



Campbell River, British Columbia. Source: Province of British Columbia.

PLANNING FOR CYCLING IN SMALL CITIES IN WESTERN CANADA

Capstone Project Summary
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ABOUT THIS REPORT

This report summarizes my capstone project, which was completed as part of the Master of City Planning program at the University of Manitoba. The project explored the state of cycling infrastructure in 45 small cities in Western Canada. I also examined barriers and opportunities that planners from small cities encounter when attempting to develop more cycling infrastructure.

The findings in this report are based off an infrastructure audit using open-source OpenStreetMap data, which I used to examine the current state of cycling infrastructure in all 45 cities. I also conducted an online survey with 18 planners and semi-structured interviews with 10 planners from small cities to identify barriers and opportunities to creating more bike infrastructure. The results and recommended strategies are summarized in this report.

PROJECT IMPORTANCE

Climate change is one of the most pressing issues of our time. One way to help reduce greenhouse gas emissions is to encourage a modal shift away from private vehicles to lower carbon modes like biking (Banister, 2011). However, as many people are uncomfortable cycling in mixed traffic, safe bike infrastructure is key to this shift.

In the last twenty years, scholars have developed a large body of research on cycling infrastructure. However, most of this research is based on case studies from large cities. When smaller cities are included in this research, it is usually only cities with outstanding cycling rates or infrastructure.

This narrow research focus is problematic for multiple reasons. Small cities generally have different development patterns and lower densities than larger cities. They also face different social, cultural, and political barriers than large cities when attempting to develop bike infrastructure. In

Western Canada, residents of small cities are also more likely than the average provincial resident to drive to work, and less likely to use active or public transportation (see Figure 1). For these reasons, the policies and approaches that major cities use to improve cycling conditions may not be effective or relevant in smaller communities (McAndrews, Tabatabaie, & Litt, 2018). Given these differences, McAndrews, Okuyama and Litt (2017) argue that more research is needed on cycling in small cities to develop “more inclusive and effective transportation planning practices and policies for multimodal transportation” (p. 134).

This research project helps address this gap by analyzing the existing cycling infrastructure in 45 small cities in Western Canada. These cities all have between 10,000 and 50,000 residents. The project also explores barriers and opportunities for improving cycling conditions in these cities.

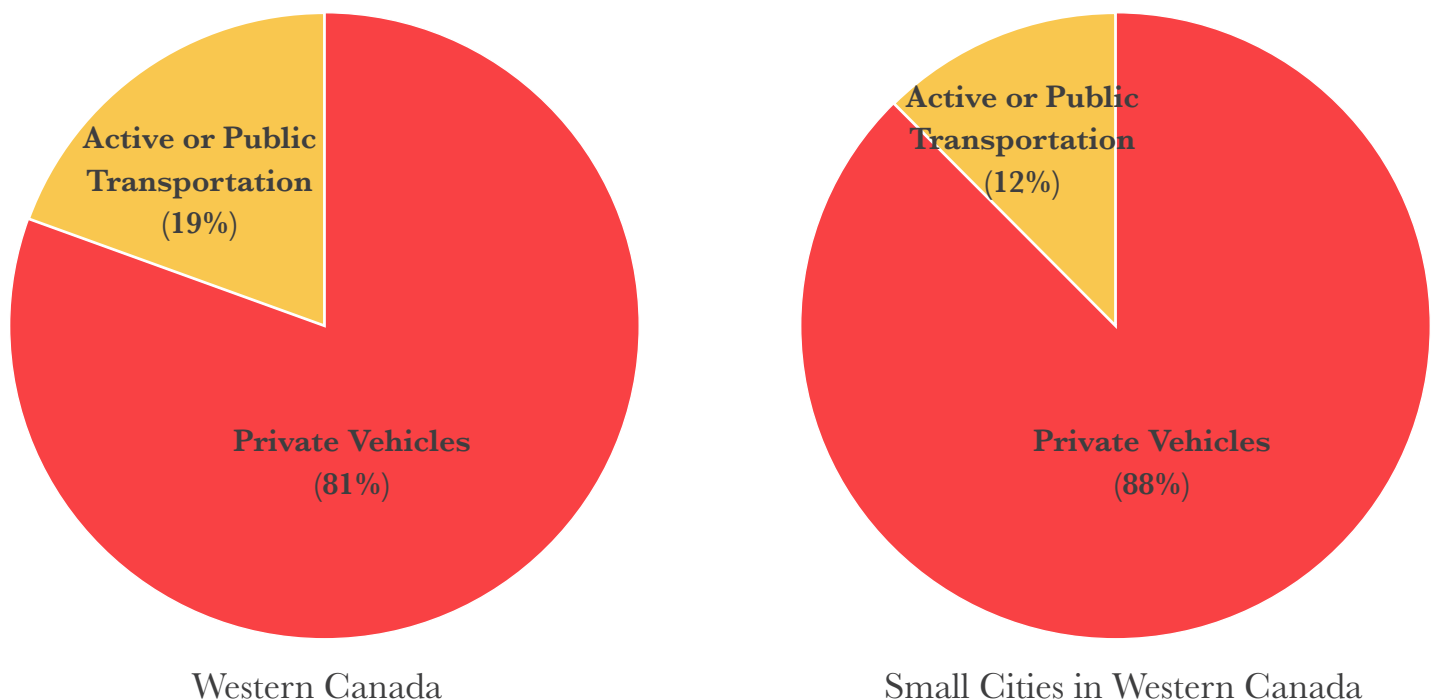


Figure 1: Commuter Mode Share, 2016

WHAT IS THE CURRENT STATE OF CYCLING INFRASTRUCTURE IN WESTERN CANADA?

Safe, convenient bike infrastructure is key to encouraging a mass modal shift to more frequent cycling. To explore the current quantity and type of cycling infrastructure in small cities in Western Canada, I conducted an infrastructure audit using open-sourced data from an online platform called OpenStreetMap (OSM). Using Ferster et al. (2020)'s methodology, I categorized the OSM data into five types of cycling infrastructure: cycle tracks, bike lanes, bike paths, bikeways, and ambiguous infrastructure (see Figure 3). I found that some types were more common than others (see Figure 2). Bike paths were most common while cycle tracks were least common. I also found there was a significant variation between communities. While some small cities did not appear to have any bike infrastructure, three had upwards of 60 kilometres of infrastructure for cyclists (see Figure 4).

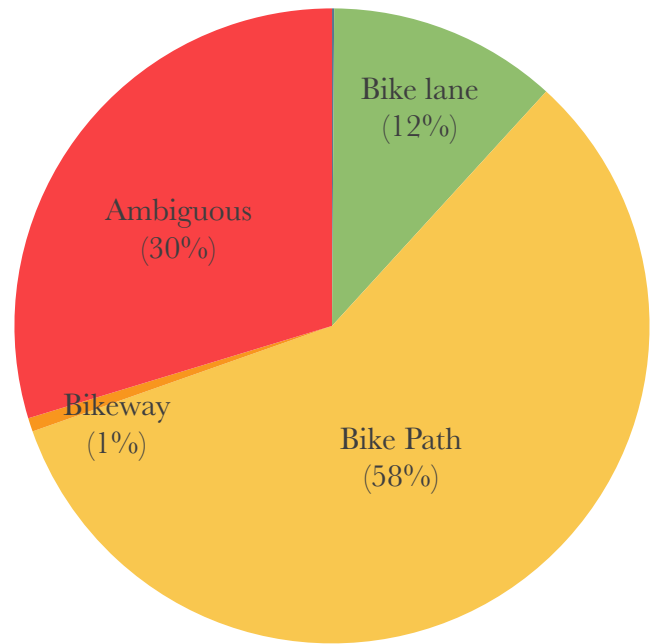
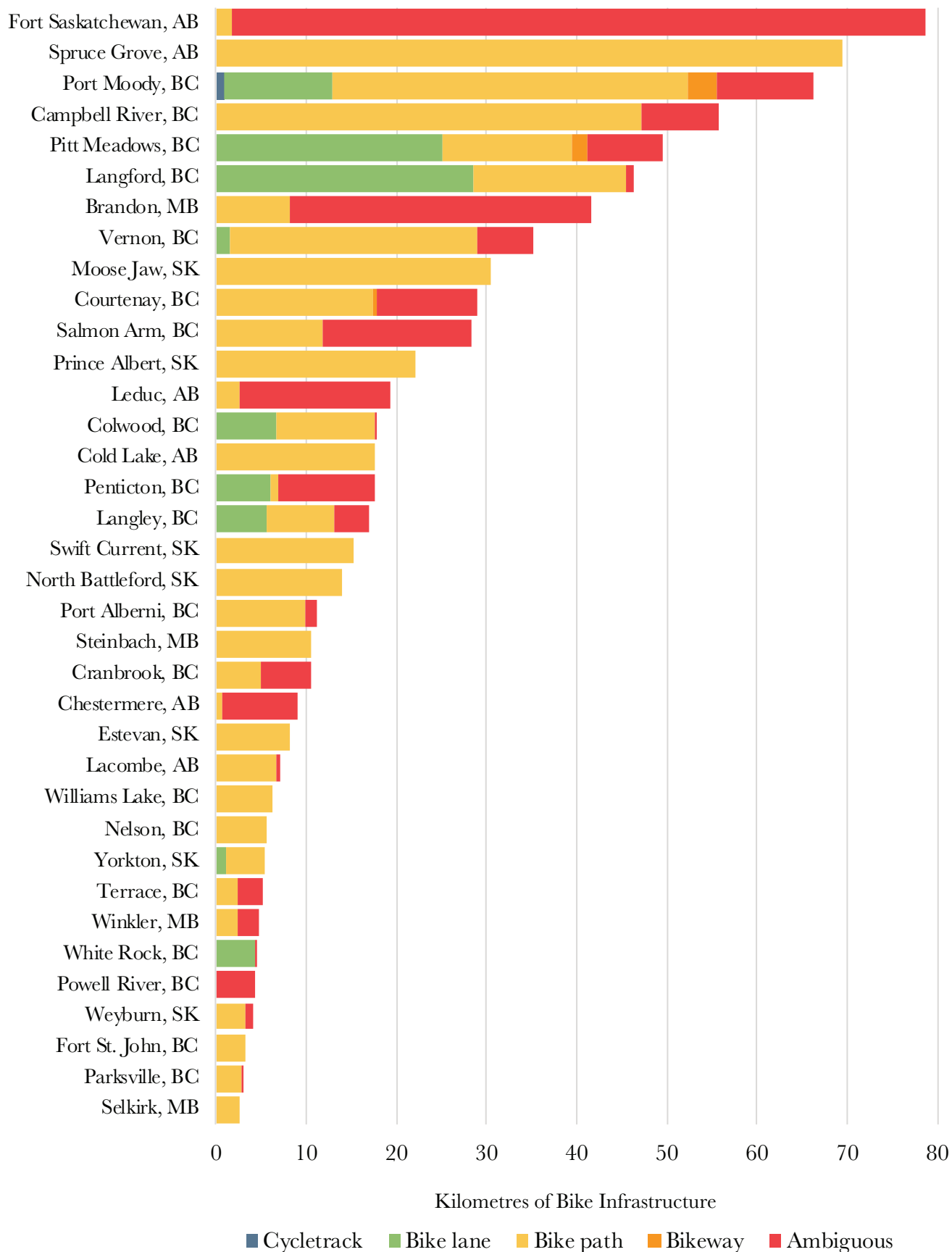


Figure 2: Proportion of Cycling Infrastructure by Type

Figure 3: Example of Infrastructure Audit in Spruce Grove, Alberta



Figure 4: Total Kilometres of Cycling Infrastructure by City*



*Only includes cities that appear to have more than 1 kilometre of cycling infrastructure

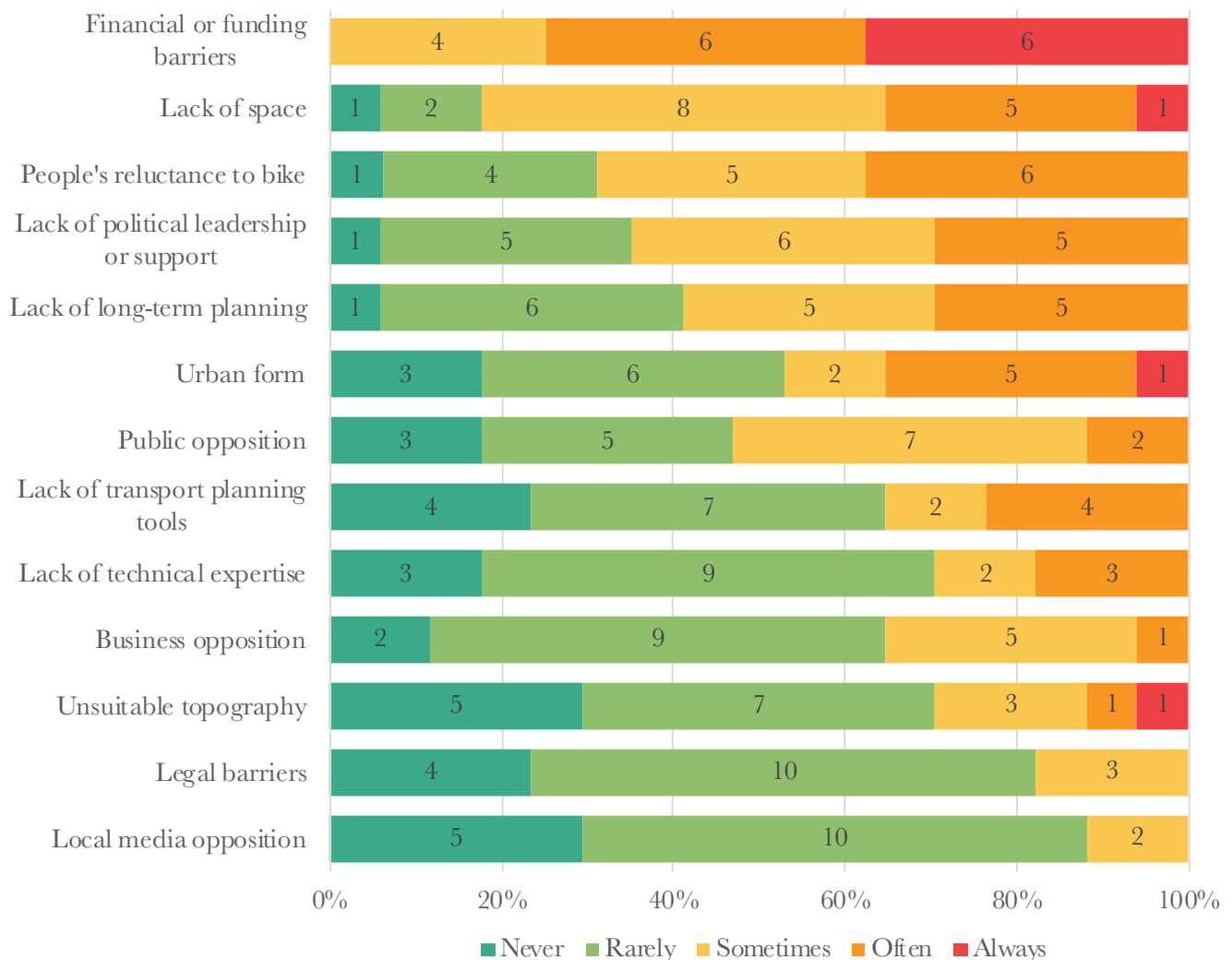
WHAT BARRIERS PREVENT SMALL CITIES FROM DEVELOPING CYCLING INFRASTRUCTURE?

To explore this question, I conducted an online survey with 18 planners and semi-structured interviews with 10 planners from small cities in Western Canada (see Figures 5 and 6).

Limited resources were a barrier to building bike infrastructure for many of the cities. In the survey, respondents said financial or funding barriers were always, often, or sometimes an issue. In interviews, planners from five cities noted that financial issues were a challenge. They said their cities needed financial support to pay for construction costs or buy the necessary the right-of-way beside the road.

There were also social barriers. In the survey, more than half the respondents said people's reluctance to bike was often or sometimes an issue. In interviews, six planners said they thought many residents did not support on-street bike lanes because they involved reallocating parking spaces or traffic lanes. However, they thought the public generally supported off-street bike paths. As planners had not conducted their own surveys to evaluate public perception, they based these comments on informal interactions with community members.

Figure 5: Survey Results of Barriers to Creating Cycling Infrastructure



Another challenge that planners discussed was the mode share in their cities. In the survey, the third most significant barrier was people’s reluctance to bike. Five planners who were interviewed also said the limited mode share was a challenge. They said that while their existing bike paths were used recreationally, very few people used them to commute to work or run errands.

“There isn’t a lot of bike-to-work activity... it seems like people are sort of satisfied to get around town however they do it, and then go for a bike ride in the woods.”
- Planner

Another notable barrier was a lack of road space or land availability. In the survey, more than 80 percent of respondents said a lack of space was always, often, or sometimes an issue. In the interviews, six planners said a lack of road space or land availability was a challenge. Planners said that in many older cities, the road widths were relatively narrow, which made it difficult to add on-street bike lanes without removing traffic or parking lanes. The other option for older cities was purchasing the right-of-way next to roads, but planners said this was often cost prohibitive.

Planners also discussed the importance of political support. More than half of survey respondents said a lack of political support was often or sometimes an issue. Three planners who were interviewed said that limited support from local councillors was a barrier. They said that politicians generally responded to demands from the business community, advocacy groups and the public, who were not always interested in bike infrastructure.

Some planners also said that the urban form and land use pattern of their city caused challenges. One planner said their city separated residential and commercial land uses, which disincentivized

Factor	# of Interviews Mentioned
Resources	
Lack of Funding	5
Maintenance	3
Limited Staff Capacity	3
Institutional or Policy Factors	
Lack of Political Support	3
Lack of Collaborations	3
Engineering Standards	2
Asset Management Approach	2
Social or Cultural Factors	
Perception of On-Street Lanes	6
Mode Share	5
Lack of Advocates	3
Other Factors	
Lack of Road Space or Land	6
Urban Form and Land Use	5
Cold and Snowy Winter Climate	5
Mountains or Hilly Topography	2

Figure 6: Interview Results of Barriers to Creating Cycling Infrastructure

cycling. Two planners also said the location of major highways prevented some residents from biking to potential destinations such as workplaces.

Finally, planners discussed how their city’s climate and topography posed challenges for cyclists. Five planners said that cold and snowy winter conditions discouraged residents from cycling all year. Two planners also talked about how hilly topography made it difficult to create user-friendly bike routes.

WHAT OPPORTUNITIES EXIST FOR SMALL CITIES TO EXPAND THEIR CYCLING NETWORK?

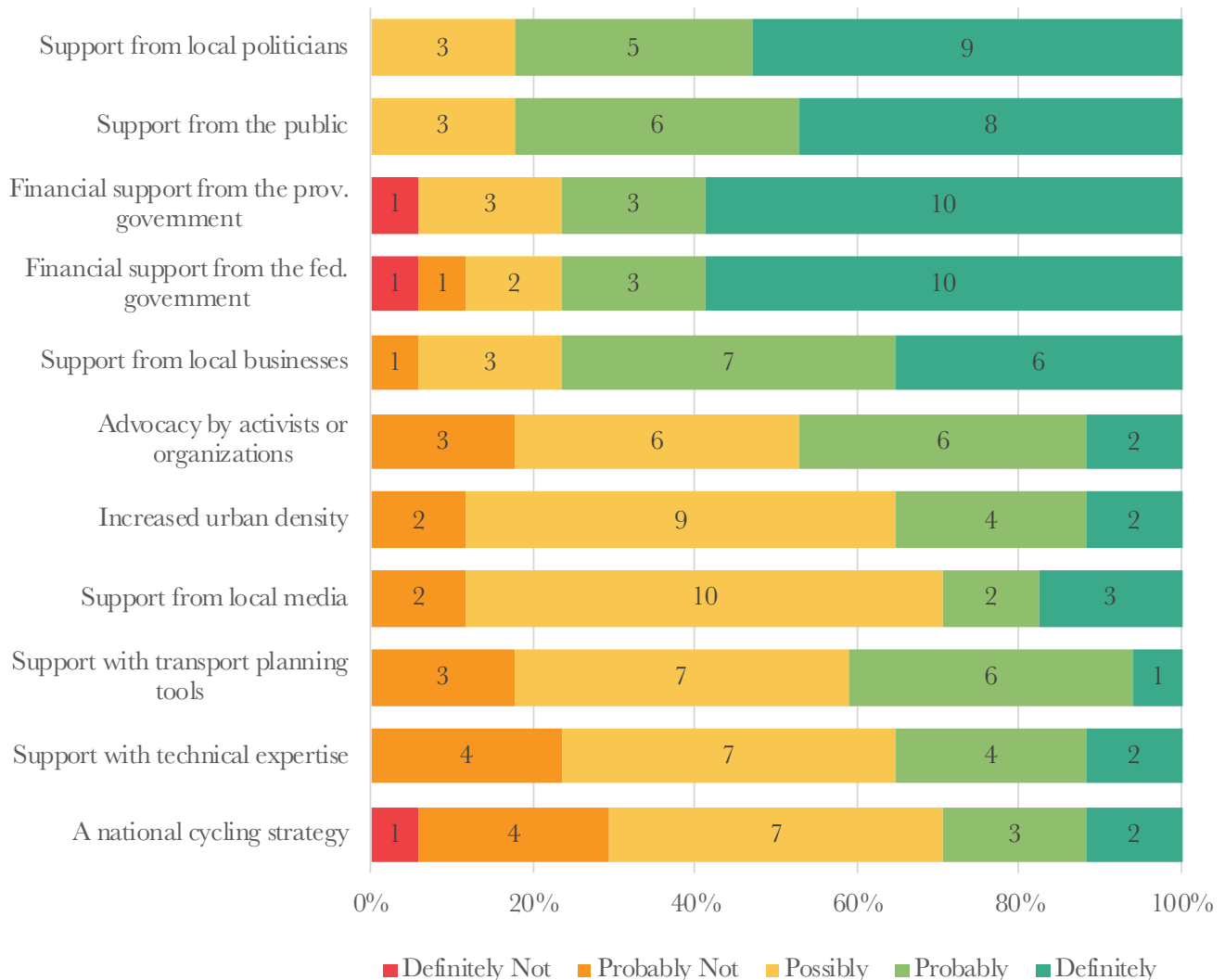
In addition to examining barriers, I also explored potential opportunities that would help small cities expand their cycling network through the survey and interviews (see Figures 7 and 8).

The majority of planners interviewed said private development helped their cities build bike infrastructure. This was especially true for small cities in Alberta that were growing quickly. Planners said they often required developers to include new off-street bike paths or on-street bike lanes in their projects as part of the approval process. Sometimes

these requirements were based off detailed network designs in the cities' plans. Other times they were based on more general policies that required developers to connect their neighbourhood to the existing trail network.

Some planners also noted the importance of political support. More than 80 percent of survey respondents said support from local politicians would definitely or probably help their city develop bike infrastructure. Six planners said support from local politicians was key to the

Figure 7: Survey Results of Potential Opportunities for Creating Cycling Infrastructure



success of their cycling projects. These planners said their councilors supported bike paths and lanes by developing committees, supporting active transportation plans, putting aside municipal funds for infrastructure, and implementing policies that required private developers to build bike infrastructure.

Planners also emphasized the importance of municipal plans and by-laws, which were approved by political leaders. Planners from six cities said municipal plans helped their city prioritize and coordinate investments in bike infrastructure. These plans included municipal development plans, transportation master plans, active transportation plans, and green space plans.

“Our system is developed because, at a policy level, it became imperative that developers provide the rights-of-way and construct the trails.”

- Planner

Although planners thought the public was opposed to on-street bike lanes, they believed residents supported off-street paths that could be used by cyclists and pedestrians. They explained their off-street trails were well supported because they accommodated multiple users and did not take away road space.

Planners also highlighted the role of activists and advocacy organizations. Five planners said that local advocacy groups helped influence city councilors to invest in the cycling network.

Another factor that planners discussed was external collaborations. One planner said a regional transportation agency helped them coordinate and fund bike infrastructure. Another said their city was part of a regional alliance of several municipalities that coordinated the creation of bike trails. The

Factor	# of Interviews Mentioned
Resources	
Private Development	8
Available Funding	3
Institutional or Policy Factors	
Political Support	6
Municipal Plans & Policies	6
External Collaborations	5
Social or Cultural Factors	
Perception of Off-Street Bike Paths	5
Local Advocates	5
Cultural Trends	2
Other Factors	
Available Road Space or Land	5

Figure 8: Interview Results of Opportunities for Creating Cycling Infrastructure

planner said the alliance had helped establish a network of trails across the region.

Some planners also said their cities made the most of existing road space and land to add to their bike network. Two planners acknowledged their cities had developed relatively recently and had wide roads, which made it easier to add on-street bike lanes. Four planners also discussed how their city took advantage of existing land to build off-street bike paths. They emphasized the importance of connecting parks, green spaces, and public utility lots to build out their trail network. Planners also said their cities used abandoned rail lines or disused roadways to create new trails.

DISCUSSION AND RECOMMENDATIONS

The results from this research suggest there is currently limited cycling infrastructure in most small cities in Western Canada. While there are a few notable exceptions such as Spruce Grove, Alberta or Port Moody, British Columbia, most cities have very limited bike infrastructure. This is a challenge for environmental reasons. However, there are a number of ways all levels of government can help expand cycling networks in small cities. Five of these strategies are discussed below.

FINANCIAL SUPPORT

One of the main ways the federal and provincial governments can support the creation of bike infrastructure in small cities is through financial support. In both the survey and the interviews, respondents said a lack of funding was a major barrier in their cities.

There are multiple reasons why small Canadian cities have limited financial resources for bike infrastructure. As “creatures of the province,” cities have limited taxation powers. Compared to other some countries like Germany, small cities receive limited support from higher levels of government for bike infrastructure.¹ There is some financial support for cycling at the provincial level in Canada, but this varies between jurisdictions.

To address these financial shortcomings, higher levels of government could develop annual funding grants for municipalities dedicated to cycling infrastructure. While cycling infrastructure can be cost-prohibitive for small cities with very limited taxation powers, the cost of bike paths and lanes is a fraction of what provincial and federal governments regularly invest in highway infrastructure. This could help municipalities rapidly expand their cycling networks.

¹As this capstone was being completed, the Government of Canada announced a \$400 million fund to support active transportation projects over the next five years. However, funding has not been guaranteed after the five-year period.

PRIVATE DEVELOPMENT

Another way cities can expand their bike networks is by leveraging private development. Planners said private developers helped expand their cities’ networks by creating trails in new subdivisions and contributing off-site levies for other projects.

In some cases, small cities had policies or by-laws that required developers to make these contributions. For example, one of the policies in the City of Spruce Grove’s *Active Transportation Master Plan* (2012) is to require the “provision of pedestrian and cycling facilities, including bicycle parking facilities, in all new developments” (p. 20). These policies and bylaws ensured that new developments would include multi-use paths.

Although this finding suggests private developers can help cities expand their cycling networks, it does not mean governments should abdicate their fiscal responsibilities to develop infrastructure to the private marketplace. If this happened, developers will largely be able to determine where new bike infrastructure is developed based on market demand rather than considerations like equity, density, or network connectivity. Therefore, while small cities should take advantage of private development, these private investments should not replace public support for bike lanes and paths.

OFF-STREET INFRASTRUCTURE

Another way that small cities can increase cycling infrastructure in their cities is by focusing on the construction of off-street multi-use paths instead of on-street dedicated bike infrastructure. In interviews, planners said local residents were more supportive of off-street multi-use paths than on-street bike lanes. For these reasons, multiple planners said their city focused on building off-street bike paths instead of dedicated on-street

lanes. This suggests other small cities that are looking to expand their cycling network should consider the same approach.

However, small cities should consider the challenges associated with off-street multi-use paths. Because of the diverse range of users, there is a higher risk of cycling collisions and injuries on multi-use paths compared to dedicated bike lanes. There may also be safety concerns associated with off-street bike paths through parks or wooded areas where there are fewer “eyes on the street.” To address this issue, cities should try to route off-street paths through visible areas with adequate lighting (Furth, 2021).

PUBLIC PROGRAMS & OUTREACH

In addition to building off-street multi-use paths, small cities could try to increase public support for other types of bike infrastructure through public education and outreach. The findings in this study indicate that a lack of public support for investments in dedicated cycling infrastructure is a barrier in many cities.

Secondary research demonstrates how public outreach and educational programs can increase public support for cycling (Pucher, Dill & Handy, 2010). In an analysis of cycling in small and medium-sized cities, Handy, Heinen and Krizek (2012) found that programs helped encourage local residents to bike more.

Examples of programs included bicycle education for school children, ‘bike rodeos’ at schools, Safe Routes to Schools programs, bicycle training programs for adults, annual Bike Weeks, online route-finding systems, bicycle maps and brochures, bike film festivals, radio advertisements promoting biking, and ‘bike summits’ to identify issues and solutions. Similar programs could increase public support for cycling in small cities in Western Canada, which may encourage local politicians to invest more resources into cycling infrastructure.

COLLABORATIONS

One interesting finding that planners emphasized was the importance of external collaborations. Planners said that collaborating with multiple stakeholders helped their cities expand their bike networks. These stakeholders included regional planning organizations, nearby municipalities, and non-profit organizations.

Most cycling scholarship does not emphasize the importance of external collaborations. This is likely because most of the scholarship is based on studies from larger cities, where external collaborations may be less important to the success of a city’s bicycle network. In contrast, smaller cities with fewer resources may need to rely more on external partnerships to develop bike infrastructure.

REFERENCES

- Banister, D. (2011). Cities, Mobility, and Climate Change. *Journal of Transport Geography*, 19, 1538-1546.
- City of Spruce Grove. (2012). Transportation Master Plan. The City of Spruce Grove.
- Ferster, C., Fischer, J., Manaugh, K., Nelson, T., & Winters, M. (2020). Using OpenStreetMap to Inventory Bicycle Infrastructure: A Comparison with Open Data from Cities. *International Journal of Sustainable Transportation*, 14(1), 64-73.
- Furth, P. (2021). Bicycling infrastructure for all. In R. Buehler, & J. Pucher, *Cycling for Sustainable Cities* (pp. 81-102). Cambridge: The MIT Press.
- Handy, S., Heinen, E., & Krizek, K. (2012). Cycling in Small Cities. In J. Pucher, & R. Buehler, *City Cycling*. Cambridge, MA: The MIT Press.
- McAndrews, C., Okuyama, K., & Litt, J. (2017). The Research on Bicycling in Rural, Small, and Low-Density Places. *Transportation Research Record*, 2662(1), 134-142.
- McAndrews, C., Tabatabaie, S., & Litt, J. (2018). Motivations and Strategies for Bicycle Planning in Rural, Suburban, and Low-Density Communities: The Need for New Best Practices. *Journal of the American Planning Association*, 84(2), 99-111.
- Pucher, J., Dill, J., & Handy, S. (2010). Infrastructure, Programs, and Policies to Increase Bicycling: An International Review. *Preventive Medicine*, 50, S106-S125.