



## TRANSPORT FINDINGS

# Reactions to University Campus Commute Mode Shifts During COVID-19

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## Findings

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This study summarizes University of Wisconsin-Milwaukee (UWM) campus commute mode shifts during COVID-19. The greatest shifts were to telecommuting and away from public transit. These shifts were uneven across the campus population: respondents with lower incomes and lower automobile access were less likely to shift to telecommuting. Open-ended responses provide insights into commuters' reactions to their mode shifts: most new telecommuters enjoyed not having to travel to work, and concern about COVID-19 transmission was only one of several factors pushing commuters away from public transit.

### 1. Questions

Early research suggests that COVID-19 was associated with dramatic increases in telecommuting and shifts away from public transport towards private automobiles, walking, and bicycling, particularly due to concerns about virus transmission and personal health (Abdullah et al. 2020; Barbieri et al. 2021; Thombre and Agarwal 2021). Yet, relatively few studies have examined shifts in university campus commutes (Caulfield et al. 2021; Filimonau et al. 2021) or explored people's reactions to their mode shifts (Aoustin and Levinson 2021; Bohman et al. 2021). Using the University of Wisconsin-Milwaukee (UWM) as a case study, we asked two main questions: 1) What commute mode shifts occurred between the fall 2019 semester (before the pandemic) and the fall 2020 semester (during the pandemic)? 2) What were commuters' reactions to their mode shifts?

### 2. Methods

We collected commute data through the fall 2020 UWM Transportation Survey. This timing coincided with UWM's response to the global COVID-19 pandemic, which included shifting most classes to a remote, online format and reducing in-person classroom capacity to less than half of normal. Many staff with administrative and clerical jobs were also required to work remotely.

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Recognizing these changes, we asked survey participants to report their commuting behavior in fall 2020 and to recall their previous commuting behavior in fall 2019.

We e-mailed an online survey link to the entire UWM community, including more than 23,000 students, 2,900 staff, and 700 faculty in three waves between October 27 and November 17, 2020. Nearly 20% of these people provided at least partial, valid responses, with higher participation among staff and faculty. Under normal conditions, approximately 80% of the UWM community is on the main Kenwood Campus on the northeast side of the City of Milwaukee. This analysis focuses on Kenwood Campus commuting.

We used Z-tests of the difference in proportions to identify which particular commuting characteristics were statistically different between 2019 and 2020. We complemented this quantitative analysis by coding responses to an open-ended question, “Please add a sentence or two to describe how your experience commuting one year ago (Fall 2019) compares to your experience commuting this semester (Fall 2020). This will help indicate how COVID-19 has affected commuting to UWM.”

### 3. Findings

Of the 3,580 valid Kenwood Campus responses, 1,978 included a commute mode for both fall 2019 and fall 2020. 1,335 of the respondents who provided a commute mode in both years (67.5%) changed their mode ([Table 1](#)). 1,139 of the respondents who shifted modes (85.3%) wrote an open-ended comment about their commute experience.

**New telecommuters enjoyed not having to travel.** The greatest commute mode shift was to telecommuting (0.4% in 2019 vs. 58.2% in 2020,  $p < 0.01$ ). Overall, shifting to telecommuting was viewed positively. We classified 206 (20.8%) of 992 comments from new telecommuters as positive and only 35 (3.5%) as negative (the rest were descriptive or neutral). Staff and faculty provided significantly more positive comments than students (28.6% vs. 10.4%,  $p < 0.01$ ). Compared to other modes, respondents who shifted from personal automobile to telecommuting provided the highest proportion of positive comments (26.3% vs. 12.5%,  $p < 0.01$ ). Respondents who lived near campus (in the same zip code as UWM) provided significantly fewer positive comments about telecommuting than others (10.7% vs. 23.3%,  $p < 0.01$ ).

Positive responses commonly highlighted reductions in travel time and out-of-pocket costs, particularly with regard to automobile parking ([Table 2](#)). Negative views emphasized missing opportunities and resources on campus (e.g., in-person teaching and learning, social interaction, technology support) and missing benefits of travel (e.g., routine, time to decompress, exercise).

Table 1. UWM Campus Commute Mode Shifts, Fall 2019 to Fall 2020

	2020 Commute Mode									
2019 Commute Mode	Bicycle	Bus	Carpool/ Rideshare	Other	Personal Auto	Remote	UWM Shuttle	Walk/ Run	2019 Total	2019 Share
Bicycle	16	1	0	0	2	50	0	2	71	3.6%
Bus	11	134	10	1	42	221	1	13	433	21.9%
Carpool/Rideshare	0	4	19	0	12	55	1	1	92	4.7%
Other	0	0	0	6	0	22	0	0	28	1.4%
Personal Auto	5	4	10	2	395	667	3	7	1093	55.3%
Remote	0	0	0	0	2	5	0	0	7	0.4%
UWM Shuttle	1	1	2	0	7	31	16	9	67	3.4%
Walk/Run	9	8	4	2	12	100	0	52	187	9.5%
2020 Total	42	152	45	11	472	1151	21	84	1978	100.0%
2020 Share	2.1%	7.7%	2.3%	0.6%	23.9%	58.2%	1.1%	4.2%	100.0%	
% Change, 19-20	-40.8%	-64.9%	-51.1%	-60.7%	-56.8%	16342.9%	-68.7%	-55.1%		

Table 2. Major Themes Mentioned by Respondents who Shifted to Telecommuting

Overall Theme		Responses	Example Quotes
Reduced travel time	Time between home and campus	81	<ul style="list-style-type: none"> <li>• "This is like getting a raise and at least 1.5 hours of my life back each day. And I get more done at work..." --<i>Staff, Shifted from personal vehicle to telecommuting</i></li> <li>• "This year I'm working entirely from home...I do miss the walking/biking (fresh air, exercise), but I've gained some time and flexibility in my schedule..." --<i>Staff, Shifted from walking to telecommuting</i></li> </ul>
	Time to search for a parking space	32	<ul style="list-style-type: none"> <li>• "I no longer waste time looking for parking spaces and moving my car on the street to avoid tickets during the day." --<i>Staff, Shifted from personal vehicle to telecommuting</i></li> <li>• "I would typically spend 20-30 minutes each morning trying to find a spot in Fall 2019, often not finding one. Most days, I would try and coordinate my arrival time and my class times to coincide with parking availability. This is a huge waste of valuable faculty time!!!" --<i>Faculty, Shifted from personal vehicle to telecommuting</i></li> </ul>
Reduced out-of-pocket costs	Cost of parking	63	<ul style="list-style-type: none"> <li>• "It's much easier for me to be at home, and cheaper. Parking is very expensive on campus so I've definitely cut costs on that." --<i>Student, Shifted from personal vehicle to telecommuting</i></li> </ul>
	Cost of operating vehicle	42	<ul style="list-style-type: none"> <li>• "It's odd, I like that I'm saving the gas money but I'm sacrificing my education for this pandemic." --<i>Student, Shifted from personal vehicle to telecommuting</i></li> </ul>
Reduced personal stress		22	<ul style="list-style-type: none"> <li>• "One year ago: stressful and expensive. Today: Blissful!" --<i>Staff, Shifted from personal vehicle to telecommuting</i></li> </ul>
Other or general comment		52	<ul style="list-style-type: none"> <li>• "Although I miss being on campus, working with students face-to-face, I do enjoy NOT having to commute to campus." --<i>Staff, Shifted from personal vehicle to telecommuting</i></li> </ul>

Commuters with fewer resources were less likely to shift to telecommuting. Prior to the pandemic, lower-income staff and faculty were more likely to take the bus or UWM shuttle than higher-income staff and faculty (29.0% vs. 6.5%,  $p < 0.01$ ) and less likely to use a personal automobile (55.5% vs. 70.5%,  $p < 0.01$ ) ([Figure 1](#)). There were similar trends for all UWM commuters based on automobile access. During the pandemic, UWM community members with lower incomes and lower automobile access were significantly less likely than others to shift to telecommuting (48.4% of low-income vs. 62.3% of high-income commuters,  $p < 0.01$ ; 40.5% of low-automobile-access vs. 61.0% of high-automobile-access commuters,  $p < 0.01$ ) ([Figure 2](#)). Lower-resource commuters may be more likely to have jobs requiring in-person work (Matson et al. 2021), but further research should also explore whether telecommuting differences by resource level might be associated with disparities in household technology and workspace availability (Cuerdo-Vilches, Navas-Martín, and Oteiza 2021), workplace culture (Wilton, Páez, and Scott 2011), or personal preferences (Mokhtarian and Salomon 1997).

**Concern about COVID-19 transmission was only one of several factors pushing commuters away from public transit.** Public transit modes experienced the largest proportional decreases in mode share (UWM shuttle: -68.7%; local bus: -64.9%). The 281 open-ended responses from people who shifted from these two transit modes in 2019 to another mode in 2020 showed mixed reactions: 69 (24.6%) were positive, while 45 (16.0%) were negative.

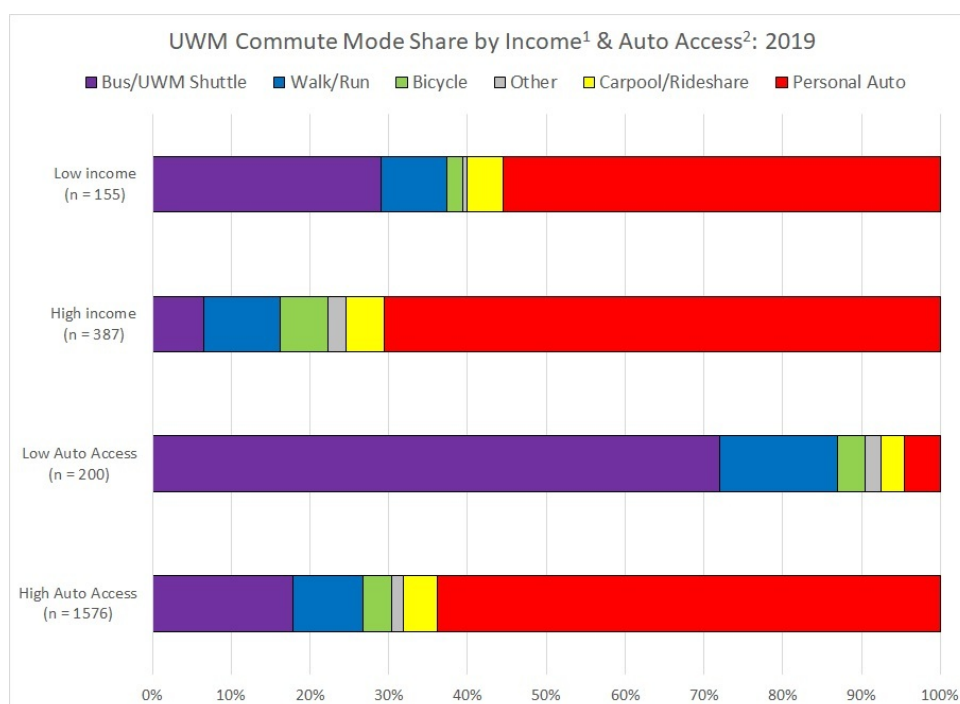


Figure 1. UWM Commute Mode Share by Income and Automobile Access: 2019

Notes:

- 1) Low income: Annual household income <\$50,000. High income: Annual household income >=\$100,000. These low- and high-income groups only include staff and faculty respondents because we were unable to determine if students reported their own incomes, their parents' incomes, or reported the total income of a group house.
- 2) Low auto access: Do not have consistent access to a reliable vehicle or are unable to drive. High auto access: Have access to their own reliable vehicle or share access with only one other driver who they live with. These low- and high-auto-access groups include staff, faculty, and students.

These respondents mentioned other convenience and cost tradeoffs (Schneider 2013) even more often than concerns about exposure to COVID-19 in public vehicles ([Table 3](#)). In response to the pandemic, UWM discontinued its 55% transit pass subsidy for employees, shuttle and bus capacities were capped at 25% to 40%, and several bus lines were suspended. Simultaneously, automobile parking fees were reduced by approximately 25% and parking became easier to find on campus. Many bus and UWM shuttle commuters adapted to these new convenience and cost conditions by shifting modes. Compared to other commuters who changed modes, former transit users were significantly more likely to switch to driving alone (14.1% vs. 2.8%,  $p < 0.01$ ), as expected when underlying conditions become less favorable for transit and more favorable for driving.

These findings are specific to UWM, an urban campus with many off-campus commuters (Schneider and Willman 2019), so additional studies are needed to explore the impacts of the pandemic on campus commuting in other contexts.

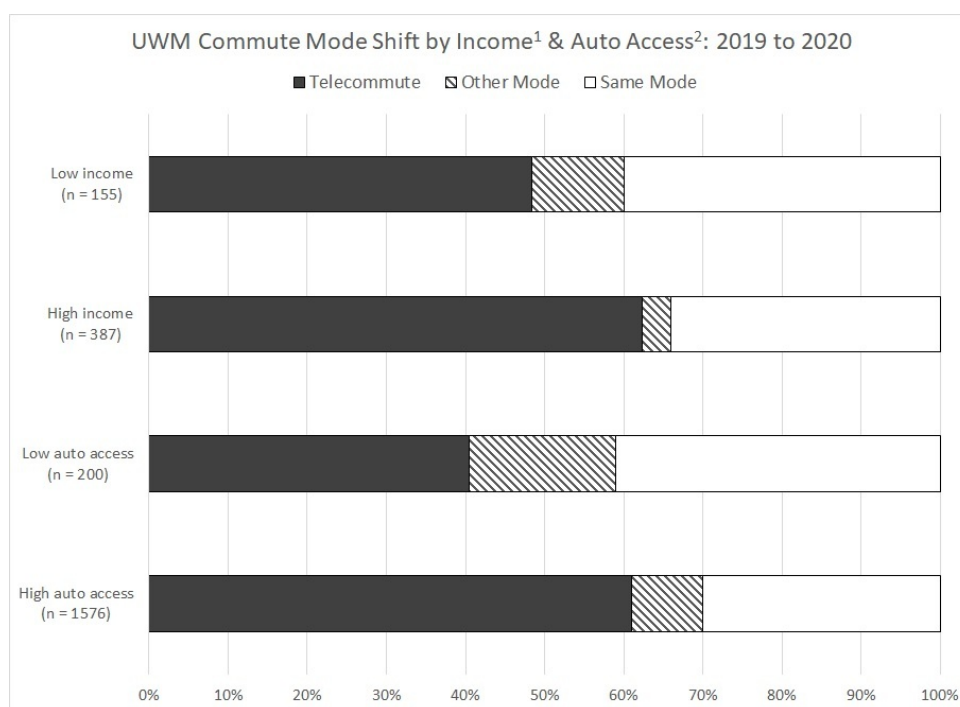


Figure 2. UWM Campus Commute Mode Shift by Income and Automobile Access: 2019 to 2020

Notes:

- 1) Low income: Annual household income <\$50,000. High income: Annual household income >=\$100,000. These low- and high-income groups only include staff and faculty respondents because we were unable to determine if students reported their own incomes, their parents' incomes, or reported the total income of a group house.
- 2) Low auto access: Do not have consistent access to a reliable vehicle or are unable to drive. High auto access: Have access to their own reliable vehicle or share access with only one other driver who they live with. These low- and high-auto-access groups include staff, faculty, and students.

Table 3. Major Themes Mentioned by Respondents who Shifted from Public Transit Commuting

Overall Theme		Responses	Example Quote
Convenience and cost tradeoffs	Lost transit subsidy/fare too high	21	<ul style="list-style-type: none"> <li>"I would rather take the bus than drive, but the bus pass is no longer subsidized by the university so the parking pass is cheaper..." --Staff, Shifted from bus to personal vehicle</li> </ul>
	Travel time savings	18	<ul style="list-style-type: none"> <li>"Last year I didn't spend as much money for parking. But this year I am saving so much time by parking in campus." --Staff, Shifted from UWM shuttle to personal vehicle</li> </ul>
	Transit capacity limits/crowding	8	<ul style="list-style-type: none"> <li>"I now use my car because of the passenger limit on the buses and because it's safer." --Student, Shifted from bus to personal vehicle</li> </ul>
	Reduced transit service & reliability	8	<ul style="list-style-type: none"> <li>"The busses run more infrequently and are unsafe. I can rely on my car so I take that 100% of the time now." --Student, Shifted from bus to personal vehicle</li> </ul>
	Easier auto parking	7	<ul style="list-style-type: none"> <li>"Parking is much easier to find in the Fall 2020. But I don't like not taking the bus." --Faculty, Shifted from bus to personal vehicle</li> </ul>
Safety concerns about COVID exposure on transit vehicle		36	<ul style="list-style-type: none"> <li>"I have to rely on my family for rides...my family isn't comfortable with me taking the bus because of Covid." --Student, Shifted from bus to carpool/rideshare</li> </ul>

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