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Harnessing the Power of Big Data in Transportation Planning:
A Comparative Analysis of High Accuracy Geolocation Data Sources

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AGENDA

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Data Sources Comparison

	Data Sources	Movement Captured	Location Accuracy	Sampling Rate	Persistent Identifier
Location-Based Services (LBS) Data		People	High	Variable	Yes
Connected Vehicle (OEM and TSP) Data		Vehicles	High	Very High	No

Origin-Destination Trip Matrix

Origin-Destination Trip Matrix
Quantifies the number of trips between different geographic locations—typically zones, cities, or intersections—within a study area over a specific time period.

Answers questions like:
- What is the frequency of trips between each zone based on trip purpose by each time of day?

Used For:
- Transportation modeling
- Infrastructure planning / Project prioritization

month	origin_zone	destination_zone	home_zone	aggregation	time_of_day	purpose	count
202203	219604	193778	219604	Mon_Tue_Wed_Thu	H07:H08	HO	23.7
202203	206934	213228	206934	Mon_Tue_Wed_Thu	H10:H11	HO	5.6
202203	206873	202006	211466	Mon_Tue_Wed_Thu	H12:H13	OW	5
202203	221975	190143	221975	Fri	H11:H12	HO	5
202203	197085	224995	190929	Mon_Tue_Wed_Thu	H15:H16	OO	10
202203	190339	209649	190339	Mon_Tue_Wed_Thu	H16:H17	HO	5

CV vs. LBS Data Trip Matrix Comparison

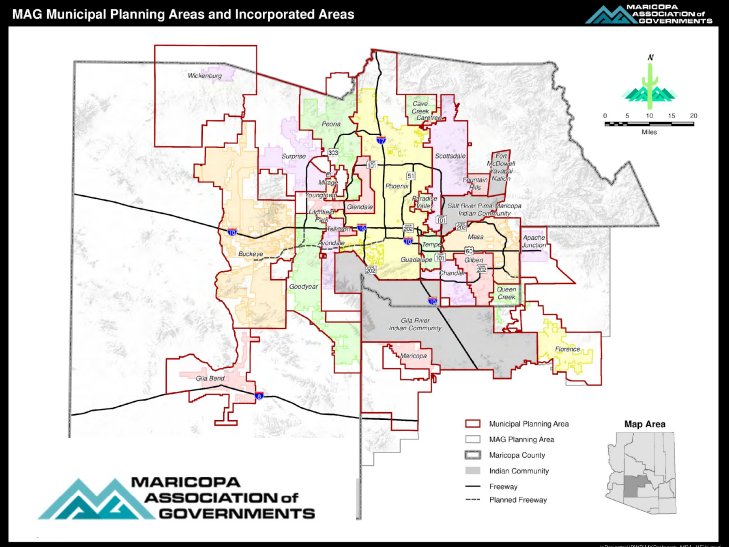
	OEM CV Data	TSP CV Data	LBS Data
Direct Vehicle Measurements	✓	✓★	
Full Population with Modal Representation			✓
Home Locations			✓
Socio Demographic Insights			✓
Trip Purpose			✓
Select Link Analysis	✓	✓	✓★
Micro Trip Matrix (Turning Movements Analysis)	✓	✓	
Main Biases	Cars only	Fleet Composition	

MPO-wide Trip Matrix: Maricopa Association of Governments (MAG) Regional Planning Model

AirSage provided:

Trip Matrix (TM) table output representing the estimated number of people traveling within and between each zone.

MAG leveraged AirSage LBS data among its data sources to ensure it had a complete picture of what was happening, including the movement of non-locals before and during special events.



Case Study: https://airsage.com/case-studies/maricopa-association-of-governments/

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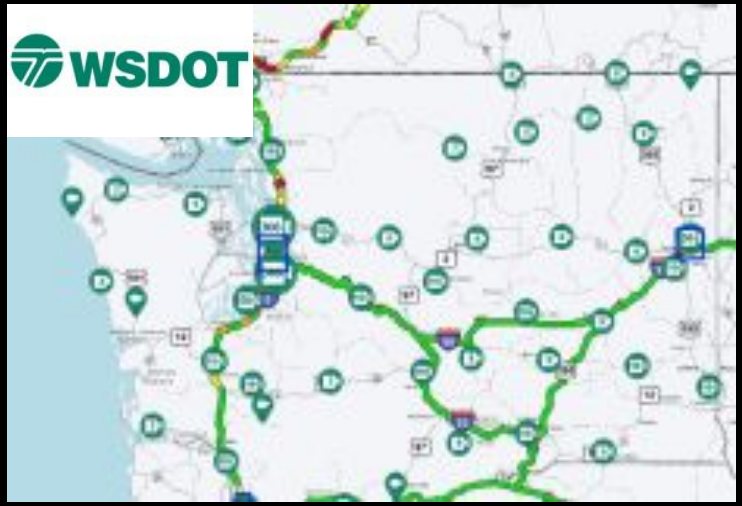
Multi-Statewide Trip Matrix: Washington State DOT Planning Model

AirSage provided:

- ✔ Two Trip Matrix (TM) table outputs based on Census Tract zonal structure for the study area
- ✔ ~2,000 total zones representing the State of Washington and the Amtrak Cascades Line corridor
- ✔ Includes zones into Oregon and Canada



WSDOT employed AirSage LBS data in their Trip Matrix (2023) to update travel flow baselines from a pre-Covid travel demand model using 2019 data.

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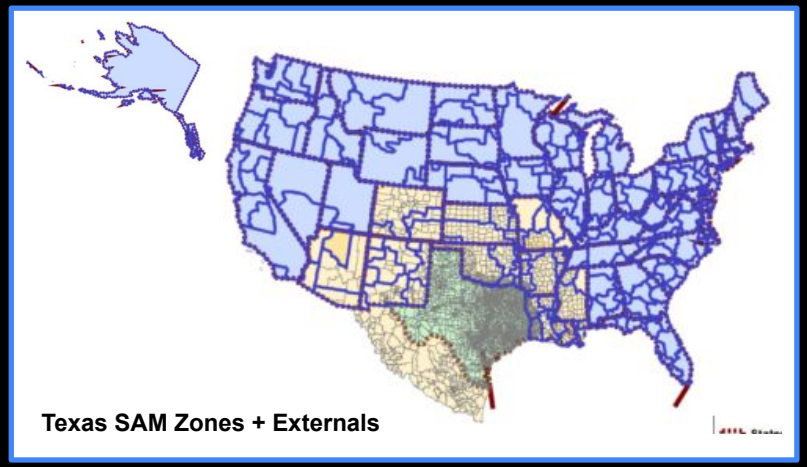
Statewide Trip Matrix: TxDOT's Statewide Analysis Model (SAM) Update

AirSage provided:
Trip Matrix (TM) table output with 6,861 internal zones, 2,394 external zones, and ~250 nationwide halo zones

- ✔ Origin-Destination (O-D) trip matrix
- ✔ E-I, I-E, E-E Analysis
- ✔ Long-Distance trip chaining

TxDOT leveraged AirSage LBS data to provide a statewide trip matrix that included air travel and trip chaining (which could not be provided by CV data).



Texas A&M Transportation Institute

Texas Department of Transportation

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A Combined Approach is Best

By integrating insights from both sources, cities can craft holistic solutions that account for all modes of travel and maximize efficiency. Here's why blending the two is powerful:

- Broader Coverage
- Better Decision-Making
- Enhanced Modeling
- Future-Proof Solutions

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Turn to the most powerful Insights to Build a Better Future

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