

Transportation Challenges Post COVID-19

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Outline

- Context
- Freight
- Roadway person travel
- Air travel
- Transit
- Policy Issues



The Context

- **Transportation will be different** in the post-COVID era. The impact of COVID and the probable residual impacts are unprecedented.
- **Transportation recovery from COVID and its economic consequences** remain speculative and will vary by mode and context, taking years to fully play out.
- **USDOT pre-COVID programs and policies, and emergency actions** taken in response to COVID may be unsustainable or undesirable going forward.



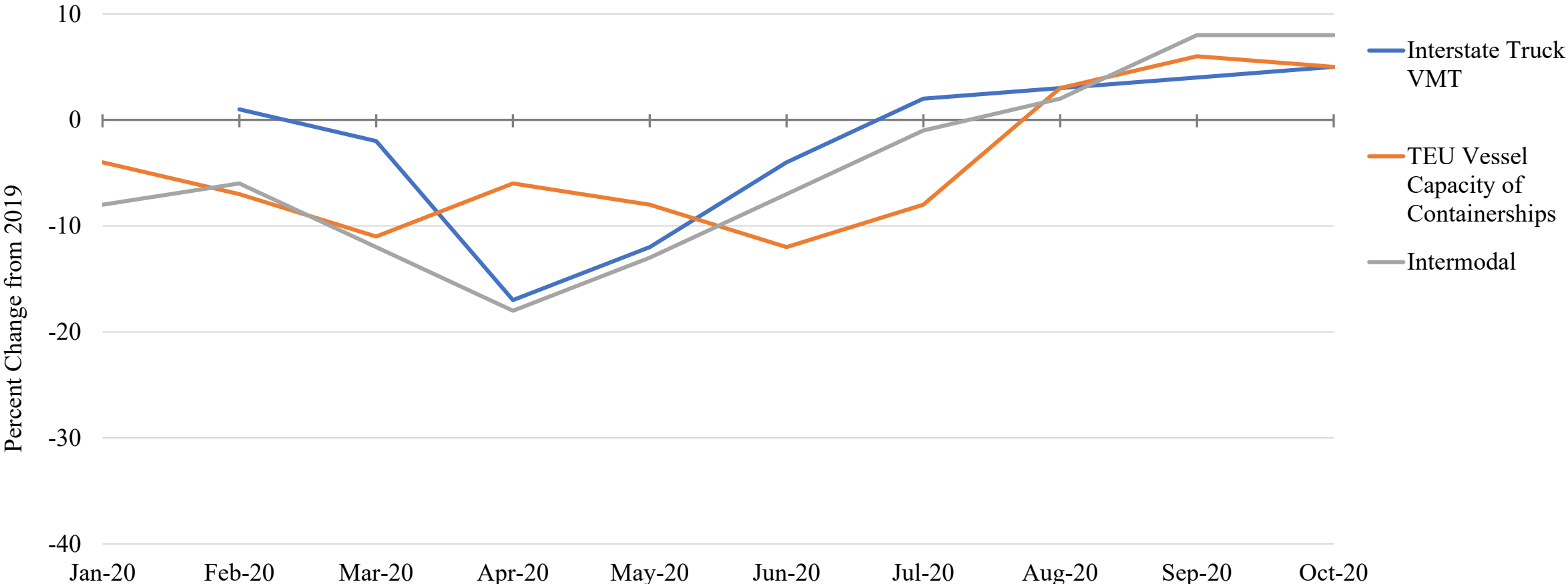
The Context

- **Reauthorization, Infrastructure initiatives and a new administration actions** should review and address how fundamental governmental responsibilities are carried out post-COVOD. This includes:
 - planning,
 - funding,
 - spending priorities,
 - regulation,
 - respective roles of the different levels of government, and,
 - the role of government relative to the private sector



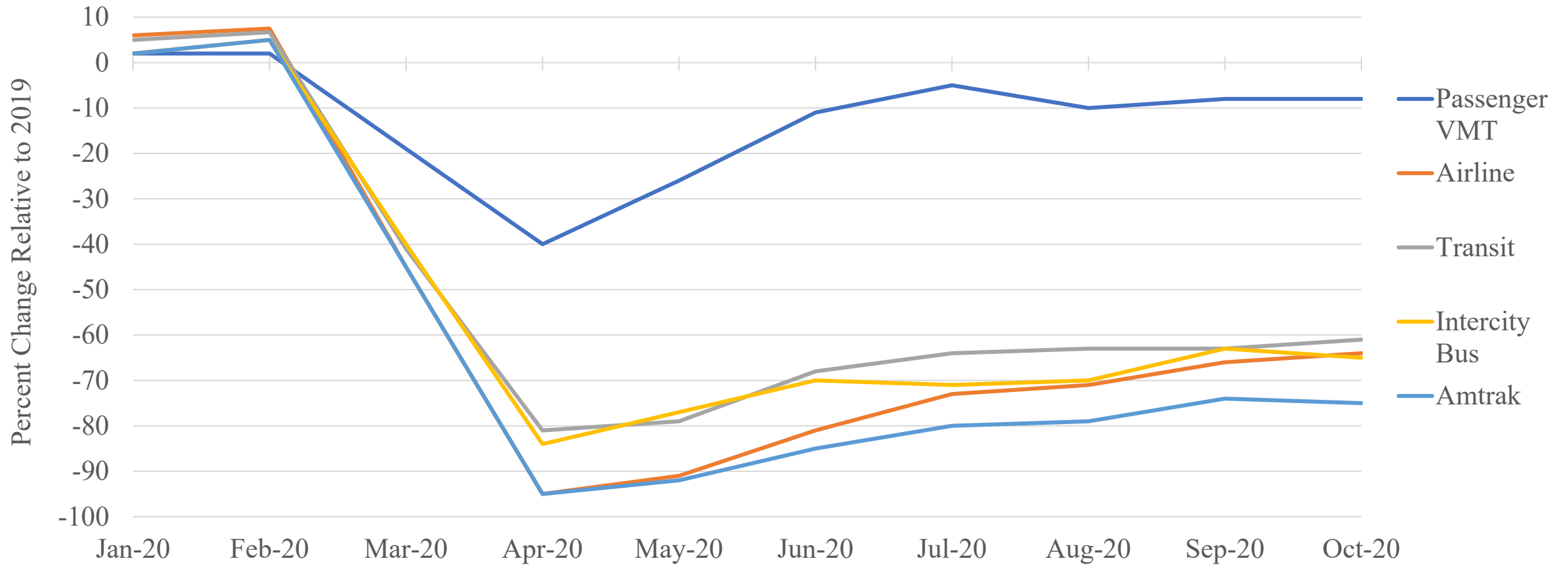
Freight Trends

Freight has rebounded to higher levels.



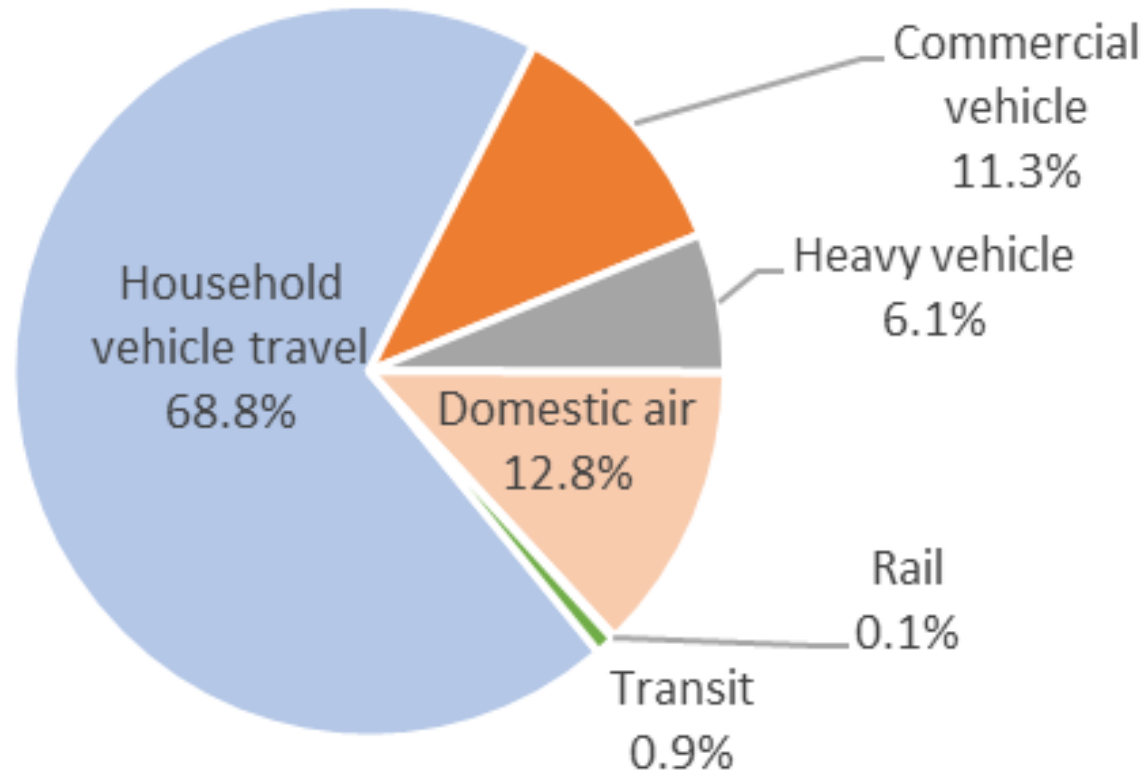
Change in Travel Demand

Shared-use modes, such as airlines, transit, intercity bus, and Amtrak declined more than passenger VMT.



Annual Estimated U.S. Person Miles of Travel by Mode 2019

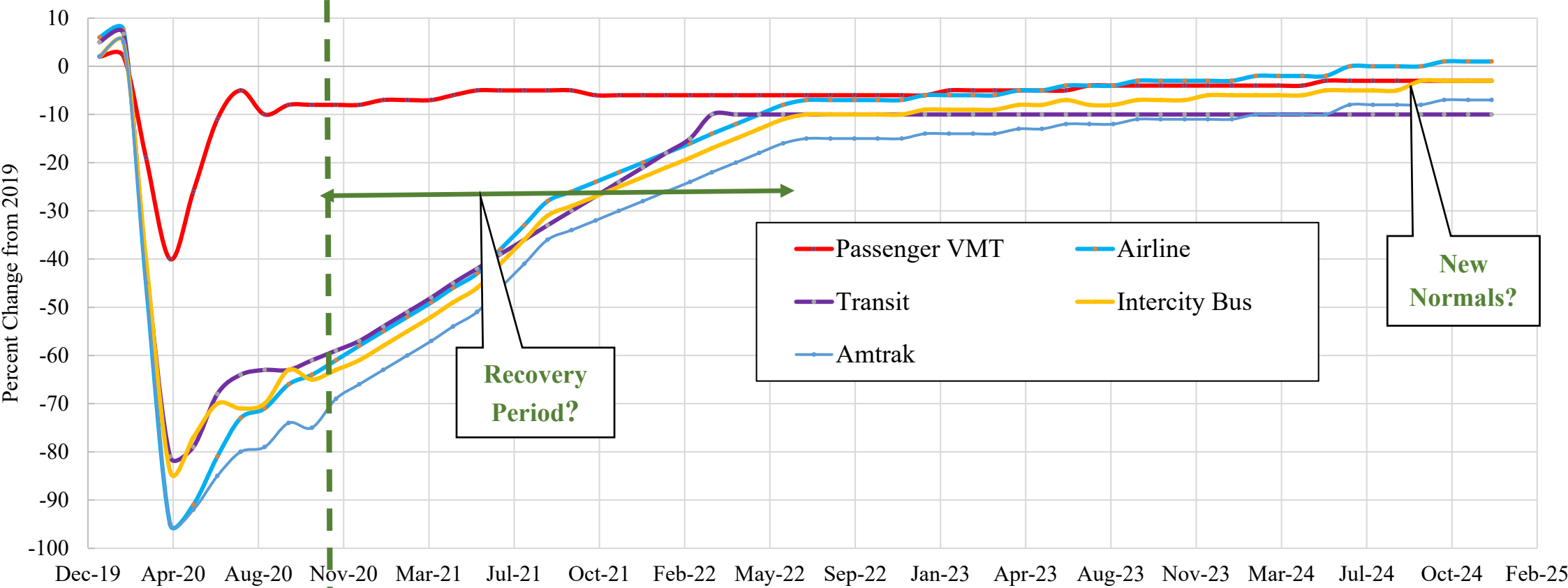
Household vehicle travel dominates person miles traveled.



Source: OST-R analysis of NHTS and BTS data.

Potential Recovery Scenarios by Mode (Estimates)

It is going to be a multi-year recovery. We do not know when modes will be back to a stable trend, which could be different from pre-COVID.



* Taxi/TNC, Bike/Scooter, Walk not shown.

Scenario of Change in Demand Relative to 2019 (%)

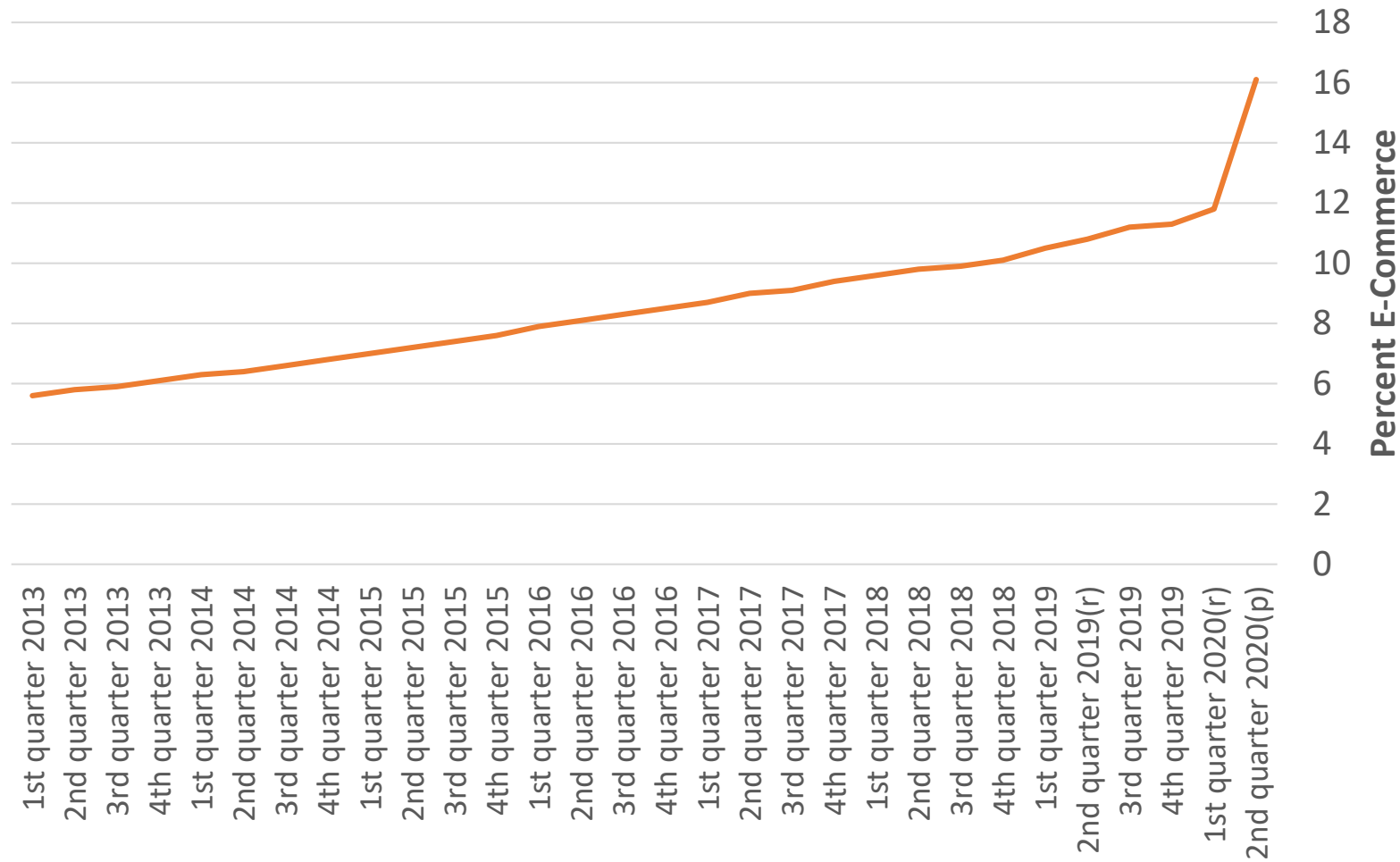
The shape of the recovery curves remains uncertain.

	2020	2021	2022	2023	2024
Passenger VMT	-11.6	-5.8	-6.0	-4.5	-3.3
Airline	-57.6	-36.3	-9.9	-3.6	-1.7
Transit	-52.0	-37.5	-11.1	-10.0	-10.0
Intercity Bus	-54.8	-39.3	-12.9	-7.8	-4.7
Amtrak	-62.8	-44.3	-17.9	-12.3	-8.7

Blue cells are for modes where future demand will be further affected by service and price changes, if subsidies were not available.

* Taxi/TNC, Bike/Scooter, Walk not shown.

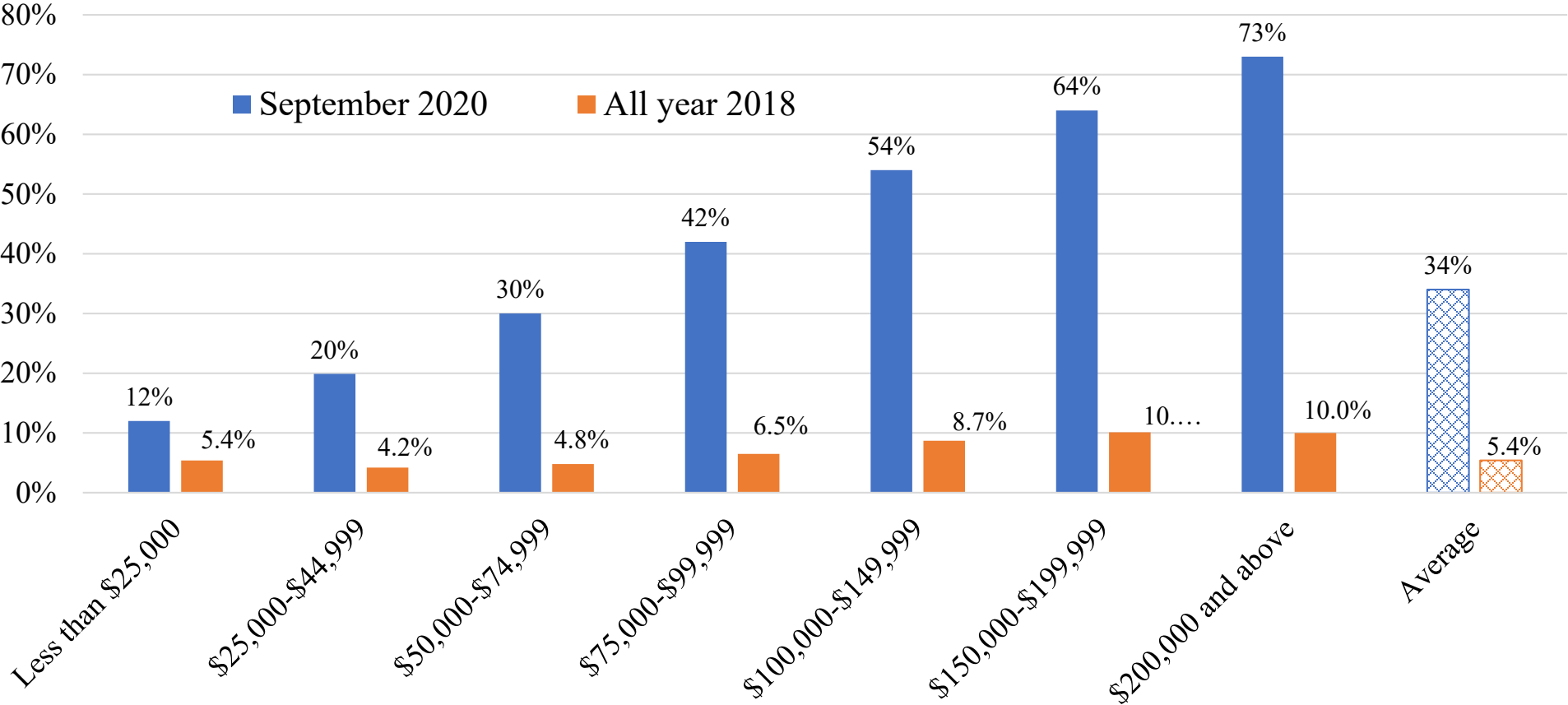
Estimated Quarterly U.S. Retail Sales (Adjusted): E-commerce



2020 Census Monthly Retail Trade Report.

Post-COVID Telecommuting Levels Will Be Higher

2020 substituted work-at-home for usual work location and 2018 telecommuters by income.



2020 Census Pulse Survey, persons who previously commuted to a place of work. Sept 2-14, 2020

2018 ACS, Usual means of commuting in prior week for all workers.

Workers Want More Telework

Many workers would like to continue some telecommuting, which is functioning well for some purposes.

Benefits of Telework

- **51%** report being more productive, **44%** as productive.
 - Fewer interruptions (**68%**)
 - More focused time (**63%**)
 - Quieter work environment (**68%**)
 - More comfortable workplace (**66%**)
 - Avoiding office politics (**55%**)
- Many reported personal lives have improved.
 - 79% cited the lack of commuting.
 - 72% enjoying the lack of commuting costs.

Drawbacks of Telework

- **49%** miss seeing their colleagues, **14%** miss chats.
- **11%** reported being lonely.
- **7%** cited “distracted” as a reason for missing the office.
- **12%** worried about the impact on their career.
- **20%** of workers say they find it difficult to “unplug.”
- **37%** miss nothing.

Post-COVID Plans

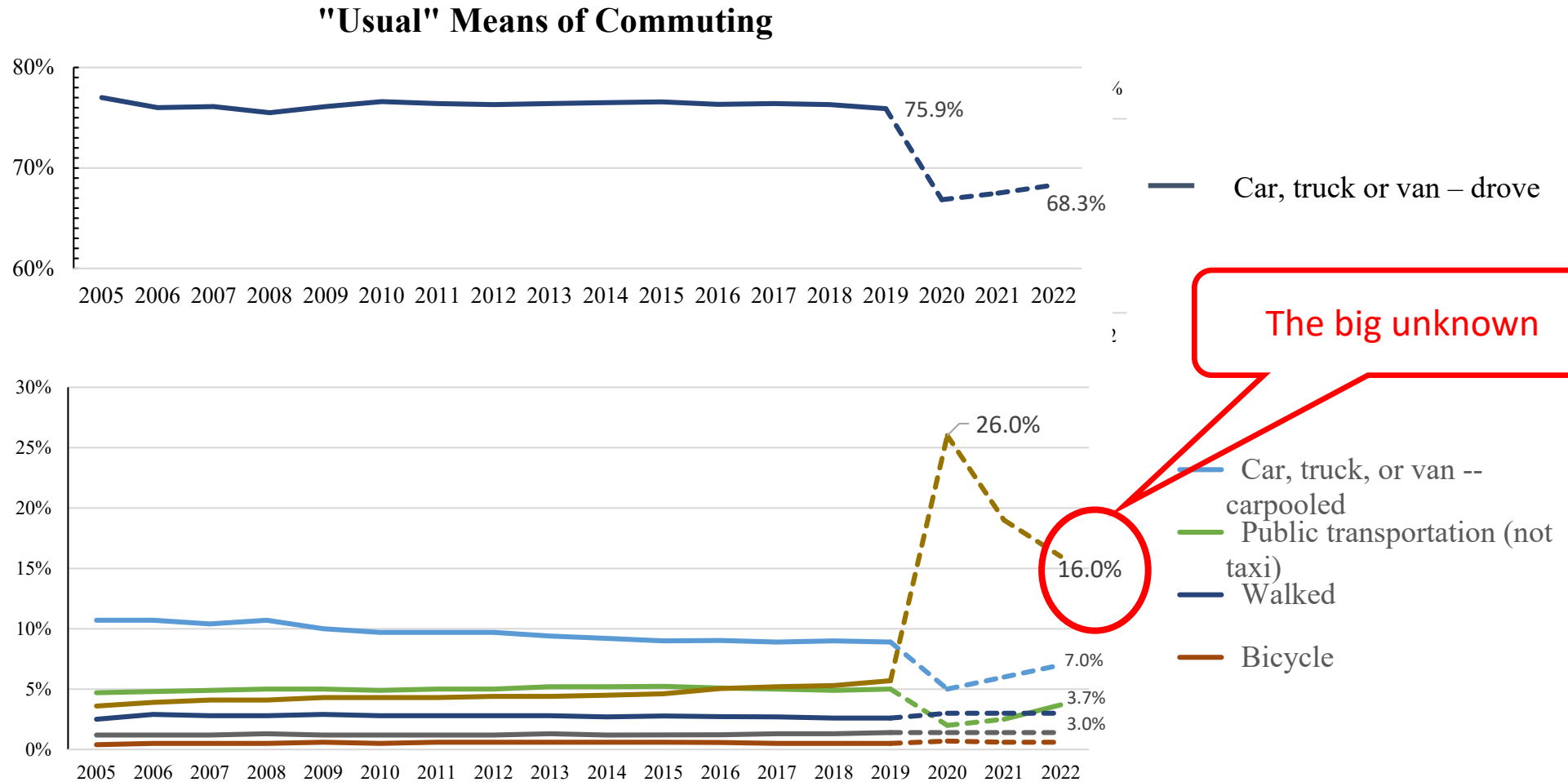
- 65% of respondents want to become full-time remote employees post-pandemic.
- 31% would prefer a hybrid work arrangement.
- 4% would prefer to return to the office full-time.

Source: FlexJob Survey of 4,000 remote workers <https://www.flexjobs.com/blog/post/survey-productivity-balance-improve-during-pandemic-remote-work/>



Unprecedented Changes in Commuting Behaviors

Telecommuting will have a major effect. (Dashed lines are estimated future scenarios.)

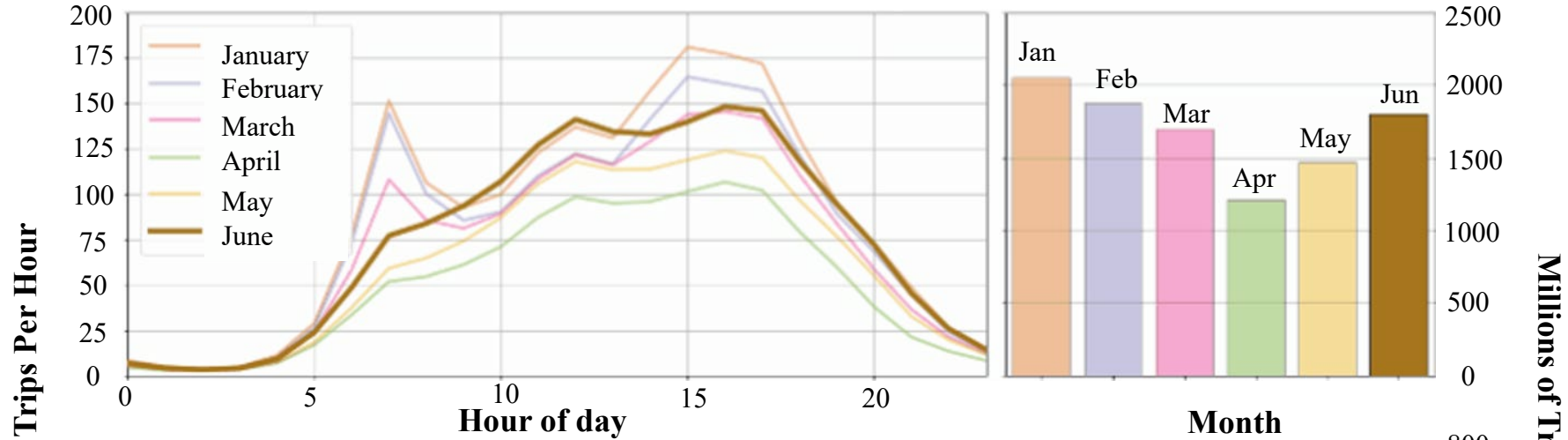


Daily Distribution of Trips Has Flattened

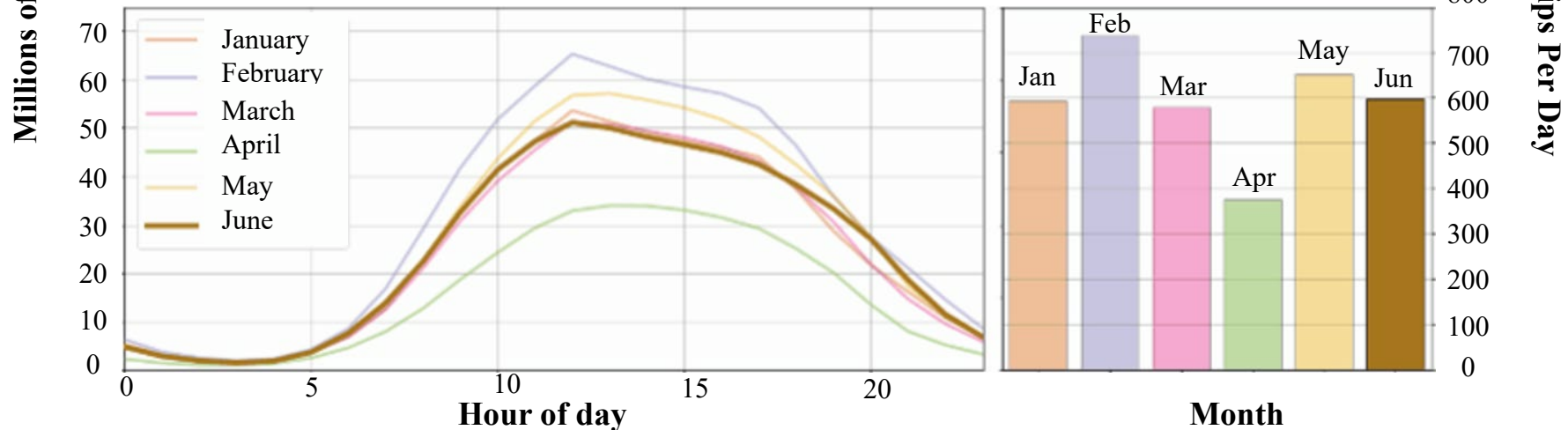
Shifts in mobility behavior by month. (N=138B light-duty vehicle trips.)



Weekday

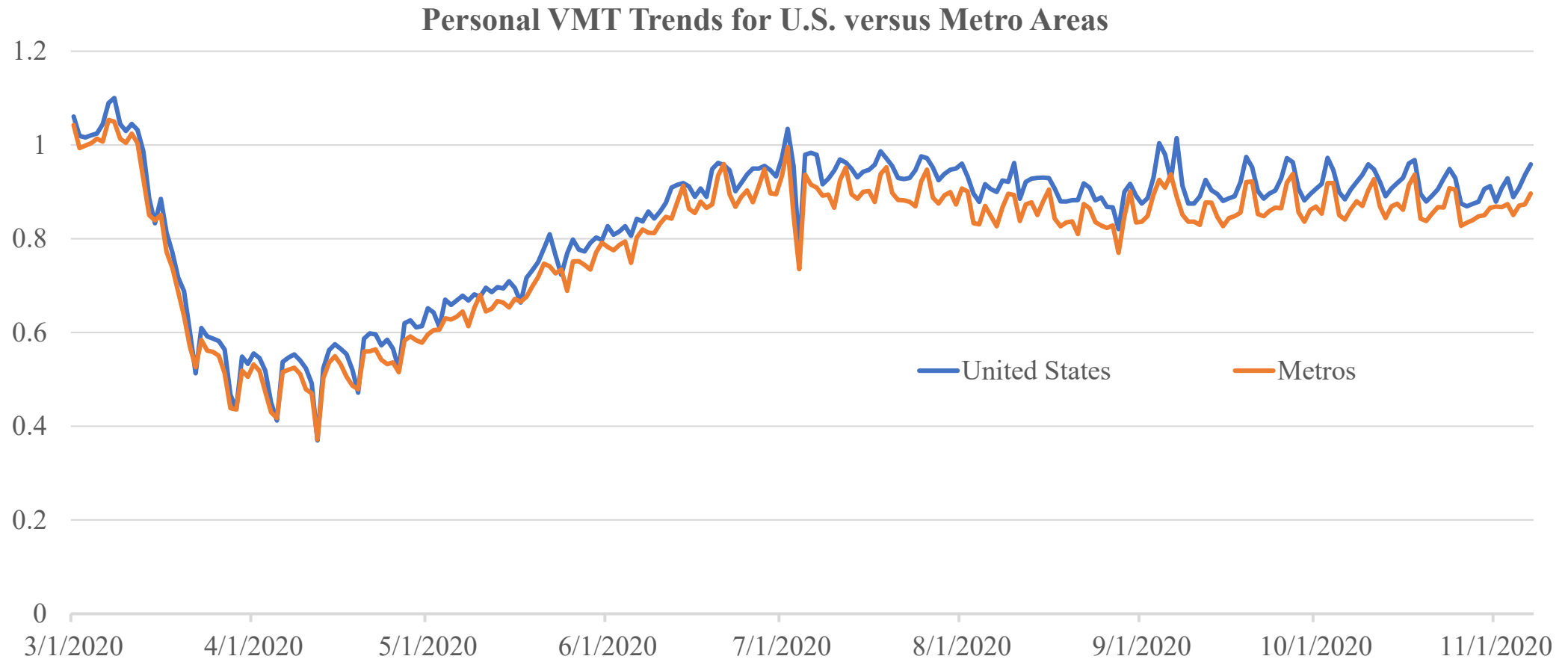


Weekend



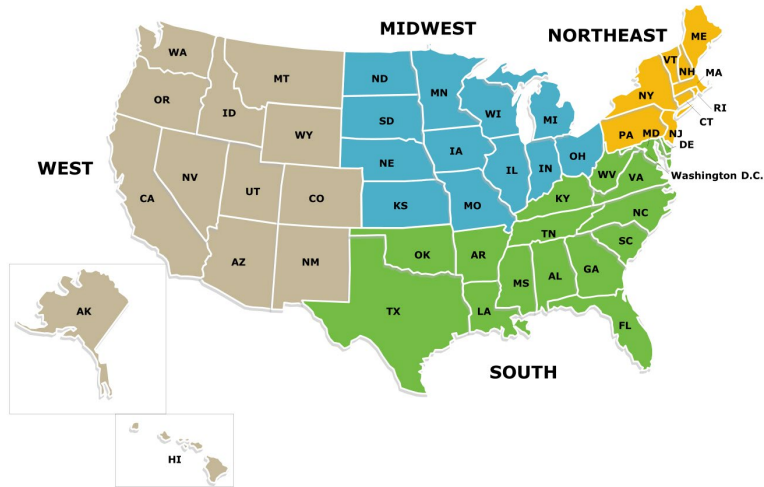
Recovery Lags for Urban Vehicle Miles Traveled

Roadway demand is shifting geographically. (Urban recovery lags US average by about 4.5% since June 1)



Pre-Pandemic Migration Trends

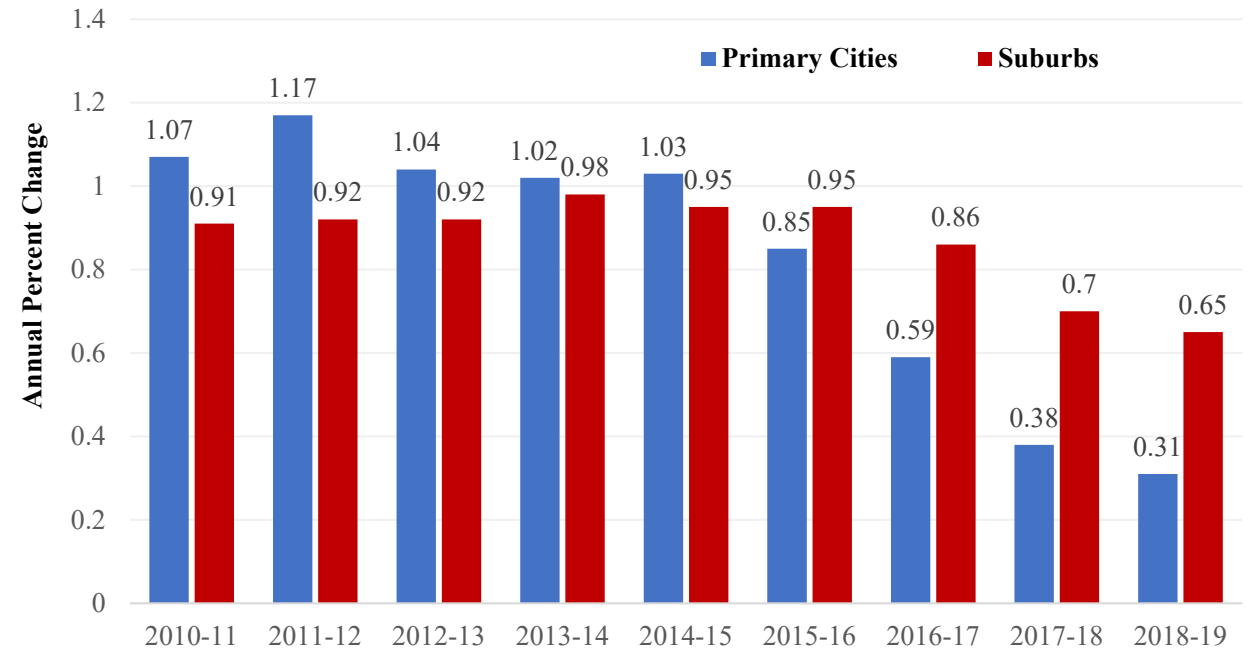
People were migrating to the South and West and moving to the suburbs before COVID-19.



Census American Community Survey 2013-2018 Regional Migration Flows

	In Domestic	Out Domestic	Net Domestic	In from Abroad	Net Regional Migration Total
Midwest	783,261	934,353	-151,092	304,237	153,145
Northeast	529,112	844,470	-315,358	396,618	81,260
South	1,598,693	1,215,461	383,232	815,151	1,198,383
West	974,183	890,965	83,218	571,725	654,943

Population Growth Trends, Analysis of Census Estimates

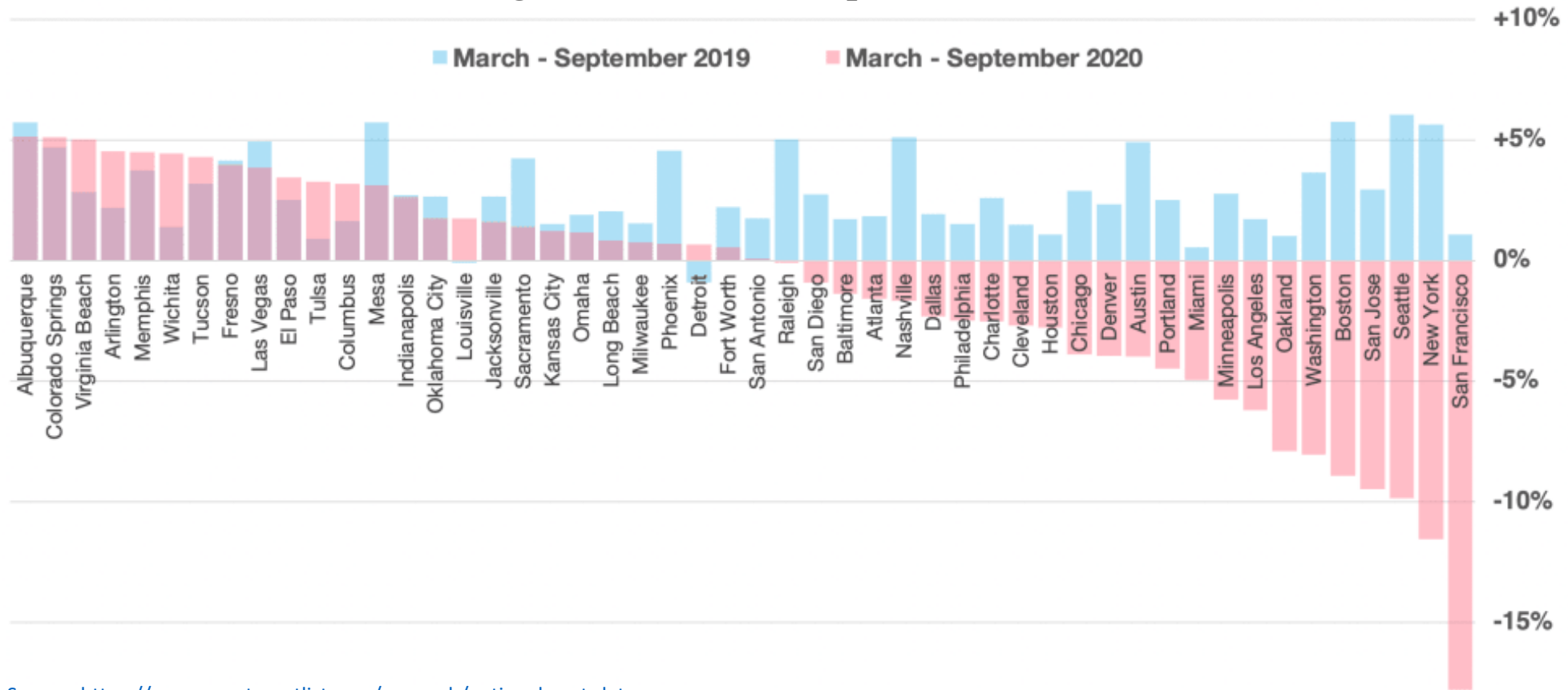


Source: William H. Frey, Analysis of primary cities and suburbs within major metro areas, May 21, 2020

Emerging Evidence of Land Use Effects

Meaningful rent change trends especially in larger tech and information centric job cities.

Rent Change from March to September in 2019 & 2020



Source: <https://www.apartmentlist.com/research/national-rent-data>

Emerging Evidence of Land Use Effects

New residential sales spiked in response to COVID-19.



Source: Census New Residential Sales Data,
https://www.census.gov/construction/nrs/historical_data/index.html

U.S. Home Sales Rise to New 14-Year High, Offering a Boost to Economy

- **+20.9%** from 2019
- Fourth straight month of increases
- 2.7 months supply – lowest since 1982
- Only San Francisco and New York City posted increase in number of homes for sale
- Motivations include:
 - Record low interest rates
 - Millennials entering prime buying years
 - Desire for space driven by COVID-19
- “Urban and city centers are seeing what I would call a demise in demand,” said Mike Miedler, chief executive of Century 21 Real Estate LLC.

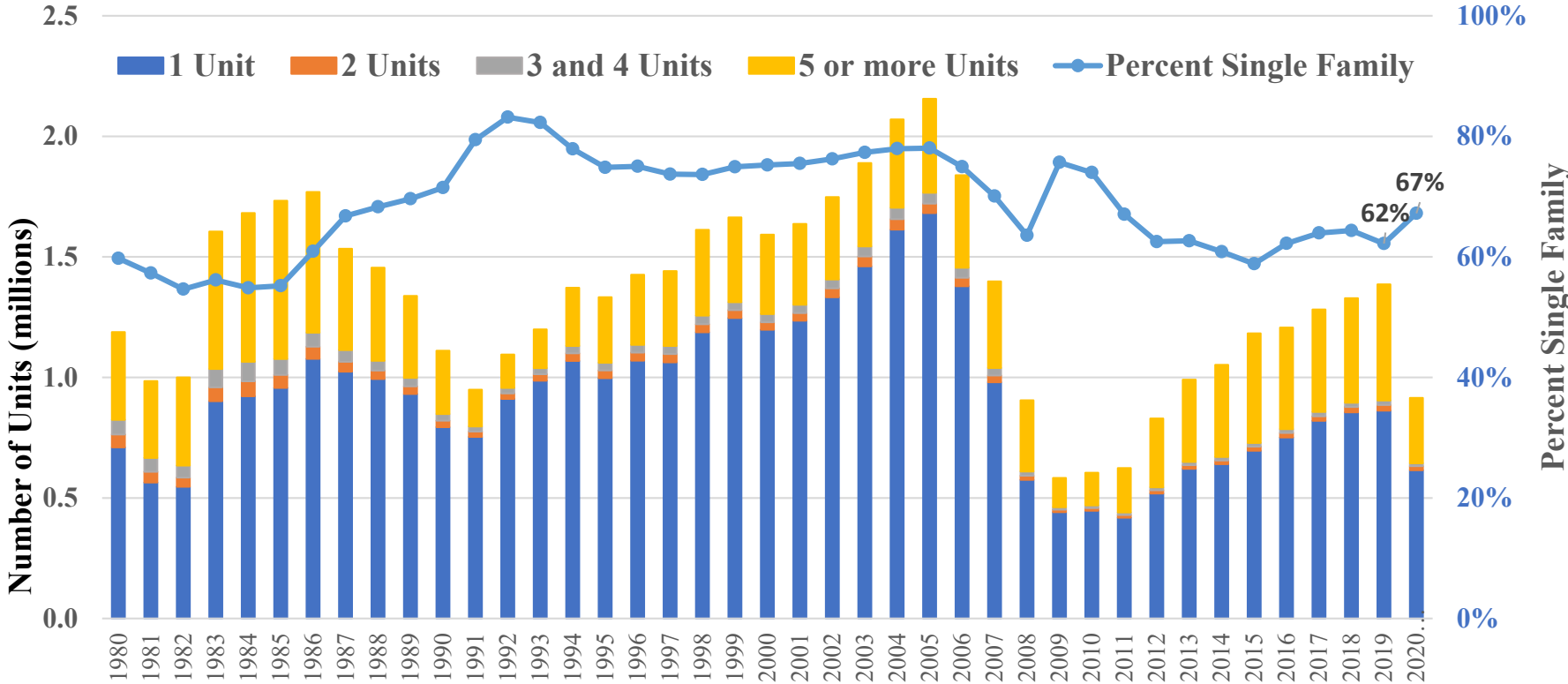
Source: The Wall Street Journal, October 22, 2020



Residential Building Trend

Housing inventory changes relatively slowly.

National Inventory New Units
American Housing Survey 2019



**Total Inventory, ACS,
Single Family/
Manufactured**
74.6%

2-4 Units
7.3%

5+ Units
18.0%

**124,135,000
occupied units**

Source: <https://www.census.gov/programs-surveys/ahs.html>

Commercial Real Estate

The effects of COVID-19 on commercial real estate remain uncertain.

- Rapid growth in delinquencies
- Greatest impacts on tourism related properties, lodging, retail, restaurant
- Shifting perspectives as COVID-19 has continued
- Highly dependent on perspectives on continued telework and virtual meetings with customers and clients
- Greater impacts in tech centric industries
- Accelerates sector and geographic trends apparent before pandemic
- Potential for adaptive uses of existing structures to new purposes



Vehicle Miles Traveled New Normal

When and where people are driving is changing.

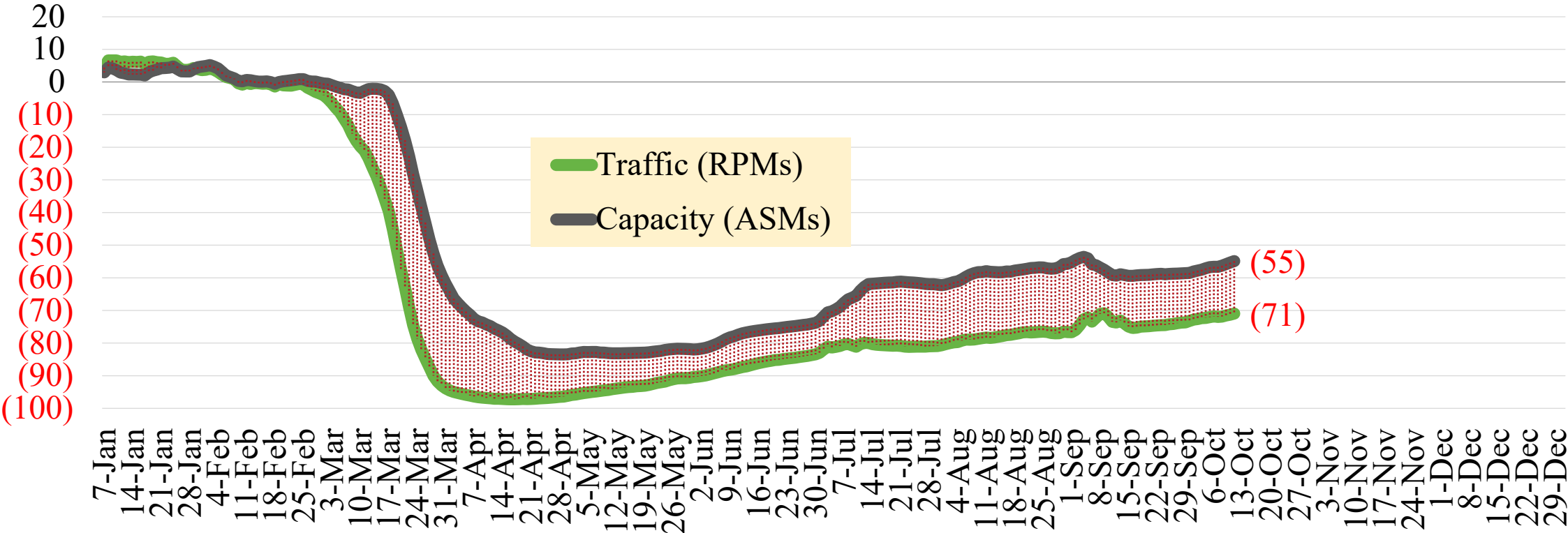
- ↓ residual diminished activity participation by a small segment of the population that fears new strains of COVID or other viruses such that they are motivated to reduce exposure,
- ↓ diminished travel resulting from the remaining economic impacts from COVID that may result in lower levels of commuting and lower other travel such as shopping, eating out, etc.,
- ↓ diminished travel due to ongoing communications substitution for travel for telework, e-commerce, virtual business meetings and other activity,
- ↑ additional personal vehicle travel by persons who have shifted travel from air, transit or other modes to auto travel,
- ↑ catch up travel from activities forgone during the pandemic such as visiting friends and relatives,
- ↑ changes in travel associated with changes in the land use /activity distribution of activities, and,
- ? possibly other unanticipated factors.



System-wide Airline Traffic and Capacity (%)

U.S. airline capacity cuts have not caught up with the severe drop in demand. (Seven-day rolling average.)

7-Day Rolling YOY Change in System-wide Traffic and Capacity (%)

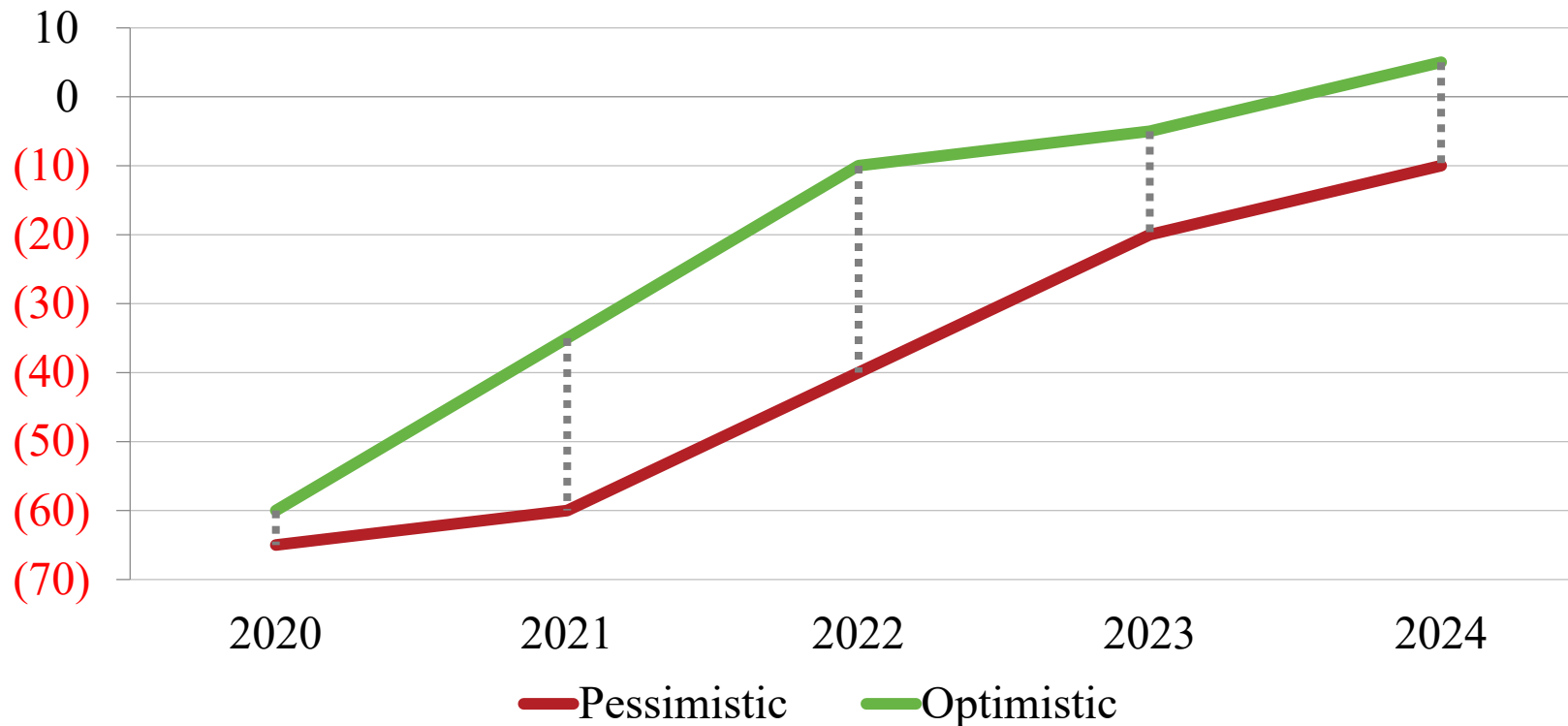


Source: A4A member passenger airlines as report to A4A on a consolidated company basis (including branded code share partners)

Passenger Volumes Unlikely to Recover Before 2023-2024

Uncertainty exists regarding the state of the pandemic, vaccination, therapeutics, and the economy.

Estimated U.S. Airline Industry Passenger Traffic Change Relative to 2019 (%)

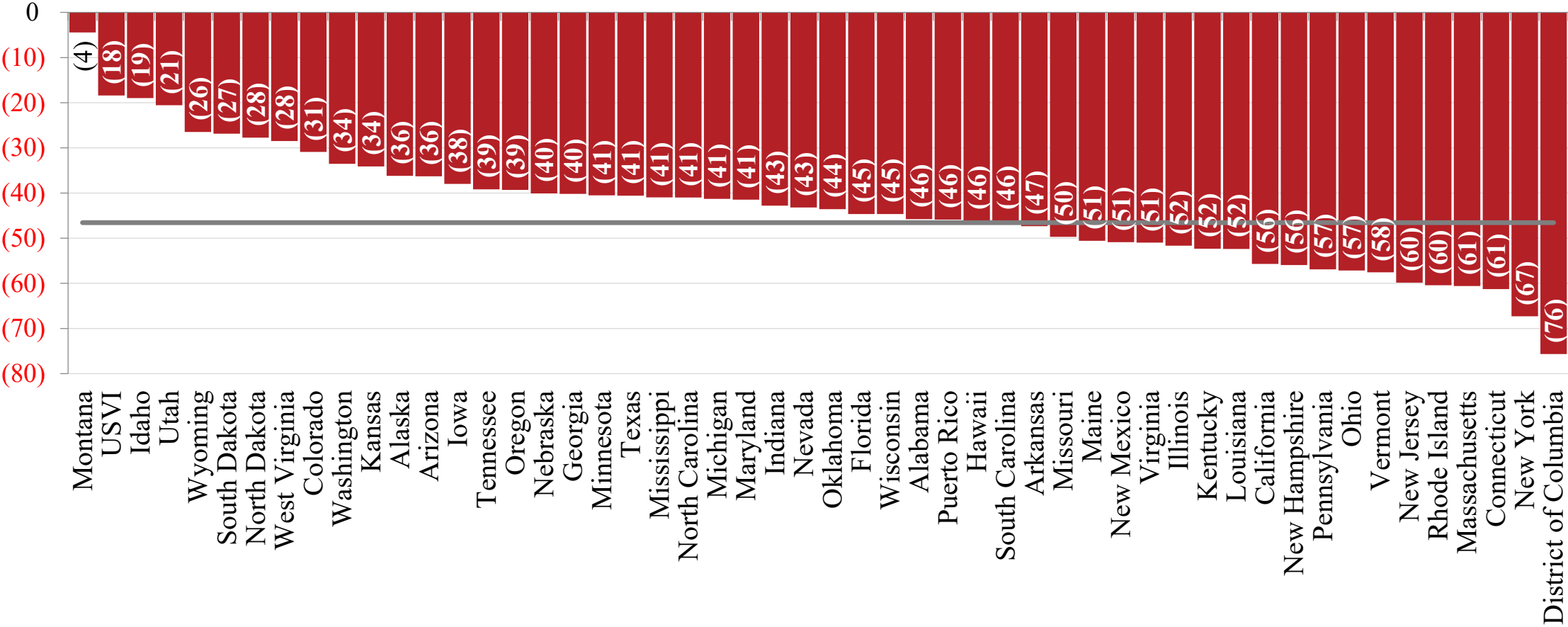


The [Dallas \(TX\) Morning News](#) (10/22) calls the current financial state of the travel industry “unsustainable” with every airline spending more money than it is bringing in. Lucrative business travel remains low, and Southwest President Tom Nealon suggested that there “very well could be a 10% to 20% structural reduction in business travel coming out of COVID” that could take several years to rebuild.”

Source: A4A and various airline equity analysts

Change in Scheduled Passenger Flights, October 2020 (%)

DC and Northeast states are seeing the largest air service reductions for October 2020 relative to October 2019.



Source: Via A4A, Diio by Cirium published schedules (Sept. 18, 2020) for all airlines providing scheduled service to all destinations

Air Travel New Normal

The rate at which business and international travelers return and the degree to which they do so will strongly influence the recovery of air travel.

The share of airline profit from business travel is considerably higher than the share of total trips accounted for by business trips.

- Business trips constituted **29%** of air trips in 2019¹.

The willingness to travel internationally and the continued travel restrictions imposed by the U.S. and governments around the world will significantly affect demand for air travel.

- Nonresidents constituted **44%** of international air travel and **3%** of domestic air travel in 2018².

Source: ¹ Airlines for America, Air Travelers in America: Annual Survey, January 2020, <https://www.airlines.org/dataset/air-travelers-in-america-annual-survey/#>

Source: ² International Visitor Spending on Transportation in the U.S.: 2018, <https://www.bea.gov/tourism-satellite-accounts-data-sheets>



Air Travel New Normal

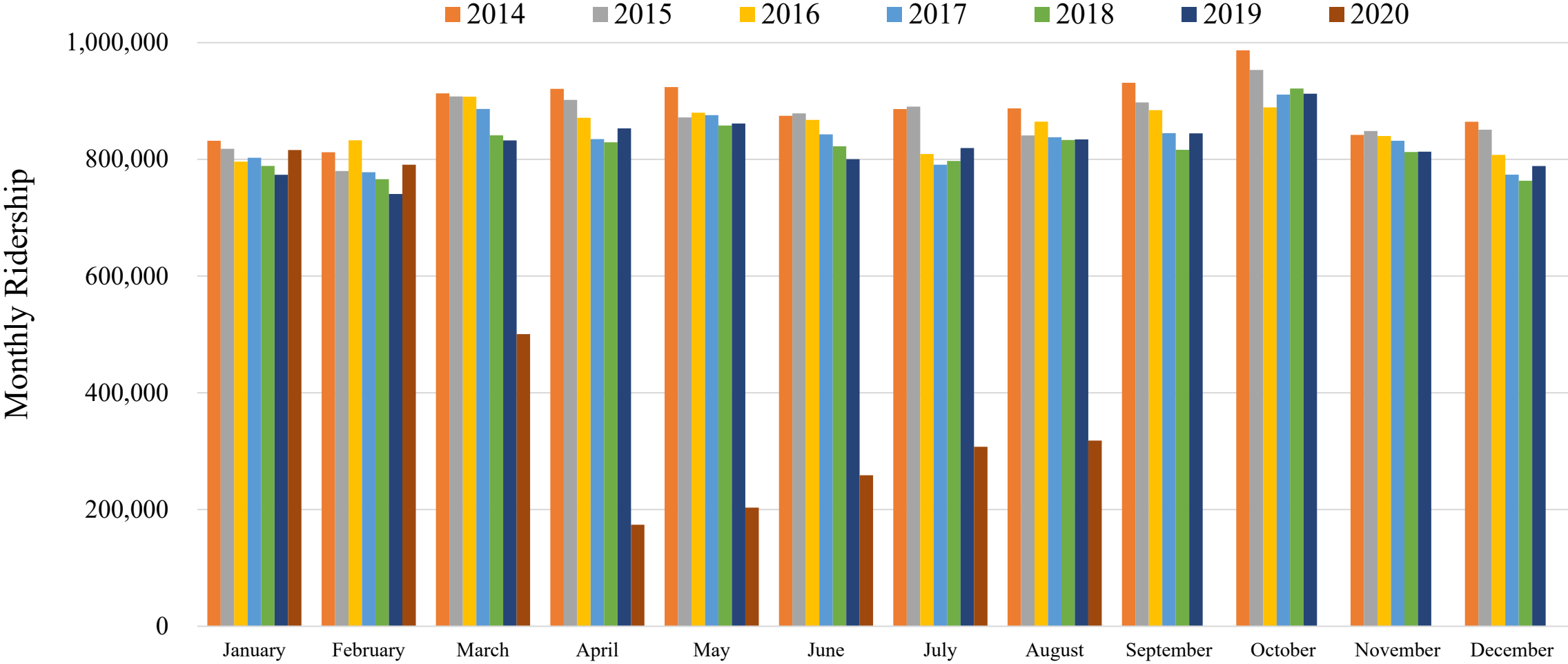
Decreases in air travel driven by multiple factors.

- ↓ Individuals choose to take fewer trips due to economic constraints.
- ↓ Reduced business travel.
- ↓ Travel restrictions to foreign countries.
- ↓ Mode shifts to driving for shorter trips.
- ↑ Fare discounting and promotions.
- ↑ Pent up demand.
- ↓ Fare rationalization to adjust to new business cost model.



Public Transit Ridership Plummetts in 2020

Public transit ridership, all sub-modes.



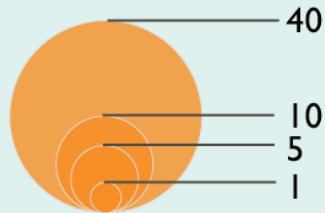
Transit Ridership Changes Vary by Mode and Location

Transit market share and percent change in bus and rail ridership for the top 26 transit markets in the U.S.

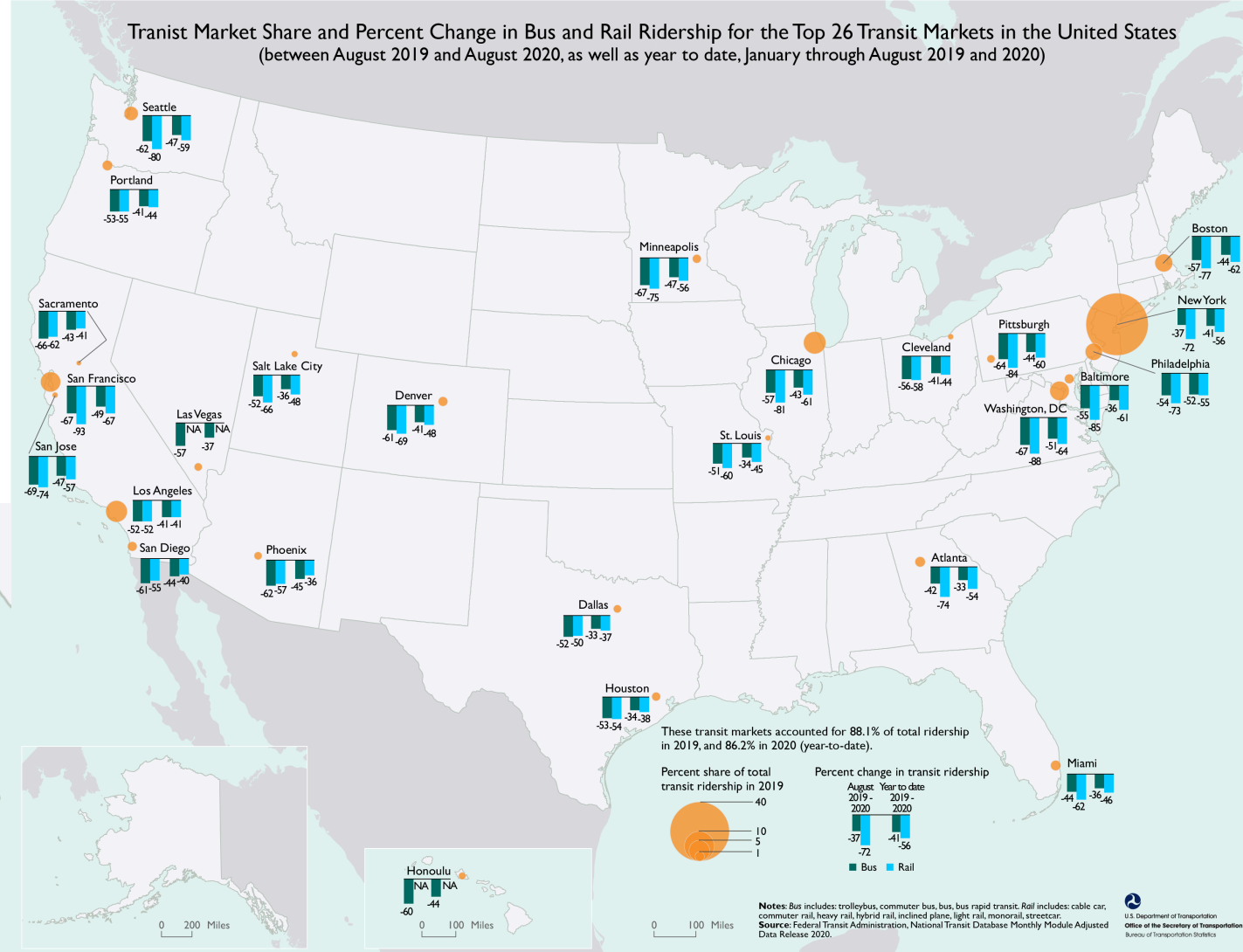
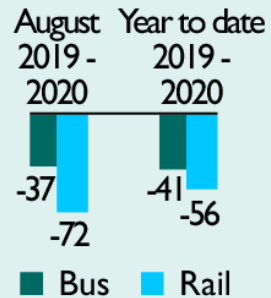
(Between August 2019 and August 2020, as well as year-to-date, January through August 2019 and 2020)

These transit markets accounted for 88.1% of total ridership in 2019, and 86.2% in 2020 (year-to-date).

Percent share of total transit ridership in 2019



Percent change in transit ridership

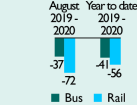


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Percent share of total transit ridership in 2019



Percent change in transit ridership

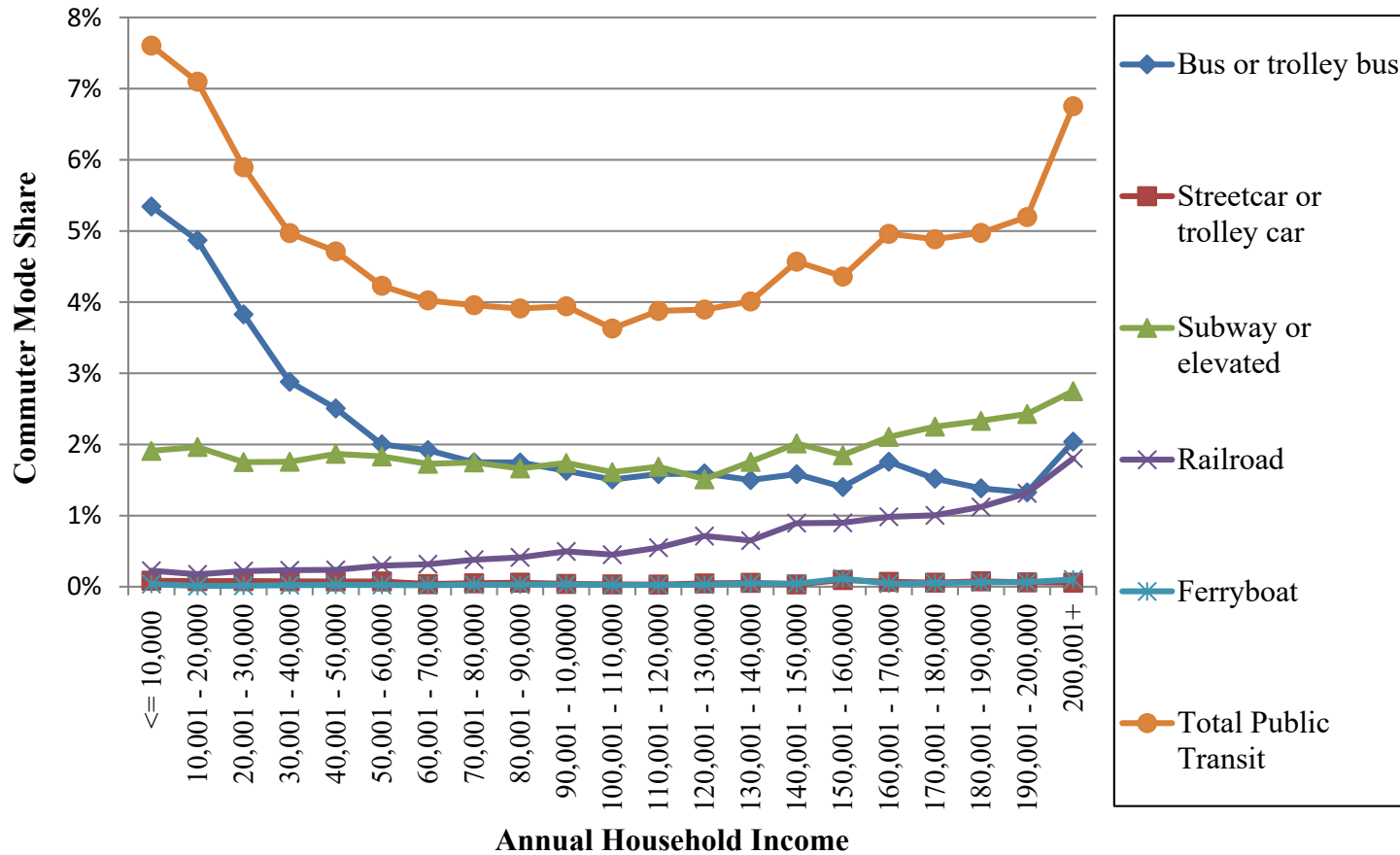


Notes: Bus includes: trolleybus, commuter bus, bus, bus rapid transit. Rail includes: cable car, commuter rail, heavy rail, hybrid rail, inclined plane, light rail, monorail, streetcar.
Source: Federal Transit Administration, National Transit Database Monthly Module Adjusted Data Release 2020.

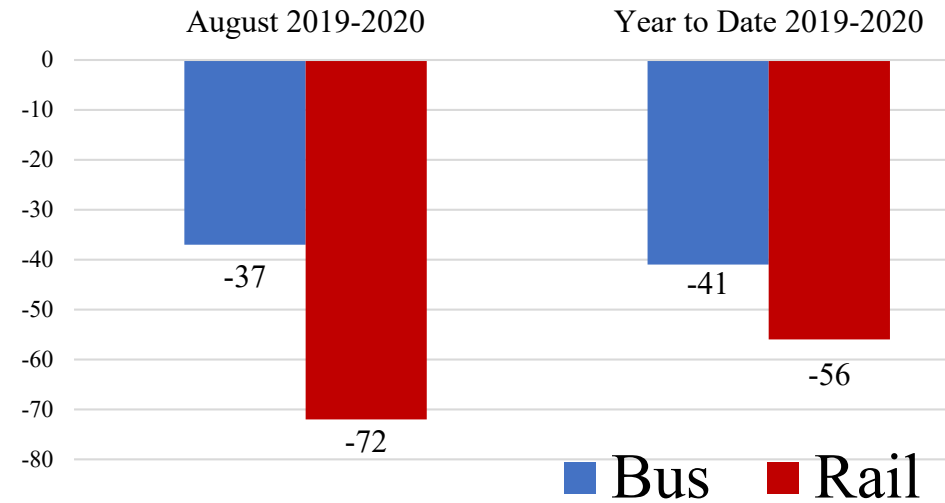
The Public Transit Challenge

Work at home jeopardizes transit rail recovery

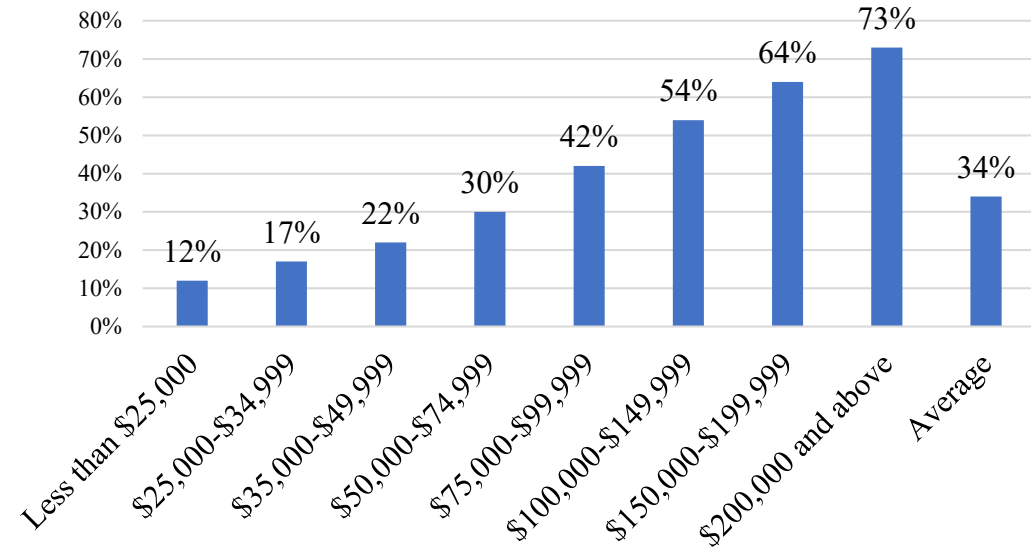
2017 ACS Commuting Mode Share by Income and Transit Sub Mode, 2017 ACS Analysis



Transit Ridership in Top 26 Metros (%)



Work-at-Home by Income



Public Transit New Normal

Challenging transit environment post COVID.

- ↓ Individuals choose to take fewer trips due to economic constraints.
- ↓ Telecommuting and communications substitution hurt demand.
- ↓ Residual fear of group travel.
- ↓ Mode shifts from dispersion trend, higher auto ownership, lessened roadway congestion due to telecommuting, etc.
- ↓ Mode shifts from reduced service levels.
- ? Strongly supported as critical to essential workers.



Factors Affecting Future Demand

	Passenger Roadway Travel	Air Travel	Freight/ Commercial	Public Transit	Amtrak	Intercity Bus	Taxi/ TNC	Bike, walk, scooter
A COVID-induced recession								
Reduced employment	↓	↓	↓	↓	↓	↓	↓	↓
Reduced commercial/retail	↓	↓	↓	↓	↓	↓	↓	↓
Reduced socialization/leisure	↓	↓	↓	↓	↓	↓	↓	↓
Residual fear of shared travel		↓		↓	↓	↓	↓	↓
Communication Substitution for Travel								
Telecommute/Work-at-home	↓ ↓ ↓			↓ ↓ ↓			↓	↓
E-commerce	↓		↑	↓			↓	
Virtual Business meetings	↓	↓		↓	↓	↓	↓	
Other (telemed, E-school, etc.)	↓			↓			↓	
Demand reduction induced by service cuts/price hikes		↓		↓	↓	↓	↓	
Pop/Employment dispersion	↑		↑	↓			↓	↓

What Policy Implications Arise

- Transportation Planning
- Funding Roles and Priorities
- Raising Revenues
- Equity
- Travel Demand Management



Transportation Planning Post COVID

COVID-19 strengthens the need for significantly updating transportation planning processes and methods.

- Scenario planning isn't enough – integrate consideration of flexibility and adaptability
- Move beyond demand growth driven planning – recognize the need to plan for stable or declining demand in some markets/modes
- Demand models need recalibration with post COVID behaviors
- Performance metrics for transportation need to be updated post COVID (capital and operating costs, capacity, productivity, energy/emissions efficiency, etc.) to reflect COVID and equity or other factors that will alter prior relationships.

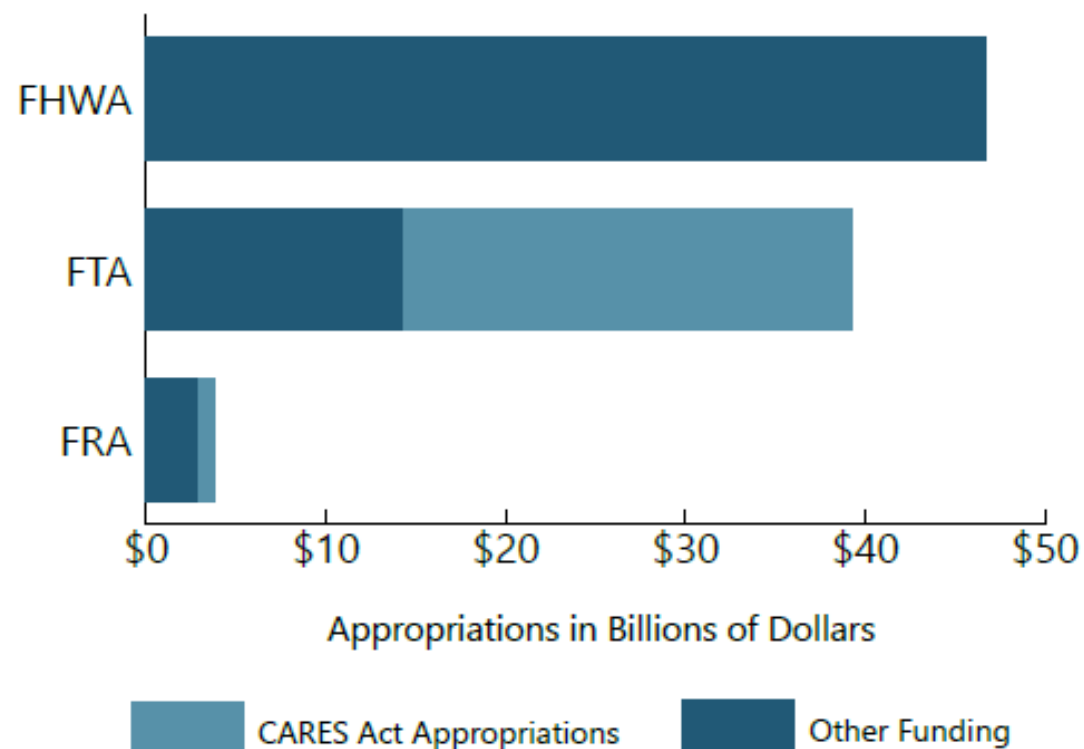


Restoring a Stable Spending Strategy

Different funding across modes raises issues about fairness and sustainability.

- The transit funding supplement was nearly twice the annual total federal commitment. This more than offsets fare revenue losses and restores or replaces local funding.
- Should Supplemental FHWA roadway funding be added to also replace lost state and local roadway spending revenues?
- How will these entities be weaned from extra federal funds to offset any “not-their-fault” shortages in normal revenues?
- Is it fair to intercity bus to provide Amtrak extra funds, strengthening their competitive position?
- Airlines were provided high risk loans, should taxi, car rental, intercity bus, e-scooter and other private providers be given the same opportunity?

DOT Funding for Surface Transportation Agencies for FY2020, Including CARES Act Appropriations



Source: OIG analysis of DOT data



Revenue from Where?

Different funding across modes raises issues about fairness and sustainability.

- Will we move further from a user/beneficiary based funding strategy?
- Does greater general fund investment undermine market based privately provided/operated options?
- How will congestion dependent options fare (toll facilities, managed lanes, etc.)?
- As events impact revenue streams differentially who should be responsible for shortfalls?



Equity Implications of COVID Response

COVID and 2020 heightened sensitivity to equity

- Equity by socio-demographic groups (essential workers, minorities, income levels)
- Equity across modes (roadway, transit, Amtrak, air, etc.)
- Geographic equity (urban, rural, etc.)
- Equity across levels of governance (local, state, federal)
- Equity between payees and beneficiaries
- Equity between public and private sector entities
- Equity versus market demand as a determinant of service levels



Travel Demand Management Post COVID

- Reducing VMT/travel thru communications partially undermines an urban centric, transit intensive settlement pattern.
- How proactive will government be in managing the post-COVID commuting demand across 5 days per week? Do we prescribe peak infrastructure and service levels for a three day work week?



Unanticipated Consequences of COVID-19

Behaviors and activities, including those that can affect travel, will change.

In a survey of 19,131 persons married between 2005 and 2012:

- 22 percent met while at work
- 37 percent met online
- Online marriages have been happier and more stable
John Cacioppo of the University of Chicago's Department of Psychology, 2013
- 85 percent of affairs begin in the workplace
Lori Hollander LCSW-C, BCD Relationships & Marriage, 2011



Questions

