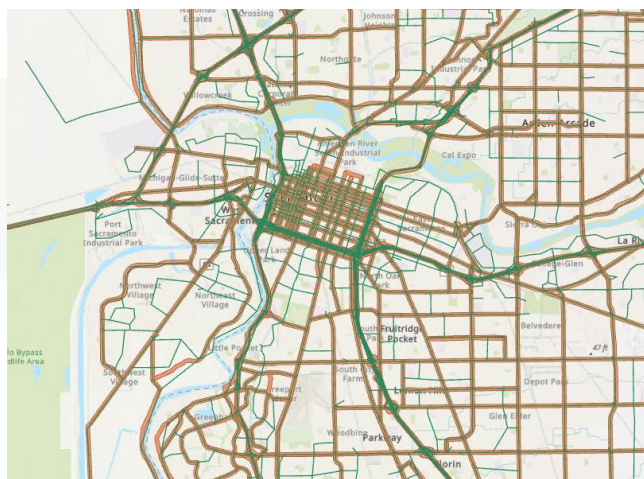
Free-flow Speed Calibration

Data source: NPMRDS
INRIX

Programmatic
conflation and manual
check/adjustment

Schemes of Free-flow
speed calculations

Evaluate with volume
and speed validation

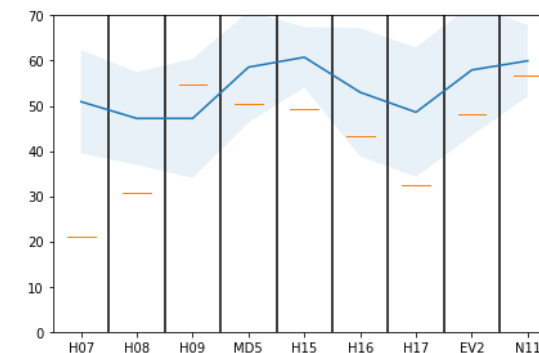


Freeway:
90.5%

Local roads:
41.1%

85th/60th
Speed
scenario

10pm-4am
Speed
scenario



Freeway		
Guideline	Thresh	SACSIM
% of Locations w/ Model < Max Deviation	>75%	80%
Correlation Coefficient	> 0.88	0.92
Validation Ratio	0.90~1.10	1.00
Local roads		
Guideline	Thresh	SACSIM
% of Locations w/ Model < Max Deviation	>75%	86%
Correlation Coefficient	> 0.88	0.90
Validation Ratio	0.90~1.10	1.00

DAYSIM Improvements

Data availability: *SACOG*

*2018 regional household travel survey**

Incorporate changes in

- **Demographics**
- **Travel behavior**

Re-estimated **23 sets of parameters**

Further calibration of parameters of major choice models, including **Time of Day (TOD) Calibration**

Function changes

to address planning needs of 2025 Blueprint

- **Ride-hailing** (or transportation network company, TNC)
- **Telework** in in person day pattern choice

New Mode: TNC

- With designated utility function in mode choice
- **Deadheading: 40%** of ride-hailing/TNC VMT(Fehr & Peers)

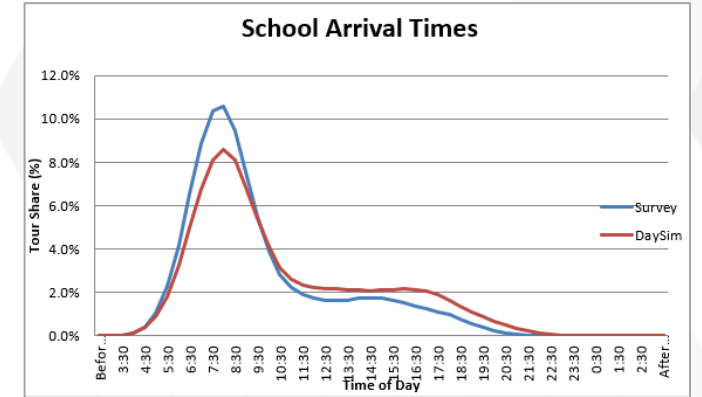
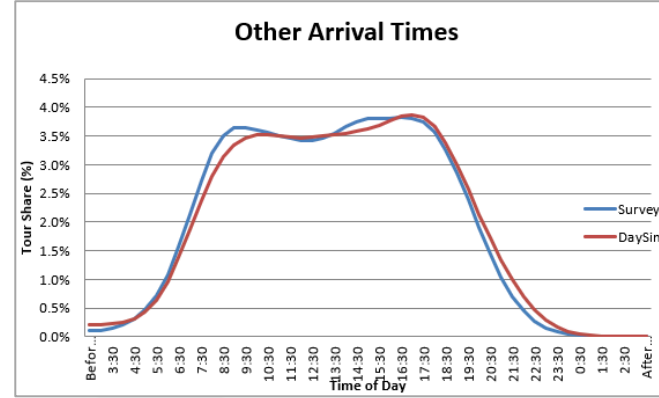
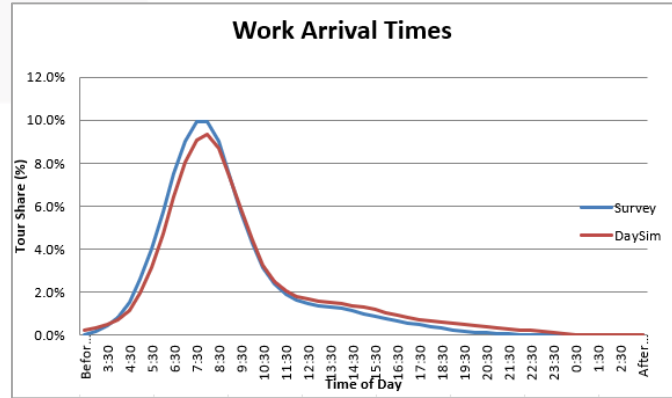
Remote working

- **Work-at-home**
 - A worker does not have an office other than home. In SACSIM, only self-employed workers work at home.
 - A variable in person table
- **Telework**
 - A worker has a long term work location outside home and telework part time or full time as a person day pattern.
 - A new variable in person day table

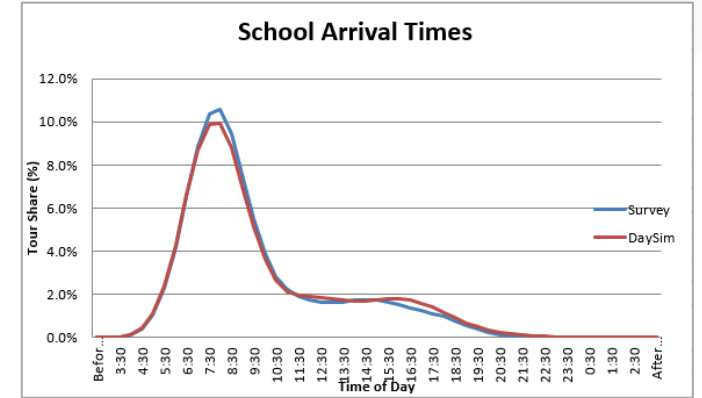
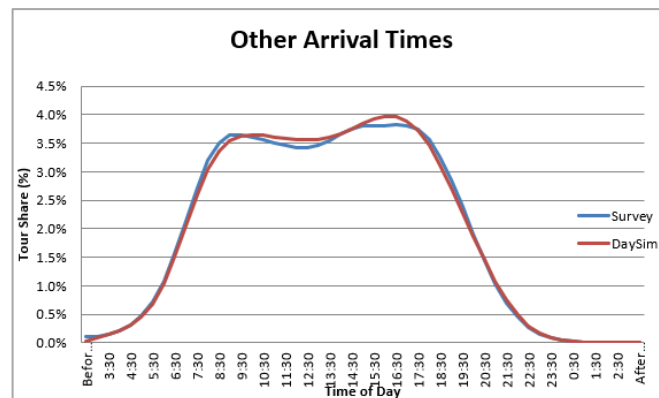
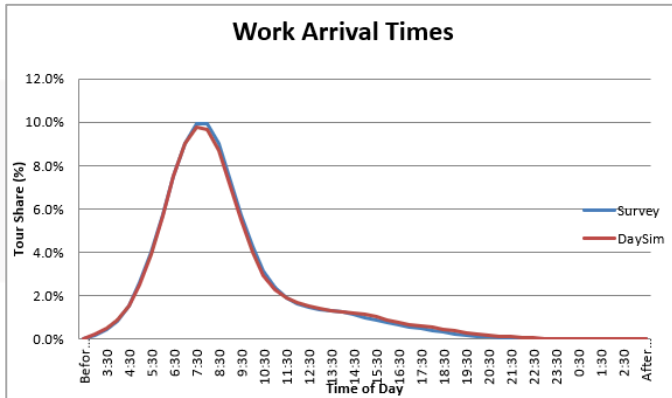
*Go to the Data Requests webpage: <https://www.sacog.org/planning/data-resource-center/data-requests>

Time of Day (TOD) Calibration: Arrival Times

Before



After



TOD Calibration Leads to Better Validation by Time Periods

Before

Period	% Meet Thres	Correlation	Avg. Link Err	RMSE	Valid Ratio
H07	98%	90%	32%	37%	122%
H08	96%	92%	36%	39%	127%
H09	100%	92%	21%	23%	103%
MD5	91%	92%	21%	22%	105%
H15	99%	90%	19%	23%	95%
H16	99%	90%	21%	26%	109%
H17	98%	90%	29%	35%	121%
EV2	92%	89%	38%	37%	123%
N11	87%	87%	28%	30%	88%

After

Period	% Meet Thres	Correlation	Avg. Link Err	RMSE	Valid Ratio
H07	99%	91%	22%	26%	108%
H08	99%	93%	25%	27%	114%
H09	99%	93%	19%	22%	103%
MD5	96%	94%	17%	18%	98%
H15	99%	92%	18%	21%	97%
H16	99%	92%	19%	23%	105%
H17	98%	90%	21%	26%	109%
EV2	96%	88%	27%	29%	107%
N11	92%	91%	27%	25%	91%

*Draft results in 2023 for SACSIM23 development purposes.

Summary

TAZ Updates

Better aligned with block group boundaries, city/county boundaries, sphere of inference

Incorporated with natural geographical boundaries, and major roadways

Incorporated Tribal Lands

Free-flow Speed Calibration

Utilized INRIX data, which leverages big data

Programmatic spatial conflation with rigorous manual check/adjustments

Multiple schemes of free-flow speed calculation tested

Rigorous evaluated through volume and modeled speed validation

DAYSIM Improvements

2018 regional household travel survey

Re-estimated parameters with further calibration on major choice models

Time of Day (TOD) Calibration leads to better validated modeled volumes by time periods (new model development tool)

Added functions for TNC and Telework

Request the 2018 Regional Household Travel Survey data

Go to the Data Requests webpage

<https://www.sacog.org/planning/data-resource-center/data-requests>



Questions?

Email: yzhang@sacog.org