Work, Activity, Travel Pattens in Southern California

Post Pandemic Era

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Outline

- Overview of SCAG ABM
- Recovery from the impact of the COVID 19 pandemic
- WHF & Activity & Travel Patterns in post pandemic era
- SCAG ABM Enhancement

SCAG Activity Based Model (ABM)

Highlights

Microsimulation framework

Simulates the daily activities and travel patterns of every individual in the region to estimate vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions.

Add on policy components – telecommuting

Addresses the requirements of metropolitan planning process and relevant State and Federal requirements

Advanced principles of modeling

Flexible

Easily integrated with other non-ABM component such as the existing truck models.

Innovation& Technology

- *Transcad*
- *Amazon Cloud*
- *Big data*
- *Electric vehicle*

SCAG Activity- the largest ABMs in the country- with over 19 million persons in the base year and over 11,000 zones

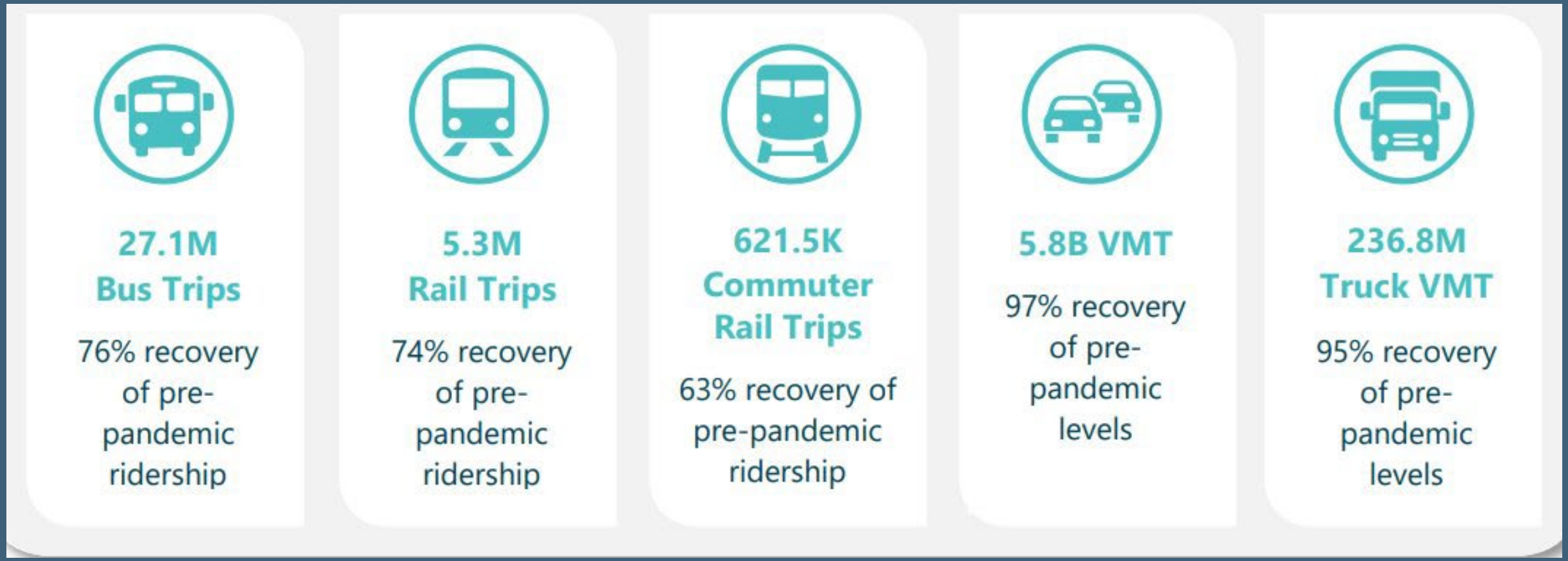
Peer review conclusion

SCAG hosted in-person peer review meeting (2019,2023)

Overall Findings of the Peer Review Panel

The current SCAG travel demand model is an advanced activity-based model based on CT-RAMP2 structure that meets and, in many cases, exceeds the state of the practice. The model is suitable for use in preparing 2024 RTP, conformity analysis, and SCS.

Recovery from the impacts of the COVID-19 pandemic



Transit ridership

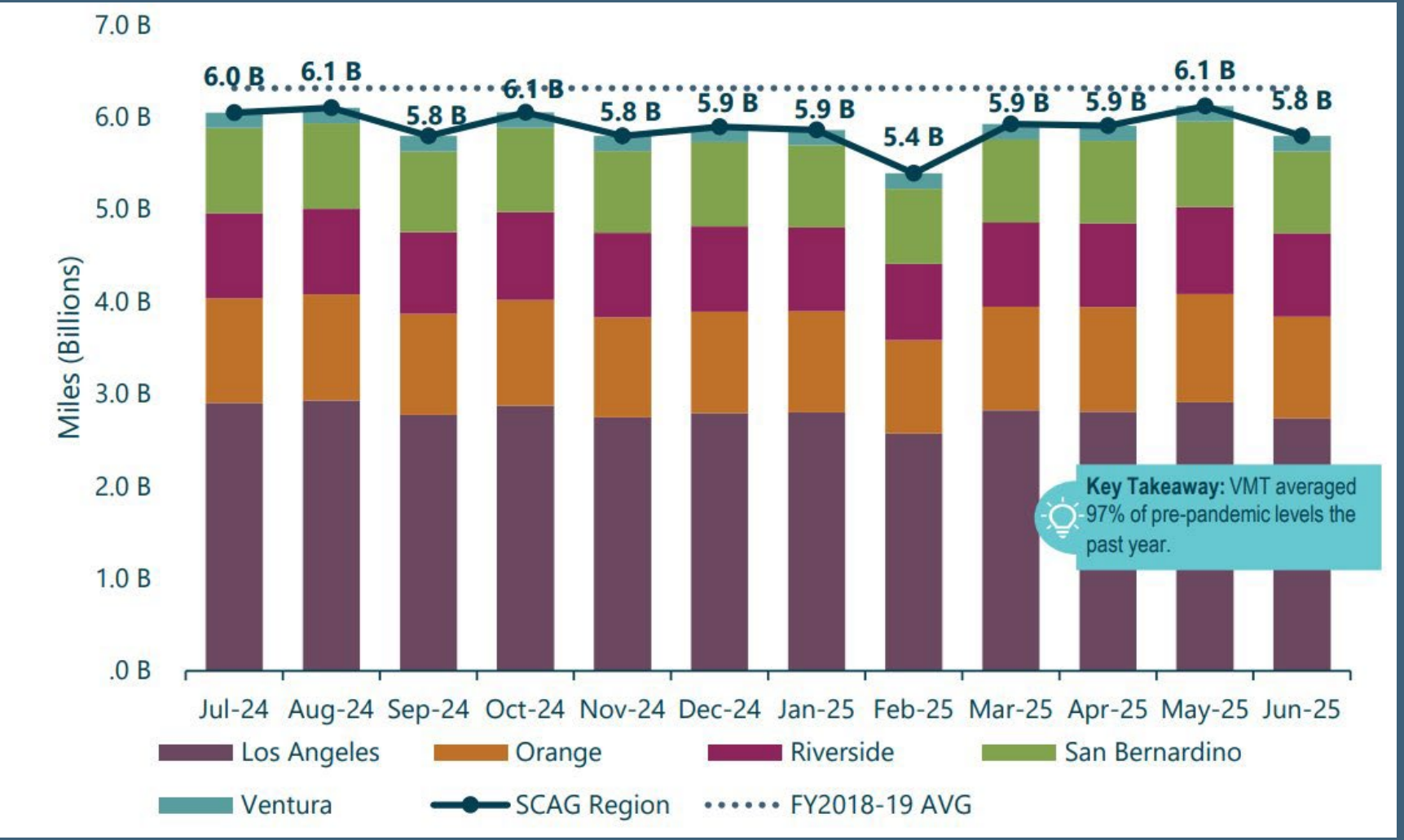
	2019	2020	2021	2022	2023	2024
Metrolink	39,221	5,876	11,777	15,211	19,293	24,307
LA Metro Rail	295,889	160,126	145,150	181,644	194,374	205,038
LA Metro Bus	878,862	490,374	544,935	610,831	688,062	746,464

- **Consistent growth-** LA Metro has been continuous ridership growth since its pandemic lows
- Pre-Pandemic comparison: Overall, weekly ridership in 2024 was around 80% of 2019 level
- Bus vr Rail: Bus ridership has recovered more quickly than rail – continues to be the primary transit mode
- Fare program: the student GoPass program, which offers free transit passes to K-12 and community college students, Low-Income Fare is Easy (LIFE) program-*a 23 percent increase over June 2023 (1,384,218).*

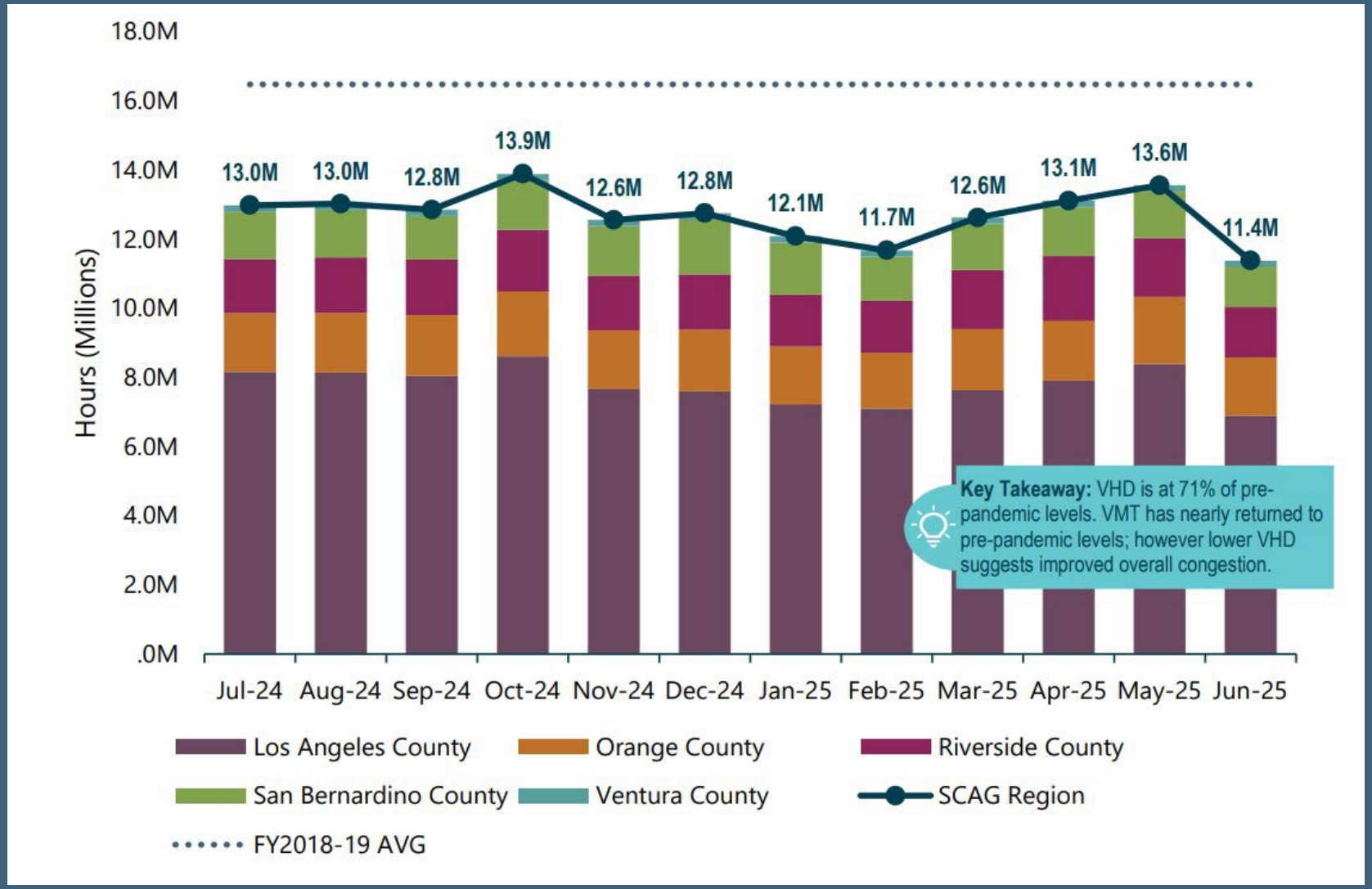
VMT in the SCAG Region by Month

Data source:

- California Performance Measurement System (PeMS).



VHD in the SCAG Region by Month,

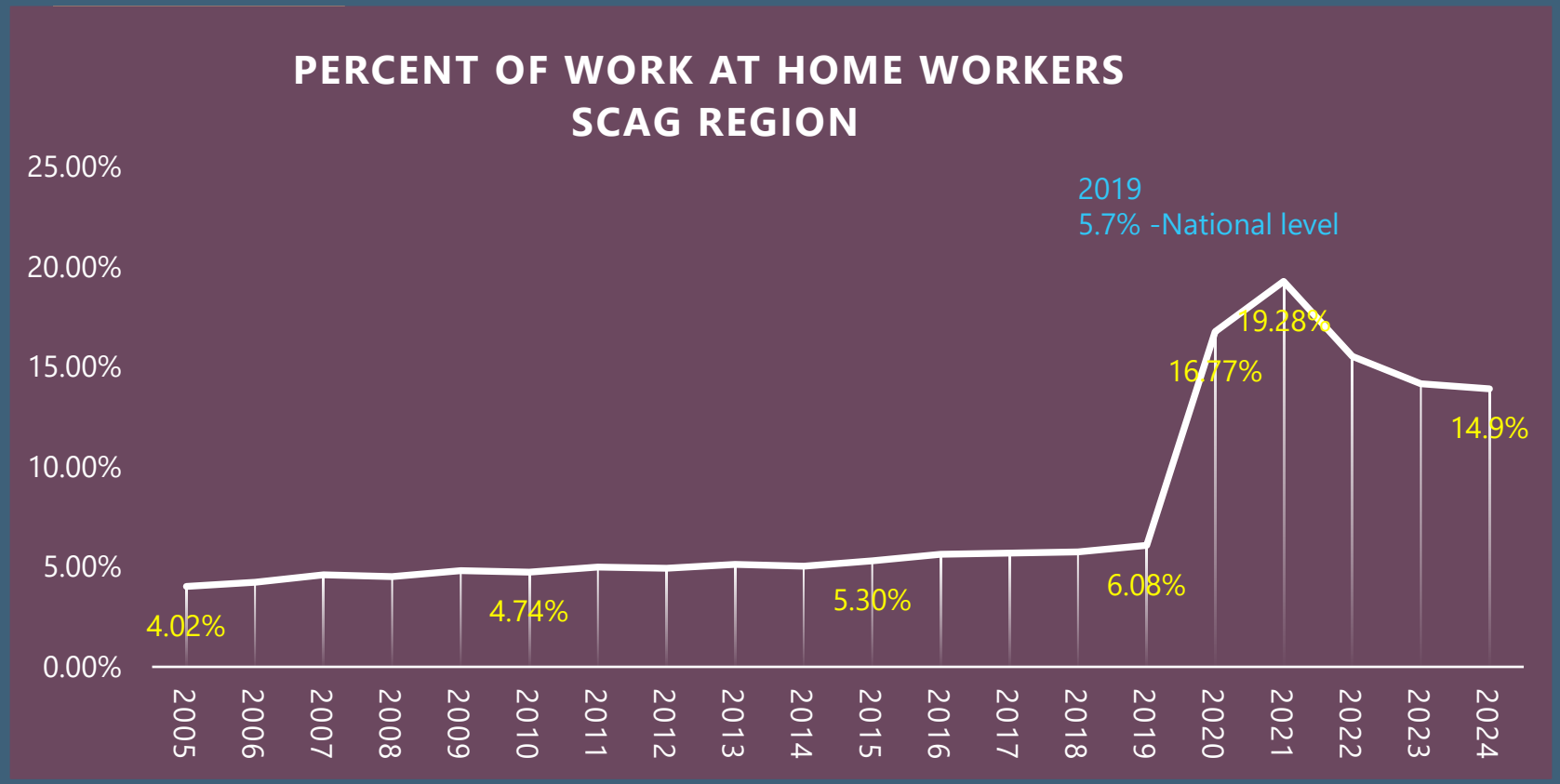


how often, how far, which mode, why and when people travel

KEY POST PANDEMIC CHANGES

ACS - American Community Survey

Q: primary means of transportation to work
"Work at home"



Annual Data	% W@H
1990	2.71%
2000	3.60%
2005	4.02%
2006	4.23%
2007	4.60%
2008	4.52%
2009	4.81%
2010	4.74%
2011	4.99%
2012	4.93%
2013	5.13%
2014	5.04%
2015	5.30%
2016	5.63%
2017	5.69%
2018	5.76%
2019	6.2%
2020	**16.7%**
2021	19.2%
2022	15.5%
2023	**14.1%**
2024	**14.9%**

The work-from-home share stabilized in 2024, settling in at just over double its pre-pandemic level.

- 20 percent of U.S. workers able to work from home (see Kane, Moreno, and Myers 2022).

ACS & SWAA*-Percentage of Workers by Number of WFH

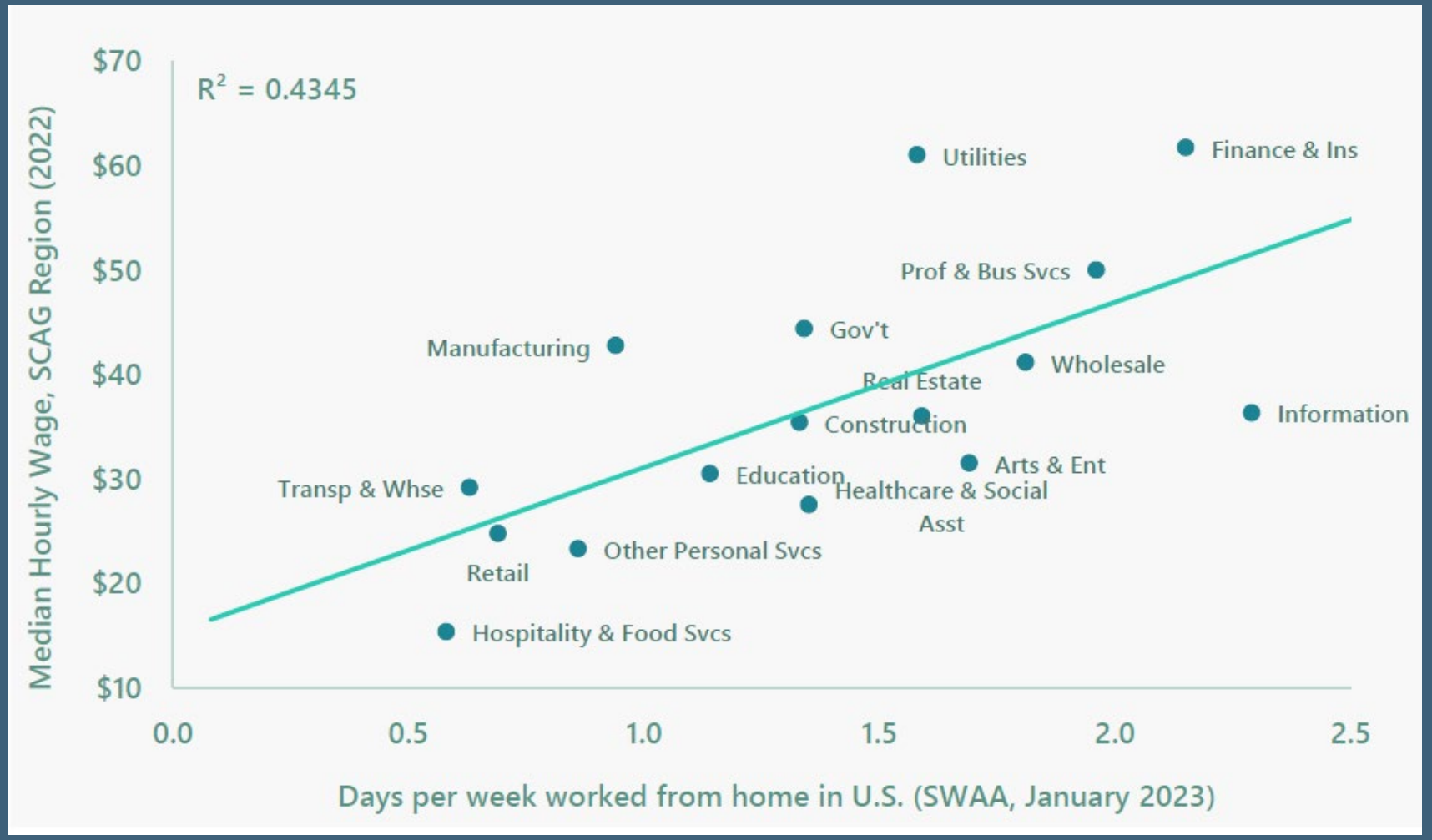
Year	ACS
2019	6.1%
2020	16.7%
2021	19.3%
2022	15.5%
2023	14.2%
2024	14.9%

Survey of Working Arrangements and Attitudes (SWAA) *

Year	Hybrid	Remote	WFH
2022	20.7%	16.5%	37.2%
2023	19.4%	14.9%	34.3%
2024	15.9%	16.9%	32.9%
2025	17.6%	15.6%	33.2%

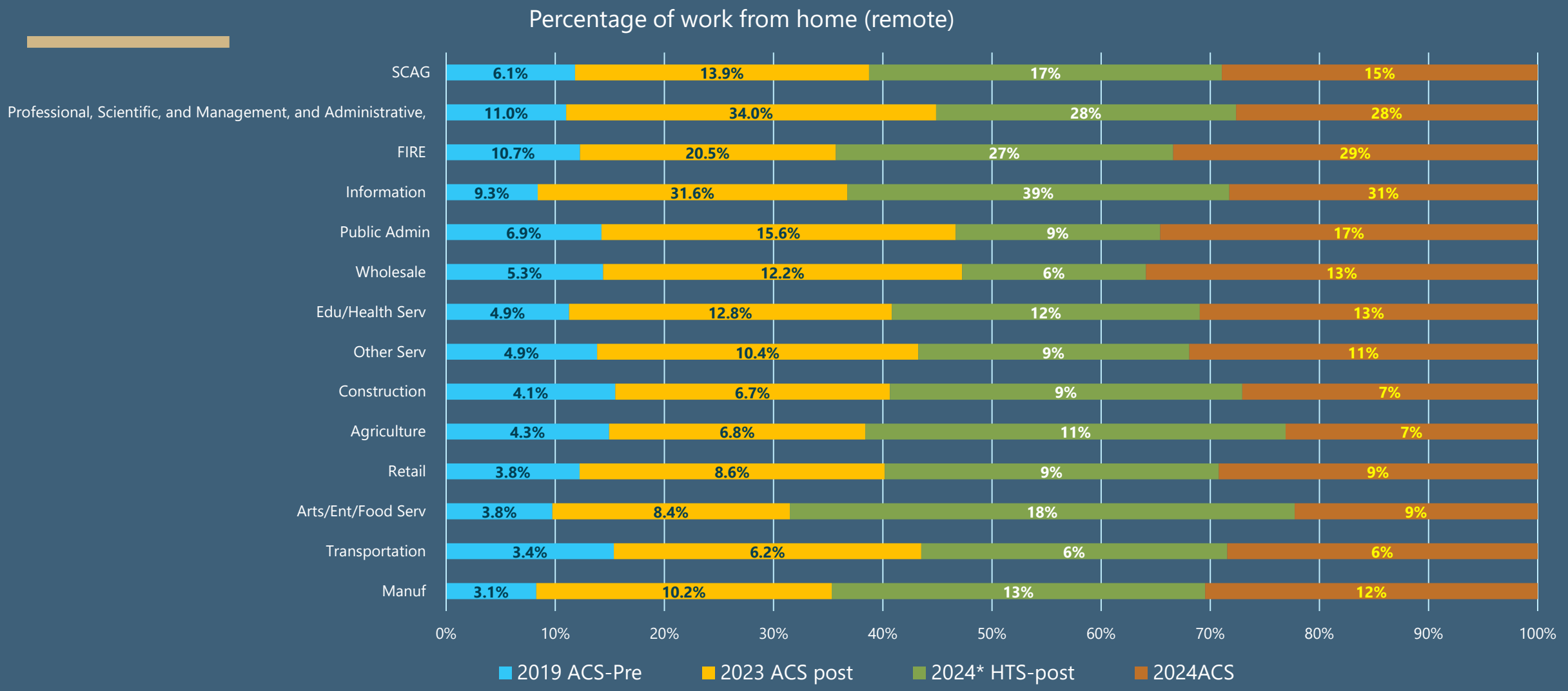
- Initiative were developed in response to the significant impact of COVID-19 on work arrangements
- Work status for each day of the week, categorized as:
  - Did not work
  - Worked from home
  - Worked at an employer or client premises

WHF-By Industry

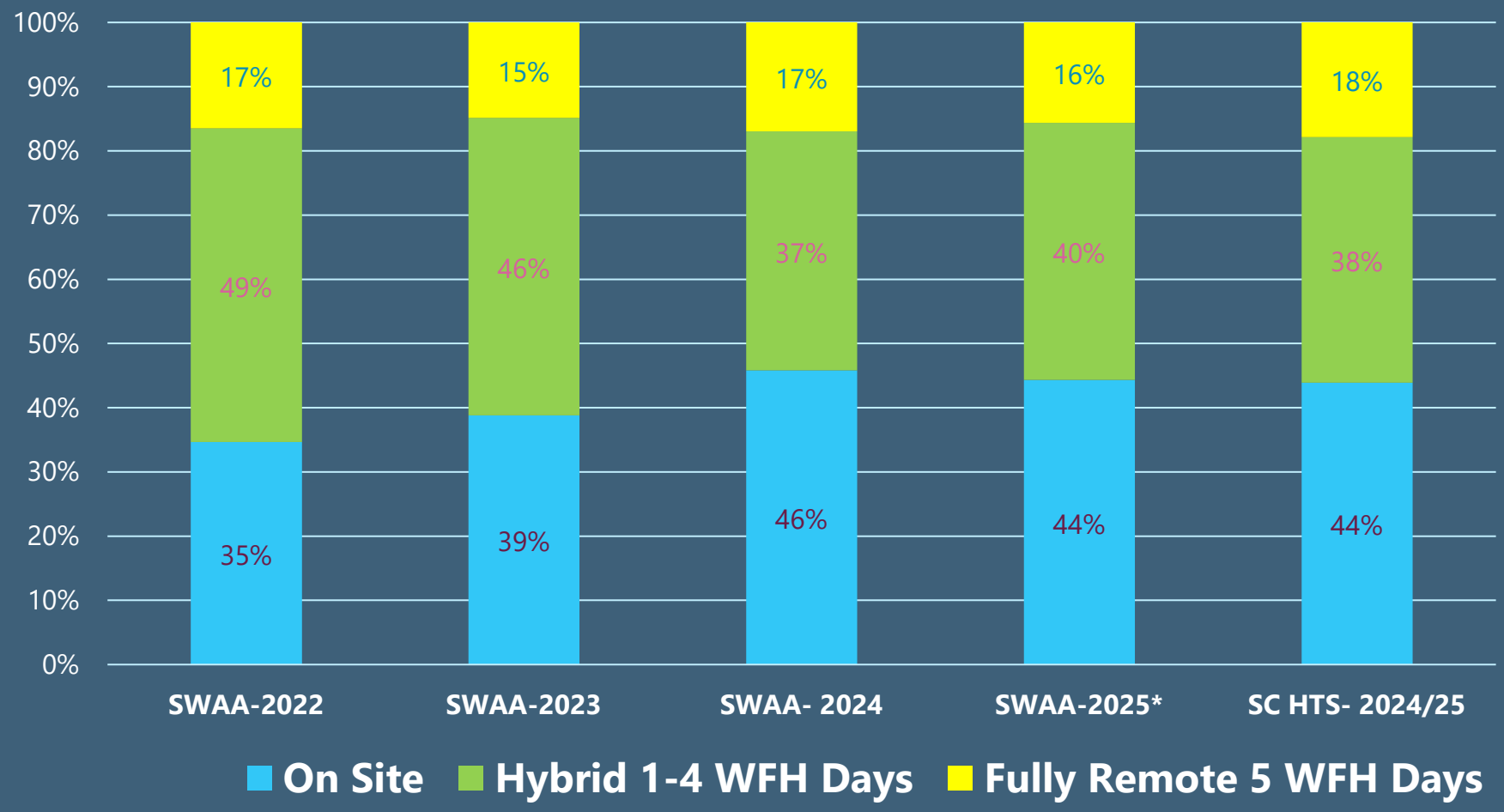


Source: Wage data from BLS QWI LED, WFH data from Barrero, Jose Maria, Nicholas Bloom, and Steven J. Davis, 2021. "Why working from home will stick," National Bureau of Economic Research Working Paper 28731.

Work from home- Industry



Percentage of WFH workers



Work from home- County

- In 2021, Los Angeles County led the way regionally, with 22.2% of employees working from home followed by Orange County (20.9%). Counties in the Inland Empire recorded far lower rates (13.7% in San Bernardino County and 13.6% in Riverside County)
- Imperial, Los Angeles, and Ventura counties saw the biggest surge in remote work share
- In 2024, Orange County has the highest rate of telecommuting at 16.5 percent

WHF & Activity & Travel

Telecommuting/ WFH – been touted as a potential solution to chronic transportation issues

- **Reduce traffic congestion**
- **Lower vehicle emission**
- **Saving time and cost**
- **Improved work-life balance**

Understanding of COVID 19 impact on mobility in SCAG region

Survey analyses

- **ACS** (American Community Survey)
- **SWAA** (US Survey of Working Arrangement and attitudes)
- **UC Davis -SCAG survey, SoCal HTS, NHTS**

SCAG ABM enhancement

- **Vehicle type choice (Body ,Fuel, AV)**
- **Telecommute model**

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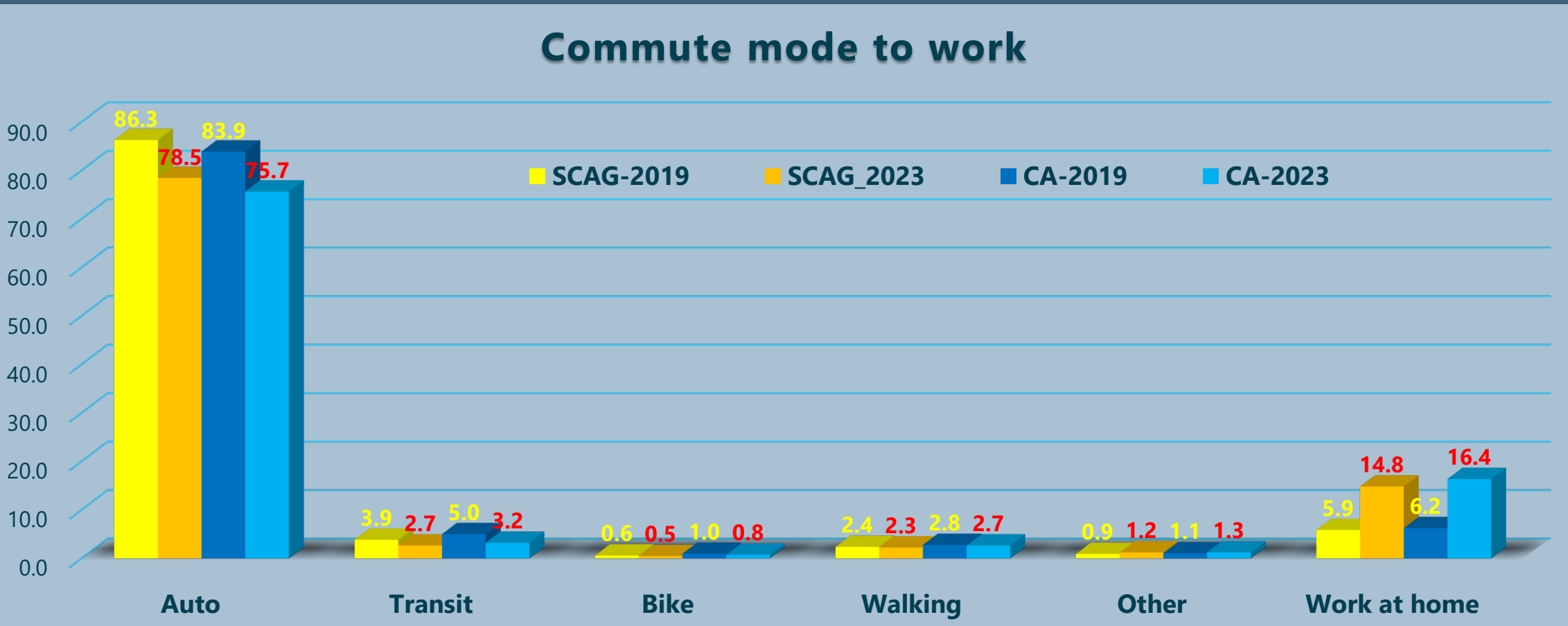
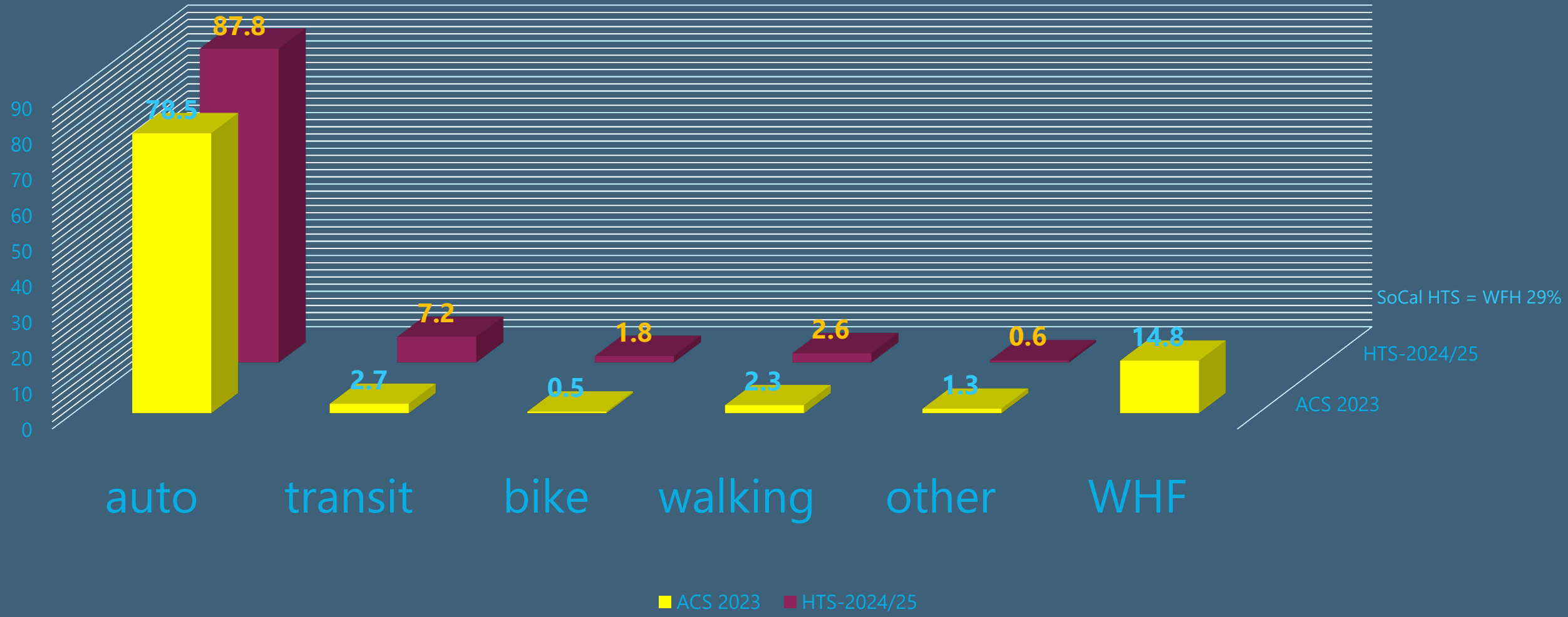
ACS- 2019-2023 – Commute mode

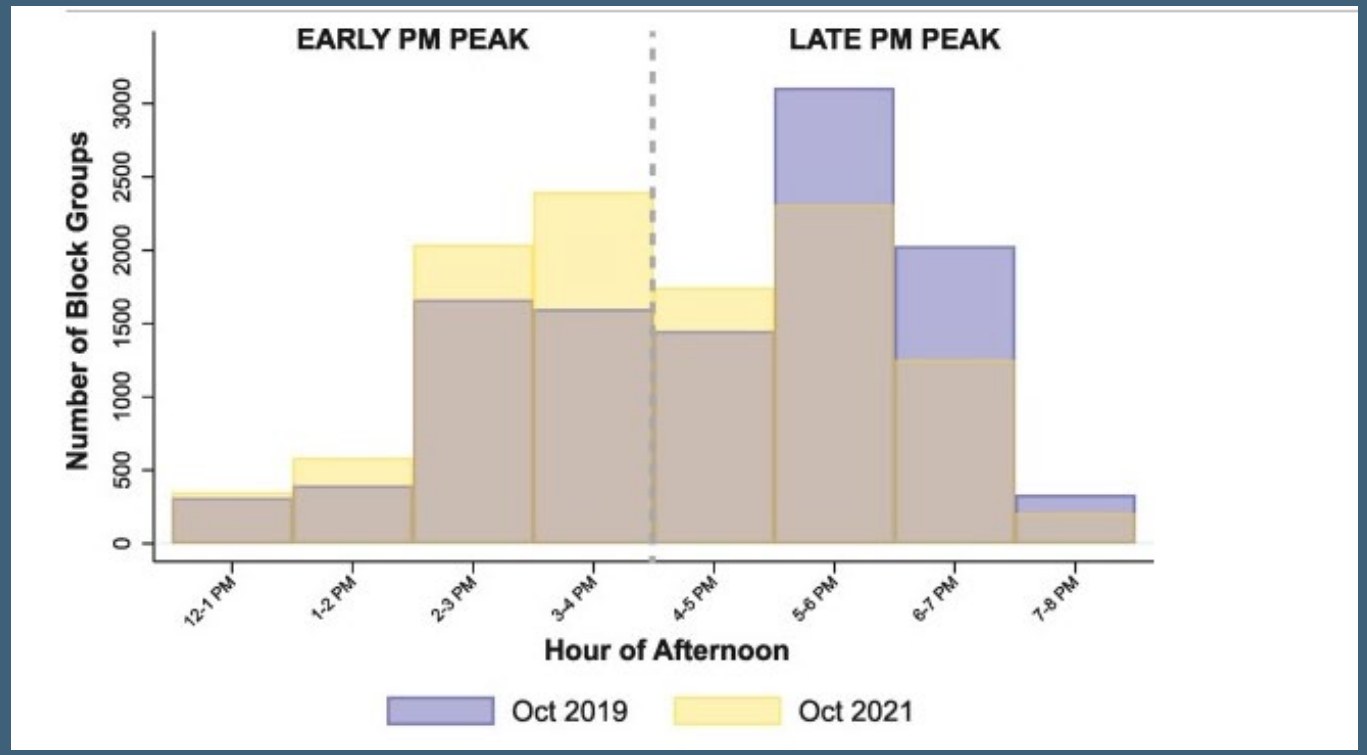


Commute mode –ACS and SoCal HTS



Trips by hour

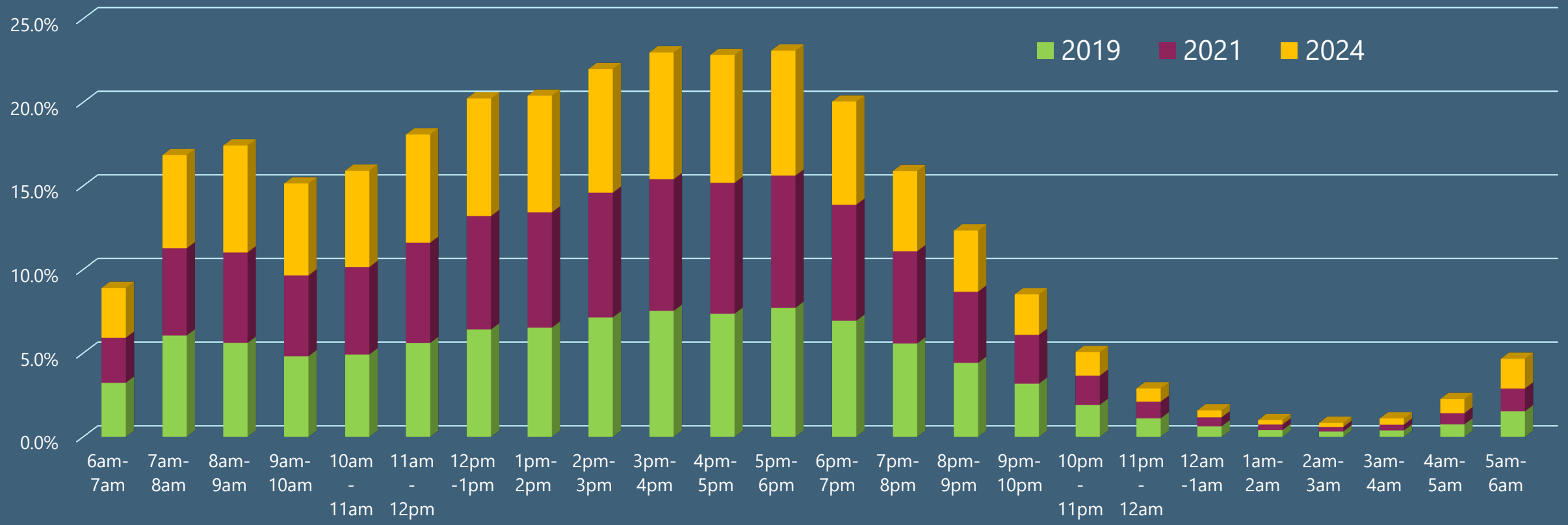
- Speroni et al., 2024 : Peaked too soon? Analyzing the shifting pattern of PM peak period travel in Southern California (UCLA ITS)
  - Found notable shifts in timing of post pandemic PM peak travel
  - Peak afternoon evening trip making hour shifted from 5-5:59pm to 3-3:59pm
  - More late PM peak trip making prior pandemic , and more early PM peak trip making in 2021



Source: Streetlight
Average Daily Zone Traffic (StL Volume)
2019,2021,2024

Trips by hour

Weekday: Average daily volume by hour

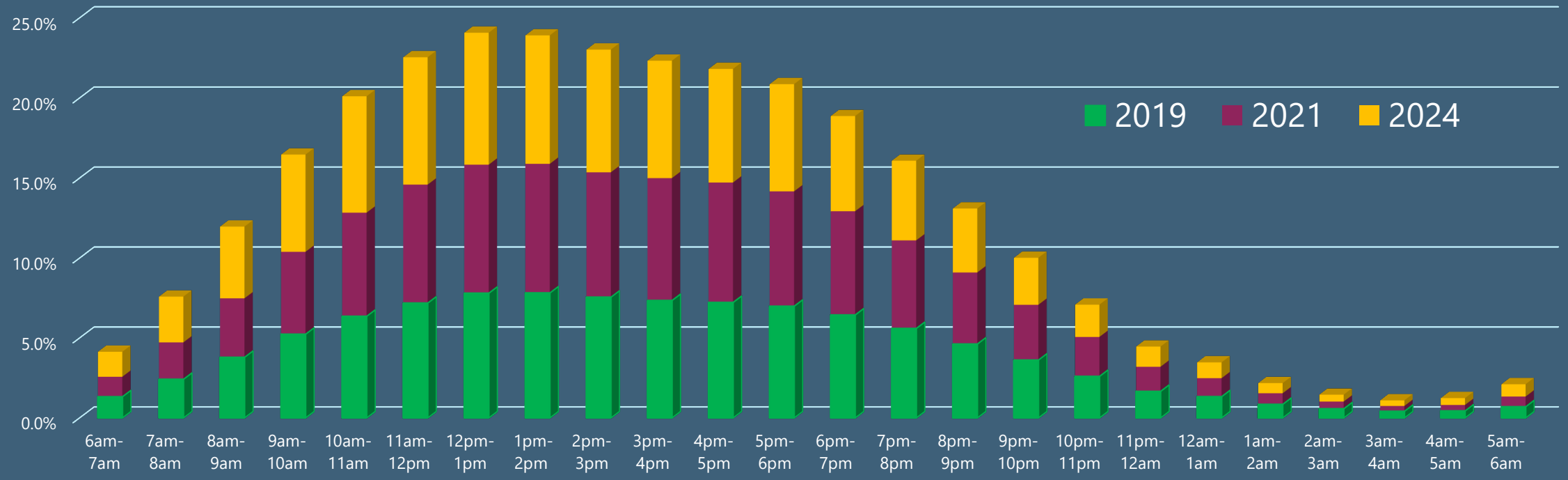


	AMPEAK					Midday				PM peak			Evenining				Night					
2024	3.0%	5.6%	6.4%	5.5%	5.8%	6.5%	7.0%	7.0%	7.4%	7.6%	7.7%	7.5%	6.2%	4.8%	3.7%	2.4%	1.4%	0.8%	0.4%	0.3%	0.2%	0.4%	0.9%	1.8%
2021	2.7%	5.2%	5.4%	4.8%	5.2%	6.0%	6.8%	6.9%	7.5%	7.9%	7.8%	7.9%	6.9%	5.5%	4.3%	2.9%	1.7%	1.0%	0.5%	0.3%	0.3%	0.3%	0.7%	1.4%
2019	3.2%	6.1%	5.6%	4.8%	4.9%	5.6%	6.4%	6.5%	7.1%	7.5%	7.4%	7.7%	6.9%	5.6%	4.4%	3.2%	1.9%	1.1%	0.6%	0.4%	0.3%	0.4%	0.7%	1.5%

Trips by hour

Weekend Daily average volume

Source: Streetlight
Average Daily Zone Traffic (StL Volume)
2019,2021,2024



	6am-7am	7am-8am	8am-9am	9am-10am	10am-11am	11am-12pm	12pm-1pm	1pm-2pm	2pm-3pm	3pm-4pm	4pm-5pm	5pm-6pm	6pm-7pm	7pm-8pm	8pm-9pm	9pm-10pm	10pm-11pm	11pm-12am	12am-1am	1am-2am	2am-3am	3am-4am	4am-5am	5am-6am
	AMPEAK						Midday				PM peak				Evenining						Night			
2024	1.6%	2.9%	4.5%	6.1%	7.3%	8.0%	8.2%	8.0%	7.7%	7.3%	7.1%	6.7%	5.9%	5.0%	4.0%	2.9%	2.0%	1.3%	1.0%	0.6%	0.4%	0.3%	0.4%	0.8%
2021	1.2%	2.3%	3.7%	5.1%	6.5%	7.4%	8.0%	8.1%	7.8%	7.6%	7.5%	7.2%	6.5%	5.5%	4.5%	3.5%	2.5%	1.5%	1.1%	0.7%	0.4%	0.3%	0.4%	0.6%
2019	1.3%	2.4%	3.8%	5.2%	6.4%	7.2%	7.8%	7.8%	7.6%	7.4%	7.2%	7.0%	6.4%	5.6%	4.6%	3.6%	2.6%	1.7%	1.3%	0.9%	0.6%	0.4%	0.4%	0.7%

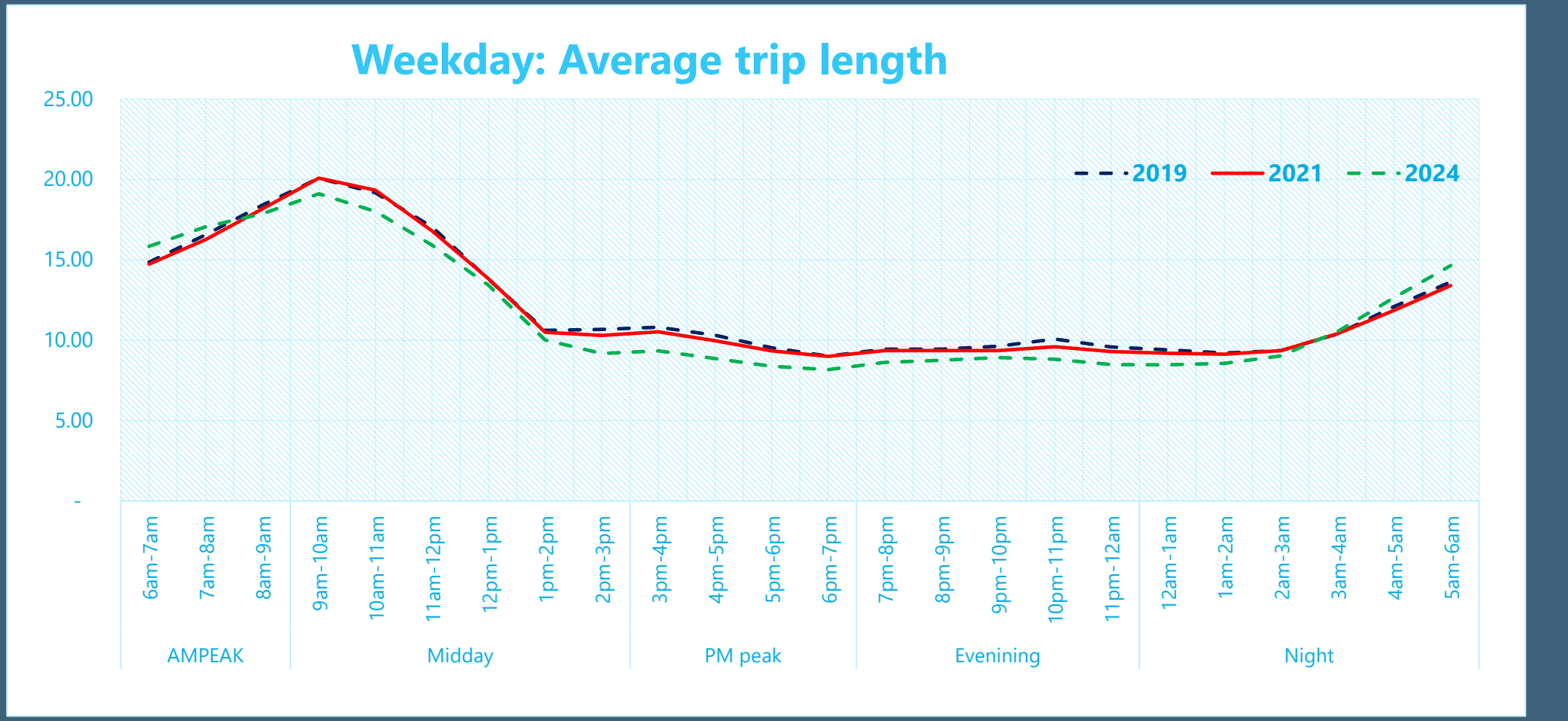
Trips distance

- Little is known about changes in Americans' travel patterns in trips by distance (Chen and Steiner, 2022) -data limitation
- In the early pandemic phase, residents in California, Illinois, New York, and Washington reduced their travel distance by over 80 % (Warren and Skillman (2020)
- The sustained travel pattern shows that Americans still travel less overall, mostly due to the decrease in short trips less than 25 miles (Chen and Steiner, 2022)

how far people travel ?

Trips distance

Source: Streetlight
Avg Trip Length (mi))
2019,2021,2024



Trips distance

Source: Streetlight
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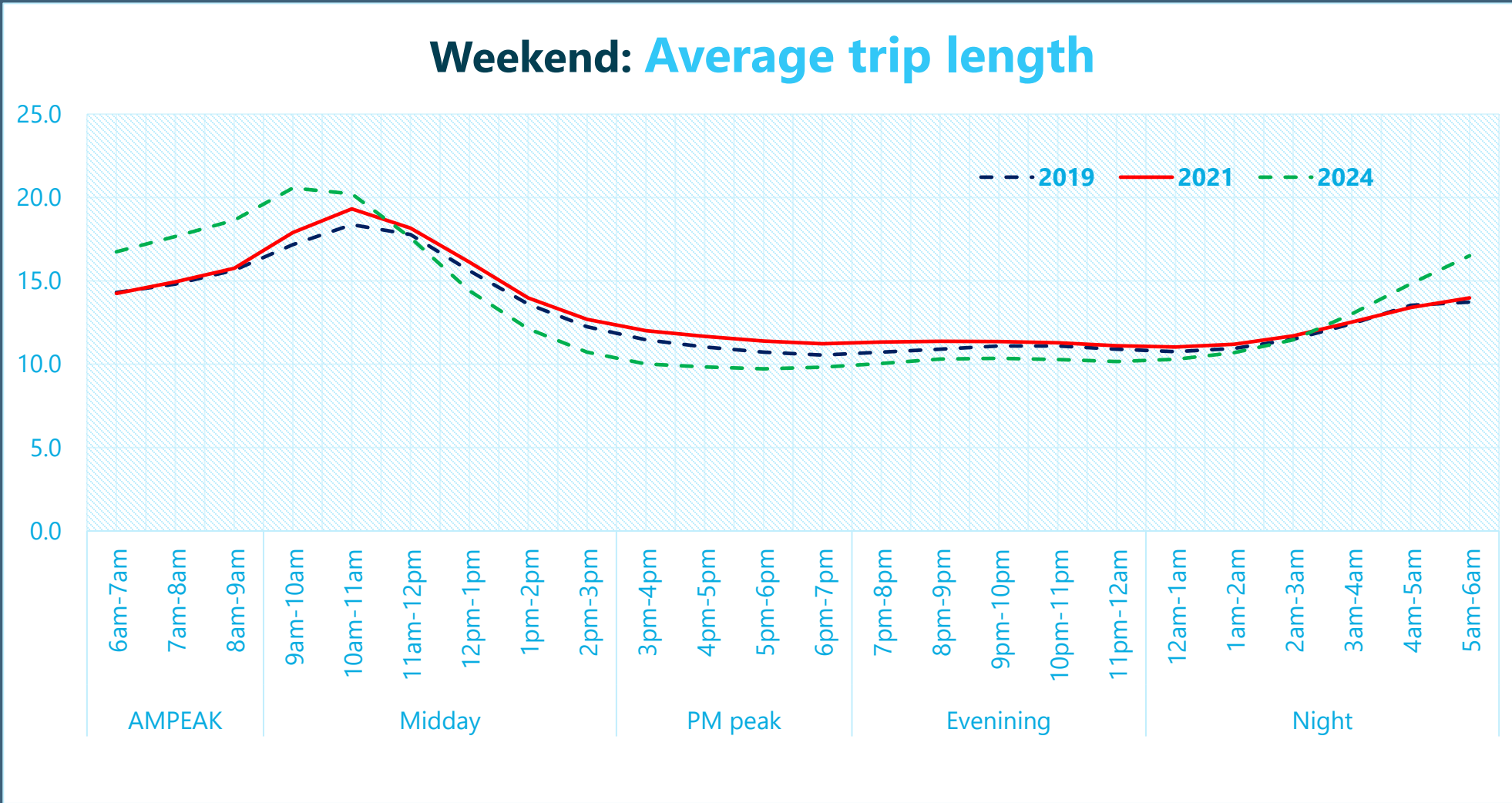


Rebound impact-WFH

- Work from home allows people to avoid commuting, it may have some negative effects, often described as *rebound effects*.

- Telecommuting and remote services have become increasingly popular strategies in the SCS program after the COVID-19 pandemic, which have led to renewed interest in these strategies to create more sustainable communities.

- Reduced commute opens space in peoples' schedules… *and on roadways*
  - Remote workers making additional trips when they work from home, or at other times
  - Hybrid or remote workers relocating farther from work

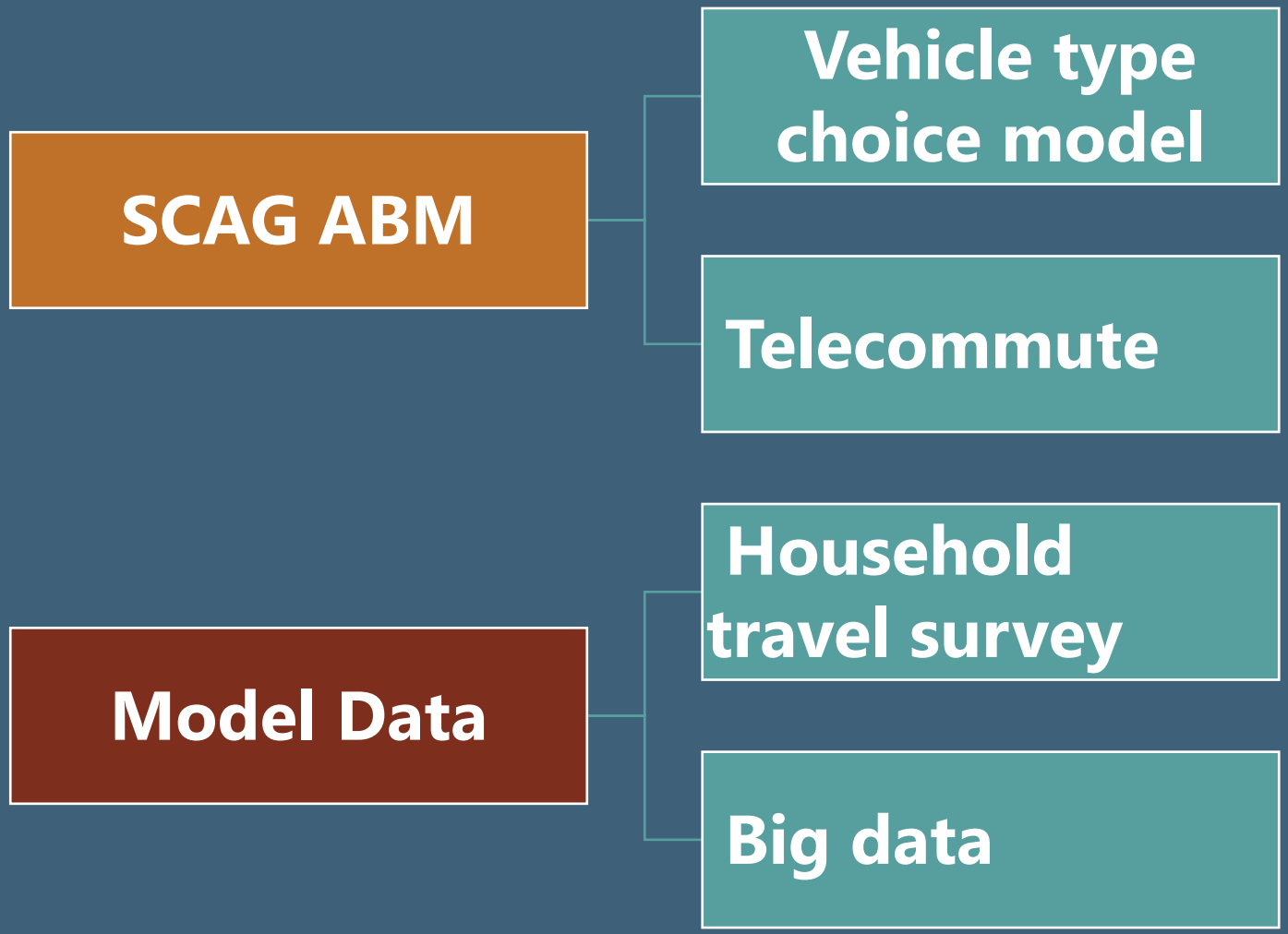
Rebound impact 2024 RTP/SCS

- The VMT rebound effect due to working from home is integrated into the SCAG model
- With a 10% increase in WfH workers, LM VMT is reduced by **3%**, reflecting a 32% rebound effect from VMT savings due to reduced commuting

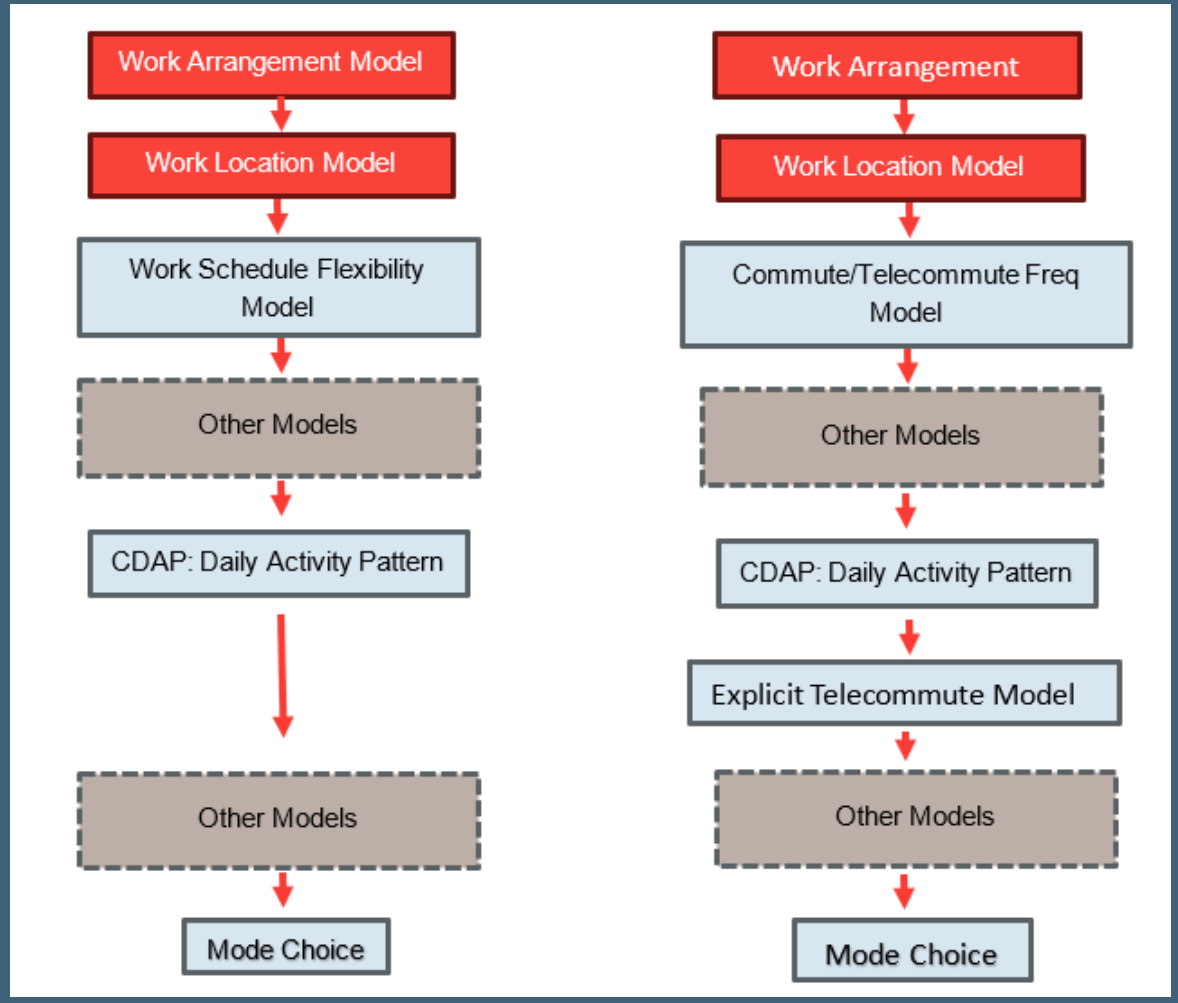
	%
Work VMT to Total LM VMT (SCAG Analysis)	44.7%
With Additional 10% WfH Workers	
Expected LM VMT reduction	-4.47%
Model Result	-3.04%
VMT Rebound	1.44%
% VMT Rebound	-32.1%

SCAG ABM ENHANCEMENT

ABM-enhancements



ABM enhancement: Telecommute sub-model



SCAG | SoCal Transportation Study

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SoCal Transportation Study

Data Collection Waves:

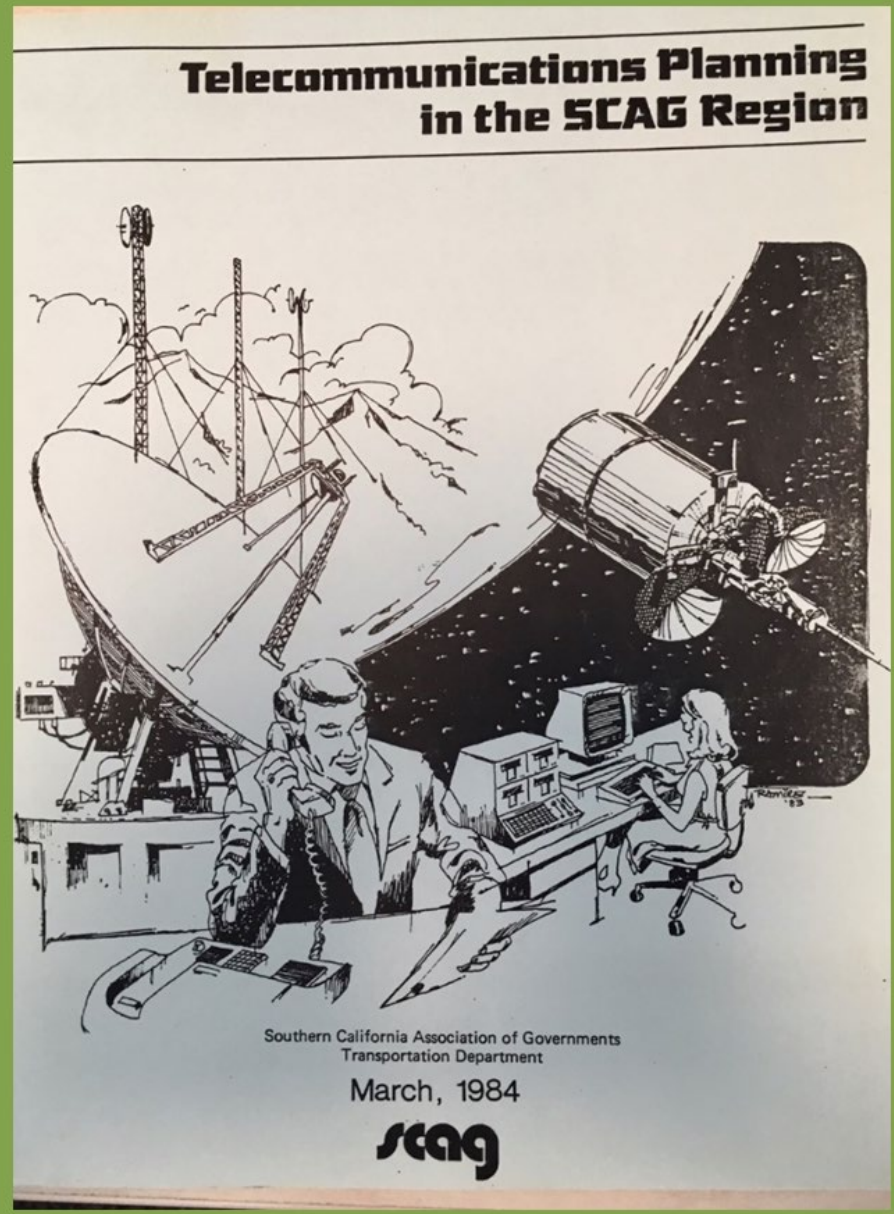
- Wave 1 (Fall 2024): Sept. 19 – Nov. 3, 2024:
- Wave 2 (Spring 2025):
- Wave 3 (Fall 2025):
- Wave 4 (Spring 2026)

Conclusion

- The SCAG region's travel patterns reflect an ongoing but uneven recovery
- Bus, light and heavy rail, and commuter rail ridership are steadily climbing, but remain below pre-pandemic ridership levels
- Roadway volumes are close to rebounding, yet congestion levels remain lower, reflecting lasting impacts of remote work and evolving commute habits
- Notable shifts in timing of post pandemic PM peak travel, along with a reduction in overall travel distances

Conclusion

- The work-from-home share stabilized in 2024, settling in at just over double its pre-pandemic level.
- Looking ahead, SCAG is committed to continued evaluation and ongoing model improvement.
- SCAG is currently enhancing its travel survey data and improving SCAG ABM to better capture post-pandemic travel patterns



THANK YOU

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