

Stepping Up: Enhancing Urban Mobility, Health, and Inclusion Through Sidewalk Investment in the City of Vancouver

Executive Summary



GERO 840: Developing Inclusive Urban Streetscape
Department of Gerontology, Simon Fraser University

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Key Takeaways

- Sidewalks affect the quality of life for older adults and people with disabilities.
- Sidewalks must be understood as a necessary public health intervention.
- An age-inclusive, accessible city is a city with strong sidewalk infrastructure.
- Investing in sidewalks aligns with other city priorities by creating walkable, inviting environments that attract businesses, tourism, and promote local economic growth.
- Proactive measures such as regular inspections and repairs to prevent injuries and promote pedestrian safety.
- Addressing the discrepancy between existing sidewalk guidelines and the actual state of sidewalks is crucial for enhancing safety and accessibility for all residents.



Introduction

Functional, well-maintained sidewalks are a crucial component of our communities. They help us move safely from point A to point B, whether that be to get to school, work, transit stations, grocery stores, or community centers. Beyond their strictly functional roles, they also serve social roles as spaces to gather and to get exercise. **Sidewalks are vital connections that tie our communities together.**

In Vancouver, the need for sidewalk repair and renewal far outpaces funding. **At current funding levels, it will take roughly 300 years to complete the missing segments of sidewalks in the City of Vancouver** and to repair the defects across the existing sidewalk network, according to the City of Vancouver's Engineering Services' estimates. Cracks, missing curb ramps, and missing sidewalk segments plague Vancouver's sidewalks, making **sidewalks inaccessible and unsafe for many older adults (OA) and persons with disabilities (PWD) in the city.**

In collaboration with City Studio, a team of graduate students from Simon Fraser University's Gerontology program investigated how damaged sidewalks within the city create barriers to mobility and access for residents, with the aim of **communicating the day-to-day human impact of poor sidewalk conditions** and other gaps in the pedestrian infrastructure. This report includes a literature review on the importance of sidewalks, a review of COV guidelines and policies, lived experiences of Vancouverites with disabilities, and policy-maker perspectives. Ultimately, **adequate fundings of pedestrian infrastructure is an investment in equity, accessibility, and public health.**

"At current funding levels, it will take roughly 300 years to complete the missing segments of sidewalk in the City of Vancouver and to repair the defects across the existing sidewalk network."





Literature Review: Sidewalks as a Health, Quality of Life, and Social Inclusion Intervention

Health and Wellbeing

- Well-maintained sidewalks are **crucial for public health**, especially for older adults and people with disabilities.^{1, 21, 22, 23}
- Quality sidewalks improve health outcomes such as **reduced cholesterol and lower depression rates**.^{2, 24}
- Older adults from lower income backgrounds, who disproportionately rely on walking, especially benefit from well-maintained sidewalks.³
- Poor sidewalk conditions **increase fall risks**, particularly in lower-income neighbourhoods. Lower-income areas experience higher rates of falls on sidewalks, streets, and curbs.^{3, 4, 25}



Social Inclusion and Participation

- Poor sidewalk quality **reduces neighbourhood participation** among older adults, especially those with chronic health conditions. Sidewalks and curbs are common **barriers to neighbourhood participation**.^{5, 6, 7, 26}
- Falls, and the fear of falling is a risk factor for loneliness and social isolation, making **safe sidewalks are essential for reducing loneliness and social isolation**.^{8, 27}
- The City of Vancouver Seniors' Advisory Committee underscores the importance of walkable neighbourhoods with well-maintained sidewalks to **combat social isolation** among older adults.⁹

Equity

- Low-income neighbourhoods have more pedestrian-vehicle collisions due to car-centric infrastructure.¹⁰
- Street conditions impact mobility for people with impairments.¹¹
- Uneven sidewalks increase fall risks for visually impaired individuals.¹²
- Seniors, who often walk, face increased fall risks, exacerbating social and mobility challenges.¹³

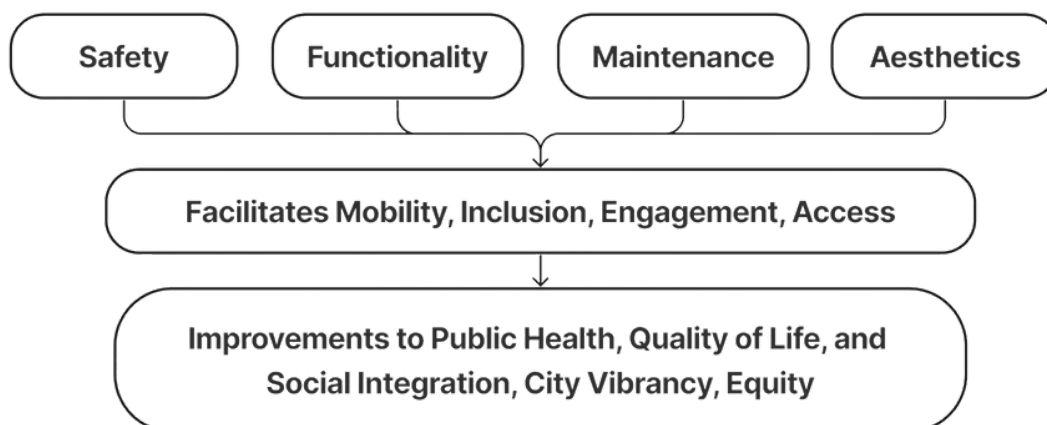
Economic Vibrancy

- Walkability lowers transportation costs for city residents.¹⁴
- Walkable areas draw homebuyers and Renters and supports local businesses and increasing property value.¹⁵
- Investment in walkable infrastructure drives job growth.¹⁶
- Pedestrian-friendly streets increase city tax revenue.¹⁷

Environment

- Sidewalks shape environmental outcomes, reducing car usage and improving air quality.^{18, 20}
- Walkable communities provide green spaces and support biodiversity.¹⁹
- Vancouver aims to reduce carbon pollution through transportation transformation in their Climate Emergency Action Plan.²⁰

Conceptual Framework



Safe, functional, well-maintained, and aesthetically pleasing sidewalks are crucial for enabling access, mobility, inclusion, and engagement within the city. These elements are integral to achieving broader objectives pursued by city planners and policymakers, such as improving quality of life, fostering social integration, revitalizing city vibrancy, promoting equity, and enhancing public health.



Beyond Sidewalks: Elements of a Walkable Neighborhood

Accessible, adequate sidewalks are a **necessary** but **not the sole** component of a walkable neighbourhood. The following section explores the important features of a neighbourhood that support walkability:

Urban Design:

Appearance and Maintenance: Neighbourhood **aesthetics** impact walking duration, particularly for recreational walking. Adequate **street furniture** such as **benches** and **street lighting** encourages older adults to walk.

Transportation Systems:

Traffic Safety and Congestion: Neighbourhoods with high rates of traffic collisions negatively impact the walking behavior of older adults.

Sidewalk Condition: Well-maintained sidewalks contribute to extended walking durations and encourage more walking.

Public Transportation: Greater **satisfaction with public transportation** correlates with **increased walking** for transportation purposes.

Land Use Patterns:

Accessible Destinations: Access to various destinations within walking distance, such as shopping areas and social hubs, encourages physical activity among older adults



Investment in Sidewalks Aligns with Other City Priorities

Broad Policy	Connection to Adequate Sidewalk Investment
Transportation Demand Management Action Plan	Encourages more active transportation and transit use to reduce the number of private vehicle trips.
Active Transportation Plan	Encourages active transportation , including infrastructure for walking.
Transportation 2040	Encourages walking culture and stronger pedestrian network .
Vision Zero	Aims to have zero traffic related fatalities. Where sidewalks are missing, the risk for collisions is higher, highlighting the need for a safe and complete sidewalk network.
Climate Emergency Action Plan	Aims to have two-thirds of trips in Vancouver to be by active transportation and transit by 2030. Calls for investments in walking, cycling and transit infrastructure .
Accessibility Strategy	Commits to the application of universal design principles to transportation and reaffirms the city's role maintaining accessible sidewalks .
Vancouver 2050	Aims to create more vibrant, walkable neighbourhoods by addressing the many underutilized residential neighborhoods in Vancouver.
Healthy City Strategy	Aims to build a healthier city through investment in people, communities, and environments. Commits to improving neighbourhood walkability .



Review of City of Vancouver's Policies, Sidewalk Bylaws and Design Principles

We reviewed the City of Vancouver's guidelines, focusing on key themes that align with their priorities of equity, safety, accessibility, community engagement, and social inclusion. These themes are crucial for creating safe, accessible, and vibrant public spaces, especially in the context of sidewalk infrastructure. The **city's commitment to these principles is evident in policies such as Vision Zero and the Transportation Demand Management Action Plan**, which emphasize the importance of sidewalks for active transportation.

To see how these themes will be applied to action, we have reviewed the design principles for the City of Vancouver, selecting several key ones that are shown in the table below.

However, our analysis reveals a **notable gap between these ideals and the current state of many sidewalks** in Vancouver. This underscores the urgent need for increased funding and proactive measures to enhance sidewalk maintenance, ensuring the safety and accessibility of all residents

Priorities	Design Principles
Equity	Inclusive Material Selection
Safety	Monitoring and Compliance
Accessibility	Flexibility in Design
Community Engagement	Continuous Training & Awareness
Social Inclusion	User-Centric Approach





Lived Experience Perspectives on Sidewalk Conditions in Vancouver

The **Stakeholders' Walkability/Wheelability Audit in Neighbourhoods (SWAN)** tool, was used to collect data on the sidewalk network in Vancouver. Data was collected on access, function, maintenance and safety of sidewalks by older adults and people living with disabilities. 21 residents at four intersections in Vancouver collected data. Based on interviews with people with lived experience the following aspects of sidewalk networks impact participants' mobility and social participation levels

Safety:

Maintaining **defect-free sidewalks** is crucial for ensuring accessibility and safety for all pedestrians, especially older adults and people with disabilities. Sidewalk defects pose **significant hazards, increasing the risk of trips and falls**, which can have serious consequences for individuals' well-being.



"Some of those sidewalk surfaces are really challenging for me. I've **fallen before because of cracks** in the sidewalk, and sometimes I'm **afraid** to step outside,"
33-year-old man, using a mobility assistive device



"A good sidewalk is **clean, smooth, and wide**,"
40-year-old man, living with vision impairment

Functionality:

A functional sidewalk is wide, clean, and smooth. Clean and smooth surfaces enhance safety and accessibility for pedestrians, particularly those with **visual or mobility impairments**. Additionally, wider sidewalks **accommodate individuals with varying mobility needs**, while features like tactile paving and curb ramps further enhance accessibility.



"Yea, I wanna take a walk on the sidewalk, but it's kinda dead out there, not much going on, you know? I wanna **see some people**, feel the vibe! Wish there were **more spots along the way to just sit**, watch the world go by, and maybe start up a chat..."
82-year-old woman

Social and Seated Resting Opportunities:

Sidewalks are **vital public spaces for social interaction and community engagement**. Providing seating options along sidewalks creates inviting spaces for people to rest, socialize, and enjoy the outdoors. **Integrating community gathering spaces and public art installations** further enriches the social experience, **fostering inclusivity and strengthening community connections**.



Sidewalk as Components of a Larger ecosystem

We found other complementary themes on the broader pedestrian infrastructure in which sidewalks operate. It's essential to recognize that sidewalks are not standalone entities.



"We noticed along a particular stretch, **some storefronts appeared to be completely inaccessible** due to high curbs or stairs at the front. However, I don't typically encounter that in the usual places I visit."
58-year-old man using an electric wheelchair

Participatory Approach: Involving people with lived experience in decision-making processes to ensure that designs are inclusive and meet the diverse needs of our community is essential.

This includes **raising awareness about existing features for safety and accessibility** and how to use them is crucial for creating a safe and inclusive sidewalk environment.



"Having these landmarks along the sidewalk is great. It's like having little checkpoints that **make me feel sure I'm heading in the right direction.**"
85-year-old woman living with dementia

Accessible Destinations: sidewalks serve as pathways to parks, shops, and community centers. Ensuring these destinations are easily accessible and inclusive from sidewalks is fundamental for equitable mobility and access.



"I have been fully blind since the year 2000, and I **never knew these push buttons** you mentioned existed because no one told me about them and I never heard them with all the traffic noise. I think without raising awareness about these good initiatives, these are not very useful to people like us who do not know about these things..."
97-year-old fully blind woman

Navigation and Wayfinding: Enhancing sidewalk navigation for all pedestrians involves providing **clear signage and landmarks to make sidewalks easy to navigate**, particularly for individuals with visual impairments or cognitive disabilities.

Case Study: WE Choo\$e Participatory Budgeting Pilot

In 2019, the City of Vancouver launched "WE Choo\$e", a Participatory Budgeting pilot program in the West End. \$100,000 was allocated to the West End, where citizens could decide how to allocate the funds. Ultimately, 30% of the funds (\$30,000) were allocated to sidewalk improvements. **Vancouver residents, when asked directly, value the quality of their sidewalks.**

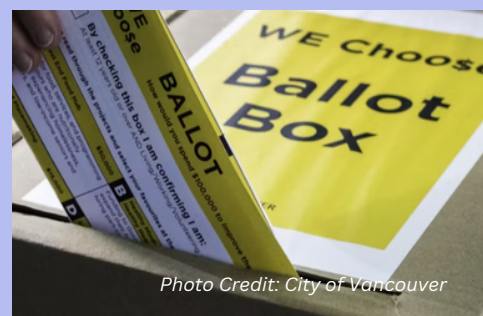
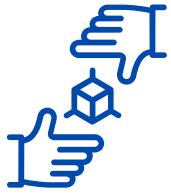


Photo Credit: City of Vancouver



City of Vancouver Staff Perspective on Older Adults, Sidewalks and Funding

- Safe sidewalks **reduce ageism, social isolation, and loneliness, while enhancing community programs.** Without safe sidewalks, older adults face risks from social isolation to poorer physical health.
- **Highlighting the connection** between safe sidewalks and issues older adults facing could **justify more funding.**



“If a community can become an **age-friendly** community, but doesn’t have a **complete sidewalk** network, then that is a **misnomer**”

A City staff member

- Securing more sidewalk funding is challenging due to limited resources.
- Factors considered in budget allocations include **alignment with city plans, cost-effectiveness, safety, and integration with other tasks.** Political will and council priorities heavily influence funding distribution, highlighting the need to align requests with city priorities and clearly communicate the importance of sidewalk investment.
- **Funding levels are insufficient,** with maintenance needs surpassing incremental increases.
- A significant funding boost is necessary to adequately address sidewalk maintenance.



Conclusion: Walking the Talk

Sidewalks shape the fabric of Vancouver. By directing resources towards sidewalk networks, we can champion public health, equity, and inclusion. Embracing sidewalks as critical infrastructure, and funding them accordingly, paves the way towards a more **robust, inclusive, and economically vibrant Vancouver.**

Literature Review

1. Borst et al., 2009; Mitra, R., Siva, H., & Kehler, M. (2015). Walk-friendly suburbs for older adults? Exploring the enablers and barriers to walking in a large suburban municipality in Canada. *Journal of Aging Studies*, 35, 10–19. <https://doi.org/10.1016/j.jaging.2015.07.002>
2. Hanson, S., & Jones, A. (2015). Is there evidence that walking groups have health benefits? A systematic review and meta-analysis. *British Journal of Sports Medicine*, 49(11), 710–715. <https://doi.org/10.1136/bjsports-2014-094157>
3. Li, W., Procter-Gray, E., Lipsitz, L. A., Leveille, S. G., Hackman, H., Biondolillo, M., & Hannan, M. T. (2014). Utilitarian Walking, neighbourhood Environment, and Risk of Outdoor Falls Among Older Adults. *American Journal of Public Health*, 104(9), e30–e37. <https://doi.org/10.2105/AJPH.2014.302104>
4. Bradley, S. M. (2011). Falls in Older Adults. *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine*, 78(4), 590–595. <https://doi.org/10.1002/msj.20280>
5. Twardzik, E., Clarke, P., Judd, S., & Colabianchi, N. (2021). neighbourhood Participation is Less Likely Among Older Adults with Sidewalk Problems. *Journal of Aging and Health*, 33(1–2), 101–113. <https://doi.org/10.1177/0898264320960966>
6. Santos, M. D. D., Silva, M. F., Velloza, L. A., & Pompeu, J. E. (2017). Lack of accessibility in public transport and inadequacy of sidewalks: Effects on the social participation of elderly persons with functional limitations. *Revista Brasileira de Geriatria e Gerontologia*, 20(2), 161–174. <https://doi.org/10.1590/1981-22562017020.160090>
7. Theis, K. A., & Furner, S. E. (2011). Shut-In? Impact of Chronic Conditions on Community Participation Restriction among Older Adults. *Journal of Aging Research*, 2011, 759158. <https://doi.org/10.4061/2011/759158>
8. Hajek, A., & König, H.-H. (2017). The Association of Falls with loneliness and social exclusion: Evidence from the deas german ageing survey. *BMC Geriatrics*, 17(1). <https://doi.org/10.1186/s12877-017-0602-5>
9. Elmer, 2018, p.99)
10. Battista, G. A., & Manaugh, K. (2019). Examining social inclusion among pedestrian plans in Canada. *Canadian Geographies / Géographies canadiennes*, 63(4), 663–675. <https://doi.org/10.1111/cag.12549>
11. Clarke, P., Ailshire, J. A., Bader, M., Morenoff, J. D., & House, J. S. (2008). Mobility Disability and the Urban Built Environment. *American Journal of Epidemiology*, 168(5), 506–513. <https://doi.org/10.1093/aje/kwn185>
12. Seetharaman, K., Mahmood, A., Rikhtehgaran, F., Akbarnejad, G., Chishtie, F., Prescott, M., Chung, A., & Mortenson, W. B. (2024). Influence of the built environment on community mobility of people living with visual disabilities: A scoping review. *Urban, Planning and Transport Research*, 12(1), 2296891. <https://doi.org/10.1080/21650020.2023.2296891>
13. Pearson, C., St-Arnaud, J., & Geran, L. (n.d.). Understanding seniors' risk of falling and their perception of risk.
14. Litman, T. (2003). Economic Value of Walkability. Victoria Transport Policy Institute, 10(1), 1–33. Retrieved from <https://www.vtpi.org/walkability.pdf>

Literature Review

15. Ryan, B. (2003). Economic Benefits of A Walkable Community. Retrieved from <https://fyi.extension.wisc.edu/downtowneconomics/files/2012/07/economic-benefits-of-a-walkable-community.pdf>
16. Snip, I. (2016). The Economic Benefits of a Walkable City. Forbes Georgia. Retrieved from <https://forbes.ge/the-economic-benefits-of-a-walkable-city/#:~:text=In%20Bristol%2C%20UK%2C%20the%20number>
- Welcome to the Vancouver Plan! (2022, April 1). The Vancouver Plan. Retrieved from <https://vancouverplan.ca/about/>
17. Quednau, R. (2018). Strong Towns. Strong Towns. Retrieved from <https://www.strongtowns.org/journal/2018/1/16/why-walkable-streets-are-more-economically-productive>
18. Cmons, M. (2019). Living in a walkable neighbourhood has a downside. Popular Science. Retrieved from <https://www.popsci.com/walkable-neighbourhood-pollution/>
19. Charron, D. (2017). Walkable neighbourhoods provide health, environmental and financial benefits. The Washington Post. Retrieved from <https://www.washingtonpost.com/news/where-we-live/wp/2017/10/09/walkable-neighbourhoods-provide-health-environmental-and-financial-benefits/>
20. Action Plan Summary Climate Emergency. (2020). Retrieved from <https://vancouver.ca/files/cov/climate-emergency-action-plan-summary.pdf>
21. Talen, E., & Koschinsky, J. (2014). Compact, Walkable, Diverse neighbourhoods: Assessing Effects on Residents. *Housing Policy Debate*, 24(4), 717–750. <https://doi.org/10.1080/10511482.2014.900102>
22. Rosenberg, D. E., Huang, D. L., Simonovich, S. D., & Belza, B. (2013). Outdoor Built Environment Barriers and Facilitators to Activity among Midlife and Older Adults with Mobility Disabilities. *The Gerontologist*, 53(2), 268–279. <https://doi.org/10.1093/geront/gns119>
23. Cauwenberg, J., De Bourdeaudhuij, I., De Meester, F., Van Dyck, D., Salmon, J., Clarys, P., & Deforche, B. (2011). Relationship between the physical environment and physical activity in older adults: A systematic review. *Health & Place*, 17(2), 458–469. <https://doi.org/10.1016/j.healthplace.2010.11.010>
24. Schauder, S. A., & Foley, M. C. (2015). The relationship between active transportation and health. *Journal of Transport & Health*, 2(3), 343–349. <https://doi.org/10.1016/j.jth.2015.06.006>
25. Li, W., Keegan, T. H. M., Sternfeld, B., Sidney, S., Quesenberry, C. P., & Kelsey, J. L. (2006). Outdoor falls among middle-aged and older adults: A neglected public health problem. *American Journal of Public Health*, 96(7), 1192–1200. <https://doi.org/10.2105/AJPH.2005.083055>
26. Bigonnesse, C., Mahmood, A., Chaudhury, H., Mortenson, W. B., Miller, W. C., & Martin Ginis, K. A. (2018). The role of neighbourhood physical environment on mobility and social participation among people using mobility assistive technology. *Disability & Society*, 33(6), 866–893. <https://doi.org/10.1080/09687599.2018.1453783>
27. Taube, E., Jakobsson, U., Midlöv, P., & Kristensson, J. (2015). Being in a bubble: The experience of loneliness among frail older people. *Journal of Advanced Nursing*, 72(3), 631–640. <https://doi.org/10.1111/jan.12853>

Bylaws and Guidelines

1. City of Vancouver. (2019). Engineering Design Manual. Retrieved from: <https://vancouver.ca/files/cov/engineering-design-manual.pdf>
2. City of Vancouver. (2017). Design Guidelines for Large Sidewalk Patios on City Property and Sample Drawings. Retrieved from: <https://vancouver.ca/files/cov/design-guidelines-for-large-sidewalk-patios-on-city-property.pdf>
3. City of Vancouver. Streetscape Design Guidelines. Retrieved from: <https://vancouver.ca/streets-transportation/streetscape-design-guidelines.aspx>
4. Norquay Village Neighbourhood Centre: Shopping Area: Public Realm and Transportation Improvements Plan. Adopted by City Council Nov. 4, 2010. Retrieved from: <https://vancouver.ca/files/cov/norquay-village-public-realm-and-transportation-plan-2010-november-4.pdf>
5. Cambie Corridor Public Realm Plan. Retrieved from: <https://vancouver.ca/images/web/cambie-corridor/cambie-corridor-public-realm-plan.pdf>
6. Southeast False Creek Private Lands (2009), Public Realm Enrichment Guide. Retrieved from: <https://vancouver.ca/docs/sefc/public-realm-guide.pdf>
7. City of Vancouver Management Action Plan 2021-2025: Encouraging Active Transportation & Transit, and Reducing Personal Vehicle Trips. June 2021
<https://vancouver.ca/files/cov/transportation-demand-management-action-plan.pdf>
8. Vision zero: Vancouver's transportation safety action plan
<https://vancouver.ca/streets-transportation/transportation-safety.aspx>
9. City of Vancouver Active Mobility Plan, Sidewalk Priorities, 2023-2027
<https://vancouver.ca/files/cov/sidewalk-priorities-map-2023-2027.pdf>
10. City of Vancouver. Active Transportation Promotion & Enabling Plan: Background Report
<https://vancouver.ca/files/cov/active-transportation-promotion-and-enabling-full-plan.pdf>
11. City of Vancouver, Climate Emergency, Action Plan, 2020-2025
<https://vancouver.ca/files/cov/climate-emergency-action-plan-summary.pdf>
12. City of Vancouver, Healthy City Strategy, A long-term, integrated plan for healthier people, healthier places, and a healthier planet
<https://vancouver.ca/people-programs/healthy-city-strategy.aspx>
13. The City of Vancouver's accessibility strategy, phase 1
<https://vancouver.ca/files/cov/accessibility-strategy-phase-1-full-strategy.pdf>
14. City of Vancouver, Equity Framework, Getting our house in order, 2021
<https://vancouver.ca/files/cov/equity-framework.pdf>
15. City of Vancouver, Vancouver plan 2025
<https://vancouverplan.ca/about/>