# PSRC Transit Access Work Program

# Summary of Literature Review Findings

## Overview

For purposes of this study, PSRC defines transit access as: "the ability of people to easily get to and use public transportation." In 2014, PSRC conducted a literature review to better understand the key characteristics influencing transit access. This work was a foundation for PSRC's subsequently developed transit access tools and assessments. For this summary, PSRC focused on the review of additional resources that were published since the last review was conducted. This update aims to reaffirm currently identified elements that still influence transit access and identify any potential new factors. PSRC reviewed transit agencies' long-range plans (LRPs), peer-reviewed articles, and other pertinent documents. The review reaffirmed the use of previously identified key characteristics, including urban form, transit service, and parking, and identified additional factors based on recent studies. The following sections summarize the key characteristics for assessing transit access, strategies to improve transit access, and equity considerations.

### *Urban form*

Urban form continues to be a defining characteristic of transit access, as research shows that transit-oriented development (TOD) elements correlate with increased transit access and ridership. Specific attributes of TOD, such as higher residential and employment densities, street connectivity, and diverse land use, contribute to better transit usage.[1] Since 2014, there has been a greater emphasis on ensuring TOD provides access to opportunities and decreases the negative impact on marginalized communities. TOD can improve access to regional transportation systems and contribute to neighborhood revitalization when racial equity is prioritized in the planning and implementation of TOD projects.[2]

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[1] Nasri, A., & Zhang, L. (2019). How Urban Form Characteristics at Both Trip Ends Influence Mode Choice: Evidence from TOD vs. Non-TOD Zones of the Washington, D.C. Metropolitan Area. Sustainability, 11(12), 3403. MDPI AG. Retrieved from http://dx.doi.org/10.3390/su11123403

[2] Sandoval, G. F., & Herrera, R. (2015). Transit-oriented development and equity in Latino neighborhoods: A comparative case study of MacArthur Park (Los Angeles) and Fruitvale (Oakland). Retrieved from: https://pdxscholar.library.pdx.edu/trec_reports/65/

## Urban design

Urban design features at and around transit stations are a key factor in supporting transit access.[3, 4] Walking and rolling are best supported by the quality and condition of sidewalks, the presence of pedestrian-scale lighting, and the density of pedestrian crossings.[5, 6] Meanwhile, bicycle access is best supported by the presence of protected bicycle lanes and bicycle parking and the overall connectivity of local and regional bicycle networks.

Inadequate urban design features pose barriers for transit riders with disabilities. Inaccessible sidewalks, footpaths, and crossings prevent riders from reaching transit services.[7] In their 2021 long-range plan, King County Metro noted that 70% of their ADA paratransit customers in their service area cannot access regular transit due to similar accessibility barriers.[8] This forces individuals to rely more on ADA paratransit, rather than fixed-route transit, which could require long wait times and may not allow for same-day scheduling.[9]

## *Transit service*

Transit access also is influenced by transit service characteristics like frequency, service connections, and proximity to and from stations.[10, 11] In the region, the expansion of light rail and bus rapid transit along major travel corridors and the passenger-only fast ferry service in Kitsap County, have substantially boosted transit ridership and improved access by providing more frequent and higher quality service.[12]

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[3] Ferguson, B., & Sanguinetti, A. (2023). Integrating Micromobility with Public Transit: A Case Study of the California Bay Area. Retrieved from: https://nap.nationalacademies.org/catalog/26793/accessibility-measures-in-practice-a-guide-for-transportation-agencies

[4] Sound Transit. (2022). Station Experience Design Guidelines. Retrieved from: https://www.soundtransit.org/sites/default/files/documents/sound-transit-station-experience-design-guidelines-june-2022.pdf

[5] King County Metro. (2021). Metro Connects Long-Range Transit Plan. Retrieved from https://kingcounty.gov/~/media/depts/metro/about/planning/metro-connects/metro-connects-final.pdf

[6] Sound Transit. (2022). System Access Implementation Plan.

[7] Park, J., & Chowdhury, S. (2022). Towards an enabled journey: barriers encountered by public transport riders with disabilities for the whole journey chain. Transport Reviews, retrieved from: https://www.tandfonline.com/doi/abs/10.1080/01441647.2021.1955035

[8] King County Metro. (2021). Metro Connects Long-Range Transit Plan.

[9] Bezyak, J. L., Sabella, S. A., & Gattis, R. H. (2017). Public transportation: an investigation of barriers for people with disabilities. Journal of Disability Policy Studies, retrieved from: https://journals.sagepub.com/doi/abs/10.1177/1044207317702070

[10] Jiao, J. (2017). Identifying transit deserts in major Texas cities where the supplies missed the demands. Journal of Transport and Land Use, retrieved from: https://www.jstor.org/stable/26211743

[11] National Academies of Sciences, Engineering, and Medicine. (2022). Accessibility Measures in Practice: A Guide for Transportation Agencies. Retrieved from: https://nap.nationalacademies.org/catalog/26793/accessibility-measures-in-practice-a-guide-for-transportation-agencies

[12] Kitsap Transit. (2022). Long-Range Transit Plan 2022-2042. Retrieved from: https://www.kitsaptransit.com/uploads/pdf/planning/lrtpreport_6dec2022.pdf

## Mobility-on-demand

Mobility-on-demand (MOD) addresses first- and last-mile connections through new and emerging technologies to offer accessible transportation options on an as-needed basis, like microtransit, rideshare, and micromobility.[13, 14] Studies indicate micromobility services, like bike share or scooter share, extend the catchment area around stations, shorten travel times, and improve the rider experience in urban areas.[15, 16] In rural areas, transit can be especially hard to access.[17] As such, jurisdictions and transit agencies are considering MOD services like microtransit and ride-hailing to improve transit access and decrease costs in rural communities.[18]

## Passenger experience

Passenger experience is improved by transit services that are reliable, intuitive, and available. Transit routes with shorter frequencies and longer service hours provide flexibility for riders and improve access. Furthermore, providing accessible means of communication and wayfinding (i.e., for multiple languages and different abilities) can minimize barriers for transit users.

Passenger experience is also influenced by the design of transit stops and stations, especially when prioritizing individuals of different ages, abilities, and socio-economic backgrounds.[19] Well-designed stations meet the safety and reliability expectations of riders (e.g., good lighting, visible pathways, and weather protection), while providing a seamless transit experience.[20] This is especially pertinent for facilitating transfers, providing safe connections, and improving personal security around station areas. Improving the passenger experience

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[13] Ma, T., Liu, C., & Erdoğan, S. (2015). Bicycle sharing and public transit: Does capital bikeshare affect Metrorail ridership in Washington, DC?. Transportation Research Record, retrieved from: https://journals.sagepub.com/doi/abs/10.3141/2534-01

[14] Brown, A., Manville, M., & Weber, A. (2021). Can mobility on demand bridge the first-last mile transit gap? Equity implications of Los Angeles' pilot program. Transportation Research Interdisciplinary Perspectives, retrieved from: https://www.sciencedirect.com/science/article/pii/S2590198221001032

[15] Kong, H., Jin, S. T., & Sui, D. Z. (2020). Deciphering the relationship between bikesharing and public transit: Modal substitution, integration, and complementation. Transportation Research Part D: Transport and Environment. Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/S1361920920305794.

[16] Liu, L., & Miller, H. J. (2022). Measuring the impacts of dockless micro-mobility services on public transit accessibility. Computers, Environment and Urban Systems. Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/S0198971522001296

[17] Rodier, C., Harold, B., & Zhang, Y. (2022). A Before and After Evaluation of Shared Mobility Projects in the San Joaquin Valley. National Center for Sustainable Transportation. Retrieved from: https://escholarship.org/content/qt7nr194n7/qt7nr194n7.pdf?t=rcqrfs&v=lg

[18] King County Metro. (2021). Metro Connects Long-Range Transit Plan.

[19] Sound Transit. (2022). Station Experience Design Guidelines.

[20] Ferguson and Sanguinetti. (2023). Integrating Micromobility with Public Transit: A Case Study of the California Bay Area. National Center for Sustainable Transportation. Retrieved from: https://doi.org/10.7922/G2J38QV7

at transit stops and stations can also be achieved by integrating universal design elements, which often exceed ADA requirements.

## *Parking*

Parking continues to be a key factor influencing transit access. Transit agencies in our region are actively investing in park-and-rides and parking facilities at transit stations to encourage transit use for individuals who must drive to stations.[21, 22] Parking investments are especially pertinent in areas of lower density, where it is more difficult to access transit without a personal vehicle.

### Parking reform

While parking continues to see investment, research continues to re-evaluate the impacts of parking on transit access and ridership in urban settings. Particularly, jurisdictions are beginning to limit park-and-rides in urban areas since they can detract from the quantity and quality of TOD.[23] Furthermore, King County Metro and Pierce Transit's LRPs, in particular, propose repurposing urban parking lots into mobility hubs or high-density residential and commercial infill projects. These would provide safe and reliable access to transit services. This is a theme among long-range transit plans from our region, as transit agencies seek to prioritize active transportation access to transit.

## *Transportation equity*

Since 2014, there has been a greater emphasis on researching the intersections between equity and transit access. Studies confirm TOD can better racial equity by providing easy access to regional transit system, affordable housing, and essential goods and services.[24] Though historically low-income BIPOC communities often lack access to high-quality transit, prioritizing TOD in these communities can improve access to regional destinations.[25]

The expansion of MOD services, like microtransit, is another emerging strategy to improve transportation equity. Jurisdictions are considering MOD services like car sharing and ride-

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[21] Pierce Transit. (2020). Pierce Transit 2040 Long-Range Plan Update. Retrieved from: https://www.piercetransit.org/destination-2040/

[22] Sound Transit. (2022). System Access Implementation Plan.

[23] Cao, J., & Duncan, M. (2019). Associations among distance, quality, and safety when walking from a park-and-ride facility to the transit station in the Twin Cities. Journal of Planning Education and Research, 39(4), 496-507. Retrieved from: https://journals.sagepub.com/doi/abs/10.1177/0739456X19883858

[24] Sandoval and Herrera. (2015). Transit-oriented development and equity in Latino neighborhoods: A comparative case study of MacArthur Park (Los Angeles) and Fruitvale (Oakland). Portland State University, Transportation Research and Education Center, Retrieved from: https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1064&context=trec_reports

[25] Jiao. (2017). Identifying transit deserts in major Texas cities where the supplies missed the demands. Journal of Transportation and Land Use. Retrieved from: https://www.jtlu.org/index.php/jtlu/article/view/899

hailing to provide transit to underserved communities.[26] One study indicates that MOD services can improve transit access for low-income individuals in rural areas, often not well served by traditional transit. [27] However, MOD services that require credit cards or smartphones can also pose barriers for some riders.

## Conclusion

This literature review reaffirmed the important influence of urban form, transit service, and parking on transit access. Furthermore, more recent research has emphasized the importance of new considerations such as MOD, parking reform, and equity.

[26] Brown, Manville, and Weber. (2021). Can mobility on demand bridge the first-mile transit gap? Equity implications of Los Angeles' pilot program. Transportation Research Interdisciplinary Perspectives. Retrieved from: https://www.sciencedirect.com/science/article/pii/S2590198221001032?via%3Dihub

[27] Rodier, C., Harold, B., & Zhang, Y. (2022). A Before and After Evaluation of Shared Mobility Projects in the San Joaquin Valley. National Center for Sustainable Transportation. Retrieved from: https://doi.org/10.7922/G2CZ35GV