Small Towns
Big Steps
in Active Transport

Summary of the Literature

BC Alliance for Healthy Living

real estate foundation BRITISH COLUMBIA

PACIFIC BLUE CROSS Health Foundation

CN STRONGER Communities Fund

BC Healthy Communities people • place • potential

BC LUNG FOUNDATION

BCRPA BC RECREATION AND PARKS ASSOCIATION

Canadian Cancer Society

Canadian Mental Health Association British Columbia *Mental health for all*

DIABETES CANADA

Heart & Stroke

PHABC

UBCM

Introduction

Active transportation encompasses all human-powered modes of transportation. Here, we focus primarily on walking, cycling, and rolling, as described in the BC Active Transportation Design Guide (1), while also considering human-powered transportation to connect to transit, ferries, and other forms of transportation. Active transportation is about modes of travel available to people to get somewhere; therefore it doesn't include recreational trail development, such as dedicated hiking, cross-country skiing, or mountain bike trails.

Active transportation increases physical activity levels and may have a range of other positive effects, from improvements in mental health to reductions in air pollution (2). Increasing the safety and practicality of walking and biking in towns and cities of all sizes promotes energy independence, fitness, public health, sustainability, choice-making when it comes to transportation options, and develops a stronger sense of community (1,3).

This scan of the literature is meant to provide a broad overview of active transportation interventions and advice relevant to small municipalities in British Columbia. It is not intended as a comprehensive review of the literature, more it aims to provide ideas of possible directions to take when making changes to promote active transportation in small towns, and where possible, we accompany those ideas with evidence for what has worked, or at least been done, in small communities in North America. We examined academic and grey literature obtained from searches in Google Scholar, Google, PubMed, and Transport Research International Documentation (TRID) databases, as well as through manual searches of reference lists in relevant publications.

Active Transportation Interventions – Overarching Concepts

The Healthy Built Environment Linkages Toolkit (4) indicates four broad areas of planning and design, supported by evidence that support healthy transportation networks in communities. These areas will be considered throughout this discussion.

1. Use street designs that prioritize active transportation
2. Make active transportation networks safe and accessible for all ages and abilities
3. Design connected routes for active transportation and support multiple modalities
4. Consider the aesthetics of road, rail and waterway networks

Inclusion is an overarching concept in designing for active transportation: facilities need to be "comfortable, convenient, safe, and attractive for everyone, regardless of age or ability" (1). This concept is referred to as 'All Ages and Abilities', 'AAA' or 'Triple A', and is supported by universal design. Further, active transportation facilities should be accessible at all times, and in all weather, with maintenance and operations planned to support this from the outset. Active transportation is more likely to achieve mobility for all if plans and policies are equitable, inclusive, age-friendly, accessible, and safe (1).

In metropolitan areas, the "D" characteristics of the built environment – density (of jobs and homes), diversity (mix of land uses), design (interconnected street networks), destination accessibility, distance to transit - are often drawn on to increase walkability (and therefore active transport) (5). Rural and smaller communities have also used the "Ds", but it is not clear whether the same neighbourhood built environment features that support active transportation in urban areas also work, or are even relevant in small towns (6). In fact, one study showed while perceptions of walkability (related to destinations, parks, routes, paths, aesthetics) were significantly related to walking frequency in urban residents, there was no association between perceived walkability and walking frequency for rural residents (6). Another study demonstrated that the relationships between built environment characteristics and active transportation were in opposite directions when comparing areas with populations under 50,000 people and more populated areas, and concluded that "rurality is an important moderator in active transport-environment relationships" (7). For example, where intersection density (objective measure of street connectivity) was positively related to active transportation in highly populated areas, the association was negative in areas that had populations under 50,000 people. In smaller towns with a limited number of streets, whether the streets are connected may not be important for walking. Interestingly, in both areas, sociodemographic factors explained much more of the variance in active transportation than did built environment factors (7). This finding supports the need for attention to equity in developing policies and strategies for active transportation.

> From our understanding of what works in urban areas, a "walkable environment is conceptualised as having more destinations (such as shops, services and recreational resources) close by; and easy-to-walk, well-connected streets, to get to such local destinations".
>
> *Berry et al. Int J Environ Res Public Health 2017, 14, 965.*

Similarly, another study that focused on the built environment in small towns reported a negative association between the presence of a small number of restaurants in the home neighbourhood and utilitarian walking. Conversely, in urban Seattle, restaurants within the home neighbourhood had a positive, dose–response association with utilitarian walking. The authors discussed how destinations are more strongly associated with active transportation in higher density areas, and recommended complete streets policies and design guidelines that make active travel safe and comfortable in small towns so that residents can walk or cycle to the few nearby destinations (5). These types of policies and community design interventions likely need to be accompanied by campaigns or demonstrations that work to change perceptions and normalize active transportation in small towns or rural areas.

At the neighourhood level, Sallis and colleagues (8) reported that factors related to active transportation varied somewhat by age group. Street lights, benches, curb cuts, sidewalk presence, and buffers between streets and sidewalks were significantly related to active transportation for all age groups except older adults. Aesthetics and social characteristics – like building maintenance and absence of graffiti - were not significant for any age group. For older adults, crossing signals had the strongest relationship to active transportation. For adolescents, street lights and sidewalk buffers were the most important factors related to active transportation. This study suggests that it's important to consider both the municipality and demographic contexts in making improvements to facilitate active transportation.

While recognizing that behavioural change interventions like bicycling mentorship, group-based education and social support, pedestrian safety education, and incentives can influence active transportation uptake (9–12), this exploration of the literature will highlight policy, systems, and environmental interventions – mechanisms that municipalities are more likely to focus on - that support active transportation and are relevant to small towns. These types of interventions provide "the opportunities and supports to facilitate active transportation … [and] … can have broad and sustainable impact on transportation choice, given that all people exposed to the changes can benefit. The approaches are generally more permanent than programs focused on individual behavior change."(13)

Small Town Context for Active Transportation

Active transportation occurs in small and rural communities and many towns have good places to walk and ride bikes (3). Further, many small towns have compact centres that are suited for active transportation trips. However, it is uncommon for small towns to have a complete and safe network that enables walking and cycling through the whole community, and infrastructure to support active transportation. Some active transportation challenges and issues are common to small towns, including longer non-local trip distances, higher crash rates, and health and income disparities (14). Resources and infrastructure to support safe active transportation – such as speed reduction infrastructure, safe routes to school programs, pedestrian and cyclist safety programs - are lacking in small communities in BC, as compared to larger communities (15).

> "A walkable and bikeable community is one in which active transportation trips are safe and comfortable for people of all ages and abilities."
>
> *Small Town and Rural Multimodal Networks, US Department of Transportation 2016.*

In British Columbia, a small population centre has over 1,000 people and less than 30,000 people (16). Within this literature scan, we aimed to consolidate evidence and resources relevant to the nearly 100 small municipalities in BC, including cities, towns, villages, and district municipalities that are not considered part of a metropolitan area, that fit within this definition of small population centre. The municipalities contained within this definition vary considerably on a range of factors. For example, population density, which relates to rurality, is higher in some communities in which the population and services are clustered in a smaller area. In Tumbler Ridge (population approximately 2,000), the population is spread over a very large area, resulting in a very low population density (1.3/km2), whereas Nelson's population (10,500) lives in a smaller area, yielding a higher population density (884/km2). Rurality likely plays a role in active transportation and the changes that can be made to promote it.

A survey of municipalities of all sizes in North Carolina revealed fewer walking and cycling projects, programs, or policies in less populated municipalities as compared to urban centres (see policy examples in Table 1). Projects, programs, and policies to increase active transportation were more likely to exist if they were included in a planning document (17).

This suggests that a great resource for small towns would be planning or strategy development assistance such that active transportation is represented in plans for the municipality, therefore making action in the form of projects and policies more likely.

Table 1. Examples of supportive active transportation policies, by municipality size, from (17).

Policy	Municipal population ≥ 5,000	Municipal population < 5,000
Restrict the speed or access of automobiles (e.g., road diets, car-free streets, speed limit reduction, and traffic calming)	70%	36%
Maintain sidewalks, trails, footpaths, and crosswalks	92%	54%
Build sidewalks, trails, or greenways	95%	44%
Enhance pedestrian facilities in new development	77%	31%
Address the needs of special populations	45%	11%
Facilitate walking/bicycling to school	62%	16%

Active transportation in small towns is enabled by a complete network that offers safe, comfortable and accessible routes, with facilities that appeal to a range of ages and abilities, like shared use paths, sidewalks and bike lanes. These facilities help make transportation equitable for people of all ages, abilities, and living at all income levels (14). Convenient access to important destinations and separation from motor vehicle traffic make a network safer and more direct, thereby promoting active transportation further (14).

Notably, a "connected network is not developed by a single trail, sidewalk, or bike lane but is comprised of many facilities that support walking and bicycling throughout the community (14)". Overall, one study of a small town in Mississippi demonstrated that aesthetics of the walking environment – how pleasing it was to the walker - was the most important factor underpinning destination walking in that small town (18). Similarly, older adults in rural, suburban and urban neighbourhoods were all more likely to walk if they perceived greater street connectivity (19). In the same neighbourhoods, older adults who perceived less street connectivity were less likely to walk. Further, in suburban neighbourhoods, older adults were more likely to walk if they had higher overall satisfaction with their neighbourhood (19). The experience of active transportation comes together through aspects of the built environment that influence walking and cycling participation – in other words, people will likely walk and cycle to work and other destinations if they want to travel through and experience the route, aesthetics and all.

The US Department of Transportation identified eight key challenges for walking and cycling in small towns and rural areas (14) (Figure 1). Well-targeted active transportation interventions in small and rural towns would need to plan around these challenges. At the same time, small communities have great potential for active transportation, considering there's often good access to businesses, schools, and services within a relatively small community core. Active transportation connections to neighbouring communities may be more challenging, especially when trying to ensure comfort for all users.

1. Agricultural uses: Considerations related to wide and slow-moving agricultural equipment
2. Public lands access: Proximity between small towns and public lands (which may be popular destinations), and the need to create linkages.
3. Auto-oriented roadways: Lower densities and greater distances means more cars are on the surrounding roads.
4. Lack of transportation options: Lack of pedestrian and cycling facilities due to auto-oriented culture makes active transportation a less likely choice.
5. Constrained terrain: Physical constraints to the provision of pedestrian and cycling facilities.
6. Safety: High speeds, lack of space, and lack of well-defined pedestrian crossings makes streets barriers that divide communities
7. Highway as a main street: Provincial highways that pass through small towns and prioritize through traffic.
8. Climate and maintenance: Cost of winter maintenance, and need for specialized equipment to clear active transportation facilities.

Figure 1. Active Transportation challenges in small towns and rural areas.

Intervention Area 1: Pedestrian and Bicycle Infrastructure

Bicycle and pedestrian facilities are infrastructure or facilities that make active transportation easier. For cyclists, these might include road space, bike storage and parking, and bike share systems. For pedestrians, facilities include designated routes, sidewalks, street crossings, benches, lighting and traffic control devices. Active transportation infrastructure should also accommodate people using wheelchairs and other mobility assistive devices (13). Facilities that protect or separate cyclists from cars are especially important (13)

> "Appropriate infrastructure can create or enhance the convenience and social acceptability of bicycle and pedestrian modes, reduce the risk of crashes, and improve safety."
>
> *Young et al. Circulation 2020; 142:e167-e183.*

The British Columbia Active Transportation Design Guide specified guiding principles based on intervention best practices for design of active transportation facilities (1):

- Safe and stress-free: mitigating real and perceived safety concerns.
- Inclusive: considering the needs of users of all ages and abilities, and users with physical or cognitive impairments.
- Context-sensitive: considering climate, topography, land use, size of municipality, and rural or urban nature.

- Cohesive and direct: providing direct and timely access to destinations, with multimodal options.
- Attractive and intuitive: aiming for facilities to be comfortable and pleasant for people of all ages and abilities, well-maintained, attractive, welcoming, predictable, recognizable, and consistent.

A systematic review of infrastructure interventions on active transport reported no effect (due to low strength of evidence) on adults of streetscape improvements to encourage walking and cycling, in the 28 interventions studied. However, having multiple streetscape improvements (i.e., two or more of crosswalk and sidewalk improvements, improved and covered bike parking, installation of traffic calming features (raised platforms, zebra crossings) and parking bays; creating safe places to walk) was positively related to increased active transport in children (20). The analyses did not note specific effects in smaller towns as compared to larger urban centres, and very few studies were focused on smaller towns.

Doescher et al. reported that there were higher odds of utilitarian walking in small towns with the presence of crosswalks and pedestrian signals, and noted that the relationship between this infrastructure and active transportation mirrored what they observed in larger cities (21).

In terms of walkability and infrastructure, rural areas are different than small towns and larger urban centres. Kegler and colleagues (22) reported that sidewalks were not viewed as essential for walking in rural neighbourhoods, and there were few destinations to walk to. While residents may view their rural neighbourhood as "walkable", in that particular study, there was little reason for utilitarian walking given the lack of destinations. Most walking was for leisure purposes.

Advisory Bike Lane (ABL)
ABLs are defined as a road consisting of a single center lane which supports two-way motor vehicle travel and an edge lane on either side, preferentially intended for one-way bicycle and pedestrian use. ABLs do not possess a centerline, and the edge lanes are delimited by broken lines indicating a permissive condition. Motorists travel in the center lane until they need to pass an approaching vehicle. In order to pass, they merge into the edge lanes, after yielding to any non-motorized users there. After completing the passing movement, motorists return to the center lane.

Michael Williams, ITE Journal 2018.Networks, US Department of Transportation 2016.

Advisory Bike Lanes (ABL), originally introduced as a rural solution (guidance provided in (14)), seem to work in both urban and rural environments. The ABL is an entire roadway, a reconfiguration that adds bike and pedestrian infrastructure for lower cost to roads that aren't wide enough for protected bike lanes or sidewalks. ABLs "are applicable only to lower-speed, lower-volume, two-lane roads" (23). There are advantages and disadvantages to ABLs (see Table 2), however, evaluations have shown they are safe (23) and create an opportunity for cycling and walking facilities – perhaps in small towns and rural areas – when other options don't exist.

Table 2. Advantages and disadvantages of Advisory Bike Lanes (23).

Advantages	Disadvantages
ABLs provide facilities for cyclists and pedestrians on roads that may not receive them otherwise.	ABLs can be deceptive.
ABLs have a calming effect on vehicular speeds.	Some aspects of ABLs are legally ambiguous.
ABLs allow flexible use of edge lanes.	ABLs are unknown to most road users.
ABLs are cheap.	ABLs are largely unknown by transportation professionals.
ABLs reduce the maintenance costs of asphalt roads	Americans with Disabilities Act (ADA)/ PROWAG guidance with respect to edge lanes is unclear.

Small Town and Rural Multimodal Networks (14) provides many examples of infrastructure that creates opportunities for active transportation in the small town context. A brief overview of infrastructure recommendations for small and rural towns is provided in Table 3. Related to these recommendations, details on design considerations for rural and suburban environments are provided in British Columbia Active Transportation Design Guide (Sections C.4, D.6, E.2, F.1, G) (1).

Table 3. Overview of roadway infrastructure for biking and walking in small and rural towns (14).

Type of Infrastructure	Key points
Mixed Traffic Facilities	
Yield Roadway: designed for walkers, cyclists and motor vehicle traffic within the same slow-speed travel area. Bidirectional motor vehicle traffic without lane markings.	• Less costly, low maintenance • Connects residential areas to network destinations • Encourages slow travel speed • Used effectively in Manzanita, Oregon (population 700) to create a connected network for walking, cycling, and driving.
Bicycle Boulevard: shared roadway bicycle facility, offering priority for bicyclists over motor vehicles.	• Increased comfort and less risk of injury for cyclists as motor vehicle traffic is lower and reduced. • Connects residential roads to commercial corridors and schools • Can improve conditions for pedestrians, when sidewalks and crossings are part of design • Used in Arcata, California (population 18,000) to connect critical destinations like the high school to downtown, the Arcata Marsh and Wildlife Sanctuary, and public transportation.

Type of infrastructure	Key points
Mixed Traffic Facilities	
Advisory Shoulder: uses pavement markings to create usable shoulder for cyclists on roads that are too narrow to accommodate one. Motorists travel in both directions in centre lane, using the shoulder to pass as needed.	• Also called advisory bike lane (ABL), as described above • Considered "new" treatment type in North America and lacking performance data • Provides delineated but nonexclusive space for biking • Efficient use of existing space • Implemented in Hanover, New Hampshire (population 11,000) as part of the Safe Routes to School Project on a 400m stretch of road, with a promising evaluation leading the community to add more advisory shoulders to bicycle and pedestrian connections between schools and neighbourhoods.
Visually Separated Facilities	
Paved Shoulder: functional space for cyclists and pedestrians in the absence of more separated facilities.	• Improves cycling experience on higher speed/volume roads • Stable surface that provides space for all users • Reduces pedestrian crashes (from walking on roadway) and cyclist crashes from behind • Requires increased striping and signs, and a wider roadway • Installation of pigmented and textured shoulders with improved signage, landscaping and lighting on State Route 16 now connects communities in California's Yolo County more safely for cyclists.
Bike Lane: exclusive space for bicyclists, directly adjacent to motor vehicle travel lane.	• Pavement markings and optional signs designate lane • Provides more separation distance between sidewalk and motor vehicle area (if sidewalk is present) • Connects bike networks through busier areas • Space for many skilled bicyclists • Supports school access if designed as wider lane on lower speed/volume roads • Visual cue for drivers that they should expect cyclists on the road • Bike lanes in Lydonville, Vermont (population 1,200) are part of the on-street bike lane network and shared streets that connect downtown with residential streets and the state college.
Physically Separated Facilities	
Shared Use Path: travel area for bicyclists, pedestrians, wheelchair users and others separate from motor vehicles.	• Low-stress for a variety of users • Dedicated facility for users of all ages and abilities • Can provide short-cuts to destinations • Increases access to natural and recreational areas • Small footprint with rural/small town character • Used to connect the City of Easley (population 20,300) to City of Pickens (population 3,150) with fencing, landscaping and roadway crossings for a safe, attractive path.

Type of infrastructure	Key points
Sidepath: bidirectional shared use path immediately adjacent and parallel to a road.	• Offers high quality experience for a range of users • Maintains small town/rural character • Reduces roadway crossing distances • Completes a network where a high speed road is the only corridor, while making cycling and walking possible in high-volume/speed areas. • Requires a wide roadside environment • Used in Ennis, Montana (population 1,000) where previously no pedestrian facilities existed to connect neighbourhoods to school and businesses.
Sidewalk: dedicated, safe, accessible space for pedestrians.	• Separated from the road physically by a curb or unpaved buffer • Reduces pedestrian collisions in rural areas, reduces "walking along roadway" crashes • May increase walking in areas with high traffic speed/volume • May not support rural visual character • Requires moderate width roadside environment • Used in Miles City, Montana (population 8,400) to connect neighbourhood streets to a network of exiting sidewalks around the local school, providing a critical network link between home, school, and park.
Separated Bike Lane: facility for exclusive use by cyclists within or directly adjacent to roadway, and physically separated with a vertical element.	• Roadway separation is the vertical element • Increases cyclist comfort on high-speed/volume roadways • Similar to sidepaths, but reduced operational and safety concerns related to bidirectional nature of sidepaths • Reduces sidewalk riding and user conflicts • Increases connectivity when configured as one-way directional lane on both sides of street • More urban visual atmosphere • Requires wide roadside environment • Implemented in Connellsville, Pennsylvania (population 7,000) as the connection of the Great Allegheny Passage (long distance trail network connecting Pittsburgh to Washington, DC) through Connellsville. The separated bike lane connects trail cyclists with businesses, and residents with the trail. • With the acceptance of protected bike lanes as best practice in BC, there are more examples of their use, including in Squamish's (population 19,500) active transportation plan (24).
Key Network Opportunities	
Multimodal Main Streets in small towns: main streets in small towns can support multimodal travel through several design options.	• Four-lane to three-lane road diet increases safety while balancing needs of through travel and local community access. • Road diet with buffered bike lane • Streetscape (sidewalk) expansion with bike lanes through narrowing/consolidating excess space dedicated to motor vehicles • Road diet with creation of median and separated bike lanes

Type of infrastructure	Key points
Bridges: critical connections in multimodal networks.	• Separation is critical due to constrained area • A barrier like a narrow bridge can render a multimodal route undesirable • Facilities should maintain consistent alignment across bridge (i.e., no crossing from one side to the other) • Signing, marking, and active warnings are needed on bridges • Bikers and walkers should be assumed users of any new or replacement bridge structure • In Boonville, Missouri (population 8,370), the Boonslick Bridge features a sidepath separated from traffic by a concrete barrier, and connects communities on opposite banks of the river

A few examples of active transportation infrastructure in small towns

Haliburton County's (population 18,000) Official Plan contains policy that specifies support for active transportation: "Land use patterns and development should promote energy efficiency improved air quality and allow for compact development that is designed in such a way to support and encourage active transportation ... " (County of Haliburton Official Plan 2010 2.3.5.3) (25). This has resulted in an ongoing partnership among the County, Communities in Action, and the health unit which has guided the implementation of active transportation infrastructure and supportive materials including signs, bike racks, campaign posters, newspaper ads and educational brochures, as the addition of over 32 km of 1.0-1.2m paved shoulders on county roads when they have been up for reconstruction (25).

With funding from the BC government, the City of **Nelson** (population 10,600) will complete phase 1 of their primary bike route which involves new and improved facilities for cycling and walking, as part of their new Active Transportation Implementation Plan (https://www.nelson.ca/DocumentCenter/View/3641/Active-Transportation-Plan-). The project will add a shared neighbourhood bikeway in two locations with sidewalk upgrades and bump-outs and speed humps to reduce vehicle traffic speeds, re-orientation of STOP signs to all free-flow bike traffic, pavement markings and signage identifying the bike route and a reduced speed limit to 30 km/hr, Further, the project will improve the walking access to school, add a bike only travel lane near the school, and reduce vehicle traffic to one-way travel near the school (26).

The District of **Kent** (population 6,800), through implementing it's Active Transportation Plan (2015) has added substantially to it's cycling infrastructure: through the plan, the District constructed the Mountain View Trail, Centennial Park Perimeter Trail and widened Highway 9 between Agassiz and Harrison Hot Springs. Sidewalks, bike lanes, and signage to support pedestrians and cyclists are in the future plans for active transportation infrastructure (27).

The City of **Revelstoke** (population 7,500) has an Active Transportation Plan focused on six neighbourhoods and five critical locations (28), and has been working on implementation for nearly 10 years. In 2020, Revelstoke received provincial funding to provide four safe bike racks at strategic transportation locations throughout the City, and develop an active transportation network plan within the city's Master Transportation Plan.

Lanesboro, MN (population 750) benefited from the construction of the Root River State Trail on an out-of-service rail line, where new facilities for bikers and walkers translated to a better economic situation for the town. The town now takes in $1.5 million annually as dividend from the bike riders and other trail users, and new businesses have opened on its main street (3).

Intervention Area 2: Complete Streets

"Complete Streets" is a concept that underpins policies and action supporting active transportation. Simply, Complete Streets require street design to address the needs of all users – pedestrians, cyclists, mobility aid users, motorists, and others – to promote safe travel for everyone. Equity is part of the Complete Streets concept, so that the needs of all people factor into planning, design, operation , and maintenance of transportation networks (13). Complete Streets policies in the United States are associated with lower rates of collisions and injuries between cars and cyclists or pedestrians, and save millions of dollars in collision and injury costs every year (29). Further, streets designed to meet the needs of all users increase active transportation in all age groups (8). For example, people with disabilities living in neighbourhoods with low street connectivity perceived more barriers to engagement in daily activities, including active transportation (30). These concepts of safety, health and equity underpin the rationale for Complete Streets in small and rural towns. Further, moving towards Complete Streets makes good economic sense as "slowing traffic, widening sidewalks, adding trees and pedestrian crossings can increase property values, improve retail sales, and attract private investment (31).

> "The term 'complete streets' has been widely used to refer to roads that balance safety, access, and comfort for users of all modes, as opposed to the historic North American road design that typically prioritized motor vehicles."
>
> *British Columbia Active Transportation Design Guide 2019*

Similar principles apply when we extend the Complete Streets concept further to 'Complete Networks'. Small Town and Rural Multimodal Networks identified six principles to guide the development of complete networks in small towns (14):

1. Cohesion: How connected is the network in terms of its concentration of destinations and routes?
2. Directness: Does the network provide direct and convenient access to destinations?
3. Accessibility: How well does the network accommodate travel for all users, regardless of age, income level, or ability?
4. Alternatives: Are there a number of different route choices available within the network?
5. Safety and Security: Does the network provide routes that minimize risk of injury, danger, and crime?
6. Comfort: Does the network appeal to a broad range of age and ability levels and is consideration given to user amenities?

Complete Streets may look different in small and rural communities than in larger cities. For example, roads in agricultural areas could be made "complete" by widening the shoulders to increase walking and cycling safety and by connecting to trails and public transportation.

Residential streets in small towns could be "complete" if the speed is low, crossings are well-marked and sidewalks have accessible curb cuts. Small communities can build on the strength of existing multi-use trail systems already in place by improving the connections to key destinations (work, library, downtown, shopping, restaurants) to improve the active transportation opportunities. This can be done by focusing on the 'last mile' between trails and destinations and completing safe on-street routes supplemented by wayfinding signage (31). Creating a municipal Complete Streets policy helps communicate and consolidate the community vision (32). The policy is an important launching point for active transportation, however, the implementation of the policy is as important as its development (see box to right). We provide examples of small towns in the U.S. and Canada that have adopted Complete Streets policies in Table 4.

> "[The] missing piece is an emphasis on integrating Complete Streets policies into a broader strategic vision for the given community, whether that is represented in a transportation plan, or a cycling master plan. ... Implementation of Complete Streets policies requires significant effort to ensure that other organizational policies and procedures are updated to reflect the new priorities introduced in complete street policies. This should include asset management strategies, official community plans, development bylaws and capital and operational budgeting processes."
>
> *BC Cycling Coalition, Active Transportation and Complete Streets in British Columbia 2017*

Smart Growth America communicated the ten elements of a Complete Streets policy (33), and provides many examples of excellent policies in communities of all sizes (https://smartgrowthamerica.org/program/national-complete-streets-coalition/publications/policy-development/policy-atlas/). Every few years, Smart Growth publishes the best Complete Streets policies from U.S. municipalities, making decisions on the quality of the policies through an extensive review process that awards points based on the extent of meeting ten elements:

1. Clear vision and intent that communicates the need for a complete, connected network, identifies motivation or benefit of pursuing Complete Streets (including equity), and identifies modes including biking and walking.
2. Recognizes diverse users, prioritizing vulnerable users or neighbourhoods and establishes accountability towards priority groups or places.
3. Strong commitment in all projects and phases, so that all transportation projects and maintenance operations account for needs of all users and modes of transport.
4. Clear, accountable exceptions, that are transparent to the public and justified.
5. Jurisdiction and what organizations/projects need to comply with policy is clear.
6. Uses best practice design standards and guidelines.
7. Land use and context sensitivity are integrated.
8. Performance measures are planned and communicated to public and specific agencies, and consider a range of outcomes, process evaluation, and embed equity.
9. Modifies project selection criteria in jurisdiction to encourage Complete Streets implementation.
10. Implementation steps are included in the policy.

Table 4. Examples of Complete Streets policies and projects in small and rural municipalities in Canada and the United States.

Community	Complete Streets policy or project
Kingston, NY (population 23,000)	2009 resolution for Complete Streets, adopted in 2010: "BE IT RESOLVED, that the City of Kingston encourages walking, bicycling, and public transit for transportation, health, fitness, and recreation, it recognizes the importance of creating Complete Streets that enable safe travel by all users, including pedestrians, bicyclists, public transportation riders and drivers, and people of all ages and abilities, and it supports education about the need for accessibility through events, programs, outreach, and incentives." (34)
Sedro-Woolley, WA (population 10,000)	Ordinance ensuring bicycling and walking are safe, convenient options (32).
De Soto, MO (population 7,000)	2008 ordinance requiring Complete Streets approach (32).
Manistique, MI (population 3,500)	Complete Streets "support economic growth and community stability by providing accessible and efficient connections between home, school, work, recreation and retail destinations." (32)
Hamburg, NY (population 9,409)	Introduced traffic calming measures on their main street (which was a busy highway and truck route) including four new roundabouts, pedestrian crossings, curb extensions and wider sidewalks. Property values doubled in five years, the village attracted $7 million of private investment in building projects and several new community events (31).
Elmira, ON (population 9,900)	The community's main street (Church Street) was designated a Rural Village Main Street in the region's Context-Sensitive Regional Transportation Corridor Guidelines, which made active transportation an automatic priority. New design included a new sidewalk, three landscaped pedestrian refuge islands, new street lighting, and 1.5 metre on-road cycling and horse and buggy lanes (31).
Clearwater, BC (population 2,300)	In 2013, Clearwater developed a Road Cross-Section Bylaw, which established new street types based on land uses and user types. Myrtle Crescent (which provides a connection between a subdivision and a park, library and shopping) was updated because of the bylaw as the adjacent development needed to include active transportation elements. Myrtle Crescent now has a sidewalk on one side, a multi-use path on the other, a crosswalk, street lighting and trees. The municipality's recently completed Trails Master Plan will extend the trail to a seniors' home (31).

Community	Complete Streets policy or project
Neptune Beach, FL (population 7,300)	Policy prioritized design elements that would work in the community context (Neptune Beach is/was a dangerous area to walk). Elected official was strong advocate for Complete Streets and led the community engagement, focusing on the safety issue. Focused limited resources on walking and cycling safety in high need areas. Since the policy passed, council put in a traffic-calming ordinance and is working on a 5-year sidewalk/muti-use path improvements program. "Every time you are discussing Complete Streets and why they're important you have three or four buckets: economic development, environmental sustainability, social equity, and health … When you get [Complete Streets] right, it is going to hit all of the buckets…We want people to safely access schools, jobs, recreation and entertainment with a focus on long-term placemaking." – Fred Jones (Vice-Mayor, Neptune Beach) (33)
Courtenay, BC (population 25,600)	Courtenay's 5th Street Complete Street Pilot Project, completed in 2018, involved substantial overhaul of above-ground and below-ground infrastructure to improve walking and cycling, and includes (https://www.courtenay.ca/EN/main/city-hall/projects-gallery/5th-street-complete-street-pilot-project.html): • Two newly paved vehicle lanes • Bike lanes physically separated from vehicle traffic • Improved accessibility for strollers, scooters, and wheelchairs • Alternating parking and rain gardens throughout most of the corridor • Innovative stormwater management to improve drainage
Ogdensburg, NY (population 10,500)	Ranked #1 for Best Complete Streets Policy in 2014 by National Complete Streets Coalition (U.S.) for this policy: "The City shall develop a safe, reliable, efficient, integrated and connected multimodal transportation system that will promote access, mobility and health for all users, and will ensure that the safety and convenience of all users of the Public transit, people of all ages and abilities, motorists, emergency responders, freight providers and adjacent land users." (24) The Complete Streets policy is to be added to all existing plans, development plans, development guidelines, manuals, and checklists, and is to be considered and implemented where possible in any construction of new roadway, including redevelopment and subdivisions of existing lands.

Intervention Area 3: Active Transportation to Schools

Walking and biking to school incorporates physical activity into the day for children, and is associated with increased energy expenditure and cardiovascular fitness (35). In 2020, the Middle Years Development Instrument (MDI) in BC assessed children's active transportation to school. This data showed that on average, grade 4 students in BC mostly travelled by car to school (58%), with 24% walking and just 2% cycling, skateboarding or scootering. Slightly fewer (50%) grade 7 students travelled by car, and slightly more walked (25%) and cycled (3%). For both age groups, about 15% of the population took a bus to school (36). Analysis by community size was not completed, although active transportation data is available at the level of the school district (which may include both large and small municipalities in a particular region).

> The most effective active travel to school initiatives "combine engineering improvements with education and encouragement programs, and sustain them over multiple years.
>
> *Young et al. Circulation 2020;*

Children's independent mobility - freedom to move around their neighborhood without adult accompaniment – is positively related to active transportation and physical activity (37), suggesting that interventions that encourage and support children's freedom of movement are needed. A systematic review of active school travel interventions in North America highlighted the importance of focusing on facilitating policy change through advocacy campaigns, interest groups, and active school travel champion strategies to generate sustainable active school travel interventions (38). This focus on supportive policy change is applicable across urban and non-urban centres of all sizes. Jones and colleagues' systematic review and meta-analysis further supported the key role of policies in effective active travel to school interventions, and noted that policies were rarely part of interventions (39).

One study that compared differences in active transportation to school between children in urban and non-urban settings reported that walking to school was more common in the non-urban setting (35). Controlling for setting, the authors identified that (1) having a mother who actively commuted to work, (2) a safe neighbourhood to walk in (as reported by parents), and (3) living less than two kilometres from the school were the strongest predictors of active transportation for children. Based on this, small towns may be just as likely as urban centres to increase active travel to school, if issues like acceptability, safety, and distance to school are considered.

In North Carolina, schools located in cities were significantly more likely to register for walk-to-school-day events than schools in the suburbs, towns, or rural environment (40). Underpinning involvement in walk-to-school-day events was policy development: schools with bicycle or pedestrian promotive policies were nearly 3 times more likely than schools without policies to register for walk-to-school-day. This highlights the need to support small municipalities and their schools in policy development as a starting point for increasing active travel to schools.

The research pointed to the relationships among aspects of active transportation to school: policy development supported registration in promotional events like walk-to-school-day, and participation in walk-to-school-day related to ongoing participation in active transportation

initiatives. Schools that registered for walk-to-school-day were 17.5 times more likely to engage in recurring active transportation programs (40). This study also discussed the important role of schools in small and rural towns in the provision of opportunities to build pedestrian and biking safety skills, given that biking and walking infrastructure is less likely to exist and the municipality may be less able to fund skills-based programming, as compared to larger urban centres (40). Partnerships between small municipalities and schools and/or school districts are essential in building and sustaining active transportation to school.

Initiatives focusing on active travel to school have often centred around the "six Es" (below) to comprehensively encourage children to walk, ride and roll to school (41).

- Education: Learning how to safely walk, bicycle, and roll.
- Engineering: Improve streets and neighbourhoods so that active transportation to school is safer.
- Encouragement: Events, activities, and programs to raise interest in active transportation to school.
- Enforcement: Reduce unsafe traffic behaviors (e.g., speeding along school routes).
- Evaluation: Assess effectiveness and outcomes
- Equity: Plan and deliver active transportation initiatives so that all groups (including under-resourced groups) benefit.

Another way of packaging the active travel to school approach is through School Travel Planning (STP), used by the Ontario Active School Travel program (42) and others. The STP approach involves five stages: program setup, data collection and problem identification, action planning, implementation, and ongoing monitoring. STP recognizes that each school context is unique and developing a plan that will work requires significant understanding of the facilitators and barriers to active, safe travel in that particular context. School active transportation champions from Alberta highlighted several school-level strategies that support and sustain active transportation at their schools, including:

- Structured planning and programming;
- Dedicated time (FTE) to plan and implement;
- Capacity in terms of volunteers and champions;
- Parental and teacher role-modelling of active transportation;
- Incentives (e.g., prizes);
- Collaboration within their own school and with other local schools.

The same Alberta champions indicated that municipal support was crucial to advancing active transportation at school within a holistic/systemic approach, and recommended development of supportive municipal policies to create safer walking and cycling paths, improve road quality and maintenance, make funds available for active transportation initiatives, change regulations, and provide more resources for rural areas (42).

Children are more likely to actively travel to school when (43):

- The school is close
- They don't have to cross major streets
- Roads are not busy
- There are shops and restaurants in the area (i.e., eyes on the street)
- The blocks are shorter and there's mixed land use
- There's other people around

Considering these factors, small and rural communities may have multiple barriers to active school travel. Outside large cities, schools might be further from homes, there may be less crosswalks, roads (e.g., provincial highways) can be busy, there is less commercial activity and services on the streets, the blocks can be longer and there may be less mixed land use, and since the population density is lower, there may be less people around. In small communities, a lack of capacity for municipal staff to work on active travel adds to the challenge (44). Given these potential challenges, municipal planning and partnerships to encourage active and safe travel to school are warranted in small and rural towns.

On the other hand, small and rural communities may have some advantages when it comes to designing and implementing changes to encourage active travel to school. Since life tends to revolve around schools in smaller communities, it may be easier to make the case that the route to school deserves attention as the centre of community activity. Also, decision-makers may be more accessible in a smaller, more intimate community, facilitating quicker decision-making and potentially less red tape. Finally, there may be more funding available per capita in smaller and more remote communities, given that some granting programs prioritize an equitable approach that increases opportunities for more vulnerable populations (45).

In Vernon, BC (population 40,000, a little bigger than "small"), active travel to school was integrated with the municipality's transportation planning when they shifted in 2008 towards multi-modal and complete routes. City staff worked alongside school staff and families, participating in the School Travel Planning process, and using data from family surveys and school committees to help them identify the way forward. As a result, school zone areas took top priority in upgrading sidewalk and bike route infrastructure, with an ongoing dedicated budget of $400,000 for sidewalks and $200,000 for bike lanes and trails. Infrastructure improvements like narrowing the roads and widening the sidewalks led to reduced vehicle speed in one school zone (46).

Though results were not differentiated by municipality size, a systematic review of infrastructure interventions on active transport indicated strong evidence for a positive relationship between multiple streetscape improvements (i.e., two or more of crosswalk and sidewalk improvements, improved and covered bike parking, installation of traffic calming features (raised platforms, zebra crossings) and parking bays; creating safe places to walk) and increased active transport to school in children (20).

Pinkerton and colleagues compared active transportation safety features around schools in urban and rural areas in Canada (47). They included schools in rural areas (population <1,000) and in small population centres (population 1,000-30,000) and larger population centres. The authors noted significant urban/rural gradients for four of the ten safety feature measures (sidewalk coverage, crosswalks, traffic medians, speed bumps), and these measures were all more common in medium sized communities and urban areas, as compared to small towns and rural areas.

Small town school areas performed better than rural school areas on many safety features. For example, where 59% of rural schools had complete sidewalk coverage near the school, 77% of small town schools had complete coverage and just 5% of rural schools had a traffic median at the crosswalk compared to 22% of small town schools.

At the same time, school administrators in urban areas were more concerned about traffic safety around their school, as compared to administrators in rural areas: 84% of rural school and 63% of small town school administrators indicated that traffic was "not a problem" around their school, as compared to just 39% of school administrators in urban areas. Though there was much more emphasis on installation of safety features to encourage active transportation in medium and large urban centres, the perception of traffic as a safety problem persisted (47).

Small Town and Rural Multimodal Networks noted the importance of schools as key destinations in small communities, where they often are the centre of activity (14). The presence of children every day in the school vicinity means it is essential to provide separation from motorized traffic, controlled crossings, and wayfinding. Notably in school areas, (1) separation is preferable over mixed traffic, (2) sidewalks are preferable over shoulders, and (3) sidepaths are preferable on heavy traffic streets.

> The most effective way for rural school districts to establish a permanent commitment to Safe Routes to School is by adopting policies that support walking and bicycling.
>
> *On the Move: Safe Routes to School Policies in Rural School Districts, ChangeLab Solutions*

Planning and design of routes to school need to consider the characteristics of children including slower reaction time, narrower field of vision, difficulty judging speed, distance, and direction of auditory input. In Mt Shasta, California (population 3,292), a street reconstruction project at the school removed parking opposite the school and a mid-block crossing, and added bike lanes and improved sidewalks. Removal of parking across from the school stopped students from crossing the street to get to their parent's car. The improvements provide a safer route to school by bike or on foot and complete a link in the town's bicycle route network (14).

Intervention Area 4: Active Transportation Safety

Small towns have different issues than urban centres when it comes to active transportation safety. As an example, child cyclists in rural areas are twice as likely to be injured from a motor vehicle collision than are child cyclists in urban areas (47). It is important that small towns assess the incidence and locations of crashes, injuries and fatalities during active transport, so that strategies to reduce these incidences are specific to the small town's unique context. Small towns can support Vision Zero – a transportation system with no fatalities – by increasing the safety of active transportation routes. Vision Zero is supported by the Safe System Approach which views safe road networks holistically, consisting of safe speeds, safe roads and roadsides, safe vehicles, and safe road users (48). To make active transportation routes safer, strategies might include reducing speed limits, posting feedback for drivers when they exceed the limit, bicycle helmet encouragement and/or enforcement, stronger regulation for safe driving practices, improving active transportation infrastructure, improving road design, markings and signage. Further, we know that a big barrier to active transportation is perceived lack of safety, so coupling engineering and enforcement approaches with culturally relevant and targeted safety education would be a

The B.C. Community Road Safety Toolkit (Module 1: Protecting people walking and cycling) makes several recommendations to increase the safety of active transportation through reduction of crashes with motor vehicles (49). These ideas follow the logic connecting safer active transportation to more participation in active transportation. Largely, the recommendations could apply to both large and small communities; we highlight several relevant recommendations with the strongest evidence related to the active transportation design ideas already discussed in this document (Table 5). The toolkit provides more information related to the evidence of effectiveness for each measure and further resources in the Resource Kit section of each module.

Table 5. B.C. Community Road Safety Toolkit recommendations for making cycling and walking safer.

Strategy	Example design relevant for small towns, with strong evidence
Separating Road Users in Physical Space	**Wider and connected sidewalks** • Sidewalks are built with at least a 2 metre wide area (the "clear width") that is free of any obstructions • Sidewalks can provide between a 50 and 88% reduction in vehicle-pedestrian crashes compared to locations without sidewalks
	Advance stop lines • Advance stop lines are effective in increasing drivers' ability to see people attempting to cross the road • The likelihood of drivers yielding to pedestrians crossing can increase by approximately 60%
	Off-street walking and bicycle paths • Off-street paths are located away from motor vehicle traffic • Cycling injury risk can be reduced by 30 to 90%, compared to on-street riding with no cycling infrastructure
	Curb extensions and pedestrian refuge islands (+ offset crosswalk) • Both low-cost features work to reduce roadway crossing distances for people, allowing them to safely and more quickly reach the opposite side • Raised refuge islands have reduced vehicle pedestrian crashes by 46% at marked crosswalks and by 39% at unmarked crosswalks • Drivers are more likely to yield to pedestrians when the person is crossing from a curb extension
	Protected and connected bicycle lanes • A protected bicycle lane (one-way is safest) runs alongside a street, physically separated from motor vehicle traffic, distinct from the sidewalk. Connected bicycle lanes ensure that the network of lanes is uninterrupted • If implemented well, can reduce vehicle-bicycle crashes resulting in injuries by as much 90%
	Road diets and complete streets • Occurs when a 4-lane street is reduced to a 2-lane street and pedestrian and cycling facilities are added to make it a "complete street" • Complete Streets projects successful in reducing motor vehicle crashes by between 19 and 47%, depending on the characteristics

Strategy	Example design relevant for small towns, with strong evidence
Separating Road Users in Time	**Leading pedestrian intervals** • Leading pedestrian intervals (advanced green for pedestrians), are re-programmed intersection signal phases that provide pedestrians with a several-second head start over drivers • A proven and low-cost safety design, can achieve a 59% reduction in vehicle-pedestrian crashes at intersections
Increasing the Visibility of People Who Walk and Cycle	**Safe crosswalk signalization** • "Pedestrian recall": "WALK" signal coincides with most of the duration of the green light for drivers, changes to a flashing "DON'T WALK" signal several seconds before the light turns yellow, reverts to the solid "DON'T WALK" signal at the same moment that the light for drivers turns yellow • Other safe crosswalk signalization designs include automated pedestrian detection systems and accessible pedestrian signals for people with visual limitations • Pedestrian recall increases pedestrians' compliance with crossing signals • Automated pedestrian detection systems reduce the number of conflicts between drivers and pedestrians
	In-street yield to pedestrians crosswalk signs • "In-street pedestrian crosswalk signs" are regulatory yield signs placed in the middle of the crossing, typically along the centre line of the road, to emphasize the possible presence of pedestrians in the crosswalk. • Low-cost safety feature • Can lead to a 13 to 46% increase in drivers yielding to pedestrians at the crosswalk
	Rectangular rapid flashing beacons • A form of warning amber flashing beacon used at unsignalized pedestrian crosswalks, activated by pedestrians • Use a high-intensity rapid and irregular flash pattern to capture drivers' attention • Can increase the number of drivers yielding to crossing pedestrians by 52 to 77%
	Coloured bicycle lanes • Coloured bicycle lanes increase the visibility of the lane to drivers, highlight the presence of cyclists and reinforce the right-of-way for cyclists • Can improve the number of drivers yielding to cyclists by 12 to 20%

A systematic review of risk factors for bicycling injuries in children (50) showed that biking in rural areas was associated with greater risk of injury than biking in urban areas. Lower socioeconomic status, riding on the road, and riding on the sidewalk were also positively associated with injury. Findings also showed a lack of protective effect of bicycle safety education in preventing injuries. Creating safer environments for cycling, especially in less populous areas and where families with lower income live, is warranted for preventing injuries.

In both rural and urban areas, an analysis of safety interventions to prevent bicyclist crashes with automobiles showed that road infrastructure interventions could have prevented 75% of bicyclist fatalities (51). In particular, the authors highlighted the accident prevention potential of: (1) separated paths for bicyclists, (2) bicycle crossings with speed calming measures, and (3) roundabouts in combination with bicyclist crossings with speed calming measures. Notably, just 11% of the 184 accidents studied occurred while commuting to or from work, with the majority of crashes occurring during leisure time (51). Cycling for active transportation may be safer than cycling for other reasons, potentially due to the increased skill level accrued with regular riding, though this was not discussed in the article.

Wayfinding signage - point-of-decision cues and aids that convey information about orientation and distance - is an engineering tool that informs pedestrians and cyclists about the availability of safer routes (52). Wayfinding signs that supported navigation and decision-making about routes encouraged residents to walk or bicycle more often in a small community in Hawaii (e.g., one-third of survey respondents agreed that seeing the wayfinding signs helped them walk or bike more) (52). Signs aimed to guide pedestrians and bicyclists along routes that were considered safer "based on local knowledge, observation of travel patterns, and consultation with resources such as the O'ahu Bike Plan" (52). Of those who saw the signs, 41% indicated that they were helpful in choosing a route. Beyond signage, survey respondents recognized other measures that would make walking and cycling safer in their community including traffic-calming measures, more visible crosswalk markings and more separated bicycle lanes (52).

Small Town and Rural Multimodal Networks highlighted the role of speed management in safety of multimodal networks (14). The smaller populations and limited road connectivity of small towns translate to increased emphasis on speed reduction over volume reduction for increased safety. Three traffic-calming, speed reduction measures for small and rural towns were noted: Physical measures, such as vertical deflections (e.g., speed bumps), horizontal shifts, and roadway narrowings, intended to reduce speed and enhance the street environment for non-motorists. Nonphysical measures using signs and markings are intended to raise awareness and reduce speed through visual indications. Diversion treatments reduce cut-through traffic by obstructing or otherwise preventing traffic movements in one or more directions (14).

Intervention Area 5: Street-scale Design and Placemaking

Street-scale design and place-making support active transportation in a community by affecting the quality of pedestrians' and cyclists' experience, across all abilities. Street-scale features (Table 6)– like sidewalks, street crossings, bicycle facilities, traffic calming, landscaping - are easier and less expensive to change than the road network (13). Improvements in local street-scale design can support Complete Streets or school active transportation initiatives, and improve access and equity across neighbourhoods and demographics. Place-making design (Table 6) optimizes public spaces for people's benefit, making them distinctive, appealing, comfortable, and safe, usually focusing on the enjoyment of pedestrians, cyclists, and those using assistive devices and transit (13).

Table 6. Street-scale design and place-making interventions that encourage walking and biking (from (13)).

Street-scale design encouraging walking and biking	Place-making interventions encouraging walking and biking
Walking	Creation of pop-up retail or services
Presence and coverage of sidewalks	Reactivate open space or an empty lot
Absence of trip hazards on sidewalks	Create parklets (mini-parks)
Buffer between sidewalks and traffic (eg, planting strip or parked cars)	Improve pedestrian, bicycle, and transit facilities
Streetlights	Install traffic-calming features through proven design features such as: • Curb extensions • Median islands • Lane narrowing (adding a bike lane) • Mini-traffic circles and roundabouts • High-visibility paint treatments • Temporary speed tables (e.g., raised crosswalk)
Quality of street crossings	
Curb cuts	
Traffic calming to slow traffic	
Public art	
Street furniture such as benches	
Variety of building designs	
Destinations	
Biking	
Bicycle lanes	
Protected bicycle paths and multiuse trails	
Streetlights	
Bicycle racks	

The aesthetic experience of active transportation can be enhanced through creating a safe and welcoming sense of place along routes or at destinations. Maximizing aesthetically-pleasing features that reflect the unique character of communities - like public art, places to sit, or highlighting the natural scenery – encourages active transportation. Further, place-making and associated positive walking and cycling experiences can be supported by road maintenance, lighting and by minimizing signs of decay such as trash and vandalism (4).

Though results were not differentiated by municipality size, a systematic review of infrastructure interventions on active transport indicated moderate evidence for a positive relationship between installation of fitness equipment or playground equipment at parks and playgrounds and active transportation in adults (20).

In small towns, placemaking on main streets can strengthen community identity through enhanced aesthetics, space for community activity, and attracting business, potentially resulting in greater community cohesion and public participation (14). In Los Molinos, California (population 2,037), reconstruction of the busy State highway-main street added buffered bike lanes (with stamped colored concrete buffers), sidewalks, and crosswalk signal treatments (with in-pavement flashers at crosswalks), islands, lighting, street trees, and speed feedback signs (14). Following this reconstruction with its place-making aspects, vehicle speeds and crash rates were lower, enabling a safer environment for cyclists and pedestrians to visit, do business, and participate in their community.

> The quality of the active transportation "experience is expected to influence the user's likelihood of being active in a particular place again."
>
> *Young et al. Circulation 2020; 142:e167-e183*

Mixed Land Use and Zoning

Active transportation is influenced by features of land use patterns (13) including:

- Overall density of development and density of residential development
- Mix of land use types
- Availability of open space and parks
- Transit density
- Shorter blocks
- Continuity and connectivity of the bike and pedestrian network (i.e., complete networks)
- Functional design that benefits pedestrians and cyclists (e.g., buildings opening directly to sidewalks)

These features are brought together in the SMARTer Growth neighbourhood concept, which are a system-based land use and transport development design policy (49). This neighbourhood design locates residents near services in neighbourhoods that invite active transportation. With through traffic on perimeter roads, the neighbourhoods are designed for low speeds, low volumes, and local access only which results in safer, active transportation opportunities, suited to all ages and abilities. Through design that increases accessibility, SMARTer Growth results in improved social equity. SMARTer Growth design principles have been used in small communities in the Netherlands, and in the City of Kelowna, however we are not aware of a small community in BC that has designed a neighbourhood this way. With comparable capital costs to conventional development patterns and lower ongoing costs, as well as cost-savings associated with reduced crashes and improved health, SMARTer Growth design for increasing active transportation in small BC communities may be feasible (49).

While we see these land use patterns working together to influence active transportation in larger cities, select features may be more pronounced influencers in small towns. For example, the availability of parks and green spaces is a notable advantage in many small towns, that supports active transportation. Doescher et al. reported that the availability of parks or natural recreation areas in small town neighbourhoods significantly increased the odds of utilitarian walking (21).

In smaller towns, supportive features of land use may be most noticeable around the "main street" businesses and surrounding homes. Zoning can further support active transportation, such as zoning for mixed-use districts, concentrated areas of development, required pedestrian/bicycle accommodations, a range of housing affordability, human-scale design requirements, and de-coupling of parking and land use (13). Even in smaller and less populated areas, it's important to have somewhere to actively transport to: perception of nearby trails and non-residential destinations were especially predictive of active transportation in non-urban areas in a recent study (53).

In a study of older adults in small town neighbourhoods (defined by population of 1,001-3,000 people per square mile), land use mix related to access (i.e., ease of access to nonresidential land uses: stores within walking distance, parking availability, ease of walking to transit stop) was significantly related to total weekly walking (19).

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