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Designing Streetscapes for Gender Inclusivity

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Client: LADOT

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DISCLAIMER

This report was prepared in partial fulfillment of the requirements for the Master in Urban and Regional Planning degree in the Department of Urban Planning at the University of California, Los Angeles. It was prepared at the direction of the Los Angeles Department of Transportation (LADOT) as a planning client. The views expressed herein are those of the authors and not necessarily those of the Department, the UCLA Luskin School of Public Affairs, UCLA as a whole, or the client.



DESIGNING STREETSCAPES FOR GENDER INCLUSIVITY

UCLA Institute of Transportation Studies

A comprehensive project submitted in partial satisfaction of the requirements for the degree Master of Urban and Regional Planning.

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EXECUTIVE SUMMARY

Introduction

Within the US, Los Angeles has been at the forefront of making efforts to factor gender inclusivity into transportation planning. In 2021, LADOT released *Changing Lanes: A Gender Equity Transportation Study* (LADOT, 2021), which focused its assessment on the travel needs of low-income, BIPOC women and communities in LA. It found that LA's current transportation system is not adequately serving women, girls, and gender minorities in these communities as they are often left with subpar transportation options, whether it is due to financial limitations or inadequate infrastructure or public transit service. Because of LA's car-centric environment, individuals with limited access to cars who must rely on public transit or active modes of transportation are often at a disadvantage when it comes to accessing jobs and other resources. To address these inequities, LADOT is taking the next steps to implement gender-inclusive transportation infrastructure design strategies. This capstone, *Designing Streetscapes for Gender Inclusivity*, presents five case studies on pedestrian street lighting, public seating, bus stop amenities, pedestrian infrastructure, and bicycle infrastructure that showcase strategies for implementing such projects effectively and equitably.

Literature Review

Differences in how women and men travel in the US are well established: women are more likely to trip chain and carry out trips related to maintaining a household or caring for others, are less likely to use active transportation, and give more weight to safety in choosing when and how to travel (Loukaitou-Sideris, 2020). While substantial research has been done on gendered travel behavior and the factors that best support the travel patterns of women, these findings have not been widely applied to transportation planning practice in the US. A 2009 study in which 131 US transit agencies were surveyed found that only three of them had implemented programs that sought to address women's fears in transit environments (Loukaitou-Sideris & Fink, 2009).

A 2022 assessment of 129 US public transportation agencies rated 79 as having “low to no gender inclusivity,” 41 as having “moderate gender-inclusivity,” and only 9 as having “high gender-inclusivity”; this analysis was based on interviews and the discussion of gender in public documents (Hazelton-Boyle, 2022). While there is an awareness of differences in how women and men travel and experience transportation environments, overall little has been done to address these differences in transportation planning practice.

Methodology

In the US, no known cities have applied a gender equity lens to transportation projects on a wide scale. Nevertheless, some agencies have instigated specific projects with a gender equity purpose in mind. To develop design strategy recommendations for LADOT, I first identified US cities that have implemented equity frameworks for evaluating transportation projects and/or equity-minded project prioritization methodology. Then through a review of transportation agency websites and documents, I selected agencies that have made significant progress in one of five areas: pedestrian street lighting, public seating, bus stop amenities, pedestrian infrastructure, and bike infrastructure.

I conducted semi-structured interviews with planners from five transportation agencies: the Seattle Department of Transportation, the New York City Department of Transportation, TriMet (Portland Region), the Minneapolis Department of Public Works, and the Austin Transportation Department. These interviews centered around the topics of prioritization methodology, successes and challenges, and the consideration of equity in project planning. In addition, I reviewed transportation guidelines and plans produced by these agencies. From the information gathered, I developed five case studies, each focusing on a different strategy for improving gender inclusivity in streetscape design.

Case Studies

- Street Lighting: Seattle Department of Transportation
- Public Seating: New York City Department of Transportation
- Bus Stop Amenities: TriMet
- Pedestrian Infrastructure: Minneapolis Department of Public Works
- Bicycle Infrastructure: Austin Transportation Department

Planning Recommendations

Based on these case studies, I also developed six recommendations for improving planning processes and working towards improving gender inclusivity in transportation environments:

1. Take a proactive approach to identifying deficiencies in infrastructure
2. Use geospatial data to aid in project prioritization
3. Set quantitative goals with clear success criteria
4. Establish unified goals between city agencies to facilitate partnerships and cooperation
5. Collect self-disclosed information on the gender of participants during public outreach
6. Include a gender equity component in project prioritization methodologies

Conclusion

Drawing from these case studies and the subsequent recommendations, LADOT can work to create a transportation system that serves the needs of all Los Angeles residents, regardless of gender or other sociodemographic factors. It is my hope that this report can serve as a precursor to citywide gender inclusive design guidelines and aid in the implementation of streetscape design strategies that prioritize gender equity and inclusivity in the myriad transportation environments of Los Angeles.

INTRODUCTION

Within the US, Los Angeles has been at the forefront of making efforts to factor gender inclusivity into transportation planning. In 2015, former mayor of Los Angeles Eric Garcetti signed Executive Directive 11, “Gender Equity in City Operations,” which ordered all city agencies to assess gender equity within their organizations (City of Los Angeles, 2015). At this time, both LADOT and Metro had women in executive management, with Seleta Reynolds as General Manager of LADOT and Stephanie Wiggins as Deputy Chief Executive of Metro. These two agencies, one at the city level and the other at the county level, went beyond the requirements of Executive Directive 11 to pave the way for greater consideration of gender equity and inclusivity in transportation.

LA Metro released *Understanding How Women Travel* in 2019 (LA Metro, 2019). This report used a gender disaggregated analysis of Metro data to examine the travel patterns and needs of women in LA County, particularly those who ride LA Metro transit. In 2021, LADOT followed suit and released *Changing Lanes: A Gender Equity Transportation Study*, which focused its assessment on the travel needs of low-income, BIPOC women and communities in LA (LADOT, 2021). This report found that among residents of LA, women often have greater transportation-related safety concerns than men, women are more likely to trip-chain than men, men are more likely to use active modes (walking, biking, rolling) than women, and less women have driver’s licenses than men. Furthermore, it found that LA’s current transportation system is not adequately serving women, girls, and gender minorities, especially those in low-income, BIPOC communities with limited transportation options. Because of LA’s car-centric environment, individuals with limited access to cars who must rely on public transit or active modes of transportation are often at a disadvantage when it comes to accessing jobs and other resources. To address these inequities, LADOT is taking the next steps to implement gender-inclusive transportation infrastructure design strategies.

My research on infrastructure that supports walking, biking, rolling, and waiting helps to lay the groundwork for gender-inclusive design guidelines, and it focuses on strategies that can improve comfort and safety for women, girls, and gender minorities. Most of the literature discusses gendered travel behavior of women; however, many of the concepts discussed can be applied to a range of gender minorities.



Credit: Sophie Frank

A woman and two children waiting at a bus stop in Los Angeles

LITERATURE REVIEW

Gender Differences in Travel Behavior in the US

Differences in how women and men travel in the US are well established: women are more likely to trip chain, are more likely to carry out trips related to maintaining a household or caring for others, are less likely to use active transportation, and give more weight to safety in choosing when and how to travel (Loukaitou-Sideris, 2020). These differences in travel behavior are in part the result of traditional gender roles and concerns about personal safety in public spaces, but the degree to which these factors play a role in how women travel is also affected by characteristics such as income, ethnicity, immigration status, and age. The ability of transportation systems to support these gendered travel behaviors impacts women's access to resources and has the potential to limit their freedom of mobility.

Trip chaining, in which one makes multiple stops during a trip that begins and ends at home or work, is a travel behavior more commonly found among women than men (McGuckin & Murakami, 1999). Women are more likely to carry out household and care-related tasks such as grocery shopping and taking children to and from school, and this has an effect on their travel patterns (Taylor et al., 2015). Sánchez de Madariaga has termed this the 'mobility of care' (Sánchez de Madariaga, 2013). This in turn impacts mode choice, as it is less convenient to travel with baggage or companions and make multiple stops by bike or public transit than with a car. A study on the relationship between gender and bicycle use found that women were less likely to use bicycles for household and care-related trips than for trips not being carried out for those purposes (Singleton & Goddard, 2016). Additionally, complex trip chaining, such as that which involves tasks related to caring for children, has been found to discourage the use of public transit (Hensher & Reyes, 2000). However, low-income women may have little choice of mode due to financial constraints and may have to rely on public transportation even though it does not suit the purpose of their trips.

Blumenberg points out that low-income women in the US are especially disadvantaged by the limits of public transportation and not having access to cars (2016).

Safety also factors into how and when women travel. Studies have shown that women experience greater fears of victimization in public spaces than men and tend to be more risk averse (Tandogan & Ilhan, 2016). In transit environments, women express greater concerns about safety in regard to walking to and from and waiting at transit stops and stations and may avoid using public transit at night or avoid it altogether for fear of threats to their personal safety (Loukaitou-Sideris, 2014). Additionally, the frequency of service, amount of lighting, and presence of other people, such as transit staff or police, can affect the level of safety and comfort women experience in transit environments (Loukaitou-Sideris, 2014; Yavuz & Welch, 2010).

In terms of active transportation, traffic safety also plays a role in how women choose to travel. A study on gender differences in walking behavior found that women were less likely to walk at night than men, were more likely to walk with companions, and were more concerned with safety factors like the presence of street lighting and automobile speeds (Clifton & Livi, 2005). Risk aversion seems to play a role in the gender gap in cycling rates within the US. Women have been shown to have a stronger preference for separated bike facilities than men and express greater concerns about traffic safety in regard to cycling (Aldred et al., 2017). A 2021 study of 17 countries found a gender gap in bicycle use in countries with low rates of cycling like the US, whereas in countries with high rates of cycling, like Germany and the Netherlands, cycling rates were much more even between men and women (Goel et al., 2021). The study points out that countries with high rates of cycling also tend to have more substantial bike networks with protected facilities, so this may play a role in the higher rates of cycling among women.

Clearly there are differences in how women and men travel and the degree of comfort they experience when walking, biking, and using public transit. Taking into account the ways in which women travel is paramount to improving transportation systems so that they adequately meet the needs of all users.

The Disconnect Between Research and Practice

While substantial research has been done on gendered travel behavior and the factors that best support the travel patterns of women, these

findings have not been widely applied to transportation planning practice in the US. A 2009 study in which 131 US transit agencies were surveyed found that only three of them had implemented programs that sought to address women's fears in transit environments (Loukaitou-Sideris & Fink, 2009). This is in spite of the fact that two-thirds of the agencies responded that women do have specific safety-related needs in transit environments. A 2022 assessment of 129 US public transportation agencies rated 79 as having "low to no gender inclusivity," 41 as having "moderate gender-inclusivity," and only 9 as having "high gender-inclusivity"; this analysis was based on interviews and the discussion of gender in public documents (Hazelton-Boyle, 2022). While there is an awareness of differences in how women and men travel and experience transportation environments, overall little has been done to address these differences in transportation planning practice.

There is often a disconnect between urban planning research and practice, and this rings true for the implementation of gender equitable practices in transportation planning. While cities abroad can serve as useful case studies, oftentimes they cannot be directly applied to the US context with its greater levels of economic and racial inequality. The form of the built environment and existing transportation system are additional factors that influence how women travel. For example, in Berlin, Germany, a compact city with a substantial public transit network, walking makes up 26.8% of the female mode share, cycling makes up 15%, and public transit makes up 23.7% (Goel et. al., 2023). In Los Angeles, walking makes up 13.2% of the female mode share, cycling makes up 0.7%, and public transit makes up 6% (ibid.). A more concerted effort to incorporate findings on gendered travel behavior into the implementation of transportation projects must be made to improve mobility for women and gender minorities in the US and specifically, Los Angeles.

METHODOLOGY

In the US, no known transportation agencies have applied a gender equity lens to the planning, design, and implementation of transportation projects on a wide scale. Nevertheless, some agencies have instigated specific projects with a gender equity purpose in mind. As part of its recommendations, LADOT's *Changing Lanes* report identified design strategies that should be implemented to create a more gender equitable transportation environment (see **Figure 1**); I centered my case studies selection around these strategies.

Figure 1

Design Recommendations from LADOT's Changing Lanes Report

Objective C: Design a safe, convenient, and comfortable transportation environment

PARTNERS: BSS, BSL, BOE, GSD, CBOs

1. Increase street lighting, particularly in and around bus stops, shade cover, and the amount of street furniture.
2. Repair and widen sidewalks, such that a person with a stroller, wheelchair, or dependent can easily pass.
3. Increase the amount of crosswalks and crosswalk signal frequency and duration in infrastructure-deficient neighborhoods.
4. Place bus stops near active businesses and/or other active uses, and install key infrastructure at transit stops, such as seating and trash cans.
5. Accommodate traveling with dependents and/or older adults, including priority seating on transit, space for stroller storage on transit, car seat availability in vehicles and child-seats and cargo racks/baskets on bikes/e-bikes, among other accommodations.

Note. From *Changing Lanes*, by LADOT, 2021, p. 62.

To develop recommendations for LADOT, I first identified US transportation agencies that have developed equity frameworks for evaluating transportation projects and/or equity-minded project

prioritization methodology. Changing Lanes used an intersectional approach in its analysis, and many criteria evaluated through broader equity frameworks are relevant to the topic of gender equity. I also reviewed publications from nonprofits like TransitCenter and recognition programs such as the UNC Highway Safety Research Center's Walk Friendly Communities program and the League of American Bicyclists' Bicycle Friendly Communities program. Then through a review of transportation agency websites and documents, I selected agencies that have made significant progress in one of five areas: pedestrian street lighting, public seating, bus stop amenities, pedestrian infrastructure, and bike infrastructure. Bus stop amenities focus on shelters and seating, and pedestrian infrastructure focuses on sidewalk and intersection improvements.

My reasoning for selecting each transportation agency is summarized in the following:

Street Lighting: SDOT (Seattle Dept. of Transportation)

SDOT developed its *Citywide Pedestrian Lighting Plan* in 2012 that details strategies for implementing pedestrian-scale lighting projects. The Department has made a concerted effort to increase the amount of pedestrian lighting since the plan's adoption. SDOT has also created a Transportation Equity Framework to address historic inequities in transportation infrastructure and ensure equitable outcomes for future transportation projects.

Public Seating : NYC DOT (New York City Dept. of Transportation)

NYCDOT has installed over 2,000 benches on sidewalks in the last decade and has set a goal to install 500 benches at transit stops per year starting in 2023. To date, the installation of benches has been prioritized at locations that serve older adults and people with disabilities, but they have also been installed at bus stops without shelters and locations with high pedestrian traffic. In terms of equity, NYC DOT has developed Priority Investment Area tiers for prioritizing projects; the criteria include low-income and non-white populations, to name a few.

Bus Stop Amenities: TriMet

TriMet, the regional public transit agency for the Portland metropolitan area, owns all of its bus stop amenities and prioritizes adding amenities where they will best serve riders, such as at stops with high lift usage and stops located near destinations such as senior centers. In 2002, the agency developed its first *Bus Stop*

Guidelines and released an update in 2010. Equity also plays an important role in the siting of transit stop amenities, and TriMet uses an equity index coupled with GIS software to identify where upgrades should be prioritized.

Pedestrian Infrastructure: Minneapolis Dept. of Public Works

The City of Minneapolis is rated as a gold-level Walk Friendly Community and over 92% of its streets have sidewalks on both sides. Pedestrian infrastructure projects are included in the City's Capital Infrastructure Plan and the *20 Year Streets Funding Plan* outlines detailed criteria for prioritizing these projects. The Department of Public Works has also established a robust Racial Equity Framework for Transportation to address historic inequities in transportation infrastructure and center all current and future projects around equity.

Bicycle Infrastructure: Austin Transportation Department

The City of Austin has taken an aggressive approach to expanding its bike network, with the goal of having 400 miles of its All Ages and Abilities network built out by 2025. The City reached the halfway point in 2021 and has completed 232 miles to date. The City is currently updating its active transportation plans and has taken an equity-centered approach: the Austin Transportation and Public Works Departments have produced an Equity Scan, Public Outreach Plan, and Equity Framework as well as developed Equity Analysis Zones to ensure upgrades to active transportation infrastructure are equitable.

I conducted 30- to 45-minute semi-structured interviews over Zoom with planners from each of these agencies. These interviews centered around the topics of prioritization methodology, successes and challenges, and the consideration of equity in project planning. All of the planners I interviewed directed me to additional documents which I then reviewed in the development of each case study. I started each interview with the question, "Is gender considered in the planning of X projects?" to which each interviewee responded no. However, planners for the Seattle Department of Transportation and Austin Transportation Department mentioned other ways gender has been assessed in projects; I discuss this in the street lighting and bicycle infrastructure strategies sections.

Each case study provides an overview of the prioritization methodology that is applied to the implementation of each of these projects, all of which include an equity component. This helps to ensure investments are made where they are most needed and will have the greatest impact on users of a transportation system. Additionally, each case study ends with a section on successes and challenges discussed by the interviewees.

PEDESTRIAN STREET LIGHTING

Why is this important for gender equity?

- Uniform illumination provided by pedestrian-scale street lighting allows for clear visibility of one's surroundings while walking or waiting at transit stops at night
- Women more often than men are fearful of street crime and harassment, and the presence of well-lit settings helps lessen this fear
- Adequate street lighting increases feelings of comfort and safety, especially among women and gender minorities (Boomsma & Steg, 2014; Loewen et al., 1993)
- Poor lighting near transit stops has been associated with increased risk of sexual violence against women and LGBTQ+ individuals (Ceccato et al., 2020)



Credit: Inked with Wanderlust

CASE STUDY: SEATTLE SDOT

Background

The Seattle Department of Transportation (SDOT) released its *Citywide Pedestrian Lighting Plan* in 2012 to apply a data-informed approach to siting pedestrian lighting and to improve its planning, design, and implementation (SDOT, 2012). While the plan has not been fully implemented to date, it is used as the guiding document in the planning of pedestrian lighting projects in Seattle. SDOT and City Light, Seattle’s public electric utility company, have an interdepartmental memo of understanding (MOU) under which SDOT plans and installs pedestrian lighting according to City Light standards; City Light then takes over maintenance and ownership responsibilities (G. Seo, interview, March 1, 2023). SDOT also works with Sound Transit, the public transit agency for the Seattle metropolitan area, and King County Metro, the county public transit agency, to install lighting near transit stops.

There are no citywide standards for pedestrian street lighting in

Seattle, but its installation is guided by neighborhood plans, urban design guidelines, street design concept plans, and streetlight district standards, to name a few (SDOT, 2012). In 2017, SDOT established standards in the Seattle Right-of-Way Improvements Manual that require the inclusion of pedestrian-scale street lighting with street improvement projects in Downtown Seattle (G. Seo, interview, March 1, 2023). The standards provide Prescriptive Lighting Guidance (see Appendix B) with approved fixtures for the area (City of Seattle, 2017). SDOT is also working to develop pedestrian lighting standards for other neighborhood types (G. Seo, interview, March 1, 2023).

The *Citywide Pedestrian Lighting Plan* outlines several ways pedestrian lighting projects are funded. SDOT has a Pedestrian Lighting Program with \$100,000 in funding each year, which covers the cost of two to three pedestrian lighting projects. Because of the limited amount of dedicated funding, the City prioritizes incorporating pedestrian lighting in street improvement projects when possible; pedestrian lighting projects are not given dedicated funding through Seattle's Capital Infrastructure Program (CIP) (G. Seo, interview, March 1, 2023). Some pedestrian lighting projects are also funded through SDOT's Neighborhood Street Fund, which allows community groups to propose projects with an estimated cost between \$100,000 and \$1 million (SDOT, 2023).

In some instances, requests for the installation of pedestrian lighting have also been brought to SDOT by community groups. Market to MOHAI was a community-led effort to create a pedestrian corridor connecting Pike Place Market to the Museum of History and Industry (MOHAI). A lighting design consultant was hired to do a street-by-street assessment of potential lighting improvements for the project area (Berger Partnership, 2018). After public and private funding was secured, SDOT installed 11 pedestrian-scale lights along the project corridor and has another 10 or so lights slated for phase two of the project (G. Seo, interview, March 1, 2023).

With transit agency partnership funding from the One Center City Near-Term Action Plan, SDOT has been able to address lighting needs identified by the Public Life Program (see *Gender* section for more detail) and the Seattle Chinatown International District Preservation and Development Authority (SCIDpda) *Lighting Needs Plan* (G. Seo, interview, March 1, 2023). After receiving funding from the City of Seattle's Office of Economic Development, SCIDpda worked with a lighting design consultant in 2018 to develop a lighting needs plan for the Chinatown International District. This neighborhood has a high

proportion of low income residents and older adults, and the consultant hosted meetings and nighttime walk audits with community members to identify lighting priorities (SCIDpda, 2018). The plan's recommendations center around providing visual acuity, comfort, and sense of place, which serve as useful principles for designing pedestrian-scale lighting:

Visual Acuity

- Faces should be identifiable from 30 feet away
- Accurate color rendering makes it easier to identify people and objects
- Uniform distribution of lighting reduces the need for your eye to adjust between bright and dark areas
- Glare (light shining directly into your eyes) can obstruct your view

Comfort

- The color temperature of light can influence how a location feels to the user
- Irritating glare should be avoided

Sense of Place

- Landmarks should be well lit and prominent at night
- Repeated decorative elements enhance community identity
- Colorful awnings, colored light and signage can add visual excitement
- Consistent color temperature of white light throughout the entire neighborhood enhances the feeling of unity (SCIDpda, 2018)

SDOT has implemented some of the recommendations presented in the *Lighting Needs Plan* (G. Seo, interview, March 1, 2023). The *Pedestrian Master Plan* implementation team has also applied for grants to install more pedestrian-scale lighting in the Chinatown International District.

Prioritization Methodology

The *Citywide Pedestrian Lighting Plan* established Pedestrian Lighting High Priority Areas (see **Figure 2**) based on criteria from the 2009 *Pedestrian Master Plan*. The calculation of these areas took into account:

- Pedestrian demand: based on land use as a generator or attractor for pedestrian use
- Socioeconomic analysis: using a variety of social and economic data to prioritize traditionally under-served

populations and meet the intent of the City's race and social justice initiative

- Street-type analysis: a characterization of each street segment based on how the City plans to utilize the street network (SDOT, 2012)

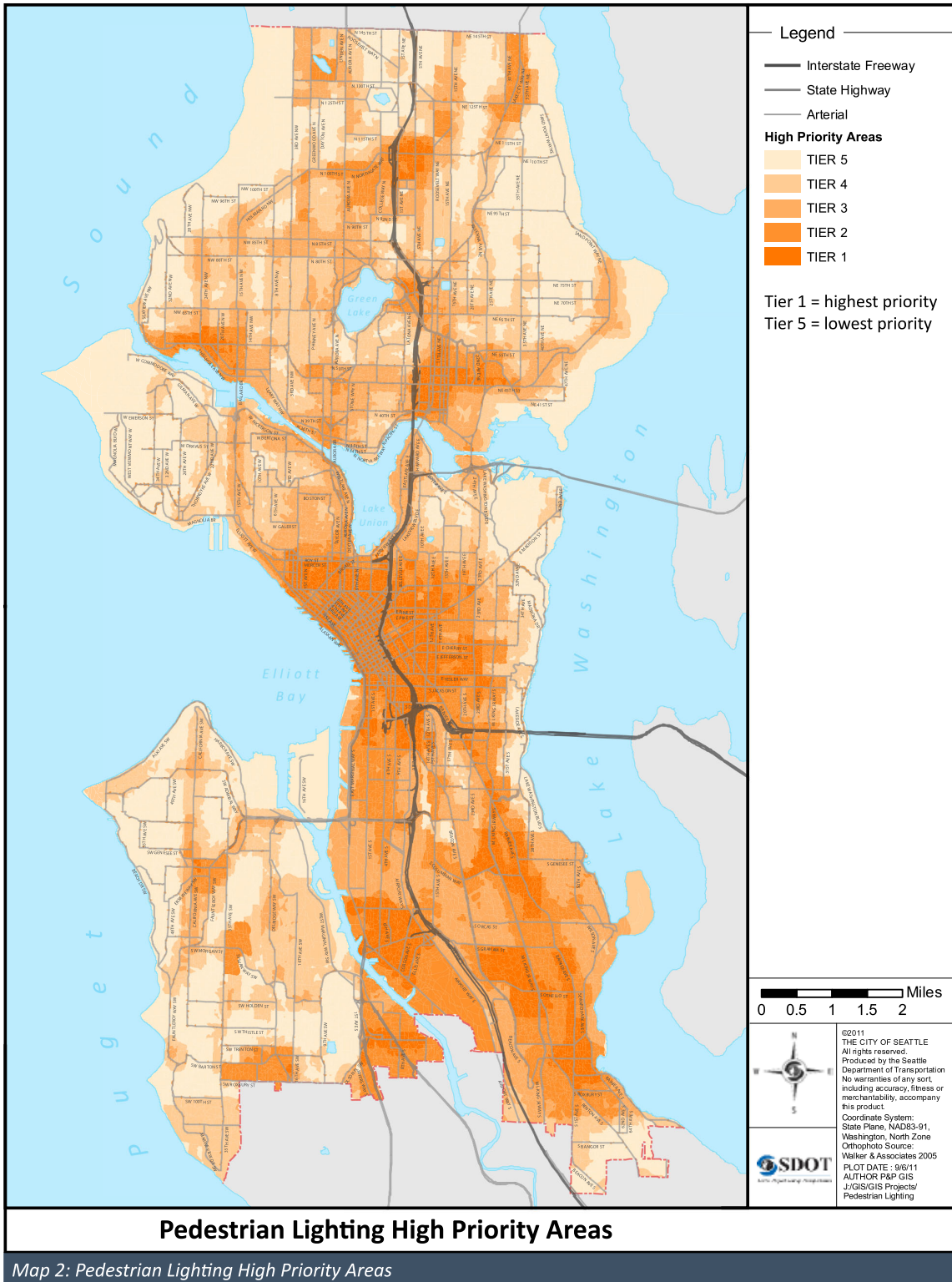
The highest scores for pedestrian demand were given to areas in close proximity to locations such as institutions of higher education, major trip generators, light rail stations, multi-family housing developments, and bus stops serving at least five routes (SDOT, 2017). 2025 population and employment forecasts were also considered in calculating future pedestrian demand. The socioeconomic component took into account car ownership rates, low-income and disabled populations, obesity rates, diabetes rates, and physical activity rates. Finally, the street-type analysis looked at the City's street classifications based on those from the American Association of State Highway and Transportation Officials (AASHTO), with regional connectors, commercial connectors, and local connectors given the greatest weight.

While the *Citywide Pedestrian Lighting Plan* has not been updated since its completion in 2012, the *Pedestrian Master Plan* was updated in 2017 and now features a more specific methodology for calculating High Priority Areas. It prioritizes streets near public schools and the Frequent Transit Network¹, takes into account traffic safety data tied to Vision Zero, evaluates "along-the-roadway" vs. "crossing-the-roadway" needs, and incorporates a health and equity component factoring in low-income population, disabled population, communities of color, physical activity, obesity rates, and diabetes rates (SDOT, 2017).

The *Citywide Pedestrian Lighting Plan* also incorporated a fourth factor in the identification of Pedestrian Lighting High Priority Areas: areas of high crime potentially linked to inadequate street lighting as identified by the Seattle Police Department (SDOT, 2012). From the identification of Pedestrian Lighting High Priority Areas, SDOT then conducted a gap analysis to determine top ten lists of arterial corridors, intersections, and trails and pathways that should be prioritized when funds for pedestrian lighting are available.

¹The 2016 Transit Master Plan defines the Frequent Transit Network as "a network of top-quality services provided by bus and rail modes, connecting residents and workers to the regional transit system via transportation centers that are well integrated with urban village life" (SDOT, 2017, p. A7-4)

Figure 2
 Map of Pedestrian Lighting High Priority Areas



Note. From *Citywide Pedestrian Lighting Plan*, by SDOT, 2012, p. 18.



Gender

While SDOT has not assessed street lighting through a gender lens specifically, the agency has made headway in analyzing the users of Seattle’s public spaces more broadly. SDOT established its Public Life Program in 2017 and in 2018 conducted a citywide public life study that involved observing how people use public space on 108 block faces in 38 different neighborhoods (SDOT, 2018). This study found that women, children under 15, and adults over 65 are underrepresented in Seattle’s public spaces in comparison to population statistics from the Census; 41% of users in these public spaces were female-presenting. The study states, “the presence of women can be a good proxy indicator for sense of safety, while the presence of a diversity of ages is an indicator of age-friendly or inclusive design” and that further evaluation is needed at sites with disproportionate representation from these groups (SDOT, 2018).

A public life study specific to the Yesler Crescent area in Downtown Seattle was then conducted in 2019 to come up with design recommendations based on observations, surveys, and focus groups of users of six public spaces (SDOT, 2019). Only 26% of users lingering in and 35% of users moving through these public spaces were female-presenting; no users under 15 were observed and only 10% were older adults. At some locations female survey respondents expressed much lower feelings of safety than male respondents and walked different routes through the spaces than male respondents. Improved sight lines,

increased seating, and increased pedestrian-scale lighting, to name a few, were recommended to improve the comfort provided by these spaces.

SDOT's public life studies have shown to be useful for identifying underrepresented user groups and the factors that may limit some users, such as women or older adults, from experiencing a public space comfortably or safely.

Successes and Challenges

Securing funding for projects has been the biggest challenge in increasing the amount of pedestrian-scale lighting in Seattle. One successful strategy has been to tap into private development: "It's in [developers'] own interest to have a good street in front of their development. So often if [SDOT] engage[s] early, and if [SDOT has] standards and requirements in place, often they will not be resistant to providing those facilities or infrastructure" (G. Seo, interview, March 1, 2023). This strategy has been used in Downtown Seattle where design and development standards for pedestrian-scale lighting have been implemented.

Having limited funding also underscores the importance of pinpointing where pedestrian lighting is most needed. For example, "places where [there is] higher density, higher foot traffic...have more leverage in terms of getting people out of their cars and prioritizing the pedestrian environment...In terms of policy, those are lower hanging fruit" (G. Seo, interview, March 1, 2023). Recently, SDOT has referred to maps of age-friendly destinations and communities most affected by COVID-19 to identify locations that should be prioritized for pedestrian lighting. SDOT's Age-Friendly Map shows "overlapping walksheds for destinations that serve young people and older adults" (City of Seattle, n.d.). These destinations include schools, hospitals, libraries, assisted living facilities, senior meal sites, senior centers, community health centers, and swimming pools. Being strategic with project selection ultimately helps to maximize the cost-to-benefit ratio when funding is hard to come by.

KEY TAKEAWAYS FOR PEDESTRIAN STREET LIGHTING

- Including pedestrian-scale lighting in street improvement projects and development standards can help to get more lighting on the ground when funding is limited
- Nighttime walk audits, especially with local community members, should be used in the planning of projects to identify lighting needs
- Consistent color temperature and light distribution along with the minimization of glare can create a more comfortable nighttime environment
- Public space analyses grounded in observation can be used to identify populations that may be underrepresented, such as women, girls, and gender minorities, and determine improvements that should be made to make all populations feel safe and comfortable

PUBLIC SEATING

Why is this important for gender equity?

- People who are pregnant, have a disability, or are older may need to stop to rest while out walking, whether it is for exercise, to access public transit, or run household errands
- Women often have greater care responsibilities and public seating can serve as spaces to care for dependents or older companions while out in public
- Public seating provides spaces for women, girls, and gender minorities of all ages to socialize comfortably on the street



CASE STUDY: NYC DOT

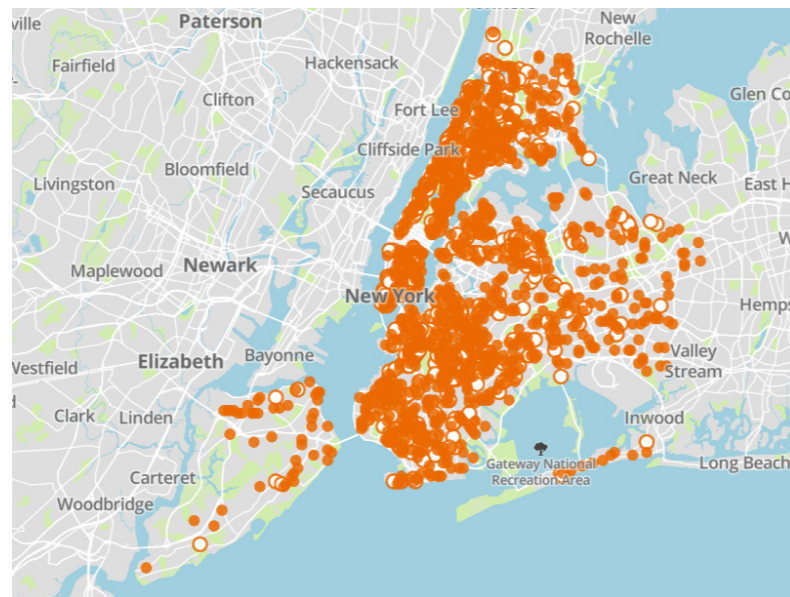
Background

NYC DOT launched its CityBench program in 2012 to provide public seating on sidewalks throughout the city. Leading up to this, the City's *Active Design Guidelines*, *Age-Friendly NYC* report, and *World Class Streets* report all pointed out the need for public seating to increase walkability, support older adults and people with disabilities, and improve street life (Office of the Mayor, City of New York, 2011). The initial 1,000 benches were funded through a \$2.4 million Section 5310 program (Enhanced Mobility of Seniors & Individuals with Disabilities) grant from the Federal Transit Administration (FTA) and \$600,000 from NYC DOT and the New York State Department of Transportation (City of New York, 2023; Horan, 2011). NYC DOT installed its 1,500th CityBench in 2015 and during the same year secured an additional \$1.5 million from the FTA (NYC DOT, 2015). Since the program's launch, over 2,100 backless and backless benches have been installed on sidewalks. In the 2023 update to its five-year transportation plan, NYC DOT set a new goal to

install 500 CityBenches at transit stops each year moving forward (NYC DOT, 2023).

NYC DOT tracks the locations of CityBenches using GIS and includes information such as bench type (backed or backless), installation date, street address, category (e.g., bus stop, senior center, municipal facility), and bus route number, if applicable. The map below (**Figure 3**) illustrates the locations and concentration of CityBenches in the five boroughs of New York City.

Figure 3
Map of NYC DOT CityBench Locations



Note. From NYC OpenData, by NYC DOT, 2020.

CityBenches have three seats, each 27 inches in width, with four armrests (Spradlin, 2022). As part of the design process, Ignacio Ciocchini, the industrial designer behind the CityBench, observed bench users and interviewed people about why they did not sit at public benches in New York City. Many respondents expressed that the seats did not provide adequate space between individuals. The CityBench is over a foot longer than the previously allowable maximum length of 6 ft. in NYC DOT's Street Design Manual, and its larger size provides more space between individuals and enough room to place baggage on one's own seat.

While armrests on public benches are often seen as being intentionally designed to discourage sleeping in public spaces, older adults were one of the main demographics in mind in the design of the CityBench



Credit: Ignacio Ciocchini



Credit: NYC DOT

Left: example of a CityBench; Right: a previous style of bench on an NYC sidewalk

(Spradlin, 2022). Armrests were added so that people with mobility impairments can gradually lower themselves onto the bench and lift themselves to stand up. Additionally, armrests provide separation between individuals sitting on the benches so that they do not encroach on each other's personal space.

Prioritization Methodology

Since the program's start, installation of CityBenches has been prioritized at locations that serve high populations of older adults and people with disabilities. These locations include:

- Hospitals and community health centers
- Municipal facilities (e.g., libraries and schools)
- Designated Access-A-Ride (paratransit) stops
- Bus stops without shelters
- Senior centers
- Commercial corridors

The Street Furniture Unit has also determined areas of focus for installing CityBenches among New York's 59 community districts. Variables assessed include "non-white and low-income populations, population density, population change, population over 65 years old, the history of CityBench installations in that district, and the existing ratio of benches to population" (NYC Streets Plan 2021). They also take into account the locations of commercial areas and public institutions.

More recently, NYC DOT has begun factoring equity into all planning unit projects, including the siting of street furniture. With the release of the first *NYC Streets Plan* in 2021, NYC DOT established three tiers of

Priority Investment Areas (PIAs) (J. Harris-Hernandez, interview, March 15, 2023). The PIA tiers are based on percent non-white and low-income populations, total jobs and population per square mile, and prior NYC DOT investments over the decade between 2011 and 2021. The scores for each category were weighted accordingly:

- Higher Non-White Population Share: 25%
- Higher Low-Income Population Share: 25%
- Higher Job Density: 10%
- Higher Population Density: 20%
- Fewer Prior Capital Project Dollars: 10%
- Fewer Prior In-House Improvements: 10% (NYC DOT, 2021)

The final breakdown for each PIA can be seen in **Figure 4**.

Figure 4
 NYC DOT Priority Investment Area Tiers

PRIORITY INVESTMENT AREA

- Priority Investment Area Tier 1
- Priority Investment Area Tier 2
- Priority Investment Area Tier 3

| Prioritization Tier | Tier 1 33% | Tier 2 33% | Tier 3 33% |
|---------------------|---------------|---------------|---------------|
| Total Population | 3.15 mil | 2.70 mil | 2.56 mil |
| Total Jobs | 740,000 | 825,000 | 2.5 mil |
| Avg % Non-White | 90% | 74% | 38% |
| Avg % Low Income | 27% | 14% | 10% |

Note. From NYC Streets Plan 2023 Update, by NYC DOT, 2023, p. 19.

Successes and Challenges

One of NYC DOT’s recent successes in the planning of CityBenches has been the use of Cyclomedia imagery software. During the COVID-19 Pandemic, the Street Furniture Unit, which manages the CityBench Program, began relying on Cyclomedia to identify and evaluate locations for street furniture (J. Harris-Hernandez, interview, March 15, 2023). Cyclomedia is a GIS company that collects 360-degree street-

level imagery clear enough to evaluate the condition of city assets remotely. It also collects LiDAR (light detection and ranging) data that allows distances, surfaces, orthogonal information, and height to be measured accurately (Cyclomedia, 2023). Street measurements were previously done in-person by the Street Furniture Unit, and using this service saves time that would otherwise be needed for site visits and helps to streamline the planning process for CityBenches (J. Harris-Hernandez, interview, March 15, 2023). It also allows NYC DOT to double check data collected in the field, such as sidewalk measurements (A. Ftouhi, interview, March 15, 2023).

In terms of challenges, fabrication and installation of CityBenches can sometimes prove difficult. Contracts for bench fabrication can take years to go into effect, and “the contract [NYC DOT is] trying to start right now was initiated two years ago, before [the] 500 goal, and [NYC DOT isn’t] able to change the contract” (J. Harris-Hernandez, interview, March 15, 2023). NYC DOT does have in-house crews who install street furniture, but with the increase in the target number of bench installations, they may need to initiate an installation contract.

Additionally, NYC DOT occasionally receives complaints about unhoused individuals using CityBenches and requests for benches to be removed due to drug dealing occurring near them, for example (J. Harris-Hernandez, interview, March 15, 2023). Most complaints come from individuals living in underserved communities, which can pose a challenge to NYC DOT’s pursuit of installing CityBenches equitably.

KEY TAKEAWAYS FOR PUBLIC SEATING

- In addition to transit stops, public seating should be installed at locations such as commercial corridors, senior centers, and civic institutions like schools, libraries, and healthcare facilities
- Benches with backs, wide seats, and armrests offer increased support and personal space
- The use of imagery software like Cyclomedia can simplify the process of identifying appropriate locations for seating installation and for checking the condition of street furniture

BUS STOP AMENITIES

Why is this important for gender equity?

- **Bus stop shelters provide protection from direct sunlight and inclement weather, which is especially important for more vulnerable populations such as pregnant people, children, and older adults**
- **Seating at bus stops provides these populations with a place to sit and rest while waiting for transit**
- **Trash cans can deter littering and help maintain a pleasant transportation environment**



Credit: The Oregonian

CASE STUDY: TRIMET

Background

TriMet is the regional public transit agency serving 26 cities in the Portland, Oregon metropolitan area. The agency owns all of its bus stop amenities and prioritizes their installation at locations that will have the greatest benefit to their ridership (M. Wyffels, interview, March 7, 2023). In 2010, TriMet released an update to its *Bus Stop Guidelines* which details the agency's standards for designing and siting bus stops and bus stop amenities; the agency is in the process of developing a second revision (B. Baldwin, interview, March 7, 2023). In the 2023/2024 fiscal year budget, TriMet has included over \$2,500,000 for bus stop development (TriMet, 2023).

Since the 1990s, TriMet has had a shelter siting agreement with Portland that streamlines the process of installing shelters within the City (B. Baldwin, interview, March 7, 2023). Approximately 1,000 of TriMet's 6,000 bus stops (consolidated from around 7,000 in the last decade) have shelters and under 2,000 have benches (ibid.; TriMet, 2010). Unlike many other transit agencies, the potential for advertising revenues is not the main priority in the siting of bus stop amenities. At the time

of release of the 2010 *Bus Stop Guidelines*, TriMet sold ad space on less than 20% of its shelters and less than 40% of its benches to its advertising contractor (ibid.).

TriMet has several bus stop shelter and seating types designed to accommodate varying ridership levels and sidewalk space constraints (see **Table 1**). Most shelters require a setback of at least 11 feet from the curb, but two types with narrow widths of 2.5 feet only require a minimum setback of at least 9 feet. TriMet’s seating types range from 4-foot-long benches used in shelters to standalone 6.5-foot-long benches used in business and retail districts. At some stops where the bus stop pole is far enough from the curb, Simme seats, which attach to the pole itself, have been installed.

Table 1
Bus Shelter Types Used by TriMet

| Shelter Type | Dimensions (in feet) | Minimum Required Setback (from curb, in feet) | Minimum Daily Boardings | Other |
|---------------|----------------------|---|-------------------------|--|
| B | 8.5 x 4.5 x 8 | 11 | 50 | Basic and most common shelter; sited in business and retail districts, residential neighborhoods, industrial and manufacturing areas, etc. |
| A | 8.5 x 2.5 x 8 | 9 | 50 | Narrow version of B shelter; pursued when a B shelter is warranted but right-of-way is limited. |
| BX | 12 x 4.5 x 8 | 11 | 100 | Longer version of B shelter; option at stops with strong usage. |
| AX | 12 x 2.5 x 8 | 9 | 100 | Rarely used; a possibility at stops with strong usage and limited setback. |
| BB | 16 x 4.5 x 8 | 11 | 150 | Double length shelter; only used at stops with significant ridership and likely only at activity centers. |
| High Capacity | Varies | Varies | >200 | Special shelters for extremely high usage areas e.g., transit centers, light rail stations and high transfer points. |
| Awning | Varies | Not applicable | Not applicable | Protection provided by businesses... |

Note. From *Bus Stop Guidelines*, by TriMet, 2010, p. 11.

Table 2
Seating Types Used by TriMet

| Type of Seat | Length (in feet) | Criteria for Placement | Notes |
|---------------|------------------|---|---|
| Shelter Bench | 4.0 | N/A | Placed in TriMet shelters. |
| Premium Bench | 6.5 | Minimum of 25 daily boardings; appropriate surroundings | Often placed in business and retail districts where shelters are not appropriate. |
| Ad Bench | ~6.0 | Will be considered at any stop lacking amenities if in a safe location. | Placed for ad exposure or at TriMet’s request. |
| Simme Seat | N/A | Minimum of 12 daily boardings | Mounted on bus stop pole, appropriate where there are curb tight sidewalks (pole placed behind sidewalk). |

Note. From *Bus Stop Guidelines*, by TriMet, 2010, p. 12.

In terms of lighting, TriMet aims to have 1.5 to 2 foot candles of lighting surrounding bus stops to improve the safety and security of waiting passengers (TriMet, 2010). TriMet's in-house options include shelters with hard-wired lighting systems, solar LED powered pole mounted lighting, and solar LED powered shelter mounted lighting.

TriMet also installs trash cans at stops with bus shelters. For stops that do not have shelters, TriMet has established an Adopt-A-Stop program in which the agency installs trash cans at bus stops if a nearby entity, such as a business or community organization, enters an agreement for regular trash disposal (Trimet, 2010).



Credit: Steve Morgan



Credit: TransitCenter



Credit: TriMet

Examples of seating and bus shelters used by TriMet

Prioritization Methodology

The installation of shelters is prioritized at bus stops with more than 50 daily weekday boardings; this minimum is lowered to 35 boardings at stops with infrequent service (defined as headways above 17 minutes during peak travel times) and in communities designated as having higher equity priority according to TriMet's Equity Index (TriMet, 2010; M. Wyffels, interview, March 7, 2023). TriMet also considers installing shelters at bus stops near senior housing (at least 20 daily weekday boardings) and at stops with high lift usage (4% usage and at least 15 daily weekday boardings).

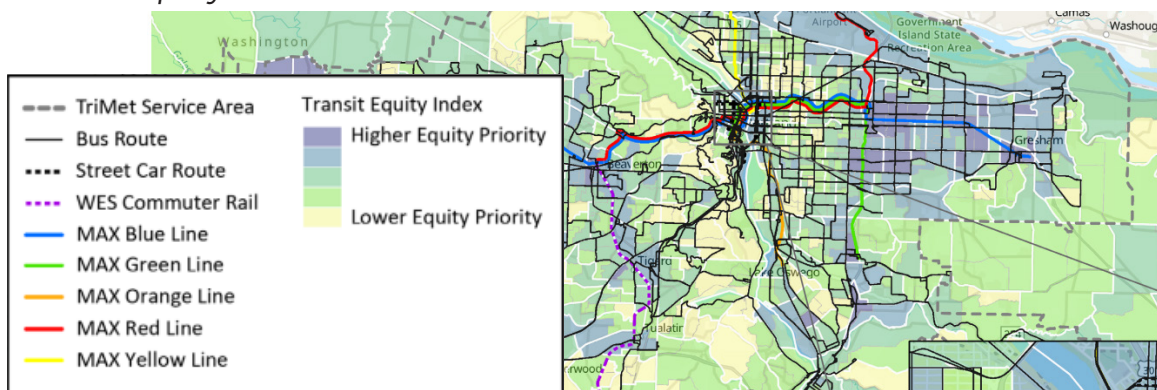
Benches can be placed at bus stops as long as there is adequate space so that the bench does not compromise safety (e.g., located too close to the roadway) or accessibility (e.g., blocks the sidewalk) (TriMet, 2010).

Using GIS, planners at TriMet overlay Transit Equity Index zones (see **Figure 5**) with transit network layers to identify high priority areas for bus stop improvements and locations with high lift usage, for example (M. Wyffels, interview, March 7, 2023). TriMet's Transit Equity Index is broken down by census block and calculated using 10 factors:

- Minority population
- Low-income population
- Limited English Proficiency (LEP) population
- Senior population
- Youth population
- People with disabilities
- Limited vehicle access households
- Low and medium wage jobs
- Affordable housing units
- Key retail/human/social services (TriMet, 2022)

Figure 5

Transit Equity Index Zones Overlaid with Transit Network



Note. From Revised Technical Memorandum (for Trimet), by Parametrix, 2022, p. 19.

Successes and Challenges

TriMet attributes much of their success to having ownership of bus stop amenities and control over placing them (M. Wyfells, interview, March 7, 2023). TriMet must gain approval from the different jurisdictions they operate in, but standardizing amenities as right of way improvements and creating siting agreements helps to simplify the process. Because of this, TriMet is “able to do some improvements that really make sense to the agency” (B. Baldwin, interview, March 7, 2023).

The largest challenge TriMet has faced in recent years in regard to bus shelters is an increase in vandalism, with roughly \$650,000 of its maintenance budget going to broken glass replacement; it was previously around \$100,000 per year (B. Baldwin, interview, March 7, 2023). While glass siding allows for transparency and visibility of one’s surroundings, it is not able to sustain damage beyond what is typically expected from regular use. TriMet is taking this into account in the design of its next generation of bus shelters and considering more durable materials (B. Baldwin, interview, March 7, 2023).

KEY TAKEAWAYS FOR BUS STOP AMENITIES

- Siting bus stop shelters and benches where they are most needed, not where they will result in the highest advertising revenues, can help to ensure they are placed where they will best support transit riders
- The minimum number of daily weekday boardings for installing bus shelters should be lowered in underserved communities and at locations serving high numbers of vulnerable customers such as older adults or people with disabilities
- Forming partnerships with businesses and community groups to maintain bus stop amenities such as trash cans can help to increase the provision of amenities at locations that do not meet minimum daily weekday boarding requirements
- Using a GIS-based equity analysis that includes factors such as Limited English Proficiency populations and limited vehicle access households, for example, can aid in identifying locations where the addition of bus stop amenities should be prioritized

PEDESTRIAN INFRASTRUCTURE

Why is this important for gender equity?

- Wide, level sidewalks with pedestrian curb ramps provide barrier-free access for people traveling with strollers, carts, or mobility devices
- Curb extensions and pedestrian safety islands increase the visibility of pedestrians and shorten the crossing distance at intersections, which supports traveling with dependents and older adults



Credit: Toole Design

CASE STUDY: MINNEAPOLIS DEPARTMENT OF PUBLIC WORKS

Background

The City of Minneapolis has approximately 2,000 miles of public sidewalks and 92% of its streets have sidewalks on both sides (City of Minneapolis, 2022c; 2022d). The Department of Public Works (DPW), which oversees all transportation-related projects for the City, has prioritized pedestrian improvements in recent years and has set a goal to increase the pedestrian mode share from 16% to 25% by 2030 (City of Minneapolis, 2020). Between 2017 and 2021, an average of 8.24 miles of pedestrian realm improvements, 571 ADA ramps, and 157 curb extensions were constructed per year (see **Table 3** for breakdown); this includes both quick-build and permanent treatments. In 2017 alone, the City also upgraded 3,700 crosswalks to high-visibility continental crosswalks (City of Minneapolis, 2018b).

According to the City:

The functionality of a street for pedestrians is most impacted by the provision of ramps at intersections (for access by all people, including those using assistive devices or with strollers or carts), the width of the pedestrian zone (wider zones are more comfortable and allow pedestrians to pass each other), and sidewalk obstructions (City of Minneapolis, 2018a, p. 13).

Table 3

City of Minneapolis Pedestrian Improvements, 2017 to 2021

| | Miles of Pedestrian Realm Improvements | ADA Ramps Installed | Curb Extensions Installed |
|----------------|--|---------------------|---------------------------|
| 2017 | 12 miles | 388 | 166 |
| 2018 | 8.1 miles | 479 | 132 |
| 2019 | 7.7 miles | 538 | 179 |
| 2020 | 2.1 miles | 441 | 67 |
| 2021 | 11.3 | 1010 | 242 |
| Average | 8.24 miles | 571.2 | 157.2 |

Note. Data from City of Minneapolis *Your City, Your Streets Progress Reports*, years 2017 to 2021

Pedestrian infrastructure programs such as Defective Hazardous Sidewalks, Sidewalk Gaps, Pedestrian Safety, and Vision Zero are outlined in the City’s 6-year Capital Improvement Plan (CIP), with Vision Zero having top priority among a total of 62 CIP programs under the DPW (City of Minneapolis, 2022b). The Sidewalk Gap Program fills in sidewalks where they are nonexistent, and the Defective Hazardous Sidewalks Program repairs deteriorated, broken, projecting, and uneven public sidewalks. The Pedestrian Safety Program focuses on hardscape improvements such as concrete curb extensions and medians, and it prioritizes these improvements at unsignalized intersections. Vision Zero installs safety treatments such as bollards, high-visibility crosswalk markings, and hardened centerlines on high-injury corridors using both quick-build and permanent treatments. Together these programs work to make walking in Minneapolis more comfortable and safe for pedestrians.

The DPW has created inventories of its major pedestrian infrastructure assets, which helps in maintaining their condition and identifying where upgrades are needed. Data on all pedestrian ramps was collected in



High-visibility continental crosswalks and quick-build curb extensions

2013 and has been updated regularly since then (City of Minneapolis, 2022a). A tablet application is used in the field to collect this data, which includes information on pedestrian curb ramp type, length, width, running slope, cross slope, counter slope, and obstructions.

In terms of sidewalks, the DPW collects data on their locations, widths, and the presence of gaps. 69% of sidewalks in Minneapolis are 6 feet in width or wider, which is the minimum ADA requirement (City of Minneapolis, 2022a). The DPW is in the process of deciding on a strategy to create a more in-depth inventory of all sidewalks in the City, whether this is by having people collect data in the field or using remote technology (K. Fogt, interview, March 2, 2023). Six methods of data collection have been tested out: manual, tablet-based, GPS/GIS-based, Segway-based, terrestrial LiDAR-based, and aerial LiDAR-based. The 2022 update to the *ADA Transition Plan* describes the advantages and disadvantages of each strategy (City of Minneapolis, 2022a). It also recommends that a sidewalk inventory include information on:

- Non-compliant sidewalk slopes (cross slope and longitudinal)
- Sidewalk widths and obstructions in the pedestrian access route
- Vertical displacements (e.g. raised panels and tripping hazards)
- Sidewalk condition (City of Minneapolis, 2022a)



Pedestrian safety islands with curb ramps

Prioritization Methodology

In 2016, the Minneapolis City Council passed an ordinance establishing the *20 Year Street Funding Plan* which determines the prioritization of street paving projects for the 6-year Capital Improvement Plan (CIP) that is updated annually. Capital street paving projects include the ADA Ramp Replacement Program and street reconstruction projects that involve pedestrian realm improvements such as new sidewalks, pedestrian ramps, green infrastructure, and pedestrian lighting.

Projects that fall under this category in the CIP are first identified through an equity-focused quantitative analysis, and virtually every street in Minneapolis has been given a score using this (K. Fogt, interview, March 2, 2023). There are over 20 criteria evaluated in the calculation of scores for asset condition and equity, the latter of which is split into two categories: community demographics and uses and modes (see **Table 4**). The Pedestrian Facilities criteria under Asset Condition awards points to “streets with non-compliant ADA ramps, streets with pedestrian zones less than ten feet, and streets with sidewalk obstructions” (City of Minneapolis, 2018a, p. 13). The Pedestrian Needs criteria under Equity: Use and Mode Conditions awards points to “streets with sidewalk gaps, streets with complex intersection and bridge needs, and streets with other pedestrian needs (new connection, sidewalk infill, or priority corridor)” (ibid., p. 19).

The Community Demographic Conditions criteria look at

- Non-white population, with streets in census block groups with over 50% non-white residents receiving the most points
- Low-income population, with streets in census block groups with over 40% of residents living at or below 185% of the federal poverty threshold receiving the most points
- Vehicle availability, with streets in census block groups with less than 0.5 household vehicles per resident over 16 receiving the most points
- Potential users, with streets in census block groups with more than 20 housing units per acre or streets located in regional activity centers receiving the most points

Table 4
Criteria Evaluated in the 20 Year Street Funding Plan

| CRITERIA | POINTS |
|--|---------------|
| Asset Condition | 92 |
| Pavement Condition - Vehicle and Bicycle | 66 |
| Pedestrian Facilities | 8 |
| Safety | 12 |
| Utility Needs | 6 |
| Equity | 82 |
| Community Demographic Conditions | 48 |
| Non-White Majority | 12 |
| Low-Income Population | 16 |
| Vehicle Availability | 8 |
| Potential Users | 12 |
| Use and Mode Conditions | 34 |
| Pedestrian Needs | 12 |
| Bicycle Needs | 8 |
| Transit Needs | 8 |
| Freight Needs | 2 |

Note. Adapted from 20 Year Streets Plan, by the City of Minneapolis, 2018, p. 11-12.

After receiving public input on the initial *20 Year Street Funding Plan*, the scoring was adjusted in the 2018 update to increase the number of points given to the Pedestrian Facilities and Low-Income Population categories (City of Minneapolis, 2018a).

Potential projects that have been identified through the quantitative analysis are then evaluated through a qualitative screening centering around these questions:

- Are there other nearby projects that will also be under construction?
- Can projects be combined to reduce disruption or cost?
- Is this the right fix at the right time?
- How does the project fit with larger city priorities and goals? (City of Minneapolis, 2018a)

The first 5-year CIP developed after the passing of the ordinance featured a 94% increase in street reconstruction projects with potential for pedestrian improvements (City of Minneapolis, 2016).

While the *20 Year Street Funding Plan* targets street repaving projects in the CIP, other programs, such as Pedestrian Safety, also use the equity criteria from the *20 Year Streets Plan* to prioritize projects (City of Minneapolis, 2022b).

Successes and Challenges

Proposed changes to curb lines can sometimes create challenges for pedestrian project implementation (K. Fogt, interview, March 2, 2023). When curbside uses are altered, such as reducing the number of parking spaces for a mid-block crossing, the DPW often receives a lot of push back from the community. In these situations it can be easier to move forward with a project if the curb lines are not altered. Ultimately, “safety is a big goal for [the DPW] and if you’re not able to influence the way people cross the street, then you’re not helping anyone” (ibid.)

A key to success for improving the pedestrian realm in Minneapolis has been the inclusion of pedestrian improvements such as pedestrian ramp and sidewalk upgrades in almost all capital projects (ibid.). The DPW also aims to be strategic with the materials it uses for different kinds of projects, as they “can do a lot for a little in a [street reconstruction] type of scenario. When you start trying to do a spot improvement at an intersection, do a bump out for instance or a mid-block crossing...it gets harder to do that at scale” (K. Fogt, interview, March 2, 2023). For these “spot improvements,” the DPW more often uses quickbuild treatments. The Vision Zero Program was established a few years ago and mostly implements projects with bollards and paint; this strategy “has been really instrumental in making a lot of changes quickly where [the DPW] can’t do it in concrete as quick” (ibid.) The DPW then makes these treatments permanent over time using concrete.

KEY TAKEAWAYS FOR PEDESTRIAN INFRASTRUCTURE

- Creating and regularly updating inventories of pedestrian assets can aid in forming a baseline of existing conditions, identifying disparities in the condition of infrastructure, and developing action plans to bring all infrastructure up to standard
- Developing detailed equity-focused prioritization criteria can help ensure that funding for projects goes to communities where investments are most needed
- Establishing a Capital Improvement Plan can help to target investments years in advance and create a roadmap for achieving larger goals such as improving gender equity
- Initially prioritizing quick-build treatments can help to make wide scale improvements in a short time frame

BICYCLE INFRASTRUCTURE

Why is this important for gender equity?

- In the US, there is a large gap in cycling rates between women and men, and women are often deterred from cycling due to traffic safety-related fears (Dill, 2021)
- Women have been shown to prefer protected bicycle facilities and are more likely to take up cycling when there is greater protection (Aldred, et al., 2017; AitBihiOuali & Klingen, 2022)
- Physical separation from moving vehicles, whether through vertical treatments such as bollards or separated paths, can decrease the level of stress experienced by cyclists and encourage more people to cycle



CASE STUDY: AUSTIN TRANSPORTATION DEPARTMENT

Background

The Austin Transportation Department set a goal in its *2014 Bicycle Plan* to build out a 400-mile All Ages and Abilities Bicycle Network (City of Austin, 2023a). The Department reached the halfway mark in 2021 with the completion of 207 miles of low-stress bike facilities. Much of this was funded through \$60 million contributed by the 2016 and 2020 City of Austin mobility bonds (City of Austin, n.d.). The *2023 Bicycle Plan* is now nearing completion, and the mileage goal for the AAA Bicycle Network has been increased to over 1,200 miles with the addition of new projects identified through public outreach and additional evaluation (L. Dierenfield, interview, March 24, 2023). At present, approximately 250 miles have been completed and 150 miles have been planned and funded (City of Austin, 2023b). The Austin Transportation Department has set goals to have 350 miles completed by the end of 2026, 450 miles completed by the end of 2029, and 600 miles completed by the end of 2033.

The *2023 Draft Bicycle Plan* notes a shift from focusing on cycling for recreation to cycling for transportation and the development of three themes for the AAA network: access to neighborhood destinations, access to nature, and access to citywide destinations (City of Austin, 2023b). Access to neighborhood destinations focuses on connectivity to schools, libraries, parks, convenience stores, and commercial corridors, and access to nature focuses on connectivity to parks and open spaces. Connectivity to employment centers, regional parks, cultural centers, colleges and universities, supermarkets, medical centers, and transit stations are prioritized under access to citywide destinations.

The types of facilities included in this network are protected bike lanes and intersections, neighborhood bikeways, intersection crossings, trails, and paths; together these create a comfortable biking environment for people ages 8 to 80 (City of Austin, 2023b). Quick-build treatments such as flex posts and concrete buttons have been used to rapidly develop protected on-street bike facilities. Treatments are hardened with permanent materials like concrete and planted barriers as funding becomes available.

Low-stress bicycle facilities have also been prioritized through the standards in Austin’s Transportation Criteria Manual (TCM). The TCM recommends 7-foot-wide bike lanes with 4 foot buffers on collector streets (6.5 and 2 if constrained) and 8-foot-wide bike lanes with 4 foot buffers on arterial streets (7 and 2 to 3 if constrained) (City of Austin, 2022). 12 feet is recommended for two-way bike lanes and 10 feet is the minimum in constrained spaces. The *2023 Draft Bicycle Plan* describes the design vehicle for bike facilities as including “bicycles, scooters, cargo bikes, trailers, trail-a-bikes, and tandems,” and these recommended bike lane widths can comfortably accommodate and allow the co-presence of different micromobility devices (City of Austin, 2023c, p. 52)

Prioritization Methodology

The *2023 Draft Bicycle Plan* establishes a GIS-based model used in prioritizing bike projects to “reduce human biases and blind spots from the project selection process” (City of Austin, 2023b, p. 65). It aims to prioritize cycling for transportation over recreation. The criteria used in the model are grouped into four categories—Equity, Destinations & Travel Demand, Connectivity & Safety, and Cost—which are then broken down into more specific variables (see **Table 5**). A proximity analysis was applied in GIS using these datasets to map out priority corridors for the network (N. Wilkes, interview, March 24, 2023).

Table 5
Prioritization Methodology Used in Development of the AAA Network

| GROUP | VARIABLE | WEIGHT | GROUP WEIGHT |
|---|--|----------------|---------------------|
| Equity | Prioritizes BIPOC residents | 20 pts | 100 pts |
| | Prioritizes lower income residents | 20 pts | |
| | Located in a block group with low vehicle ownership | 20 pts | |
| | Proximity to programmatic affordable housing | 20 pts | |
| | Prioritizes communities with health risk factors | 20 pts | |
| Destinations & Travel Demand | Access to neighborhood destinations | 10 pts | 80 pts |
| | Access to key citywide destinations | 10 pts | |
| | Connections to lower wage jobs | 5 pts | |
| | Connections to high density employment centers | 5 pts | |
| | Residential density | 10 pts | |
| | Serves a park deficient neighborhood | 5 pts | |
| | Connects to Urban Trails and parks / open space networks | 5 pts | |
| | Near transit service | 10 pts | |
| Near high-capacity / reliability transit stations | 20 pts | | |
| Connectivity & Safety | Fills gaps in AAA bicycle network | 40 pts | 80 pts |
| | Improves access across major barriers | 20 pts | |
| | Street-level score | 20 pts | |
| Cost | Cost per mile | 40 pts | 40 pts |
| | Total | 300 pts | |

Note. Adapted from *2023 Draft Bicycle Plan*, by City of Austin, 2023, p. 65.

Projects identified as being of the highest priority are then assessed individually for “feasibility, detailed connectivity considerations, ability to address barriers along routes, cost benefit of the project, and coordination opportunities” (City of Austin, 2023b, p. 68).

Gender

Gender has not been considered explicitly in the development of the AAA Bike Network, but the design of its bike facilities has been centered around “comfort based on the understanding that more people will be willing to ride with an All Ages and Abilities network” (L. Dierenfeld, interview, March 24, 2023). According to a comparison of data from the American Community Survey on the proportion of female bicycle commuters and bicycle network growth, the share of female bicycle commuters in Austin is increasing as the bike network expands (N. Wilkes, interview, March 24, 2023). The Austin Transportation Department does collect self-disclosed information on gender during public outreach, and this data can be disaggregated to see if there is a gender split in the responses that come from a community (ibid.).

Successes and Challenges

A significant challenge the Austin Transportation Department often faces is securing representative participation from different socio-demographic groups in public outreach, especially BIPOC and low-income communities (L. Dierenfeld, interview, March 24, 2023). During outreach for the City’s bicycle, sidewalk, and urban trail plan updates, the Department aimed to obtain greater participation from focus populations: respondents with incomes below \$50,000 or respondents who do not identify as white (City of Austin, 2023b). According to 2019 Census data, 47% of Austin residents are white, 33% are Hispanic or Latinx, 9% are Asian, 7% are Black or African American, 4% are multiracial, and 0.2% are Native/Indigenous (ibid.). Among survey respondents, 74% were white, 13% were Hispanic or Latinx, 5% were Asian, 3% were Black or African American, 3% were multiracial, and 1% were Native/Indigenous. In terms of income, 42% of Austin residents have incomes below \$50,000, meanwhile only 17% of respondents had incomes below this. Additionally, 54% of respondents had incomes above \$100,000; 24% of Austin residents have incomes above \$100,000 according to the Census (ibid.). In the feedback review process, the Department “intentionally screened for these characteristics to understand the perspectives of these populations” (L. Dierenfeld, interview, March 24, 2023).

Taking a flexible, equity-centered design approach has aided in the Austin Transportation Department’s success in gaining community support for projects. The Department emphasizes communities’ knowledge of and everyday experiences with their streets when engaging with them. Benefits and tradeoffs of lane reconfigurations and changes to parking, for example, are openly discussed and scenarios where no changes will be made are presented. The Department also hires community ambassadors to engage with people in their own communities and “bring feedback in narrative and survey form” to the Department (L. Dierenfeld, interview, March 24, 2023).



KEY TAKEAWAYS FOR BICYCLE INFRASTRUCTURE

- To rapidly build out a connected low-stress bicycle network, quick-build treatments should be implemented at first and hardened over time as funding becomes available
- Bike lanes should be designed so that they can accommodate a variety of micromobility devices, including cargo bikes and mobility devices
- Self-disclosed information on the gender (and other sociodemographic factors) of participants in public outreach should be collected so that differences in feedback can be discerned and addressed

PLANNING RECOMMENDATIONS

While each case study outlined in this report showcases different strategies for planning and prioritizing projects, there are certain commonalities between them that have greater implications for effective transportation planning and the use of a gender lens in planning. Five of the following six recommendations are based on comparison of findings from each agency, and the sixth poses an additional recommendation for factoring gender inclusivity into project prioritization.

1. Take a proactive approach to identifying deficiencies in infrastructure

An important step in overhauling infrastructure is identifying where disparities and gaps exist. Creating comprehensive inventories of assets and their existing conditions can help to quantify needs and set targets for improvements. In Los Angeles, members of the public are often directed to contact their city council district or submit service requests through 311 to report issues such as broken sidewalks, for example. However, communities with high non-white populations, high unemployment rates, or a high number of individuals with Limited English Proficiency may be less likely to report issues or submit requests to the City (Kontokosta et al., 2017). While developing comprehensive inventories of assets is resource- and time-intensive, it can lead to more equitable outcomes in the long run. Without an awareness of where infrastructure upgrades are needed and where large gaps exist, it can be difficult to make improvements equitably. Women, girls, and gender minorities living in underserved communities may be especially disadvantaged by poor quality streetscapes, and tracking the quality of infrastructure can ultimately aid in improving gender inclusivity.

2. Use geospatial data to aid in project prioritization

Asset inventories can in turn be overlaid with geospatial data on sociodemographic factors, bicycle and pedestrian network gaps,

residential density, destination density, etc. to identify where investments are most needed. All five agencies reviewed in this report use some sort of GIS-based analysis in the assessment and prioritization of projects. Some conduct spatial analyses using these datasets, while others have created more sophisticated models to identify potential infrastructure networks.

3. Set quantitative goals with clear success criteria

Of the five agencies reviewed in this report, NYC DOT and the Austin Transportation Department have set clear targets for installing public seating and bike facilities, respectively. NYC DOT has installed over 2,000 benches in the last ten years and has established a new goal to install 500 benches at transit stops each year starting in 2023. The Austin Transportation Department met its 50% buildout goal for its All Ages and Abilities Bicycle Network on time and is on schedule to reach its next benchmark. Setting quantitative goals with deadlines can aid in aligning resources and tracking progress over time; they can also be used as an objective tool for measuring success in the implementation of projects

4. Establish unified goals among agencies to facilitate partnerships and cooperation

In the City of Los Angeles, LADOT, the Bureau of Engineering, StreetsLA, and the Bureau of Street Lighting all play different roles in the management of the public right-of-way. Communication and collaboration among these agencies is key in working towards unified goals, such as implementing gender inclusive design in transportation environments. The creation of memorandums of understanding can help to foster a consistent and shared internal understanding of what gender equity means and what must be prioritized to ensure LA's transportation environment is supporting all its users. Additionally, different city agencies may use different metrics in assessing equity, whether it is LA Metro's Equity-Focused Communities designation or the Los Angeles County Climate Vulnerability Assessment Social Sensitivity Index, for example. Agreeing on a standard metric for equity that is used by all agencies can help to aid in the project prioritization process and ensure that all parties are working towards the same goal.

5. Collect self-disclosed information on the gender of participants during public outreach

This can help in understanding the unique concerns, preferences, and needs of women, girls, and gender minorities. Feedback that is collected through outreach can be disaggregated by gender (as well

as other demographic factors such as race and ethnicity) to see if there are distinct differences among populations. This can help to develop design solutions that target gender-specific issues, such as increased fears of personal victimization. Furthermore, collecting data on gender can aid in evaluating if there is equal participation from people of different genders and rectify this in future outreach if there are large discrepancies.

6. Include a gender equity component in project prioritization methodology

There are many similarities among the criteria evaluated by each of the transportation agencies reviewed in this report. Common variables include vehicle ownership rates, non-white population, and low-income population. Developing an evaluation category specific to gender equity could help to prioritize projects at locations women are likely to frequent in taking care of others and maintaining a household. Such a metric could look at walksheds or bikesheds around destinations associated with caregiving, e.g. schools, grocery stores, senior centers, parks, and medical facilities. Another potential category could look at locations where there may be greater risk for gender-based harassment or assault; these locations could be identified through an analysis of reports of on-street sexual harassment or assault.

Applying a proactive, data-driven, and gender inclusive approach to transportation planning is paramount to achieving gender equity in transportation environments. By implementing the planning recommendations mentioned above, LADOT and the City of Los Angeles can more successfully work towards ensuring women, girls, and gender minorities, especially those in underserved communities, have access to safe and comfortable transportation options.

CONCLUSION

This report outlines strategies and recommendations for LADOT, and the City of Los Angeles, in improving the experience of walking, biking, rolling, and waiting for women, girls, and gender minorities. Prioritizing equity and taking gendered travel behaviors into account in the planning process can help to make transportation in Los Angeles safer, more comfortable, and more accessible for all users. The design strategies suggested here include increasing pedestrian street lighting, increasing public seating, increasing the number of bus stops with amenities such as shelters and seating, improving accessible and safe pedestrian infrastructure, and developing low-stress bike networks. Coupled with an equity-focused and data-driven prioritization approach that takes gendered differences in patterns into account, the implementation of these design strategies can ensure the needs of women, girls, and gender minorities who rely on active transportation and public transit are met.

By taking lessons from these case studies and recommendations, the City of Los Angeles can work to create a transportation system that serves the needs of all its residents, regardless of gender or other sociodemographic factors. It is my hope that this report can serve as a precursor to citywide gender inclusive design guidelines and aid in the implementation of streetscape design strategies that prioritize gender equity and inclusivity in the myriad transportation environments of Los Angeles.

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APPENDIX A

| Organization | Interviewee | Job Title |
|--|---------------------------|--|
| Seattle Department of Transportation | Gabriel Seo | Urban Design Strategic Advisor |
| TriMet | Ben Baldwin | Senior Operating Projects Coordinator |
| | Michelle Wyfells | Planner, Planning and Policy |
| Minneapolis Department of Public Works | Kelsey Fogt | Transportation Planning Manager |
| New York City Department of Transportaion | Jennifer Harris-Hernandez | Acting Director, Street Furniture Unit |
| | Amine Ftouhi | Project Manager, Street Furniture Unit |
| Austin Transportation Department | Laura Dierenfield | Active Transportation and Street Design Division Manager |
| | Nathan Wilkes | Senior Project Designer |

Note. Interview participants

APPENDIX B

Prescriptive Lighting Guidance Implementation

Prescriptive Path

| | Lumec UrbanScape MPTC |
|-------------------------------|---|
| Performance | At Least 1.0 fc Average |
| Placement | Mount at 40'-0" to guarantee minimum light level requirements |
| Distribution | Type IV – Forward Throw |
| Mounting Height | 14'-0" (Type E) AFG |
| Uniformity | 3.0 : 1 |
| Max Wattage | 52w (Type E) |
| Voltage | 120-277V |
| Color Temperature | 3000K(+/-300K) |
| EPA | 1.7 sq. ft. |
| Weight | 32.2 lbs. |
| Luminance Distribution | Less than 5% of light above 80-degrees |

Note. From Seattle Right-of-Way Improvements Manual, by City of Seattle, 2017.