So Close Yet So Far: Investigating the Role of City Public Transportation for Improving Healthcare Accessibility During and Post-COVID-19

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Substantial research and real-life applications have shown the importance of public transportation — classified as *Non-emergency Medical Transportation* (NEMT) — in relation to healthcare accessibility for the elderly, Medicaid-insured, and low-income city dwellers. Still, purposeful public transit expansion for these populations has yet to be fully improved and has only recently begun ramping up. City leaders in America should prioritize the development of new transit routes connecting care centers and marginalized communities as a pressing city-wide infrastructure goal, especially during this critical moment of re-emergence from the pandemic. Historical context is also necessary to provide a better understanding of our current status quo, as well as the spotlight on specific individuals and communities impacted by the lack of public transit options within their urban neighborhoods. Centering our focus on the San Francisco Bay Area, scholarly literature detailing health equity, and recent legislative policies, I aim to locate the role of public transportation in providing equitable access and the steps that should be taken to enhance accessibility throughout underserved, marginalized urban residents across the United States.

"For disabled people, it's really a hardship to be able to walk up the hills. It's almost impossible.... This is a congested part of the city, with lots of people here, people of color, low income. The Tenderloin always seems to be neglected."

Cheryl Shanks, in a *San Francisco Chronicle* interview, November 2020.

Amid the height of the COVID-19 pandemic in 2020, San Francisco's Municipal Transportation Agency (SFMTA) nosedived to 60% of their usual service operations on their city-wide routes. Citing falling revenue due to a stiff decrease in daily ridership, SFMTA director Jeffery Tumlin told the *San Francisco Chronicle*'s Mallory Moench — a veteran reporter on San Francisco public transportation — that his agency had organized "transit service cuts very much with equity in mind" (Moench, 2020). Yet, residents of San Francisco's Tenderloin District, a historically underserved and impoverished region of the city, have wondered if Tumlin's statement is as valid as it may seem. Two of the transit routes lost because of SFMTA's pandemic reductions were the 27 and 31 lines — the only services that connected the Tenderloin to other city districts providing access to grocery stores, shopping malls, and, more importantly, healthcare centers. Cheryl Shanks, a Tenderloin resident and community organizer for the Tenderloin People's Congress, described to Moench the unnecessary hardships enacted upon her and those she knew by the elimination of affordable and accessible public transportation options in her neighborhood. Pre-pandemic, Shanks would have taken the 27 to the nearest medical clinic three-quarters of a mile away, St. Francis Memorial Hospital, for regular checkups. However, her recent spine surgery, the inability to properly walk, coupled with the removal of the 27 line, have forced her to rely on private volunteer-based forms of transit options (Moench, 2020). Unfortunately, others in the district are not as lucky as Shanks: with formerly reliable city transportation abandoning them, they are unwilling — and understandably so — to make the journey to quality care centers often miles away.

San Francisco is not alone in this public transit-healthcare conundrum. According to The New York Times, additional metropolitan centers are moving ahead with the slashing of transit services with the goal of permanently keeping these changes. In Washington D.C., 19 stations have been shuttered alongside weekend routes; in Atlanta, 70 of their 110 bus routes have been placed on hold; and in New York City, transit planners have proposed cutting subway times by 40 percent and light rail by 50 percent (Goldbaum & Wright, 2020). Though it is crucial to acknowledge the financial burdens in place for these public transit agencies exacerbated mainly by the pandemic, it is also imperative that we understand who bears the brunt of these changes daily.

As of 2021, over 17% of individuals living in the top 50 American cities — areas such as New York City, Los Angeles, Houston, Chicago, and Detroit — are under the poverty line (DePietro, 2021). Nearly one in five people. Fortunately, state governments and presidential administrations have propelled insurance expansion to widen affordable healthcare access for the past several decades. Since the passage of the Affordable Care Act (ACA) in March 2010, improvements have been made within state-led plans to provide comprehensive coverage for low-income residents. Take, for example, Medi-Cal, California's Medicaid health care program, which

jumped from covering 12.9 million to 13.9 million Californians from 2020 to 2021 — roughly 35% of the state's population. Altogether, 93% of California residents possess some form of health insurance, which mirrors an upward trend that has been occurring nationally in many states that expanded Medicaid from 2010 to 2020 (Finegold et al., 2021). However, even though many under-resourced Americans can now afford to pay for their healthcare, they still cannot afford to *commute* to healthcare centers in a timely manner without efficient and robust public transit networks present.

Substantial research and real-life applications have shown the importance of public transportation — classified as *Non-emergency Medical Transportation* (NEMT) — in relation to healthcare accessibility for the elderly, Medicaid-insured, and low-income city dwellers. Still, purposeful public transit expansion for these populations has yet to be fully improved and has only recently begun ramping up. City leaders in America should prioritize the development of new transit routes connecting care centers and marginalized communities as a pressing city-wide infrastructure goal, especially during this critical moment of re-emergence from this pandemic that has deepened inequities and disparities rooted by other systemic factors. Centering our focus on the San Francisco Bay Area, scholarly literature detailing health equity, and recent legislative policies, I aim to locate the role of public transportation in providing equitable access and the steps that should be taken to enhance accessibility throughout underserved urban neighborhoods across the United States.

Unraveling the history behind the underutilization of public transit

When it comes to sustainable public transportation implementation, the United States lags behind other countries such as Canada, South Korea, Chile, and France. In the present day, American transit systems have experienced consistently low ridership levels, choppy service hours, and unreliable wait times between stations. Yet, more and more public tax dollars are heading towards public transit funding without seeing beneficial results— the "worst of all worlds," as Vox's Joseph Stromberg puts it (Stromberg, 2015). So how did this all end up happening? The status quo is, unfortunately, the result of several factors that have intersected and compounded since the 1950s: 1) suburban sprawl, 2) the National Interstate and Defense Highways Act (1956), and 3) the political mentality surrounding busses and light rail lines.

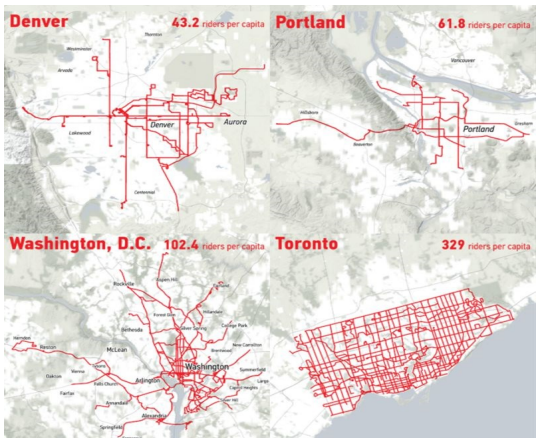

FIGURE 1: Bus and Rail lines in three American cities compared to Toronto, Canada. (English)

Compared to denser Canadian and European towns and capitals, most American cities developed after the invention of the mass-produced automobile have been constructed with cars as the primary transportation sources in mind. Thus, newer urban areas within the United States feature "cul-de-sac-heavy" suburbs and neighborhoods that do not promote interconnectedness prominent in street-grid cities, which in turn limits expansive transit systems (Figure 1). This layout complicates cost-efficient and expedient transit and inevitably surges the costs needed to implement bus and rail lines that serve a specific population across a wider area (Stromberg, 2015). So, when Congress passed the Interstate Highway Act in 1956 with the goal of "federal funding for 90 percent of the cost of free high-speed autoroutes across the country," public and private transit organizations chose not to serve the new suburbs that were being built and stay within the urban centers. This decision, however, presented some issues down the road. As the suburban centers grew and became merged with the central city, the transit systems — confined to limited inner-city routes — failed to scale accordingly (English, 2018). Because of this inflexibility, many transit networks, mostly privatized at the time, became bankrupt and ceased operations. Train tracks were removed from streets in an attempt to get rid of unused rail lines.

Cities soon began taking over transit companies during the Transit Revival Era (the 1960s-1980s), but many perceived the acquisition as a way for urban leaders to maintain these systems for welfare purposes tailored to those who could not afford cars. While this has allowed cities to subsidize public transit heavily, it has also led to the issue of preventing agencies from charging higher fares for those who can afford it to provide more efficient service. Unfortunately, this mindset of the American public toward public transportation has contributed to the inflation of car dependency and permeates our legislative branch of government. Viewing what they see as a social program for the poor, some public officials have been historically unwilling to pursue funding for more robust and equitable public transportation that serves all types of people — causing partisanship and congressional deadlock to limit meaningful progress (Zhong et al., 2022). Due to this, healthcare accessibility powered by public transit decreases and results in the current situation today, exacerbated by the pandemic.

Where the research currently stands: revealing the facts and reality

The unfavorable impacts of this slow, decades-long tug-of-war on transit improvement can aim at those who need the most aid and protection. Current studies demonstrate that scarce or limited transit options critically harm marginalized populations regarding medical care opportunities and overall health. Academic literature has been rigorously targeting this topic since the onset of the 21st Century. For example, in 2005, the U.S. Transportation Research Board (USTRB) determined that over 3.6 million Americans living in urban areas do not obtain medical care due to the lack of public transit options annually (Wallace et al., 2005). Moreover, the Board also revealed that 86% of respondents in a 2004 research conducted by Sipe et al. reported missing an appointment due to inadequate transportation availability, and 95% declared that they had arrived late before, as compared with 27% and 43%, respectively, for individuals with personal cars.

Though the USTRB's results are nearly two dec-

ades old, in 2013, Dr. Samina Syed from the University of Illinois at Chicago identified similar patterns of disparities placed on impoverished populations. In a *Journal of Community Health* report, Syed determined through a systematic literature search of 61 academic publications that 25 percent of low-income patients have missed or rescheduled their appointments due to lack of transportation (Syed et al., 2013). However, this commuting barrier goes beyond *reactive* medical care (health visits during times of injury or illness) and ventures into the territory of *preventative* care: those with transportation issues missed filling their prescriptions more than twice as often as wealthier individuals without transit-related obstacles (Syed et al., 2013). These groups of people experience a combination of negative outcomes, including undiagnosed cancers, diseases, infections and disorders, that could have been averted with consistent visits (Nguyen, 2010). Last-minute emergency room visits skyrocket, paired with rising levels of acute stress and anxiety for transportation-limited patients and their families. Patients who do not make it to their appointments — *no shows* as they are called — are not the only people who get harmed in this process. Doctors, nurses, and institutional systems face damaging consequences on the other end of the interaction. For medical providers, no-shows seriously disrupt the hourly workflows and treatment plans that they develop for each patient. Healthcare networks face millions of dollars in lost revenue to sustain operations and unexpected downtimes, as resources were allocated in preparation for an individual who ends up not making an appearance (Alaeddini et al., 2011). Data and interviews with medical providers demonstrate the urgent need for effective and efficient public transit offerings that connect marginalized communities with centralized city health centers.

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As we emerge from the remnants of the pandemic, lower and middle working-class Americans may need to increase their dependence on public transit to reach inner-city clinics due to financial instability within hospital clinics. Even prior to COVID-19, the threat of closures appeared on news headlines. In 2018, officials in Daly City, a city immediately south of San Francisco, faced an impending “health crisis” as Seton Medical Center — one of Daly City’s largest medical centers serving over 28,000 emergency room patients in 2018 — filed for bankruptcy and was feared to shut down operations. Nearby San Mateo County Supervisor David Canepa shared his frustration at the time with ABC7 News, who noted that 80 percent of Seton Medical Center’s clients were low-income individuals and the elderly (Hassan, 2018).

“It is sad that throughout the United States, hospital bankruptcies are plaguing poor communities. It's an absolute shame for what happens to poor people,"

- David Canepa, San Mateo County supervisor, to ABC7 News, 2018.

Although Seton Medical Center did not end up closing down, a primary care hospital in Atlanta, Georgia, endured another fate. Wellstar Atlanta Medical Center South (AMC-South) houses the only emergency room in the southern half of Fulton County, an area with over 1 million residents and a 42.5% African-American population. On April 6, 2022, AMC-South announced that the emergency department would be shut down, officially citing “staff shortages.” Ariel Hart, a health care reporter for *The Atlanta Journal-Constitution*, provides other explanations: financial struggles. Since AMC-South is a non-profit organization, Hart wrote, revenue considerations are made and may compel hospital systems to move to regions with a higher demographic of wealthier households (Hart, 2022). These multifaceted factors play a substantial role in health equity concerns, but the immediate bottom line is that poorer patients will need to travel long distances for medical care offerings, underscoring the critical nature of cultivating robust transit networks in the cities of urban America.

Fortunately, academic information compiled last year in conjunction with real-life public transit developments supports the tangible improvements of establishing more expansive transit routes for a community and their healthcare access needs. Dr. Laura Smith and her five-member team, composed of health experts from Harvard and the University of Minnesota, analyzed the effects of a new light rail line that opened in 2014, connecting communities between St. Paul and Minneapolis, Minnesota. Named the Green Line, the $957 million project stretches for 11 miles and stops at 23 stations, bridging the Twin Cities as a form of transportation called Light Rail Transit (LRT) (Heilman, 2014). Smith et al. compiled four years’ worth of data from 2013 to 2016 across 97 clinics located in the two cities and over 3 million appointments recorded in their medical system, finding a 9.5 point decrease in the missed appointment rate for Medicaid-covered individuals living near the rail line stops (Smith et al., 2021).

Case Study on San Francisco’s Public Transit – Healthcare Network

For the city of San Francisco, California, vast-reaching public transportation networks are not necessarily a factor that exacerbates healthcare inequities. Its transit network spreads to all parts of the urban peninsula, reaching middle-class suburbs like the Sunset District and the Richmond District while concentrating in the Downtown area (Figure 2). In fact, San Francisco’s Municipal Transportation Agency (SFMTA) announced that with recent major service renovations and phasing suspended routes back post-pandemic, its bus, light rail, and heavy rail lines (MUNI) would reach nearly the entirety of San Francisco residential and industrial areas as of May 2021. “98% of San Francisco [will be] within two to three blocks of a Muni stop,” SFMTA wrote on their website (Kirschbaum, 2021). Back in 2018, the agency formed an *Equity Working Group,* collaborating with community-based organizations, including the Chinatown Community Development Center, San Francisco Bicycle Coalition, Senior Disability Action, and Tenderloin Neighborhood Development Corporation (SFMTA, 2015). Fast forward to 2021, SFMTA stated that the eight districts in which the *Equity Working Group* organizations operate would have 100% accessibility for MUNI services, meaning that “100% of residents in these neighborhoods can conven-

iently access a Muni stop within two or three blocks of their home" (Kirschbaum, 2021). Furthermore, with extensive MUNI service, public transit appreciation is relatively high among residents in comparison to other areas of similar size and scope. Pre-pandemic, the San Francisco government conducted a ridership study and found that, compared to peer cities (Chicago, Boston, Washington D.C., Philadelphia, Portland, Seattle, Los Angeles, Minneapolis, Oakland, Miami, Long Beach, San Diego, Denver, Sacramento, San Jose, and Baltimore), San Franciscans are likely to utilize MUNI 35% of all commutes — around 18 points higher than the average of the 16 other cities (City and County of San Francisco). Further research should be conducted to analyze how to increase available routes and model San Francisco's ride levels in proportion to other forms of transportation.

Figure 2: Map of all existing MUNI routes within San Francisco, CA. (SFMTA, 2015)

Still, the MUNI network is by no means the perfect standard of an equitable, successful public transportation system. To foster one, a city must achieve 1) vast routes that touch all neighborhoods of the region and 2) a sustainable and timely transportation status quo (Min, 2017). While SFMTA performs well in the first half, the failure to succeed in the latter has dragged SFMTA — and by extension, the low-income, marginalized communities — down. According to the same study conducted by the city of San Francisco, data reveals that MUNI moves slower by an average of 3 miles per hour compared to its peers and encounters a high amount of vehicle failures: buses run for 7,700 miles before breakdown, and for light rail, it is 5,200 miles (City and County of San Francisco). In comparison, Denver's public transit can run for 70,900 miles and 49,000 miles, respectively. Thus, these factors consequently prove disastrous for under-resourced residents. More public transit breakdowns, lengthier wait times, and unpredictable, last-minute cancellations. So, while there are plenty of stations located in areas defined by the *Equity Working Group*, it does not guarantee that the buses and trains will pick them up on time, arrive at their destinations efficiently, or show up in operable form. The *TransitCenter Equity Dashboard*, a non-profit platform of community statisticians, allows for the effects of unreliable public transportation to be shown in full display. Their interactive map depicting the average travel time to the closest hospitals details that during September 2021, those in the Tenderloin district needed 10 to 20 minutes using MUNI to reach their closest medical care center. However, residents in nearby, more wealthy districts such as Pacific Heights and Nob Hill only required less than 10 minutes for the same process (Sustainable Systems Research, 2021).

Not all health clinics are equal in the level of care that they provide. In 2019, more than half of San Francisco's 26 acute-care hospitals received C and D grades for keeping patients safe, and only six facilities attained A's. According to the conductors of the study, the Leapfrog Group, patients receiving care at "D" hospitals face a 92 percent greater chance of avoidable death and 88 percent greater for "C" hospitals (Moffitt, 2019). Thus, individuals and families, even those marginalized, ideally should commit to a better healthcare center farther away over a mediocre or poorly-rated center nearby. *But how can they do so if MUNI may not arrive on time, take too long to get there, or run into mechanical issues on the highway?*

Fortunately, SFMTA has been progressing to create positive change. From April 2020 to April 2022, the on-time percentage for MUNI has risen from 31 to 54 percent (Fallon, 2018). While it is not close to 100 percent, the trend is slowly improving, signaling that purposeful actions are essential for improving. One factor that could have influenced this beneficial increase may be the implementation of recent bus-only lanes called Bus Rapid Transit (BRT) — a more suitable option over LRT for some cities. The Federal Transportation Agency defines BRT as a "rapid transit mode that combines stations, vehicles, services, running way, and Intelligent Transportation Systems (ITS) elements into an integrated system with a strong positive image and identity" (Levinson et al., 2022). Put simply, it is a rapid mode of transportation fusing the quality of rail transit and the flexibility of buses that arrive at selected, high-demand destinations.

On April 1, 2022, SFMTA officially opened the Van Ness BRT line — a 1.5-mile stretch of bus-exclusive center lanes along Van Ness Avenue, one of San Francisco's busiest North-to-South corridors. A month in, and the results have been piling in: according to director Tumlin, SFMTA and riders alike have seen "tremendous travel time savings… and big improvements in reliability" (Cano). A 28% decrease in travel time, to be exact. Previously, it would take 50 minutes to travel roundtrip between the two endpoint stations; now, 14 minutes have been shaved off from the journey. Among the nine stops on the Van Ness BRT, one is situated on the block of Geary St. and O'Farrell. What else is on that block? California Pacific Medical Center — a non-profit high-quality care clinic only several stops from the heart of the Tenderloin District. While continuous analysis must be conducted to determine the long-term benefits of this specific Van Ness BRT line in relation to low-income healthcare access, general research present and anticipate promising future results, as BRTs "offer significant benefits to low-income groups, in terms of travel time and cost savings, access enhancement, and safety and health benefits" (Venter et al., 2018).

Looking ahead: cultivating a better America

Coinciding with SFMTA's improvements and stated commitment to achieving equitable public transit in accessing quality healthcare, recent legislation introduced on a national level has signaled that the United States is poised to launch a new era of tackling the issue of public transportation — something that American cities should take advantage of immediately. These include 2021's INVEST in America Act and Bipartisan Infra-

structure Bill. In June 2021, the U.S. House approved $109 billion dollars for transit improvements and included a statute that requires states to not turn to highways as the first action for congestion relief (Wanek-Libman, *INVEST in America Act,* 2021). Likewise, inside the Bipartisan Infrastructure Bill's $1.2 trillion legislative package, $69.9 billion have been designated over the next five years for public transit advancements, including enhanced mobility of seniors and disabled individuals and equity pilot programs via urban rail and bus rapid systems (Wanek-Libman, *Bipartisan Infrastructure Bill,* 2021*)*. The umbrella coverage of both the INVEST in America Act and the Bipartisan Infrastructure Bill is President Biden's Build Back Better Act, which has itself allocated additional funds in the billions of dollars to improving public transportation and the construction of rapid transit lines through federal grants requested by cities (Johnson, 2021).

Urban centers in the United States have historically utilized infrastructure funds to improve roads and build highways, but relatively little has been done with these grants to address equity within public transportation. As of 2018, only 13 cities out of America's 19,495 have implemented BRT projects and corridors, according to Wes Guckert, the CEO of The Traffic Group, a traffic engineering and transportation planning firm (Guckert, 2021). Cost-benefit analyses have additionally demonstrated that BRT is 20% cheaper to construct compared to LRT, increased opportunities for low-income riders in non-uniform, congested metropolitan streets to ride onboard, and cultivated massive amounts of economic growth for businesses next to stations (Guckert, 2021). Thus, mayors and transit planning officials should capitalize now on the increase in federal funding and introduce BRT lines within their own cities that spearhead accessibility, efficiency, and equity among under-served populations. Further implementation may include inviting healthcare networks to sponsor BRT systems — an example seen in Cleveland's HealthLine, a route organized by the Cleveland Clinic and University Hospitals (Farkas, 2017).

Apart from federal guidance, individual cities need to engage in *proactive* solutions when approaching transit equity for healthcare rather than being solely *reactive*. For urban areas that have implemented BRT lines, it only came into fruition after decades of debate and several years of construction, an example being San Francisco's Van Ness BRT (Thompson, 2022). It's critical that leaders like San Francisco Mayor London Breed and SFMTA's Tumlin — and public officials in similar cities — harness more expedient processes to accelerate planning. While Americans are awaiting new projects that will fast track travel and flourish equity among marginalized communities, there are several actions available to be enacted presently that can alleviate undue stress and burden on low-income urban communities dependent on buses and light rail for medical care: 1) ensure that designated district leaders are continually consulted to discuss how critical transit can effectively run through underserved communities, 2) delegate budgets and funds to prioritize under-resourced populations over wealthier neighborhoods that rely less on public transportation, and 3) continuing initiatives to providing free or low-cost passes for individuals taking NEMT for healthcare purposes — just as San Francisco did during the city's COVID-19 vaccination drive (Belov, 2020).

In this research-based piece, I sought to understand the role of public transit in providing health equity for low-income individuals and families within cities. What began as a specific investigation into the transportation system within my hometown of San Francisco expanded into a full-scale exploration that involved two-decades worth of studies, firsthand accounts of experiencing NEMT and hospital closures, and the promising impact of BRT lines. With new knowledge in hand, I recommend that American city organizers pursue proactive approaches and solutions, coupled with taking advantage of the deluge of funds incoming from the federal government to prioritize equitable transportation policy. Without intentional efforts, minorities and impoverished groups stuck in NEMT-less zones may be silenced and may not have the chance to seek continuous, high-quality care that they rightfully deserve.

Overall, my findings do suggest that public transportation does play an integral role in allowing for increased health mobility for low-income, elderly, and disabled people. While I certainly do not expect the shift to fully accessible and equitable city transit networks to occur within days — especially given that we are still situated in the pandemic — my goal is that the recommendations and findings offered will allow for multi-year initiatives that many major United States cities can partake in and draw inspiration from. Looking to the future with reasonable optimism, I find hope that with continued dialogue, transparent research, and local government working in tandem with under-resourced community leaders, we can create more effective public transit strategies that serve all citizens effectively — ensuring that no city district or anyone will ever feel "*neglected*" again.

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