Saint Paul
Bike Equity Report

A Tool for Reviewing the Saint Paul Bicycle Plan with a Health Equity Lens

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Contents

Figures

Acknowledgments

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Background

In 2015, the Center for Prevention at Blue Cross and Blue Shield of Minnesota (Blue Cross) commissioned Wilder Research to assess the current Saint Paul bicycle network and planned infrastructure changes from a health equity perspective. This project was funded through Blue Cross' Active Living for All (ALfA) initiative, which works with nine organizations to increase access and reduce barriers to physical activity by improving the active living environment in their respective communities.

Bicycle Access – Any person living within ¼ mile of a bikeway was considered to have access to the bikeway.

Bikeway – "Any roadway where signage or pavement markings have been used to identify a bicycle route or to alert bicyclists and motorists that bicycles will be on the roadway." – Saint Paul Bike Plan (2015)

Expanding Saint Paul bikeways can improve opportunities for residents to engage in healthy activities and access employment, education, and other community resources. When implemented with a health equity lens that reflects community interests and priorities, changes to the bicycle infrastructure can strengthen efforts to reduce health inequities and improve well-being.[1] This is especially important for low-income communities and communities of color who often disproportionately experience poor health outcomes and a lack of access to community resources.[2,3]

This report provides Saint Paul residents, advocacy organizations, and City of Saint Paul staff with information describing who has access to existing bicycle infrastructure in Saint Paul and how access is likely to change as the Saint Paul Bicycle Plan is implemented. It also shows how the proposed bicycle plan will impact access to community resources that support health, including schools, grocery stores, and community recreation facilities. Finally, it offers recommendations to prioritize implementation of bicycle plan components in an equitable manner.

Methods

Using Minnesota Compass' geographic profiling features (available at www.mncompass.org), a review of Saint Paul's seven wards was conducted to identify characteristics that are relevant to discussing bike equity, such as vehicle ownership, population diversity, and household

1 Wilder Research. (2012). *Health inequities in the Twin Cities*. Retrieved from https://www.bcbsmnfoundation.org/system/asset/resource/pdf_file/59/Health_Inequities_in_the_Twin_Cities_2012__Full_Report.pdf

2 Metropolitan Council (2013). *Public transit and human services transportation coordination action plan Twin Cities Metropolitan Area.* Retrieved from http://www.metrocouncil.org/Transportation/Publications-And-Resources/Public-Transit-and-Human-Services-Transportation-C.aspx

3 Day, K. (2006). Active living and social justice: Planning for physical activity in low-income, black, and Latino communities. Journal of the American Planning Association, 72(1).

income. Ward boundaries were entered into the neighborhood profile feature based on current City of Saint Paul ward maps. To assess equity of the Saint Paul bicycle system, Wilder Research produced a series of maps displaying current and proposed Saint Paul bicycle infrastructure and ward characteristics, including the number of residents of color and number of residents living at or below 200 percent of the Federal Poverty Level (FPL).[4] The maps do not include the 18 miles of bikeable shoulders identified as bikeways by the City of Saint Paul, as these on-street bicycle facilities have few visible markings and offer minimal separation from motorized vehicle traffic.

Two different U.S. Census Bureau data sources were used to identify demographic characteristics of each ward within the City of Saint Paul. Ward-level demographic descriptions were based upon the 2009-2013 American Community Survey. Demographic information used for mapping race and ethnicity data at the block level is based upon the 2010 Census, while socioeconomic status maps included data from the 2009-2013 American Community Survey. These data sources provide the most accurate estimates available at each geographic level. Differences in bikeway access by race based on 2010 Census data do show statistically significant differences; however, the margins of error for the estimates of socioeconomic status are too large to determine whether these differences in bikeway access are statistically significant.

Multiple sources of data were used to identify community resources that support health, defined in this report as community recreation centers, parks, Nice Ride locations, schools, libraries, and grocery stores. Business lists that included the types of community resources of interest in this report were compiled by MSG, an external vendor. In situations where the list included businesses or other entities that did not clearly fit into each category, internet searches or telephone follow-up calls were made to determine whether the business should be included or excluded. Information from the City of Saint Paul and Saint Paul Public Schools websites were also used to identify the location of parks, schools, and libraries. Blue Cross provided data with the location of each Nice Ride station.

Limitations

In this report, all residents who live within one-quarter mile of a bikeway were counted as having access to bike infrastructure.[5] However, this likely overestimates the number of residents who can readily access existing and planned bikeways for a few key reasons. First, areas within the one-quarter mile zone may include high-traffic roads, busy intersections, steep hills, and other physical barriers that reduce safety and comfort for people on bikes,

[4] 200% of the Federal Poverty Level (FPL) in 2015 is $48,500 a year for a family of four. (Centers for Medicare and Medicaid, 2015)

[5] This is the definition used by Partnership for Sustainable Communities, an interagency partnership between the U.S. Department of Housing and Urban Development (HUD), U.S. Department of Transportation, (DOT), and the U.S. Environmental Protection Agency (EPA).

ultimately reducing access. Second, because some off-street bike paths have a limited number of access points, residents who seem to live within one-quarter mile may need to travel a much greater distance to access the bikeway. Third, while the maps note different types of bikeways, the measure of access treats all types of bikeways equally rather than also considering how well the type of bikeway aligns with the preferences of residents. Fourth, this report does not assess connectivity between bikeways and public transit, which is an important aspect of an equitable transportation system. Finally, residents who have access to a bikeway that lacks connections to other bike lanes and key community resources do not have the same level of access as people living in areas with more connected bike systems.

A number of other factors that influence residents' ability to actually use the bicycle system are not included in the maps presented in this report because there are not existing data sources available, and it was beyond the scope of this project to collect this information. Social norms, attitudes, and perceptions of bicycling all influence how likely residents are to use bikeways, as do perceptions of safety and relations between residents and police officers. Non-bikeway infrastructure that support bicycling such as bike lockers, showers at places of employment, and bike shop locations were also not taken into consideration for this report. In addition, data quantifying bikeway qualities, such as the road surface itself and proximity to green spaces, are not readily available, but can impact the experience of people on bicycles.

The race and ethnicity categories used in the report are the standard categories used by the U.S. Census and American Community Survey. Because of data limitations estimating the number of residents within specific race and ethnicity categories at a block level, the maps in this report describe residents "of color," which includes all race and ethnicity groups except for white, non-Hispanic. The use of these categories reflects the level of data available for this analysis, but does not adequately describe the many cultural communities included within each race and ethnicity category. Different research methods involving direct input from community residents would be needed to understand bicycle accessibility among different cultural communities or among residents who live in a specific geographic area (e.g., near key intersections or in areas with limited bikeway options).

Although multiple data sources were reviewed to identify the location of key community resources, businesses and other entities that were not included on these lists were inadvertently excluded from our analysis. In addition, the community resource list includes businesses and entities in place in 2015; places that opened or changed location since that point are not included in the maps and analysis of accessibility.

Using this report

Ideally, this report provides interested organizations with data and visuals that can help identify geographic areas with limited bicycle access and help to understand demographic characteristics of residents who live in these neighborhoods. However, this report is only an initial step in understanding the concerns and priorities of community residents regarding bicycling. To make meaningful changes in Saint Paul neighborhoods, organizations and entities must have a more comprehensive understanding of specific barriers to bicycling and the overall experience of people on bicycles.

The following strategies are just a few ways in which organizations and agencies can use data provided in this report to explore specific local issues:

- Use discussion groups, surveys, and outreach activities with community residents to identify specific barriers to bicycling in key neighborhoods.
- Develop case studies, short summaries, or other brief communication tools that combine data, visuals (e.g., photographs or drawings), and quotes or stories from community residents to inform decision makers about barriers to bicycling in specific geographic areas.
- Conduct bicycling audits or other types of group rides to give residents and decision makers opportunities to experience barriers to bicycling, including breaks in connectivity, and discuss potential solutions together.
- Consider additional sources of data, such as street speed limits, public transportation routes, and sites of bicycle accidents, to better understand all transportation options in local neighborhoods and to improve safety.

Bikeway access with an equity lens

Using an equity lens to assess impact and accessibility

> *Health equity is realized when every person has the opportunity to realize their health potential – the highest level of health possible for that person – without limits imposed by structural inequities.*
>
> *–Minnesota Department of Health, Advancing Health Equity in Minnesota (2014)*

Health is influenced by the conditions where people live, work, and play. The conditions, called social determinants of health, refer to the social and economic factors that shape communities and impact health. They include community safety, access to resources and services, employment opportunities, social support, and racial discrimination. In Saint Paul and throughout Minnesota, social and economic conditions vary significantly by neighborhood, often as the result of long-standing policies and historical practices that divest resources away from some communities and contribute to growing advantage, wealth, and power in others. As a result, some neighborhoods are rich in community resources that support health while others pose barriers to healthy living.

These accumulated differences between neighborhoods contribute to health inequities, or unjust differences in health between groups of people. Health inequities are evident across many different types of health outcomes and at all ages. For example, the *Health Inequities in the Twin Cities* report demonstrated that in the 7-county Twin Cities region, average life expectancy is higher in more affluent neighborhoods, as measured by median household income and rates of poverty.[6] The same report showed that mortality rates are notably higher among American Indian and African American residents than for other cultural communities and that racial health inequities persist across all income levels.

While these pervasive health inequities will not be eliminated by the Saint Paul Bicycle Plan alone, it offers an important opportunity to establish a bicycle infrastructure that can be a health resource for all Saint Paul residents. Access to bikeways increases opportunities for people to participate in physical activity, and can be a primary mode of transportation, increasing access to a wide range of community resources. Using a health equity approach to implement the plan can lead to: all neighborhoods getting an adequate number of high quality facilities (geographic equity); all citizens having the same opportunity to access bikeways regardless of age, race, ethnicity, and gender (demographic equity); and all stakeholders treating biking as an equivalent form of transportation with personal vehicles,

[6] Wilder Research, 2012. *Health Inequities in the Twin Cities.* Retrieved from www.wilderresearch.org

public transportation, and walking (modal equity).[7] While these long-term goals focus on ensuring bike access for all, the short-term decisions focusing on which sections of the plan to prioritize must consider the varied needs and interests of residents in different Saint Paul neighborhoods.

Equity and the Saint Paul Bicycle Plan

The City of Saint Paul's Bicycle Plan outlines its approach to increase the existing bicycle system by 129 percent by 2019 and increase bicycling as a mode of transportation used by residents.[8] It was prepared by City of Saint Paul staff and influenced by community residents who participated in open house events, attended hearings, or provided written input. This plan has been adopted as an addendum to the city's current Comprehensive Plan in 2015 and will also help shape the next iteration of that planning document and other city, county, and regional transportation plans. While bicycle infrastructure needs have been identified in other planning processes and reports, this is the first plan to address bicycling in a comprehensive manner with a citywide focus. The full report and other supplemental materials can be found online: https://www.stpaul.gov/departments/public-works/bicycles/saint-paul-bicycle-plan.

The Saint Paul Bicycle Plan identifies the major and minor bikeways needed to establish a connected bicycle system that is accessible to all residents. This high-level plan sets the stage for future work to address specific bicycle infrastructure concerns, such as problem intersections where bicycling accidents occur, and to develop the final design for the proposed bikeways.

Throughout the plan, there is a strong emphasis on creating a system that improves access to bicycle infrastructure for all residents, regardless of whether they bicycle recreationally or as a form of transportation. It also considers the varied needs of bicyclists with different levels of experience and comfort. However, because the full plan will take a number of years to complete and require new financial support, implementation of the plan will require thoughtful consideration and difficult decisions.

The plan identifies the downtown bicycle network and northern half of the Grand Round[9], a plan to develop scenic parkways that connect neighborhoods with off-street bicycle and pedestrian facilities, as two critical components of the bicycle plan that should be prioritized. Other specific construction or enhancement projects are not listed; instead, the plan lists five principles that should be considered at equal weight when prioritizing implementation of bikeway segments: connectivity, cost effectiveness, equity, safety, and usage. The plan

7 City of Minneapolis. (2011). *Minneapolis Bicycle Master Plan. Retrieved from* http://www.ci.minneapolis.mn.us/www/groups/public/@publicworks/documents/webcontent/convert_275983.pdf

8 City of Saint Paul. (2015). *Saint Paul Bicycle Plan*

9 www.saintpaulgrandround.org

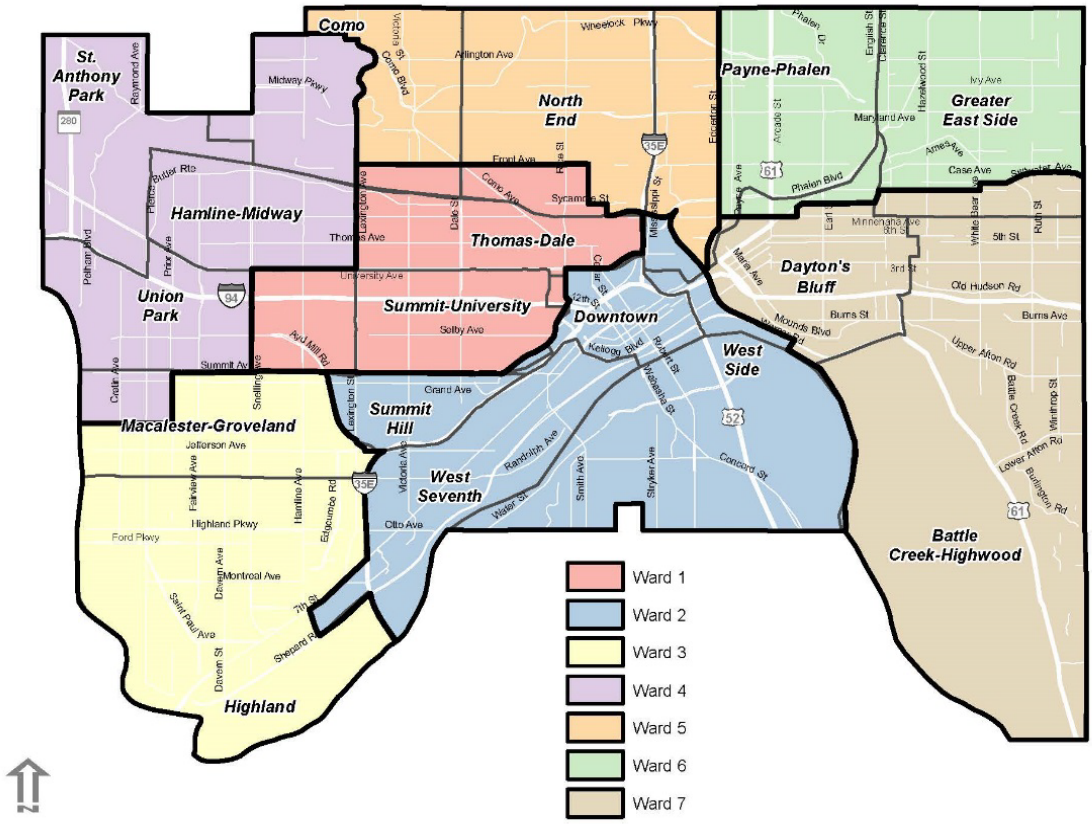
describes the equity principle as making "improvements in areas with a higher percentage of minority populations, low income residents, or households without access to an automobile." Defining equity in this manner can bring attention to the need for prioritizing bikeway improvements in areas that currently lack bicycle infrastructure. However, different decisions may be made about where to prioritize new bike infrastructure when equity is one of multiple considerations, rather than the main goal of all phases of planning and implementation. Bicycle advocates and community residents can play important roles in elevating equity as a key value as priorities are discussed and implementation decisions are made.

Key demographic characteristics of Saint Paul wards

The City of Saint Paul is made up of seven wards and 17 planning districts or neighborhoods (Figure 1). Because there is not perfect alignment between the ward and neighborhood boundaries, this report consistently refers to wards when describing geographic areas of the city.

Understanding the defining characteristics of each geographic area can help stakeholders use an equity lens when planning the implementation of the Saint Paul Bicycle Plan. An effective bicycle system must meet the need of community residents who have varied levels of comfort bicycling and who would use the bicycle system for different purposes. An effective implementation strategy should also be attentive to recognizing social, economic, and cultural factors that influence perceptions of bicycling and the degree to which it is a community priority. For example, in neighborhoods where many households do not have a vehicle, bicycling can be a key mode of transportation when bikeways connect to schools, stores, places of employment, and other community resources. However, experiences, perceptions, and social norms around using a bicycle as a primary mode of transportation can vary. For example, residents who did not learn how to ride a bicycle as a child may not feel comfortable learning to ride as an adult. In addition, community safety, which can include concerns about motor vehicles to the availability of secure bicycle storage spaces, can have a significant influence on how likely residents are to own and ride a bicycle. Understanding the demographic characteristics of residents in each ward can also help stakeholders identify communities who have not been engaged in discussions and decisions and make changes to better reflect all perspectives in their ongoing education and advocacy work.

1. Saint Paul ward and neighborhood boundaries



Ward 1	Thomas-Dale/Frogtown, Summit-University (also includes portions of: Como, North End, and Union Park)
Ward 2	Downtown, Summit Hill, West Seventh, West Side (also includes a portion of Dayton's Bluff)
Ward 3	Highland Park, Macalester-Groveland
Ward 4	Hamline-Midway, St. Anthony Park, Union Park (also includes portions of: Como, Macalester-Groveland)
Ward 5	North End (also includes portions of Como, Payne-Phalen)
Ward 6	Greater East Side, Payne-Phalen (also includes a portion of Dayton's Bluff)
Ward 7	Battle Creek-Highwood, Dayton/s Bluff (also includes a portion of Greater East Side)

There are notable differences in the demographic characteristics of residents who live in the seven Saint Paul wards. Overall, Wards 5, 6 and 7 (which include Battle Creek, Dayton's Bluff, Greater East Side, North End, and Payne-Phalen) are more racially diverse than the other Saint Paul wards. They tend to have higher levels of poverty and unemployment, as well as lower levels of education. Ward 3 (which includes the Highland Park and Macalester-Groveland neighborhoods) is more affluent and well-educated and less racially diverse than the other wards (Figure 2). Examples of other key differences between Saint Paul wards and neighborhoods are highlighted below:

- **Wards 1, 5, 6, and 7 are the most racially diverse ward.** In each of these wards, the majority of residents (59-62%) are persons of color. African-Americans make up 31 percent of the population in Ward 1, more than in any other ward, at least 20 percent of residents in all four wards are Asian.

- **In Wards 1, 5, 6, and 7, nearly one-quarter of residents were born outside of the United States.** New immigrant and refugee communities may have varied levels of experience and comfort bicycling, as well as cultural norms that may discourage bicycling. Different types of education and outreach may be needed to address community concerns and increase residents' comfort using bicycles as a form of transportation. Perceptions of safety and comfort navigating streets are other topics that may need to be discussed and addressed in order to reduce barriers to bicycling.

- **At least half of residents in Wards 5 and 6 live in low-income households.** A larger percentage of residents live at or below 200 percent of the Federal Poverty Level (FPL) in these wards compared to other areas of Saint Paul. The neighborhoods with the largest percentage of low-income residents are North End (64%), Payne-Phalen (57%), and Dayton's Bluff (57%).

- **In Wards 1, 2, 5, and 6, at least 15 percent of households do not have a vehicle.** These residents are more reliant on bicycling, public transportation, and other forms of transportation (e.g., car sharing) and can benefit most significantly from a well-planned and connected transportation system that is walkable, bikeable, and connected to public transportation routes. Residents who live in downtown Saint Paul are less likely to have a vehicle than in other neighborhoods: 33 percent of households do not have a vehicle. Among residents in households without vehicles, interest in bicycling might be much different than among residents who can afford other transportation options and choose bicycling, compared to residents who use bicycles out of necessity.

Ultimately, an equitable bicycle system is one that will provide all Saint Paul residents with access to safe bikeways. However, because implementation of the Saint Paul

Bicycle Plan will occur over multiple years, it is important to consider how the choices made to prioritize bicycle infrastructure in Saint Paul neighborhoods impact residents in each ward and either exacerbate or reduce inequities in bicycle access. For example, new bikeways may be particularly beneficial in neighborhoods where residents are most reliant on public transportation. However, these bikeways must connect neighborhoods to schools, stores, places of employment, and other community resources in order to be most beneficial to community residents.

2. Demographic characteristics, by ward

	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7
Total residents	41,667	40,871	41,527	40,890	40,065	40,768	41,082
% children (0-17)	28%	21%	19%	17%	29%	33%	29%
Race, ethnicity, nativity							
White, not Hispanic/Latino	38%	66%	78%	79%	42%	42%	42%
African American	31%	11%	9%	9%	17%	11%	19%
American Indian	**	**	**	**	1%	1%	1%
Asian	20%	6%	4%	5%	23%	28%	22%
Two or more races	4%	3%	3%	3%	3%	4%	5%
Hispanic/Latino	7%	14%	6%	4%	12%	13%	12%
Foreign-born	23%	12%	14%	9%	23%	23%	22%
Transportation							
No household vehicle	20%	17%	9%	11%	16%	15%	14%
Socioeconomic status							
Residents living at or below 200% FPL[a]	44%	37%	23%	32%	53%	50%	48%
Bachelor's degree or higher	33%	41%	61%	56%	27%	21%	24%
Working age adults employed	66%	73%	79%	76%	67%	69%	69%

Note: Asterisks (**) are shown when reliable population estimates could not be calculated for smaller population groups

[a]200% of the Federal Poverty Level (FPL) in 2015 is $48,500 a year for a family of four. (Centers for Medicare and Medicaid, 2015)

Summary of key findings

To understand whether the current bicycle infrastructure and the Saint Paul Bicycle Plan will result in equitable bicycle access for Saint Paul residents, a series of maps and analyses were completed (see the "Detailed Findings" section of the report). The following key findings describe who lives within one-quarter mile of a bikeway, highlighting potential racial and socioeconomic disparities in bikeway access:

- **There are currently disparities in access to bikeways across the seven Saint Paul wards.** Ward 7 (Battle Creek, Dayton's Bluff) had the lowest rates of bicycle access for all residents (43%), while Ward 4 (Hamline-Midway and nearby neighborhoods) had the highest rates of access (85%). There are also neighborhoods within wards that do not have bikeways available within one-quarter mile, including neighborhoods in the West Side (Ward 2), North End (Ward 5), Payne-Phalen (Ward 6), and Greater East Side (Ward 6). A number of wards also have short bikeways that are not well connected to a larger system.

- **Differences in access to bikeways by race are relatively small within each ward.** When access between white residents and residents of all other racial groups combined were compared, residents of color had higher rates of bikeway access in five wards, while whites had higher access in two wards. The largest difference in bikeway access by race was only six percentage points. However, because there are some highly segregated neighborhoods in Saint Paul, geographic areas without access to bikeways may disproportionately impact specific cultural communities at a more local level.

- **People of color and residents in lower-income households tend to live near bikeways that are not connected to longer, continuous bikeways, limiting accessibility.** Many of the longer, continuous bikeways in Saint Paul are located along the river and in state or regional parks. While connectivity is an issue throughout the city, Wards 5, 6, and 7 (which do not border the river) have fewer bikeways overall and fewer bikeway connections.

- **There are also disparities in the availability of resources that support health across the seven wards and how accessible these resources are to bicycles.** Bikeways should connect residents to key community resources, such as places that support physical activity (community recreation centers, parks, bike sharing (Nice Ride) stations), healthy eating (grocery stores), and learning (schools and libraries). The availability of these resources and their proximity within one-quarter mile of a

bikeway varied considerably by ward. However, resources and accessibility tended to be most limited in Wards 3, 5, 6 and 7.

- **While the Saint Paul Bicycle Plan proposes a network of bikeways that will significantly increase access and connectivity, implementation currently is limited to bikeways along roads where construction projects are scheduled.** Aligning implementation of some bicycle plan features with planned mill and overlay projects is a cost-effective way to increase bikeways in Saint Paul. Yet, this approach does little to implement the full plan, and the scheduled road reconstruction projects are not necessarily planned in places that would increase connectivity and bikeway access within wards. A long-term plan, with a focus on equitable implementation and strategies to address other barriers to bicycling, is needed.

- **Components of the Saint Paul Bicycle Plan can be implemented through existing planning processes, but none of these alone will comprehensively prioritize and direct the implementation of the proposed bicycle plan in its entirety.** The plan offers a set of important factors that should be considered when prioritizing implementation of the full plan. However, existing planning processes may focus on certain types of projects or areas of the city, potentially leading to different priority areas being identified than if the entire plan was reviewed by stakeholders in a comprehensive way. Further, without dedicated funding and clear implementation timelines, it is not clear how the proposed bicycle plan can be fully realized.

Considerations for equitable implementation

When construction of all bikeways included in the Saint Paul Bicycle Plan is complete, nearly all residents will be within one-quarter mile of a bikeway. However, there are currently notable differences in access to bikeways among residents who live in different wards. If equity in bicycle access is not considered, it is possible that projects increasing the number of miles of bikeways in the city may exacerbate current demographic and geographic inequities in access, rather than improving bikeway access in neighborhoods that may most benefit. In addition, because the expansion of the bicycle system is planned to be completed as many independent, standalone projects, connectivity and overall utility of bikeways may be delayed if these factors are not considered as projects are planned and implemented. Finally, there is a need to engage community residents throughout these planning processes to ensure that the bicycle plan is implemented using features that will address safety concerns and meet the needs of residents.

The following recommendations were developed to strengthen the implementation of the Saint Paul Bicycle Plan:

- **Develop a comprehensive implementation plan with community resident involvement that uses an equity lens when prioritizing construction and funding.** The Saint Paul Bicycle Plan lists "equity" as one of five principles that should be considered at equal weight when prioritizing implementation of bikeway segments. If equity is considered as a primary value, the order in which new bikeways are constructed becomes increasingly important to ensure that communities experiencing poorer health outcomes and other inequities are not further marginalized. A focus on equity and intentional inclusion of community residents in decision-making can also broaden the discussion from the placement of new bikeways to others barriers to bicycling that need to be addressed.

- **Prioritize bikeway implementation in a manner that maximizes connectivity to other parts of the bicycle system and to important community resources.** A well-connected bicycle system will provide residents with more opportunities to access community resources that promote health and to comfortably use bicycles as their preferred mode of transportation. Connectivity to the overall bicycle system and to community resources is currently varied across the wards; thoughtful planning and prioritization is needed to maximize the utilization of bikeways in all wards. In addition, the location of new businesses and community resources should take current and planned bicycle infrastructure into account.

- **Increase connections and collaboration between agencies involved in implementing portions of the Saint Paul Bicycle Plan and community residents.** Multiple city, county, regional, and state agencies have decision-making authority that can influence the implementation of the Saint Paul Bicycle Plan. Additional connections may be needed across these agencies to foster shared planning processes and complementary implementation plans, as well as a more collaborative approach for engaging community residents in decisions.

- **Develop a dedicated funding source to ensure all planned bikeways can be completed**. Having dedicated funding would allow for a more comprehensive implementation plan to be developed, rather than construction being done through disconnected, independent projects.

- **Engage diverse groups of community residents in ongoing efforts to identify and respond to bicycling barriers.** Classes and educational events can provide information and skill training to residents with limited experience bicycling. However, there are a range of issues beyond bicycling skill and experience that influence where and how often residents ride bicycles. Two recent local reports describe factors that influence residents' decisions about using bikeways, paying particularly attention to cultural

differences and the priorities of diverse communities.[10] Among the many issues highlighted in these reports are affordability as a significant barrier to bicycling and the need for additional work across multiple sectors to be more inclusive in efforts to inform and engage all people who ride bicycles. Ongoing work is needed to expand the diversity of perspectives and people involved in conversations related to all aspects of bicycling, including decisions about bikeway priorities and implementation.

- **Identify and address aspects of the physical environment that impact access to bikeways.** The maps presented in this report define access as residents living within one-quarter mile of a bikeway. However, bikeways within this distance can be largely inaccessible to residents when highways, high traffic roads, railroads, and busy intersections act as physical barriers and reduce safety for people on bicycles. Noise and air quality, particularly on bikeways along high-traffic roads, can also impact where residents feel comfortable bicycling. Accessible bikeways should have adequate access points, and thorough and visible signage located to aid people on bicycles and written in multiple languages, when applicable. Bikeway access is also maximized when there is proper lighting and good quality roads and paths that are free of major surface issues, such as potholes. There is not a source of data available to identify areas of Saint Paul where these access barriers are present that could be easily incorporated into the maps prepared in this report. Community organizations, advocacy groups, and residents play an important role in identifying these barriers and bringing them to the attention of city planners and key decision-makers.

- **Closely consider the types of bikeways that could be added and how they will suit the community**. There are a variety of bikeway options that could be constructed, including on-street (bicycle boulevards, protected bicycle lanes, and shared lanes) and off-street routes. The community's intended use, rider experience, and priorities should be understood and reflected in final plans before construction begins.

- **Consider strategies to minimize challenges related to other social and environmental issues that influence bikeway use.** Community safety (e.g., neighborhood conditions, attitudes of drivers), comfort with bicycle maintenance, and personal lifestyle (e.g., caring for children, physical limitations, commuting long distances) are just a few of

[10] K'MA. (2015). *Healthy Connections Active Transportation: From our own perspectives and voices*. Retrieved from: http://media.wix.com/ugd/783cdd_f7190a0f0bc44cd18e8b3f93024ef34d.pdf.

Cycles for Change. (2015). *Diverse bicyclists, diverse needs: Cycles for Change community conversations.* Retrieved from: http://cyclesforchange.org/wp-content/uploads/2015/11/CommunityConversationsReport_withlinks.pdf

many factors that can influence residents' decisions about bicycling.[11] Some of these concerns can be addressed in classes or informal educational opportunities, while others are systemic issues that can only be solved through much larger, collaborative efforts. Construction of new bikeways is a critical step to support residents who want to use bicycles as a form of transportation, but it is only one of multiple changes needed to establish an equitable transportation system in Saint Paul.

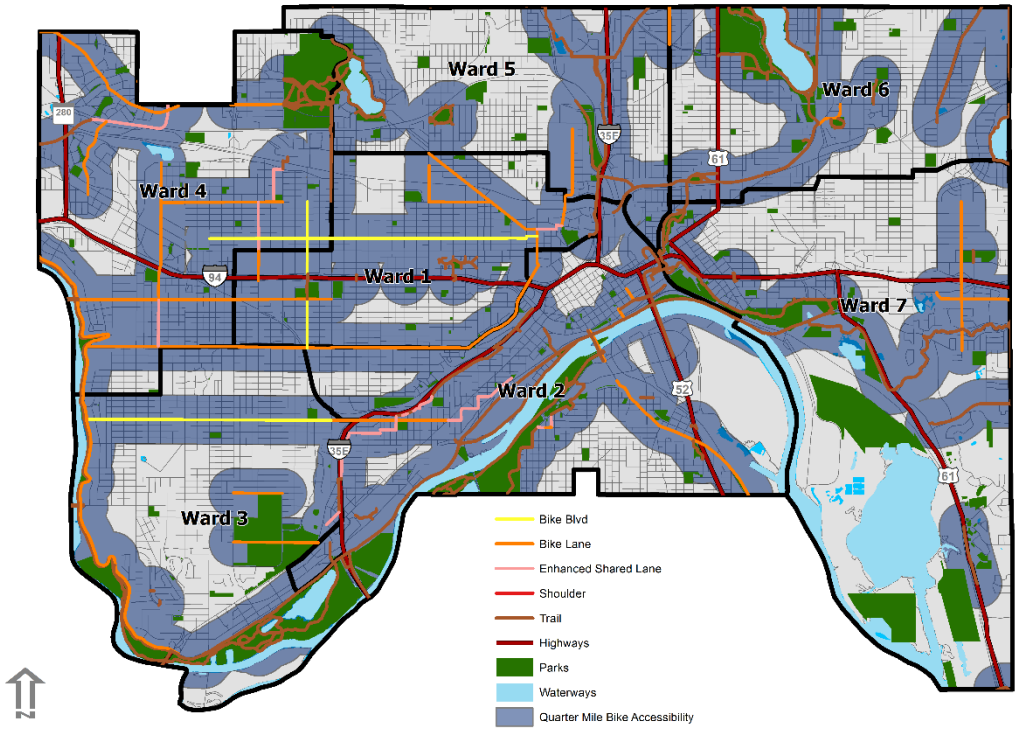
[11] Pooley, C. G. (2011). *Understanding walking and cycling: Summary of key findings and recommendations*. Retrieved from http://www.its.leeds.ac.uk/fileadmin/user_upload/UWCReportSept2011.pdf

Appendix: Detailed findings and Saint Paul maps

Access to existing Saint Paul bikeways

According to the Saint Paul Bicycle Plan, nearly half (48%) of the 153 miles of bikeways currently available in Saint Paul are off-street paths. Fewer are bicycle lanes (23%), bikeable shoulders (12%), bicycle boulevards (5%), or enhanced shared lanes (12%).[12] In this report, residents who live within one-quarter mile of any bicycle lanes, bicycle boulevards, or enhanced shared lanes were considered to have access to at least some portion of the city's bicycle infrastructure (Figure 3). Areas with access to bikeable shoulders were excluded, as quality varies and they do not offer the same level of separation from traffic as other bikeways. While all seven Saint Paul wards have some areas of limited access, the largest gaps are in Wards 5, 6, and 7.

3. Access to existing bicycle infrastructure



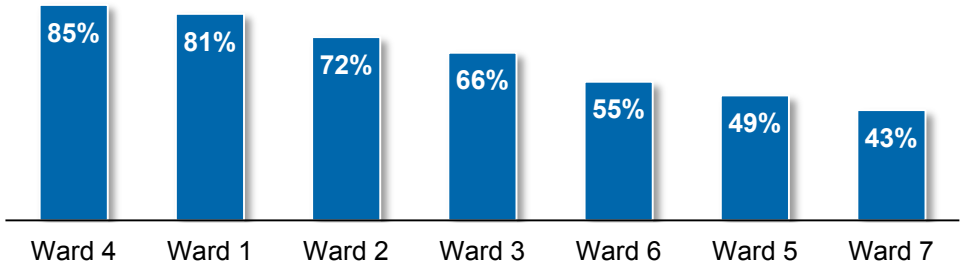
Source: City of Saint Paul Public Works Department 2010 US Decennial Census (block level)

[12] **Off-street paths** are trails separated by car traffic, often by a curb or green area that can be bike-only or shared by pedestrians. **Bikeable shoulders** are streets with paved shoulders 4 or more feet wide. **Bicycle boulevards** are roads designated by pavement markings or signs that prioritize bikes or motor vehicles on low-traffic streets, often including traffic calming measures to reduce speeds. **Enhanced shared lanes** have pavement markings or signs that show motor vehicles and cars and both use the street; however, traffic volume and speeds tend to be greater than on bike boulevards. (Adopted from Saint Paul Smart Trips' Saint Paul Bikeways Glossary www.smart-trips.org)

Nearly twice as many Ward 1 and 4 residents live within one-quarter mile of some type of bicycle infrastructure, compared to residents in Ward 7. Over 80 percent of Saint Paul residents in Wards 1 and 4 currently have bicycle system access, compared to 43 percent of residents in Ward 7 (Figure 4).

In Wards 5, 6, and 7, bikeway access is largely concentrated around recreational areas and lacks connections to other key community resources that support health. Much of the bicycle infrastructure in Wards 5, 6, and 7 is located around lakes and rivers, with few bikeways that cross residential and commercial areas. This limits the potential use of bikeways in the ward. Residents in these wards also tend to live near fragmented bikeways, limiting the degree to which existing bikeways can be a preferred mode of transportation among residents.

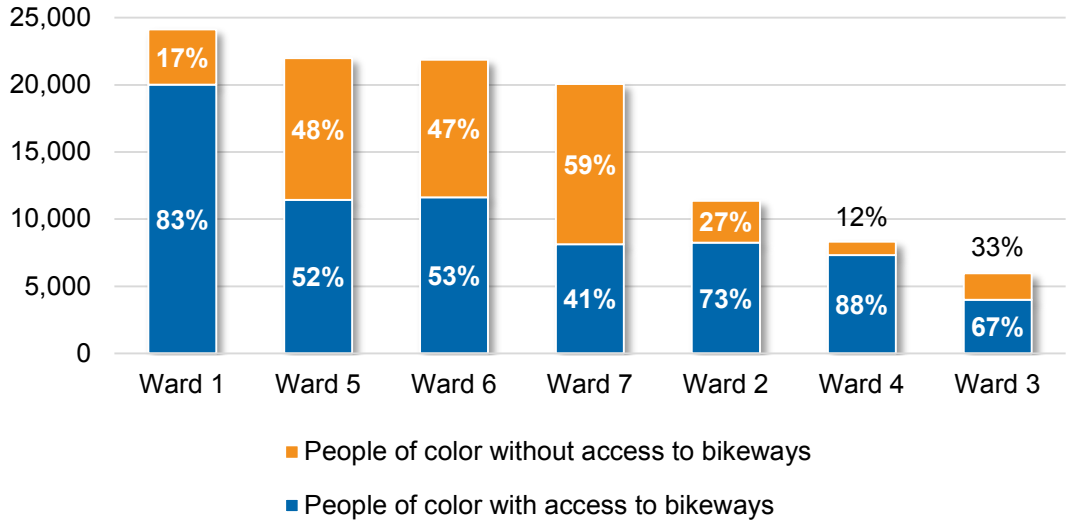
4. Percentage of ward residents who live within one-quarter mile of existing bicycle infrastructure



Access to bikeways by race/ethnicity

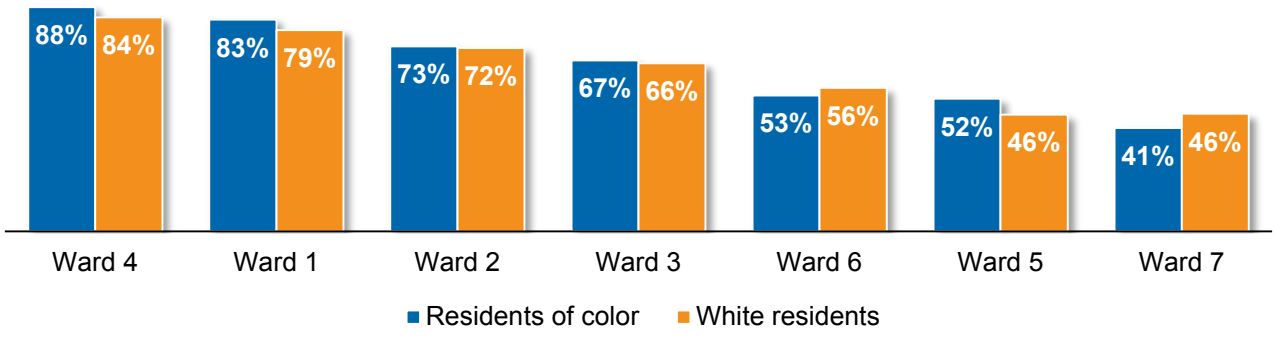
Bikeway access for people of color varies considerably by ward of residence. The total population of each ward is approximately 41,000 residents; however, Wards 1, 5, 6, and 7 are more culturally diverse than other areas of Saint Paul. In Wards 5, 6, and 7, residents of color had less access to existing bicycle infrastructure (41-53%, compared to 70-83% in other wards) (Figure 5).

5. Number and percentage of residents of color with access to existing bicycle infrastructure, by ward

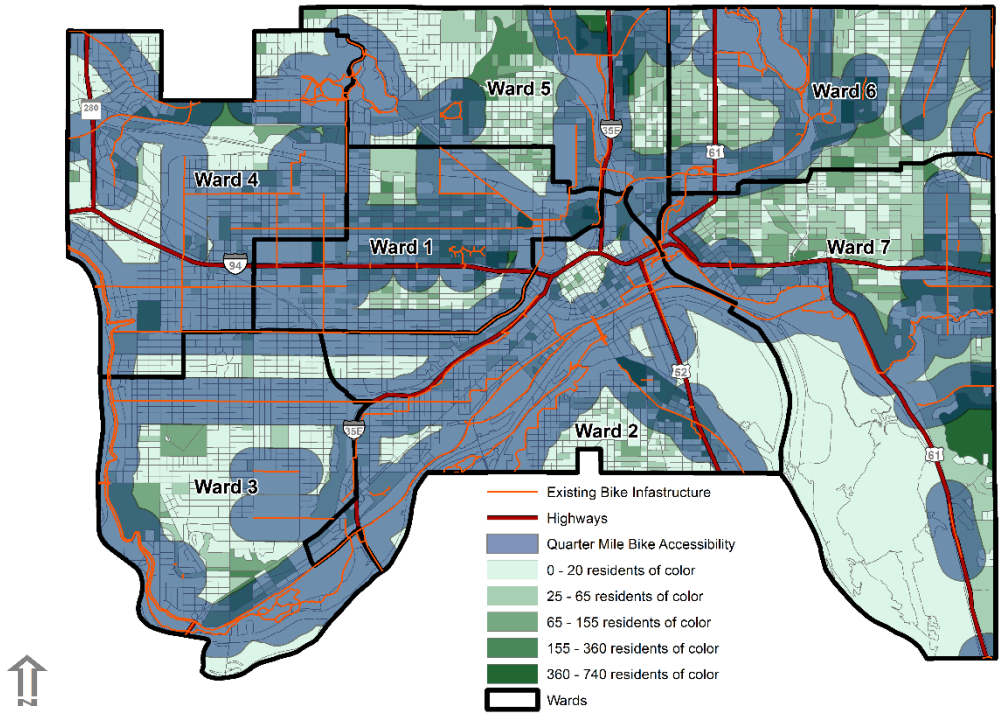


There are relatively small differences in bicycle access by race within wards. Across all wards, there is no more than a six percentage point difference in bicycle access between white residents and residents of color (Figure 6). While this suggests that differences in bicycle access by race may be small, it is important to note that specific cultural communities, particularly communities that tend to live in specific neighborhoods, may have less access to existing bicycle infrastructure. Community members and advocacy organizations that serve specific neighborhoods can use the maps available to strategically identify communities that may be disproportionately impacted by the lack of bicycle infrastructure (Figure 7).

6. Comparison of access to bikeways between white residents and residents of color, by ward



7. Access to existing bicycle infrastructure among residents of color, by census tract and ward



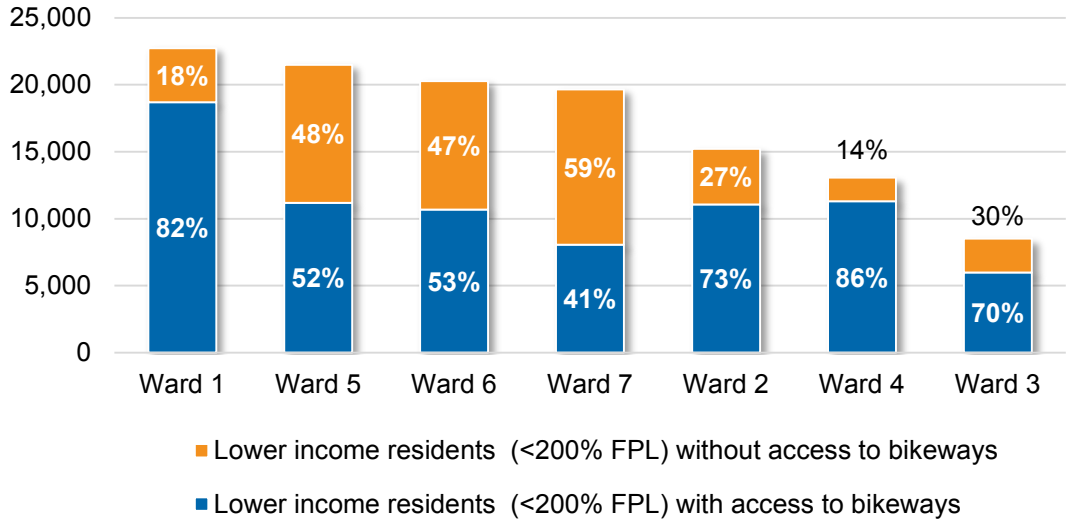
Source: City of Saint Paul Public Works Department, 2010 US Decennial Census (Block level)

Access to existing bikeways among lower-income residents

In this report, lower-income residents are defined as persons who live in households with annual income of 200 percent or less of the Federal Poverty Level (200% FPL), $48,500 for a family of four in 2015. This definition includes many working poor families who may rely on bicycles and public transit as primary sources of transportation. In Saint Paul, there are many similarities in the maps exploring socioeconomic and racial inequities in bikeway access. This illustrates the racial socioeconomic inequities in the region and across the state. Data available through Minnesota Compass (www.mncompass.org) show that in the Twin Cities region, 6 percent of white residents live in poverty, a much lower poverty rate than among residents who are black (30%), American Indian (28%), Hispanic (25%), Asian (19%), or multi-racial (20%).

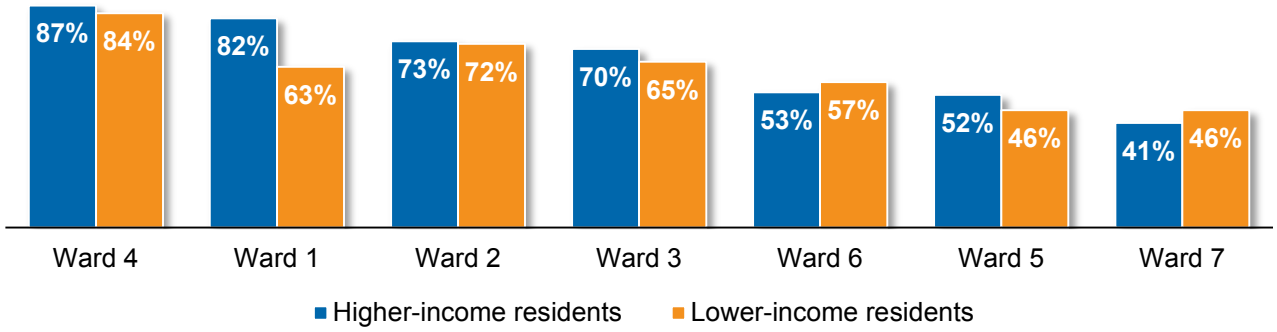
Bikeway access for lower-income people varies considerably by ward. In each of Wards 1, 5, 6, and 7, approximately 20,000-23,000 residents live in lower-income households. In three of these areas (Wards 5, 6, and 7), approximately half (41-53%) of lower-income residents have access to existing bikeways (Figure 8). Bikeway access was much higher for lower-income residents living in the other wards (70-86%).

8. Number and percentage of lower-income residents with access to existing bicycle infrastructure, by ward



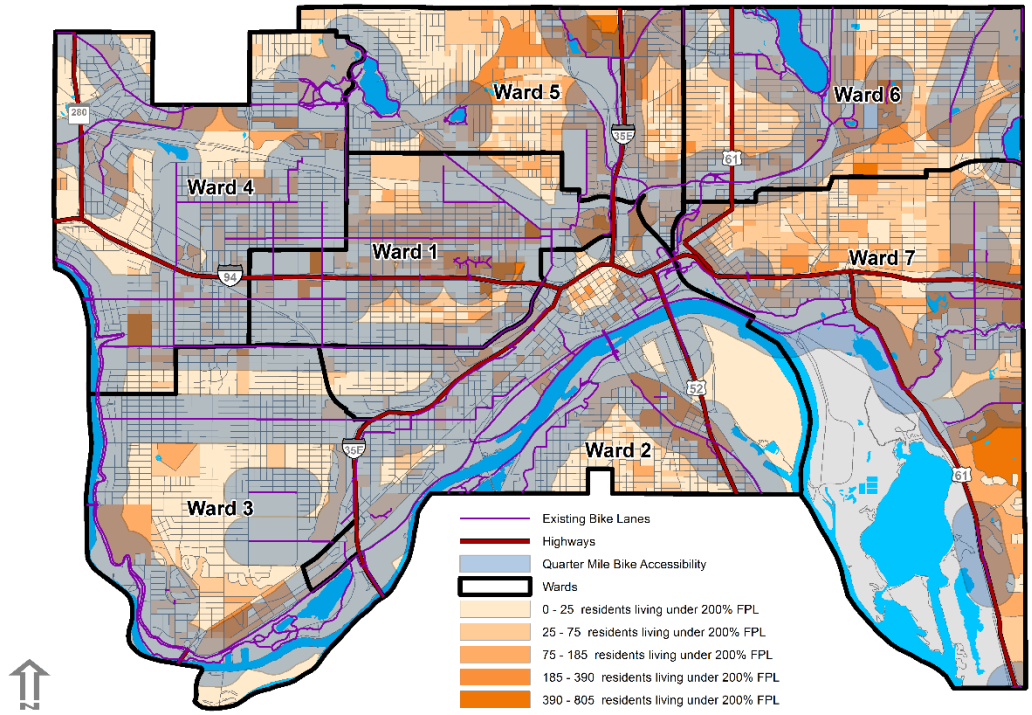
Within most wards, differences in bikeway access by socioeconomic status were small (5% or less). However, higher-income residents in Ward 1 (i.e., residents with household incomes at or above 200% FPL) are much more likely to live within one-quarter mile of existing bikeways than lower-income residents (63% and 82%, respectively; Figure 9).

9. Comparison of bicycle access between higher- and lower-income residents, by ward



Wards with large populations of lower-income people and low rates of bikeway access (Wards 5, 6, and 7) often have bikeways concentrated around recreational areas without connections to other community resources. In Wards 5, 6, and 7, large portions of bikeways are located around lakes and rivers (Figure 10). This makes for good recreational bicycle riding, but it may limit the use of bikeways for commuting purposes, as there are not as many bikeways that transverse wards or connect bikeway systems. While a number of lower-income neighborhoods are located within one-quarter mile of existing bicycle infrastructure, there are neighborhoods, particularly in Wards 5 and 6, where lower-income residents do not have bikeway access.

10. Access to existing bicycle infrastructure among lower-income residents, by census tract



Source: City of Saint Paul Public Works Department, ACS 2009-2013 5-Yr Estimates (Table: C17002, Ratio of Income to Poverty level in the past 12 months. Table: B02001, Race), 2010 US Decennial Census

Note: Due to high margins of error in the Census Tracts of ACS 2009-2013 5-Yr estimates, only the percentage of residents living at 200% of the FPL or lower and the percentage of residents of color were applied to the 2010 US Decennial Census Blocks.

Execution of planned bicycle system construction

When all construction of new bikeways is complete, nearly all Saint Paul residents will have bicycle system access, a notable increase from the 65 percent of residents who currently have access. Saint Paul plans to increase the total miles of the bicycle system from 153 miles to 350 miles by adding both on-street and off-street bicycle infrastructure. When the plan is fully implemented, much of the bicycle infrastructure will consist of off-street paths and in-street separated lanes, two types of bikeways that separate bicycles from vehicle traffic (Figure 11). The 18 miles of bikeable shoulders that are part of the existing bicycle system will be modified into one of the other bikeway types that are more protected and clearly marked.

11. Summary of existing and planned bicycle infrastructure, by type

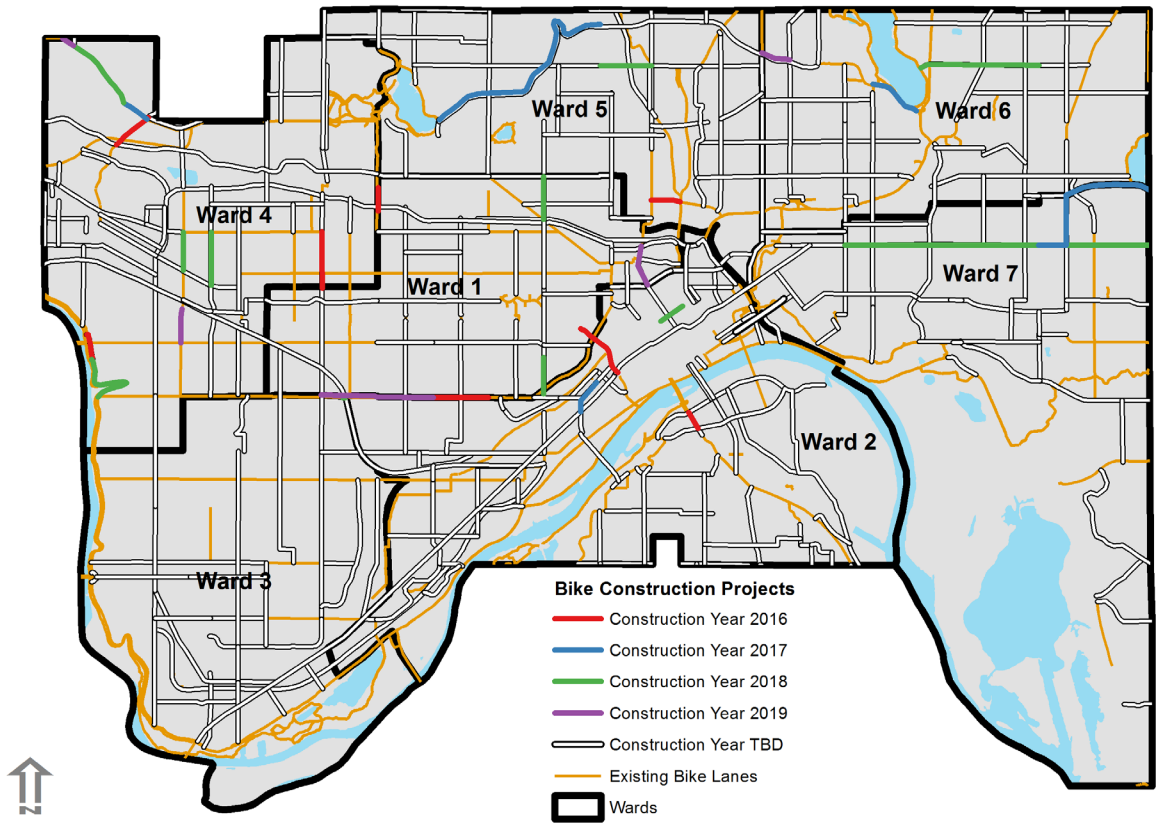
	Existing (miles)	Planned (miles)	Total, fully implemented plan (miles)
Off-street facilities			
Off-street path	74	57	131
On-street facilities			
Bikeable shoulders	18	0	0
In-street separated lanes	35	61	115
Bicycle boulevards	7	40	47
Enhanced shared lanes	18	39	58
Total	**153**	**197**	**350**

Note: Mileage refers to miles of roadways, not miles of lanes. There is no distinction between roadways with bicycle lanes on one or both sides. Existing bikeable shoulders will be converted into other types of on-street facilities under the proposed plan.

Source: Adapted from the Saint Paul Bicycle Plan (2015)

While the proposed bicycle plan will significantly increase access to bikeways when fully implemented, there is no clear plan or timeline for implementing most bicycle infrastructure components. Select bikeway additions are scheduled to be completed during planned construction projects through 2019 (Figure 12). However, most of the planned bikeways have completion dates that are yet to be determined. This leaves considerable uncertainty as to which neighborhoods will have access to an integrated network of bikeways and opens the potential for bicycle plan implementation to widen disparities in bicycle access if implementation is not considered using an equity lens.

12. Existing and planned construction of proposed bicycle infrastructure, by year

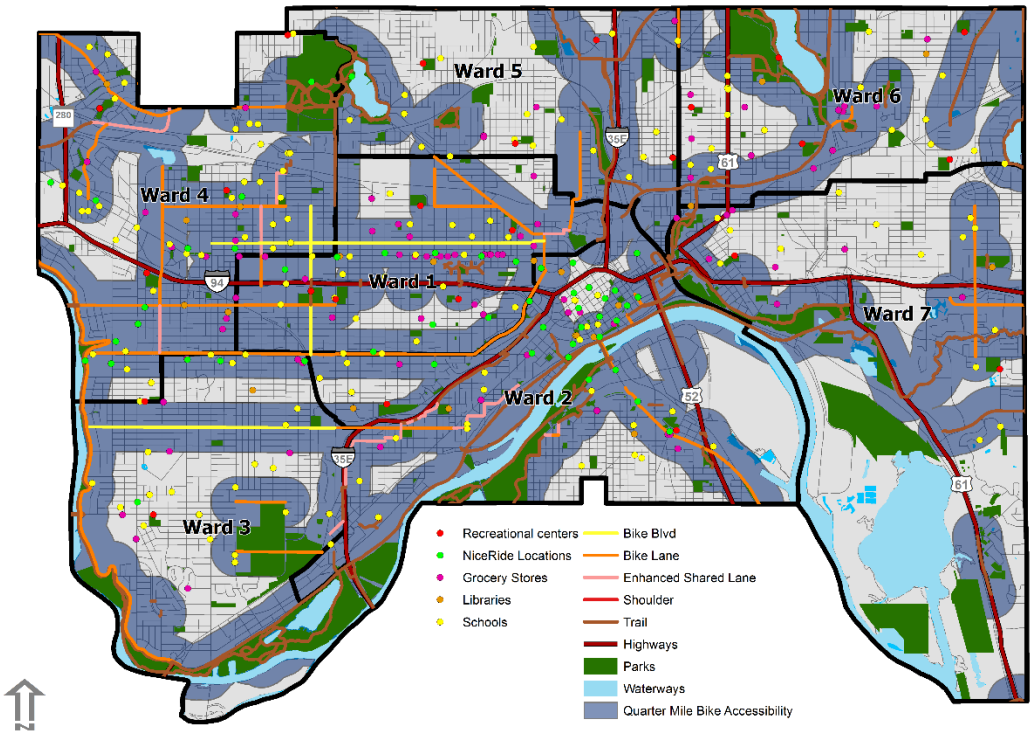


Access to community resources

As the bicycle plan is implemented, it is important to not only consider resident access to bikeways, but also how well the bikeway infrastructure helps residents connect to key community resources. This allows residents to more easily choose bicycling as a preferred mode of transportation for recreation, commuting, shopping, and other types of activities.

- **Currently, there are disparities in the availability of resources that support health across the seven wards and how accessible these are to bicycles (Figure 13).** Of the 24 community recreation centers located in Saint Paul, only 14 are located within one-quarter mile of existing bicycle infrastructure. Although all centers will be accessible by bicycle as the plan is implemented, two of the wards (Wards 3 and 7) do not currently have any bicycle accessible community recreation centers (Figure 14). The 49 Nice Ride stations, offering bicycles that residents can rent hourly, are located primarily in Wards 2 and 4. There are no stations in Wards 6 and 7, and only one station in Ward 5. Access to parks also varies by ward; less than three-quarters of parks are accessible by bicycle in Wards 3, 5, 6, and 7.

13. Existing Saint Paul bicycle access to community resources that support health



Source: City of Saint Paul Public Works Department 2010 US Decennial Census (block level)

14. Bicycle access to community physical activity resources

	Nice Ride locations		Community recreation centers		Parks	
	Number	Number within ¼ of bikeway	Number	Number within ¼ of bikeway	Number (total acres)	Number within ¼ of bikeway
Saint Paul – Proposed Bicycle Plan	49	49 (100%)	24	24 (100%)	174 (3099)	173 (99%)
Existing bikeways						
Saint Paul	49	41 (84%)	24	14 (58%)	174 (3099)	138 (79%)
Ward 1	9	8 (89%)	5	5 (100%)	23 (93)	20 (87%)
Ward 2	24	19 (79%)	2	2 (100%)	45 (283)	42 (93%)
Ward 3	4	3 (75%)	2	0 (0%)	17 (811)	12 (71%)
Ward 4	11	10 (91%)	4	3 (75%)	33 (513)	28 (85%)
Ward 5	1	1 (100%)	4	1 (25%)	16 (164)	11 (69%)
Ward 6	0	N/A	5	3 (60%)	20 (378)	12 (60%)
Ward 7	0	N/A	2	0 (0%)	20 (857)	13 (65%)

There is variation in the number of grocery stores in each ward and their bicycle accessibility. A total of 89 grocery stores are located in Saint Paul, with the largest number located in Ward 1 (n=28) and the fewest in Ward 5 (n=5) and Ward 7 (n=7). While all 16 grocery stores in Ward 4 are within one-quarter mile of a bikeway, only 2 of the 5 grocery stores in Ward 5 are bicycle accessible (Figure 15). It is important to note that residents may be able to access groceries from retailers, such as farmers markets, that were not included in this list of resources.

15. Bicycle access to grocery stores

	Grocery stores	
	Number	Number within ¼ of bikeway
Saint Paul – Proposed Bicycle Plan	89	89 (100%)
Existing bikeways		
Saint Paul	89	65 (73%)
Ward 1	28	23 (82%)
Ward 2	13	10 (77%)
Ward 3	10	5 (50%)
Ward 4	12	12 (100%)
Ward 5	5	2 (40%)
Ward 6	14	9 (64%)
Ward 7	7	4 (57%)

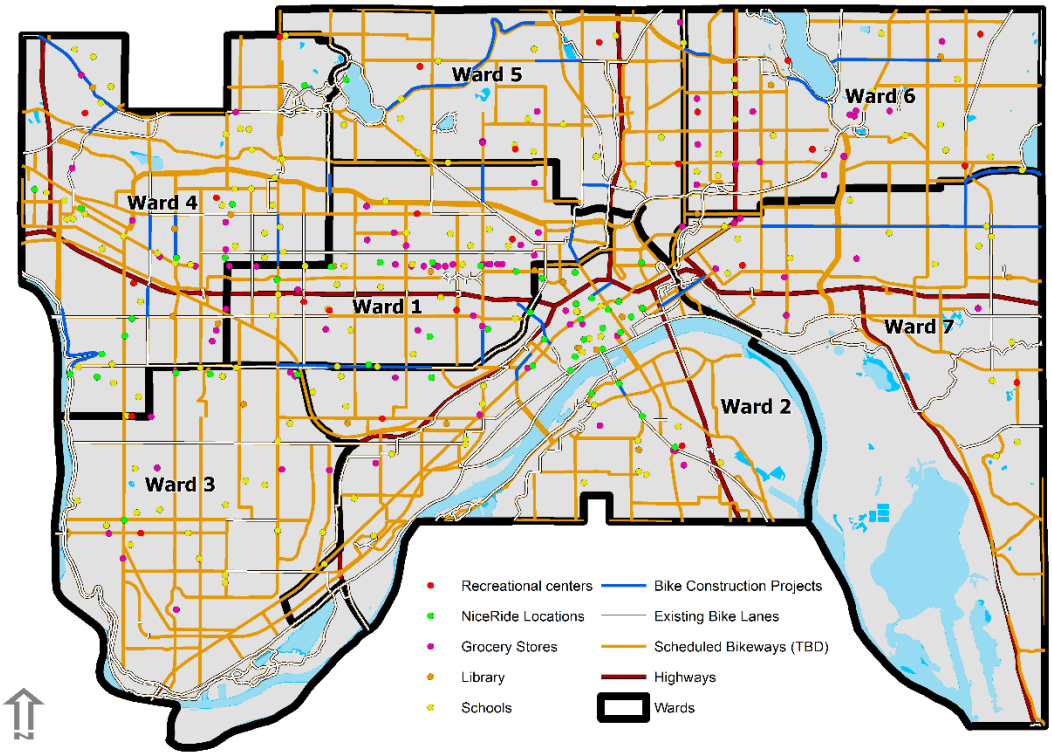
Overall, 71 percent of the 176 schools located in Saint Paul are located within one-quarter mile of a bikeway. Again, the number of schools and overall bicycle accessibility varies by ward, with Wards 3, 5, and 6 having the fewest number of schools and relatively low bicycle access (33-67%). When the Saint Paul Bicycle Plan is fully implemented, all schools and libraries will be accessible by bicycle (Figure 16).

16. Bicycle access to schools, libraries

	Schools		Public libraries	
	Number	Number within ¼ of bikeway	Number	Number within ¼ of bikeway
Saint Paul – Proposed Bicycle Plan	176	176 (100%)	28	28 (100%)
Existing bikeways				
Saint Paul	176	124 (71%)	28	24 (86%)
Ward 1	26	24 (92%)	3	3 (100%)
Ward 2	31	22 (71%)	10	10 (100%)
Ward 3	23	13 (57%)	3	1 (33%)
Ward 4	43	36 (84%)	8	7 (88%)
Ward 5	19	10 (53%)	0	N/A
Ward 6	19	10 (53%)	3	2 (67%)
Ward 7	15	9 (60%)	1	1 (100%)

When the bicycle plan is fully implemented, access to key community resources will increase considerably. In all wards, schools, grocery stores, community recreation centers, and other resources that support health will be much more accessible by bicycle (Figure 17).

17. Access to community resources after implementation of the Saint Paul Bicycle Plan



Some Wards have few community resources that support health. For example, Ward 5 has five grocery stores compared to 28 in Ward 1 (Figure 18). In some wards, there is a need to not only improve bicycle access to community resources that are available to residents, but also to consider ways to bring more resources that support health into neighborhoods with limited resources.

18. Summary table – Number of community resources and percentage of these community resources within one-quarter mile of a bikeway, by ward

	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7
Parks	23 (87%)	45 (93%)	17 (71%)	33 (85%)	16 (69%)	20 (60%)	20 (65%)
Nice Ride locations	9 (89%)	24 (79%)	4 (75%)	11 (91%)	1 (100%)	0 (N/A)	0 (N/A)
Community recreation centers	5 (100%)	2 (100%)	2 (0%)	4 (75%)	4 (25%)	5 (60%)	2 (0%)
Schools	26 (92%)	31 (71%)	23 (57%)	43 (84%)	19 (53%)	19 (53%)	15 (60%)
Libraries	3 (100%)	10 (100%)	3 (33%)	8 (88%)	0 (N/A)	3 (67%)	1 (100%)
Grocery stores	28 (82%)	13 (77%)	10 (50%)	12 (100%)	5 (40%)	14 (64%)	7 (57%)

Note: The table shows the number of resources available and percentage of these resources accessible by bicycle. A color gradient is used to show differences in bicycle accessibility to existing community resources. Areas shaded in green have the highest percentage of community resources accessible by bicycle, while areas in red have the fewest bicycle accessible resources.

Appendix: Data sources and definitions

Data sources

Demographic data used to describe ward residents and create the maps came from 2010 U.S. Decennial Census (block level), 2009-2013 American Community Survey, and 2013 2nd Quarter Longitudinal Employer-Household Dynamics. Bicycle infrastructure data used to map current and planned bikeways was provided to Wilder Research by the City of Saint Paul. Community resources that support health were compiled using vendor lists of the following resources: grocery stores (convenience stores, gas stations, and specialty food stores were excluded), public libraries, and schools (including primary and secondary schools, community/technical colleges, and colleges/universities). Community recreation centers included those listed on the City of Saint Paul website (www.stpaul.gov).

Definitions

In this report, the following types of bikeways are identified:

Off-street paths are trails separated by car traffic, often by a curb or green area that can be bicycle-only or shared by pedestrians.

Bikeable shoulders are streets with paved shoulders four or more feet wide.

Bicycle boulevards are roads designated by pavement markings or signs that prioritize bicycles over motor vehicles on low-traffic streets, often including traffic calming measures to reduce speeds.

Enhanced shared lanes have pavement markings or signs that show motor vehicles and bicycles both use the street; however, traffic volume and speeds tend to be greater than on bicycle boulevards.

In-street separated lane is a term used to more broadly refer to portions of roadway that are designed to be used exclusively by bicycles. Examples of these bikeways includes designated bicycle lanes, buffered bicycle lanes, bicycle shoulders, and protected bicycle lanes.

Source: Adapted from Saint Paul Smart Trips' Saint Paul Bikeways Glossary (www.smart-trips.org)