Health Implications of Transportation:

A Detroit Case Study

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ABSTRACT

Many metropolitan areas have been deliberately designed for cars, without the consideration of inclusive and reliable public transit. Transportation links people to employment and resources necessary for upward mobility. In an economically deprived city where a large percentage of residents are without personal vehicles, a broken public transit system perpetuates the cycle of poverty. This is the case in Detroit, which remains the largest metropolitan area in the United States without an adequate regional transit system. Racial animosity and the decline of the automotive industry drove a deep wedge between the city and the suburbs, which continues today and results in stark health and economic disparities. The region's underfunded and uncoordinated transit network fails to reliably connect carless residents to employment opportunities and nutritious food sources in the suburbs – adversely affecting the health of Detroiters. While there have been several attempts at more inclusive regional transit, all proposals thus far have been met with strong opposition from suburban officials and voters. Southeast Michigan must invest in a coordinated and reliable public transit network for all residents for the betterment of both public health and the economy.

Americans are increasingly reliant on personal vehicles to access social and economic opportunities. Most of us understand the importance of transit – whether personal or public – in getting us from point A to point B. Perhaps less understood is its importance in linking people to opportunities and services that are necessary for attaining upward mobility and leading healthier lifestyles. The United States' historic predilection for cars over public transit has had inequitable impacts on community health and wellbeing. While these impacts are common to many urban areas lacking reliable public transportation, this paper will use the Metropolitan Detroit context to illustrate the connection between transportation and health.

The collapse of the automobile industry, administrative and cultural forms of racial discrimination, and rapid depopulation all contributed to the decentralization of employment opportunities in Detroit, which plunged many of its remaining residents into poverty. Households that could no longer afford to own a car (in a city intentionally designed for cars) faced increased barriers to finding employment, commuting to work, and accessing healthy and affordable food. Regional transit has reemerged as a potential solution to address health inequities faced by carless residents with little agency over their health. More widespread and reliable public transit opportunities could reduce many of the barriers Detroiters face. City and suburban decision makers must consider the health implications of regional collaboration for public transit. Detroit decision makers, in particular, can highlight the connection between transportation and health to further justify the need for regional transit.

A BRIEF HISTORY OF TRANSIT IN DETROIT

Detroit, like many major metropolitan cities in the United States, was primed for cars even before the dawn of its Motor

City age. Starting in the 1920s, federal and state legislatures passed policies enabling extensive highway construction.[1] During World War II, demands for military equipment spurred additional construction of expressways and highways to move military supplies with ease – inadvertently providing significant advantages to postwar expressway planning and financing.[2] Unsurprisingly, cars became necessary to navigate the city and region, and manufacturing plants capitalized on this momentum.

The automotive industry brought prosperity and opportunity to Detroit but also contributed to its descent. By the early 1950s, Chrysler, General Motors, and Ford had become the largest corporations in the United States.[3] Their growth stimulated job opportunities and a massive influx of workers from the south. Detroit quickly became a prosperous city for blue-collar workers of all races and ethnicities as the population swelled to 1.8 million.[4] However, its prosperity was short-lived. In 1956, the "Big 3" experienced a decline and moved assembly plants to more cost-effective locations in the suburbs.[5] Those who could afford to move out of the city to find work in the growing suburbs did so. At the same time, racial tensions swelled and came to a violent head during the 1967 rebellion – accelerating the rate of depopulation.[6] The bust of the automotive industry and resulting exodus of workers to the suburbs left the city fragmented and desolate. Remaining residents who were confined to the urban core due to oppressive acts of discrimination were left with few job opportunities and lower earning potential.[7]

While automobile ownership continued to increase in popularity, many Detroiters were unable to afford cars – which left public transit as their primary option. State and federal transit subsidies resulted in the establishment of two independent transit agencies to serve the metropolitan region: one for Detroit – the Detroit Department of Transportation (DDOT), and one for the suburbs – the Suburban Mobility Authority for Regional Transportation (SMART).[8,9] Deliberate and often racially motivated attempts by suburban officials to defund existing transit options and deny proposals for public transit resulted in a system that did not adequately link the city's patchwork of neighborhoods or travel outside of the city's boundaries.[10] As the region continued to expand in the 1960s, Detroit's transit system struggled to adapt to the car-centric landscape, and fares no longer covered the costs of maintaining operations.[11] Mistrust and prejudice fueled contention among city and suburban officials over the allocation of funds, which further divided the agencies and halted regional transit plans.[12] DDOT eventually eliminated several routes due to deep cuts in funding resulting from reductions in ridership.[13] Making matters worse, state law gave suburban municipalities the choice to opt out of paying for and participating in transit services.[14] Today, nearly 50 cities in the region have opted out despite having concentrated centers of employment.[15] As a result, job-rich suburbs remain

Carlessness in Detroit

Figure 1: *An estimated 26% of Detroit households are carless and must rely on sub-standard public transit or other means to access healthy food options (Crain's Report by Bloomberg, 2012).*

largely inaccessible to carless individuals in the urban core – which has led to high unemployment rates. Ultimately, Detroit's broken transit system has contributed to a cycle of poverty that continues today and results in negative health outcomes for residents.

TRANSPORTATION AND HEALTH

The cycle of poverty exhibited in Detroit is partially maintained by residents' inability to access healthcare, work, education, and nutritious food. Limited mobility directly and indirectly compromises physical and mental health. For example, the inability to reach a medical professional or obtain medication can lead to direct health consequences. However, less obvious is the inability to consistently and reliably travel to educational institutions, which hinders employability indirectly and also causes stress that can be harmful to health.

Although the connection between transit and health is clear, it is often overlooked. This paper will focus on indicators of stress among Detroit's underemployed, commuting, and food-insecure population. It will use these examples to explain transportation's role as a social determinant of health and to argue for increased investment in regional transit to improve the wellbeing of all Detroiters.

Employment and Commuting

Detroit's transit system was originally designed to transport city residents to city locations.[16] However, with the migration of people and employers to the suburbs, the majority of job opportunities for those within the city are now located outside of the city limits. According to the Brookings Institute, only 22% of jobs in Metro Detroit are located within 10 miles of the urban core, making it necessary to commute to the outer suburban ring where 77% of jobs are located.[17] Dispersal of urban city jobs to the suburbs, housing discrimination, and inadequate transportation to link the city to suburbs are largely to blame for high rates of unemployment and concentrated poverty within central cities.[18] This phenomenon, the spatial mismatch hypothesis,[19] is salient in the Detroit metropolitan area. The hypothesis proposes that the problem does not solely lie in geographic distance from jobs; rather, it is the inability to get from areas of poverty to areas of opportunity. The Detroit region is the largest urban area without regional transit,[20] and this deficiency is a contributor to cyclical poverty in Detroit.

Lack of reliable transportation adversely affects employment opportunities and subsequently health outcomes for Detroit residents trying to gain economic stability. The unemployment rate in Detroit is at a record low, yet the poverty rate is twice as high as the state average.[21] The discrepancy between these two statistics is partly because the unemployment rate does not consider

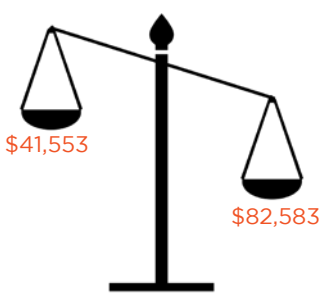

Figure 1: *The Imbalance of Family Income in Metro-Detroit (US Census Bureau, 2012).*

the number of residents underemployed in part-time, temporary, and/or low-paying job opportunities. Chronic stress from joblessness and poverty is demonstrated to decrease life expectancy.[22] The reverse is also true. Gainful employment improves economic mobility, which can alleviate stressors caused by poverty and thereby improve health outcomes such as life expectancy. Research not only shows that reliable transportation significantly increases the likelihood of finding and retaining employment[23] but also that the health implications associated with poverty are often worsened by the long, taxing commutes carless residents face in reaching jobs.

Given Detroit's decentralized job market, unreliable transportation significantly extends commute times for city residents to suburban jobs, having deleterious impacts on physical and mental wellbeing. For the estimated 26% of carless households in Detroit,[24] public transportation and active transport (e.g., bicycling and walking) are some of the only means of commuting. While active transport is associated with decreased risk of chronic disease and obesity, among other positive health outcomes,[25] perceived stress while engaging in active transport is also associated with an increase in commuting duration and unpredictability.[26] Stress can accelerate aging, promote early onset of and increased susceptibility to chronic diseases, and lead to unhealthy coping strategies.[27,28] Furthermore, a long commute is associated with sleep disturbance and exhaustion and is a precursor to work-life imbalance.[29] Studies have linked high work-life imbalance to depressive, negative emotions; fatigue; and overall poor self-rated health.[30] While commuting is not inherently a threat to health, in Detroit, some workers are forced

Figure 3: *Location of Employment and Healthy Food Options from the Center City (Brookings Institute, 2012)*

to walk hours to and from work because the bus will not travel past the city line. One former Detroiter walked 21-miles to and from work in the suburbs each day – an extreme example of how a lack of adequate transportation affects residents' daily lives.[31] These same stressors from commuting to the outer suburban ring are compounded by the difficulties of relying on public transit to reach healthy and affordable food options.

Food Security

A diet limited in nutrient-dense foods such as fruits and vegetables could increase risk of diet-related diseases. An insufficient consumption of such foods can also

compromise the body's ability to protect itself from chronic conditions such as diabetes, hypertension, and heart disease, which is the leading cause of death in Detroit.[32,33] Studies show that adults living in very food-insecure households, where one or more household members skip meals because they lack money, are 40 times more likely than their food-secure counterparts to be diagnosed with a chronic condition.[34] Wayne County, where the rate of food insecurity is 1.6 times higher than the national average, is no different.[35] Further, inadequate intake of nutrients during the developmental stages of life can also lead to delays in social development, cognitive impairments, behavioral issues, depressive symptoms, and poor physical health.[36] It is important for a city to provide its residents with options for maintaining healthy diets, yet in Detroit, this has not been fully remedied.

Detroit has made strides to confront its previous designation as a food desert but still falls short. In 2009, Zenk et al. found that the nearest supermarket in the most impoverished, predominately black inner-city neighborhoods averaged 1.1 miles farther from residents' homes when compared to predominantly white neighborhoods with the same socioeconomic status. These same black neighborhoods also, on average, had 2.7 fewer supermarkets within a 3-mile radius compared to their white counterparts.[37] As of 2015, an evaluation of the city's food environment found that although the number of food sources increased (including restaurants – full service and fast food – and grocery, liquor, and convenience stores), their presence was inequitably distributed.[38] Neighborhoods with the highest percentage of black residents still have a lower ratio of people-to-food sources and tend to be dominated by fringe stores for available food.[39] Fringe stores are venues that sell foods that are made strictly for convenience (as opposed to health), with long shelf lives.[40] Even with an increase in affordable food outlets, some neighborhoods (namely majority black, which comprise a large percentage of neighborhoods in Detroit) remain disproportionately saturated with options that negatively impact residents' health.

The products most fringe retailers offer provide few nutritive benefits and are associated with poor diets and an increased risk of diet-related disease. This includes processed, high-caloric, nutrient-poor foods, which are often sold at convenience and liquor stores, fast-food restaurants, and gas stations. Predominantly low-income urban areas like Detroit tend to have a higher density of fringe stores.[41] Considering that people tend to make diet choices based on what is available in their immediate vicinity,[42] city residents will likely choose fringe retailers for sustenance, which decreases their consumption of nutrient-rich foods. This is a pattern demonstrated by black women in Detroit, where availability of poor-quality food is linked to decreased consumption of fruits and vegetables,[43] and in young adolescents when there is elevated access to convenience stores.[44] Additionally, a qualitative study on two Detroit neighborhoods found that residents are aware that their options within the city are limited and of low-quality, and they prefer to shop at grocery stores on the outskirts[45] that have higher-quality, lower-priced produce.[46] However, reaching these stores is time and labor intensive and thus not feasible on a consistent basis.[47] Limited transportation is a barrier to healthy diets in Detroit, and improving residents' ability

to access healthful food is key in improving diet-related health outcomes.

While the availability of healthy food options is only one aspect of creating and maintaining a healthy diet, accessing healthy food options that are few and far between is another. Due to the underdeveloped transit system, travel options are restricted for carless households in Detroit. Active transport can be impractical and extremely inconvenient for some, including single-parent households, the elderly, those with disabilities, and residents living in high-crime areas. Studies examining diet and proximity to chain supermarkets report that a better-quality diet is associated with proximity.[48] They also show that residents of areas with greater access to stores with affordable, healthful foods display a higher intake of nutritious foods.[49] Although the distance from grocery stores is linked to diet choices, researchers have observed that the degree to which carless households are able to make travel arrangements to those stores was even more influential on diet.[50] Uncertainty caused by unreliable modes of transportation leads to stress, worry, and anxiety.[51] Added stress can worsen these negative effects of a poor-quality diet. However, there is hope for the future. While the regional transit debate is not solely centered on improving food access, improvements to Detroiters' ability to obtain healthy food could lead to improved health outcomes.

THE FUTURE OF DETROIT TRANSIT

Transportation can help to alleviate poverty that some city residents experience. There have been regional attempts to move towards a more coordinated public transit system. The Regional Transit Authority (RTA), formed in 2012 in response to the lack of coordination between regional transit agencies,[52] has attempted to address problems associated with inadequate transportation facing Detroit's downtown residents.

Its first attempt at more inclusive mass transit, the Reflex system, consisted of two rapid lines running along major corridors crossing both city and county boundaries. As of January 2018, Reflex was replaced by a new service, FAST. While FAST adds an additional line to the airport and promises to be easy and reliable to use, it has a limited range of services and stops, and it still fails to meet the service needs of carless residents outside of the more affluent downtown area.[53]

RTA's most recent proposal, which narrowly lost in the local 2016 election, was the most promising modern-day attempt thus far to alleviate barriers to economic and health-promoting opportunities. The proposal would have added rapid transit lines along major corridors, express buses to the airport and downtown Detroit, and major improvements to existing DDOT and SMART bus services. To make suburban job opportunities more accessible to Detroiters, the plan included 11 cross-county connectors that would extend into municipalities that opted out of SMART.[54] While the plan was more inclusive of Detroiters' service needs, it also had shortcomings. The increase in services would have been funded primarily by a property tax millage, and if necessary, by vehicle registration fees.[55] While this is not inherently bad, it could cause funding inequities when coupled with its "parochialism clause." The clause

required that 85% of revenues raised by the RTA stay in the county in which they were collected,[56] potentially resulting in the wealthiest (suburban) counties gaining the majority of the funding, while less-affluent counties gained the least, despite being the areas that needed it the most. The ballot initiative was not supported by the majority of residents in Oakland and Macomb Counties, which contributed to its defeat. Regional county executives tried to renegotiate a compromise that also failed to gain approval in 2017.[57]

Regional transit may reappear on the ballot in 2018. However, according to the transit advocacy group Motor City Freedom Riders, the new proposal is in jeopardy. The compromise that was reached and scheduled to be announced in January 2018 cut the northern portions of Oakland and Macomb Counties out of RTA jurisdiction. These areas would not be taxed or receive transit services. This new plan gave into most of the demands of Brooks Patterson, Oakland County Executive. However, Patterson decided to withdraw his endorsement at the last minute, citing reluctance to force municipalities in Oakland County to participate in a transit system from which they would not benefit.[58] Despite pushback, many believe that the RTA should move forward with the new plan without Oakland and Macomb Counties.

CONCLUSION

Whether transportation impacts health indirectly through stress or directly by impeding access to healthy food and employment, the connection is clear. Transportation is a prerequisite to accessing services and amenities necessary for a healthy life in Detroit. Lack of access to education, food, healthcare, and employment perpetuates the cycle of poverty, which has adverse and cumulative effects on mental and physical health. Transportation is an important component of achieving employment, reducing poverty, and thereby alleviating debilitating stressors, yet is a barrier to those without cars or reliable public transit. Southeast Michigan needs a coordinated plan to connect all Detroiters to opportunities for employment and healthy food. Furthermore, decision makers must consider health in matters of design and public transportation planning and demonstrate these connections to their constituents, especially with the possibility of a plan for more inclusive regional transit on the ballot in 2018. ■

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