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MOVING HEALTHY CITIES FORWARD: THE STATE OF CYCLING INFRASTRUCTURE IN CANADA

**Daniel Fuller, Meghan Winters, Yan Kestens, Hiroshi Mamiya,
Meridith Sones, Benoît Thierry, Zoé Poirier Stephens**

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ABSTRACT

Investments in transportation, greening, and housing play a critical role in fostering healthier, more resilient cities. Canada has led global research on healthy cities over the last 30 years, but how are Canadian cities implementing these research findings? This paper explores deficits in health-promoting infrastructure, with a focus on cycling infrastructure in four Canadian cities. Well-designed cycling infrastructure is a fundamental part of providing safe, comfortable options in a multi-modal transportation system. Cycling infrastructure is often located in central urban areas, while outer regions can face significant deficiencies, limiting accessibility and perpetuating spatial inequities. Children are disproportionately affected by the lack of safe cycling infrastructure, and as low-income households increasingly migrate to the periphery, they may face growing disparities. Addressing these challenges requires integrated land use and transportation planning that emphasizes equity in design and implementation. Optimizing investments in cycling infrastructure is essential for fostering healthy, equitable, and resilient Canadian cities.

AUTHOR BIOGRAPHIES

INTERACT is a pan-Canadian collaboration of scientists, city builders, community partners, and residents studying the design of healthy cities. Our research addresses the urgent need for better evidence that can guide local action toward healthier and more equitable cities.

INTERACT is led by three researchers: **Daniel Fuller** is an associate professor in community health and epidemiology at the University of Saskatchewan. **Meghan Winters** is a professor at Simon Fraser University in Vancouver and a CIHR/PHAC Applied Public Health Research Chair. **Yan Kestens** is a professor at École de santé publique de l'Université de Montréal and researcher at the Centre de recherche en santé publique. **Hiroshi Mamiya** is assistant professor in epidemiology in the Department of Epidemiology, Biostatistics, and Occupational Health in the School of Population and Global Health at McGill University. **Meridith Sones** is INTERACT's knowledge mobilization manager, **Benoît Thierry** is the team's GIS specialist, and **Zoé Poirier Stephens** is the research manager.

INTRODUCTION

Urban health researchers are watching government commitments to infrastructure closely. Why? Because infrastructure – like transportation, greening, and housing – plays a pivotal role in shaping healthier, more resilient cities.

Since the early 1990s, Canada has been a global leader in research on healthy cities, contributing valuable insights into how infrastructure can support not just public health but also sustainability and equity. These goals are interconnected – what makes a city healthier often makes it more livable, sustainable, and resilient.

Over three decades later, we've learned a lot about what makes a healthy city, but questions remain. Where does Canada stand today in terms of implementing this vision of a healthy city? Are infrastructure deficits – such as gaps in active transportation facilities, green spaces, and housing – leaving certain groups behind?

In this chapter, we look at deficits in health-promoting infrastructure in Canada. First, we discuss what a healthy city is, and how Canada's leadership in this space has propelled change internationally. We then focus on one aspect of what makes a healthy city: cycling infrastructure. We present evidence on the health benefits of cycling infrastructure investments and review its current state in four Canadian cities. We share key insights into the implications of cycling infrastructure deficits and discuss four key opportunities to optimize new investments for healthier cities. Capitalizing on these opportunities is essential, not only for public health but for the long-term resilience of Canadian communities.

CANADA AS A LEADER IN HEALTHY CITIES RESEARCH

Given that over 80% of Canadians live in urban areas, cities have the potential to make a major impact as focal points for health promotion. There are multiple definitions of healthy cities;¹ here, we refer to one of the earliest and most enduring:

A healthy city is one that is continually creating and improving those physical and social environments and strengthening those community resources which enable people to mutually support each other in performing all the functions of life and achieving their maximum potential.²

This definition is in line with the Ottawa Charter for Health Promotion, which positions health as a positive resource and health promotion as more than just the responsibility of the health sector.³ There are four ideas at the core of healthy cities research:

1. Healthy cities are a process. There is no endpoint: a healthy city is one that is always striving toward the goal of improving resources and support for people.
2. Health is only one outcome of a healthy city. Healthy cities create environments that allow people to achieve the goals they want in their lives.
3. Health is affected by social and environmental factors that go well beyond healthcare and hospitals. Healthy cities improve access to health-promoting resources, such as parks, transportation, affordable and safe housing, clean air, healthy foods, and more.
4. Healthy cities have built-in equity considerations. They strive to create environments that allow everyone to get what they need, accounting for different barriers and conditions.

Canada has been – and continues to be – a research leader in understanding how cities affect health and health equity. In 2017, Chief Public Health Officer Dr. Theresa Tam’s annual report, “Designing Healthy Living,” called for better information to allow governments to measure the health impacts of community design, in order to incorporate evidence-based strategies into community planning.⁴ In response, the Canadian Institutes of Health Research (CIHR) directed millions of research dollars to funding healthy cities research in Canada. In 2019, CIHR launched the Healthy Cities Research Initiative, with the “overarching goal of improving health by maximizing the health-promoting potential of cities and urbanized areas in Canada and internationally.”⁵ These research investments

¹ De Leeuw and Simos, *Healthy Cities*.

² Hancock and Duhal, “Promoting Health in the Urban Context.”

³ Public Health Agency of Canada, “Ottawa Charter for Health Promotion.”

⁴ Chief Public Health Officer, “Designing Healthy Living.”

⁵ Canadian Institutes of Health Research, *Healthy Cities Research Initiative*.

have generated evidence, built capacity to boost our understanding of healthy cities in Canada, and opened opportunities for international research collaborations.

Our research program – the INTerventions, Equity, Research, and Action for Healthy Cities Team (INTERACT) – is funded in part by the Healthy Cities Research Initiative. INTERACT is a pan-Canadian collaboration of scientists, city builders, community partners, and residents studying the design of healthy cities. In 2017, INTERACT launched a multi-year cohort study and intervention research platform to understand how changes to the built environment influence health. We have since expanded INTERACT’s research program to help cities respond effectively to today’s most pressing challenges. Ultimately, we aim to address the need for better evidence, generated by and for communities, that can guide local action and inform a broader national conversation on the design of healthier and more equitable cities in Canada. While the concept of healthy cities encompasses a range of topics, including access to health care, environmental hazards, social determinants of health, and harm reduction, in this paper we focus on sustainable transportation infrastructure.

BUILDING HEALTHY CITIES: FOCUS ON TRANSPORTATION

Affordable housing in amenity-rich neighbourhoods, fair access to green space, and transportation infrastructure that makes it easier to get around by foot, bike, or transit can improve population health overall while also providing mitigation and adaptation strategies for the climate crisis.⁶ However, the distribution of transportation infrastructure is uneven, and equity-deserving areas and groups are continually overlooked – exacerbating the inequity.⁷ Only 20% of urban residents in Canada live in amenity-rich neighbourhoods where access to parks, libraries, and transit is easily within reach.⁸

We focus on cycling infrastructure as a key piece of healthy cities to better understand the infrastructure deficit. Well-designed cycling infrastructure offers people safe and comfortable ways to move through the city and is key to promoting cycling among the wider population. Protected bike lanes, off-street paths, and local street bikeways are preferred by inexperienced bicyclists, risk-averse individuals, women, people with children, people with disabilities, and younger and older cyclists, who are less likely to feel comfortable riding near motor vehicles.⁹ These facilities offer the greatest safety benefits. For example, users of protected bike lanes have one-ninth the odds of injury that cyclists on major streets have.¹⁰ Protected lanes mitigate existing inequities in cycling and appeal to parents, people with disabilities, older people.¹¹ Connectivity is equally important: networks of bike infrastructure are needed to encourage more cycling.¹² Building connected, convenient, and comfortable cycling infrastructure that connects downtown cores to suburbs, shops, services, schools, employment, transit, community centres, and parks is fundamental to creating a multi-modal transportation system.¹³

Cycling infrastructure can be transformative for both health and health equity. Using active modes of transportation, such as walking or cycling, offers an opportunity for Canadians to increase their overall level of physical activity, yet only 6% of adults reported using mainly active modes to get to work or school in May 2024.¹⁴ Increased cycling infrastructure creates opportunities for physical activity and

⁶ Giles-Corti et al., “City Planning and Population Health: A Global Challenge”; Reyes-Riveros et al., “Linking Public Urban Green Spaces and Human Well-Being”; Glazener et al., “Fourteen Pathways between Urban Transportation and Health.”

⁷ Firth et al., “Not Quite a Block Party”; Zhao et al., “Who Has Access to Cycling Infrastructure in Canada?”; Allen and Farber, “Sizing up Transport Poverty.”

⁸ Alasia et al., “Measuring Proximity to Services and Amenities.”

⁹ Winters and Teschke, “Route Preferences among Adults in the near Market for Bicycling”; Garrard, Rose, and Lo, “Promoting Transportation Cycling for Women”; Dill et al., “Can Protected Bike Lanes Help Close the Gender Gap in Cycling?”

¹⁰ Teschke et al., “Route Infrastructure and the Risk of Injuries to Bicyclists.”

¹¹ Buehler and Pucher, *Cycling for Sustainable Cities*; Verlinden et al., “Increasing Cycling in Canada.”

¹² Buehler and Dill, “Bikeway Networks”; Schoner and Levinson, “The Missing Link.”

¹³ Keesmaat, “2020 Declaration for Resilience in Canadian Cities.”

¹⁴ Statistics Canada, “More Canadians Commuting in 2024.”

the prevention of chronic disease, and improves well-being, social connections, place attachment, and civic engagement. When cycling trips replace private motor vehicle trips, cycling also brings population health benefits – even for those who aren’t cycling themselves – through reductions in emissions, congestion, and noise. Despite the health co-benefits, not everyone has easy access to sustainable transportation options. The Canadian Bikeway Comfort and Safety Classification System (Can-BICS, discussed further below under “Methods and Data,”) found that one-third of neighbourhoods in Canada had no cycling infrastructure, and only 6% of Canadians live in areas with strongly supportive environments for cycling.¹⁵

“Building connected, convenient, and comfortable cycling infrastructure that connects downtown cores to suburbs, shops, services, schools, employment, transit, community centres, and parks is fundamental to creating a multi-modal transportation system.”

¹⁵ Winters et al., “Canadian Bikeway Comfort and Safety Metrics (Can-BICS).”

STUDY CONTEXT

In this article, we examine the current state of cycling infrastructure in four Canadian cities that INTERACT has been working with, mapping out where investments are happening and where there are still deficits in terms of access to health-promoting urban infrastructure.

Victoria

In 2016, Victoria began building an All Ages and Abilities (AAA) cycling network of high-safety, high-comfort, connected bike routes across the city.¹⁶ The first segment of the network was built in the downtown core, and additional segments spread to various neighbourhoods. The first phase of the vision, a 32-kilometre network, will be complete in 2025, at which point 95% of the municipality will live within 500 metres of an AAA cycling route.

Vancouver

The City of Vancouver is upgrading and expanding its cycling network to make biking more safe, convenient, and comfortable for people of all ages and abilities.¹⁷ Part of the network is made up of City Greenways, active transportation routes and high-quality linear public spaces that link neighbourhoods and support active travel between Vancouver and neighbouring municipalities. The City has adopted an ambitious target for sustainable transportation modes: that at least two-thirds of all trips be made by foot, bike, and transit by 2040.¹⁸

Montreal

The City of Montreal has expanded its cycling network to make transportation easier, recently focusing on the Réseau Express Vélo (REV), or Express Bike Network, which upon completion will be a 191-kilometre network of year-round separated or protected bike lanes on the Island of Montreal.¹⁹ The City has implemented five corridors totalling 22.7 kilometres as part of phase 1. The City's goal is to for 15% of trips in Montreal's central boroughs to be by bicycle by 2027.

¹⁶ City of Victoria, *Cycling Network*.

¹⁷ City of Vancouver, *Cycling in Vancouver*.

¹⁸ City of Vancouver, "Transportation 2040."

¹⁹ Ville de Montréal, *Le REV*.

Saskatoon

Saskatoon has limited cycling infrastructure. Most of the network is made up of paved multi-use pathways along the Meewasin River Valley, which runs through the city.²⁰ Other infrastructure is mainly on-street bike lanes or short segments in parks and parking lots. The City's 2016 Active Transportation Plan set ambitious targets for the share of trips to be taken by walking and cycling, recognizing that major investments in safe cycling infrastructure are needed to reach these goals.²¹

²⁰ City of Saskatoon, "Active Transportation Plan."

²¹ City of Saskatoon, "Active Transportation Plan."

METHODS AND DATA

Can-BICS is a national dataset with the goal of standardizing and classifying cycling infrastructure across major Canadian cities. It groups infrastructure into high-, medium-, and low-comfort classifications (see Figure 1).

To map the cycling infrastructure deficit, inequities, and access to cycling infrastructure, we combined the Can-BICS 2022 data with data from the 2021 Canadian Census.²² (We used the 2022 infrastructure data because it aligns the most closely with the 2021 census.) We used census tracts as the unit of analysis (20 tracts in Victoria, 127 in Vancouver, 55 in Saskatoon, and 541 in Montreal).

We calculated the density of cycling infrastructure (in kilometres per hectare) in each of these census tracts by dividing the length of cycling infrastructure by the area of the census tract. We considered the different types of cycling infrastructure as outlined in Figure 1.

Figure 1. Types of cycling infrastructure, according to the Canadian Bikeway Comfort and Safety (Can-BICS) Classification System

High-comfort cycling infrastructure



Protected bike lanes: Dedicated cycling lanes that are separated from other vehicular traffic.



Local street bikeways: Local streets with traffic calming and bicycle priority measures where cyclists share the roadway with motor vehicles.



Bike-only paths: Off-road paved paths used exclusively by cyclists, located along independent corridors away from roads.

²² Winters et al., “Canadian Bikeway Comfort and Safety Metrics (Can-BICS)”; Statistics Canada, *Census Profile*.

Medium-comfort cycling infrastructure



Multi-use paths: Two-way paved paths shared by cyclists, pedestrians, and other users (e.g., skateboarders and rollerbladers). They may be located either along independent corridors away from roads or next to a roadway.

Low-comfort cycling infrastructure



Painted bike lanes: Painted lanes along a busy roadway that are designated as exclusively for cyclists by means of pavement markings (bicycle and diamond symbols). These lanes are positioned between a vehicle travel lane and the curb.

Source: Adapted from Meghan Winters et al., “The Canadian Bikeway Comfort and Safety (Can-BICS) Classification System: A Common Naming Convention for Cycling Infrastructure,” *Health Promotion and Chronic Disease Prevention in Canada* 40, no. 9 (2020): 288–93, Table 1.

Equity-deserving groups

To assess which populations have access to cycling infrastructure, we mapped where there are higher proportions of population groups that have been historically under-represented in cycling or in urban planning processes and decision-making: racialized people, recent immigrants, people in low-income households, children, and older adults.²³

All the measures detailed below were operationalized as the census tract-level proportion of the total population (i.e., city and year-specific prevalence). Census data were extracted using the CanCensus package in R statistical software.²⁴

²³ Doran, El-Geneidy, and Manaugh, “Pursuit of Cycling Equity”; Firth et al., “Who Bikes?”; Lugo, *Bicycle/Race*; MacEacheron et al., “Is Canada’s Commuter Bicycling Population Becoming More Representative?”

²⁴ von Bergmann, Shkolnik, and Jacobs, “Cancensus.”

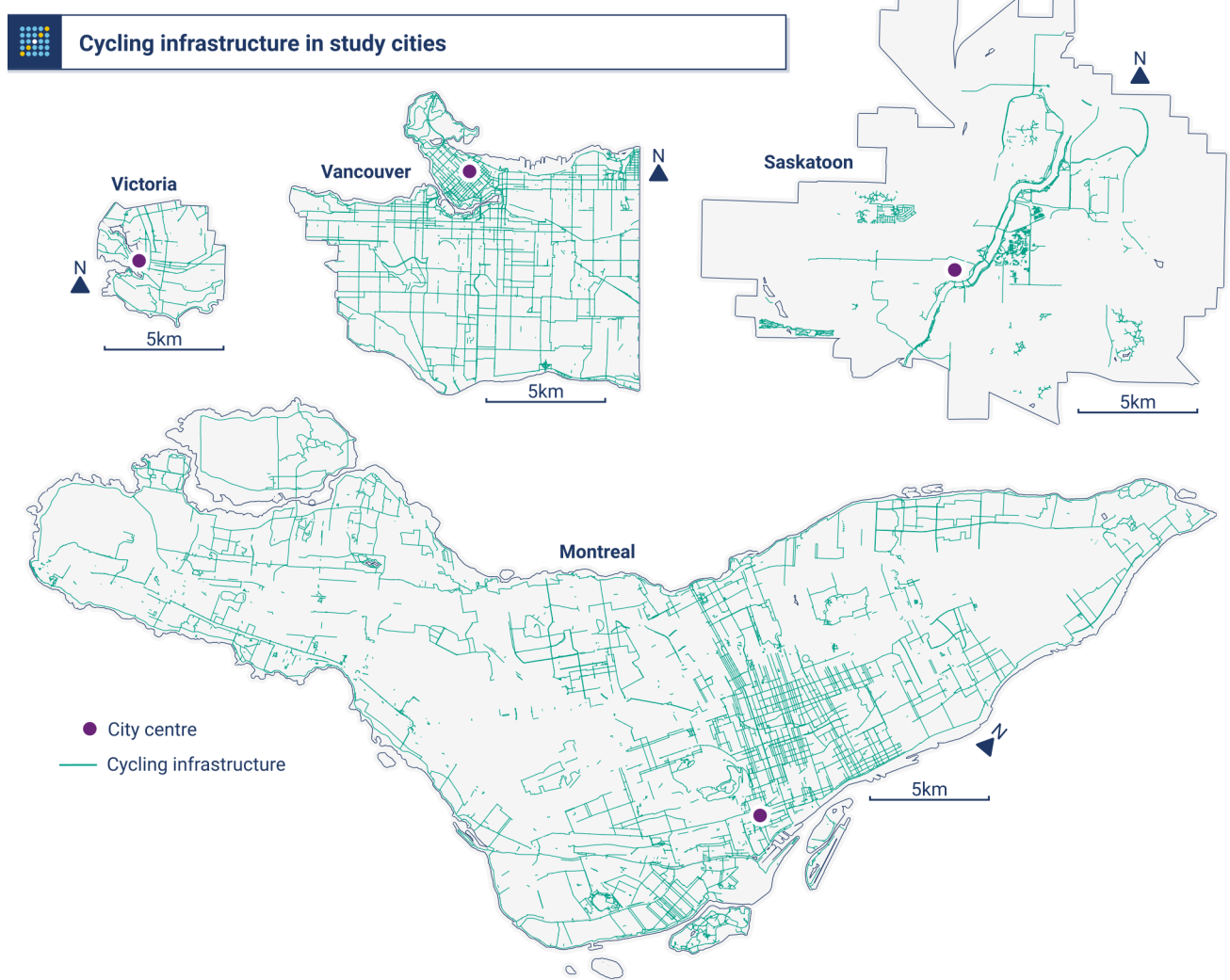
ANALYSIS

To assess the patterns of infrastructure deficit in our four study cities, we first created a bivariate map for each city to show the density of cycling infrastructure (km/ha) per census tract by population density. We then used an equity lens to assess who is most affected by these deficits. To do this, we calculated the proportion of equity-deserving groups within each census tract and combined this data with the density of cycling infrastructure in that tract. We again used bivariate maps to present both the density of infrastructure and equity-deserving groups.

RESULTS

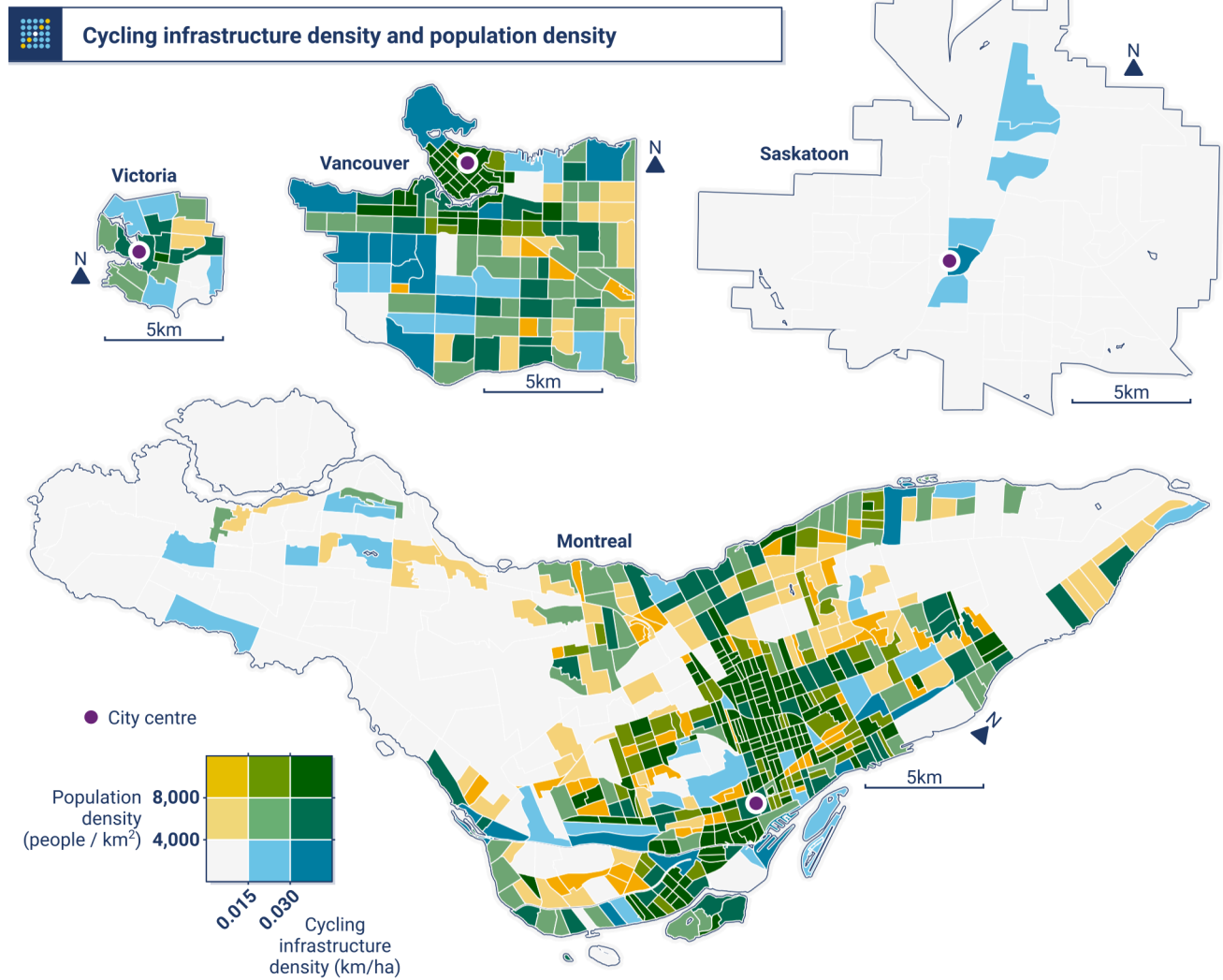
Our results are shown in the following maps of infrastructure deficits in cycling in Victoria, Vancouver, Saskatoon, and Montreal.

Figure 2(a). Population density and cycling infrastructure in four Canadian cities, using tertiles



Data Sources: Canadian Bikeway Comfort and Safety metrics (Can-BICS) 2022

Figure 2(b). Population density and cycling infrastructure in four Canadian cities, using tertiles



Data Sources: Statistics Canada 2021 Census of Population; Canadian Bikeway Comfort and Safety metrics (Can-BICS) 2022

The dark yellow colour in the top left square indicates infrastructure deficits, since these are areas that have a high population density along with a low amount of cycling infrastructure. (Note that for Saskatoon only, natural breaks were used rather than tertiles because of the relatively low density of cycling infrastructure.)

In the large cities of Vancouver and Montreal, cycling infrastructure is generally concentrated in central areas, where there is a higher population density (dark green areas on the maps in Figure 2). Montreal has a dense weave of cycle paths in the centre of the island, with segments along the shores to connect peri-urban boroughs to central areas. In Vancouver, the downtown core is densely covered with infrastructure, which progressively thins to the southeast. In the two smaller cities, the infrastructure follows different patterns: Victoria has a distributed grid covering the entire city; Saskatoon’s cycling infrastructure is mainly along the river, with small, disconnected segments through the city, leaving the city’s periphery with important deficits.

Historically, cycling infrastructure has mainly developed in central areas, where land use patterns, economic activity, density, and urban design have favoured cycling uptake.²⁵ Our findings here align with this history: there are gaps in cycling infrastructure across all four cities, mainly outside of dense central areas.

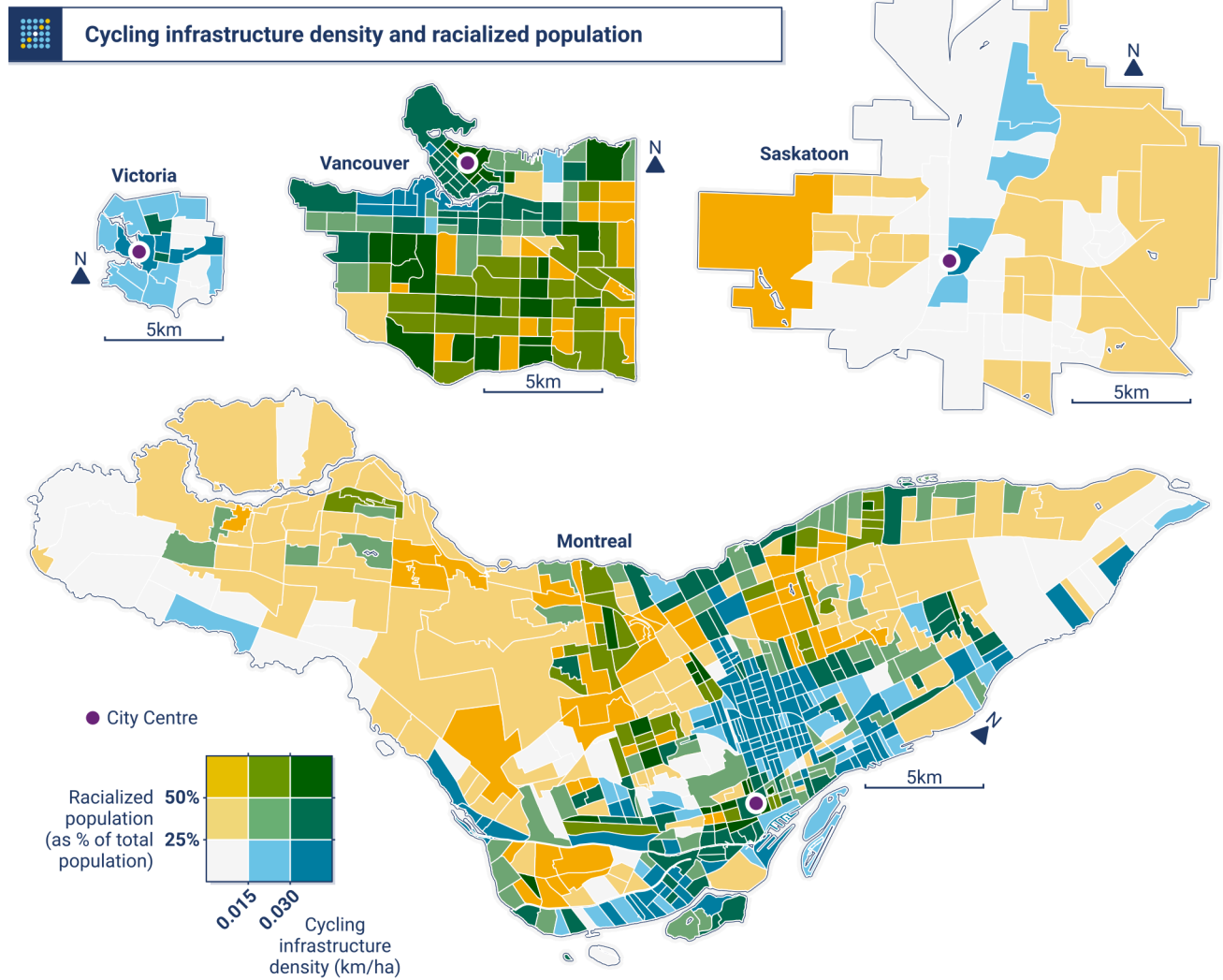
To look at which population groups are most affected by these deficits, we mapped the amount of cycling infrastructure in each census tract and the proportion of equity-deserving populations. To interpret the maps, consider that areas with a high proportion of equity-deserving populations and a low amount of cycling infrastructure are presented in dark yellow. These indicate areas with the most inequity.

Racialized populations

Looking at where racialized populations are living, we found that patterns in access to cycling infrastructure varied by city (see Figure 3). In some, there were clear trends. For example, the southeast area of Vancouver, home to a large Asian and South Asian population, is under-resourced in terms of cycling infrastructure. In Saskatoon, the peripheral areas are more racially diverse and are also currently disconnected from the city's modest cycling network. In Montreal and Victoria, however, patterns were less clear: pockets of racially diverse areas that have little cycling infrastructure in Montreal abut areas with high cycling infrastructure density. In Victoria, the highest concentrations of racialized populations live east of downtown (dark green on the map), an area that benefits from high levels of access to cycling infrastructure.

²⁵ Assunção-Denis and Tomalty, "Increasing Cycling for Transportation in Canadian Communities"; Winters et al., "Equity in Spatial Access to Bicycling Infrastructure in Mid-Sized Canadian Cities."

Figure 3: Proportion of racialized populations per census tract by density of cycling infrastructure in four Canadian cities, using natural breaks



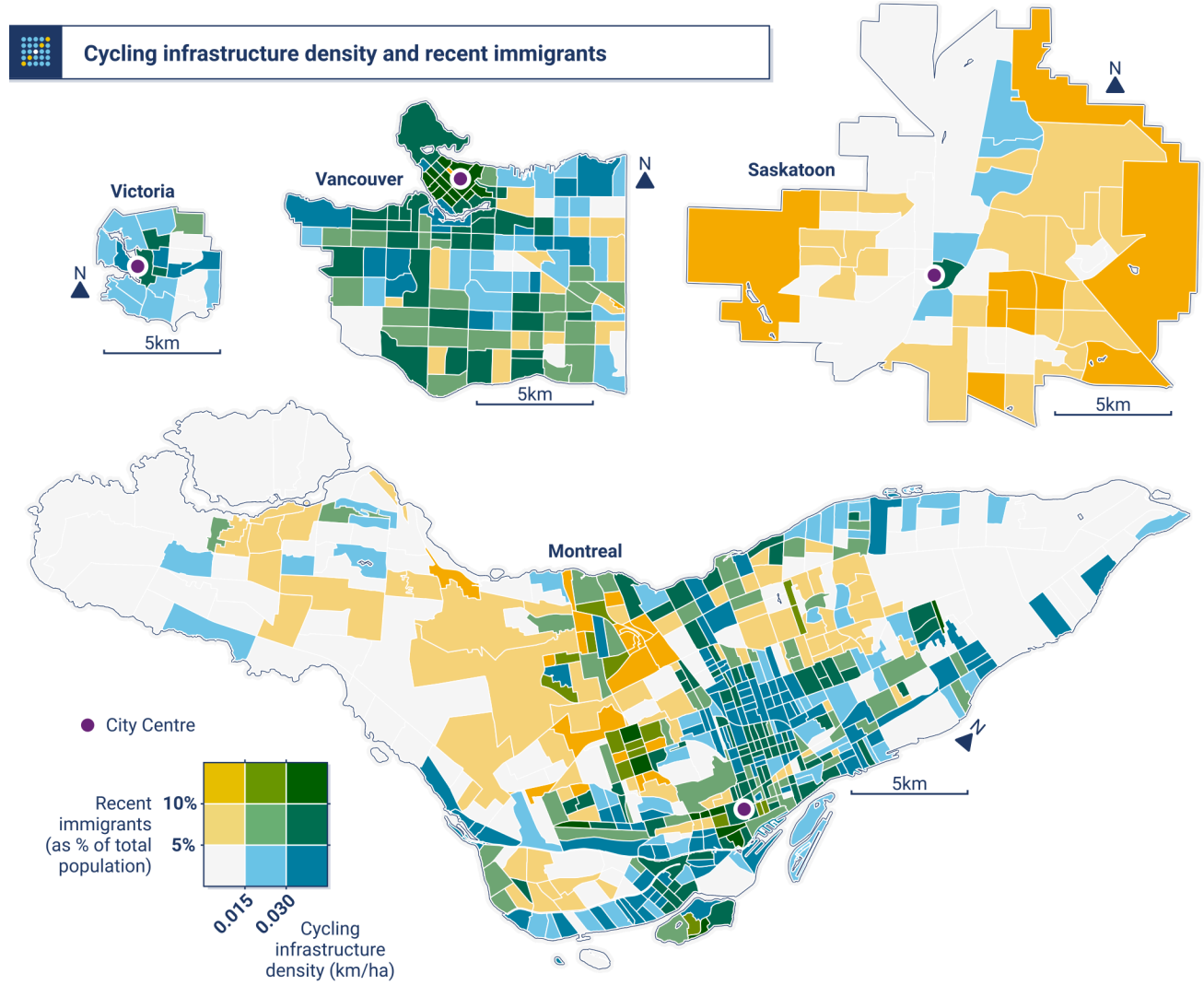
Data Sources: Statistics Canada 2021 Census of Population; Canadian Bikeway Comfort and Safety metrics (Can-BICS) 2022

The dark yellow colour in the top left square indicates areas that have a high proportion of racialized populations and a low amount of cycling infrastructure. This combination suggests that the distribution of infrastructure is less equitable in these areas, because equity-deserving groups don't benefit from much cycling infrastructure nearby. The dark blue colour in the bottom right square indicates areas that have a low proportion of racialized populations and a high density of cycling infrastructure. These areas could be seen as having less equitable distribution of infrastructure, since advantaged populations have high access.

Recent immigrants

In the larger cities of Montreal and Vancouver, as well as in Victoria, there are a few pockets where recent immigrants have low access to cycling infrastructure (dark yellow on the maps in Figure 4). In Saskatoon, the pattern is similar to the one for racialized populations: high concentrations of recent immigrants in the areas east of downtown, where access to cycling infrastructure access is high. This finding may speak to differences in how immigrants settle in the city, with new immigrants tending to live on the periphery.

Figure 4: Proportion of recent immigrants per census tract by density of cycling infrastructure in four Canadian cities, using natural breaks



Data Sources: Statistics Canada 2021 Census of Population; Canadian Bikeway Comfort and Safety metrics (Can-BICS) 2022

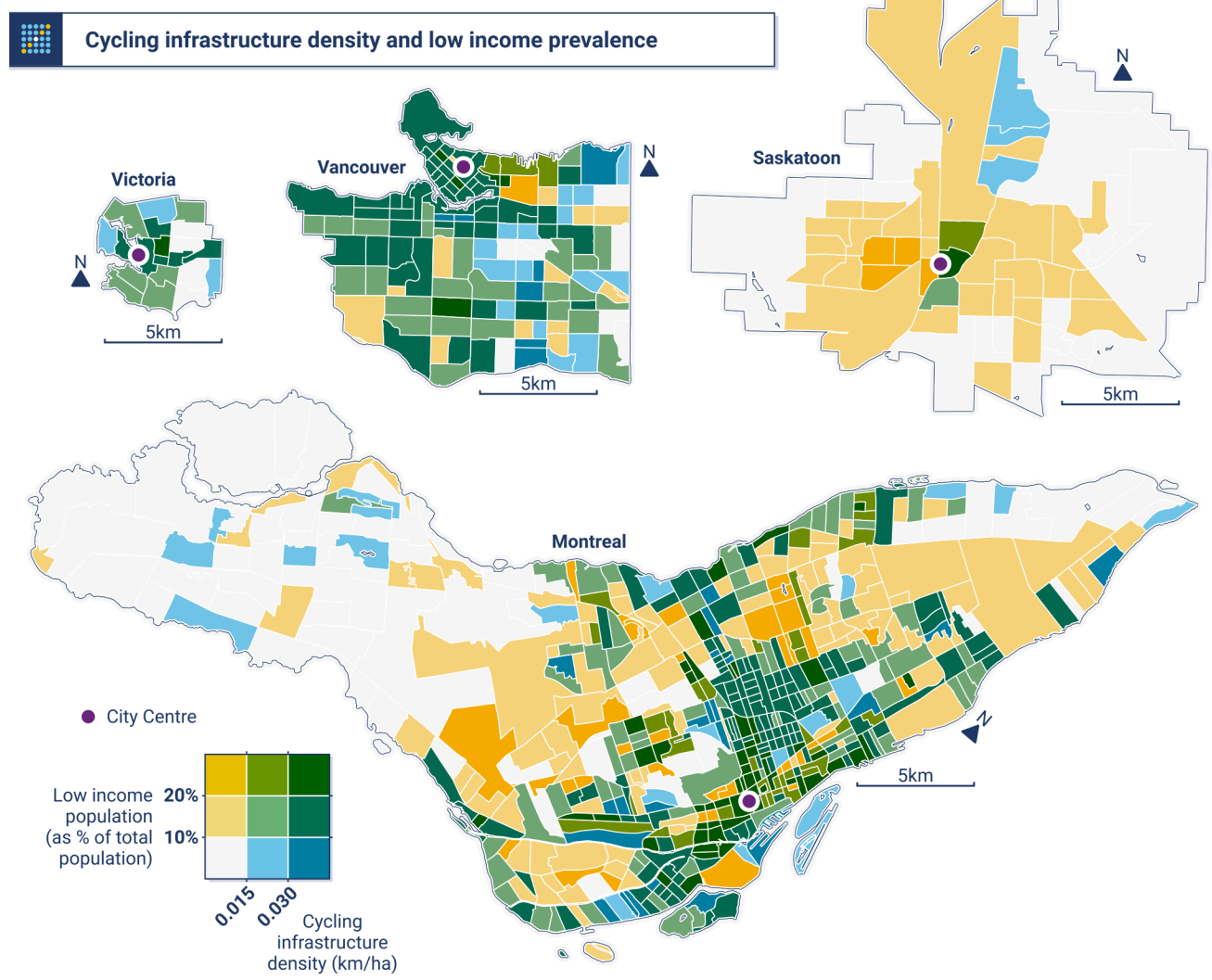
The dark yellow colour in the top left square indicates areas that have a high proportion of recent immigrants and a low amount of cycling infrastructure. This combination suggests that the distribution of infrastructure is less equitable in these areas, because equity-deserving groups don't benefit from much cycling infrastructure nearby. The dark blue colour in the bottom right square indicates areas that have a low proportion of recent immigrants and a high density of cycling infrastructure. These areas could be seen as having less equitable infrastructure distribution, since advantaged populations have high access.

Low-income households

Overall in our study, there are few areas with a high proportion of low-income households and low access to cycling infrastructure (dark yellow on the map). In Victoria, there are none; in Vancouver, only the Downtown Eastside is highlighted in dark yellow on the map. In Saskatoon, pockets on the west side of the city, known as the core neighbourhoods, show a high degree of inequity. In Montreal, there are areas of dark yellow peppered across the island, especially in central areas.

Compared to other equity-deserving groups, people in low-income households have relatively good access to cycling infrastructure. This is likely because low-income households are generally located in denser, more urban areas, where cycling infrastructure is more developed.

Figure 5. Proportion of people in low-income households per census tract by density of cycling infrastructure in four Canadian cities, using natural breaks



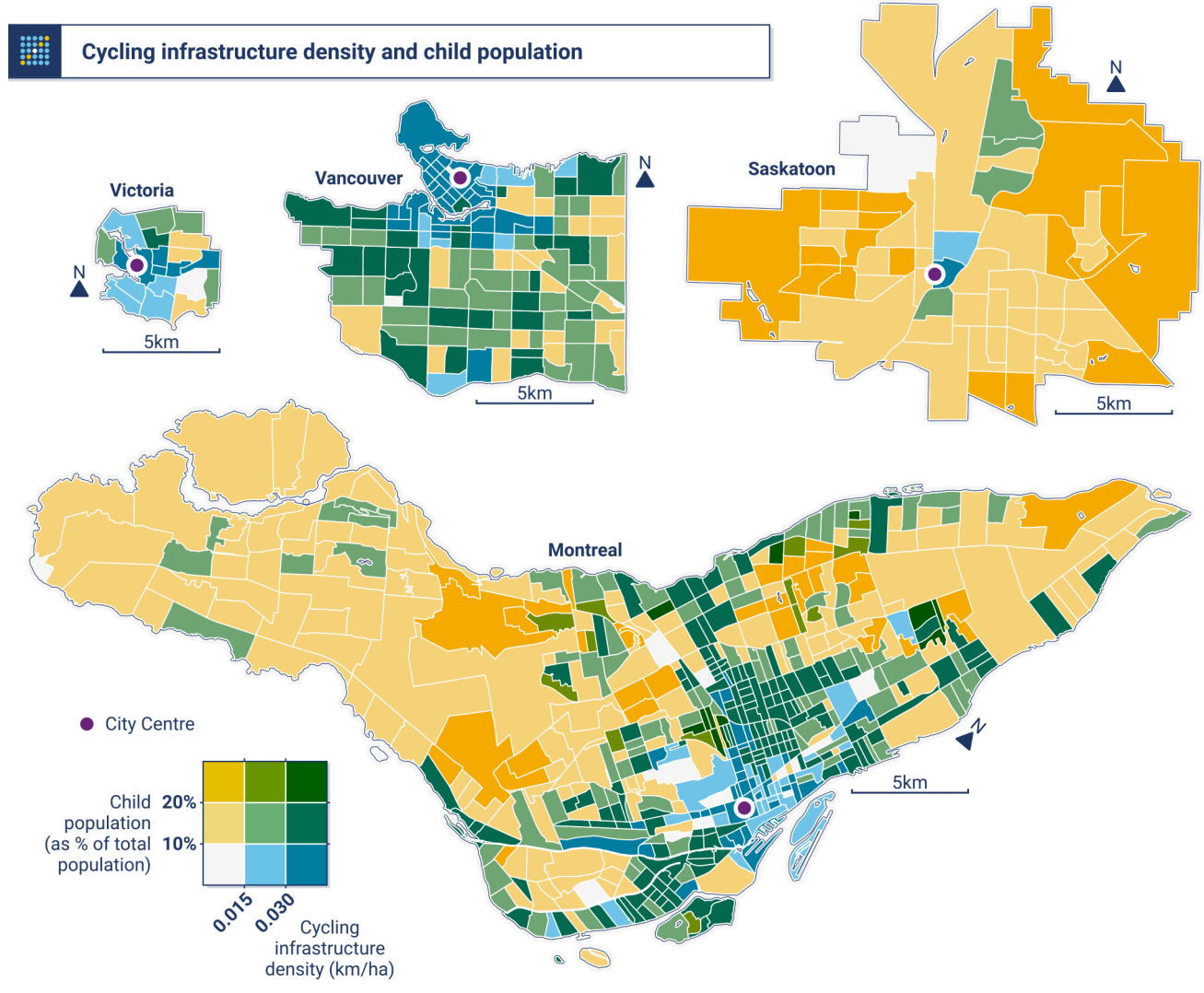
Data Sources: Statistics Canada 2021 Census of Population; Canadian Bikeway Comfort and Safety metrics (Can-BICS) 2022

The dark yellow colour in the top left square indicates areas that have a high proportion of people in low-income households and a low amount of cycling infrastructure. This combination suggests that the distribution of infrastructure is less equitable in these areas, because equity-deserving groups don't benefit from much cycling infrastructure nearby. The dark blue colour in the bottom right square indicates areas that have a low proportion of people in low-income households and a high density of cycling infrastructure. These areas could be seen as having less equitable distribution of infrastructure, since advantaged populations have high access.

Children

Figure 6 shows many areas across all cities with a high proportion of children who have low access to cycling infrastructure (dark yellow on the map). Since children are some of the most vulnerable road users, infrastructure deficits in areas with families have a strong impact on health. Injuries and fatalities due to road traffic disproportionately involve children – road traffic is in fact the number-one cause of death for children and teens aged 5 to 19. Parents may feel uneasy about letting their children travel by bike when there is little cycling infrastructure to make their rides safer. In Vancouver, the limited availability of downtown housing options for larger families means that people with children are more likely to live outside of the city's dense, bike-friendly areas.

Figure 6. Proportion of children per census tract by density of cycling infrastructure in four Canadian cities, using natural breaks



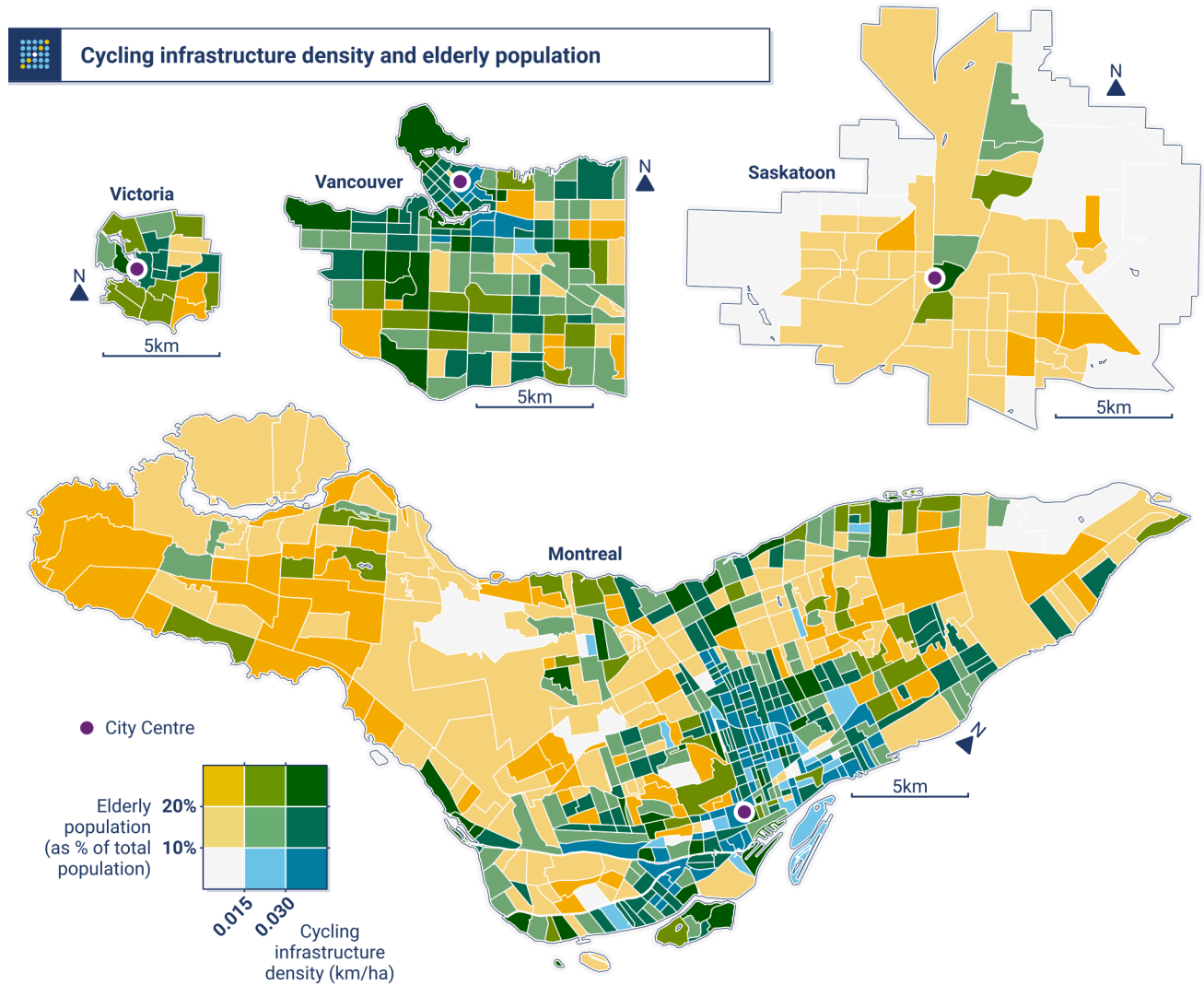
Data Sources: Statistics Canada 2021 Census of Population; Canadian Bikeway Comfort and Safety metrics (Can-BICS) 2022

The dark yellow colour in the top left square indicates areas that have a high proportion of children and a low amount of cycling infrastructure. This combination suggests that the distribution of infrastructure is less equitable in these areas, because equity-deserving groups don't benefit from much cycling infrastructure nearby. The dark blue colour in the bottom right square indicates areas that have a low proportion of children and a high density of cycling infrastructure.

Older adults

Figure 7 shows that many areas across all cities have both a high proportion of older adults and low access to cycling infrastructure (dark yellow on the map), particularly in the south of Vancouver, James Bay in Victoria, and the southeast in Saskatoon, where there are newer suburban developments. High-comfort cycling infrastructure is particularly important for older adults, as it allows for safe, accessible, and independent mobility options. Well-designed cycling networks can also increase physical activity and enhance social inclusion by making it easier for older adults to connect with their communities.

Figure 7: Proportion of older adults per census tract by density of cycling infrastructure in four Canadian cities, using natural breaks.



Data Sources: Statistics Canada 2021 Census of Population; Canadian Bikeway Comfort and Safety metrics (Can-BICS) 2022

The dark yellow colour in the top left square indicates areas that have a high proportion of older adults and a low amount of cycling infrastructure. This combination suggests that the distribution of infrastructure is less equitable in these areas, because equity-deserving groups don't benefit from much cycling infrastructure nearby. The dark blue colour in the bottom right square indicates areas that have a low proportion of older adult and a high density of cycling infrastructure.

“Low-income households are generally located in denser, more urban areas, where cycling infrastructure is more developed.”

KEY INSIGHTS

Cycling infrastructure deficits generally occur outside of central urban areas. In Saskatoon, where the infrastructure mainly follows the river, deficits are more widespread. If we want to see an increase in the share of trips taken by bicycle, we need to build bike infrastructure throughout the city so that people can consider cycling for all trips. This means that instead of following a “hub and spoke” model (i.e., bike paths all leading to a central area), we need to build actual networks so people can use bicycles to visit family and friends and to reach key destinations like stores, daycares, and community centres.

We saw spatial disparities in access following different patterns in different cities. The greatest inequities we observed were for children. This is of particular concern because a) children need safe infrastructure to take up cycling in the first place and to feel safe riding their bikes, and b) they are the most affected by road traffic injuries and deaths.

There are fewer inequities in access to cycling infrastructure for low-income households than for the other equity-deserving populations we studied. This is because low-income households tend to be concentrated in central city cores. Yet these patterns may be changing; researchers have warned that there has been a growing exodus of low-income households toward the suburbs.²⁶

Transportation is inherently related to land use and housing. Planning and housing policies that allow for mixed-income, family-friendly housing are needed alongside investments in cycling infrastructure in under-resourced areas. An integrated approach to land use and transportation planning is critical for effective action toward healthy and equitable cities.

While equity considerations in transportation have received increased attention recently, cities are still far from where they aim to be in terms of operationalizing transportation equity on the ground.²⁷ In Laberee et al.’s review of 35 active transportation plans from Canadian municipalities, over 70% use the language of planning “for all ages and abilities” in cycling; however, few specified what types of bike infrastructure this comprised in their cities, or which populations were considered under “all abilities.”²⁸

²⁶ Allen and Farber, “Suburbanization of Transport Poverty.”

²⁷ Williams et al., “Practices and Inspiration for Sustainable Transportation Equity”; Doran, El-Geneidy, and Manaugh, “Pursuit of Cycling Equity.”

²⁸ Laberee et al., “‘All Ages and Abilities’.”

FOUR OPPORTUNITIES TO OPTIMIZE CANADA'S NEXT INVESTMENTS

We have shared how gaps in cycling infrastructure vary across neighbourhoods, and how they form patterns in relation to population groups. These patterns occur with other types of infrastructure as well; our close look at cycling serves as an example.

As Canada looks to fill the infrastructure gap with the goal of healthy cities, one thing is clear: *how* we invest in infrastructure will be just as important as *how much*. Based on the data from this study and our years of research and practice, we present below four opportunities for decision-makers to advance healthy cities.

Adopt health-promoting policies at every level

Some of the most critical drivers for health are controlled outside of the public health sector by a constellation of actors who determine their funding, planning, and implementation. In recognition of this, the WHO has called for countries to adopt Health in All Policies, an approach that considers the health and social implications of policies by all sectors of government.²⁹ At the municipal level, an explicit focus on health can provide additional support for equitably increasing sustainable transportation infrastructure, including for cycling. Municipal policies determine how infrastructure is planned, who is involved, which projects are prioritized, and how they are designed. What we see in policy and practice today will shape the health of our communities for years to come.³⁰

Commit to addressing inequities upstream

Through our work with city builders, we've heard that strong policy support for equity means better results for those who need it most.³¹ To optimize investments in infrastructure, strong equity commitments in the form of policies, tools, and practices are crucial for embedding equity throughout the life cycle of infrastructure projects. Equity frameworks can increase diversity in terms of who participates in decision-making, where interventions are prioritized, and what features the infrastructure includes.³² Yet governments rarely consider the various dimensions of equity. Municipal policies tend to include a general focus on "access for all" but leave out specifics, especially when it comes to the locations where interventions are built. A clear commitment, and a clear operationalization of equity when it comes to planning and implementing infrastructure, are needed.

²⁹ Bernier, "Towards a Health in All Policies Approach for Canada's Federal, Provincial and Territorial Jurisdictions?"; Tonelli, Tang, and Forest, "Canada Needs a 'Health in All Policies' Action Plan Now."

³⁰ Verity et al., "Health and Equity Considerations in Policy and Practice Related to Sustainable Transportation Interventions in Four Canadian Cities."

³¹ Williams et al., "Practices and Inspiration for Sustainable Transportation Equity"; Verity et al., "Health and Equity Considerations in Policy and Practice."

³² Verity et al., "Health and Equity Considerations in Policy and Practice."

Collect local data and build tools to equip communities and decision-makers

Every government level is looking for data to help ensure that investments are going where they are most needed and will make the biggest impact. Local, comparable, and regularly updated data are needed to guide decisions and evaluate impacts. At the municipal level, spatial data on infrastructure barriers, disaggregated socio-demographic and health data, travel behaviour data, measures of exposure to risk, and qualitative evidence of people's experiences are key inputs. Yet city staff report that their access to data is incomplete, limiting their ability to act. Census data are updated infrequently, collecting primary data on mobility behaviours can be prohibitively costly, and survey data often reflect only a small segment of the diversity of perspectives within a city. Given how closely related land use and transportation planning are, regular data collection at the local level allows communities to monitor how changes in one area may lead to unexpected consequences in other. See Box 1 for an overview of some useful tools and platforms to support this growing need.

Box 1. Tools and platforms for urban equity and sustainability data

Going forward, cities will be looking for localized data, tools, and research support to measure the impacts of equity initiatives and integrate insights into future work. To address this need, researchers have developed tools and platforms to better connect practitioners with data. Examples include the following:

- [HealthyPlan.City](#), an online tool created by Canadian Urban Environmental Health Research Consortium, maps urban environmental conditions such as temperature, air quality, access to green spaces, and community amenities across Canada to help planners identify where infrastructure is most needed.
- [Curbcut](#) is a platform for exploring urban sustainability across multiple spatial and temporal scales. It covers a range of urban issues such as demographics, housing, transport, and urban life, integrating a wide range of information to help inform interested citizens, communities, researchers and policy-makers about their communities.
- Specific to transportation, Mobilizing Justice's [Transportation Equity Dashboard](#) visualizes federal spatial access measures.

Partner across sectors to evaluate the impact of new infrastructure and learn from different approaches

Learning from what works is just as important as addressing what doesn't work. Cross-sector partnerships can help identify successful approaches that could be scaled or adapted to other cities, while also fostering a culture of continuous improvement. By leveraging collaborative partnerships with researchers, public health practitioners, and community organizations, governments can maximize the impact of infrastructure investments, ensuring they align with broader social, environmental, and economic goals.

LOOKING FORWARD

Urban infrastructure is a powerful tool at Canada's disposal, if we can wield it effectively. It plays a pivotal role in shaping health outcomes, influencing everything from physical activity levels to mental health and social well-being. Our closer look at cycling infrastructure deficits across four Canadian cities reveals clear patterns of inequity, showing that certain groups are being left behind. Safe, accessible cycling infrastructure is essential to building healthier, more inclusive cities. Canada now has an opportunity to build on its legacy of healthy cities research by turning these insights into action. Addressing the infrastructure deficit is a critical step forward.

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General inquiries:

Contact us at schoolofcities@utoronto.ca or 1-416-946-7534

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