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Pathways to Sustainability in Rural Communities: Case Study of Active Transportation and Eco-Tourism at Pinawa, Manitoba, Canada

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Abstract

Active transportation (AT) strategies improve community living, health, and the environment in all communities, including rural ones. Pinawa is a small Canadian town in Manitoba that won national awards for active living but wanted an AT plan for further improvement. We undertook a case study of AT priorities of Pinawa's community members and tourists through 22 semi-structured interviews, site observation, mapping, and cost-benefit analysis. Prioritizing AT users in infrastructure planning and design offers Pinawa many health, environmental, eco-tourism, and economic development benefits. Community priorities to enhance AT are improving infrastructure with bike lanes, sidewalks, crosswalks, and trails. Other planning factors, such as way-finding signage, bike rentals, and shuttles, would further promote AT. This paper contributes to understanding the role of AT in rural communities, providing practical recommendations for infrastructure and policy changes.

Keywords

Active Transportation, Community Planning, Green Infrastructure, Environmental Health, Mobility, Accessibility, Connectivity, and Eco-Tourism

1. Introduction

Active transport (AT) is challenging in rural areas for both locals and tourists around the world. In the countryside, people typically must travel large distances to meet their basic needs or for others to visit. Tourism can have a large ecological footprint from travel, bringing people, typically by car, to pristine, rural commu-

nities for eco-tourism. Tourism, attracting many people to a pristine place, can undermine its cultural and ecological integrity. Tourism, unless carefully planned, can be an extractive industry consuming its host, i.e., the local community, culture, and natural environment (Hussain & Haley, 2022). Tourists consume much more energy than most residents due largely to motorized vehicle travel using fossil fuels (Galati et al., 2023; Gössling & Peeters, 2015).

Planning for sustainable tourism in rural communities should consider active transportation's role in its sense of place, culture, community safety, and green space (Gocer et al., 2024; Litman, 2018). Community well-being is impacted by tourism, particularly over-tourism, where many people visit inconsiderate of community protocols, safety, culture, and the environment (Bellato et al., 2023, 2024; Hussain & Fusté-Forné, 2021). This paper focuses on AT and other planning aspects, considering Pinawa as a case study of a rural eco-tourist community in Manitoba, Canada.

The literature review considers AT components and benefits applicable to the community of Pinawa. Our methods included 22 semi-structured interviews and observation to determine an AT plan. The AT priorities and recommendations offer practical solutions to many rural communities worldwide.

2. Literature Review

Rural areas are diverse. A rural area is typically outside of urban centers and their commuting zones (Statistics Canada, 2022). These rural areas are typically lower-density areas than urban areas and include small towns. Statistics Canada (2022) reported that 18% (6.6 million) of the Canadian population resides in rural areas.

Rural Canada is a cultural mosaic. Rural Canada is the native home of Indigenous people (Lamoureux et al., 2024; Rich et al., 2021). Rural Canada has been shaped by its colonization by European settlers, who geographically positioned themselves on prime land to extract natural resources, often forcefully relocating Indigenous peoples to reserves on marginal lands (Harris, 2004). This legacy requires reconciliation with Indigenous people regarding their Native land, including environmental conservation.

2.1. Benefits of AT Planning

Active transportation (AT) provides environmental and health benefits. Public transit and active transportation are key to the United Nations' Sustainable Development Goal (SDG) target 11 of "more inclusive, safe, resilient, and sustainable" human settlements (United Nations, 2024; Shariat Zadeh & Thompson, 2025). Target 11.2 aims to provide access to safe, affordable, and sustainable transport systems for all by 2030, which aligns with AT (United Nations, 2024).

Active transport (AT) reduces the negative impacts of cars (Sallis et al., 2006). Private vehicles produced about 10% of global carbon dioxide emissions in 2022 and used 25% of global oil (International Energy Agency [IEA], 2023; Shariat Zadeh & Thompson, 2025).

Active transport engages people in healthy lifestyles. The lack of physical activity is the fourth-highest risk factor for mortality globally, with AT being an antidote (Strain et al., 2024; WHO, 2024). For example, regular cycling can reduce mortality risk by about 10% (WHO, 2022). Globally, 80% of youth students and 31% of adults are inactive enough to be unhealthy (Shariat Zadeh et al., 2025; WHO, 2024). The WHO recommends at least 150 minutes of moderate physical activity per week for adults and at least one hour per day for children (Shariat Zadeh & Thompson, 2025; WHO, 2022). AT can bring down the estimated 3.2 million deaths that occur globally from physical inactivity (WHO, 2024). The estimated cost of physical inactivity to public healthcare systems globally is US$ 27 billion per year for 2020-2030 if physical activity levels do not increase (Strain et al., 2024; WHO, 2024).

Risks from disease decrease with AT. Walking, cycling, and other physical activities reduce the risk of cardiovascular diseases, diabetes, colon and breast cancer, depression, and hip or vertebral fracture risk and help control weight (Strain et al., 2024; World Health Organization, 2024). The many positive impacts of AT include reducing stress, enhancing mental well-being, strengthening the immune system, and maintaining a healthy weight (Pitt et al., 2021). **Figure 1** illustrates how AT promotes the well-being of users through reducing air and noise pollution and increasing resilience through physical activity promotion.

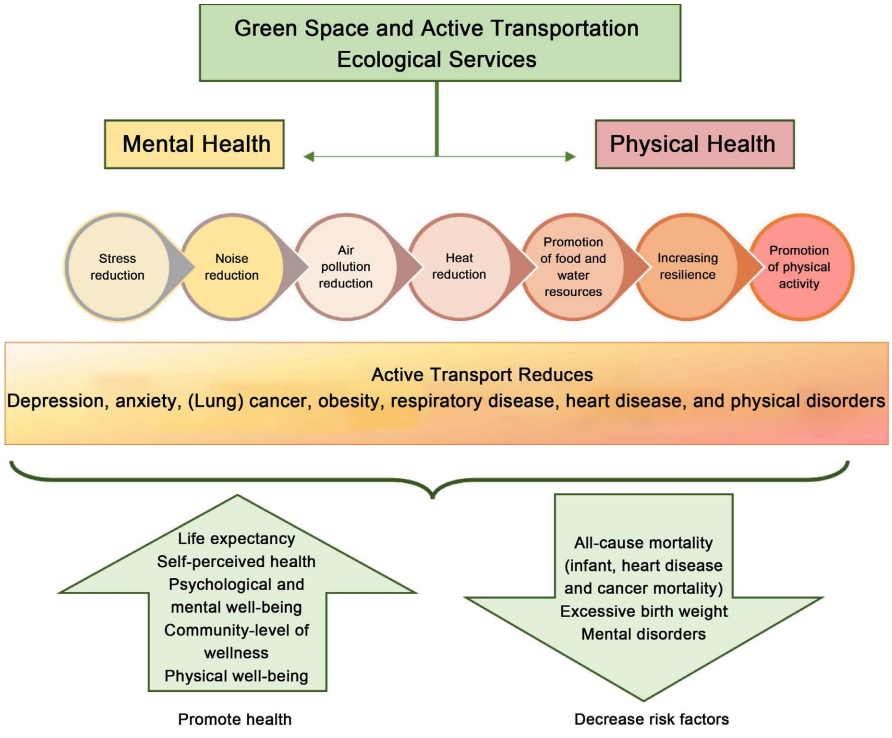

Figure 1. Health outcomes of active transport and green spaces. Source: author.

2.2. Planning for Active Transport

Safety and accessibility are top priorities in AT planning (Hagel et al., 2019). A

thoughtful design optimizes safety and enhances the AT user experience. Safety planning considers all potential users, including cyclists and pedestrians, with separate spaces where possible (Aceves-González et al., 2020; Hong, 2018). The availability of sidewalks and cycling paths increases AT behaviors (McIlroy et al., 2020; Rasouli, 2013) by enhancing safety and the ease of walking (Reynolds et al., 2010; Slater et al., 2020).

Inclusive access occurs when individuals of all ages and abilities can travel to key destinations easily (Lowry et al., 2016). People at every stage of their lifespan, whether in baby carriages, walkers, wheelchairs, or blind people, need to be considered in planning (Baobeid et al., 2021). Universal design principles for AT require areas to be walkable and cyclable for people of all ages and abilities (Baobeid et al., 2021; De Luca et al., 2021).

Planning for AT access examines the availability of AT services and infrastructure. Green infrastructure should be physically separated from roads to create safe AT with dedicated bike lanes and sidewalks (Lowry et al., 2016). Planning for bicyclists requires bike lanes and bicycle racks to securely park bikes (Congiu et al., 2019; Hamidi et al., 2019). Sidewalks are needed to facilitate walking (Aceves-González et al., 2020). Motorized vehicles impose risks when sharing the same space as pedestrians, bicyclists, and those in wheelchairs. Mixing motorized and pedestrians decreases the perception of safety for active users (von Stülpnagel & Rintelen, 2024).

Public transit systems and regional transport services make AT safer and allow travel access (McIlroy et al., 2020). Public transit reduces traffic congestion and environmental pollution. People should be able to travel to access programs, services, and destinations. However, approximately one million people in Canada experience "transport poverty," where limited transportation options to cars only restrict their access to opportunities (Williams et al., 2023). Integrating other public transport modes, such as bike rentals, provides a versatile transport system (Ross, 2016), especially in tourist areas.

2.3. Study Area

Pinawa is renowned for its natural elements and waterways. Pinawa is located 110 km northeast of Winnipeg, as shown in **Figure 2** (Pinawa, 2019). Pinawa has a population of 1306 people. Since Pinawa was highly promoted for regional tourism during COVID-19, the number of tourists to Pinawa has increased dramatically. Pinawa's population doubles with tourists in the summer, averaging one thousand visitors during the work week and up to two thousand on weekends (Dearing, 2020).

The name Pinawa comes from the native Anishinaabe term "calm waters," as the waterway in town bypasses the lengthy rapids of the Winnipeg River (Pinawa, 2019). The northern area of present-day Pinawa was developed in 1903 by constructing a hydroelectric generating plant by the Winnipeg Electric Street Railway Company (Welch & Payne, 2012). Production stopped in 1951 because the seven

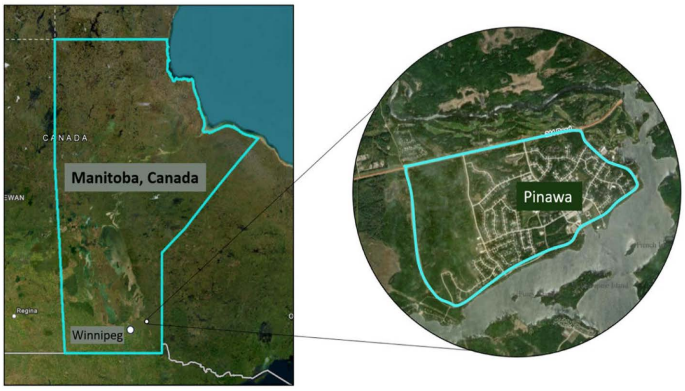

Figure 2. Pinawa's location in Manitoba, Canada. Source: author.

sister hydroelectric projects required water (Welch & Payne, 2012). Pinawa was established 10 kilometers away from the old town in the 1960s as a planned nuclear industry town. The planning of this town was aimed at conserving the area's natural beauty, and all riverfront property was designated as public access (Pinawa, 2019).

Pinawa offers many outdoor activities in the midst of natural beauty. Pinawa became a popular tourist destination during COVID-19. Pinawa offers various leisure activities, including boating, water sports, hiking, and golf (Wintrup, 2017). The key tourist attractions in Pinawa include the Ironwood Trail, Waterfront, Pinawa Suspension Bridge, Pinawa Club, Pinawa Beach, and the Pinawa Channel Float (Pinawa, 2019). The marina and golf club have always been favorite destinations for locals and tourists. **Figure 3** showcases Pinawa's popular attractions on a map. The Pinawa Dam and Whiteshell Provincial Park are scenic destinations within half an hour of Pinawa.

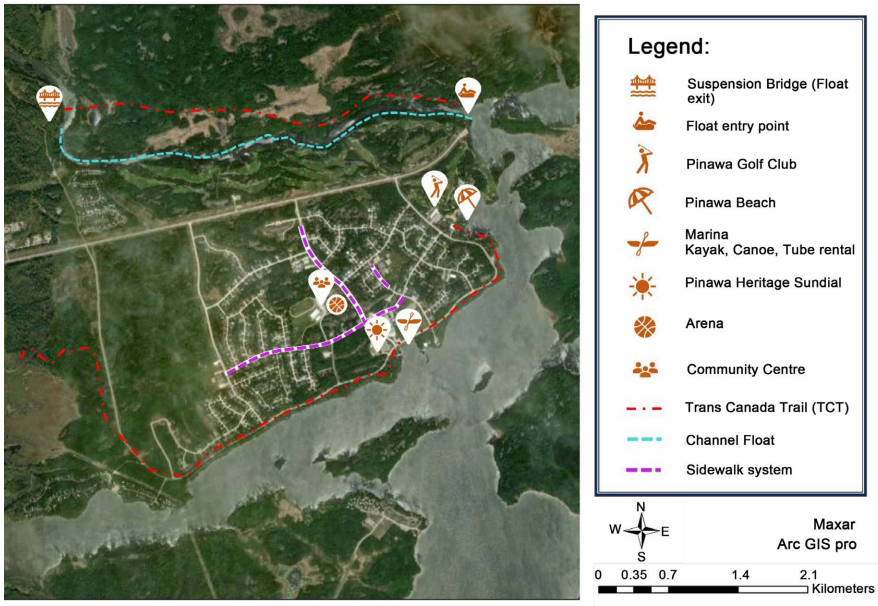

Figure 3. Pinawa's popular attraction map shows rental options and activities. Source: author.

3. Methods

We undertook two main approaches: observation and interviews regarding AT at Pinawa under University of Manitoba ethics # R2-2021:080 HS25063.

3.1. Pinawa Observations

We observed traffic, infrastructure, and AT at Pinawa's key attractions during six visits between 2021 and 2023. The Pinawa Community Development Corporation (PCDC) board members and mayor assisted with research tours for the initial trip in the summer of 2021. We organized two trips to Pinawa from Winnipeg, involving students and professors, to witness how small (10) groups and large (30) groups navigated and engaged with the community.

Through observation and site evaluation, we analyzed the transportation-related strengths and weaknesses of Pinawa's key destinations. We studied the safety, connectivity, AT infrastructure, and AT behaviour at trail systems, crosswalks, pedestrian pathways, parking spaces, and key attractions (Rasouli, 2013; Chang & Huang, 2006). Pinawa's key destinations are its suspension bridge, Pinawa Club, waterfront and trails, sundial, channel float, and community center.

3.2. Interviews with Residents and Tourists

We conducted 22 participants with semi-structured interviews with key stakeholders, including residents, business owners, and visitors. The interviews occurred in person, online through Zoom meetings, or via email, based on the preference of the participant. Our questions gave interviewees a focal guideline on safety and accessibility considerations during the interviews (Rabionet, 2011). These participants included 14 Pinawa residents identified through the community resource guide and word of mouth. All interviews followed approved ethics by the Research Ethics Board 2, Protocol # R2-2021:080 HS25063. We provided participants with the map, as shown in **Figure 4**, to locate and dialogue about their AT and eco-tourism ideas. We transcribed interviews and coded the data using NVivo 11 software for themes (Jugder, 2016; Leedy & Ormrod, 2015).

Figure 4. Map for participants to discuss AT and eco-tourism ideas. Source: Pinawa, 2019.

4. Findings and Discussion

4.1. Interview Themes and Discussion

Six key themes were identified from the content analysis of the 22 interviews. The six themes are connectivity, transportation, education, destinations, safety, community, and tourist priorities. Public open spaces and natural spaces, which are both land use themes, and regional services, which are a public transportation theme were ubiquitously mentioned by all 22 participants. In Figure 5, the bar graph shows that all 22 participants, both tourists and local people, discussed these three sub-themes. Both residents and tourists expressed a desire to better protect Pinawa's natural environment, including public spaces like the Ironwood Trail, by increasing awareness. People emphasized the need for more accessible public seating areas in nature to encourage people to spend time outdoors. In addition, some participants mentioned certain sub-themes, including pedestrian facilities, community programs, safety, access/mobility, and accommodations/restaurants many times, which is shown by the deeper intensity of the bar graph colours. Participants discussed wanting regional transport services to facilitate travel from Winnipeg to Pinawa. This travel could be organized by local tourist operators offering a bus or van for day trips. Many interviewees also discussed the limited amenities, such as restaurants, and the absence of bicycle lanes, crosswalks, and sidewalks. Figure 6 shows these five themes with their subthemes to show how together they make a holistic AT consideration for eco-tourism.

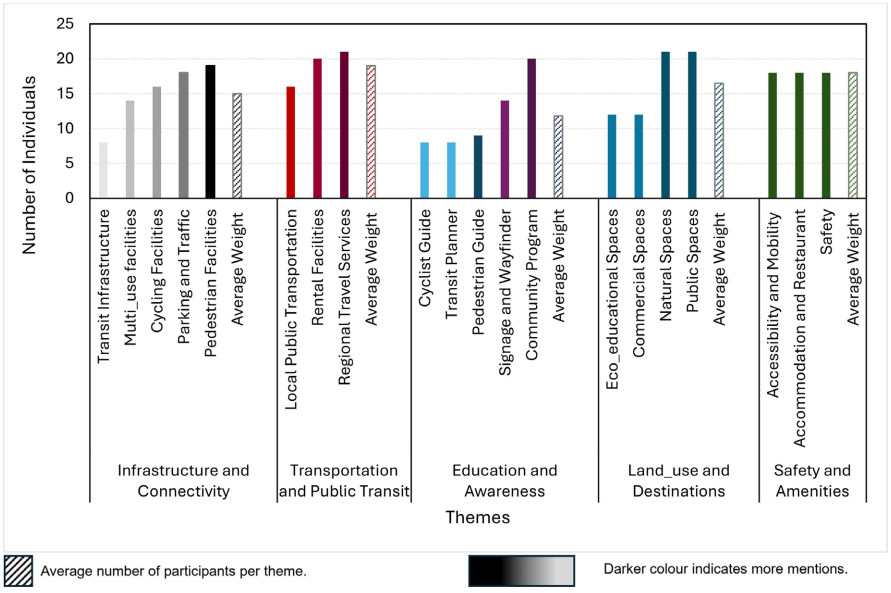

Figure 5. Five themes with their sub-themes were identified in 22 interviewees regarding Pinawa's Active Transport Planning.

4.2. Active Transport Connectivity

Pinawa is a walkable community. Pinawa was awarded the most active community in Manitoba in 2022. Pinawa's trail system is a part of the Trans Canada Trail

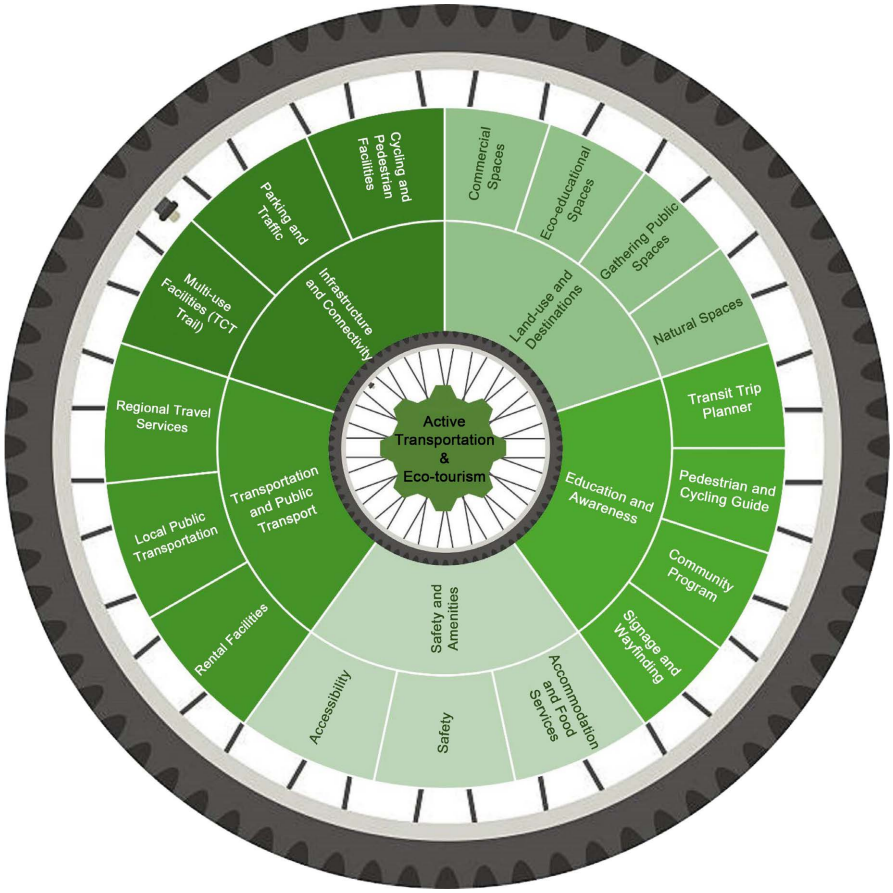

Figure 6. Active transport factors for eco-tourism in Pinawa. Source: author.

(TCT) network, connecting Pinawa to the rest of Canada. The Ironwood Trail, along the river in Pinawa, and the Pinawa Channel Heritage Trail, outside of Pinawa, are both part of the TCT, providing scenic hiking trails.

Pinawa meets the goals of a "15-minute city" by having locally accessible services within walking distance everywhere in town. The Pinawa downtown, with food, banking, recreation, and services (government and other), are reachable within 10 minutes for most places and 20 minutes from every house in Pinawa (Barratt & Swetnam, 2022), according to **Figure 7**. The AT town, like the 15-minute city, has all essential services, including food stores, banks, health care, and other amenities, accessible within a 15-minute walk from a person's home, school, and workplace (Barratt & Swetnam, 2022). Pinawa shows that the "15-minute city" idea is applicable to rural communities and that small towns should plan for AT.

Accessibility is more than distance; it is also safety for AT users. The AT plan for a town should have the infrastructure to support AT. Pinawa has sidewalks in front of most essential services, such as hospitals, churches, and schools. However, other places lack these sidewalks. Also, Pinawa has bike racks but lacks any bike lanes. The existing sidewalks, trails, and bike racks show great potential for AT in Pinawa. Extending accessibility to connect places with sidewalks and bike lanes would improve AT at Pinawa.

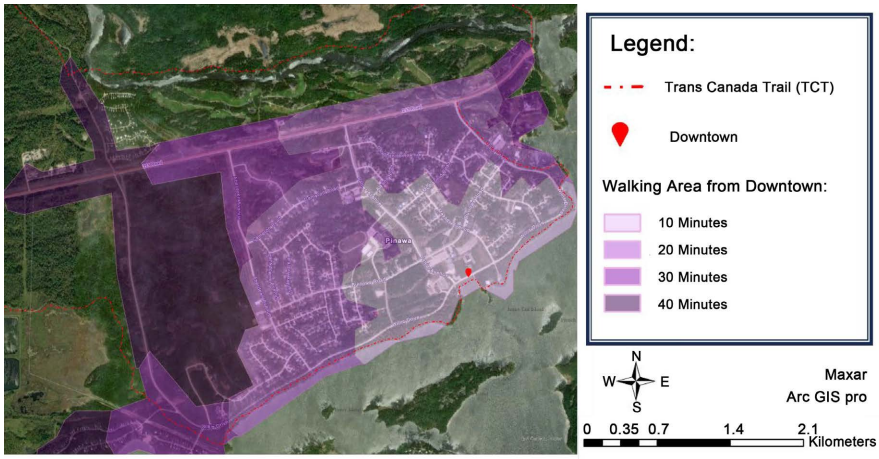

Figure 7. Pinawa's walkability from downtown mapping for 10-minute to 40-minute walks. Source: author.

Major eco-tourism destinations are within walking distance of Pinawa. Trails to the channel float can be reached within a 40-minute walk, and most other trails in 20 minutes. The community has an exceptional trail system that connects key points of interest along the Winnipeg River. Major tourist destinations can be reached in 30 minutes by walking and 7 minutes by cycling. However, the trail network has gaps without a bike lane, sidewalk, or trail to the Pinawa Channel Float from Pinawa.

Planning recommendations for connectivity

Better trail connectivity in Pinawa would improve the AT plan in this town. Pinawa's two major trail systems are not connected. Figure 8 has red dashes to show the lack of connection between the two trail systems. A path connecting the Ironwood Trail, along the river in Pinawa, and the Pinawa Channel Heritage Trail, just outside of Pinawa, would encourage walking to the channel and help prevent traffic congestion at the Pinawa Channel Heritage Trail, which is a problem. At present, people must travel 2.1 km on Highway 211, a busy highway. The time required to walk is 30 minutes, and it takes 7 minutes to cycle, and this puts them at risk. A bike lane, sidewalk, or trail would allow safe passage by AT to Pinawa's Channel Float from Pinawa.

The existing AT network in Pinawa is strong, but there are a few gaps to fill. Three gaps are identified in Figure 8, which would build on the existing AT infrastructure to facilitate AT to reach all Pinawa's key destinations. Most Pinawa roads have sufficient width to accommodate bikes and walking, dedicated lanes, and vehicles to extend the dedicated trail or sidewalk system. Extending the trail system in these three areas will better protect the safety of pedestrians and cyclists. In addition, signs and way finders are needed to facilitate navigating to these locations.

Infrastructure and services would greatly enhance AT connectivity in Pinawa. An anonymous resident noted a desire for infrastructure improvement, saying, "Pinawa is missing better [AT] infrastructure and services to support tourism."

Others believe the current infrastructure is adequate but underutilized. Figure 9 displays nine pedestrians and cyclists walking and biking along Willis Drive on summer days in an area without sidewalks.

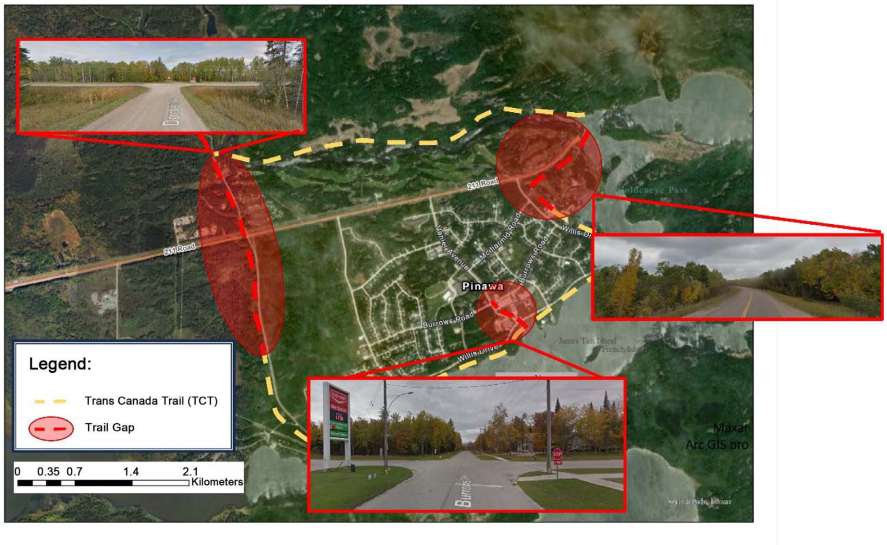

Figure 8. Connecting the Trans Canada Trail with three trails to fill active transport gaps (Photos: Google Earth).

Figure 9. Pedestrians and cyclists on the road due to a lack of sidewalks or bike lanes. Source: author.

Pinawa would benefit from a comprehensive and interconnected network of pathways and routes. For example, the sundial sitting area and town centre are adjacent to the waterfront trail system but lack a crosswalk across the wide road, which acts as a barrier to the Ironwood trail. Busch, a resident, suggested, "An expansion of the Ironwood Park into the center of town by the creation of paths between the shopping center, sundial, and the marina would enhance the sundial as a meeting place." Strategies, such as adding a scenic gravel path, provide efficient AT solutions for desired paths to provide visual flow and connectivity. Figure 10 displays the popular walking destinations downtown that lack crosswalks and sidewalks between the beautiful sundial space and the Ironwood trail. This crosswalk requires only a can of paint and a painter, so it should be easy to implement.

Figure 10. Lack of sidewalks and crosswalks from the waterfront to the sundial. Source: author.

Crosswalks benefit pedestrian and vehicle traffic, whether low or high volumes and at any speed, by providing a clear, safe path for people to cross the street (Global Designing Cities Initiative, 2016). Crosswalks could connect Pinawa's town centre, with its shopping, government services, and parking infrastructure, to the Ironwood Trail and waterfront. Crosswalks, either pinch-point or conventional, as shown in **Figure 11**, will allow safer connectivity between the tourist attractions and Pinawa's service centre. Pinch point/yield crossings slow traffic and facilitate shorter crossing distances at mid-block locations for areas with low pedestrian and vehicle traffic and speeds under 30 km/h.

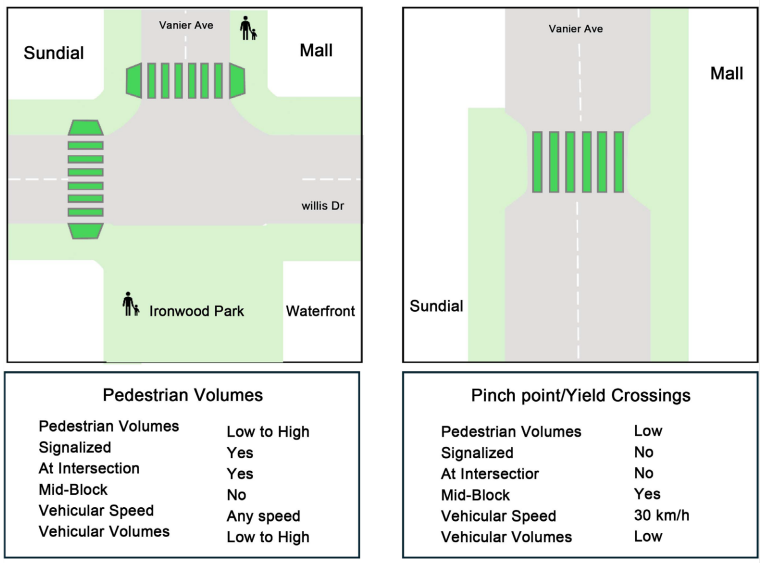

Figure 11. Two safe options applicable to Ironwood Park and Pinawa's waterfront to the sundial and town centre. Source: author.

Everyone who was interviewed wanted improvements in tourist parking. Residents expressed dissatisfaction over tourists parking in unauthorized zones or on the roadside. The tourists were frustrated by unclear parking instructions and difficulty finding parking spots. People recommended using underutilized downtown parking spaces (as shown in Figure 12) rather than developing new parking lots in Pinawa. Pinawa can increase the park and ride potential by promoting alternative transportation options such as rental bikes or bike rickshaws. Bike rentals have the dual benefit of addressing parking limitations while advancing the town's environmental sustainability goals.

Figure 12. The excess parking available in Pinawa's center at the co-op food store and mall. Source: author.

4.3. Public Transit

No local or regional public transport network offers public transit to Pinawa. Without buses or trains, personal vehicles are required to travel to the rural community of Pinawa for tourism. Regional transport options would increase the overall accessibility to Pinawa and the region, which has many tourist attractions.

Public transportation in Pinawa offers access only to the channel float. Shuttles exist presently to take tourists from the channel's end to its start, to allow them to jump in their cars after their channel float experience. However, these shuttles' roles could be expanded in less busy times to pick up tourists in Winnipeg and other cities. Enrique, a tourist, stated: "The shuttle is already operating from the bridge to the channel float, right? So they could easily come to town [Pinawa]. We could have these buses be part of the solution, with the buses having specific stops and creating a loop route in town." Tourist operators could offer a one-day package that includes travel from Winnipeg and other areas to experience Pinawa's many attractions.

Transportation to the eco-tourism site is typically the biggest environmental impact. To consider different options to get to Pinawa, we review carbon emissions for the 2000 people engaging in Pinawa's tourism over a summer weekend. We compared CO_2 emissions for cars, vans, and buses transporting 2000 people, considering the vehicles required and different fuel consumption rates obtained

from Environment and Climate Change Canada (2023), the International Energy Agency (2021), and Natural Resources Canada (2022). For car emissions, we assumed 500 cars, estimating that cars held four people, on average, traveling 230 kilometers, which is the return distance from Winnipeg to Pinawa, or 115,000 for the 500 cars. To estimate the private car's fuel consumption, we used an average fuel consumption rate of 8.5 L/100 km to reflect a mix of city and highway driving for modern gasoline-powered vehicles (International Energy Agency, 2021), resulting in 977 L total fuel used per summer. To determine CO_2 emissions, we applied the standard emission factor for gasoline combustion: 2.31 kg CO_2 per liter of fuel (Canada Natural Resources, 2014; Environment and Climate Change Canada, 2023).

Equation 1 for total CO_2 to be applied to cars, vans and busses

$$= \text{Total distance } (\text{km}) \times \text{Average fuel consumption } (\text{L}/100\ \text{km} \times 2.31\ \text{kg}/\text{l})$$

$$\text{Equation 1 applied to cars} = (115,000) \times 8.5\ \text{L}/100\ \text{km} \times 2.31\ \text{kg}/\text{l} = 22580.25$$

Employing shuttle service vans increased the vehicle capacity to 10 passengers per van to reduce the number of trips and distances to 200 trips and 46,000 km, respectively. Assuming an average fuel consumption of 12 L/100 km for vans (Natural Resources Canada, 2022), using equation 1 resulted in 12762.2 kg of CO_2 emissions. Vans, compared to cars, halve greenhouse gas emissions due to increased passenger capacity. Further, 40 buses with a 50-passenger capacity could transport 2000 people. Buses, rather than cars, would reduce the trips, resulting in a reduction of the distance traveled to 9200 km. Applying the average bus fuel consumption of 30 L/100 km (Natural Resources Canada, 2022) for buses resulted in 2760 L of fuel used, amounting to 6375.6 kg. Thus, employing buses as much as possible would reduce emissions to as little as one-third of the CO_2 of equivalent private car travel, highlighting its efficiency as a sustainable option for group transportation. See **Figure 13** for a summary of the emissions and vehicle traffic. As well as reduced emissions, reduced vehicle usage will help solve parking and other issues.

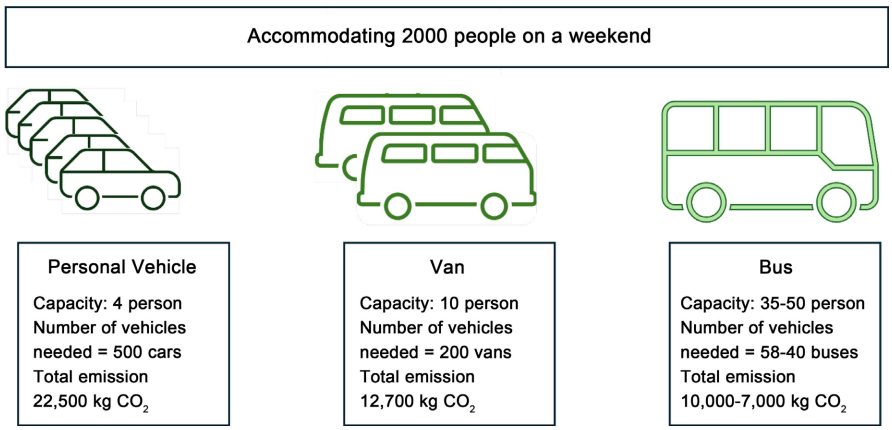

Figure 13. Comparison of CO_2 Emissions for Cars, Vans, and Buses transporting 2000 people. Source: author.

Local Transportation Options

Local businesses could offer winter and summer rental AT options for tourism in Pinawa. Interviewees highlighted various AT modes suitable for Pinawa, focusing on walking, cycling, skating, skiing, and scootering as fitting modes of transport for Pinawa's setting. Rental stations for bicycles, electric vehicles (like e-scooters, e-bicycles, e-ATVs, or golf carts), and pedicabs (cycle rickshaws), as shown in Figure 14, would expand options for travel. In the winter, ski rentals could be available to access hiking/ski trails. The AT plan should consider all ages and mobility to provide different AT options for diverse people.

Figure 14. Green transportation options that Pinawa can offer to tourists. Source: author.

4.4. Environmental Education and Awareness

Pinawa's breathtaking nature is worthy of promotion and protection. Tourists could learn about the natural attractions through educational material. Signage, an information centre, and/or online or pocket maps of Pinawa's attractions would assist cyclists and pedestrians. Figure 15 provides suggestions for signage on Pinawa's waterfront.

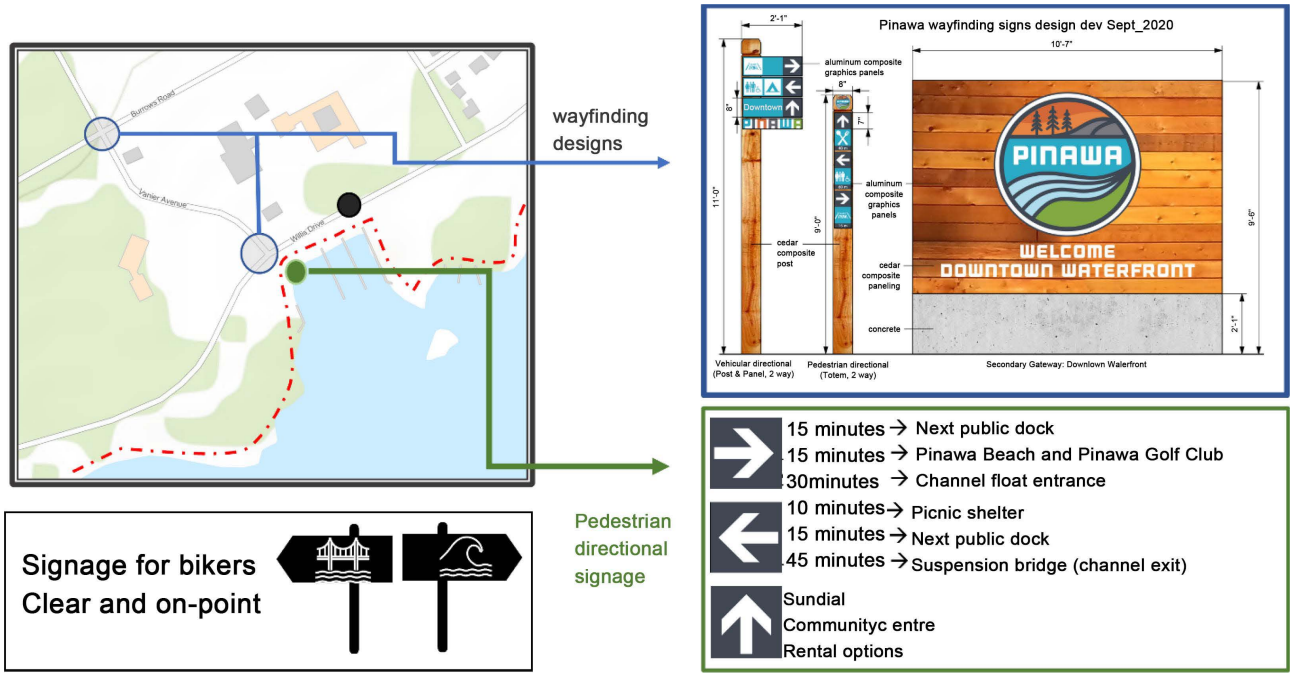

Figure 15. Signage suggestions for Pinawa's waterfront to promote Active Transport. Source: author.

Pinawa has abundant biodiversity. Turtles, deer, and foxes are abundant in the town. Land-based education opportunities could introduce tourists to wildlife viewings and share knowledge about wildlife protection programs. For example, engaging people in the turtle egg protection program to protect rare turtles in Pinawa would foster a deeper connection between people and the natural world. As turtles nest near Pinawa Beach, this location provides opportunities for environmental awareness and wildlife conservation. Tourists and residents emphasized eco-tourism to increase awareness about environmental preservation. Badat, a tourist, was surprised to hear about the turtle nests and mentioned, "There was nothing written here about what is happening at the beach." The focus on nature at the beach could promote eco-tourism and ecological restoration.

Residents wanted tourists to respect the community and nature. Everyone regarded nature as Pinawa's biggest attraction, needing protection. The Pinawa community wants to balance tourism with preserving the natural environment. Residents were upset that tourists disrupt wildlife and litter without feeling responsible for their actions.

Tourists' enjoyment of Pinawa's trails and natural attractions should not come at the expense of the environment and residents. Signage could inform visitors about local wildlife, nature care, and traffic regulations. More educational events would boost Pinawas' eco-tourism influence and encourage more responsible behaviour among visitors. A tourist suggested that eco-tourists and cultural tourists, rather than only adventure tourists, could be attracted: "I guess tourism events and festivals can help attract a broader range of tourists. Events could focus on local culture, art, and outdoor activities".

Nature preservation was the priority for community members and tourists. Many local volunteer groups, including the Friends of the Ironwood Trail (FIT), steward the land. Derrek shared how FIT has successfully regenerated tree growth along the waterfront by protecting newly planted (native) trees from wildlife. Other efforts include turtle egg protection. A tourist, Enrique, mentioned: "A car park for the weekend and tourists is not logical. You have to remove trees that have taken years to grow there. So, I don't think that makes sense. And if you want even more tourists, does that mean you need to destroy more of nature to accommodate tourists with parking? So, the end is just a river and a parking lot with no trees." Polyzois, a tourist, remarked, "Pinawa presents a unique opportunity for tourists to connect with nature in new ways; it presents many unique opportunities to engage and interact with wild animals, including deer, foxes, turtles, and beavers." So, the efforts must redirect development purposes to natural beauty preservation.

4.5. Broadening Tourist Visits Beyond the Channel and Suspension Bridge

Most tourists visit the channel and/or suspension bridge in a half-day visit to Pinawa. These tourists often do not visit or spend money at other Pinawa sites. To

benefit economically and preserve the environment, Pinawa should encourage tourists to visit the town, including its shops and restaurants. Figure 16 shows a map of Pinawa's key destinations with active travel times. Paths and AT infrastructure could effectively direct tourists to public places, pop-up markets, galleries, and retail stores, as well as the channel and suspension bridge.

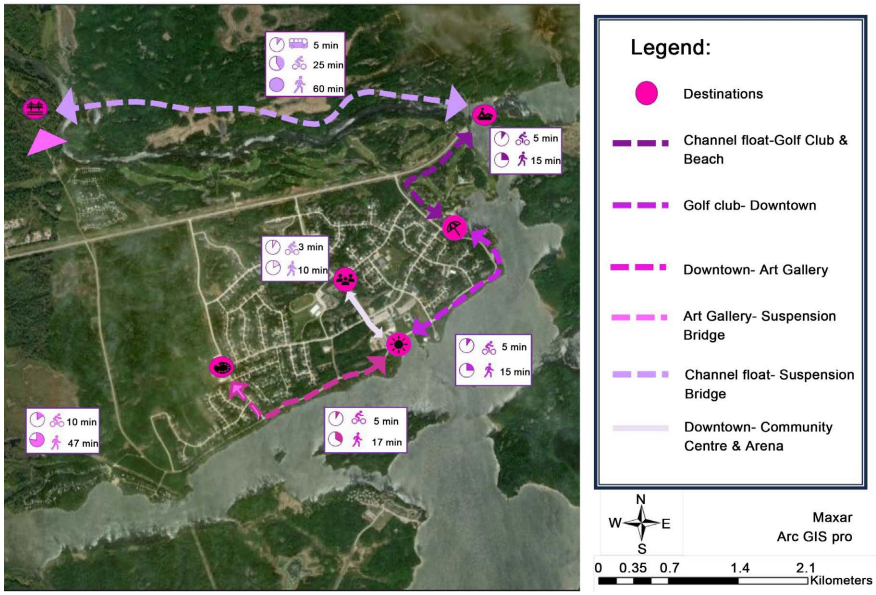

Figure 16. Pinawa's six key destinations with connecting active travel times. Source: author.

Residents reimagined Pinawa's downtown space to have more amenities. Getting tourists to Pinawa's town centre requires services that meet their needs, such as restaurants and cafes. Pop-up restaurants that cater to tourists would attract people downtown, as shown in Figure 17. Adding more food trucks and local vendors with local products in places like the channel float, suspension bridge, and downtown area was mentioned. Temporary markets create vibrant opportunities for local vendors to showcase their products, attract visitors, stimulate economic activity within the community, and foster a sense of connection between locals and visitors.

Pinawa would benefit from more placemaking through art and benches. Particularly, the sundial area and the green areas on Vanier St. and Willis Dr. offer placemaking options for tourists and locals. The sundial area, for example, would benefit from a pergola or sheltered picnic area and food trucks to be more inviting.

Winter festivals enhance Pinawa's attraction during the colder months. Cultural, sports and recreational activities like ice sculpting or skiing competitions could catalyze winter tourism, contributing to local revenue. These events could offer activities similar to Winnipeg's Festival du Voyageur, as shown in Figure 18.

4.6. Safety

Safety is a key factor for AT planning. A trail to connect the Ironwood Trail with

Figure 17. Pop-up Street Plazas offer greater amenities during the summer tourist season. (Source: author).

Figure 18. Festival du Voyageur in Winnipeg shows how people get together to enjoy winter activities and see snow sculptures. Source: author.

the Pinawa Heritage Trail to stop people from walking on the highway. An interviewee complained about the unsafe walking on the highway, "I would like to see less parking directly on the highway and fewer pedestrians on the highways as this poses a safety risk." Figure 19 presents examples of safe AT facilities in other communities.

Figure 19. Examples of walking paths away from traffic or parking to encourage active transport. Source: author.

Community members and visitors wanted to establish dedicated lanes for each category of road users, including bicyclists and walkers. The minimum width required for a two-way traffic lane is 6 meters (20 feet) (Alta Planning, 2017). The width of Willis Dr., which varies from 8 to 10 meters, could thus easily accommodate one dedicated AT lane, as shown in Figure 20. Figure 20 also illustrates two different options for bike lane developments on Willis Drive, using the existing pavement for the bike lane and a sidewalk or trail on existing grass. These options both consider that the required space for a bike lane is 3 - 4 meters for a two-way lane and 1.5 - 2 meters for a single-way lane.

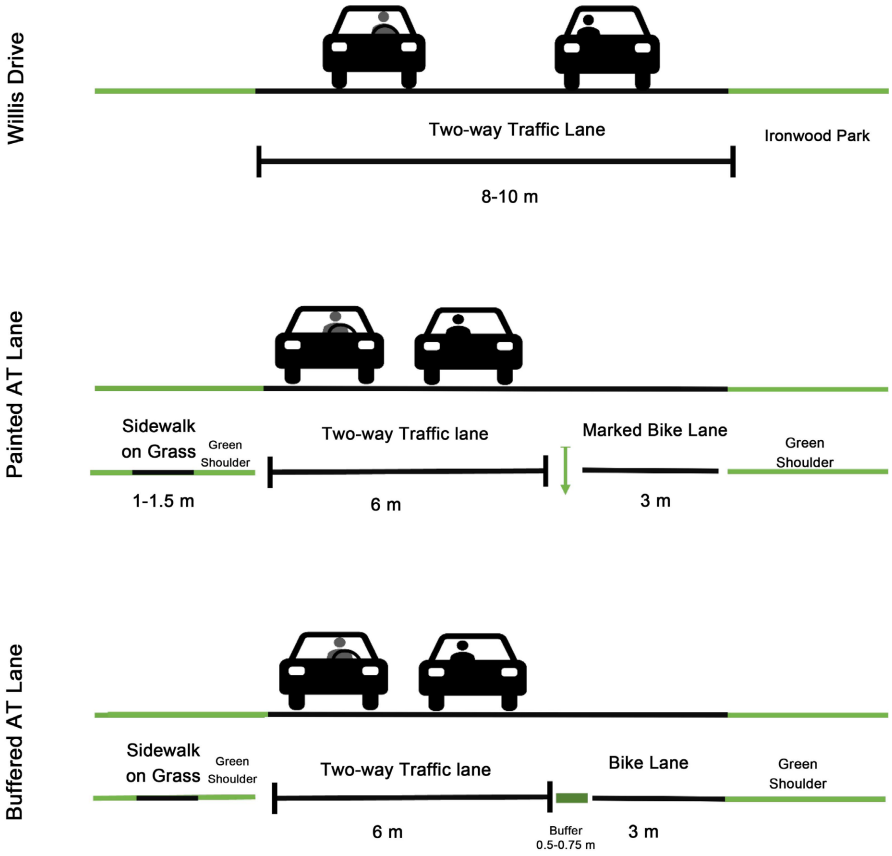

Figure 20. Present-day Willis Drive (top diagram) with the two options for dedicated lanes for different active transport. Source: author.

5. Conclusion

The quality of life in rural communities for residents and tourists can clearly benefit from AT, as shown by the case study of Pinawa. Pinawa was planned to be a walking town, but the lack of connection between its natural landscapes and the town creates gaps. In Pinawa, connecting the Ironwood Trail with dedicated AT lanes and crosswalks to its town centre and the Pinawa heritage trail would offer AT access and safety. Pinawa is a beautiful community that would benefit from better AT infrastructure and place-making for both quality of life and economic development.

AT in rural communities is possible. The AT works well with the compact town centre of most rural towns, with some special planning required to fill in some trail gaps and ensuring safety with crosswalks and dedicated AT lanes. The AT around rural towns helps foster a strong sense of place, accessible green spaces, and community well-being. Sustainable tourism practices should be the shared responsibility of tourists and the community through eco-education and cultural events. This approach aims to shift tourism to eco- and regenerative tourism in Pinawa.

Prioritizing AT infrastructure increases safe, healthy, and equitable mobility for all. At the larger levels of Canada and the world, policies must shift to prioritize health and the environment, with AT as a core planning principle. Municipal, regional, and national funding for AT projects is essential. Bike lanes, pedestrian pathways, and public transportation provisions should be required in the planning of urban cities and rural towns. Implementing programs to provide free or low-cost bike rentals should be widespread to make AT more accessible. Active transportation (AT) strategies improve community living, health, and the environment in all communities, including rural ones, and need to be considered in health and environmental planning. A shift should occur from car-culture to prioritizing AT users in infrastructure planning and design. Increasing AT planning in rural communities and all communities offers sustainable development that improves community well-being.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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