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The United States is unique in the extent of its car dependence - our reliance on individualized modes of transportation leaves little room for other, more accessible, forms of transportation in most places. This unimodal transportation design leaves those without cars unable to participate in public life in the same way, but further, it restricts our participation in civic life as a whole. Civic engagement rates have fallen with the rise of the automobile, and left us disconnected from and ignorant to the people and activities that would make up our communities. The exception tends to be areas where multiple transportation options are available - most basically, where individuals can walk to their destinations. In this paper, I explore the factors that explain the connection between walkability and civic engagement and explain the dynamics of these connecting factors using existing literature and interview content from residents and city officials of a walkable community and a car dependent community. I then consider the implications of these findings and include suggestions for future research and actions that communities can take to improve their walkability.

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WALKABILITY AS A TOOL TO FACILITATE CIVIC ENGAGEMENT

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Abstract

The United States is unique in the extent of its car dependence - our reliance on individualized modes of transportation leaves little room for other, more accessible, forms of transportation in most places. This unimodal transportation design leaves those without cars unable to participate in public life in the same way, but further, it restricts our participation in civic life as a whole. Civic engagement rates have fallen with the rise of the automobile, and left us disconnected from and ignorant to the people and activities that would make up our communities. The exception tends to be areas where multiple transportation options are available - most basically, where individuals can walk to their destinations. In this paper, I explore the factors that explain the connection between walkability and civic engagement and explain the dynamics of these connecting factors using existing literature and interview content from residents and city officials of a walkable community and a car dependent community. I then consider the implications of these findings and include suggestions for future research and actions that communities can take to improve their walkability.

Literature Review

Benefits of walkability

The fields of urban planning and design, and, to an extent, local government, maintain a strong theoretical foundation in the concept that the physical design of spaces should be created in a way that is most conducive to their intended use. This philosophy, referred to most as

functionalism, explains that any space has the potential to shape the activity that takes place within it simply by making certain activities feel more or less possible or appropriate within that space (Lipman 1969). A key function that must be considered in the design of spaces, then, is transportation: how people will navigate through it.

Recent literature and media have drawn amplified attention to the current lack of spaces that are navigable by anything other than car - most basically, by foot - that many US cities see. The field as a result has seen a swell of popularity in walkability and a focus on its importance to the general health of cities. One study by Abdulla Baobeid, Muammer Koc, and Sami Al-Ghamdi highlights the advantages of walkability in three ways (2021). First, they explain that walkability is associated with healthier populations and improved mental health. They also find that walkable communities see higher levels of livability - meaning they maintain higher levels of equity, social stability, social engagement, and a sense of local culture, along with lower crime rates. Finally, they find that walkability is an important factor for cities to increase their environmental, social, and economic sustainability.

Another study by Kevin Leyden found a correlation between walkability and social capital - the social networks and interactions that inspire trust and reciprocity among citizens (2011). This study additionally explores the connection between social capital and political involvement, economic development, and improved public health, and finds that the built environment has a strong impact on each of these factors.

Connection between walkability and civic engagement

These impacts are important because they are each factors that contribute to the overall health and sustainability of a community - one that serves the needs and interests of its citizens and which provides ample opportunities for democratic participation.

One of the most influential writings on civic engagement and community involvement in modern times, Robert Putnam's *Bowling Alone*, acknowledges this connection more specifically (2000, 213-215). In this book, Putnam finds that the rise in automobile-dependency and the design that enables it is an important factor in explaining the draw away from public life and civil society in the US since the 1960s. Putnam explains that, as we have had to travel further to our destinations and are all but required to use cars to reach these destinations, these spaces have become less personal and more private. This is contrasted with his exploration of the role that the more accessible "five-and-dime on Main Street" might have played in offering a place for informal public interactions to take place with people who are already in, or who might potentially become part of, their local social networks.

This shift away from environmental design that allows for easy navigation and informal public use, Putnam argues, drives a direct connection with the decline in civic engagement. According to time diary studies, "each additional ten minutes in daily commuting time cuts involvement in community affairs by 10 percent - fewer public meetings attended, fewer committees chaired, fewer petitions signed, fewer church services attended, less volunteering, and so on." As a whole, Putnam notes that aside from education, commute time (which is determined by urban

design and the transportation that it necessitates) is more important than any other demographic factor in determining civic engagement habits. Howard Frumpkin, Lawrence Frank, and Richard J. Jackson also find a direct relationship between commute and community participation in *Urban Sprawl and Public Health* (2004, 172-175). They attribute this correlation to a decrease in free time as well as an increase in stress because of longer amounts of time spent driving, and similarly find that this lack of opportunity for walkability reduces public life and investment in the community's well being.

This lack of public space and opportunities for interaction has been connected more directly to a decrease in voting. In her analysis, Carrie LeVan concluded that individuals living in neighborhoods with isolating characteristics - those that maximized privacy, and had little or no public spaces available - interacted with their neighbors much less often and less informally (2019). This is important because, as LeVan finds in her study, these interactions are incredibly predictive of voting behavior. Those who reported talking to their neighbors a few times a year were predicted to vote about 13% of the time, compared to those who talked to their neighbors several times a year, who were predicted to vote about 95% of the time. LeVan hypothesizes that this relationship may exist partly because interaction with neighbors can both provide individuals with basic political information, reducing the costs of political participation, and it can teach individuals that political participation is socially desirable behavior.

Focus of this paper

Lacking in the existing literature is a comprehensive analysis of the factors that potentially explain the connection between walkability and civic engagement. The literature considered here portrays empirical evidence for the impact of factors such as neighborhood design and commute time on measures of civic engagement such as community participation and voting. These studies include discussions on the importance of neighbor-to-neighbor interactions, the time available to individuals to participate in their community, and the mindsets that result from a lack of natural public life in facilitating or inhibiting civic engagement. Yet, there is a gap where the potential connecting factors have yet to be considered more thoroughly.

In this paper, I address this knowledge gap by synthesizing possible explanations for the relationship between walkability and civic engagement and exploring them more deeply through supportive literature, and through a qualitative analysis of individual experiences and observations. I consider the roles of each factor by comparing experiences shared in interviews with residents and city officials of a more notably walkable city - Ann Arbor, Michigan - and a notoriously car-dependent suburb - Livonia, Michigan. Through a collection of literature and first-hand accounts, I identify that walkability is correlated with higher levels of civic engagement for four main reasons. First, individuals who live in walkable communities have potentially more time available to participate in their community. Second, walkability and a shift away from car-dependence removes the financial burden of individual transportation. Third, walkable communities create healthier and safer environments for their inhabitants. Finally, walkability enables the building of social capital and facilitates the more informal social interactions that create a sense of public life. Each of these factors plays their own role in encouraging civic engagement, and we will explore them deeper in this paper.

Definitions

The simplest way to understand walkability is as an area in which the majority of one's daily needs could reasonably be reached by walking. This includes infrastructure and time considerations for those with physical disabilities, or who may use wheelchairs or strollers to ensure a safe and comfortable transportation option for all who need it. This means well maintained sidewalks with curb cuts and clearly marked crosswalks, and either slower traffic speeds or appropriate infrastructure to protect pedestrians from higher traffic speeds. This can also include opportunities for informal congregation within walking distance - whether that be a park, a downtown area, public square, or other option, many noted that this was an important feature that allowed for walkability to tie in more directly with community life, rather than focusing primarily on an individual's personal destinations.

Urban planners and researchers use several metrics to determine the walkability of an area. It is generally agreed upon that the ideal of walkability is achieved when people can safely walk to essential services and amenities such as food, schools, jobs, greenspace, childcare, or transit stops that can provide transportation to further destinations, within 30 minutes. Some tools take more detailed factors into account, such as accessibility and safety, while some focus primarily on density of locations and distance between them. One website, Walk Score, calculates a point value for locations based on their distance to key amenities, also taking into account factors such as population density, average block length, and intersection density. These measures are important to include when considering walkability because they indicate not only the physical distance between one physical location and another, but they also provide insight into how easy

the two locations are to walk between. For example, a shorter average block length and higher interaction density might tell us that a pedestrian will encounter more options and services in a shorter amount of time, and that they might also feel safer if vehicular traffic is forced to stop more often, and is therefore slower and more aware of pedestrians. Walk Score uses these factors to measure how walkable a neighborhood is on a scale of 0 to 100, with a score of 0 to 24 categorized as car dependent, and a score of 90 to 100 called a "walker's paradise." For the purposes of direct comparisons between cities analyzed in this paper, we will use Walk Score for its simplicity and access. However, in our discussions on walkability, we will apply features identified by interview participants that are not explicitly a part of Walk Score's metrics, such as infrastructure for pedestrian safety and options for informal congregation.

Quantifying civic engagement is in many ways less straightforward, and for the purposes of this paper, we will not attempt to do so. Instead, we will use a broad definition that encapsulates the many types of involvement that individuals can take part in as a way to understand and better their community. There are two key elements to consider. The first is an understanding of current local issues and efforts, whether through local government or community groups. The second is the decision to take some form of action based on this understanding, in whatever way was deemed necessary by the individual. This could include anything from voting; to submitting commentary on initiatives of local groups or government by participating in surveys, taking part in an online platform, or attending meetings; to pursuing longer term efforts by running for office or advocating for policies. Action could also include working with a local nonprofit to help address an issue important to the individual. In some cases, action could include efforts to strengthen connections between neighbors by hosting neighborhood-wide social gatherings or

more targeted efforts such as beautification. It is important to note that these actions do not have to be political in nature - many of them take place outside of local government or outside of any formal institutions or organizations at all. What distinguishes these actions as civic engagement is that they provide an opportunity for citizens to use their time and resources in whatever ways are available to them to in some way pursue the improvement of their community. In some cases, these efforts may lead to more direct political action or larger scale involvement, but in many cases the intention to work with others in the community towards its improvement does not require formal political action. As such, for our analysis, we will define civic engagement as the level of awareness that an individual has about their locality and their efforts to channel this awareness into an action that they see to be necessary and beneficial to the community.

City Comparisons

To better understand the factors that link walkability and civic engagement, I conducted interviews via phone or video calls with residents and city officials of two cities, Livonia and Ann Arbor, Michigan, to gather information about their own experiences with civic engagement and the built environment. Content from these interviews is used to inform the central analysis of the paper, but first let's compare the makeup of the two cities and the reflections from those who live and work in them.

These two cities have comparable populations and demographics, and are located approximately 25 miles apart - and yet they have very different transportation designs and their residents have very different experiences within them. Livonia, a suburb of Detroit, has a population of 94,422.

As an intentionally sprawling suburb, it has a population density of 2,665 per square mile. As one result of its sprawling design, it has an average Walk Score - a commonly used metric of measuring whether daily needs can be reached by foot - of 36. The city's population is 86.4% white, 3.7% Asian, 3.5% Hispanic or Latino, and 4.4% black. The median household income is $86,331 (per capita $41,065).

Ann Arbor, Michigan, is famously a college town, home to the University of Michigan, and is much less sprawling - its population of 121,536 sees 4,544 people per square mile and the city has an average Walk Score of 52. Ann Arbor's population is 70.2% white, 16.4% Asian, 4.6% Hispanic or Latino, and 6.7% black. The median household income is $73,276.

Residents' Interviews

In order to learn more about how the differences between these two cities affected their civic engagement levels, I conducted interviews over the phone or via Zoom with four residents and two to three members of city boards or commissions of each city. The interview participants were organized through social media contact and some recommendations by previous interview participants.

Livonia:

Livonia residents interviewed expressed that they did not feel a sense of connection to the city or its needs - and each interviewee identified this as an obstacle to civic engagement. One resident,

who has lived in Livonia for 8 years, explained that it feels difficult for her to be more involved in city decision making because she doesn't know what is available or when opportunities for this take place. Her primary way of learning about these options are via mail sent by elected officials. One couple, who have each lived in Livonia for over 10 years, explained that they make an effort to participate in city politics and community events by attending meetings of the local government or participating in local campaigns, as well as making an effort to be active in their neighborhood. Each found, though, that deeper involvement feels to them harder to maintain because of the city's lack of gathering places such as a downtown or any smaller "hubs" that they feel would provide neighbors with more opportunities to interact with one another. Another resident of 17 years reflected that she has felt barriers to getting more involved in the city, because she feels unsure of how to find information about how to get involved in the way that she wants to, and she has noticed that the involvement that she does see boasts long histories which doesn't feel accessible to someone who is just getting started.

Ann Arbor:

Residents of Ann Arbor shared very different experiences about their time in their home. Almost every interviewee expressed that they felt connected to the city and its needs, and this influenced their engagement. One resident explained that it felt easier to be involved in the work that she took part in in several nonprofit organizations because she felt that she knew people in the community who were in need of the support she was attempting to provide and she had a good understanding of their needs, and she was able to gain this understanding because of communication with those who lived near her. Another resident of 5 years found that living in

Ann Arbor provided him with both a broader and deeper connection with the city compared to other places he had lived - he explained that he knew each of his neighbors and communicated with them often, and he found it easy to learn about events or involvement opportunities in the city because of this communication and the informal "word of mouth" networks that this provided him. One resident of 24 years also found that she found the face to face opportunities for involvement to make it feel easier, and that the chance to connect with other residents who held the same interests and motivations enabled her to feel more motivated to maintain involvement as well.

City Officials' Interviews

Livonia:

In Livonia, city officials noted that much of the engagement they see is online. One city council member observed that most residents he knew of who were involved in community groups, whether political or social in their nature, got involved with them after becoming interested in a particular issue or cause and seeking that out. Another official echoed this sentiment, and explained that there aren't many entry points in the civic engagement groups or organizations that exist for new people to get involved very easily or to learn more about them informally. Each also explained that much of the community discussion that the city notes as well as a significant part of citywide communication about events, initiatives, or otherwise, happens through Facebook groups - and they explained that there aren't many other avenues of communication that are utilized outside of this to engage Livonia residents, meaning that

residents who are not active on Facebook may not have as many opportunities to learn about how to get involved.

Ann Arbor:

City officials in Ann Arbor voiced similar experiences with online engagement. In this case, they explained that those involved with the city noticed better responses from online outreach than other forms of communication such as mail or phone calls, and that this started a more concerted effort to offer multiple options of engagement for residents - including virtual and in person meetings, and the use of more online surveys. One city council member also highlighted that the city's Equitable Engagement Committee is an important part of assessing the best ways to reach the most residents possible about important issues and city-wide efforts in order to hear a diverse array of feedback in decision making processes. In efforts like this, another council member noted, one of the most important focuses was to ensure that all residents had the same opportunity to access relevant information, and allow the residents to decide how they wanted to get involved as a result of that information.

Connecting Factors

The following discussion considers factors that were introduced by literature and by interview participants as parts of the explanation for the connection between walkability and civic engagement. It is necessary to note that many of the connections found in the literature and presented in this paper are introduced as bivariate relationships, but there are of course external

influences that should not be excluded from consideration. For example, the discussion of health and safety draws the connection between walkability and improved health in a community. The case for this connection is strong, but we cannot ignore that it may be influenced additionally by the average income levels of residents of walkable areas, which may afford them access to higher quality healthcare in addition to seeing health benefits from walking regularly. Nevertheless, it is the intention of this paper to introduce these factors into the discussion for a more comprehensive consideration of the relationship between the built environment and civic life.

Time

One of the most straightforward connections between walkability and civic engagement is time. Those who live in walkable places quite simply have more time to invest back in their communities - and they often do so. When there is less distance to travel between one's home and one's work, or grocery store, or restaurant, or the homes of friends and families, then the necessity of driving to these places decreases, and the overall time spent traveling to these places drops. This is intuitive, but it is an important point when considering how it shapes civic engagement and the ways that people interact with their communities. There are two main reasons for this connection. First, decreased distance and less time spent traveling allows people more free time that they can use to get engaged - simply, if one does not have to spend an hour to travel home after work, they can spend that hour attending a community meeting, social event, or otherwise getting involved. Second, decreased travel distance increases the time that one spends closer to their community. This distinction is important because it specifies not just the amount of time an individual has available to them, but it recognizes the places where people spend their

time. If one does not have to travel far from home for school, work, shopping, dining, or any other activity, then they - by nature of the location of their destination - are spending more time in or close to their community as opposed to spending that time miles away from where they live. This fact by itself contributes to a multitude of other factors that also increase civic engagement, which we will discuss in another section.

Individual free time

Lack of walkability makes longer travel times and car dependence a necessity. For most, this dependence is particularly impactful on our commutes to work - the commute that we make most often. In 2021, the United States Census Bureau found that the average one-way commute time is at an all time high of 27.6 minutes (2021). This long commute is necessary for many because of the sprawl and move away from density that increase the distance between the two locations where most of us spend most of our time. It is not just our work trips that have decreased. In his influential book which highlights the state of civic engagement in the United States, Robert Putnam found that, over a period of 25 years, “the length of the average trip to work increased by 26 percent, while the length of the average shopping trip increased by 29 percent,” and this is a trend that continues to increase (2000, 212).

In fact, Putnam’s research finds that aside from education, commute time is more important than any other demographic factor in determining levels of civic engagement. While this paper is focused on voting behavior as an indicator of civic engagement, Putnam’s time dairy studies explain that, “each additional ten minutes in daily commuting time cuts involvement in

community affairs by 10 percent - fewer public meetings attended, fewer committees chaired, fewer petitions signed, fewer church services attended, less volunteering, and so on." Each of these actions, or lack thereof, are vital parts of civic engagement as a whole, as well as influences upon an individual's voting behavior.

In Urban Sprawl and Public Health, authors Howard Frumpkin, Lawrence Frank, and Richard J. Jackson found a similar phenomenon (2004, 172). They explain that sociological studies of Coburg, Washington, and Claremont, California found that commuters participated less than noncommuters in voluntary associations. These studies found a direct relationship between longer commute times and less community participation. They attribute this relationship partly to the time factor, noting that, "A commuter who arrives home at 6:30 after a grueling 50 minute commute, feeling tired, depleted, and irritable, is not likely to go back out for a 7:30 meeting of the PTA or the neighborhood association."

A city council member of Ann Arbor, who has been otherwise involved in civic engagement opportunities in the city since 2003, has seen this affect her own life. She shared that she has been fortunate to work close to her home in her time living in Ann Arbor, which relieves her of the necessity of driving to her employment. She feels that this experience has allowed her more "time and freedom of movement," and she reflected that, "I don't think I would have been able to run for city council if I had a commute of a half hour or more every day." Beyond herself, she noticed additionally that many of the people she sees that are most engaged in city politics are those who she knows have shorter commute times.

Time spent in one's community

Importantly, Putnam also finds that increased commuting time among residents of a community decreases the levels of civic engagement among all residents of that community - not just those with the highest commuting times. He explains that increased commuting has negative externalities which spill over into the rest of the community. This suggests that civic engagement is not influenced solely by the amount of time spent in a car itself, but that this increased commuting represents, "a spatial fragmentation between home and the workplace, that is bad for community life." In other words, these communities that require high commute times are probably not walkable, and one result of this lack of walkability is less time spent in the community. This is a major factor that influences that community's civic health.

When one has to travel several miles for any trip, particularly for trips like work that take up a significant amount of our waking hours, we are, either purposefully or involuntarily, spending less of our time in our communities. When we buy lunch we are not likely to travel home to buy it, when we stop for groceries we may stop at a place close to work if it's more convenient than one closer to home, when we are invited out after work we are again most likely to seek out places that are close to where we already are rather than those that are close to where we live.

Interview participants found this to be true in their own experiences. Nearly every resident of Ann Arbor agreed that their ability to walk to their desired locations had a significant impact on their decision to spend time in the city, and every resident of Livonia expressed that they would spend more time in the city if they didn't have to drive to all of their destinations. One Livonia

resident explained that the need to drive to each of her destinations reduced her sense of connection to the city. She explained, “it makes no difference to me if I get in my car and I drive to an address in Livonia or if I drive to an address in Plymouth or Northville or Novi or wherever else that might be if I’m going to get in my car and drive for 5 or 10 minutes.” Another resident of Livonia explained that where she chooses to spend her time is dependent in many cases on the parking that’s available near those locations, since she’ll have to drive to them. This limits where she feels like she can reasonably spend her time - and she will sometimes opt out of spending time at a place she might otherwise want to go to because of a lack of access to it.

As a result of these choices, we have fewer interactions with the people who live near us than we would if we spent more of our time and resources in our communities, we learn less about the places we live in and we are less invested in them. Several Ann Arbor residents as well as city officials shared that their ability to walk to many of their destinations deepened their connection to the city and further incentivized them to spend more time within it. One resident noted that just the nature of moving slower by walking instead of driving made him notice more details of his surroundings that he otherwise would not have - whether that be appreciating the architecture around him, noting new locations that he had not yet visited, or interacting more with the people around him.

This is not an argument against spending time outside of the places we live. Rather, it’s important to acknowledge the distance that we put between our homes and the places where convenience or necessity incline us to spend significant portions of our time. This distance creates a disconnect from our communities when we do not have the same natural opportunities to enjoy all that they

have to offer, and when our familiarity with them is limited. The consequences of this disconnect will guide the following discussions.

Our lack of expendable time, coupled with natural opportunities created to spend time outside of our home communities, deplete our motivation to become engaged with the community. When our free time is restrained by long commutes, we have fewer tangible opportunities to get involved with our communities in any way. Further, when we spend significant time away from our communities at work, much of our opportunities for free time more naturally fall in line with these locations that are not close to the places that we live, limiting our familiarity with and investment in our home communities and reducing the reasons that we have to become civically engaged.

Money

Another noteworthy link between walkability and civic engagement involves the amount of disposable income available to those who live in walkable communities. This does not necessarily mean that increasing walkability directly increases individual's incomes - although there is some truth to this connection that we will discuss in later sections - but rather that walkability decreases the major expenses that many who are dependent on cars have no choice but to bear. These decreased expenses link to political participation in two primary ways. First, moving away from car dependence and the extra cost burden that it entails allows individuals - lower income households - to see their budgets loosen significantly. Reducing the financial stress of personal transportation may open up time no longer necessary to spend at work, and free up

mental space related to financial stress that makes political participation more feasible. Second, for households where this reduced burden means a significant increase in expendable income and leisure time, this is likely to be utilized in the nearby community - as it offers opportunities for this surplus income to be spent. This piece is strongly related to the earlier discussion on time one spends in or near their own community without being required to travel far distances, but here we will focus on the impact of being able to spend their money nearby.

Decreased cost of transportation

It is important first to understand the financial burden of personal transportation. For most households, owning and operating a personal automobile is either the largest or the second largest expense. Costs related to personal transportation on average are estimated to make up about 20% of each household's income - this would make the cost of car ownership second only to the costs of housing, which is recommended to account for approximately 30% of a household budget (Speck 2013, 30). However, transportation is increasingly the most significant expense, even above housing. In 2022, it was estimated that car ownership and operating expenses amounted to $10,728 each year, breaking down to $894 each month (Moye 2022). This is the estimated cost breakdown per vehicle, meaning households with more than one car see this number multiply quickly. On the other hand, walkable neighborhood design provides the opportunity to lower many of these costs and opens money to be spent in other areas. Research indicates that households in communities with more accessible land use and increased transportation options beyond car-dependence - but households that still own and operate personal vehicles - spend at least 50% less on personal transportation than households in

car-dependent communities (Litman 2004, 9). With these savings, people can spend more on leisure and in their communities, and in walkable communities they are likely to spend the money close to home.

Each of the interview participants agreed that their cars are one of the biggest, if not the biggest, expenses in their households. Most of the participants were part of households with more than one car. In Livonia, this was especially necessary - residents explained that it would be impossible to reach the locations that they needed to and maintain the level of activity that they desired with just one car. In these households, car ownership was not optional, and so although the residents expressed that this ownership can sometimes cause financial stress, it is their only reliable transportation option in the area, so the number of cars was not optional.

This decreased financial burden makes a significant difference in individuals ability to participate in one's community. For example, the US Census Bureau found that in 2020, a year with record high voter turnout across the country, there still existed a 20% gap in voter turnout between those with high levels of disposable income and those with minimal disposable income (United States Census Bureau 2021). This correlation can be explained in part by an increase in leisure time that comes with financial stability - as one can decrease hours required to work to make ends meet, their time available to become involved in the community or learn about electoral politics increases. This also means that barriers to involvement are reduced. With leisure time comes the opportunity to gain knowledge of local issues on a deeper level. This also means that more time may become available for different types of involvement. Particularly in households where income is earned hourly, the time taken to participate in community efforts

that are not paid can be inaccessible. When a primary expense is lessened, it opens resources that can be channeled into engagement, or even into other expenses.

Two members of Ann Arbor city council acknowledged this in their own observations. They shared that many of the most walkable areas of the city are the most expensive - but these housing options become more accessible when transportation is no longer a cost burden. One of the council members included a note that when she first moved to Ann Arbor, her income was low and her housing costs were high, but she was able to afford it and to still be involved because she did not have to own a car in that area. More broadly, they both also noted that simply reducing this major cost could lessen the stress that comes with financial hardship, and this additionally could create greater capacity for civic engagement. One resident of Ann Arbor reflected as well that in her observations, those who are of the lowest income in the community often do not own cars, regardless of whether or not they live in an area that supports other transportation options. Thus, by intentionally including infrastructure to support pedestrian mobility or by providing increased public transportation options, the people who already cannot afford the most expensive transportation option might have more opportunities to participate in the community, simply because they are able to navigate it easier and more safely.

Individual financial decisions centered around the community

With an increase in leisure time and disposable income comes increased participation in and investment in one's community. When individuals save from a decrease in car dependence, they can use that money for leisure and entertainment in their community. The city of Portland,

Oregon, for example, drives on average 20% less than the average American. As a result, the residents of the city save a collective $2.6 billion annually, and are known to have an above average recreation consumption (Speck 2013, 29). This fact, doubled with the fact that within walkable communities there are likely to be more opportunities for dining, entertainment, and overall socialization as a result of the denser location of amenities, indicates that these savings can be used in ways that will help residents take part in their community and get to know it better. This active participation in and investment in one's community and what it has to offer may create more motivation and incentive to participate politically. Those who care about expressing appreciation for, protecting, and preserving the parts of their community that they care for will have more reason to get involved in ways that they believe will benefit the parts of the community that they know best. When people spend their money mostly in places outside of their communities, as we discussed in the previous section, there is less personal investment in and stakes in the direction of one's locality.

One Livonia resident shared her experience with this, and reflected on the lack of connection she feels when driving to the destinations she needs to reach. "That is time that I'm spending elsewhere and engaging elsewhere, and likely engaging in multiple other places. Maybe I'm going to 3 or 4 different communities for different things… so my time and my resources are being spread out." Comparatively, she says, "If it was more walkable, those might be invested within a mile or two of my house. That would be a reinforcing cycle I think, I would naturally get to build relationships and get to know people… If I'm then more compelled to do things locally and spend more money locally, then I also know what events are going on or what decisions are being made on a different level than I do now just reading about it."

Economic health of locality

One Livonia city council member noted the long term financial impact of walkability. He noted that the access to amenities that walkability brings can boost the attractiveness of the area to new residents or even to individuals looking to experience something outside of their own cities. "People would think of Livonia as a destination. That's going to raise property values [for homes], and that's going to attract new amenities and development… it has a very positive touch on an overall municipality."

Economists have found the same. Studies connect each increase in WalkScore points with an extra five hundred to three thousand dollars per point in real estate value (Speck 2013, 27). This may be in part because walkability tends to be popular for those in the market to buy or rent homes, and in many areas the supply of homes located in walkable areas doesn't meet up with the demand. However, an increase in property values is not where this benefit stops. Investments in infrastructure for walking, biking, and transit have been found to create 60 to 100 percent more jobs than investments in auto-centric infrastructure (Speck 2013, 31). These infrastructure investments built for people over cars both keep money in the local economy and attract new investment. Washington D.C. alone estimated that their focus on walkability and public transportation resulted in $127,275,000 being retained in the city each year in the first five years since the infrastructure was implemented (National Building Museum 2012). These changes also attract new business and new residents. Starting in the 1990s, Portland, OR, invested $65 million into bicycle and pedestrian infrastructure, and in the same decade they saw their population of 25

to 34 year olds increase by 50 percent - the fastest increase in this age group recorded in the city (Coletta 2004, 34).

Cities also become more productive when their residents do not have to rely on cars, and this productivity attracts new investment as well. A study out of the University of Michigan's SMART Center tested the importance of face-to-face interaction in spurring innovation and collaboration - a rule that many of us have been able to prove ourselves in our experience of remote work and school - but Susan Zeilinski, the director of the center, emphasized the role that walkability plays in making these interactions possible. She noted that, "In Europe you can get five good meetings done in a day. In Australia, maybe three, and in Atlanta, maybe two, because you've gone way, way, farther and way, way faster but you haven't been in an accessible place that allows a lot to happen. You've spent a lot of time sitting in traffic," (Brooks 2011; Mapes 2009, 268). This connects the issue of time to the issue of the economy very clearly - car-dependent places simply do not provide as many opportunities to get work done. Theoretical physicists Geoffery West and Luis Bettencourt have produced research that supports this notion from possibly the most quantitative perspective possible, and found that, "What the data clearly shows is that when people come together they become much more productive." This means that when people are spread out, and when they must travel further to complete just about any task, they become significantly less productive. Jonah Lehrer explains that, "many of the fastest-growing cities in America, like Phoenix and Riverside, CA… have traded away public spaces for affordable single family homes, attracting working-class families who want their own white picket fences. West and Bettencourt point out, however, that cheap suburban comforts are associated with poor performance on a variety of urban metrics. Phoenix, for instance, has been

characterized by below-average levels of income and innovation (as measured by the production of patents) for the last 40 years," (Lehrer 2010). Along the same issue, a study by the Environmental Protection Agency similarly found that on the state level, the more miles that an individual drives on average, the weaker that state performs economically (Kooshian and Winkelman 2011, 2).

While the economic performance of a given area is less directly related to civic engagement, it is important to note the correlation. Strong economic performance is consistently connected to higher voter turnout, and strong economic performance creates the conditions that make civic engagement more possible for a larger amount of the population in a given area (Akee et al. 2019). Economic growth can lead to higher average incomes, an increase in leisure time, and increased personal wellbeing - all important factors in encouraging residents to get involved in their communities, learn about local issues, and experience the empowerment necessary to influence their communities.

Health and Safety

The following discussion of health and safety and environmental quality focuses on factors that see a long-term impact on the connection between walkability and civic engagement. These factors contribute to the connection, but we see the effects play out over longer periods of time, rather than in more immediate behavioral or habitual changes that may come out of day-to-day time constraints or personal interactions. We see these connections created out of both the benefits of walkability, and a decrease in the harms associated with car dependence.

Epidemiologists have increasingly sounded the alarm that our car dependence is a significant culprit in the fact that, “for the first time in history, the current generation of youth will live shorter lives than their parents,” (Gotschi and Mills, n.d.). This is the result of several significant cultural and physical impacts that our cars have had on our lives, including “inactivity-inducing convenience, often violent speed, and toxic exhaust,” that are all difficult to get away from in car-dependent cultures (Speck 2013, 39). Each of these issues of health and safety contribute also to lower levels of civic engagement over time.

Car-induced inactivity

Our car dependence has significantly reduced our physical activity - those who depend on a car as their primary form of transit are three times less likely to meet their CDC recommended 30 minutes of daily physical activity (Frank 2013). Children growing up with car dependence are particularly affected - the youngest generation is the least active in American history, partly due to the fact that less than 15% of children walk to school, compared to 50% who walked to school 50 years ago (Peirce 2009). This inactivity has a major impact on the health of adults and children in the US. America’s obesity rate has risen over three times in thirty years, opening the door for a slew of obesity-related health problems, including coronary heart disease, hypertension, a variety of cancers, gallstones, osteoarthritis, diabetes, stroke, sleep apneas, as well as a variety of mental disorders. In line with the rising obesity trend, the U.S. Centers for Disease Control explains that approximately 33% of American children born after the year 2000

will become diabetic in their lifetimes, and rising asthma rates have corresponded almost exactly with the increase in car-dependence (Centers for Disease Control 2010).

The link between the automotive lifestyle and obesity related health complications is strong. One study of the Atlanta area found that for every additional five minutes an individual spends driving each day, they are three percent more likely to be obese (Leinberger 2008, 76). Another study of the San Diego area found that 60% of residents in "low-walkable" areas were obese, compared to only 35% in "high-walkable" areas. Yet another found that obesity "declined from 23% to 13% as neighborhood residential density increased from less than two to more than eight dwellings per acre," (Frank, Jackson, and Frumkin 2004, 100). A six-year analysis of Massachusetts residents found that the lowest body mass index averages were concentrated in Boston and its inner-ring suburbs, while the highest body mass index averages were concentrated in outer-ring suburbs surrounding Interstate 495, noting specifically that, "health officials suggest these higher rates are due, in part, to a lack of opportunities for every-day recreation and the time-squeezed lifestyle of many residents who have long commutes," (Noonan 2010). While an increase in obesity rates cannot be attributed solely to a decrease in physical activity, research provides clear evidence that obesity levels are often more dependent on physical activity levels than diet, and our car dependence overwhelmingly contributes to our inactivity (Frank, Jackson, and Frumkin 2004, 95; Mapes 2009, 231; Vlahos 2011).

Car-induced stress

Beyond inactivity-induced obesity, our cars, and the time and energy spent driving them, are linked to more health issues, particularly those connected to stress. Multiple studies have linked driving to heart attacks, with one finding that, “an unusually high percentage of people having heart attacks had spent time in traffic on the day they were stricken,” and ultimately concluded that each hour spent driving triples your risk of heart attack in the following hours (Mapes 2009, 239). Another study similarly found that traffic exposure accounts for more heart attacks worldwide than any other activity, even including extreme physical activity (Klotz 2011). A study in Miami found that “after driving for forty-five minutes, university students had higher blood pressure, higher heart rates, and lower frustration tolerance,” (Frank, Jackson, and Frumkin 2004, 172) Beyond stressful driving situations like traffic, the act of driving itself is linked to an overall decrease in happiness and life satisfaction. Overall, individuals with longer commutes report “lower satisfaction with life,” than those who drive less, and one study found that a 23 minute commute had the same effect on happiness as a 19% reduction in income - and that’s a commute that falls below the national average. Stress and frustration lead to additional health complications as well; including anxiety, depression, digestive problems, headaches, muscle tension, heart disease, hypertension, stroke, sleep disturbance, and memory impairment (Frank, Jackson, and Frumkin 2004, 142; Lutz and Fernandez 2010, 156; Stutzer and Frey 2007).

On the opposite end, interview participants noted that when they had the opportunity to walk to more of their destinations, their mental health improved significantly. Some credited the increased physical activity itself, but others specifically noticed that they felt happier and less stressed when they were able to commute by foot or bike because of the social nature of it. Residents of Livonia and Ann Arbor alike noted that, whether it was in their own community or

elsewhere, when they had the opportunity to walk to their destinations they had more opportunities to talk to new people, even if that just meant saying hi, because they weren't, "behind that physical barrier of a car, speeding past people and not really paying attention." Most interview participants noted the mental health benefits of simply interacting with new people. For those in Ann Arbor who had the option to commute via foot on a regular basis, they also reported decreased stress and improved mental health because of their increased familiarity with their surroundings.

Safety

Pollution, collisions, and irresponsible driving cause additional harm beyond the issues posed by the act of driving itself. Car crashes alone are the leading cause of death for all Americans under the age of 34 (Lutz and Fernandez 2010, 165), and they have killed more Americans than all of our wars combined (Siegel 2010, 30). At 14.5 traffic fatalities per 100,000 population, the United States has roughly twice the amount of traffic fatalities of Germany, and three times the United Kingdom (Drive and Stay Alive, Inc. 2016). All American cities are not equal, though. The denser and less car-centric cities of San Francisco, New York, and Portland, see 2.5, 3.1, and 3.2 traffic fatalities per 100,000 people, respectively, compared to the notoriously car-dependent cities of Atlanta, which sees 12.7, Dallas, which sees 14, and Tampa, which sees 16.2 (Frank, Jackson, and Frumkin 2004, 112). This is partly due to the miles driven in each of these cities - as the first three are more walkable and have more public transportation options - but not entirely. Residents of the five most dangerous states for driving drive, on average, 64 percent more miles than residents of the five safest states for driving, but they experience 243 more

traffic deaths per capita. This means that every mile driven in the least safe states is twice as dangerous as each mile driven in the safest states (Drive and Stay Alive, Inc. 2016). Going further, several studies have found that when comparing the risk of death in different areas including factors of crime and car crashes, the average individual is 19 percent safer in the inner city than in the outer suburbs. The only areas where this holds less true are around cities with sprawling and unwalkable inner cities, like Dallas and Houston, where car crash statistics are almost as bad as they are in the outer suburbs (Ford 2009).

Environmental health

Even individuals who spend less time driving than the majority of the country may find their health impacted by the environmental impacts of car dependence. It is well established that personal transportation vehicles are the biggest contributors to greenhouse gas emissions in our country, and that they are often the biggest contributor to an average individual's carbon footprint - the Environmental Protection Agency reports that the average passenger vehicle emits 4.6 metric tons of carbon dioxide every year, along with methane and nitrous oxide emissions (Environmental Protection Agency 2022). These emissions from personal vehicles account for two-thirds of the United States' total transportation emissions (Environmental Protection Agency 2022). Along with their daily use, personal transportation vehicles create a bigger footprint from "the emissions from the construction of vehicles; the embodied energy of streets, bridges, and other infrastructure; the operation and repair of this infrastructure; the maintenance of and repair of vehicles; the energy of refining fuel; and the energy of transporting it, together with the pipes, trucks, and other infrastructure that is required to do so," (Mehaffy 2019).

Less established is the footprint that results from our compulsory driving and the sprawl that it enables. Sustainability author David Owen explains that, in addition to the emissions from cars themselves, their biggest contribution to environmental damage lies in the fact that "they make it too easy for people to spread out, encouraging forms of development that are inherently wasteful and damaging… The critical energy drain in a typical American suburb is not the Hummer in the driveway; it's everything else the Hummer makes possible - the oversized houses and irrigated yards, the network of new feeder roads and residential streets, the costly and inefficient outward expansion of the power grid, the duplicated stores and schools, the two-hour solo commutes," (Owen 2009, 48, 104) In fact, a study by the Environmental Protection Agency compared four factors and their impact on a buildings environmental impact: drivable versus walkable location, conventional constriction versus green building, single-family versus multifamily housing, and conventional versus hybrid automobiles. The study found that whether a building was located in a drivable or walkable area had a bigger impact on its footprint than any other factor by far (Steuteville 2011).

This massive environmental difference between walkable and car-dependent places is important to consider because our environmental quality has a monumental impact on our quality of life and our ability to participate in our communities. Particulate matter from pollutants is linked to death by health issues such as cardiovascular disease, cerebrovascular disease, chronic kidney disease, chronic obstructive pulmonary disease, dementia, type 2 diabetes, hypertension, lung cancer, pneumonia, asthma, and higher rates of birth complications. Up to 200,000 early deaths

result from these conditions every year in the United States, not to mention millions of people whose quality of life is decreased by living with these conditions every year (Jost 2020).

One Ann Arbor city council member noted the impact that these harmful emissions have on generational capacity for engagement. “We know that emissions are linked to asthma, birth defects, and lots of other health complications. So, if we are fundamentally putting people at risk from the moment they’re born in many communities, that’s going to affect if they’re able to get engaged later on in life.” Other participants from both cities acknowledged that living with health complications diminishes the capacity for an individual to be engaged, because of the time and mental capacity that is taken up by treating health complications, as well as the physical barriers that they may cause. Residents of both cities also noted that, in cases where health complications reduce the possibility of driving, supportive pedestrian infrastructure or public transportation creates more opportunities to continue to be engaged without relying on a mode of transportation that is not available to them.

Several studies have found this connection to be true specifically with a very introductory measure of civic engagement - voting. One study found that those with good self-reported health were more likely to vote than those with bad self-reported health (Ehlinger and Nevarez 2021). Another found that the ten least healthy US states saw a voting turnout rate of nearly 10 points less than the 10 healthiest states (United Health Foundation, n.d.). This may be in part because individuals who experience better health have less barriers to voting - they are less burdened by complications that may make it more difficult to vote or to engage in the community in the ways that allow them to learn about local politics and develop a sense of responsibility for their

communities, as discussed in earlier sections. People who experience better health are also more likely to experience higher life satisfaction overall, which is also linked to increased community participation. Overall, individuals with better health and higher life satisfaction may have more opportunities to be involved in their communities and be more likely to feel that they should have a say in them, and they are more likely to be involved in and cultivate relationships in their communities (Moreno-Agostino, Jose Abad, and Felix Caballero 2022; Weitz-Shapiro and Winters 2011). These are all conditions which are very much affected by our transportation options - as car-dependence can inhibit healthy habits and exacerbate individual health issues caused by environmental pollution, and lead to lower life satisfaction and prevent us from being civically engaged.

Social Capital

Perhaps the most significant factor in connecting walkability to civic engagement is the role that walkability plays in creating more social capital among the residents of a community. Those who live in areas where walking to amenities is a viable option and who see the increase in time and financial flexibility as a result, also see more connection with others who live in the community built through informal social interactions. Walkable communities have been found consistently to create the conditions necessary for these unplanned, informal interactions to occur. Often, these neighborhoods not only are designed in a way that encourages walking, but they have more shared or public spaces which create opportunities for informal social gathering - one key factor that was identified by residents as an important part of walkability. The act of walking itself creates opportunities to interact with the people around us, rather than recluding to our own

personal vehicles, and this alone can strengthen our social capital in our neighborhoods. In The Death and Life of Great American Cities, Jane Jacobs notes, “Lowly, unpurposeful, and random as they may appear, sidewalk contacts are the small change from which a city’s wealth of public life may grow,” (Jacobs 1992). This means that simple or routine interactions with neighbors themselves can cultivate a greater understanding of the people in one’s community and a greater sense of responsibility to protect their needs and interests. Increased time and money spent in one’s neighborhood furthers these connections and facilitates a deeper connection with the community as a whole. Patronizing local restaurants, cafes, bars, shops, grocery stores, and other services, allows one to develop familiarity with these places, the people they serve, and the roles they play in the community. This means that when opportunities for political participation arise, one has more reason to take advantage of them. They have had the opportunity to gather what they value in their community, and to see these values as being worth advocating for.

Neighborhood interaction

Voting data

We know that walkable neighborhood design often facilitates interaction with neighbors. This is significant when considering the question of civic engagement because these interactions can be a defining factor in facilitating civic engagement. One study in particular sought to measure the impact of frequency of interaction with neighbors on voting behavior. Carrie LeVan found that those who lived in walkable neighborhoods were likely to interact with their neighbors at least once a week, as opposed to those who lived in car dependent neighborhoods and were likely to

interact with their neighbors about once a month (2019). This study found a strong positive relationship between frequency of neighborhood interaction and voting participation. Those who interacted with their neighbors about once every couple of months were predicted to vote 13% of the time, while those who talked to their neighbors more than once a week were predicted to vote 95% of the time. This shows how both neighborhoods and neighbors can influence civic engagement trends among individuals.

Political socialization - knowledge and influence

Interaction between neighbors can be consequential in political socialization, meaning these contacts can shape civic engagement in a variety of ways. First, very simply, these informal interactions serve to provide information about local issues from peers who often have similar stakes in the community to oneself. These interactions can also provide information beyond local issues, however, and can be equally helpful in creating opportunities for political learning outside of one's own resources. This increased political knowledge has been shown to mobilize individuals to become civically involved because it first removes barriers to political participation by offering information and resources without requiring one to search for them on their own, and second because it may shed light on otherwise unknown information that inspires an individual to become politically involved (McClurg 2003). Second, informal neighborhood interaction can encourage political involvement because it can frame it as a behavior which is morally or socially desirable (Abrams, Iversen, and Soskice 2011). This may take place when individuals are invited to join organizations or attend meetings which facilitate participation in the community, or on a less obvious level where individuals are made to understand that civic

engagement is an important value among their peers and which may persuade them to follow suit. Of course, these interactions will have stronger influence when they happen more frequently, because more frequent interactions can also lead to increased trust among individuals as well as increased motivation for an individual to participate in the community in a way that aligns with its values.

Residents of Ann Arbor, for whom walking is more often a part of daily routine, explained that they had much more social interaction when they walked as opposed to when they lived in places where they drove to the majority of their locations, and as a result they had better and more frequent communication with the people who lived near them. One Ann Arbor resident shared that, almost every time he or his wife walked for leisure or to reach a destination, they ended up having at least one short conversation with someone new. He explained that these unplanned, informal interactions are ones he wouldn't normally have had if he had chosen to drive instead, but he appreciates them because they make him feel like he knew how the people around him were doing and he felt that they genuinely cared about his well being as well - he describes these more meaningful interactions as the ones that make him feel a sense of community where he lives.

Residents and city officials of Livonia shared that they feel increased walkability in their city would make it easier for them to feel connected to their fellow residents and better understand their needs. A place where several people described as a city where you can "walk to walk, but not to get around," residents shared that when they did walk around their neighborhoods for leisure that they sometimes met new people, but they didn't often do so because the walk was not

a part of their daily routine. Because this is not a part of their neighbor's daily routines either, residents noted that they didn't always meet people when they walked because so few other people were outside to meet - or if they were they were often in their backyards and not in a place where they could easily interact. Instead, they noted that when much of the communication for the city took place on social media, this communication felt less nuanced and less personal, and didn't provide the same opportunities to get to know people as well as face to face interactions.

Social segregation

Car dependent communities tend to see higher levels of social segregation and, as a result, neighborhoods tend to be more homogenous (Gotham 2014, 38). This societal organization can decrease political participation as individuals feel less responsibility and necessity to see their own values and opinions represented (Polson 2014). If an individual feels that their neighbors have the same interests and values as them, they are less inclined to vote or otherwise get involved politically because their involvement may be seen as doing little more than affirming the majority opinion, rather than contributing to its establishment. Heterogeneous communities, on the other hand, are more likely to see conflicts over resources and policies and see groups incentivized to mobilize in order to protect their interests (Rubenson 2014). The influence of neighbor-to-neighbor interaction holds true among diverse communities. In some cases, informal neighborhood interaction can highlight shared values and lead to encouragement and invitation to get involved to strengthen those values in the community. In other cases, informal

neighborhood interaction can highlight differences in values and can inspire civic involvement out of interest to prevent expressed values from gaining political legitimacy in the community.

Several Ann Arbor residents expressed that their transportation habits brought them into contact with people outside of their typical social circles frequently. One resident shared that she felt that through walking a lot in the city and interacting with other pedestrians, she had the opportunity to meet and learn from people who were of different races, sexual orientations, gender expressions, ages, and incomes from her, and she felt that this gave her an overall better understanding of who else lives in the city and what their needs are, so she was able to view local issues from a more holistic perspective. Another resident, who previously lived in a car dependent community, found that walking more in his community made him interact more thoughtfully with his surroundings. He explained that when he drove most places, he was focused primarily on himself and not concerned with the people around him, or he was annoyed at other drivers or at pedestrians or cyclists that he encountered. Since decreasing his driving, he explains that he's more courteous, and he thinks more about those around him, and he feels that this translates to his way of thinking in other parts of his life as well.

Boundedness

Communities which see higher levels of car dependent commutes also importantly see a decrease in the 'boundedness' to the area in which they live, which may be one of the most important social factors that influences civic engagement. As discussed in the section dealing with time influences, when commuting outside of the community for work, leisure, and even necessities

such as food, this creates the mindset that one's home community is simply where one's housing is located, and it prevents much further connection. This also blurs the lines between locations that individuals feel that they can call 'home.' If one spends significantly more time close to where they work, which is miles away from where they live, the community they live in might not feel as much like home to them. This is important because research notes that residents of "well-defined and bounded" neighborhoods, meaning neighborhoods which have clear identities, spatial limits, functions and amenities, are much more likely to be aware of and involved in local politics and non-political community life (Putnam 2000, 214). When individuals do not feel that the communities in which they live have much to offer them, they are less likely to feel as though they have a stake in it. This 'boundedness' of communities is largely dependent on this social capital that is created when residents spend time in their communities and have opportunities for informal interactions with their neighbors and peers. This connection creates motivation to become involved in one's community in order to see its values and policies reflect one's own, because the direction of local politics has the potential to have a substantial impact on one's life. When this connection is not made, individuals are safer in their ignorance to local issues as their lives do not feel as connected to the community and the decisions it makes.

Implications

The connection between walkability and civic engagement has powerful implications. We can see that walkable communities have the potential to cultivate more meaningful relationships among neighbors, allow individuals more opportunities to spend time in their communities, bolster financial strength on the individual and economic level, and, of course, that these factors

each contribute to an increase in voter turnout and overall civic engagement. Beyond this, though, walkability - and the results of it - are important to pursue because walkable communities tend to be more equitable, and are connected to an overall better quality of life.

Equity

Scholars have identified strong walking and biking infrastructure as some of the most effective tools available to a city to increase equitability. More than a third of Americans cannot drive, either because they do not possess a license or because they do not have access to their own car. This means that these 103 million people must rely on other forms of transportation if they want to leave their house, and other forms of transportation are increasingly unavailable in sprawling American cities. When destinations are accessible by foot, bike, or transit, many more Americans are able to reach them.

Walkability serves different populations in different ways. First, elderly people who live in walkable communities are able to retain their independence much longer when they are able to satisfy most of their needs without having to drive. This allows those who can no longer drive to continue to participate in their communities and maintain their connections. Walkable communities also give children more opportunities to participate in them - when they can meet a friend or play at a park without needing to drive or be driven, they can begin to make their own connections with the city before they earn their driver's license. Investments in pedestrian safety also disproportionately serve low income populations - low income populations are more likely not to have access to driving or a car, and in turn they are more likely to rely on walking or

biking to reach their destinations. Low income communities are much less likely to have walkable infrastructure, and as a result, pedestrian injuries and deaths are much more likely in these areas. Investments in clear and safe pedestrian infrastructure and urban design allows low income communities to access destinations easier and safer, and removes some of the barriers that come with lack of access to a car. Walkability also disproportionately serves individuals with disabilities - particularly those with visual impairments and those who use wheelchairs, who face particular barriers to accessing vehicles, and for whom walking allows increased independence (Speck 2018).

Further, Dr. Lawrence Frank, a professor at the University of California, San Diego - whose work around walkability in urban planning and development led to the development of WalkScore - explains another important impact of walkability on equity. Walkability in the United States is highly racialized, meaning that neighborhoods with wealthier and whiter populations have more green-space, more opportunities for shopping, dining, and even working close to home, and all of the community benefits of walkability. On the contrary, low-income neighborhoods with higher populations of people of color are more likely to see their walking experience impacted by air pollution, noise pollution, crime, targeted policing, and increased risk of injury (America Walks 2022). So, while populations in these areas may walk as their only transportation option, they are less likely to see pedestrian and cycling infrastructure that protects them and are less likely to see urban design that makes the community considered walkable and brings the benefits of walkability to the area.

Pursuing walkable infrastructure in all communities is a powerful way to create more equitable conditions among and between communities. When infrastructure and environmental conditions protect pedestrians and allow for multiple transportation options in both high and low income areas, more communities see improvements in the connecting factors discussed in this paper, particularly economic health and personal wellbeing. The connection to civic engagement makes this a cycle that supports itself. Walkable communities see greater equity, but so do communities that are more civically engaged (Chavous 2019; Minnesota Department of Health 2022). One Ann Arbor city council member pointed out where she sees this in her work - she noted that those who see the greatest improvement in resources and community building that come from living in a walkable area are the same people who have greater ability to advocate for themselves and who are able to encourage expansions in these positive changes in their communities. By creating conditions that allow for more accessible engagement and advocacy in communities that have been historically restricted from this engagement, we can create greater potential for these communities to receive the improvement in resources, services, and attention that they need (Hannon Michael, De La Vega, and Yuen 2018).

Addressing gentrification

These equity-based approaches are also important for acknowledging and responding to the issue of gentrification that has the potential to follow efforts for walkability. Earlier in this paper, we discussed the impact that walkability has on real estate value and development. These factors can be beneficial to a municipality and generate increased revenue for the city's government, but if this change in property values causes the lowest income individuals in a community to relocate,

then the changes are not affecting all residents equally. Implementing walkable infrastructure more broadly, and which is accessible to each community in the way that they need, helps to combat the gentrifying potential of walkability (Stueteville 2017; Green 2017).

Suggestions for future research

This paper seeks to add to the literature on walkability and its impact on the overall health of communities, particularly the opportunities they provide for their citizens to have a positive impact on their surroundings, whether through informal and unplanned actions, or through broader, institutionalized or political efforts. Yet, there is still much to be understood about walkability and its capacity to influence the civic health of a community.

One contribution that is yet to be added to this field of research is an accessible tool for measuring walkability that takes into account factors of safety and social equity. Walk Score, the tool used earlier in this paper to compare the walkability of the cities of Livonia and Ann Arbor, relies primarily on the metrics of distance and density to calculate a Walk Score. While these factors are indeed the foundation of walkability, and while this tool is reputable and widely used, and its scores are considered to be an accurate predictor of walking volumes (Project for Public Spaces 2011), it doesn't take into account the factors that may have a significant impact on an individual's walking experience. Guidelines for creating walkability often include considerations for pedestrian supportive infrastructure that is accessible to all. This means considerations of sidewalk or pedestrian path connectivity; traffic safety, including traffic speed and distance or objects between street traffic and pedestrian areas; width and quality of areas for pedestrians,

particularly allowing for easy and independent access by individuals using wheelchairs or strollers; adequate lighting or shade where necessary; as well as enforced policy that protects individuals from racial profiling or over policing. These factors are not all-encompassing, and they are compiled from a variety of perspectives (Ewing and Cervero 2010; Spoon 2005; Hutabarat Lo 2009; Planetizen, n.d.; Urban Institute 2022), but they are measures that are important to keep in mind when measuring walkability. As of now, however, they require time and labor intensive efforts to quantify the walkability of very specific areas. A tool like Walk Score makes measuring walkability much more accessible, but may provide high scores for locations with close proximity to amenities without considering more deeply if there are sidewalks to connect the two locations, or what speed of traffic pedestrians will have to encounter. As such, an accessible tool or metric for tracking walkability is vital to continue this research in ways that will reflect more accurate experiences of pedestrians.

Future research could also include a more specific analysis of walkability's impact on civic engagement for historically marginalized and underrepresented groups. Particularly in the United States, car-centric infrastructure has historically been used as a tool to destroy and displace communities of color. This intentional disenfranchisement has prevented communities of color from reaching the same levels of civic engagement as white communities on average. Efforts like multi-modal transportation, which includes walking, cycling, and public transit options alongside cars, have the potential to create greater equity by allowing for more accessible transportation choices - which, as we discussed, can have a positive impact on individual finances and participation opportunities, as well as being an important tool for communities seeking greater equity. A more specific study with a racialized lens was beyond the scope of this paper, but this

is a relationship that is vital to understand as community efforts for walkability increase to ensure that these efforts are appropriately beneficial to all residents.

Suggestions for walkability

Understanding the impacts of walkability is the first step, but residents and city officials alike can advocate for their own communities to become more equitable and accessible for all. As we discussed earlier, creating walkability includes multiple components that must work together. These include factors such as density of housing and amenities as well as the distance between them; safety factors such as sidewalk quality and distance from the road; and other infrastructure such as crosswalks and bike lanes, and access to transit. Creating walkable conditions must be intentional in a country which tends to veer toward car-centric design, but many of these factors can be implemented in short term and long term efforts. Three of the most important foundations of walkability are housing, mixed land use, and traffic calming. The suggestions in this section are drawn from Jeff Speck's book *Walkable City Rules* (2018).

Housing

One significant change that cities can make to encourage the density required for walkability is allowing for and encouraging more housing types. This does not mean that large apartment complexes need to be built among single-family homes in the suburbs. Rather, current sprawling cities could benefit from utilizing "middle housing." This means allowing for duplexes and triplexes - buildings that can still be the size of a house, but fit more people - as well as flats

installed above garages, and smaller "garden apartments" which may include multiple units but are low-rise and often still include lawn space.

Mixed use developments

Cities can also pursue new models for land use. Making an effort to include commercial and residential use, where appropriate, can allow for residents to reach shopping and dining areas easier because they are allowed to be located closer to them. Especially in these mixed-use areas, where cost of housing can be inflated, it's important to provide mixed-income housing so that these most walkable areas are accessible to all who wish to live there, and that they don't become spaces that are accessible only to a select few. Diversifying the types of buildings or businesses that can be located near each other additionally helps to encourage walking, even if just by making that walk more interesting. Residents will walk more when they have a variety of interesting sensory input as opposed to walking through blocks of repetitive residential use or wide, concrete buildings at a time. Pushing for the inclusion of parks and public centers, as many of our residents interviewed noted as well, is an important tool for allowing public congregation that can encourage residents to use other forms of transportation that allow for the interaction that takes place in these spaces.

Traffic calming

Particularly on downtown streets where many are already walking more to the shopping or dining that is located in that area, cities can ensure that these spaces feel safe for pedestrians to

encourage more walking. Streets running through these centers should see slower traffic and narrower lanes to decrease the importance of the automobile and put pedestrian or cycling use on more equal ground. In these locations, on-street parking can be utilized to provide an additional barrier between car traffic and pedestrians. In these areas, and throughout the city, it's beneficial for spaces between intersections or crossing opportunities to be shortened. This allows for more chances for pedestrians to reach their destinations, and it often means that traffic moves slower and that there's less of it flowing through one high speed road.

Conclusion and Discussion

Civic engagement in the United States has long been analyzed, and its steady decline has been studied at length. The analysis of the role that the built environment plays in creating opportunities for civic engagement, though, is relatively recent to the literature. Yet, this connection is a vital one to understand, as it is one of the most foundational factors that encourages or discourages engagement. The findings of this paper and in this broader field of research must be applied in our approach to city building and urban planning in order to facilitate community advocacy, address inequalities that exist in our society, and strengthen our democracy.

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