City of Austin

Sidewalks, Crossings and Shared Streets Plan

November 30, 2023

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January 2023

ATX Walk Bike Roll Process Summary

ATX Walk Bike Roll use the Equity Office's definition of equity:

"the condition when race no longer predicts a person's quality of life outcomes in our community."

Racial equity was the primary consideration through which ATX Walk Bike Roll considered the distribution of benefits gained and burdens placed on communities from access or lack of access to pedestrian crossings, sidewalks, bikeways, and urban trails. Other considerations like socioeconomic status, age, disability status were also key factors.

ATXWBR Overview

ATX Walk Bike Roll was a coordinated effort by the City of Austin's Public Works Department and the Transportation Department to update Austin's Sidewalks, Crossings, and Shared Streets Plan; Urban Trails Plan; and Bicycle Plan. These plans guide how the City builds urban trails, sidewalks, shared streets, pedestrian crossings, and bikeways and identifies where they are needed most. For more information about ATX Walk Bike Roll, visit: AustinTexas.gov/ATXWBR.

Guiding Documents

The ATX Walk Bike Roll process—from community engagement to writing the three plans—centered equity and inclusion to create a more just transportation decision-making process and build lasting partnerships across Austin. The process and this commitment to inclusion were guided by three documents:

1. Equity Scan

The Equity Scan included a review of 20 recent planning initiatives in Austin and engaged 17 stakeholders from 12 organizations dedicated to equity, anti-displacement, public health, accessibility, and education. The goal was to understand, through the lens of community voices, how the City of Austin has incorporated equity into its plans, initiatives, processes, and outcomes, and where there are lessons to be learned. Conversations with local leaders highlighted priorities that ATX Walk Bike Roll should center, which were incorporated into the Public Outreach Plan and planning process. View Appendix A.1 for the Equity Scan.

2. Equity Framework

The Equity Framework is a tool for accountability to guide decision-making during the ATX Walk Bike Roll process and afterwards during plan implementation. The development of the Equity

This document refers to Appendices A.1 through A.6. Those can be viewed here.

Framework builds off past and ongoing work from the City's Equity Office and was informed by stakeholder guidance from the Equity Scan and the Public Outreach Plan. The Equity Framework also identifies approaches to defining and considering geographic areas with infrastructure disinvestment, lower access to opportunity, and/or concentrations of underserved populations. ATX Walk Bike Roll used the Equity Analysis Zones developed in 2021 by the Austin Transportation Department and an Advisory Team of community members. Equity Analysis Zones are areas in Austin that have higher concentrations of historically marginalized populations and more barriers to achieving equitable outcomes.

These Equity Analysis Zones were developed using weighting data from the United States Census that reflect an area's social and economic vulnerability. The Equity Analysis Zones are classified into five categories from Least Vulnerable to Most Vulnerable. Throughout the planning process, input by residents within the Equity Analysis Zones was used to identify disparities in the existing and planned pedestrian networks, safe crossings, bike networks, and urban trails. Additionally, comparisons were made between Most Vulnerable/ Medium-High Vulnerable Equity Analysis Zones and the rest of the city to identify where resources should be prioritized. View Appendix A.2 for the Equity Framework.

3. Public Outreach Plan

The Public Outreach Plan included steps for engaging the community as a whole and established a tailored strategy to engage focus populations (defined as Black, Hispanic/Latinx, and other People of Color, and those earning less than 80% of the median household income) about the challenges and opportunities facing historically underrepresented groups. View Appendix A.3 for the Public Outreach Plan.

Messaging, Tools, & Tactics

We held two Virtual Open Houses:

The first Virtual Open House was held on Zoom on August 11, 2021, introducing the project and goals. The video presentation was posted online which was attended and later viewed by at least 729 people. The second Virtual Open House was hosted on an interactive webpage and open between September 7 and October 23, 2022 and focused on the project's three scenarios for how the City of Austin can continue building urban trails and bikeways. An estimated 11,900 people visited this virtual open house. Both meetings were posted online for ongoing viewing.

We sought input through three surveys:

- **June 14 – September 26, 2021:** 4,411 people gave their input, on a survey and/or poll asking what residents value about the city's pedestrian and bicycle pathways, and their main concerns and desires for the City's pedestrian and bicycle networks.
- **January 18 - March 7, 2022:** A Mapping Survey was launched online and on paper, including both English and Spanish options. 9,778 people viewed the mapping site and 4,542 people provided survey responses. 2,807 placed markers on the map to indicate challenges, gaps, and opportunities related to walking and biking in Austin.
- **September 7 - October 23, 2022:** 2,108 people provided survey responses to either online or paper surveys which proposed three scenarios for how the City of Austin can continue building the pedestrian network, urban trails, and bikeways, asked about policy ideas and how to prioritize pedestrian crossings.

The Community Ambassadors engaged focus populations:

In August and September 2021, Community Ambassadors reached 316 people and shared 600 social media surveys. They completed 125 event reports, which documented community events or conversations where they spoke to people about walking and biking in Austin. Ambassadors used a wide range of engagement activities, including: one-on-one conversations, small group discussions, tabling at local events or along busy corridors and urban trails, emails, social media, video chats, distributing flyers to local Housing Authority of City of Austin (HACA) developments and schools, and hosting other candid conversations with focus populations (defined as Black, Hispanic/Latinx, and other People of Color, and those earning less than 80% of the median household income).We employed print, broadcast, news media, emails, and social media to spread information and increase awareness about the project:

Marketing tools included emails, flyers, social media ads, social media posts, newsprint ads, media advisories, email campaigns, interviews with journalists, video production, website updates, and the utilization of partner organization's communication channels.

We attended community events and gave presentations to community groups and Boards and Commissions:

In Phase 1, 130 tabling events and awareness activities, including two in-person events at the Mexican American Consulate and at the Boys and Girls Club of the Austin Area. We also made presentations about the project as part of six community group meetings. In Phase 3, we attended 12 tabling events, and presented at four boards and commissions and at three community groups.

We hosted Focus Groups:

Six focus group discussions were held during Phase 1 with the objectives to present the project; understand stakeholders' interests, needs, and concerns; and facilitate deep-dive discussions about the project. 27 people participated in the Focus Group discussions, with group sizes ranging from 1 to 10 people.

What We Did

13 Presentations
4 to City of Austin Boards & Commissions
9 to community groups

12,637 participants in two Virtual Open Houses

2,709,000 digital media impressions generated through promoted and organic social media posts

27 focus group participants

10,650 survey respondents in three separate surveys

Emails & calls to over **800** individuals and key organizations

142 scheduled community tabling events & awareness activities in focus population communities, which engaged **6,192** participants

Throughout the planning process the public was engaged using a wide range of methods to help shape the direction of the plan, as detailed above.


Capitol


METRO
300
METRO

How Public Input was Used to Develop the Plans

Strategies and Action Items

Community input highlighted the need to center equity, affordability, comfort, and connectivity in the plans. Specific concerns that came up repeatedly (especially amongst focus populations- defined as Black, Hispanic/Latinx, and other People of Color, and those earning less than 80% of the median household income) were expanded into plan goals, strategies, and action items.

Network Development

People were asked to identify where they'd like to see improvements to Austin's walking and biking routes. The data people provided guided changes to the Proposed Urban Trails Network and Proposed All Ages and Abilities Bike Network. Data on challenging crossings was used to help prioritize pedestrian crossing projects.

Scenarios

Three urban trails and bikeways scenarios (which were oriented around different ways of prioritizing network expansion) and three sidewalks and shared streets scenarios (which explored building different proportions of sidewalks and shared streets) were presented to the public for feedback. Input on these scenarios shaped overall plan direction regarding targets and strategy development.

Project Prioritization

Through surveys and Community Ambassador input, participants told us what considerations should be used when projects are prioritized. This input was used to create or update data-driven prioritization methods for the urban trails and bikeways plans and to better emphasize equity as a prioritization factor.

Design Guidelines

Several aspects of the Design Guidelines were informed by public input. For example, heat and climate change were identified by many people, and people of color and people with low incomes are especially burdened by these challenges. The importance of shade and reducing pavement factored into new design guidelines for urban trails and strategies to reduce paving through the use of shared streets.

Partnerships and Actions Beyond ATX Walk Bike Roll

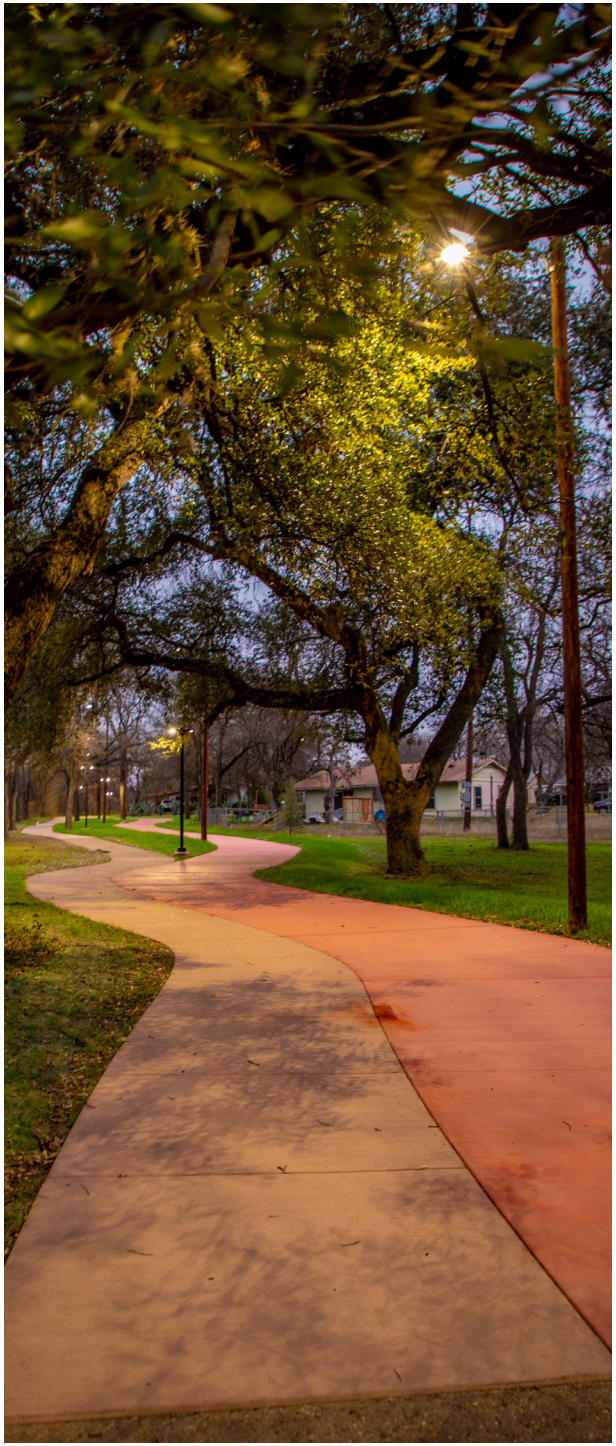
Public input identified the need for action around equity, anti-displacement efforts, and affordability that go beyond the purview of the Austin Public Works and Transportation Departments. These issues and actions were collected for consideration in a future update of the Austin Strategic Mobility Plan and by other City departments.

Did We Meet Our Goals for Inclusive Engagement?

The following goals were articulated in the Public Engagement Plan.

1. Implement a process that carries out the recommendations and guidance outlined in the project's Equity Framework and results in participation that exceeds the racial/ethnic and income demographic makeup of the city.
2. Prioritize engagement with stakeholders from historically underrepresented and underserved populations by collaborating with community organizations with access and credibility to these populations. Value this expertise through incentives and/or compensation for time.
3. Create awareness of ATX Walk Bike Roll and associated Plan Updates, the public input needed, and the overall update process.
4. Present information in a manner that respects native languages and is culturally appropriate.
5. Provide a variety of methods for public participation that are accessible in terms of language, technology literacy, location, and time so that people from focus population groups may easily participate in the process.
6. Gain substantive insights from the public input process that establishes a vision for each of the Plan Updates and guides the technical elements of the updates.

As described in the Phase Summaries below, goals #2 through #6 were met. Regarding Goal #1, the Community Ambassador program and other targeted efforts resulted in deep and broad engagement with people from historically underrepresented groups and annual household income under $50,000. However, as shown in Table 1 and 2, participation from People of Color and people with lower incomes did not exceed the racial/ethnic or income makeup of Austin. Although this goal was not met, demographic questions asked as part of outreach activities allowed the project team to review responses from the focus population separately (defined as Black, Hispanic/Latinx, and other People of Color, and those earning less than 80% of the median household income), to review differences and elevate input received from those respondents.



Racial/Ethnic Identity Groups	City of Austin	Phase I Engagement	Phase II Engagement	Phase III Engagement
Asian	7.6%	4%	4.5%	6%
Black or African American	7.8%	4%	1.5%	4%
Hispanic/Latinx	33.9%	16%	12%	21%
Native/Indigenous	0.7%	0.7%	0.3%	1%
Self-Described	3.6%	1.3%	12.2%	2%
White	72.6%	55%	60%	51%
Prefer not to say (+Skipped Question)	N/A	19.2%	12%	15%

TABLE 1. RACIAL IDENTITIES OF PARTICIPANTS IN ATX WALK BIKE ROLL ENGAGEMENT

(NOTE: This is estimated, since we did not collect demographic data on every single person who engaged in the process. However, we did so when possible, so the data below reflects the best information available about the participants in the process. This is collected demographic information collected from the Community Ambassador outreach efforts and the surveys, combined.)

Yearly Household Income	City of Austin	Phase I Survey	Phase II Survey	Phase III Survey
Less than $50000 ($0 - $49000)	30.9%	12.18%	7.96%	12.86%
More than $50000 ($50000-$150000+)	69.2%	58.81%	63.69%	67.28%
Prefer not to answer	N/A	29.02%	28.35%	19.87%

TABLE 2. YEARLY HOUSEHOLD INCOME OF SURVEY PARTICIPANTS

(NOTE: This is estimated, since we did not collect demographic data on every single person who engaged in the process. However, we did so when possible, so the data below reflects the best information available about the participants in the process.)

PLAN KICKOFF

Equity Scan & Equity Framework

Engagement

PHASE 1

Aug–Sept 2021

Preferences & Needs

We asked:

- "How you get around Austin and how you'd prefer to get around."
- "What are your concerns or frustrations?"
- "What is comfortable/uncomfortable?"

How we engaged:

- Plan Ambassadors
- Online Surveys
- Online Public Meeting
- Virtual Open House
- Focus Groups

PHASE 2

Jan–March 2022

Opportunities & Barriers

We asked:

- "Where are there barriers?"
- "Where do you want new connections?"
- "Where are challenging crossings?"

How we engaged:

- Plan Ambassadors
- Pop-Up Events
- Online Input Map

PHASE 3

Sept–Oct 2022

Scenarios & Policy Concepts

We asked:

- "Which approach to building networks and prioritizing projects do you like?"
- "What major policy changes should the City consider?"

How we engaged:

- Plan Ambassadors
- Online Surveys
- Virtual Open House
- Pop-Up Events

PLAN PUBLIC REVIEW

Phase Summaries

ATX Walk Bike Roll engagement was organized around three primary phases, illustrated in the graphic to the left and further described on the following pages.

Phase 1: Preferences and Needs

From August through September of 2021, Phase 1 of engagement sought to connect with residents – particularly those that have been historically underrepresented in past City planning efforts (Black, Hispanic/Latinx, and other People of Color, and those earning less than 80% of the median household income) – to raise awareness about ATX Walk Bike Roll and collect insight on how urban trails, sidewalks, pedestrian crossings, and on-street bicycle infrastructure impacts quality of life.

The objectives of Phase 1 were to:

- Raise awareness of ATX Walk Bike Roll
- Document the experiences of residents when using active transportation infrastructure
- Share ATX Walk Bike Roll's purpose, goals, challenges, and the planning process
- Create trust and build relationships with focus populations, guided by the Equity Framework
- Understand how residents currently get around Austin, their concerns about active transportation, and what improvements they'd like to see.
- Use public input to guide the development of scenarios for bikeways, trails, and sidewalks in Phase 3

Phase 1 of ATX Walk Bike Roll sought to create new industry best practices for prioritizing the lived experiences of underrepresented communities in planning efforts. Phase 1 engagement activities included surveys, small group events, and a pre-recorded virtual public meeting. Some Phase 1 activities also had to be adapted to the changing circumstances of the COVID-19 pandemic.

To center diverse populations in the engagement process, Phase 1 Public Outreach activities had a wide reach. Focused strategies — including Community Ambassador outreach, focus groups, and collaboration with community organizations that center equity in their mission and programs — successfully boosted engagement among Black, Hispanic/Latinx, and other People of Color, and those earning less than 80% of the median household income. Broader methods like the online survey and the virtual public meeting disproportionately represented high-income and White populations. This emphasized the importance of focused strategies, particularly the Community Ambassador Program, as vital to reaching low-income communities and communities of color.

Community Ambassadors were much more successful in reaching focus populations (defined as Black, Hispanic/Latinx, and other People of Color, and those earning less than 80% of the median household income) compared to

broader engagement methods like surveys and public meetings. Because of the successes of Community Ambassadors, the Public Outreach Plan was restructured to extend their work into Phases 2 and 3 of engagement efforts and strategies were modified to prioritize efforts designed to achieve better demographic representation to calls for engagement.

Across engagement efforts in Phase 1, participants from focus population communities expressed confusion and/or planning fatigue because of the simultaneous outreach efforts addressing upcoming transit investments in Austin. Phases 2 and 3 sought to improve on this by enhancing coordination and synchronization of messaging between the efforts, clarifying distinctions between various transportation-related projects, and sharing engagement results between projects.

More detail on outreach and a summary of public input is in Appendix A.4 Phase 1 Summary.

Phase 2: Opportunities and Barriers

Phase 2 engagement took place from January through March of 2022. A map-based outreach approach was utilized to record feedback from community members. This informed prioritization models in alignment with our Equity Framework to ensure that implementation plans match demonstrated need.

Feedback, preferences, and concerns from focus populations in Phase 1 were examined and elevated as the project moved into this Phase of engagement. Increased investment was given to the Community Ambassador program which transitioned from being managed by the consultant team to being managed by City of Austin staff in January.

Objectives for Phase 2 engagement were to:

- Explore themes and priorities heard from Phase 1
- Identify important gaps in the urban trail and bikeway networks, locations of barriers, opportunities for new urban trail or bikeway connections, and places where crossing the street is challenging
- Envision opportunities to improve connections to transit
- Gather preferences on active transportation programs like Smart Trips and Shared Streets
- Understand what is and is not working as it relates to facility maintenance
- Digest specific displacement concerns in order to craft a responsive plan for action in collaboration with ongoing anti-displacement efforts in Austin

Phase 2 engagement activities included Social Pinpoint/Online Mapping Tool available in English and Spanish; paper maps and paper surveys utilized by Ambassadors; tablet-based access to the online mapping tool delivered by Ambassadors; pop up events, shared street pop-up events hosted by Austin staff and supported by

Ambassadors; and continued Ambassador reports.

Community Ambassadors were equipped with tablets to encourage community members without easy access to a computer to take the digital survey. However, technological barriers and internet access issues prevented tablets from being a successful outreach tool. Nevertheless, through conversations and the use of paper maps, Community Ambassadors were able to continue receiving feedback.

Community Ambassadors also began functioning as project advisors providing feedback on design guidance in March. That feedback was invaluable. The engagement plan was modified to allow Community Ambassadors to continue to engage with community members and to formally utilize Community Ambassadors as advisors to the project and sponsor team. The online survey tool was also promoted through Austin's traditional communication channels. 9,778 people viewed the site and 3,319 people provided input or upvoted comments. Participants left a total of 2,807 markers on the map and completed 4,542 survey responses. The survey metrics included responses to the demographics survey as well as to questions about the markers dropped on the map.

This survey effectively captured network gaps and challenges for people with technological access and skills but required internet access, technological knowledge, and larger screens to easily drag, drop, and draw desired connections on computers, phones, or tablets. To mitigate skewed results the project team again examined and prioritized responses from people in focus populations weighting those responses more heavily.

More detail on outreach and a summary of public input is in Appendix A.5 Phase 2 Summary.

Phase 3: Scenarios and Policy Concepts

September and October of 2022 focused on presenting major plan elements for public feedback. Community members were asked to rate their level of support for three Urban Trails and Bikeways and Sidewalk and Shared Street scenarios. Phase 3 also asked if participants supported transportation policies that were meant to reduce transportation costs in an equitable way and address hidden subsidies that currently favor automobiles above other transportation options.

The objectives of Phase 3 were to gather feedback to shape:

- Network plans for urban trails and bikeways
- How large a role shared streets should play in Austin's future pedestrian network
- Prioritization methods for urban trails, bikeways, and pedestrian crossings
- Transportation policies to improve equitable outcomes from infrastructure investments

Phase 3 presented a key moment to make major decisions about where to direct new investment in walking, biking, and rolling infrastructure. The options presented in the Phase 3 survey were

created using input from Phases 1 and 2. The Phase 3 survey, offered in English and Spanish, was available online and as a paper version, and used non-technical language and images to convey complex concepts. A shortened paper version of the survey focused on key issues and was used at tabling events in focus population communities.

Community profiles were written using past input to convey the challenges and opportunities that low-income residents and/or communities of color shared to a broad audience.

In conveying the transportation realities faced by these focus populations, all survey participants could better understand how planning decisions might impact the lives of various residents. These community profiles were also used throughout Phase 3 tabling efforts and within our information packets as a way to humanize data. Profiles were born out of conversations with Community Ambassadors who questioned the efficacy of highly curated presentations complete with new terms and concepts. These were used to guide the creation of options for how to prioritize investments.

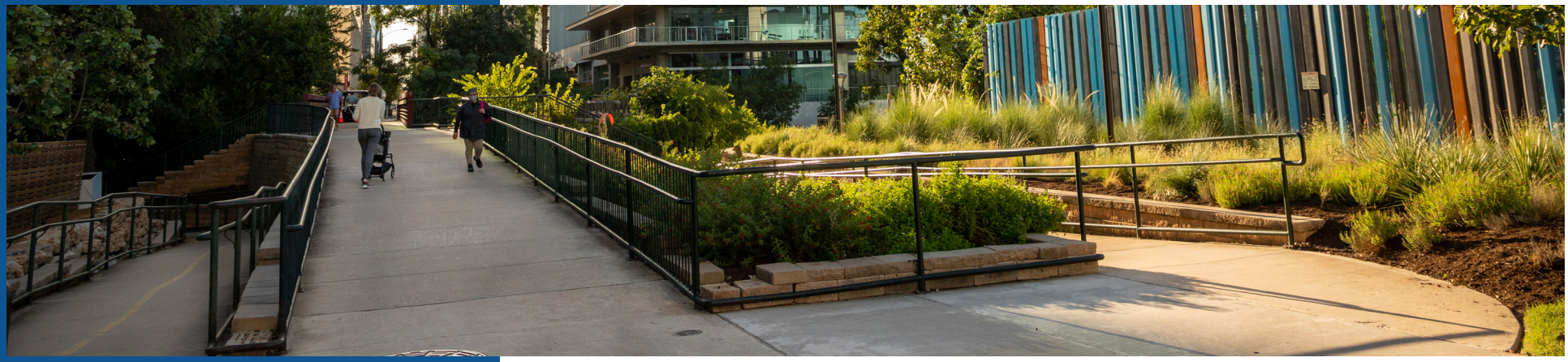
The next engagement opportunity to provide feedback involved gathering input on a series of sidewalk, bikeways, and urban trails implementation scenarios. Participants gave input on their level of support for each scenario and provided input on elements they did and did not like about each proposal. Policy considerations were also included with the desire to gain input on broad and important issues not solely transportation related, including affordability and displacement, climate resiliency and other key issues raised by focus populations over the first two engagement rounds.

The project team recognized that all Phases of engagement were significantly oversampling predominately white and wealthy residents. This was addressed in three ways.

1. Responses from low-income respondents and from People of Color were examined more closely.
2. Concerns and opportunities raised in Community Ambassador reports became central in decision making.
3. Community Ambassadors were enlisted as advisors in decision making.

These sources of information influenced the design of policy recommendations to address the many overlapping concerns that the focus populations expressed across all Phases of engagement.

More detail on what we did and a summary of key themes from the input received is in Appendix A.6 Phase 3 Summary.



“... to move beyond community engagement and into community partnerships.”

Looking Ahead to Next Steps

ATX Walk Bike Roll sought to move beyond community engagement and into community partnerships. Understanding and acknowledging past harmful policies—in Austin generally and by the transportation profession specifically—enabled project staff to work with historically marginalized community members (defined as Black, Hispanic/Latinx, and other People of Color) to test new approaches rooted in cultural responsiveness. historically marginalized community members engaged throughout this process also expressed an expectation that these sentiments be backed by action to ensure that key concerns are addressed and prioritized moving forward.

Across Phases we acknowledged when engagement methods failed to uphold the commitment to equitable engagement and listened to focus population voices to influence adaptation. When majority populations (people who are white, wealthier, and historically had and currently have more power in decision making) were oversampled in engagement, increased weight was given to the voices of focus populations. This was done in the examination of survey results and in spending resources to listen to the long form narratives reflecting the stories, realities, and lived experiences of focus populations. We also reflected on common transportation experiences faced by focus populations as an educational tool, to better inform individual participants’ feedback.

The voices of focus populations clearly described the interconnectedness of issues like housing affordability, sustainability, personal safety, and land use planning. Though the focus of the work of ATX Walk Bike Roll is active transportation, we recognize how interconnected the success of these plans are with those other topics. The community is calling for departments to break through rigid agency silos and collaborate with other City departments that address housing, utilities, and public health, to further conversations about how policy and programming can create a more just city.

Austin is experiencing an affordability crisis. As neighborhoods become more expensive, families and individuals are pushed to areas with less connectivity. An improved active transportation network across the city would help mitigate these factors, and it no longer would be a luxury to live in an area with great connectivity. Recognizing how these concerns have historically manifested in Austin's built landscape, the prioritization approach shifted to elevate projects around existing corridors with long term, stable affordable housing to ensure long standing residents can stay in place.

As the three plans developed during ATX Walk Bike Roll are adopted and move to implementation, the following key considerations for future efforts are essential to continue upholding commitments to equity in action:

Valuing Lived Experience

Valuing and prioritizing expertise that comes with lived experience is an important component to successful planning and implementation. Continuing to evaluate future decisions through the lens of focus populations will be necessary for the long-term success of ATX Walk Bike Roll. The Community Ambassadors were an asset in this area. They were more skilled at and capable of reaching people from focus populations than any other outreach efforts because of pre-established relationships and deeper levels of trust.

They were able to bring their own lived expertise:

- influencing how the City's planning team thought through implementation priorities,
- helping the planning team better tailor language and communicate more clearly,
- leading informal cultural and active transportation education for City staff,
- providing honest and candid feedback, and
- remaining a steady voice for planning efforts to better align with equity goals.

Austin would be well served by employing Community Ambassadors to continue in that role through implementation and beyond to other projects.

Designing Tools for All

Language and access are two key themes that consistently surfaced throughout outreach. Someone's access to the internet, ability to speak a certain language, or understanding of highly technical language should not limit their ability to share their thoughts on public issues. All materials, surveys, and outreach content should account for these considerations to ensure that those who have been historically left out of planning processes are included and at the center of outreach efforts.

Compensation and Coordination

Learning from Phase 1, outreach efforts with the potential to drastically increase diverse representation may have faltered because communities who have faced historic disinvestment are continually asked to share input without compensation. ATX Walk Bike Roll is just one of many ongoing efforts occurring in Austin. This may mean many community leaders from focus populations have been repeatedly engaged and answered similar questions creating engagement fatigue. To recognize this labor, transparency about when and how their responses will be used is critical and should also be supported with compensation for their participation. The significant impact of our ATX Walk Bike Roll Community Ambassadors highlights the need for similar programs to become citywide engagement standards, with adequate compensation for time and labor.

Further coordination between projects and departments is critical to make sure feedback gathered is shared across time, projects, and departments so people are not over surveyed.

Integrating Active Transportation and Anti-Displacement Efforts

While centered on walk, bike, and roll infrastructure, many of the responses across the three project Phases tied these issues to concerns for housing affordability and anti-displacement. As such, it is critical that active transportation improvements are not viewed or implemented in silos, but rather build on the integrated work that has already begun directing improvements to sidewalk networks, urban trails and bikeways with community preservation efforts. As Austin becomes increasingly unaffordable, particularly for Black people, Hispanic/Latinx people, other People of Color, and low-income residents of

all races and ethnicities, it is critical that new investment is accompanied by strategies to allow focus populations to age in place, and access is improved so people can get to the places they need to go

Embracing Multiple Approaches

Relying on a robust set of tools for engagement allows residents multiple ways to get involved. Engagement approaches like public meetings and tabling should be located in places familiar to focus populations and promoted through channels utilized by focus population communities. Less formal approaches led by trusted community members, like Community Ambassadors, allows people from focus population communities to engage as part of a typical day in candid conversations with friends, loved ones, while waiting on a bus or using transit, or folding laundry in the laundromat. These methods allow people to provide input who don't necessarily feel driven to respond to conventional outreach channels.

APPENDIX B. SIDEWALK PLAN HISTORY

Over two decades ago, the City of Austin adopted the **2000 Pedestrian Master Plan** to set forth a structured approach for improving pedestrian facilities. The 2000 Plan established a goal to "set forth policies that will encourage walking as a viable mode of transportation, improve pedestrian safety and enable people to walk to and from transit stops." It officially recognized that sidewalks and other pedestrian facilities were necessary to "help control air pollution and traffic congestion, and increase the quality of life in Austin." The document covered justification for the adoption of such a plan, policies that outline criteria for proper pedestrian infrastructure, recommendations for facilities that need improvement, and a design guide to effectively follow through on the previously identified policies with compliance to standards set by the Americans with Disabilities Act.

The **2009 Sidewalk Master Plan** began in 2003 as a two-phased process to update the 2000 Plan. Phase I, completed in 2005, included the Pedestrian Information Management System (PIMS) to meet the needs for assessing and prioritizing existing and absent sidewalk infrastructure as well as updates to the 2000 Plan and the City's Americans with Disabilities Act (ADA) Transition Plan. Phase II was completed in 2009, which was titled the 2009 Sidewalk Master Plan. The 2009 Plan included extensive stakeholder outreach to develop the sidewalk prioritization criteria and scoring system and it significantly progressed sidewalk infrastructure management in the City of Austin. After five years of implementing the 2009 Plan, the City identified several successes and lessons learned. Successes included 1) the establishment of a data-driven prioritization process, 2) absent sidewalk prioritization map, 3) citywide gap and rehabilitation cost estimates, and 4) ADA Transition Plan funding targets. Lessons learned included 1) the point-based sidewalk condition assessment provided too much granular data, making it ineffective in repair and rehabilitation assessment and prioritization, 2) the PIMS programming and interface were overly complex, making it difficult for nonspecialized staff to maintain and use effectively, and 3) the ongoing need for a stable funding source for repair and rehabilitation of sidewalks, similar to road maintenance, was not adequately identified.

Prior to initiating the update to the 2009 Plan, the City Council adopted the **Imagine Austin Comprehensive Plan** in 2012, which includes a strong emphasis on enhancing Austin as a walkable city. In June 2014, the City Council adopted an updated **Complete Streets Policy**, designed to help realize the Imagine Austin Comprehensive Plan vision for a healthy, green, vibrant, compact, and connected community.

The **2016 Sidewalk Master Plan / ADA Transition Plan Update** process began in November 2014 to update the 2009 Plan. The 2016 Update provided the opportunity to incorporate the ideals strongly emphasized in the Imagine Austin Comprehensive Plan, namely to make Austin a walkable, livable, and pedestrian friendly city through the "Compact and Connected" policies and priorities, while providing overdue technical updates using current data and methodologies. The 2016 Update was primarily intended to be a sidewalk infrastructure asset management document and ADA Transition Plan for sidewalks within the public right-of-way. It was not intended to serve as a master plan for pedestrian mobility or connectivity, and did not address mobility infrastructure such as bike lanes, crosswalks, trails, etc. The process also reengaged stakeholder groups from the 2009 Plan through public outreach and meetings, building on the previous work, rather than making substantive changes to the prioritization matrix. Key aspects of the 2016 Update included:

- Peer Cities Report – analysis of data collected from seven Peer Cities regarding current sidewalk program policies and practices, provided as a separate document
- Sidewalk Prioritization Update – simplification of the GIS-based prioritization tool and updating of the Pedestrian Attractor and Pedestrian Safety datasets

- Condition Assessment – development of a methodology for assessing and scoring the condition of existing sidewalks using a GIS-based application
- Funding Update – development of updated funding goals and funding alternatives, based on the prioritization updates, the condition assessments, and the Peer Cities Report

While the 2016 Sidewalk Master Plan/ADA Transition Plan Update was principally an asset management tool for sidewalks, the Plan functioned in tandem with other planning guidance to provide for the safe movement of people walking in the City of Austin including the Pedestrian Safety Action Plan, Vision Zero Action Plan, Bicycle Master Plan, Urban Trails Master Plan, Community Health Improvement Plan, and Austin Strategic Mobility Plan.

APPENDIX C. ATX WALK BIKE ROLL CRASH ANALYSIS

C.1 Crash Data

Geocoded crash data is critical to understanding traffic safety patterns. Police reports of collisions are the primary source for crash data. While this data is known to have problems with underreporting[1,2], it is often the most complete data source and provides necessary details for informing engineering treatments, such as the location of the collision and dynamics between the parties involved in the crash. Crash records that have missing or partial crash location coordinates were inputted to a geocoding tool using the primary and secondary street names.

The Texas Department of Transportation (TxDOT) maintains statewide crash records in the Crash Record Information System (CRIS)[3]. For this analysis, a dataset of all crashes from 2016 to 2020 within the City of Austin boundary was generated and extracted by the City of Austin using CRIS and delivered to Toole Design.

C.2 Victim Analysis (Who is involved in crashes)

Victim demographic attributes included in the CRIS crash reports have been compared to U.S. Census ACS estimates to evaluate proportionality. When looking at proportionality, values greater than 1.0 indicates that a particular cohort is overrepresented, meaning they represent a larger share of victims than they do the general population. This analysis has looked at who is impacted by crashes by comparing the distribution of victims by age, race, and sex and compared those distributions to those populations using U.S. Census ACS 5-year estimates. Analyzing these victim attributes allows us to gain more insight into who is affected by traffic violence in the City of Austin. The results of this victim analysis should be interpreted with some caution for the following reasons.

- Census ACS data used in this analysis are population counts for residents of Austin. Non-Austin residents are also victims in crashes, thereby contributing to some margin of error inherent in this approach.
- The victim race/ethnicity attributes reported in CR3 crash reports are completed by responding officers. This may often or usually be based on their visual assessment.[4] Additionally, the CR3 race/ethnicity categories do not align perfectly with U.S. Census race categories.[5] Some aggregation of U.S. Census race categories has been performed to compare the two datasets. One way to improve the accuracy of demographic reporting is to ask people involved in crashes to self-identify their race/ethnicity.

[1] Stutts, J., & Hunter, W. (1998). Police reporting of pedestrians and bicyclists treated in hospital emergency rooms. Transportation Research Record: Journal of the Transportation Research Board, (1635), 88-92.

[2] San Francisco Department of Public Health-Program on Health, Equity and Sustainability. 2017. Vision Zero High Injury Network: 2017 Update – A Methodology for San Francisco, California. San Francisco, CA. Available at: https://www.sfdph.org/dph/files/EHSdocs/PHES/VisionZero/Vision_Zero_High_Injury_Network_Update.pdf

[3] https://www.txdot.gov/government/enforcement/crash-statistics.html

[4] The Texas Department of Transportation "Instructions to Police for Reporting Crashes – 2019 Edition" does not specify whether officers should ask individuals their ethnicity.

[5] The CR3 does not include the "Native Hawaiian or Other Pacific Islander" or "Two or More" categories used by the Census, but does include an "Other" category. For purposes of this analysis, we grouped these Census race/ethnicity classifications and compared them to the CR3 "Other" category to assess proportionality.

C.2.2 *Victim Age*

Victim ages for bicyclists and pedestrians were evaluated to determine if there were any age cohorts that are disproportionately involved in crashes. Victims were analyzed looking at all injury types as well as fatal and serious injuries separately (crashes resulting in fatalities or serious injuries are referred to as KA, which refers to categories used in Texas to show fatal (K) and incapacitating injury (A) crashes).

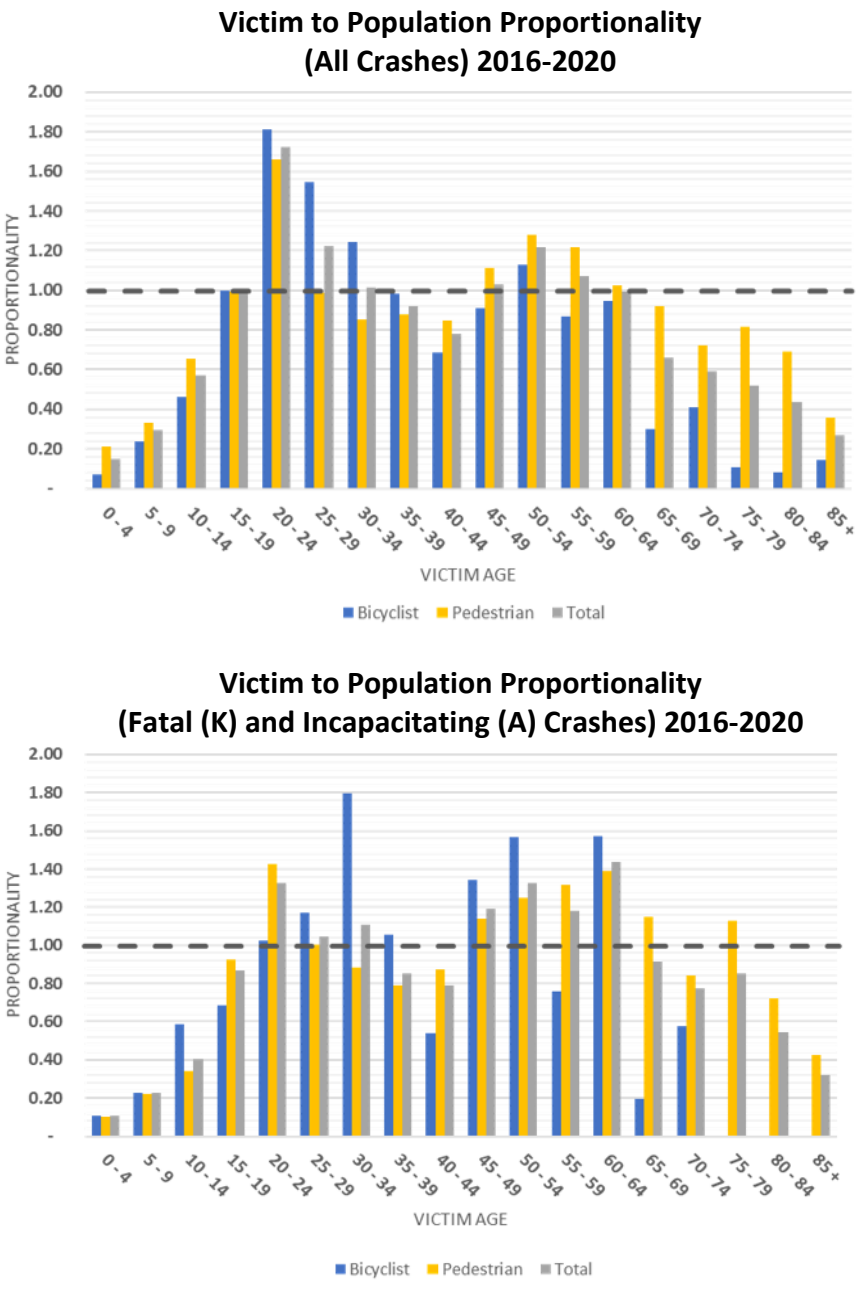


Figure C.1 – Crash Proportionality by Age

Bicyclists

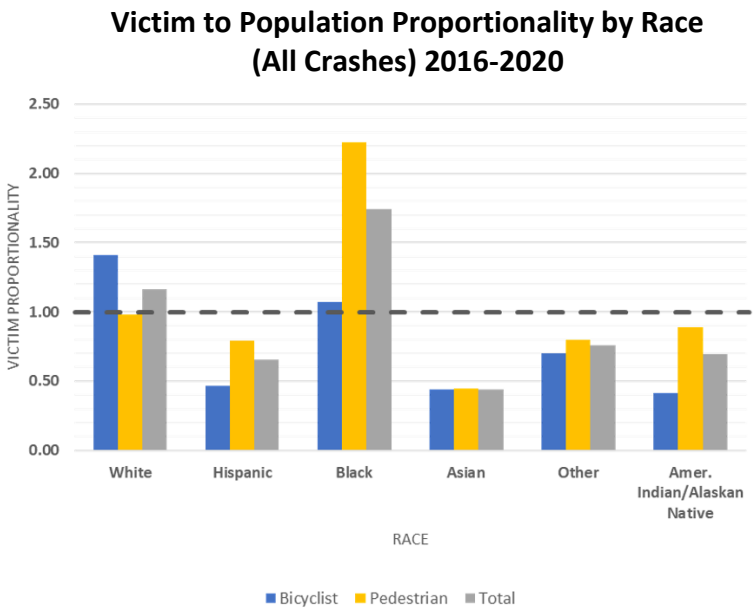
- For all injury types, the 20-34 age cohort was the most overrepresented age cohort, specifically the 20-24 cohort. Victims who are younger than 15 years of age or 65 years or older are substantially underrepresented. This suggests lower exposure due to less trips being made by bike, especially with some portions of those populations unable or unwilling to ride a bicycle along or across a street.
- For fatal and serious injuries, the 25-34 and 45-64 age cohorts were the most overrepresented, specifically the 30-34, 50-54, and 60-64 cohorts. Compared to overall crashes, victim to population proportionality is slighter higher for older age cohorts in KA crashes, though there were zero 75+ KA victims.

Pedestrians

- For all injury types, victims aged between 20-24 were the most overrepresented, with victims aged between 50-59 being slightly overrepresented. Similar to bicyclist victims, victims aged under 15 and over 65 are less involved in crashes relative to their overall population share.
- For fatal and serious injuries, victims aged between 20-24, 45-69, and 75-79 cohorts were all overrepresented. Older age cohorts were overrepresented in KA compared to overall crashes. This finding suggests a higher vulnerability to fatal or serious injury for these older age cohorts compared to younger cohorts.

C.2.3 *Victim Race*

Victim race for bicyclists and pedestrian were evaluated to determine if there were any race cohorts that are disproportionately involved in crashes. As noted earlier in this memo, victim race statistics should be interpreted with caution as race is visually reported by the responding officer and the race categories do not neatly align with the race (by Hispanic/Latino origin) categories used by the US Census. Victims were analyzed looking at all injury types as well as fatal and serious injuries separately.



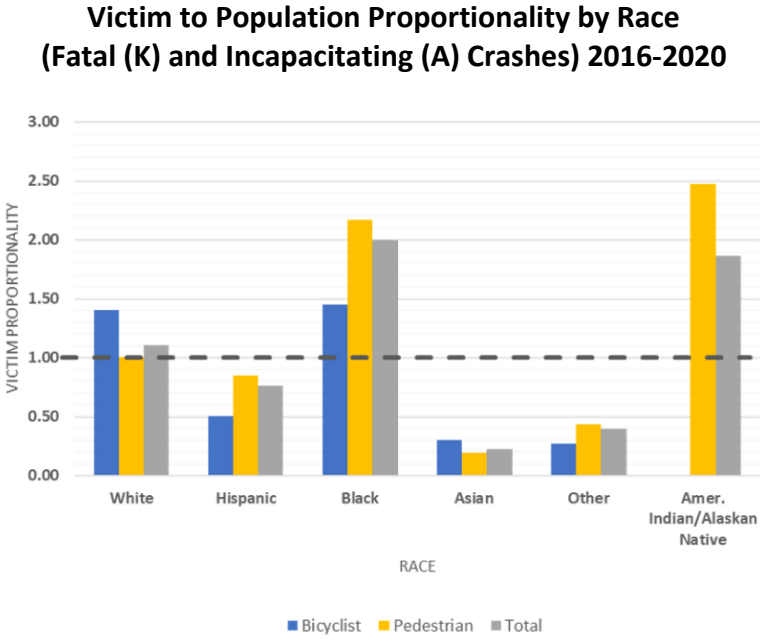


Figure C.2 – Crash Proportionality by Race

Bicyclists

- For all injury types, white people are the most reported victims. Black people are slightly overrepresented. This may mean that white people are more likely to bike in Austin compared to other populations.
- For fatal and serious injuries, both white and Black people are the most overrepresented. The increased disproportionality for Black bicyclists compared to all crashes is notable and may imply that Black bicyclists have to use less safe routes or that drivers are less likely to yield to Black bicyclists (an outcome that is statistically known to exist based on nationwide research).

Pedestrians

- For all injury types, Black people are substantially overrepresented. Multiple studies have shown that drivers across the United States are less likely to yield for Black pedestrians and people with darker skin tones. However, this can also indicate less safe conditions on streets near neighborhoods where Black people live.

- For fatal and serious injuries, Black people are again substantially overrepresented. American Indian/Alaskan Native people appear to be overrepresented, though the population size is quite small (2 fatal/serious injuries over five years with 0.18% of the population).

Victim Sex

Victim sex for bicyclists and pedestrian were evaluated to determine disproportionality. Victims were analyzed looking at all injury types as well as fatal and serious injuries separately.

Bicyclists and Pedestrians

- Male victims are overrepresented for overall crashes and fatal / incapacitating crashes for both bicyclists and pedestrians. This could be a result of multiple factors, including males being more likely than females to bike, increased risk-taking behavior amongst males, and driver biases in yielding.

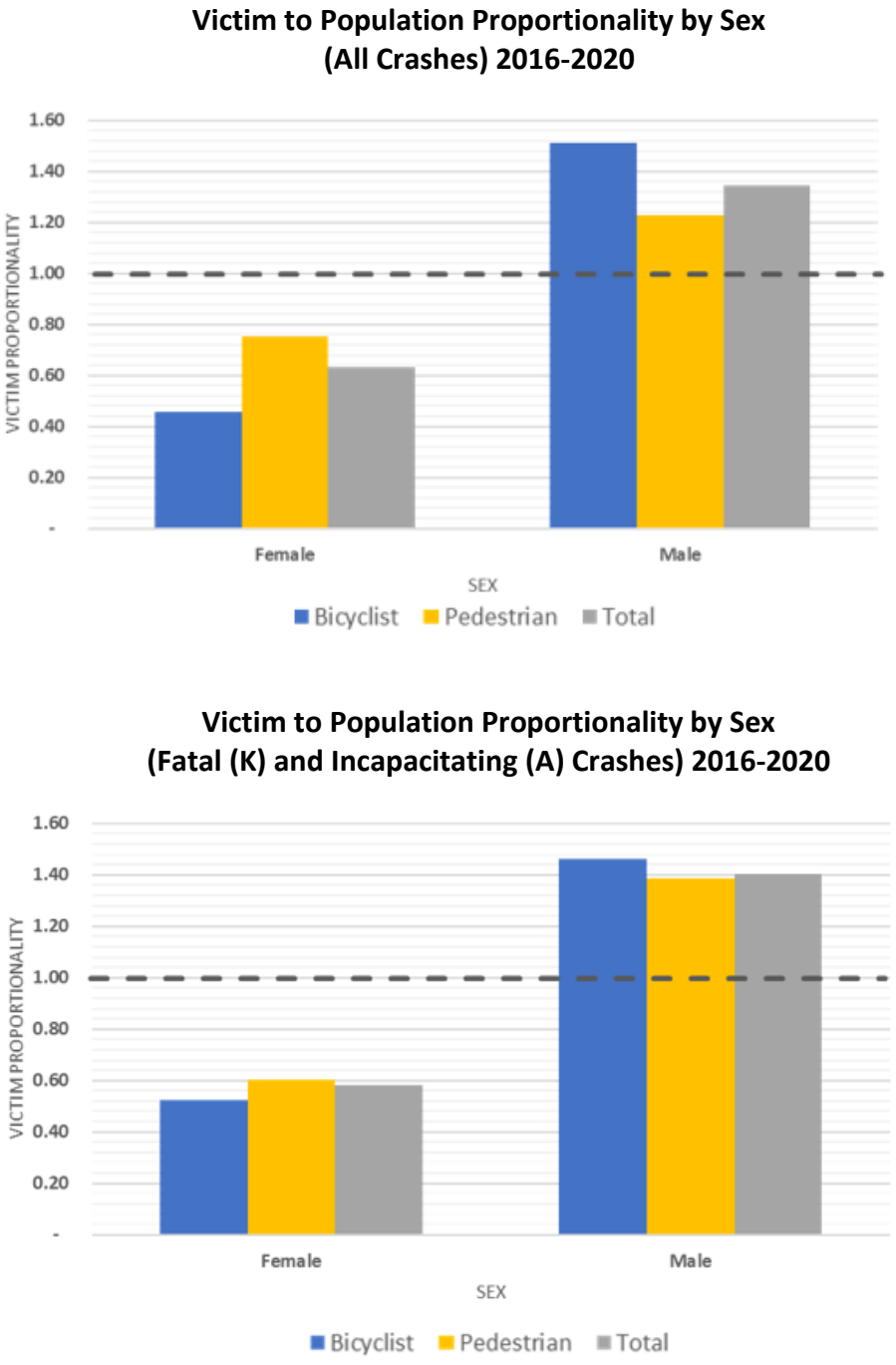


Figure C.3 – Crash Proportionality by Sex

C.3 High Injury Network Disparities

C.3.1 *Equity Analysis Zones (EAZ)*

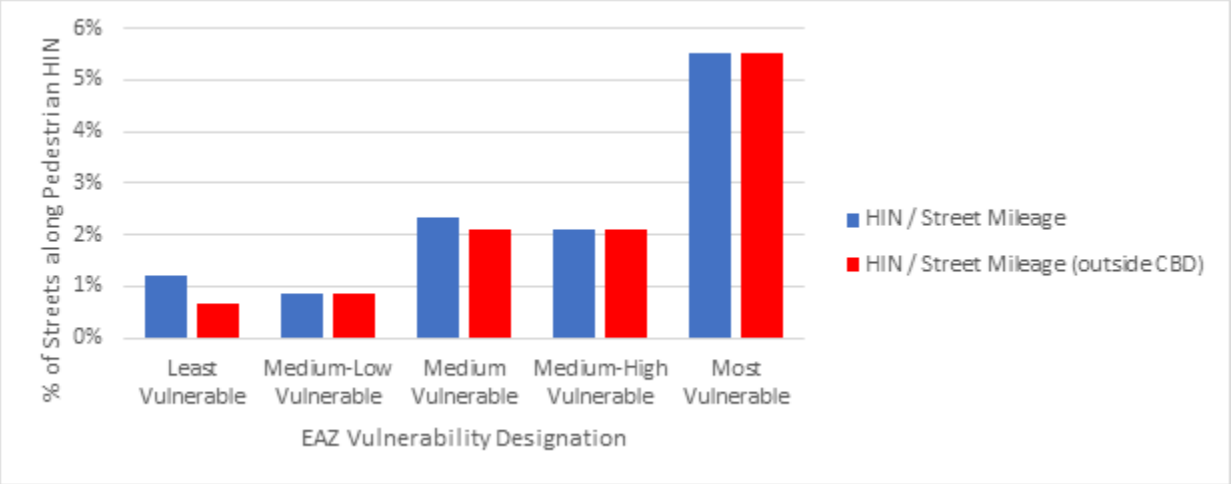
An analysis was performed to evaluate any relationship between the pedestrian High Injury Network (HIN) and City of Austin Equity Analysis Zones (EAZ). The Pedestrian HIN are streets in Austin with a relatively high number of serious injury and fatal crashes involving pedestrians. The results of the Pedestrian HIN and EAZ analysis indicate that vulnerable areas tend to be affected disproportionately by pedestrian-related crash risk.

The relationship between the HIN and EAZs was evaluated by calculating the percent of streets within each EAZ category that are designated as being on the Pedestrian HIN (i.e., HIN mileage / street network mileage within each vulnerability classification of EAZ)[6].The resulting measure aims to assess crash density[7] of the street network as a whole for pedestrians within each EAZ. Summarizing the results as a percent of the street network that is along the pedestrian HIN reduces the effect of EAZ size on the outcome.

Some EAZs have sparser street networks or fewer crossing opportunities than other similarly sized EAZs, which limit the number of routes for pedestrians to choose from. In such locations, outsize importance is given to the major thoroughfares that tend to have elevated risk for people walking. This analysis did not control for the connectivity of the street network directly.

Figure C.4 summarizes the results of this spatial analysis and differentiates the results through summarizing the results by EAZs citywide and only EAZs that are outside of the central business district (CBD).[8] Both location types (citywide and only locations outside CBD) show a positive association between pedestrian HIN and level of vulnerability assigned in the EAZ. This suggests that areas considered more vulnerable according to the EAZ designation have a higher proportion of roadways within that community that are part of the pedestrian HIN and are potentially higher risk compared to communities that are less vulnerable. **In other words, more vulnerable EAZs are experiencing more frequent and more severe pedestrian crashes according to this analysis.**

Figure C.4 – Percent of streets within each EAZ designation that are along the Pedestrian HIN



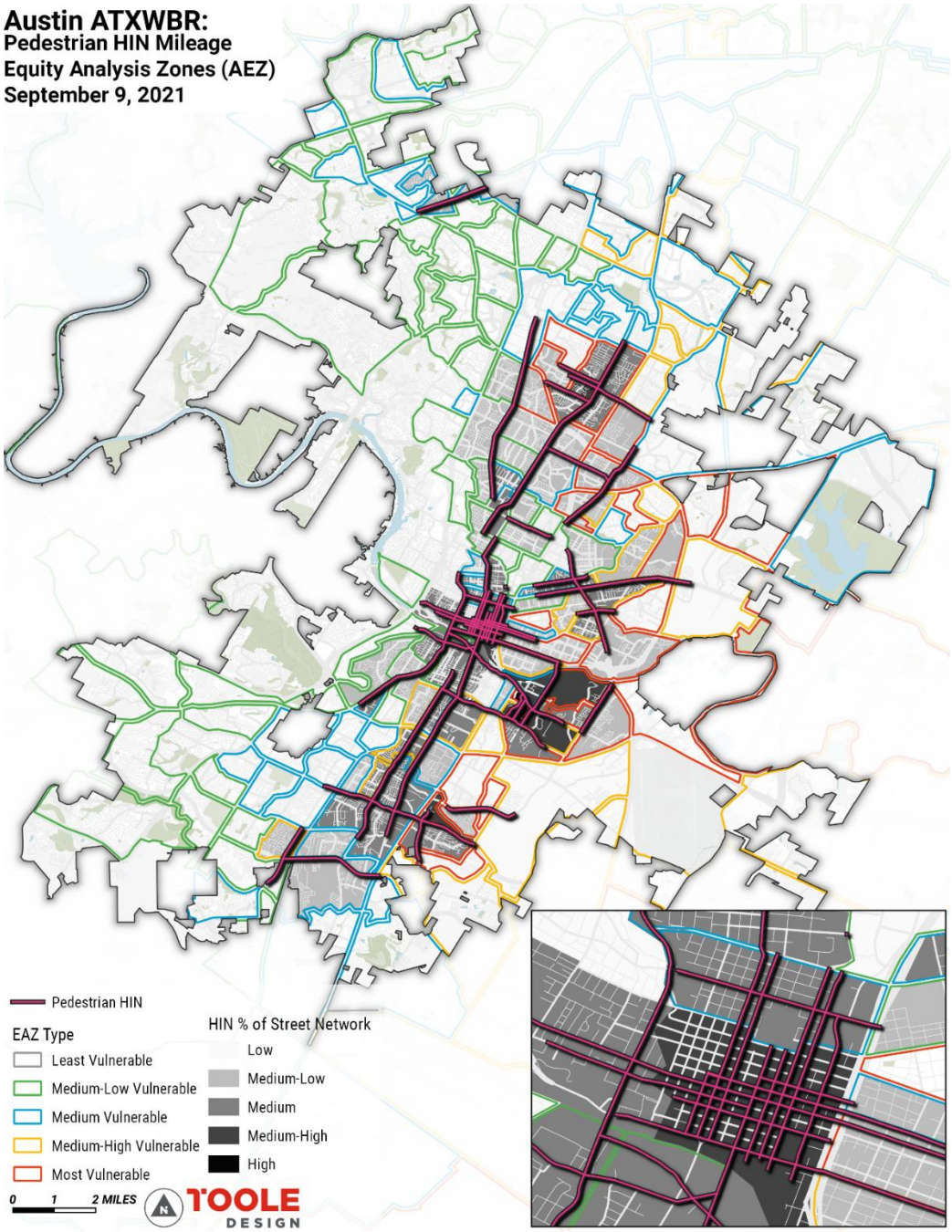
[6] A 50 foot buffer was used around each EAZ to account for streets that are located directly along EAZ boundaries.

[7] Note: This approach is not a statistical analysis that measures real pedestrian crash risk, but rather measures the percent of street network within each EAZ geography that had high pedestrian crash densities as defined by the pedestrian HIN analysis methodology.

[8] A significant portion of the pedestrian HIN exists in the CBD. Comparing results that omit the CBD helps compare predominately residential neighborhoods.

The map in Figure C.5 displays the pedestrian HIN overlayed on top of EAZs. The EAZs are symbolized using a color ramp that is correlated to the percent of the roadway within each that is along the pedestrian HIN. This illustrates the density of HIN within individual EAZs. EAZs with higher shares of the roadway network along the pedestrian HIN are generally located within four clusters: downtown/UT campus, North Lamar/Rundberg, Montopolis/Riverside, and South Austin/Onion Creek. These clusters include EAZs that are within the medium, medium-high, and most vulnerable EAZ designations and suggest these communities experience a higher degree of burden than other communities.

Figure C.5 – Pedestrian HIN Compared to Equity Analysis Zones



C.4 Pedestrian HIN and Demographics

The pedestrian HIN was reviewed in relation to demographic data at the Census block group level. The total pedestrian HIN mileage was calculated for each block group[9] and was summarized by overall HIN mileage by race and income variables. The results of this analysis help provide insight into possible disparities between pedestrian crashes and equity-related issues.

C.4.1 *Race*

Figure C.6 through C.8 display the pedestrian HIN mileage by population for each race[10] and illustrate disproportionality examples. Population density was grouped into deciles to help compare the HIN mileage between the race/ethnicity categories. The ***orange***-colored bar represents the middle decile (which includes the 50th percentile, or the median). To the left of the orange bar are the lower deciles (lower population density) and to the right of the orange bar are the upper deciles (higher population density). Figure C.7 displays the results for all block groups and Figure C.8 displays all block groups except for the block group that encompasses the central business district (CBD). This figure excludes the CBD because of the unique trip characteristics that are associated with CBDs compared to areas outside of the CBD and the fact that the CBD has a very high concentration of the pedestrian HIN.

Maps that display population density by race with the pedestrian HIN are included at the end of this document.

When looking at overall population density regardless of race, it appears population density and the pedestrian HIN mileage are both generally positively associated. This means that as population density increases, the pedestrian HIN mileage also increases. This finding is expected as we typically expect there to be higher levels of exposure (i.e., trips, activity, volume) in areas with higher population densities and therefore higher crash frequencies.

When looking at population density by race, a different pattern emerges. Block groups that have higher densities of Black and Hispanic populations appear to have higher mileage of the pedestrian HIN within the block group (e.g., they are positively skewed). However, block groups with higher densities of white, Asian, and two or more race populations do not appear to have a positive association with pedestrian HIN mileage, meaning the HIN mileage does not appear to be higher or lower as it relates to population density. **This suggests there are pedestrian crash disparities in Black and Hispanic neighborhoods and communities with higher densities of people of color**[11]; these neighborhoods tend to have a higher proportion of the pedestrian HIN compared to predominately white, Asian, or two or more race neighborhoods.

When looking at the same block group data but excluding the block group that generally encompasses the CBD, the same patterns are present (see Figure C.8). However, the distribution for the white population is even more uniform, whereas Black, Hispanic, and communities of color are even more positively skewed (e.g., a stronger positive association and higher level of disparity).

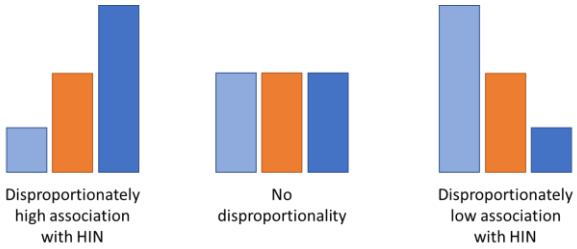
The findings suggest there is a positive association between block groups that have higher population densities of Black and Hispanic populations and pedestrian HIN mileage. This indicates that these communities have a disproportionate number of systemic safety issues.

[9] For each Census block group, the total mileage of the pedestrian HIN within 50 feet of the block group boundary was calculated. The 50-foot buffer was used to account for possible errors associated with the pedestrian HIN being located along Census block group edges.

[10] Native Hawaiian or Other Pacific Islander and American Indian or Alaska Native statistics were analyzed but are not displayed in these figures. The HIN mileage for those populations did not provide meaningful insight due to the relatively low population size.

[11] Includes all non-white populations.

Figure C.6 – Disproportionality Examples



Bar clusters that have higher values to the right and lower/fewer values to the left (such as the cluster on the left side of these examples) indicate there is more pedestrian HIN mileage associated with that demographic category. This would indicate there may be a disproportionate association between pedestrian HIN mileage and a particular racial/ethnic group. Where there are no discernable patterns between HIN mileage and population density (i.e. even distribution or the bar cluster in the middle of these examples), then there appears to be no discernable disproportionality. When there are higher values to the left and lower values to the right (the bar cluster on the right side of these examples), that may indicate a low association between race and the pedestrian HIN mileage.

Figure C.7 – Pedestrian HIN Mileage by Population Density and Race

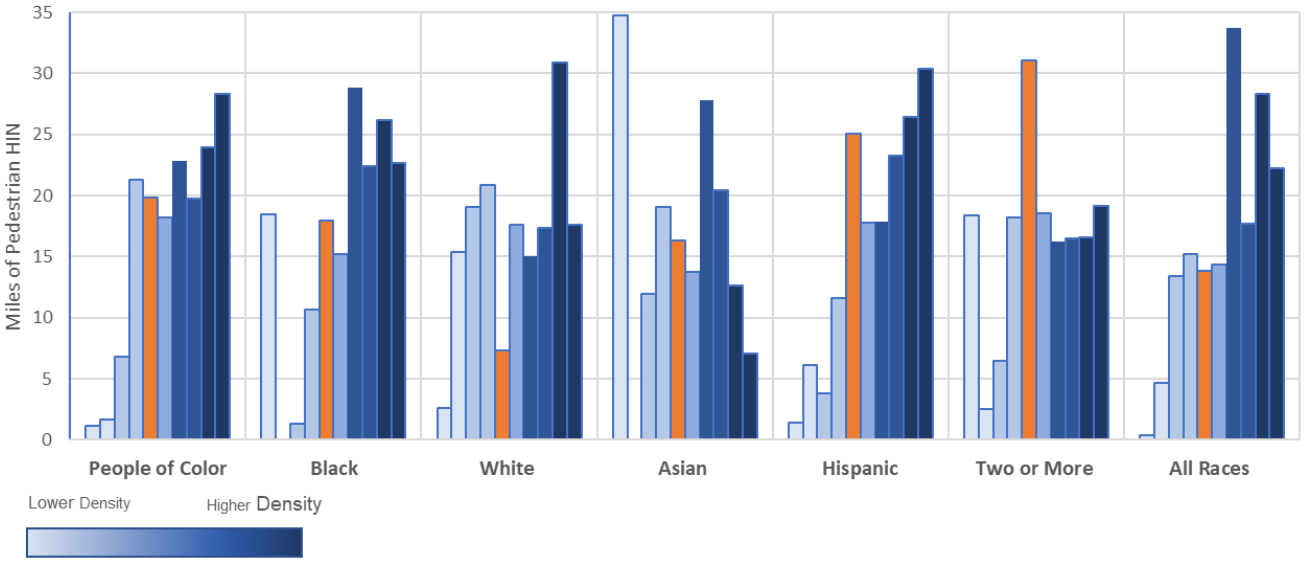
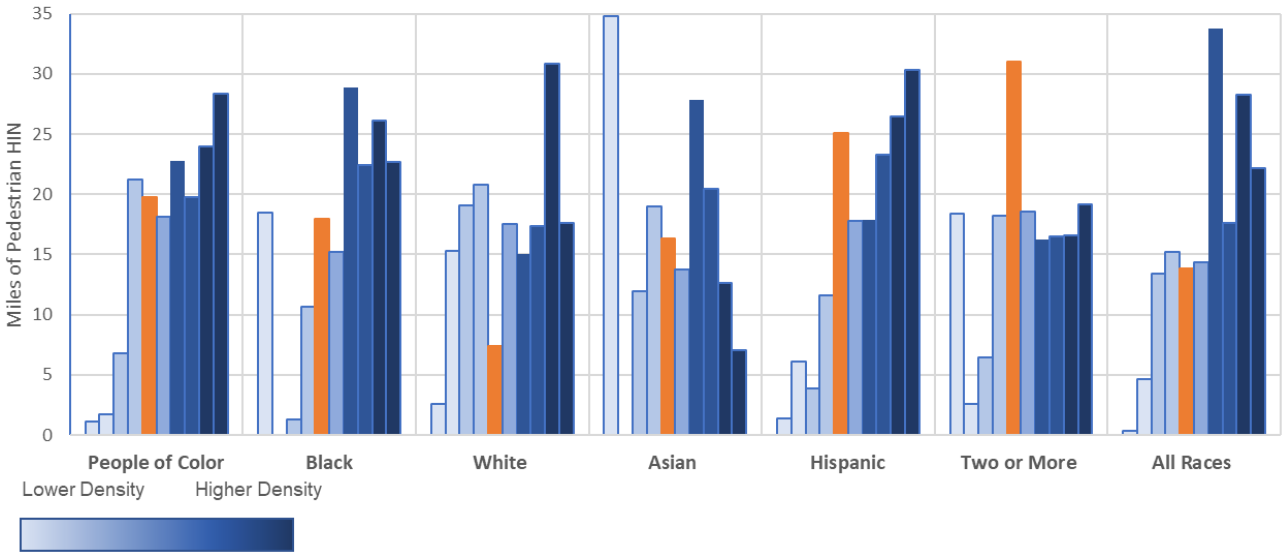


Figure C.8 – Pedestrian HIN Mileage by Population Density and Race – Excluding the CBD

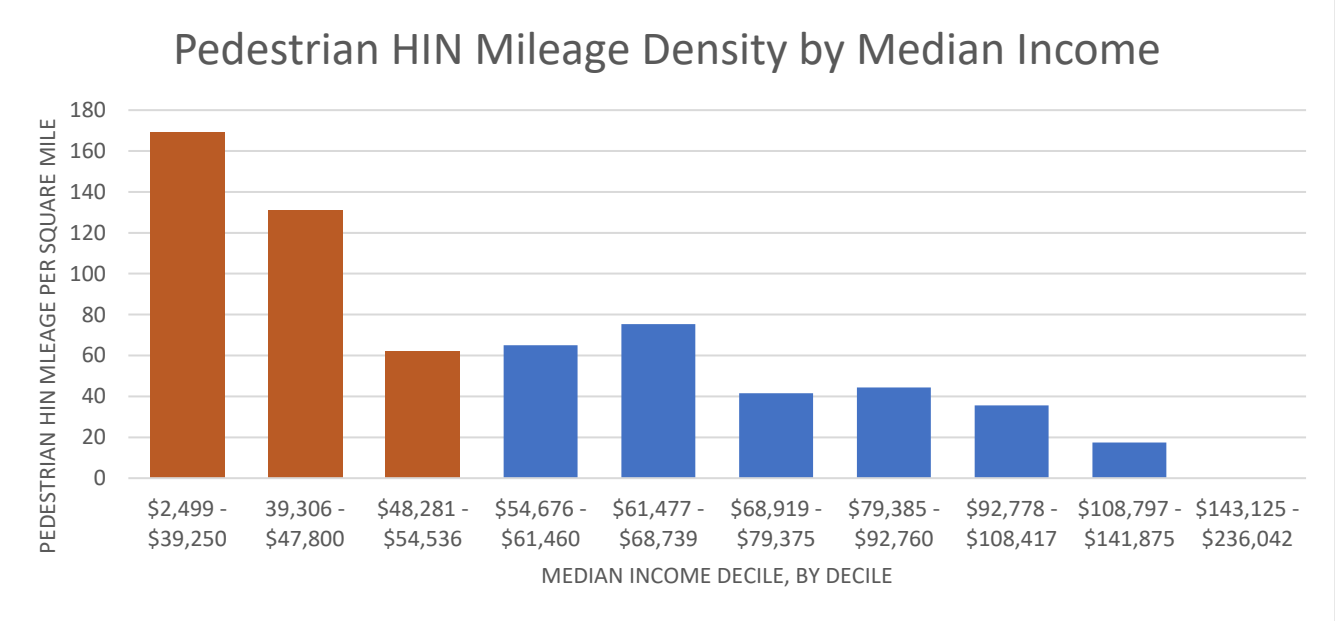


C.4.2 *Median Household Income*

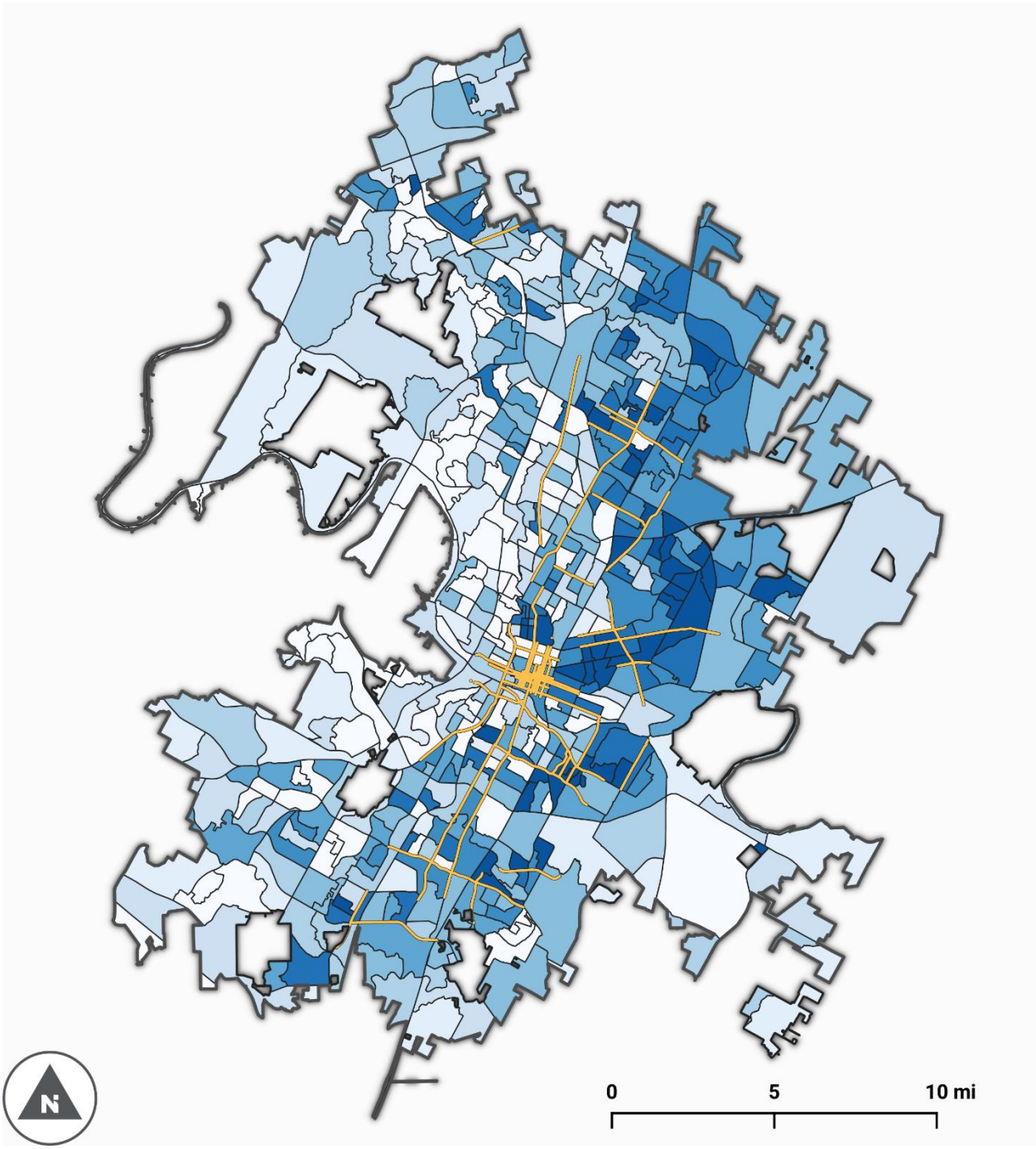
Median household income was analyzed as it relates to the density of the pedestrian HIN within Census block groups and is summarized in Figure by median incomes grouped into deciles. The lower three deciles (***orange*** colored columns) represent block groups that are at or below 80 percent of the median income in the City of Austin.

Figure C.9 suggests there are disparities when it comes to median household income and systemic safety issues. A negative association between pedestrian HIN density and median household income is observable by the higher pedestrian HIN density in neighborhoods that have lower median incomes compared to neighborhoods that have higher median incomes. In other words, as median income increases, the pedestrian HIN density decreases. This indicates that lower-income communities experience a greater burden in relation to systemic safety issues. A map that displays median household income with the pedestrian HIN can be viewed at the end of this document.

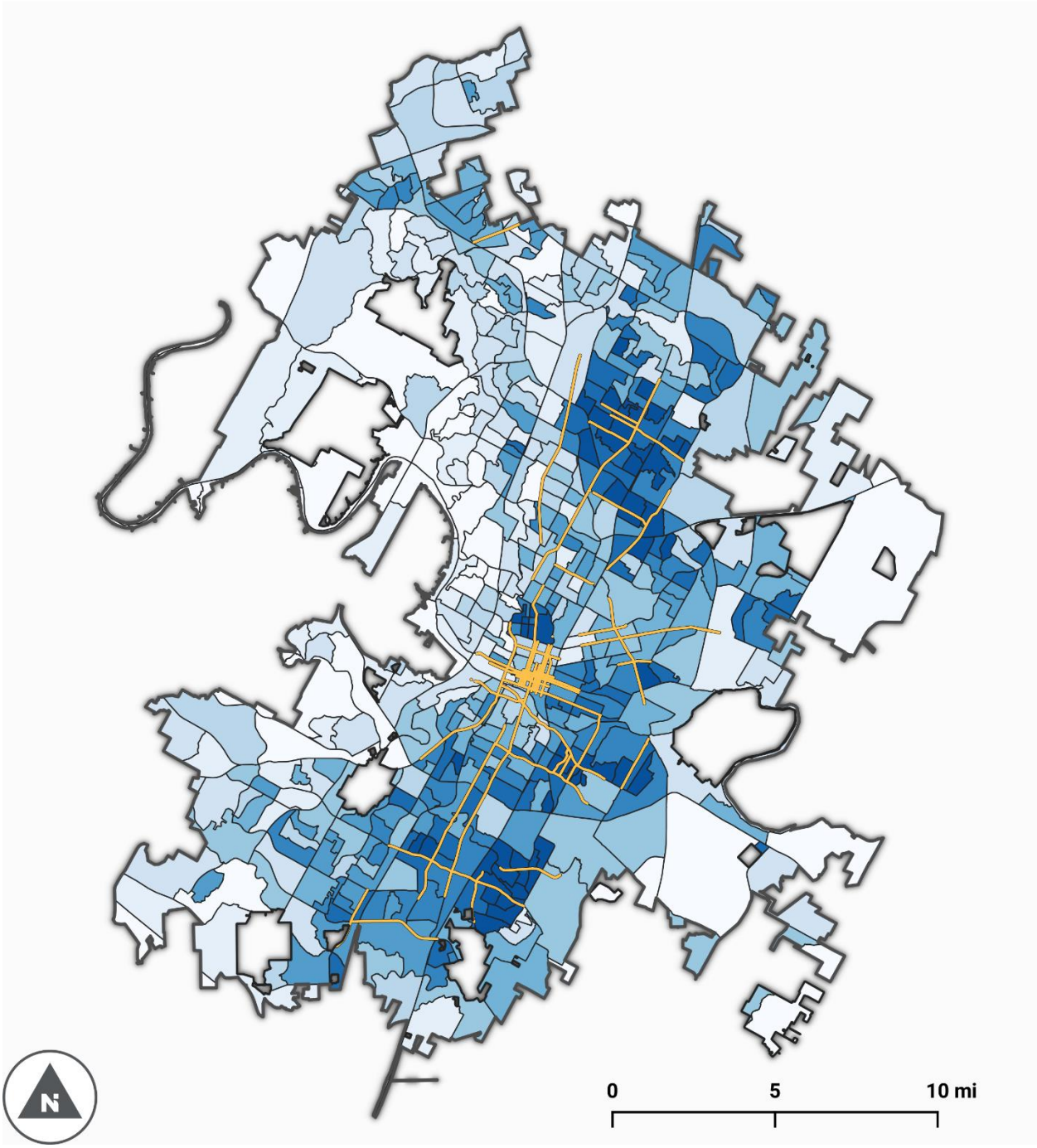
Figure C.9 – Pedestrian HIN Density by Median Income



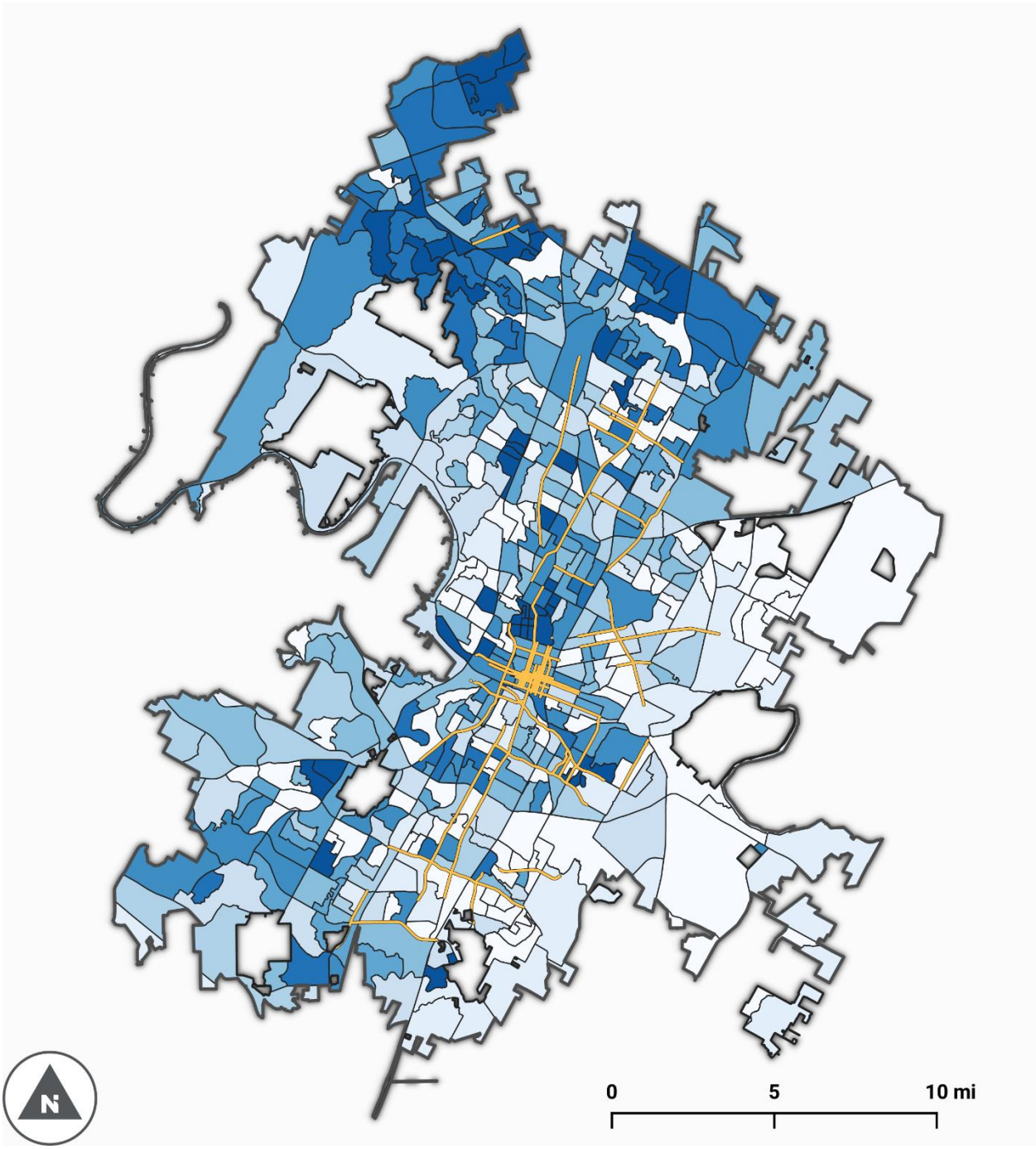
Austin ATXWBR:
Pedestrian HIN Mileage
Black Population Density
July 12, 2021



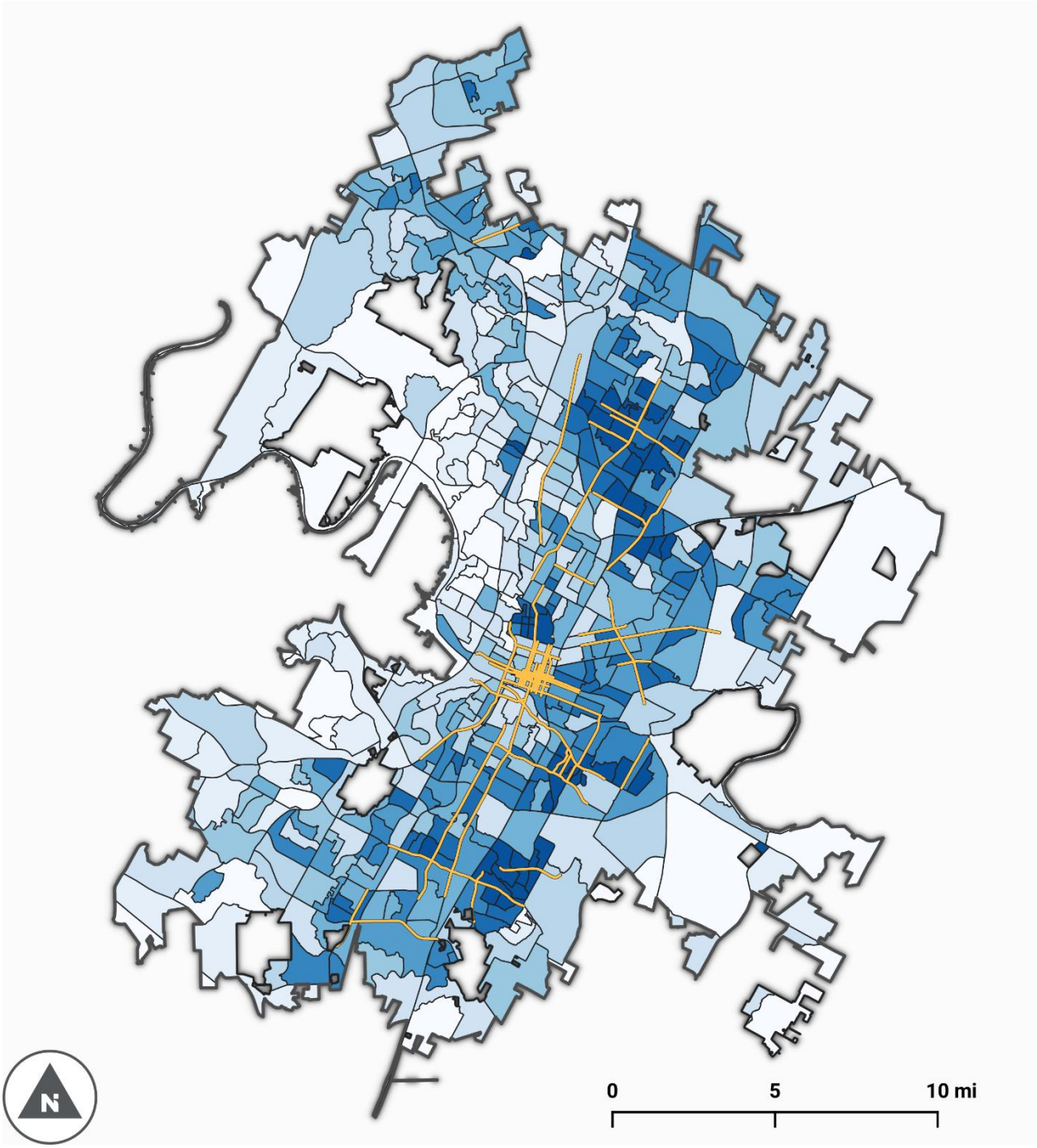
Austin ATXWBR:
Pedestrian HIN Mileage
Hispanic Population Density
July 12, 2021



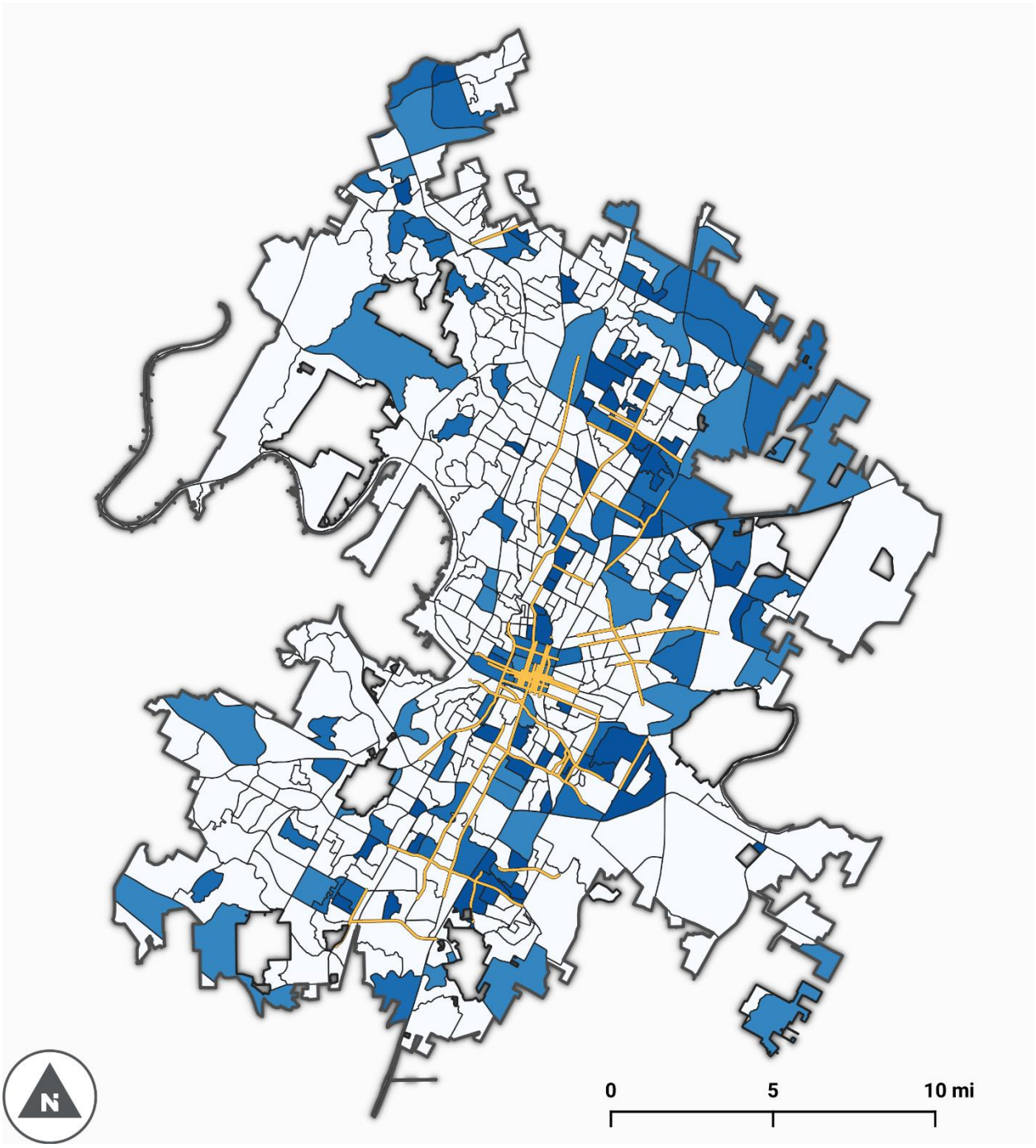
Austin ATXWBR:
Pedestrian HIN Mileage
Asian Population Density
July 12, 2021



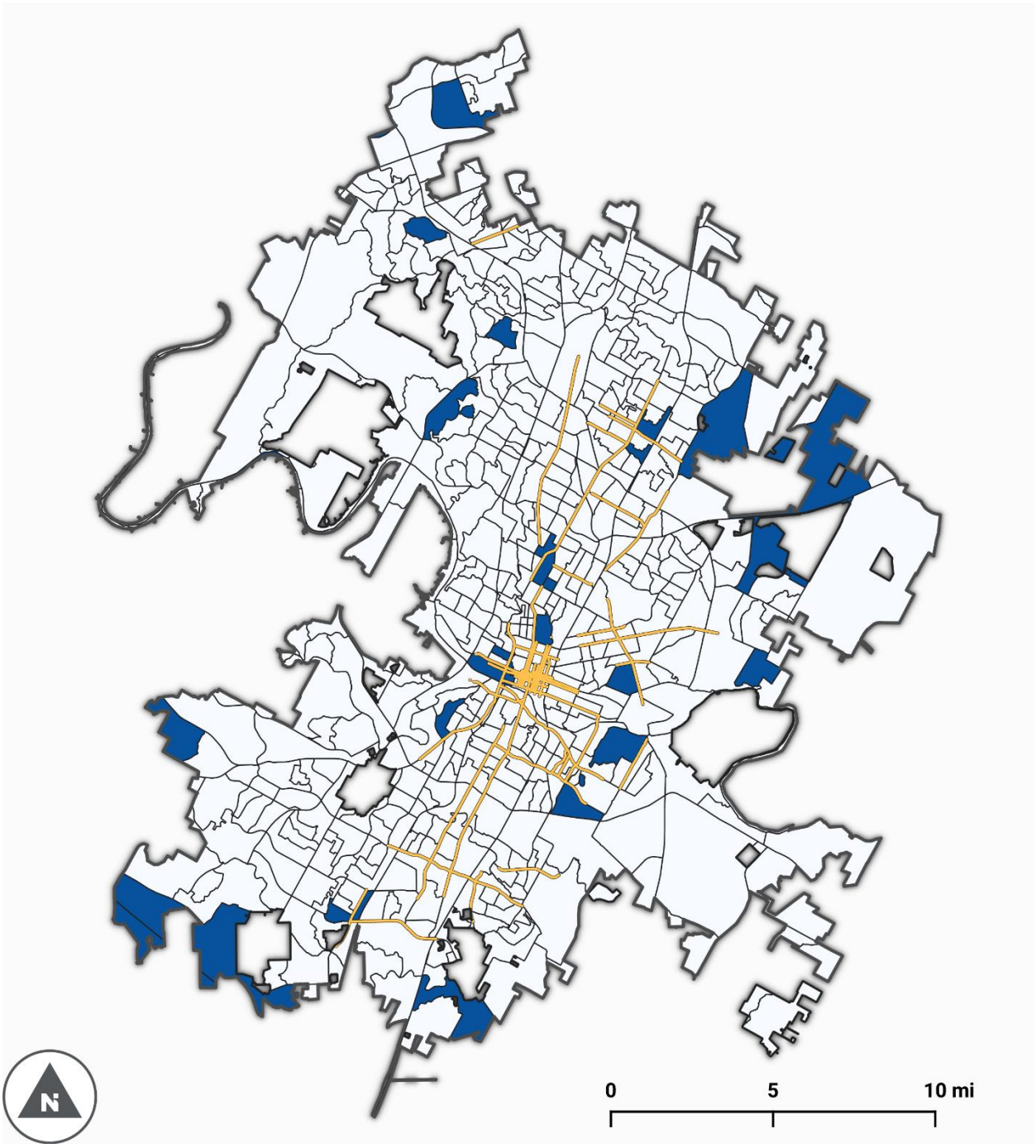
Austin ATXWBR:
Pedestrian HIN Mileage
People of Color Population Density
July 12, 2021



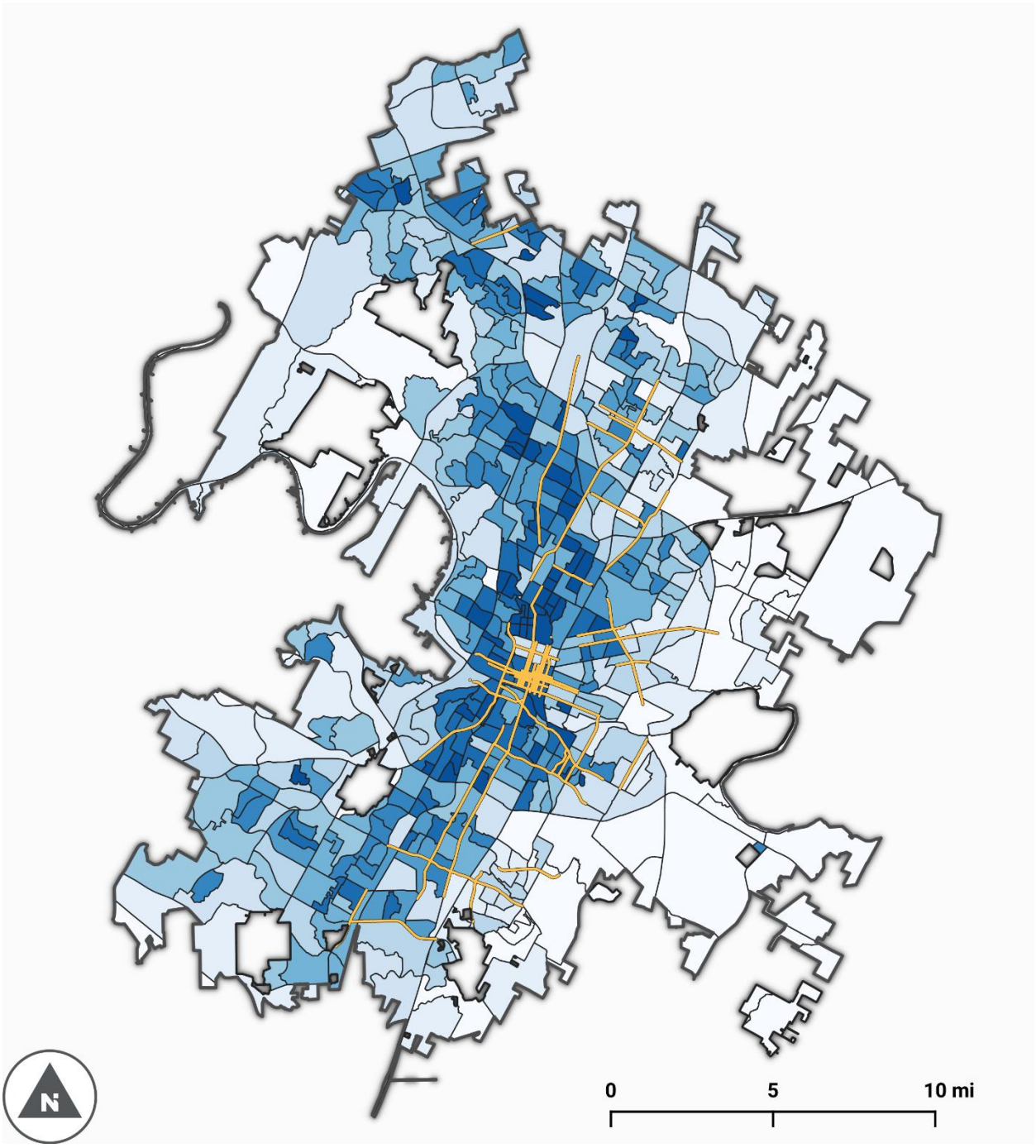
Austin ATXWBR:
Pedestrian HIN Mileage
Native Population Density
July 12, 2021



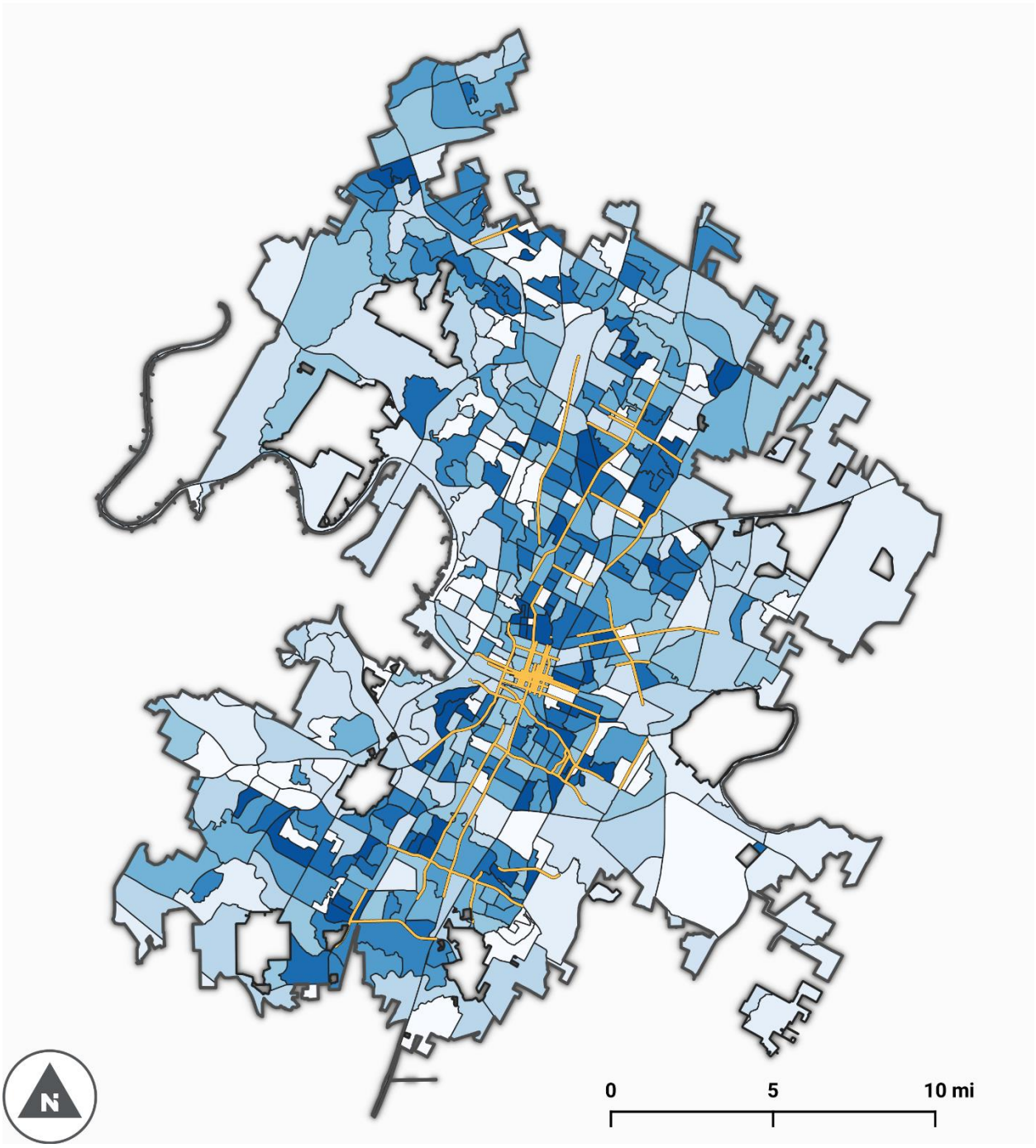
Austin ATXWBR:
Pedestrian HIN Mileage
Pacific Islander Population Density
July 12, 2021



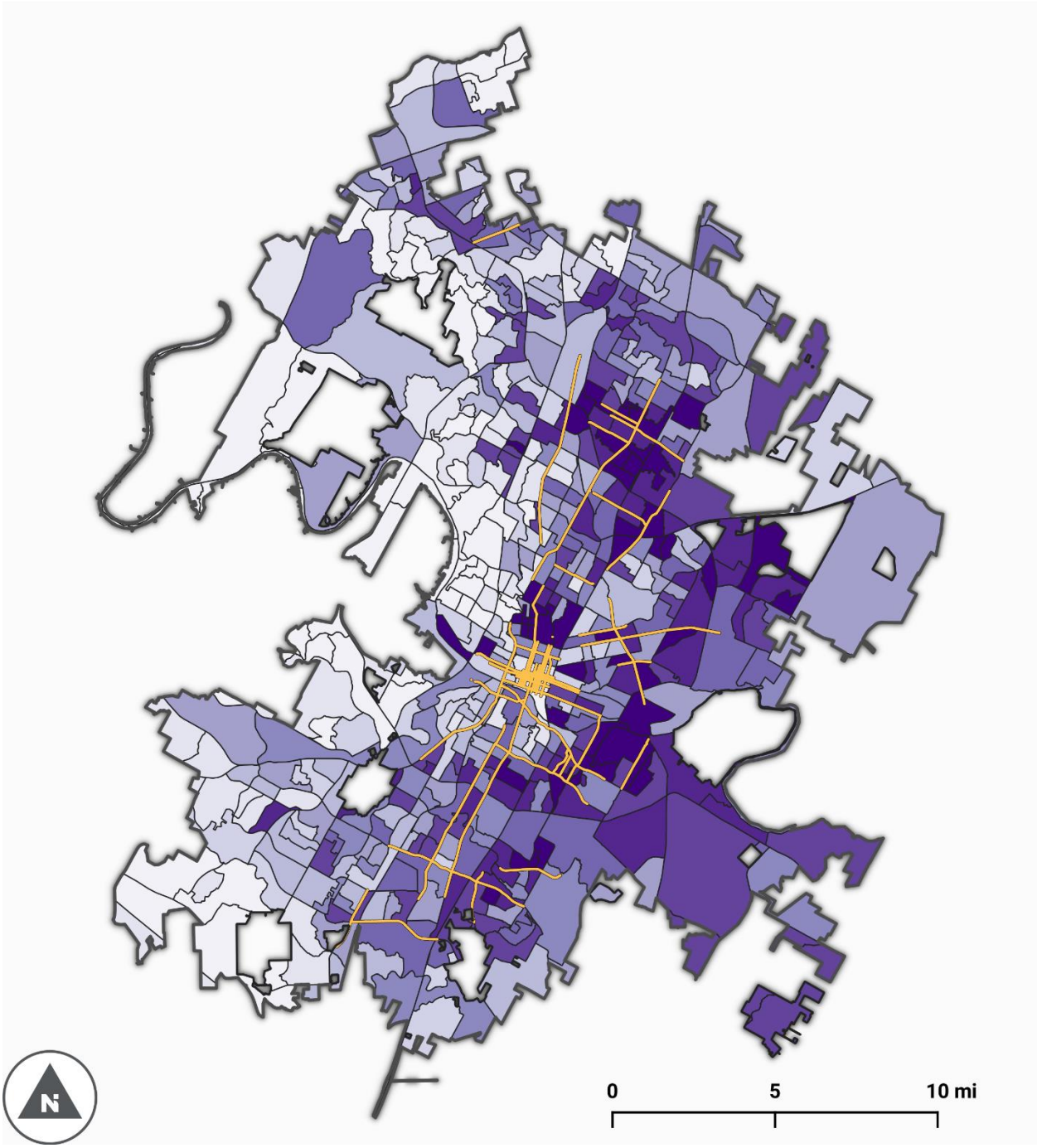
Austin ATXWBR:
Pedestrian HIN Mileage
White Population Density
July 12, 2021



Austin ATXWBR:
Pedestrian HIN Mileage
Two or More Races Population Density
July 12, 2021



Austin ATXWBR:
Pedestrian HIN Mileage
Median Household Income
July 12, 2021



APPENDIX D. NETWORK SCENARIOS

Given the cost and timeframe for complete buildout of the pedestrian network using only sidewalks, the Sidewalk Program developed three scenarios that mix levels of sidewalk and shared street investments for evaluation and presentation to the public. These scenarios were presented to the public during Phase 3 of the ATX Walk Bike Roll public engagement process. Participants were able to provide feedback on the scenarios themselves, as well as state their ideal mix of sidewalks and shared streets and voice level of support or opposition to the shared streets concept.

In addition to public feedback, the three 20-year sidewalk and shared streets scenarios were compared using three main criteria: the miles of pedestrian facilities added in each scenario, the percentage of the city that would be covered by the sidewalk network as a result of each scenario, and the percentage of properties that would have a continuous pedestrian route to a school/transit as a result of each scenario. Results of this evaluation are shown in Figure D.1.

Because all three scenarios are adding mileage to the pedestrian network, all three scenarios increase citywide coverage and access. Since shared streets cost less than sidewalks, more miles of shared streets can be built at the same investment level. Therefore, the scenario with the most shared streets—Scenario 3—added the most mileage and increased coverage the most. When comparing the scenarios based on improved access, Scenario 3 also increases access to schools the most. However, this is not the case for transit. Because transit is typically along busier streets where shared street treatments are not compatible, Scenario 2 (which includes more miles of sidewalks than Scenario 3) provides the greatest increase in access to transit. In most ways, each scenario benefits *Most Vulnerable* and *Medium-High Vulnerable* EAZs[12] to a greater degree than the citywide average. However, Scenario 2 puts these areas at a slight disadvantage for access to schools while Scenario 3 yields a slight disadvantage for total coverage.

Public input and the coverage and access evaluation support a significant proportion of shared streets in the buildout plan for the pedestrian network. Therefore, the scenario chosen for moving forward is a blend of sidewalks and shared streets, which means building approximately 34 miles of new sidewalk and 20 street centerline miles of shared street each year over the next 20 years.

[12] Equity Analysis Zones (EAZ) are based on Census tracts and include nine different US Census American Community Survey (ACS) variables that reflect an area's social and Economic vulnerability. The EAZs are classified into five different categories, from Least Vulnerable to Most Vulnerable.

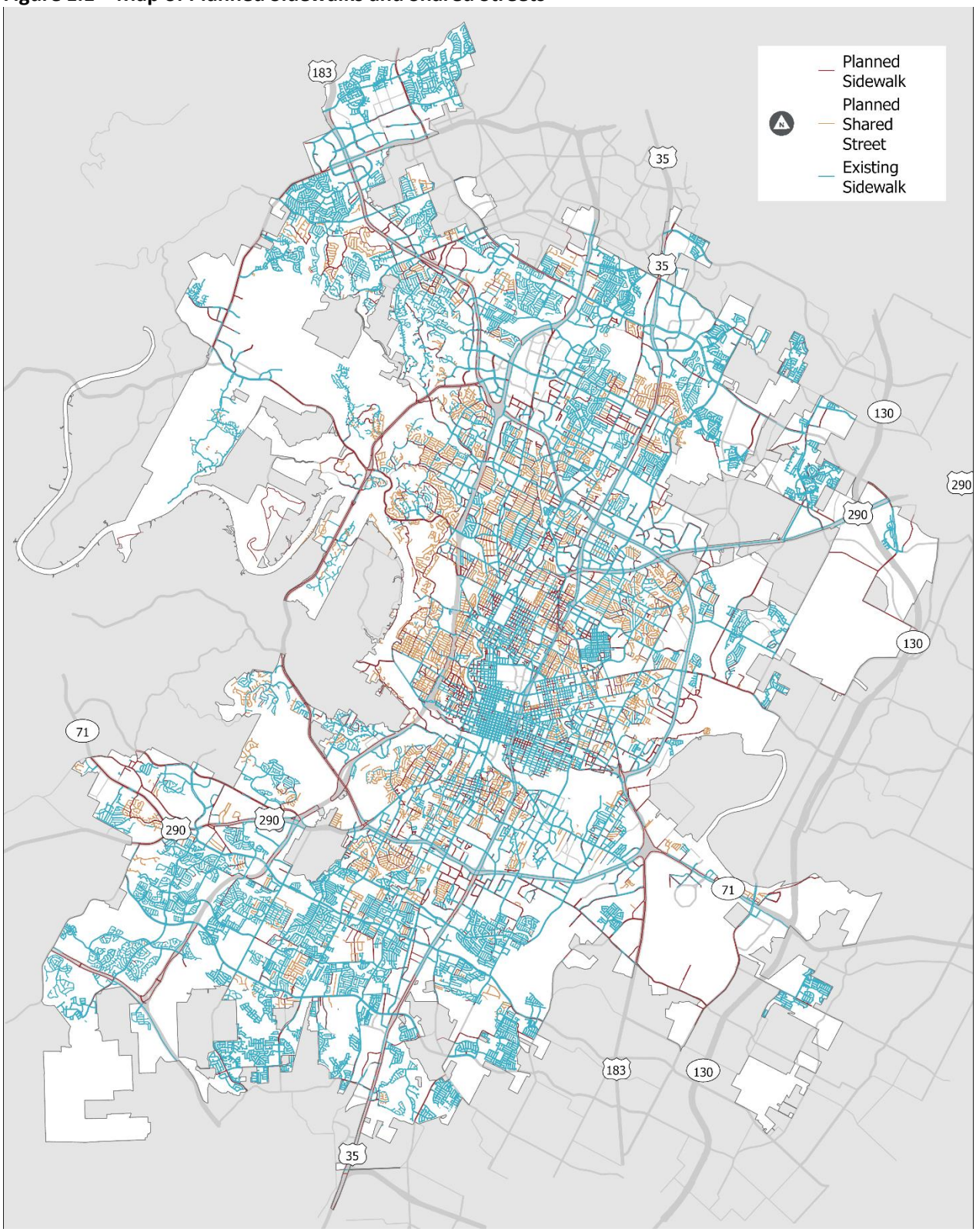
Figure D.1 Sidewalk and Shared Street Scenario Comparison

Criteria	Current Conditions	 Mostly Sidewalks	 An Even Mix	 Lots of Shared Streets
Network Additions (20 years)		**300** miles of sidewalks **90** miles of shared streets	**250** miles of sidewalks **250** miles of shared streets	**200** miles of sidewalks **390** miles of shared streets
Coverage (citywide)	61%	70%	78%	82%
Coverage (Most Vulnerable and Medium-High Vulnerable EAZs)	60%	72%	80%	81%
Access to Schools* (citywide)	51%	62%	68%	71%
Access to Schools* (Most Vulnerable and Medium-High Vulnerable EAZs)	53%	66%	67%	73%
Access to Transit** (citywide)	35%	49%	53%	52%
Access to Transit** (Most Vulnerable and Medium-High Vulnerable EAZs)	38%	52%	56%	55%

**Percent of properties within 2 miles of a school with continuous sidewalk or shared street access to a school.*
**Percent of properties within 0.25 miles of a transit stop or station with continuous sidewalk or shard street access to a stop or station.*

APPENDIX E. SIDEWALK AND SHARED STREET NETWORK PLAN MAP

Figure E.1 – Map of Planned Sidewalks and Shared Streets



APPENDIX F. SIDEWALK AND SHARED STREET PROJECT PRIORITIZATION METHODOLOGY

A primary focus of the 2009 Sidewalk Plan was the development of an objective prioritization method with diverse stakeholder input to produce prioritization maps for the citywide network. The methodology and the datasets were updated for the 2016 Update with only minor changes to the prioritization criteria matrix previously developed. The methodology has been further refined for the 2023 Sidewalks, Crossings, and Shared Streets Plan.

The method uses GIS software to analyze hundreds of thousands of planned and existing sidewalk and shared street segments using dozens of geographic datasets to provide an objective score for each segment. The scored segments can be reviewed within the GIS software or displayed on a map. The tool produces planned and existing sidewalk and shared street prioritization layers using the methodology and scoring system initially developed in the 2009 Sidewalk Master Plan, updated to reflect better data sources and to make it easier for the City to update the data and run the tool as frequently as needed.

Sidewalk and shared street prioritization scores have two components – the Pedestrian Attractors Score, which estimates pedestrian activity, and the Pedestrian Safety Score, which estimates safety risks. Figure F.1 shows a summary of the factors and weights used for sidewalk prioritization.

Pedestrian Attractors Score (PAS) Base Score Weight 56%	
Factor	**Weight**
Proximity to Attractors	45%
Residential Population	25%
Median Household Income	5%
Existing Facilities on the Street	10%
Requests	10%
Core Transit Corridors	2.5%
Bicycle Lanes	2.5%
Pedestrian Safety Score (PSS) Base Score Weight 44%	
Factor	**Weight**
Street Classification	45%
Pedestrian Health & Safety Status	35%
Pedestrian Automobile Crashes	35%

Figure F.1 Sidewalk Prioritization Factors and Weights

Prioritization rankings are intended as a tool to allocate limited City of Austin sidewalk and shared street resources; just because a particular section of sidewalk is ranked as a lower priority does not mean it is not a necessary component of a complete pedestrian network. Prioritization scores are divided into five categories from *Very High* to *Very Low* priority. Maps of the planned sidewalk and planned shared street network by priority are shown in Appendix E. Implementation of *Very High* and *High* priority projects is the focus of the 2023 Plan. An estimated 43 percent of the *Very High* and *High* priority sidewalks and shared streets are located in Focus EAZs (which contains only 28 percent of the planned sidewalk and shared street network).

F.1 Changes to the Methodology

Changes to the methodology compared to the 2016 version include:

- Use of more consistently updated input datasets, some of which are open source (the previous models required City staff to manually compile data).
- Expansion of the definition of "grocery store" to include smaller stores where people can buy food.
- Development of a new Pedestrian Health and Safety Status component, which uses regularly updated data from the Centers for Disease Control (CDC).
- Changes to which affordable housing data points are considered, so that the tool only considers affordable housing that will be guaranteed affordable for at least 5+ years and that serves the people at or below 80% of the median family income level.
- Adjusting the methodology to score entire blocks (all planned or existing sidewalks or shared streets on the same block) to improve clarity and provide flexibility in implementation.
- Removal of the Neighborhood Plan Score component, due to the inconsistent presence of neighborhood plans across the city, outdatedness of many of these plans, and inequity of this component.
- Creating a new Geographic Information System (GIS)-based prioritization tool that is compatible with the City of Austin's current GIS software while being faster and easier to run.

F.2 Scoring Matrix

The sidewalk prioritization methodology was developed to provide consistent, unbiased prioritization results in an analytical, objective manner to the City of Austin for over 300,000 sidewalk segments. The sidewalk base score is divided into two parts: the Pedestrian Attractor Score (PAS) and the Pedestrian Safety Score (PSS). Points are awarded to each sidewalk segment based on its proximity to PAS and PSS elements. Proximity is measured by two buffers around the sidewalk segment, at 1/8 mile and 1/4 mile. The Pedestrian Attractor Score accounts for 56% of the base score. Points are awarded based on the elements shown in Figure F.2

Figure F.2 – Pedestrian Attractors Score (PAS) Scoring Matrix

Score Range: 0 – 100 Base Score Weight: 56%

Element	Criteria	Data Source	Points	
Proximity to Attractors Weight 45% (max 100 pts)	Multiply Possible Points by number of attractors within specific radius of:		**1/8 Mile**	**1/4 Mile**
	State or Local Government Offices	COA Parcels Data (Land Use Code 630) and COA Building Footprints layer	10x	5x
	Commuter Rail Stations	Open Streets Map	10x	5x
	Public or Private Schools	Open Streets Map	10x	5x
	Transit Stops (Rail and Bus) (Max of 50 pts)	Cap Metro	9x	4.5x
	Grocery Stores (Supermarkets, Bakeries, Convenience Stores, Butchers, General Stores, Green Grocers)	Open Streets Map	9x	4.5x
	Places of Public Accommodation (Police and fire stations, post offices, libraries, community centers, arts centers, museums, attractions, parks, playgrounds, sports centers, healthcare facilities)	Open Streets Map	8x	4x
	Places Older Adults Frequent (Community centers, nursing homes, pharmacy, healthcare facilities)	Open Streets Map	8x	4x
	Employers with > 500 Employees	LEHD; US Census Bureau	8x	4x
	Income Restricted Affordable House Secured though City and Federal Programs for every 25 units	COA Affordable Housing Inventory	7x	3.5x
	Public Parking Facilities	Open Streets Map	5x	2.5x
	Religious Institutions	Open Streets Map	5x	2.5x
Residential Population Weight 25%	Total population residing within 1/2-mile radius of proposed project?	US Census Bureau		
	a) Population >/= 8,000		100	
	b) Population >/= 4,000 and < 8,000		75	
	c) Population >/= 1,000 and < 4,000		50	
	d) Population >/= 500 and < 500		25	
	e) Population < 500		0	
Element	**Criteria**	**Data Source**	**Yes**	**No**
Median Household Income Weight 5%	Within a census tract at or below Median Household Income	US Census Bureau	100	0
Existing Facilities on Street Weight 10%	For Level 2, 3, and 4 streets and Level 1 streets in commercial areas (defined in Section 2.4 of the Transportation Criteria Manual), are there complete sidewalks on both sides of the street?	COA Street Centerline Data	0	100
	For Level 1 residential streets, is there an existing complete sidewalk on either side of the street?	COA Street Centerline Data	0	100
Requests Weight 10%	Was the project requested by ADA Task Force?		75	0
	Was the project requested by a citizen through 311?		25	0
Core Transit Corridors Weight 2.5%	Is the sidewalk within a 1/4 mile of a Core Transit Corridor?	Cap Metro	100	0
Bicycle Lanes Weight 2.5%	Are there bike lanes on both sides of the street?	Austin Transportation Department	100	0

The Pedestrian Safety Score accounts for 44% of the base score. Points are awarded based on the elements shown in Figure F.3 below.

Figure F.3 – Pedestrian Safety Score (PSS) Scoring Matrix

Score Range: 0 – 100 Base Score Weight: 44%

Element	Criteria	Data Source	Points
Street Classification Weight 45%	a) Street Level 3, 4, or 5	COA Street Centerline Data	100
	b) Street Level 2		75
	c) Street Level 1		50
Pedestrian Health and Safety Status Weight 35%	a) Very High Needs	CDC PLACES Database	100
	b) High Needs		75
	c) Moderate Needs		50
	d) Low Needs		25
	e) Very Low Needs		0
Pedestrian/Automobile Crashes Weight 20%	Number of crashes reported to APD involving pedestrians and motorized vehicles in previous 36 months multiplied by 10 (only applied to sidewalk on the street where the incident took place)	Austin Police Department	10x (max 100 pts)

F.3 Data Sources

The GIS datasets used in the prioritization tool are from a variety of sources, but can be generally categorized in three ways:

- datasets actively maintained by COA Public Works, such as sidewalks and ramps
- datasets maintained by other City departments, such as bike lanes and street levels
- datasets maintained by others, such as census blocks and pedestrian attractors

The GIS data for sidewalks, ramps, and driveways were originally developed from aerial imagery flown in 2003 and 2006, and updated in 2009. These data are actively maintained by the City, as new sidewalks are constructed in place of absent sidewalks or with new development.

Ongoing Maintenance
The GIS datasets will require ongoing maintenance so that the prioritization scoring is based on current data. The City of Austin Sidewalk Program is responsible for maintaining updates to the GIS datasets. The dataset maintenance procedures vary based on the source and condition of the datasets. Some datasets are used by the tool with little or no preprocessing, while other datasets require processing prior to use.

Several new datasets are incorporated in the 2022 Update of this tool, including pedestrian attractor data from Open Street Map, employment data from the US Census Bureau's Longitudinal Employer-Household Dynamics database, and a composite dataset created from the Centers for Disease Control's PLACES database. The purpose of these new datasets is to provide a more consistently updated source of information so that the Sidewalk and Shared Street Prioritization Tool can be rerun more easily, more regularly, and more confidently.

F.3.1 *Open Street Map (OSM)*

Open Street Map is an open-source geospatial database that includes data on a variety of destination types. OSM Data can be downloaded from http://download.geofabrik.de/north-america/us/texas.html This website is maintained by a German company that offers cleaned/modified OSM datasets for a fee. However, they provide

the raw datasets for free. Data is downloaded as a ZIP file that contains statewide data for Texas and more layers than are necessary for this analysis. The relevant layers are:

- Points of Interest (POI)
- Places of worship
- Transport
- Traffic

The following filters are applied to the data to create each of the attractor inputs listed below:

- Commuter Rail Station (Transport) – Code – 5601 ('railway_station')
- Public/Private Schools (POI) – Code = 2082 ('school'), 2083 ('kindergarten')
- Grocery (POI) – Code = 2501 ('supermarket'), 2502 ('bakery'), 2511 ('convenience'), 2503 ('kiosk'), 2510 ('general'), 2516 ('butcher'), 2528 ('greengrocer')
- Public Accommodation (POI) – Code = 2001 ('police'), 2002 ('fire_station'), 2005 ('post_office'), 2007 ('library'), 2012 ('community_centre'), 2014 ('arts_centre'), 2721 ('attraction'), 2722 ('musuem'), 2204 ('park'), 2205 ('playground'), 2251 ('sports_centre'), 2110 ('hospital'), 2120 ('doctors'), 2121 ('dentist'), 2101 ('pharmacy'), 2111 ('clinic')
- Places Older Adults Frequent (POI) – Code = 2012 ('community_centre'), 2013 ('nursing_home'), 2101 ('pharmacy'), 2120 ('doctors'), 2111 ('clinic')
- Religious Institutions (Places of Worship) – Full layer dataset
- Public Parking Facilities (Traffic) – Code = 5260 ('parking'), 5261 ('parking_site'), 5263 ('parking_underground'), 5262 ('parking_multistory')

F.3.2 *Longitudinal Employer-Household Dynamics (LEHD; US Census Bureau)*

The US Census Bureau published data on where jobs are located and provides a data viewer (https://onthemap.ces.census.gov/) that can easily be used to download GIS data. The data download provides count of employees (jobs) per Census block.

F.3.3 *Pedestrian Health and Safety Status*

For previous versions of the Sidewalk Prioritization Tool, the Pedestrian Health and Safety Status dataset was prepared by another department within the City. However, the original dataset is no longer being updated. Therefore, an alternative dataset that is regularly updated and can serve as an appropriate replacement was identified. The Centers for Disease Control's CDC PLACES includes a database of various public health indicators. They are grouped as A) Health Outcomes indicators (obesity rates, etc.), B) Prevention indicators (prevalence of health insurance, etc.), C) Health Risk Behaviors indicators (binge drinking, etc.) and D) Health Status indicators (reported general health status).

CDC PLACES is based on the annual Behavioral Risk Factor Surveillance System survey. PLACES reports county-, place-, census tract-, and ZCTA-level data and uses small area estimation methods to obtain 29 (27 in the 2020 release) chronic disease measures for the entire United States. PLACES was last updated December 2021 based on the BRFSS 2019 survey.

Dataset Factors for PSS

Walking has been demonstrated to improve specific health outcomes related to: high blood pressure, depression, cardiovascular disease, diabetes, and obesity (Walking and Health, Walking and Diabetes). Research shows physical activity reduces risk of heart disease, high blood pressure, obesity, diabetes, depression, stroke. PLACES includes multiple datasets that indicate the prevalence of health outcomes that could be improved by increased access to comfortable places to walk. The following specific outcome indicators are used to create a composite score:

1. Obesity
2. Cardiovascular Disease
3. High Blood Pressure
4. Diabetes
5. Depression
6. Stroke

Scale and Creating a Composite

The indicators identified above are combined into a composite dataset at the Census Tract scale. After downloading the six datasets above, the raw values (which represent percent of population affected) must be manually rescaled in a range of 0 to 100. Then, an evenly-weighted composite of the 0-100 values is manually created. City of Austin staff should perform this process regularly (annually or as updated data is available is recommended). Points are then awarded as follows:

Composite Score	Classification	Points awarded in the PSS
80-100	Very High Needs	100
60-80	High Needs	75
40-60	Moderate Needs	50
20-40	Low Needs	25
0-20	Very Low Needs	0

F.4 Updated Calculation Methodology

Below is documentation of how the Sidewalk and Shared Street Prioritization Tool calculates scores.

PAS Score (56% or overall score)

- "pas_attractor_score" (45% of PAS Score)
    - This score is calculated by looking at the following destinations and assigning scores based on how many destinations are within 1/8 mile, 1/4 mile. Each category is capped to a certain maximum number of points and the "pas_attractor_score" is also capped to a maximum number of 100 points. The score for each destination below follows the format of (X,Y,Z) where X is points per destination within 1/8 miles, Y is points per destination within 1/4 miles and Z is the maximum number of points that a given destination type can receive.
        - "State or Local government offices": (10, 5, 100) – This is calculated by counting the number of features in the "building_foorptints" layer that intersect with "land_use_parcels" features coded as government buildings (land_use_code = 630).
        - "Commuter Rail Stops": (10, 5, 100) – OSM data
        - "Public or Private Schools": (10, 5, 100) – OSM data
        - "Transit Stops": (9, 4.5, 50) – CapMetro data
        - "Grocery Stores": (9, 4.5, 100) – OSM data
        - "Public Accommodations": (8, 4, 100) – OSM data
        - "Places Older Population Frequent": (8, 4, 100) – OSM data
        - "Blocks with > 500 Jobs": (8, 4, 100) – Census LEHD data
        - "Affordable Housing": (7, 3.5, 100) – this is per 25 units – COA data (only include those whose affordable period is at least 5 years into the future)
        - "Parking Facilities": (5, 2.5, 100) – OSM data

        - "Places of Worship": (5, 2.5, 100) – OSM data
- “pas_population_score": 25% of PAS score
    - Count the total population living within 0.5 miles of a segment based on intersection between Census blocks and 0.5 mile segment buffer
- "pas_income_score": 5% of PAS score
    - If a segment intersects with a Census tract with median household income <= $50000, then it receives 100 pts, otherwise it receives 0 pts
- "pas_sw_coverage_score": 10% of PAS score
    - We use a street network layer which is an output of Network Tools which joins sidewalks to street centerlines. This layer has information on whether there is existing sidewalk on one side, both sides, or no sides of the street. This layer also has information on street level
    - This layer is joined with the prioritization layer using ArcGIS’s conflation tools.
    - For street_level = 1 with sidewalk coverage on one side and for street_level > 1 with sidewalk coverage on both sides, there is adequate sidewalk coverage and they receive 0 points. For streets without adequate sidewalk coverage, they receive 100 points
- "pas_requests_score": 10% of PAS score
    - 75 points if a segment overlaps with ADA task force request layer for 100 feet. The ADA task force layer is the same one used in the previous plan
    - 25 points if a segment is within 100 feet of a 311 request which is categorized as ‘Sidewalk Repair’. The data is obtained from the city’s open data portal
- "pas_transit_score": 2.5% of PAS score
    - If the segment overlaps with the transit corridors layer, it receives 100 pts, otherwise it receives 0 pts.
    - This transit layer is obtained by merging the following layers
        - ASMP network with the query *“PRIORITY_NETWORK LIKE '%Transit%' Or PRIORITY_NETWORK LIKE '%transit%'”*
        - Core transit corridors layer from the city’s open data layer
        - Project Connect routes layer from the city
- "pas_bike_lane_score": 2.5% of PAS score
    - If a segment overlaps with bike lanes layer, it receives 100 pts. Otherwise, it receives 0 pts

PSS Score (44% of overall score)

- "pss_street_level_score": 45% of PSS score
    - Scores based on street level

Street Level	Score
1	50
2	75
3, 4, or 5	100

- "pss_health_safety_score": 35% of PSS score
    - Health and safety score data set is updated from a selection of CDC PLACES layer

    - The scores are all rescaled based on percentiles instead of linear so that there is an even spread of scores
    - Scores are assigned based on the highest health needs level in Census tracts that intersect with a segment as follows
- "pss_crash_score": 20% of PSS score
    - 10 points for every pedestrian crash within 100 feet of the features (up to a maximum of 100 points)

APPENDIX G. SIDEWALK AND SHARED STREET CONDITIONS AND PRIORITIES (MAPS AND TABLES)

Figure G.1 – Map of Planned Sidewalk and Shared Street Priorities

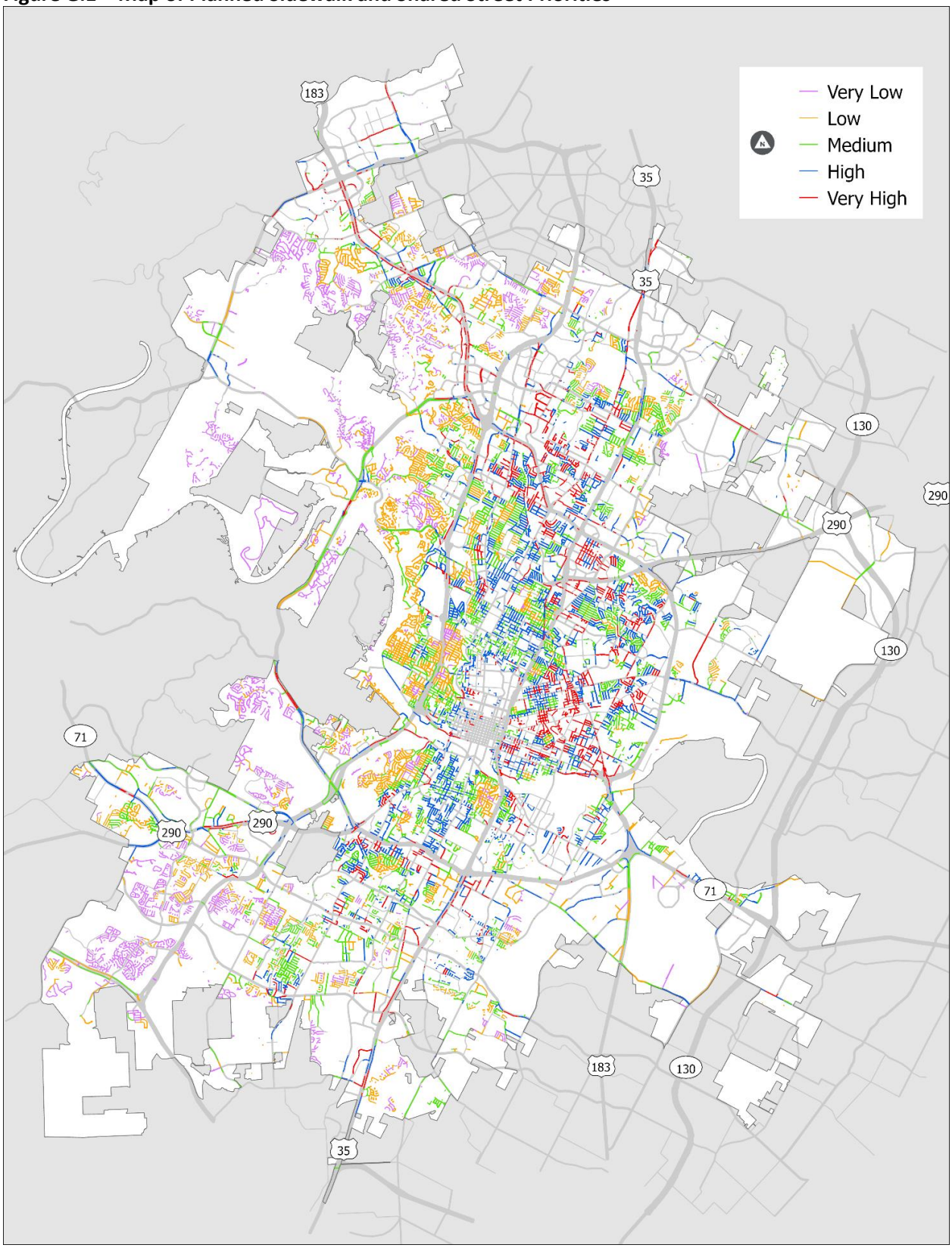


Figure G.2 – Map of Existing Sidewalk Priorities

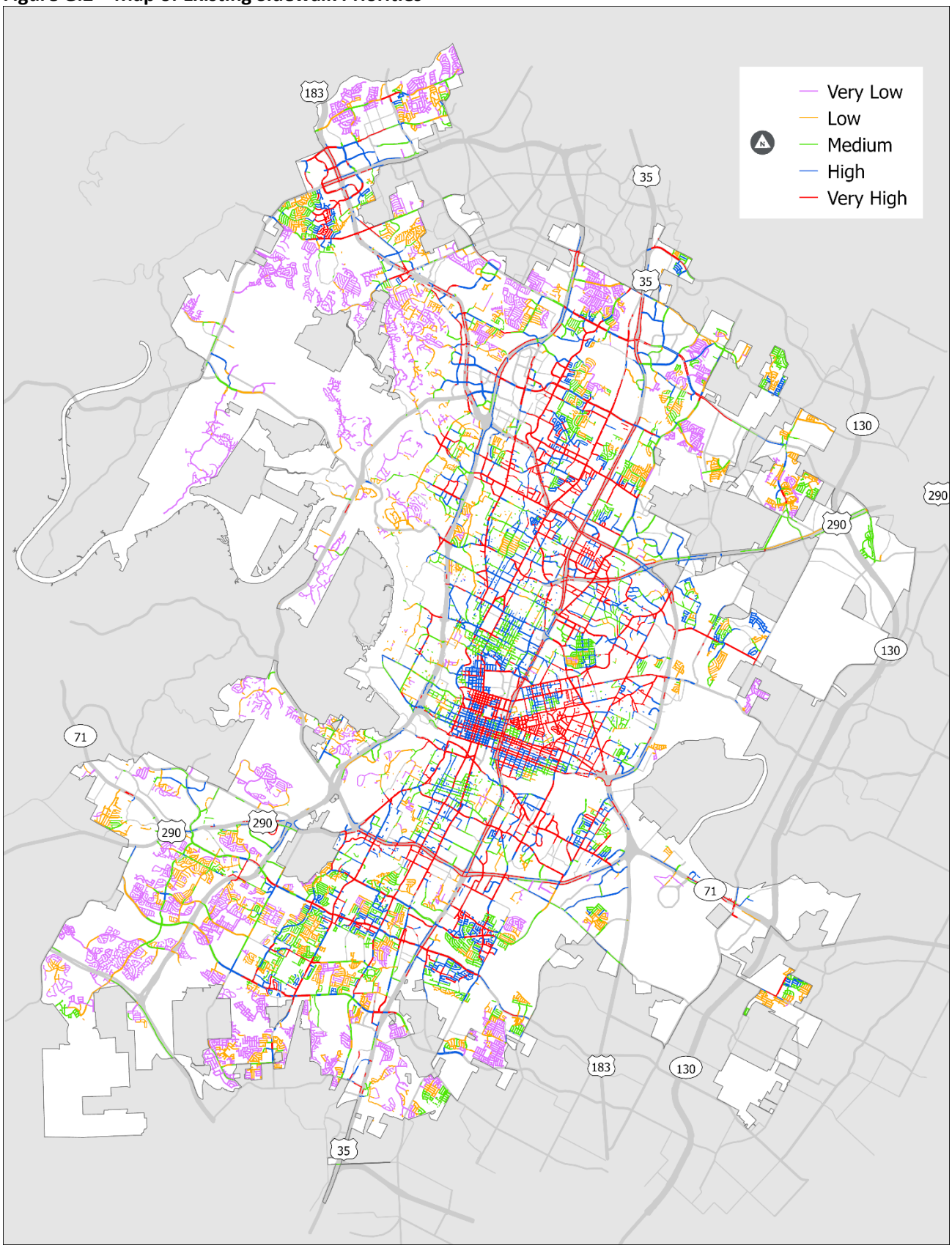


Figure G.3 – Map of Existing Sidewalk Conditions Assessment

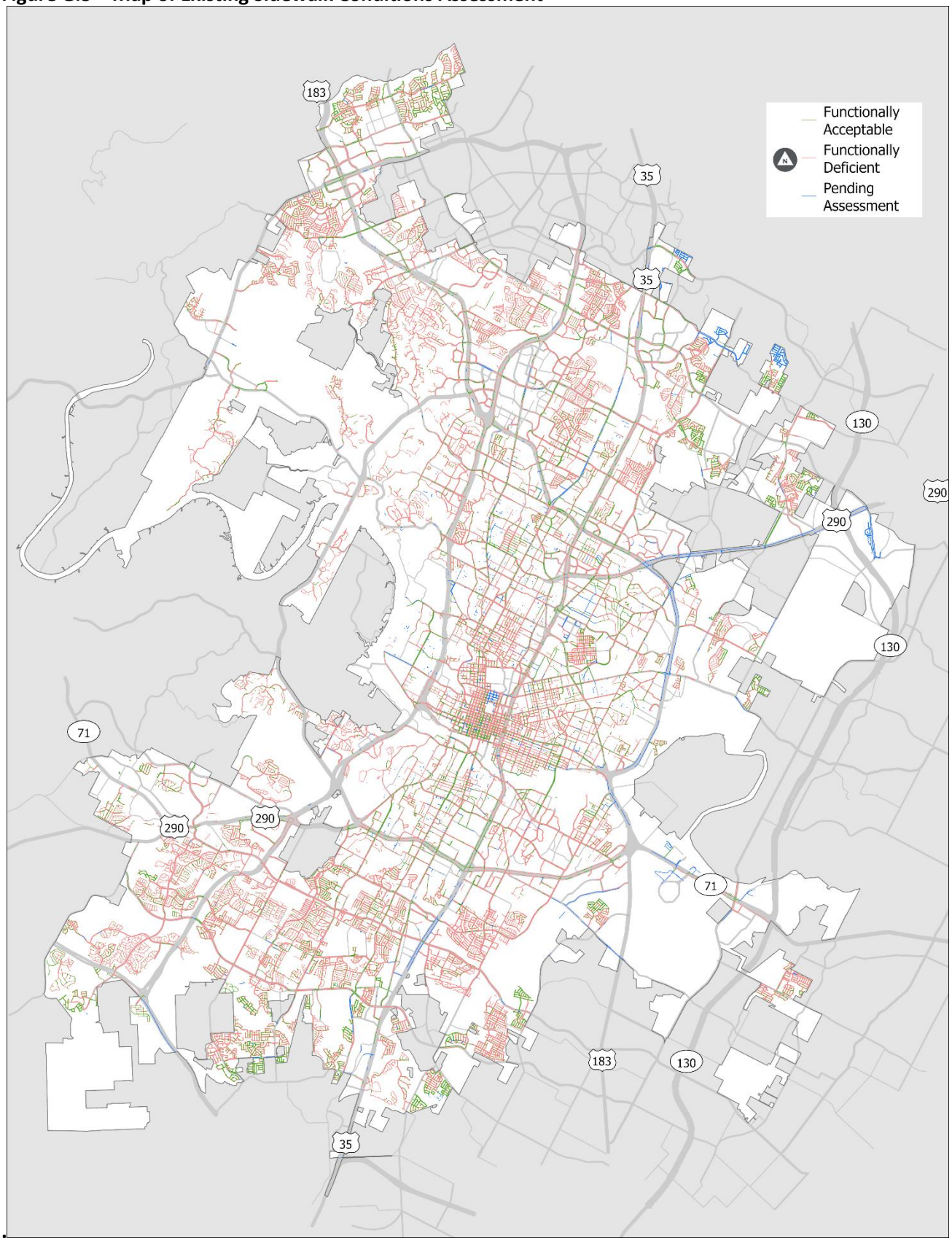


Figure G.4 – Miles of Planned Sidewalk by Council District and Priority

Council District	Very High	High	Medium	Low	Very Low	Unknown Score*	District Total
Council District 1	22.1	28.7	20.6	13.0	1.2	19.7	**105.3**
Council District 2	9.0	14.6	13.4	16.6	4.2	12.1	**69.9**
Council District 3	23.2	23.8	13.2	8.0	0.1	0.8	**69.1**
Council District 4	20.0	18.2	9.8	0.9	0.0	2.6	**51.6**
Council District 5	11.0	16.3	16.1	9.1	0.9	8.9	**62.3**
Council District 6	9.5	11.5	13.5	12.2	7.3	14.4	**68.2**
Council District 7	17.8	27.2	15.5	11.3	2.3	6.1	**80.1**
Council District 8	4.9	15.1	24.0	18.9	3.6	14.2	**80.8**
Council District 9	7.1	37.2	31.0	14.8	0.8	0.1	**91.0**
Council District 10	9.4	16.0	33.7	37.6	13.8	20.4	**130.8**
Priority Level Total	**134.1**	**208.4**	**190.7**	**142.4**	**34.2**	**99.2**	**809.0**

Figure G.5 – Miles of Planned Shared Street by Council District and Priority**

Council District	Very High	High	Medium	Low	Very Low	Unknown Score*	District Total
Council District 1	17.2	29.5	30.8	11.5	2.5	4.4	**95.8**
Council District 2	1.4	3.3	8.8	5.9	0.1	3.9	**23.3**
Council District 3	5.1	17.9	16.1	5.1	0.0	0.2	**44.3**
Council District 4	12.4	22.5	13.8	0.7	0.0	0.0	**49.3**
Council District 5	4.6	16.2	30.7	35.9	4.4	1.1	**92.9**
Council District 6	0.0	0.5	4.2	19.6	8.6	1.8	**34.8**
Council District 7	11.4	28.9	29.3	27.9	0.6	1.7	**99.9**
Council District 8	0.0	1.1	8.8	19.3	8.9	2.5	**40.6**
Council District 9	4.1	17.8	24.6	19.2	3.0	0.1	**68.7**
Council District 10	0.6	9.6	32.7	114.0	24.7	6.4	**187.9**
Priority Level Total	**56.6**	**147.2**	**199.6**	**259.0**	**52.8**	**22.1**	**737.4**

* The prioritization tool is run on street centerlines in order to standardize and normalize the scores and the priority score is then joined to sidewalk features based on a unique ID field in the GIS data. Some sidewalk segments did not receive a score because they are not associated with a single street centerline, often due to data incompleteness in the street centerline data used.

** Planned shared streets mileage is the frontage mileage not the street centerline mileage

Figure G.6 – Miles of Existing Sidewalk by Council District and Priority

	Very High	High	Medium	Low	Very Low	Unknown Score*	District Total**
Council District 1	93.1	67.6	80.0	74.7	37.0	11.4	**363.9**
Council District 2	44.0	63.8	84.4	80.3	52.1	5.7	**330.3**
Council District 3	88.3	58.8	40.8	19.0	2.9	3.3	**213.0**
Council District 4	82.7	44.7	34.6	16.9	0.4	0.7	**180.0**
Council District 5	37.6	42.2	59.7	69.0	88.5	1.0	**298.0**
Council District 6	30.4	34.1	45.8	68.0	164.3	1.8	**344.4**
Council District 7	58.8	61.6	54.3	54.4	78.2	3.1	**310.4**
Council District 8	4.6	15.4	50.1	91.6	188.3	4.7	**354.8**
Council District 9	66.3	85.3	65.4	12.0	2.8	1.0	**232.8**
Council District 10	17.3	26.7	30.0	50.2	80.1	2.0	**206.2**
Priority Level Total	**523.0**	**500.4**	**545.1**	**536.0**	**694.6**	**34.6**	**2,833.7**

* The prioritization tool is run on street centerlines in order to standardize and normalize the scores and the priority score is then joined to sidewalk features based on a unique ID field in the GIS data. Some sidewalk segments did not receive a score because they are not associated with a single street centerline, often due to data incompleteness in the street centerline data used.

**Due to data complexity and analytical margin of error these numbers do not total to the exact same amount shown within the plan.

Figure G.7 – Existing Sidewalk Condition Assessment

	Acceptable	Deficient	Pending Assessment	Percent Acceptable
All Existing Citywide	**871.8**	**1,796.8**	**166.1**	**33%**
Very High Priority Citywide	167.0	324.0	32.0	34%
High Priority Citywide	150.5	306.9	43.4	33%
All Existing in EAZ	**260.9**	**507.9**	**81.8**	**34%**
Very High Priority in Focus EAZs	87.7	168.2	17.5	34%
High Priority in Focus EAZs	57.3	117.9	25.0	33%

APPENDIX H. CROSSING GAP IDENTIFICATION AND PRIORITIZATION METHODOLOGY

This appendix describes the methodology for 1) identifying corridor segments where there are insufficient opportunities for a safe and comfortable crossing (also referred to as "gaps" or "crossing gaps"), and 2) prioritizing these segments. Identifying corridor segments where there are insufficient crossing opportunities is itself a two-part process that involves first identifying crossings that are already suitable for use, and second, evaluating corridors to measure the gap in suitable crossings, described in Parts 1 and 2 below. The prioritization approach for deficient segments is described in Section H.3.

H.1 Crossing Suitability Analysis

The Oregon Department of Transportation (ODOT) has developed a framework for evaluating the suitability of pedestrian crossings. The framework applies the simple logic of the Bicycle Level of Traffic Stress to pedestrian street crossings. The methodology considers basic details including the speed of cross traffic, distance to cross, and mitigating features like signals and refuge islands. The thresholds identified by ODOT result in a Pedestrian Level of Traffic Stress (PLTS) score from PLTS1 through PLTS4 representing the following conditions, as described in ODOT's *Analysis Procedures Manual*[13] (PLTS descriptions quoted directly from the manual):

- **PLTS 1**- Represents little to no traffic stress and requires little attention to the traffic situation.
- **PLTS 2**- Represents little traffic stress but requires more attention to the traffic situation than of which young children (defined by ODOT as 10 years of age or older) may be capable.
- **PLTS 3**- Represents moderate stress and is suitable for adults. An able-bodied adult would feel uncomfortable but safe using this facility.
- **PLTS 4**- Represents high traffic stress. Only able-bodied adults with limited route choices would use this facility.

ODOT's manual identifies PLTS2 as a reasonable target for most situations.[14]
The methodology described here include some modifications to the original ODOT tables to better reflect conditions in the City of Austin, and to better align with Austin's guidelines for selecting countermeasures for street crossings. As with the original ODOT methodology, these modifications are informed by FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations and FHWA's Crash Modification Factors (CMF) Clearinghouse. Unless otherwise stated, the tables in this document refer to the configuration, speeds, and traffic volumes of the street that is being crossed.

H.1.1 *Assumptions*

To apply this model to Austin, the suitability analysis was adjusted by making assumptions based on the Street Level as assigned in the Austin Strategic Mobility Plan (ASMP). Due to the low-speed, low-volume characteristics of a Level 1 street it is assumed that all crossings of Level 1 streets are suitable for the purposes of this analysis. In some cases, an individual assessment by an Austin Transportation Department (ATD) Engineer may find that an individual crossing of a Level 1 street may not be suitable due to unique characteristics of that crossing. Further assumptions based on Street Level relate to gaps in data quality. There are many cases where data is incomplete or unavailable for traffic speed, number of travel lanes, and vehicle volumes. In these cases, assumptions will be applied based on the Street Level as follows:

[13] https://www.oregon.gov/ODOT/Planning/Pages/APM.aspx see Chapter 14 section 5
[14] https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf section 14.5.3 (page 14-37)

Figure H.1 – Street Configuration Assumptions When Data is Incomplete

Street Level	Intersecting Street Level	Speed	# of Lanes at unsignalized intersection*	# of lanes at signalized intersection*	AADT>=
2	1	30	2	N/A	9,000
2	2	30	3	3	9,000
2	3+	30	3	4	9,000
3	all	35	5	6**	15,000
4	all	45	5	6**	25,000
5	all	45	5	7***	25,000

**At intersection; total, both directions*

***Assumes 4 through lanes, plus left **and** right turn lanes*

****Assumes 6 through lanes, plus left **or** right turn lanes.*

H.1.2 *Unsignalized Crossings*

The comfort and safety of a crossing is completely different for an unsignalized intersection compared with a signal-controlled intersection. In addition, the presence of a median refuge can impact the comfort and safety of an intersection. The base rating tables for unsignalized intersections are separated depending on whether there is a median refuge or not to account for the safety and comfort differences for users.

Base Unsignalized PLTS Ratings

Below are three Base PLTS tables, which assume no additional countermeasures at partially-controlled intersections (e.g., the intersecting street is stop-controlled but the street being crossed is not).

Figure H.2 – Base PLTS for Unsignalized Crossing with No Median Refuge

Prevailing Speed or Speed Limit	Total Lanes Crossed (Both Directions)						
	2 Lanes			3 Lanes			4+ Lanes
	<5,000 vpd*	5,000-9,000 vpd	>9,000 vpd	<9,000 vpd	9,000-15,000 vpd	>15,000 vpd	any
25 or less	1	2	3	3	3	4	4
30	2	3	3	3	3	4	4
35	3	3	4	4	4	4	4
40 or more	3	4	4	4	4	4	4

**Vehicles per day*

Figure H.3 – Base PLTS for Unsignalized Crossing with Median Refuge*

Prevailing Speed or Speed Limit	Total Lanes Crossed (Both Directions)						
	2/3 Lanes			4/5 Lanes			6+ Lanes
	<5,000 vpd	5,000-9,000 vpd	>9,000 vpd	<9,000 vpd	9,000-15,000 vpd	>15,000 vpd	Any
25 or less	1	2	2	2	3	3	4
30	2	2	2	2	3	3	4
35	2	2	3	3	3	4	4
40 or more	3	3	4	3	4	4	4

**Note: crosswalk markings and roadside warning signage are assumed to be included with median refuge.*

Figure H.4 – Base PLTS for Unsignalized Crossing for One-Way Streets

Prevailing Speed or Speed Limit	Maximum Lanes Crossed (per direction)							
	1 Lane	2 Lanes			3 Lanes			4+ Lanes
	any	<5,000 vpd	5,000-9,000 vpd	>9,000 vpd	<9,000 vpd	9,000-15,000 vpd	>15,000 vpd	any
25 or less	1	1	2	2	2	2	3	4
30	2	2	2	2	2	2	3	4
35	2	2	2	3	3	3	4	4
40 or more	3	3	3	4	4	4	4	4

PLTS Adjustments for Unsignalized Crossings

Base PLTS scores are adjusted based on the presence of common countermeasures. This is accomplished by reducing the score (thereby reflecting better conditions) depending on the countermeasure. This table should not be interpreted as recommendations for how to treat high stress crossings. These are simply factors used to estimate the likely stress of intersections across the city. This estimation is intended to identify locations where crossing improvements may be warranted. The selection of treatments for a specific crossing project should be determined during an engineering study of the individual intersection.

Figure H.5 – Adjustment Factors for Unsignalized Crossings

Treatment	Adjustment
RRFB – Assumes high-visibility crosswalk markings, roadside warning signage, and advance yield markings (if appropriate based on FHWA countermeasure guidance) are also present.	-1
Raised crosswalk – Only appropriate on streets that are <30 MPH and <9,000 vpd.	-1
Stop control – On the street being crossed. It is assumed that any street that intersects a street with a higher Street Level classification will be stop-controlled if there is no signal present. For example, where a Street Level 2 intersects a Street Level 3, it is assumed the Level 2 street is stop-controlled and the 1 point deduction to the PLTS score is applied.	-1

Adjustments can only improve (reduce) the score by 1 point to a minimum of PLTS 2 regardless of how many treatments are present. In potential future updates to PLTS ratings, City staff may apply a manual override at locations where crossings have been improved using other appropriate countermeasures as identified in FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.

H.1.3 *Signalized Crossings*

Note: signalized crossings were rated using the methodology below. However, whether these ratings apply to the identification of crossing gaps is a user-selectable function in the tool described in Section H.2. For the initial gap identification performed in 2022, all signalized crossings were deemed to be suitable so that the analysis and prioritization could focus on identifying needs for changes to unsignalized crossings.

The original ODOT methodology does not include detailed guidance for signalized intersections. Following the general principles for unsignalized intersections, the methodology was expanded for Austin.

Because cross traffic is stopped by the signal, the speed and volume of traffic on the street that is being crossed has less influence on the comfort of a signalized crossing. Instead, roadway width and interactions with turning traffic are the primary determinants of safety and comfort at signalized intersections. Various other factors

influence the comfort and safety of a signalized intersection (including presence of turn lanes on the street being crossed and on the intersecting street, whether right-turn-on-red is allowed, whether left turn signals are "permissive" or "protected", and the speed and volume of tuning traffic from the intersecting street). However, data and computational limitations prevent many of these nuances from being incorporated into a citywide analysis of this scale. Therefore, assumptions are made based on Street Level classification as to the number of lanes and presence of features such as medians.

Base Signalized PLTS Ratings

Below is the base PLTS table for signalized crossings, which assumes all crossings have pedestrian countdown timers, but DO NOT have refuge islands, prohibit right turn on red, have protected left turn phases, or leading pedestrian intervals.

Figure H.6 – Base PLTS for Signalized Crossings

Configuration of the intersecting street*	Total Lanes Crossed*				
	2 Lanes	3 Lanes	4 lanes	5 lanes	6+ Lanes
PHB/HAWK at midblock location	1	2	3	3	3
2 Lanes	2	2	3	3	4
3 Lanes	2	3	3	3	4
4 Lanes	2	3	3	4	4
5 Lanes	3	3	4	4	4
6+ Lanes	3	4	4	4	4

**Total number of lanes, including turning lanes. Where accurate data is not available, this analysis defaults to the Street Configuration Assumptions table at the beginning of this document.*

The number of lanes includes any turning lanes being crossed. Because of data limitations and incompleteness regarding presence and number of turn lanes, the assumptions in the Street Configuration Assumptions table at the beginning of this document were used to estimate number of lanes at intersections based on Street Level classification. Manual edits may be made by City staff at a later point.

PLTS Adjustments for Signalized Crossing

The Base PLTS is adjusted for crossings at signalized intersections that contain certain features that either have demonstrated crash reduction factors (CRFs) or are otherwise considered best practices to lower stress at intersections. Figure I.7 identifies the adjustments used in the 2022 rating of crossings, as well as additional adjustment factors that could be used in the future if complete data were created.

Adjustment factors are applied to the base score using the following protocol:

1. PLTS scores are rounded up. For example, a street with a base PLTS score of 3 that has a leading pedestrian interval will receive a score of 2.5, which would round back up to PLTS 3. To achieve PLTS 2, that crossing would need an additional treatment(s).
2. PLTS scores at signalized intersection can be adjusted a maximum of two points (e.g., the best possible score for an intersection with a base PLTS score of 4 that has all of the treatments listed above) is PLTS 2.

Figure H.7 – Adjustment Factors for Signalized Crossings

Treatment	Adjustment	Notes
Pedestrian refuge (island or within median)*	-0.5 (-1 for PHB crossings)	CRF of 31.5% for vehicle-pedestrian crashes.
Leading Pedestrian Interval	-0.5	CRF of 13% for vehicle-pedestrian crashes.
Due to data limitations, the factors below were NOT included in the 2022 evaluation.		
All-red signal phase	-1	
No right turn on red	-0.25	Not well studied from a crash reduction perspective, but believed to decrease stress
Tightened corner radius	-0.5	Decreases turning speeds. Radius should be at or less than 20 feet.
>20 degree crossing angle	+0.25	Lengthens crossing.
Protected Left Turn	-0.5	CRF of 33% for vehicle-pedestrian crashes.

H.1.4 *Determining Suitability and Future Updates*

For this analysis, a crossing with a PLTS score of 1 or 2 is considered suitable. A crossing with a PLTS 3 or 4 score is not considered suitable. However, the gap identification tool described in Section H.2 allows users to adjust which crossings are considered suitable to vary the analysis.

As the City implements new crossing treatments and develops better data on existing treatments, it can manually update individual crossing scores, which will impact the identification of gaps in Section H.2 of this methodology.

H.2 Crossing Gap Identification Tool

Building upon the crossing suitability analysis, the City of Austin has a new GIS-based tool that allows it to identify gaps between suitable crossings. Gaps are defined as exceeding the maximum desirable distance between marked crossings, as defined by the Transportation Criteria Manual[15] (TCM). These guidelines depend on factors such as the ASMP Street Level and whether or not the crossing is on the Transit Priority Network. The spacing guidelines in the TCM are summarized in Table 4-1 of the TCM as follows:

Table 4-1 – Pedestrian Crossing Spacing

Street Level	Context	Maximum Desirable Distance Between Marked Crossings (ft)
2	On Transit Priority Network	600
	All other streets	600
3	On Transit Priority Network	600
	All other streets	1,200
4	All	1,200
5	All	All vehicle crossings & every ½ mile maximum where vehicle crossings don't exist
All	All	Within 100 of all transit stops

The Crossing Gap Identification Tool evaluates the street network comprising Level 2 streets and above and consolidates street segments streets into continuous corridors. Corridors are defined as the continuation of a street until its terminus. In most cases, corridors are identified by a consistent street name and street level. In cases where the trajectory of one approaching leg of an intersection creates ambiguity for whether it continues through the intersection, the street name is used to determine continuity (i.e. if the street name continues through the intersection, the corridor is assumed to continue through even if the geometries are skewed). Due to data limitations, this analysis and the associated tool do not factor in Level 5 streets (which primarily include expressways and other limited-access roadways).

With the network broken into continuous corridors, the tool then looks at the crossing suitability scores and user-selected variables to divide each corridor anywhere where there is a crossing that meets the definition of suitability. The divided segments are then trimmed by half the maximum desirable distance lengths (e.g., if the maximum desirable distance is 600 feet, then 300 feet is trimmed from each end of the divided segments). The resulting divided and trimmed segments visually represent the impact of gaps between suitable crossings.

H.2.1 *Suitability Variables*

By default, the Crossing Gap Identification Tool considers crossings with PLTS scores of 1 or2 to be suitable, and all other crossings to not be suitable. However, the tool allows users to adjust the definition of suitable crossings to produce different results for different planning purposes. Namely, the tool allows the user to filter out the following crossings from the analysis (meaning they do not contribute to the identification of gaps:

1. Signalized intersections (selecting this variable omits signalized intersections from the analysis)

[15] https://library.municode.com/tx/austin/codes/transportation_criteria_manual

2. Streets with 1 lane per direction and pedestrian refuge islands (selecting this variable omits these crossings from the analysis)

The analysis performed to identify gaps for the 2023 Sidewalks, Crossings, and Shared Streets Plan used both of these variables, omitting both from the analysis.

H.2.2 *Crossing Gap Identification Tool Outputs*

The outputs of this tool are individual corridor segments that are not permeated by a comfortable crossing. These are considered gaps between suitable crossings, but do not specify exactly where crossings should be added (which is a decision requiring further case-by-case evaluation and engineering judgement).
The tool outputs three GIS layers:

1. A layer illustrating 600-foot gaps (gaps on Level 2 streets and Level 3 streets that are on the transit priority network and 1,200 foot gaps (gaps on all other street levels).
2. A layer illustrating gaps near transit stops, trimmed to within 100 feet of transit stops. These gaps overlap the 600- and 1,200-foot gaps and are represented separately for clarity.

H.3 Crossing Gap Prioritization Tool

The Crossing Gap Prioritization Tool builds upon the outputs of the Crossing Gap Identification Tool to prioritize gaps (deficient corridors) for crossing improvement projects. Prior to running this tool, users must run a separate data consolidation tool ("Sidewalks to Streets") to determine which gap segments have complete sidewalks on both sides.

For accurate prioritization, this tool should be run after crossing gaps are recalculated.

The output from the tool is a GIS dataset of crossing gaps with a composite 0-100 priority score, as well as component scores for each of the variables described below.

H.3.1 *Factors, Variables, and Weights*

The prioritization factors and weighting below were chosen to align with ASMP goals, ATXWBR values, and the goals of the 2023 Sidewalks, Crossings, and Shared Streets Plan. The variables and data sources were chosen to align with sidewalk prioritization and based on available data.

Figure H.8 – Crossing Prioritization Logic

Factor	Weight	Variable / Data Source	Scoring
Mode Shift	20%	Highest Pedestrian Trip Potential score intersected by the gap corridor (see below).	Up to 20 points
Safety	25%	Number of Lanes & Posted Speed Limit Gap corridors are divided into 200 foot segments. 2 points are awarded to any segment with a max posted speed limit of 30 MPH and 2 lanes of traffic; with 2 extra points for every additional 5 MPH, and 5 points for any additional lane. Segments are then reaggregated into corridors and a weighted average score is calculated. Examples: 2 lanes, 25 mph = 0 points // 2 lanes, 30 mph = 2 points // 3 lanes, 35 mph = 9 points	Up to 15 points
		Part of Pedestrian HIN	Yes – 10 points
Equity	30%	Pedestrian Health and Safety Status (see Appendix F) Health needs per zip code, based on factors such as crime statistics, obesity, diabetes, heart disease, and respiratory disease)	Very High Needs – 15 points High Needs – 10 points Moderate Needs – 5 points
		Corridor segment is within 1/8 mile or 1/4 mile of long term (20+years) affordable housing according to the City's Affordable Housing Inventory	1/8 mile – 15 points 1/4 mile – 10 points
Network Connectivity	10%	For Level 2, 3, and 4 streets (defined in Section 2.4 of the Transportation Criteria Manual), are there complete sidewalks on both sides of the street?	Yes – 10 points No – 0 points
Requests	15%	Was the project requested by ADA Task Force?	Yes - 15 points
		Was the project requested by a citizen through 311 or ATXWBR process?	Yes - 4 points per request per location, up to 12 points

H.3.2 *Pedestrian Trip Potential Variable*

Trip potential (sometimes referred to as "demand") is an evaluation of factors that are likely to lead to higher levels of walking activity and therefore pedestrian crossing usage. The trip potential variable is similar to the "Proximity to Attractors" portion of the Sidewalk Prioritization Tool, but because of differences in the network elements being prioritized, a different approach to calculation was needed and results in a heat map of trip potential.

The methodology developed Crossing Gap Prioritization employs an origin-destination model for estimating potential. Demographic factors (population density and household income) and intersection density are incorporated into the model. The following categories of data are included as inputs:

- Population
- Employment
- Campuses of higher education
- Transit stops
- Parks
- K-12 Schools
- Commercial activity

Because the origin-destination connections are modeled without regard for the underlying transportation network, this analysis identifies locations where trip activity could occur regardless of whether crossings (or sidewalks for that matter) currently exist. This is useful for highlighting areas where new or improved connections would be expected to increase walking activity.

Composite Trip Potential Index

The composite index for trip potential (weighting of various origin-destination pairs) was based on an evaluation of the National Household Travel Survey (NHTS), which surveys trip activity across the population and distinguishes between different origins and destinations.

Figure H.9 – Composite Trip Potential Weighting

Origin features	Destination features	Comparable NHTS trip type	Composite index weighting
Population	Parks (major and minor)	Social or recreational	15
Population	Transit	n/a	20
Higher education	Transit	School or church	3
Transit	Employment	Work	2
Population	Employment	Work	2
Population	K-12 Schools	School or church	3
Population	Higher education	School or church	3
Population	Commercial activity	Shopping; family or personal business	15
Employment	Commercial activity	Shopping; work-related business	7
Transit	Commercial activity	Shopping; family or personal business	15
Higher education	Commercial activity	Shopping; family or personal business	15

Adjustment Factors

Beyond the raw pull between origins and destinations, there are underlying demographic or built environment factors that can affect the magnitude of walking activity. This model applies two multiplicative factors that boost the trip potential results.

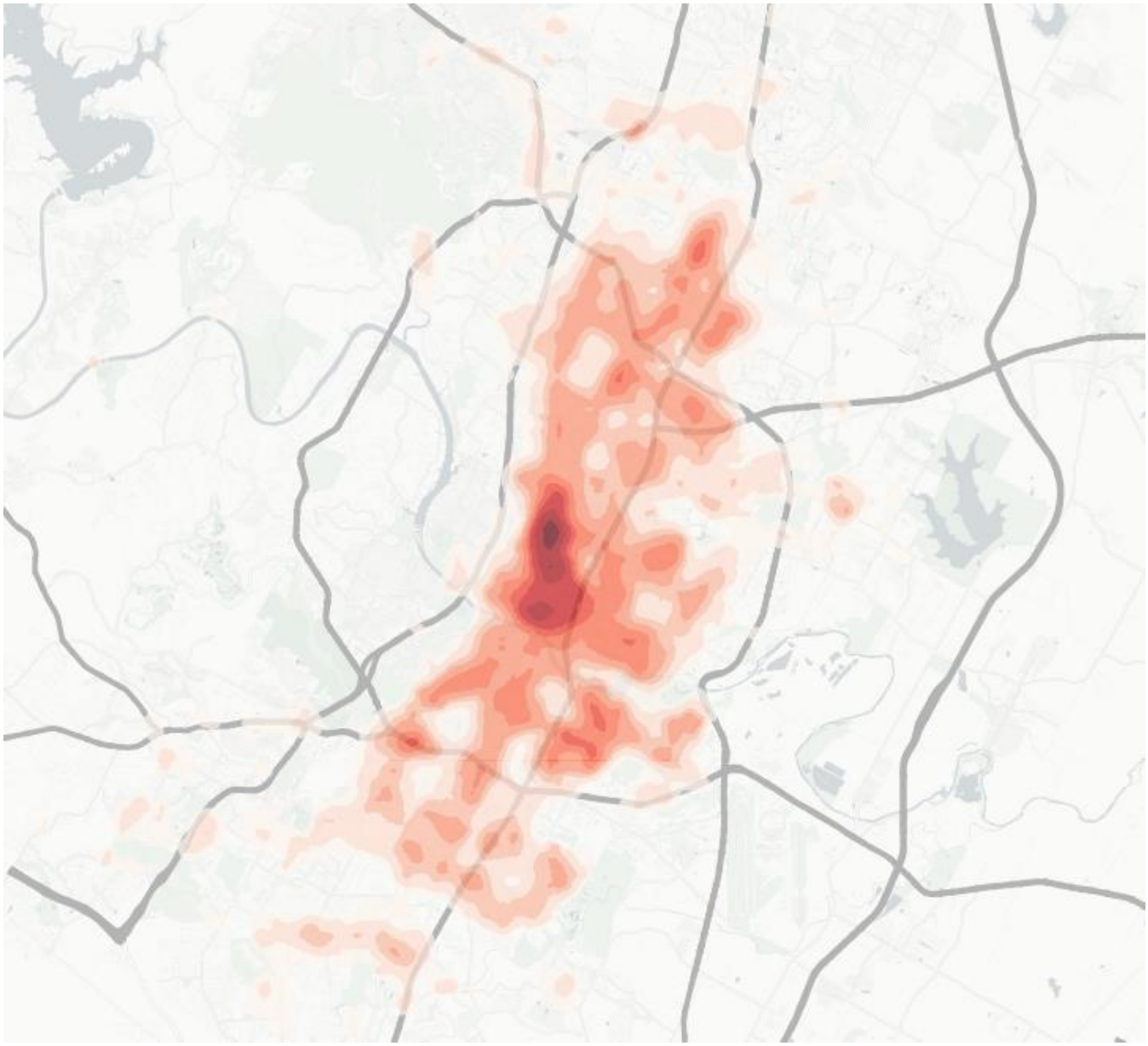
1. **Intersection Density –** Some studies have indicated the density of intersections as a factor in walking trips. This analysis applies an adjustment to the various origin-destination indices. An adjustment of up to 25% is used in areas with the highest intersection density. In areas with the lowest density, no adjustment is made. The intersection density is calculated as the number of intersections within ¼ mile.

While a correlation between intersection density and walking activity exists, no correlation with biking activity has been shown so this factor is only used for walking trips.

2. **Household Income** – The model uses household income as another factor in walking trips. Lower-income households are less likely to own cars and more likely to use walking as a regular form of transportation. The model applies an increase to population-based measures based on the proportion of households below the poverty level, scaling linearly from 0% to 10%. In other words, a census tract with the highest proportion of low-income households will receive an increase of 10% above its raw score. A census tract with the lowest proportion of low-income households will receive no increase (0%). And tracts between them will have their adjustment factor scaled linearly between the two.

The resulting trip potential index heat map is shown below.

Figure H.10 – Composite Trip Potential Index Heat Map



APPENDIX I. CROSSING GAP MAPS

Figure I.1 – Map of Existing Crossing Gaps

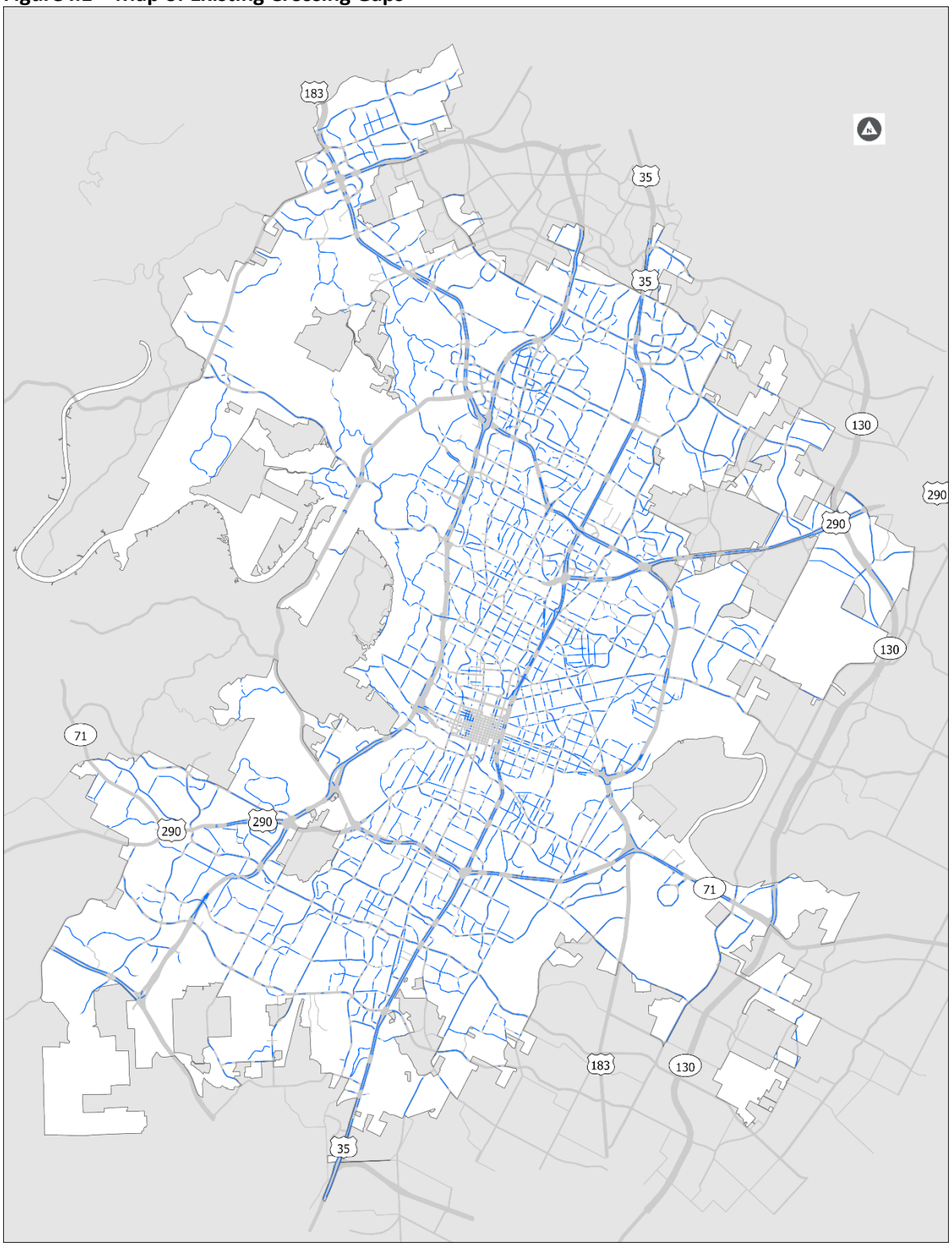


Figure I.2 – Map of Crossing Gaps by Priority