The Impacts of COVID-19 Telecommuting for the Twin Cities Metro Area

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Abstract
Amidst the COVID-19 pandemic, telecommuting has become increasingly prevalent across the United States and the world. As part of this change, commute patterns, and overall work and travel behavior significantly changed on scales not seen before. In addition, the changes, benefits and costs did not fall equally across all parts of the population, as some "essential" workers, who usually were lower income and from BIPOC populations, did not have the option to work from home. In this paper, the impacts of telecommuting on travel patterns, congestion, land use patterns, transit use, and especially the related equity issues arising from shifting employment online are examined at a high level. Using national- and state-level employment data from the U.S. Bureau of Labor Statistics, the American Community Survey, and ReferenceUSA, and travel data from the Minnesota Department of Transportation (MnDOT), MetroTransit and related datasets, this paper explores the impacts of teleworking, with a focus on Minnesota. From this high-level analysis, initial conclusions about the impacts of telecommuting during the pandemic are drawn, and suggestions made regarding short- and long-term implications for future transportation policies and investments.

I. Introduction

During the COVID-19 pandemic that began in early 2020, going to work, attending school, shopping, eating at restaurants, in-person appointments, visiting arts and cultural spaces, live entertainment, celebrations, errands, and nearly any other in-person activity that required physical travel, was replaced, or attempted to be replaced, by performing those activities from home, usually enabled by technology. While performing the activities remotely had distinct advantages in socially distanced times, it quickly became apparent that this new way of living was not without downsides. Not every job can be performed well online, if at all, certain sectors of the economy depend upon in-person interactions, and our urban infrastructure is not set up to nimbly respond.

The core of the pandemic response, from a work and travel perspective, was telecommuting, or working from home. Research has been done on the potential travel impacts of widespread telecommuting, as well as the workplace implications, but the pandemic was the first time these initiatives were implemented on a large scale. In Minnesota, before the pandemic, one of the most significant efforts was e-Workplace, which found that workers could maintain productivity, travel reduced and benefits returned over costs at a 9:1 ratio (Lari). However, COVID-19 demonstrated the limitations of such pilots, as large-scale implementation revealed the variety of work types and schedules produced benefits and costs that were not shared equally among all workers and employers. As such, issues of equity in the development and implementation of telecommuting are also addressed in this paper.

For cities and state agencies tracking travel demand and travel assets like freeways, understanding a shift in travel times for telecommuting workers has the potential to impact future infrastructure planning. Mitigating disparities in who can functionally telecommute is also critical, as such efforts address overall accessibility for workplaces that continue to use telecommuting. The Twin Cities region of Minneapolis and St. Paul, Minnesota is a useful focus area for this analysis as the region ranks 92nd out of the 100 largest metropolitan areas in the United States in racial inclusion and has some of the largest median earnings and relative poverty gaps in the country (Berube et al. 2019).

In summary, this paper examines national and Minnesota impacts of telecommuting on travel demand, transportation agencies, businesses, and the public, as well as recommends adjustments for adapting to emerging long term telecommuting behaviors after the pandemic. The findings of this paper are both quantitative, analyzing real-time data and analytics to inform transportation demand decisions, and qualitative, seeking to inform policy recommendations and provide insight into the ever-changing field of transit demand management and telecommuting in a post-COVID world, especially through an equity lens. To ensure viable and equitable outcomes from telework, while also meeting travel demand goals, policymakers will need to be intentional in the development and implementation of policies and practices that promote telecommuting.

II. Literature Review

The COVID-19 pandemic impacted mobility, transportation and the environment, among other things. To understand the magnitude and context for these changes, a brief review of the literature discussing the benefits and possible challenges of telecommuting as they relate to transportation is presented below.

A. Telecommuting Pre-COVID (eWorkPlace initiative)

Pre-COVID-19, numerous studies found telecommuting, or teleworking, could boost productivity in the workplace, promote job satisfaction, reduce turnover, and positively impact relationships between supervisors (Lari). Additionally, telework in the federal government had the potential to save taxpayers $11 billion per year, and making teleworking more accessible could reduce greenhouse gas emissions by the equivalent of 16 million planted trees (Lari).

Given these findings, eWorkPlace was established as a state-sponsored initiative for Twin Cities area businesses that fostered teleworking. Through the multi-year initiative, the program promoted telecommuting as a way to reduce greenhouse gas emissions and travel congestion. Throughout the final phase of eWorkPlace, hundreds of employees began teleworking with the help of eWorkPlace. Among participants, an average of 32 one-way daily trips were eliminated. The full reduction in daily trips was expected to be significantly higher based on the estimated number of new teleworkers reported by participating employers. Each calculator user saved more than 2 hours weekly on average by eliminating their commute – a yearly savings of about 94 hours that is presumably enjoyed by all eWorkPlace Phase III participants. The financial and carbon savings of these new teleworkers were significant as well, with the average calculator user saving over $3,600 and reducing emissions by nearly 1,900 pounds of carbon dioxide each year.

Since then, COVID-19 has renewed an overall interest in teleworking and made the findings from the initiative more relevant.

B. Telecommuting During and Post-COVID

Telework became much more significant during the COVID-19 pandemic. Much of it was mandatory, rather than voluntary, and full-time, creating challenges in areas and for people with limited infrastructure and resources to support it. The world experienced an unexpected change from the first quarter of the year 2020. Governments, in response to the statistics of cases and deaths due to the pandemic, had to enforce drastic measures to save lives. In Minnesota, as well as most states in the U.S., the governor implemented a stay-at-home executive order on March 18th, 2020, plunging offices and businesses into teleworking. The challenge for policymakers was how to continue protecting lives without causing a global recession. Measures that ensured physical distancing including the closing of schools, grounding of flights, putting a stop to large gatherings and closing workplaces were put in place.

1. Workforce impacts.

Nationally, telework has expanded sharply since early 2020. Barrero, Bloom, and Davis estimate that telework accounted for about 50 percent of paid work hours between April and December 2020, compared with 5 percent before the pandemic (Barrero et al.). At the beginning of the pandemic, the ability to telework played a significant role in whether one was able to keep their job. Dey, et al. found that, between February and April 2020, employment fell 8 percent among workers in occupations in which telework is feasible, compared with 21 percent among workers in occupations in which telework is not feasible (Dey et al.). Further, between July and September 2020, 31 percent of establishments increased teleworking opportunities for employees due to the pandemic (Dey et al.). Notably, there was substantial variation by establishment size and industry. Large establishments (those with 500 or more employees) were more than twice as likely to have increased telework than were smaller establishments (Bureau of Labor Statistics). In educational services, finance and insurance, information, and management sectors, more than 50 percent of establishments increased telework (Bureau of Labor Statistics). By contrast, in both agriculture and accommodation and food services, less than 10 percent of establishments did so (Bureau of Labor Statistics).

In Minnesota, US Household Pulse Survey and Census data estimated that about 190,000 Minnesotans were working from home in 2019, representing about 6.5% of the state's labor force. By May of 2020, over one-third of workers nationwide reported that they teleworked due to the pandemic, which would be the equivalent of more than one million Minnesotans. In June of 2021, estimates show that just over 600,000 workers in Minnesota were teleworking due to the coronavirus (US Census Bureau, Household Pulse Survey). As the spread of the virus ebbed and flowed over the course of the summer and most organizations were able to implement safety and social distancing measures, the number and percent of workers who were teleworking steadily declined, to a low of 21% by October. However, that was still more than three times as high as prior to the pandemic, and before the percentage teleworking started ticking back upward moving into the winter, climbing back above 23% by January 2022.

Workers with lower educational attainment were less likely to be able to telework, while nearly 60% of workers with a Bachelor’s degree or higher were able to work from home at one

point (Bureau of Labor Statistics). Additionally, according to the monthly population survey, in January 2021, women (26.0%) are more likely to be teleworking than men (20.8%), full-time workers (25.5%) are twice as likely to be teleworking as part-time (12.0%) workers, and by race, Asians (36.9%) and Whites (22.8%) are more likely to be teleworking than Blacks (18.8%) and Hispanic or Latinos (13.8%) (Bureau of Labor Statistics). Perhaps not surprisingly, people in their prime working years between 25 and 54 years of age (26.3%) were also much more likely to be teleworking than older workers (21.6%), as well as the youngest workers (9.8%) (Bureau of Labor Statistics).

2. Travel and economic impacts

The responses to COVID-19 also had significant impacts and implications for commuting and other travel behavior. While traffic congestion and related emissions dropped precipitously at first, more recent data shows that the results are less clear. A post-pandemic world has the prospects of being more interconnected, both in terms of interactions with others, but also between personal and work lives. Many organizations are adopting teleworking to avoid office congestion and make use of their time to be productive (Macht, 2021). However, employees working from home tend to work longer hours due to blurring of the boundaries between paid work and personal life to improve productivity (Charalampous, 2019). As a result, the changes from widespread telecommuting have proven to be much more complex than initially expected, raising questions about travel behavior, economic vitality in urban cores, equitable treatment of employees and other significant issues.

While the COVID-19 pandemic had shut down much of the U.S. economy, with over 33 million workers applying for unemployment insurance since March 15, 2020 (Bowen, 2022), millions of workers were still on the job providing essential services. Nearly every state governor issued executive orders that outlined industries deemed “essential” during the pandemic, which typically included health care, food service, and public transportation, among others (McNichols, 2020). Many of the workers in these industries, however, were already at an economic disadvantage before the crisis hit, generally earning lower wages and carrying less health-related insurance (Bowen, 2022).

In 42 U.S. states, including Minnesota, the foreign-born share of the essential workforce is the same or higher than the share of foreign-born workers in the overall labor force. Immigrant workers are overrepresented in essential jobs (ILC, 2020). Further, telecommuting disparities by income are stark. In August 2020, approximately 17 percent of Minnesotans with an income of less than $50,000 telecommuted, dropping to 15 percent in December. In contrast, 72 percent of Minnesotans with an income of $100,000 or more telecommuted in August, 2020, dropping to 70 percent in December (US Census Bureau, 2020).

In other words, to understand the travel impacts of the widespread telecommuting from the pandemic, one must understand the types of jobs that allowed people to work from home, and which ones required workers to continue to commute to the workplace. As discussed above, those in the latter category also tended to have the lowest incomes and other socio-economic disadvantages, which tends to correlate with transit dependency (Brough, 2021).

III. Traffic Impacts

A. Methods

To begin to understand the complex impacts of teleworking on the transportation system during and potentially after the COVID-19 pandemic, both qualitative and quantitative methods were used. First, the researchers began with qualitative interviews with stakeholders in the Twin Cities Metro Area. The interviews aided the researchers in understanding how workplaces and transportation demand management agencies adapted to the rapid changes in telecommuting behaviors during the COVID-19 pandemic, as well as insight on how to implement long-term strategies for long-term teleworking. Interviews also captured additional points of interest related to essential worker travel, including equity strategies implemented by workplaces or travel demand organizations that mitigate disparities across gender, race, and educational attainment in the Twin Cities Metro region. The researchers conducted interviews with Move Minnesota, Saint Paul's transportation management organization; Saint Paul Downtown Alliance, a non-profit organization representing small businesses, residents, governments, and nonprofits in Saint Paul; Metro Transit, the Twin Cities Metro Area's transit management organization; and the 494 Corridor Commission, which encourages regional and economic growth and congestion reduction along I-494.

Additionally, the researchers gathered ongoing local, state, and national reports about telecommuting to inform data gathering. Notable reports and data sources included data from the Metropolitan Council, a transportation management organization for the Twin Cities region; national transportation entities like the Bureau of Transportation Statistics, and Google Transportation Reports.

After the initial parameters of the impacts were acknowledged with the aid of qualitative data and research, the researchers began the quantitative portion. First, the researchers collected data through the US Labor Statistics, American Community Survey, and ReferenceUSA to understand the industry and employment demographics in the Twin Cities metropolitan area. The research team used the information from this preliminary study to select frequently traveled corridors and interchanges workers travel on, including areas utilized by essential workers.

Next, the research team utilized data from the Minnesota Department of Transportation sensors to gather and analyze hourly traffic volumes at key locations across the Twin Cities Metro region. Hourly traffic volume data was gathered for both directions in March, April, and May in 2019, 2020, 2021, and 2022. As shown in Image 1, he locations included:

- I-94 at 98th street
- I -35E at County Road H2
- I-494 at France Ave
- Hwy 77 at Old Shakopee Road
- Hwy 169 at Anderson Lake Road
- I-494 at Delaware Ave and
- I-35E at TH 36

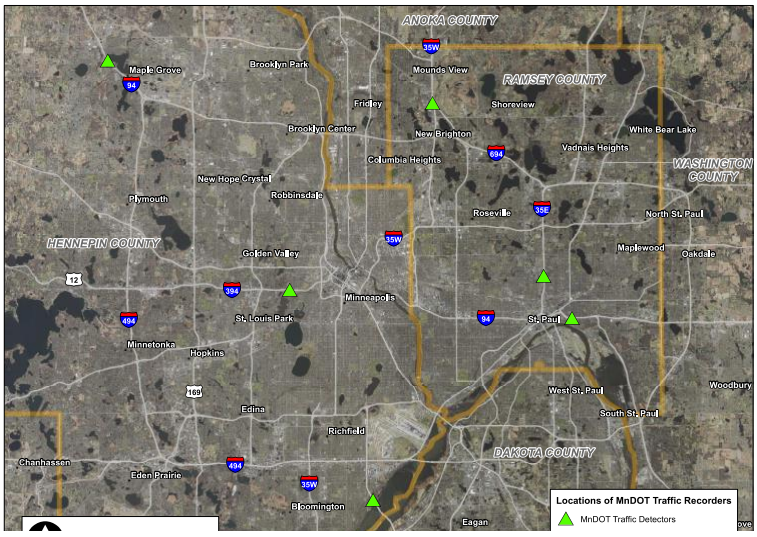


Image 1: Traffic Volume Locations

Further, to understand peak traffic volume and congestion changes due to COVID-19, the research team chose an additional seven locations that carry significant commuting trips to and from the Twin Cities urban cores. The research team utilized the data to calculate the morning peak travel volumes during weekdays for the months of May and June from 2019 to 2022. The locations of these sites are as follows:

- 35W at 98th street Northbound,
- 35W at TH96 Southbound,
- I94 at Weaver Lake Road Southbound,
- I94 at Century Ave Westbound,
- I394 at Penn Ave Eastbound including EZ Passlane,
- TH 77 at River Crossing Northbound, and,
- I35E at Larpenteur Ave Southbound.

[Insert Map]

B. Findings/Discussion

Since the start of the pandemic, many workers transitioned from in-person work to working at home. Kramer and Kramer called this abrupt shift a “great work from home experiment” and expect a better understanding of the effectiveness of working from home for different groups to develop (Kramer and Kramer). Interviews provided a broad insight into peak travel pattern behaviors. Generally, interviews found that newfound flexibility offered by telecommuting would be reflected by the dispersion of travel patterns. Specifically, this manifested itself in changed morning peak travel, as employees decided to work from home in the mornings. This morning peak volume, interviewees shared, would have implications around the middle of the standard workday, with employees that worked from home in the morning electing to travel into work throughout off-peak periods. Finally, interviewees speculated evening peak travel would never rebound to pre-pandemic patterns, citing earlier end-times for employees and greater discretionary trips.

The embrace of telecommuting during the pandemic had significant impacts on travel volumes and congestion to and from downtown. Traffic volumes traveling to downtown are depicted in Figure 1, with volume peaking in 2019 at 35,000 vehicles per hour, and a greater volume of commuters traveling earlier in the day to avoid congestion. Due to pandemic restrictions and onset of telecommuting, 2020 peak travel volume decreased by 79.45 percent to 151,000 commuters. Additionally, traffic volumes as depicted in Figure 1 show a slower, more gradual increase in commuter volume throughout the morning commute time in 2020, signifying a reduction in congestion and greater flexibility primarily due to pandemic travel restrictions. In 2022, even after travel restrictions relaxed and offices reopened to workers, peak traffic volumes remained 5 percent below pre-pandemic peak travel levels. While 5 percent reduction in traffic volume may seem insignificant, it has remarkable impacts on congestion. A Minnesota Department of Transportation study found that a 5 percent reduction in traffic volume reduces congestion by close to 40 percent (Morris, 2022). For workers traveling downtown, this 5 percent reduction in traffic volumes and subsequent congestion relief offers greater travel time savings, travel time reliability and greater access to destinations.

Peak evening travel from downtown is shown in Figure 2 and reflects greater discretionary trips. In 2019, evening traffic volumes were around 325,000, around 20,000 lower

than morning peak volumes in the 2019. By 2022, evening traffic volumes returned to pre-pandemic levels. Given the reduction in morning traffic volumes to downtown in 2022, evening traffic volumes rebounding to pre-pandemic levels indicate a greater number of discretionary trips—not commuter trips. The distribution of people leaving work at different times in 2022 indicate commuters have greater flexibility and show some level of discretionary travel.

Figure 1: Traffic Volumes to Downtown (2019, 2020, 2022)

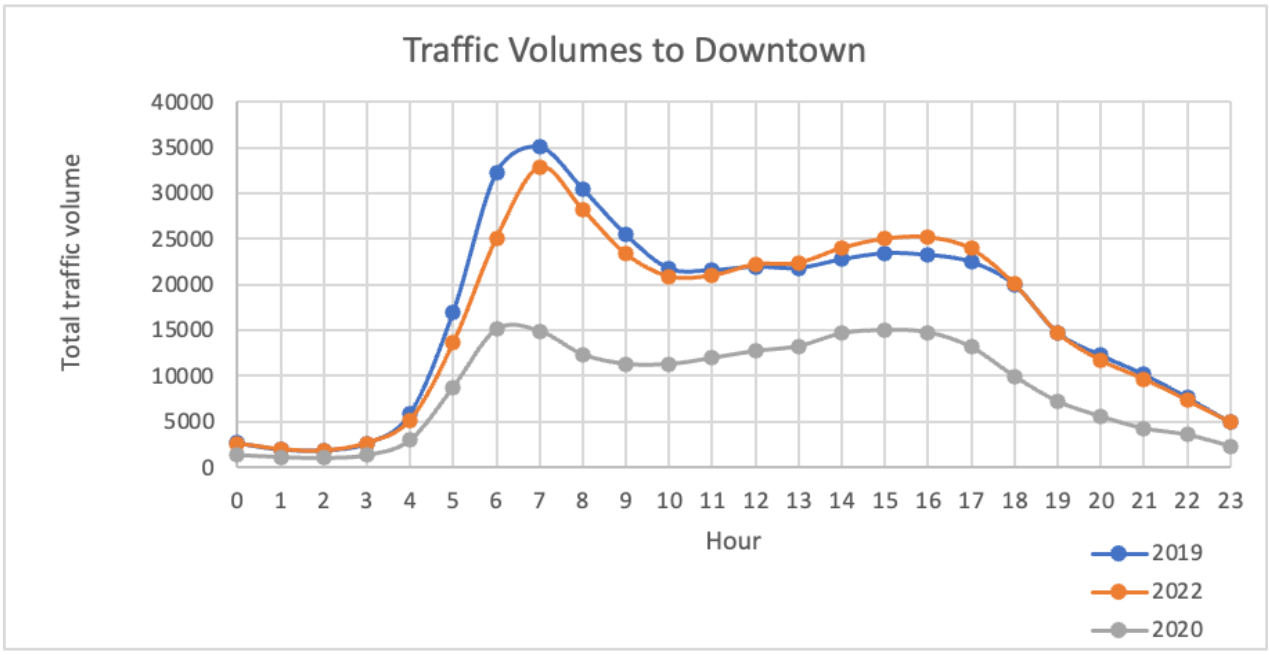
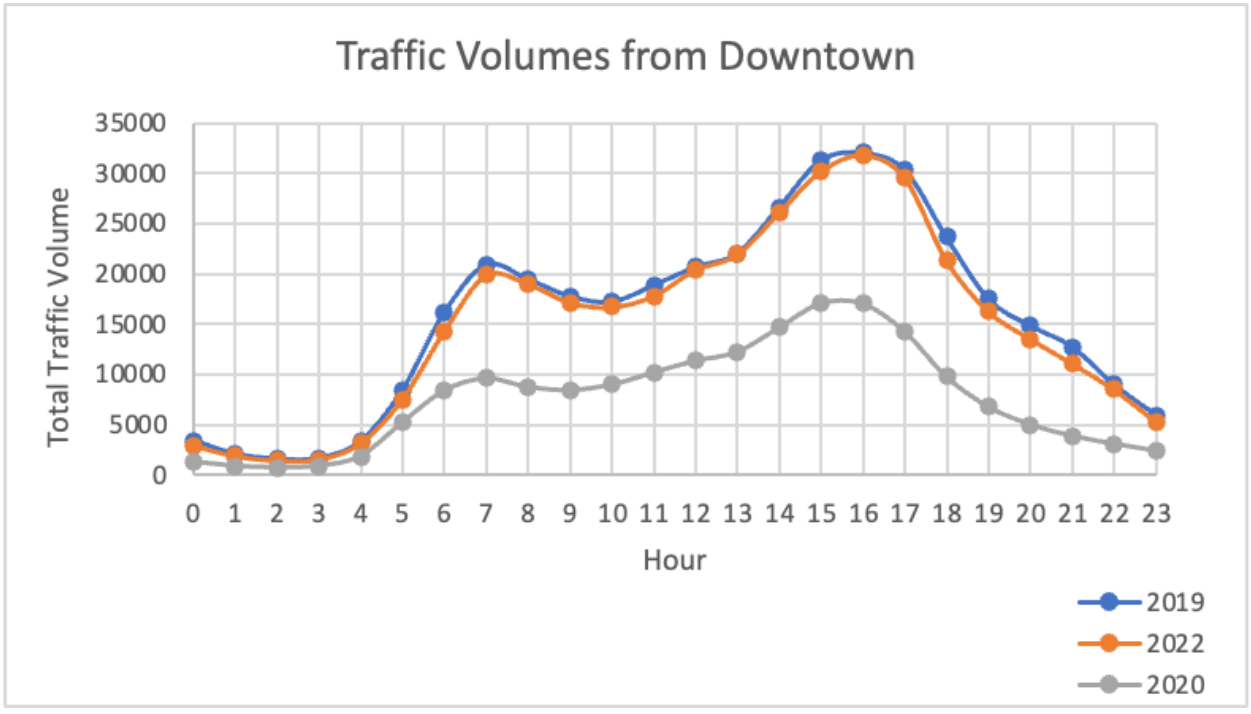


Figure 2: Traffic Volumes from Downtown (2019, 2020, 2022)



The second set of data, focused on capturing changes in travel behaviors among common commuter routes, showed notable trends. Data was gathered for March, April, and May in 2019, 2020, 2021, and 2022, and is shown in Figures 1-6. Travel behavior was fairly constant in 2019, falling at the beginning of 2020, and rebounding by 2022. First, commuters began their morning commutes to downtown later, and second, more trips were made to downtown in the evening of 2022 than in 2019. This indicates a possibly significant change in travel patterns for the future. Finally, despite other changes, we see that by 2022, all other traffic volumes have largely returned to their 2019 volumes.

The findings reflect a tenuous balance between employers and employees, as employees find greater flexibility more beneficial for their work and home life, and employers navigating an altered work environment and sense of workplace culture. Interview results suggested employees were eager for some form of hybrid working to remain long-term, while employers were juggling unforeseen land use impacts on parking services and rethinking the use of office space leases for co-working spaces. Both employers and employees were ultimately consistent in supporting schedule flexibility and work-life balance through telecommuting but had different perspectives on perceived productivity. Further, interviewees shared that the impacts on downtowns are significant, especially for small businesses in downtown skyways, such as food, and hospitality services that rely on business from downtown workers. Many of these small businesses, they mentioned, were BIPOC owned or employed significant numbers of BIPOC employees. Additionally, interviewees mentioned the overall perceived safety of downtowns have decreased as fewer people travel through downtown. The perception and reality of safety in downtowns impact how people choose to get around. If walking, transit, and biking feel unsafe, people will continue teleworking, or turn to cars because they are private, create a barrier of protection, and reduce the distance that people have to walk on streets they perceive to be unsafe.

To understand how telecommuting influenced the distribution of traffic during the work week, and subsequently travel behavior, the researchers analyzed morning peak period travel volumes during the standard 5-day work week in July for 2019 and 2022 at seven locations, as discussed above. The seven locations were chosen because they carry significant directional commuter travel during weekday mornings. The locations of these sites are as follows:

- 35W at 98th street Northbound,
- 35W at TH96 Southbound,
- I94 at Weaver Lake Road Southbound,
- I94 at Century Ave Westbound,
- I394 at Penn Ave Eastbound including EZ Pass lane,
- TH 77 at River Crossing Northbound, and,
- I35E at Larpenteur Ave Southbound.

Table 1 details the total weekly volumes along the seven corridors between 2019 and 2022 for each day of the work week and the percentage difference, with Friday showing the most significant decrease in total volumes of 35 percent. Similarly, figure 3 depicts the distribution of trips across the morning peak travel period during the standard work week. Between 2019 and 2022, there was a significant decrease in morning volumes on Fridays.

Given the choice, hybrid or remote workers are most likely to work from home or commute midday to the office on Fridays.

Table 2 details the percentage difference in volumes throughout the morning peak travel period at the seven locations. The percentage decrease in early morning volumes from 2019 to 2022 indicate a reduced need for people to start their commute due to the reduced morning congestion. In 2019, total traffic volumes at the seven locations in the peak morning period were 5 million, and in 2022 reduced 20 percent below 2019 levels. Prior to the pandemic and the acceptance of telecommuting, unreliable travel time due to congestion mandated commuters begin their commute earlier in the morning. The decreased hourly volumes shown in Table 2 show a delayed start time as workers are not facing as much congestion.

Table 1: Total morning travel distributions in 2019 and 2022

	2019	2022	% Difference
Monday	865,592	743,272	-14.13%
Tuesday	970,983	877,867	-9.59%
Wednesday	1,077,594	864,318	-19.79%
Thursday	1,065,867	859,445	-19.37%
Friday	1,034,294	678,687	-34.38%
Total	5,014,330	4,023,589	-19.76%

Table 2: Work week morning travel distributions and percent changes in 2019 and 2022

	6:00 AM	% change	7:00 AM	% change	8:00 AM	% change	9:00 AM	% change
Monday								
2019	222,902	-21.11%	246,695	-12.27%	217,600	-11.85%	178,395	-11.63%
2022	175,851		216,421		191,806		159,814	
Tuesday								
2019	263,303	-20.71%	275,420	-6.71%	237,071	-2.41%	195,189	-7.95%
2022	208,766		256,935		231,359		180,807	
Wednesday								
2019	283,297	-28.74%	299,555	-15.48%	271,431	-15.98%	223,311	-23.23%
2022	201,871		253,173		228,052		181,222	
Thursday								
2019	280,277	-28.43%	304,009	-17.52%	259,960	-13.25%	221,621	-21.60%
2022	200,597		250,748		225,523		182,257	
Friday								

2019	262,874	**-40.39%**	298,786	**-35.27%**	255,083	**-32.35%**	217,551	**-29.46%**
2022	156,695		193,417		172,575		156,000	

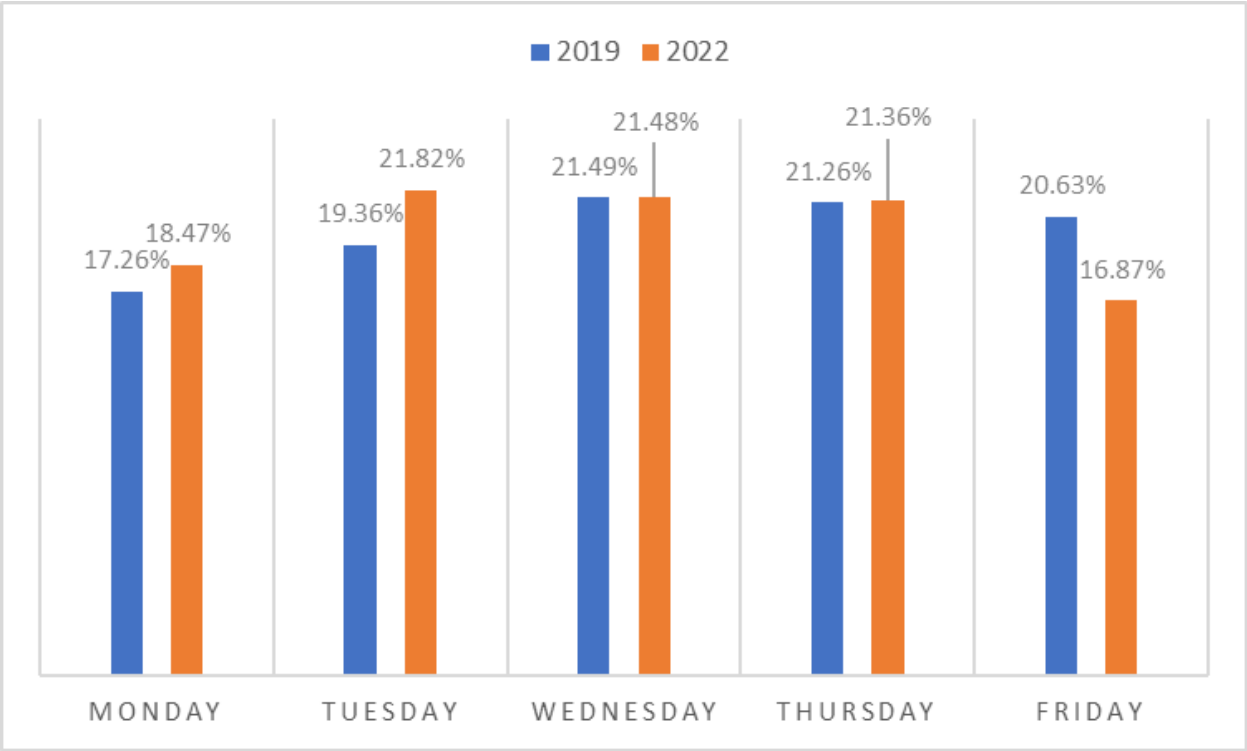


Figure 3: Percentage distribution in AM Travel volumes for 2019 and 2022

IV. Transit

The sudden and unprecedented shutdowns led to declines in travel demand at all geographic scales and across all modes. Public transit is particularly vulnerable to disruption and shocks from pandemics due to the collective nature of its mobility. Researchers examined data on transit demand for both Metro Transit and Southwest Transit. Metro Transit is the primary provider, serving the center cities in the Twin Cities region and many suburbs, largely with fixed route service operating at regular intervals throughout the day, whereas Southwest Transit serves suburban communities that “opted out” of the Metro Transit service area, offering primarily express bus service to and from the main downtown employment centers of Minneapolis and St. Paul during peak commute times.

Transit services are critical for a large proportion of workers in the Twin Cities Metro Region. During the pandemic, ridership plummeted. From the beginning of 2020, Metro Transit ridership declined by 56 percent as travel demand waned. In 2021, ridership was down compared to pre-COVID levels; however, numbers improved about 34 percent between April and December compared to the same time period in 2020. A higher percentage of essential workers live within Metro Transit service areas, maintaining greater ridership along regular service routes, and even during non-peak hours. The remaining Metro Transit riders during the pandemic were people of color, older, low-income or unemployed, and those identifying as having a disability (Metro Transit, 2022). Trip purpose during the pandemic centered on basic

life maintenance trips—shopping, basic errands, and medical appointments. In addition, some modes and routes, notably arterial Bus Rapid Transit lines, were slightly more resilient as demand remained more constant.

Another notable trend to consider in transit is typical commuter services, especially express bus services offered by Metro Transit and the “opt-out” providers, such as Southwest Transit, which serves Carver, Chaska, Chanhassen and Eden Prairie to Minneapolis and Saint Paul. As shown in figure 4, while annual bus ridership reached about 23.2 million riders in 2021, down about 12 percent from 2020, express ridership took the biggest hit, remaining down 62 percent from 2020 pre-pandemic levels.

In early 2020, at the outset of COVID-19, express ridership nearly disappeared, with ridership dropping 90-95 percent. In the second quarter of 2022, the Southwest Transit Minneapolis and Saint Paul express routes is servicing commuters at just about 20 percent of pre-pandemic ridership levels. The Minnesota Valley Transit Authority (MVTA), another “opt-out” public transportation agency for seven suburbs located approximately 15 miles south of Minneapolis and St. Paul, also experienced drastic reduction in trips and served close to only 37% riders in 2022 compared to 2019 levels.

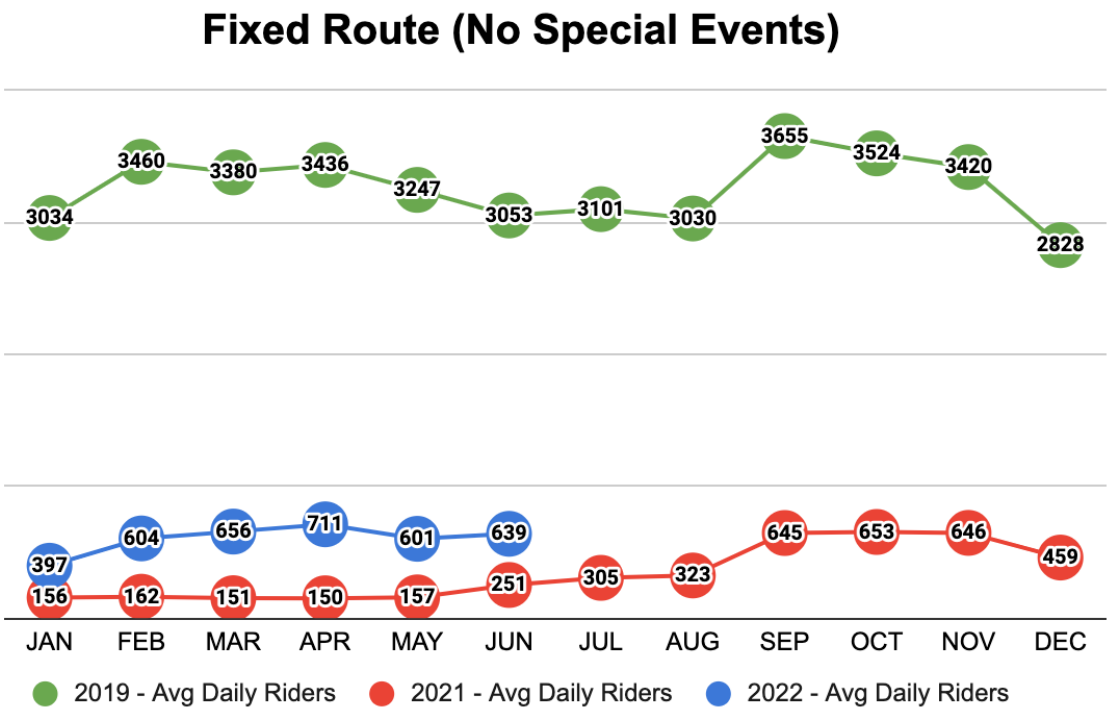


Figure 4: Southwest Transit Fixed Route Travel Volumes (Credit: Southwest Transit).

Declines in transit demand are also unequal across social groups, since many information, managerial, tech, and knowledge workers can work from home while people with jobs that demand physical presence still need to travel to work (Berube et al.). The remaining public transit users are likely transit dependent riders who require public transit for mobility and accessibility to jobs, health care, and other services (Berube et al.). Since only essential businesses and services were open during this period, these dependent riders are also likely

performing necessary activities for themselves and society, highlighting the nature of public transit as a critical service. These dependent riders traveling to perform essential jobs may also have a different hourly demand profile than the demand profile experienced by transit agencies during normal times, reflecting a potential mismatch between their needs and transit services.

Just as workers return to the commute, people are returning to transit, but transit ridership remains significantly lower than it was pre-pandemic, and a rebound in in 9-5 commuters alone will not restore ridership to pre-pandemic levels. For example, even though ridership for express busses increased by 70 percent in 2022 it remained 50 percent below 2019 ridership levels (Metro Transit, 2022). Transit continues to serve a variety of trip purposes throughout the day, however, and ridership on services that provide a wider variety of trips and serve more transit dependent populations have been more robust. These disparate declines reflect varying degrees of public transit dependence across communities. They also suggest different vulnerabilities of transit systems to shocks as drops in fare revenue may lead to subsequent cuts in services. Since a major portion of the remaining transit trips serve basic subsistence trip purposes for riders, transit services must remain. However, it is incumbent upon transit managers and urban planners to figure out how transit services might bring new efficiencies to post-pandemic travel patterns.

V. Workforce Equity

The COVID-19 pandemic exposed and exacerbated inequalities in nearly every facet of society. Jobs in retail, construction, hotels, and food services cannot be performed online, rendering teleworking unavailable to these workers, who are often earning the lowest incomes. As much as telecommuting enabled a significant economic rebound for the top 25 percent of income earners in the US, the bottom 25 percent experienced job losses upward of 20 percent. Unlike the recessions of 1990, 2001, and 2008 where impacts were felt equally by all income levels, the COVID-19 recession in 2020 through 2022 impacted primarily the least well off (Long, 2020).

Further disparities by gender, race, and educational attainment were also present. Based on a national study from the Pew Research Center, most employees working from home in October of 2020 said they would like to continue to do so after the pandemic, and women were more likely than men to say they would be interested in exclusively working from home (Parker et al. 2020). Broadly, the COVID-19 pandemic brought about particular challenges for working women — particularly mothers — and started fresh workplace conversations about childcare, a responsibility disproportionately taken on by women (Brookings, 2020). The rise of telecommuting raises questions at the intersection of work and homelife that are critical for research and policy.

A notable trend during COVID-19 included the increase in deaths from motor vehicle crashes. In interviews for the Twin Cities Metro Region, many discussed the emptiness of downtowns, unsafe behaviors on roadways with reduced congestion, and transit service cuts. In particular, perceived safety on roadways was mentioned alongside mentions of empty downtowns. Many noted an increase in unsafe driver behaviors, which produced significant increases in pedestrian and bicycle crashes resulting in severe injury or fatalities, a trend that was also seen nationwide (NHTSA, 2021). In Minnesota, the pandemic proved to be the deadliest years since 2015. In 2020 traffic fatalities increased by 26 percent, the highest one-

year percentage increase since 1943-1944, and a 37 percent increase over 2019 (Minnesota Department of Public Safety). Speed was a critical factor in one third of fatal crashes in 2021, with citations for people speeding over 100 miles per hour or more three times higher in 2021 than in 2018 (Minnesota Department of Public Safety). It seems counterintuitive that traffic fatalities increased during a time when fewer people were driving. While there is no definitive answer, there are likely certain factors that led to this increase in traffic fatalities. Because speed-related fatalities increased, it is possible that less road traffic, or congestion, led to an increase in speeding among drivers and greater speeds are associated with higher fatality rates.

Metro Transit reported an increase in their communications and outreach efforts for their Transit Assistance Program throughout the pandemic, and continued outreach efforts for businesses that commute by transit. However, while 2021 reports indicated Black and Native American people in the Twin Cites region live near services, with Native American people having higher access to high-frequency routes, Black and Native American people but were more likely to experience service cuts than any other group, and experience lower on-time-performance (Metro Transit, 2022). Interviews speculated the long-term difficulty of justifying capacity increasing projects given the decrease in demand, and ongoing telecommuting behaviors.

For essential workers unable to telecommute, significant efforts were made post-pandemic to alleviate the disparate impact of the pandemic through the Hero Fund. As of April 2022, the Minnesota Legislature approved and passed the Minnesota Hero Fund, offering those who worked during the pandemic in essential worker industries financial compensation. The only stipulation to apply was workers could not have worked from home - or teleworked. This in and of itself is not a long-term solution, but signifies that the legislature, policymakers, and advocates recognize the inequity teleworking during the COVID-19 pandemic perpetuated.

VI. Conclusions

Telecommuting became a mainstream phenomenon during the COVID-19 pandemic and offered positive impacts initially with reduced congestion (Wang, Ozbilen, 2020 & Shabanpour et. al 2018), cleaner air quality (Wang, Ozbilen, 2020), and happier employees (Charalampous, 2019). Broadly, this research found travel behavior changes that have the potential to impact investments in infrastructure across the Metro region. Shifts in peak travel volumes and the dispersion of travel times make travel behaviors less predictable and force greater flexibility by employers to maintain their workforces. Notably, as much as telecommuting became a reality for many, it remains out of reach for others. As time has gone on and the world has reopened, traffic has rebounded with greater discretionary travel in some cases. The impacts on downtown land use, infrastructure investments, transit, and equity are still emerging.

Policymakers and transit agencies have challenges ahead to address the potential for continued telework preferences to continue to have disparate impacts favoring those who are most well-off. Efforts to reinvent and rebuild transit services and funding, address new land use patterns, and ensure traffic and worker safety will be paramount. While these policy discussions are indeed taking place, many metropolitan areas, including Minneapolis-St. Paul, are less prepared than they could be to ensure teleworking is a viable option for all, and to mitigate the impacts to urban cores. Strategies are needed to overcome the disparate impacts on women,

communities of color, and those with low incomes or educational attainment to sustain any widespread benefit.

Interviews

TDM consultant. Metro Transit. Zoom, 15 Apr. 2022.

Program Manager. Move Minnesota. Zoom, 4 Mar. 2022.

President, and Director of Safety Strategies. Saint Paul Downtown Alliance. Zoom, 10 Mar. 2022.

Executive Director and Vice President, 494 Corridor Commission. Zoom, 7 Mar. 2022.

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