Commuting in America in 2020 and Beyond:
Observations, Planning Challenges, and Implications for the American Community Survey Transportation Questions

Introduction - The Census Bureau released the 2020 American Community Survey "Experimental Estimates" on November 30, 2021. This survey has been an important source for annual information on the state of commuting in America as it includes questions asking respondents about their usual commute mode in the prior week. The COVID pandemic has impacted the 2020 data, and perhaps more importantly, it has impacted the ACS commuting data and its role in transportation planning going forward.

The 2020 data is more limited as the COVID pandemic impacted the conduct of the survey and the Census Bureau has determined that they are unable to have a satisfactory level of confidence in the results to meet their standards for release as a data set comparable to prior years. Accordingly, caution should be used in interpreting these results and readers are encouraged to acquaint themselves with the modifications used in executing the survey and processing the data that the Census Bureau details in support documents. Table 1 reports the critical commuting metrics available from the survey with the empty cells indicating the limited data released. While formatted to compare to prior years, caution is urged in interpreting and drawing conclusions on the differences. This article will comment on both the 2020 results and the role of the ACS in supporting transportation planning going forward.

Table 1 U.S. American Community Survey Trends												
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change in Share 2020-2019	Percent Change in Share
MEAN TRAVEL TIME TO WORK												
U.S. (mins)	25.5	25.7	25.8	26.0	26.4	26.6	26.9	27.1	27.6			
COMMUTING TO WORK – U.S.												
Car, truck, or van -- drove alone	76.4%	76.3%	76.4%	76.5%	76.6%	76.3%	76.4%	76.3%	75.9%	69.0%	-6.9%	-9.1%
Car, truck, or van -- carpooled	9.7%	9.7%	9.4%	9.2%	9.0%	9.0%	8.9%	9.0%	8.9%	6.9%	-2.0%	-22.5%
Public transportation (not taxi)	5.0%	5.0%	5.2%	5.2%	5.2%	5.1%	5.0%	4.9%	5.0%	3.2%	-1.8%	-35.8%
Walked	2.8%	2.8%	2.8%	2.7%	2.8%	2.7%	2.7%	2.6%	2.6%	4.1%	-0.4%	-9.2%
Bicycle	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.5%	0.5%	0.5%			
Other means	1.2%	1.2%	1.3%	1.2%	1.2%	1.2%	1.3%	1.3%	1.4%			
Worked at home	4.3%	4.4%	4.4%	4.5%	4.6%	5.0%	5.2%	5.3%	5.7%	15.8%	10.1%	177.4%
VEHICLES AVAILABLE – U.S.												
No vehicles available	9.3%	9.2%	9.1%	9.1%	8.9%	8.7%	8.6%	8.5%	8.6%			
1 vehicle available	34.1%	34.1%	33.9%	33.7%	33.5%	33.2%	32.7%	32.5%	32.4%			
2 vehicles available	37.5%	37.3%	37.3%	37.3%	37.2%	37.1%	37.3%	37.1%	36.9%			
3 or more vehicles available	19.1%	19.3%	19.7%	19.9%	20.3%	21.0%	21.5%	21.9%	22.1%			

Commuting to Work - This term refers to the means of transportation by which people usually commute to work. Respondents are asked to select the most significant mode if multimodal trips and the most frequently used "usual" mode the prior week. The greatest interest for 2020 is the commute share tabulated for "worked at home" which reflects the impact of COVID induced telework behaviors initiated for many workers starting in early to mid-March 2020. As Table 1 reports, the 2020 work at home share is 15.8%. Assuming the 2019 telecommute rate until mid-March, the COVID months of 2020 would have had an approximate 17.5% average work at home share. Figure 1 shows the magnitude of changes graphically.

This number is lower than numbers from other sources often reported by the media. The Census Pulse Survey, for example, showed significantly higher numbers but their question inquired about any household worker (not just the survey respondent) and asked about commuting behaviors of individuals who used to commute to a worksite. Other sources have tended to focus on measures of telework for office workers. Additionally, reported numbers varied throughout the months of 2020 as COVID severity and workplace closure levels varied. What is most important to planners is understanding the array of numbers to gain insight into future work at home levels and the subsequent impact on transportation needs and investments.

Reviewing the changes in commuting shares for other modes confirms expectations and exhibits trends one might expect given our understanding of the sensitivities of travelers to the use of various modes as influenced by COVID exposure risk. Drive alone declined the most in numerical terms but the least in terms of the percent decline in its share of commuting. Driving alone was perceived by most travelers as the best way to avoid exposure risk during the commute for those that still needed to commute. Similar modest declines were seen for other means of travel which, in the available 2020 commute data, were grouped to include walk, bicycle, and other means. These modes are also perceived as safer from COVID exposure risk. The carpool share declined 22.5% reflecting disruptions caused by new work modalities and potential fear of some exposure risk when sharing rides. In understanding this change it's important to recognize that historically about half of carpooling trips included a family member as the carpool partner, which presumably would not increase exposure risk. Hence, it is more probable that carpooling was influenced by carpool

Figure 1 "Usual" Means of Commuting
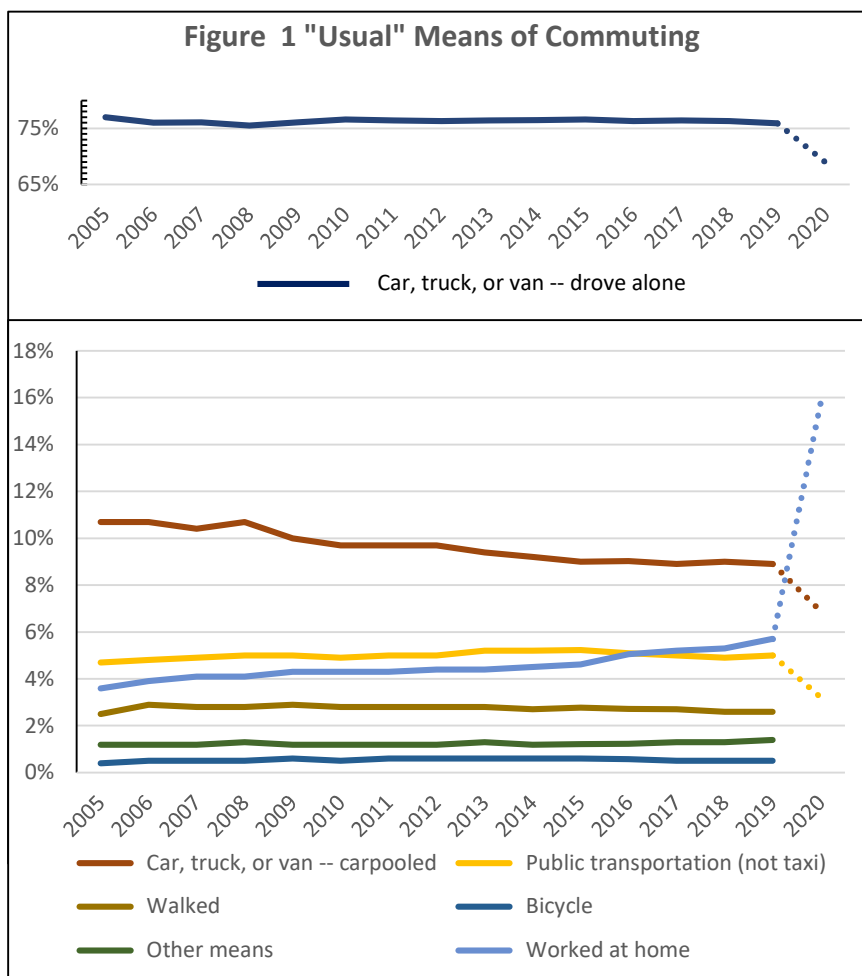
partners experiencing changes in employment status, work modalities, or commuting practices.

Most significantly, public transit showed the largest percent decline in commute share, dropping to 3.2%, a decline in share of almost 36%. If one presumes that public transit commuting during the first 2½ months of the year retained its prior 5% share from 2019, the transit share during COVID would have been approximately 2.7%, a 46% decline from pre-COVID levels.

Commute Time - This is an often-cited metric which is the usual one-way commute time in minutes for workers averaged across all modes. The trend is often used as an indication of the extent of worsening congestion. For 2020, the ACS reported the share of travelers whose commutes fall within four range categories. A new mean commute time is not now available.

Table 2   Commute Time Shares by Time Bracket

	2019	**2020**
Less than 10 minutes	11.9%	12.9%
10 to 29 minutes	48.5%	50.4%
30 to 59 minutes	29.7%	28.5%
60 minutes or more	9.8%	8.2%

As table 2 shows, the shares by trip duration changed modestly from their levels in 2019. The changes that did occur, greater shares of shorter duration trips, are what would have been expected in light of reduced congestion for commuting and greater shares of commuters traveling by auto modes which are historically faster with shorter commute times. More detailed analysis of the public use data set may provide additional insight into commute duration trends.

Vehicles Available - data on vehicles available was not released. Given reports on new and used car sales prices and activity levels, supply chain constraints, and the use of stimulus checks for auto purchases, it will be interesting to see what post-COVID vehicle availability data indicates in terms of auto availability at the household level and per worker.

What Does the 2020 ACS Commuting Data Mean for Transportation Planning?

Perhaps more important than attempting to interpret the implications of the 2020 American Community Survey data as it relates to commuting to work, is understanding the implications of both the dramatic changes in historical commuting behaviors and the uncertainty of the commute shares going forward. Within the transportation community, the two most significant implications of COVID on surface transportation appear to be the implications of changes in commuting attributable to working at home or teleworking and the longer-term implications on the ability of public transportation to accomplish the desired intentions as it relates to both accommodating volumes of travelers and providing a more environmentally benign and socially equitable means of commuting.

The work trip has been critically important - It is important to reflect on the role of commuting behavior on both transportation and specifically transportation planning activities. Commuting has historically been the single most defining trip in terms of planning transportation investments, policies, and services. According to National Household Travel Survey data, commuting is approximately 16% of person trip making pre-COVID and responsible for approximately 28% of household-based vehicle miles of travel (those commute trips are a little longer than the average trip and far more likely to have lower occupancy). Commuting has historically defined the peak travel requirements which have driven the sizing, and to some extent, the design of our urban transportation systems, both roadways and public transportation. Commuting frequently influences location decisions of households and the commuting corridor often influences other trip making activities as other trips

are linked to work trips and travelers' destination choices are influenced by their awareness of opportunities gleaned during commutes. Similarly, the historic peak period associated with commuting has long defined many roadways' capacity and design characteristics, signal timing practices, and transit service level specifications.

Within traditional transportation planning, information about the work trip is often the holy grail of information that drives transportation modeling activities. Planners know more about work trips than any other trip purpose, with the ACS derived understanding of the geography of home to work locations being fundamental to travel modeling. The ACS provides that critical link between household socio-demographic characteristics and travel behaviors. It has served as the benchmark upon which supplemental data sets are validated. Current land use models are similarly highly oriented around the home to work trip and representation of access to employment opportunities.

The future role of the ACS commuting data - Both the implications of the changes in commuting behaviors and the limitations of the ACS data given the dynamics that now characterize commuting are problematic for transportation planning going forward. The lack of sensitivity of current ACS questions to hybrid commuting behaviors undermine its usefulness in understanding post-COVID commuting. The decline in the relative significance of the commute trip, both in its scale and its travel-shaping influence, undermines the historic focus on the work trip as foundational to transportation planning.

Historically about 26% of households had no workers (retired, unemployed, unable, or undesiring to work) and so might be less sensitive to commuting conditions and congestion in travel. Also, their residential location decisions are less likely to be influenced by access to employment opportunities. Adding in the pre-COVID 5.7% share who usually work at home would increase that share. With an expectation of a 10-20% average weekday work at home share post-COVID, nearly half of all households may not have regular commuters. This shift, coupled with virtual or digital substitutions for travel for other purposes (ecommerce, telemedicine, etc.), is destined to result in meaningful changes in trip generation, trip distribution, mode choice and network utilization post-COVID – a significant challenge to transportation planning and analysis particularly in the absence of fresh, reliable, and relevant data.

Equally important, these changes are likely to be very different across geography as the propensity to work from home varies dramatically by nature of employment and geographical location, as revealed in Bureau of Labor Statistics data. Thus, locations such as areas with high concentrations of office workers are likely to see meaningful long-term impacts on trip making whereas locations characterized by higher shares of manufacturing or service employment are likely to see far lower rates of work at home and hence more modest changes in travel demand. Service worker levels in some geographies could also be impacted in locations where the service workers were supportive of information workers who are no longer consuming services in proximity to their prior office locations. How businesses and property owners respond may result in further geographic differences in post-covid work trip generation, as active in-office workers reconcentrate in prime space and marginal office space is abandoned or repurposed. Differences in work trip production (home end work trip generation) may also change differentially across geography to the extent that there is correlation between employment type, propensity to work at home, attitudes and lifestyle preferences, and type of housing/neighborhood favored by persons with that socio-economic profile.

The wait for post-COVID data - This data challenge is compounded by the fact that we are not yet at post-COVID and stable post-COVID behaviors have not been established. Given the emergence of new variants and the

prospects of ongoing uncertainty and behavioral reactions to that uncertainty, the influence of risk exposure may continue to impact travel decisions for some significant time going forward. Having said that, the strong rebound in air travel and out-of-home non-work activity engagement suggests that the influence of exposure risk is rapidly fading. However, even when conditions regarding COVID stabilize, travelers may continue to modify behaviors in response to how employers and businesses adapt to telework and hybrid work patterns. Issues such as productivity assessment, opportunity for upward mobility, employer accommodations to facilitate work at home, the criticality of retaining generous telework options to attract talent, enhancements to virtual and digital strategies to improve telework and hybrid telework operations, and other factors will play out over time. If the economy were to experience a downturn leading to a softer labor market, workers may have reduced leverage in demanding flexibility in work modalities.

Regarding data availability from the American Community Survey, we are likely several years away from having the type and quality of data we have typically relied on for model calibration and application. The 2021 American Community Survey data will also be impacted by COVID. In spring 2022 the Census Bureau will be in a position to evaluate the 2021 data after collection is completed in early 2022. At that point they may be in a position to speak to the statistical characteristics and reliability of the 2021 data. Even with the prospect that the data may no longer be badged as experimental, commuting behaviors will not have stabilized and hence the results will not necessarily be representative of post-COVID conditions at least with respect to commuting behaviors. It is clear that 2022 data will also be impacted by COVID influenced behaviors. Optimistically one might hope that 2023 data, available in fall 2024 would provide a more robust accounting of post-COVID commuting behaviors. Data quality will remain impacted for many more years for those dependent upon American Community Survey five-year data sets for model development.

Understanding temporal commuting patterns - The other serious challenge associated with the ACS commuting data is the fact that the questions rely on asking travelers about their "usual" means of commuting. A new normal that has been reinforced and increased is the growing variation in commuting behaviors over the days of the week such that reliance on "usual" is much less useful in an era of highly variable behaviors. The probability of significant hybrid work patterns coupled with pre-COVID trends to more irregular work schedules such as in health care, will result in diminished usefulness of reliance on usual commute mode information. Work-at-home capabilities are not only influencing the commute mode pattern (work-at-home is treated as a mode in commute mode tabulations) but temporal patterns of commuting appear to have shifted across the hours of the day as some workers are mixing work at home and work in the office within a workday, for example working at home through the morning then traveling to the office for in person meetings in the afternoon. Similarly, transportation planners should be interested in understanding the distribution of commuting behaviors across the days of the week. The prospect of changes in congestion levels by time of day and day of week will be important information for planners to understand going forward. While real time data from other sources will reveal these patterns, survey data is important to link those patterns with traveler characteristics to enhance our understanding and ability to forecast mobility needs of different socio-demographic groups. Congestion is a critical factor in mode and path choice and understanding post-COVID congestion characteristics will be important for planning and operating the transportation systems.

These changes in behaviors diminish the potential usefulness of current ACS commuting data for understanding commuting in the future. To support the transportation planning community, changes to the commuting questions in the American Community Survey are critical. Absent those changes, the relevance of the ACS data

to the transportation planning community will be substantially diminished. In addition to better actual mode choice information (versus usual), there would be additional value in understanding commuting if the ACS would gather data on mixed mode use for a surveyed commute trip. With emerging micromobility and mobility-as-a-service options, commuters increasingly have opportunities to use multiple means of travel in completing their commute trip. Capturing this information would be possible with a question focusing on a specific commute trip (instead of the usual trip) and would offer additional insight for planners and policy makers.

The post-COVID new normal - Better ACS data is not the panacea for improved travel forecasting and planning. Additional data and, unfortunately, the passage of time will be required to fully understand the nature of post-COVID travel behavior. The shift to telework and other communications substitutions for travel are likely to have broader implications as travelers redeploy the time and money saved in commuting to carry out other activities. Those changes and the trip generation, trip distribution and mode choice implications will be revealed over time as a new normal is established. Ongoing changes in technology, economic and demographic conditions and other lifestyle and workplace factors may well result in the new normal being less stable than what the transportation planning community has witnessed in past decades.

It has been speculated that the current era of predictable unpredictability is not going away. But as we plan long-lived and expensive infrastructure investments, we need the best possible data to bound our scenarios. Failing to take into account the probability of post-COVID travel being meaningfully different than pre-COVID travel is to risk very expensive investment mistakes. Stakeholders should seek out the best possible data and direct resources to investments that will be prudent even if post-COVID travel has substantial telework or other COVID induced or accelerated changes.