

The Bike Plan

Making Cycling Inviting for
All Reasons in All Seasons

September 2020



| **SHARE** YOUR VOICE
SHAPE OUR CITY

Edmonton



Indigenous Acknowledgements

The lands on which Edmonton sits and the North Saskatchewan River that runs through it have been the sites of natural abundance, ceremony and culture, travel and rest, relationship building, making and trading for Indigenous peoples since time immemorial. Edmonton is located within Treaty 6 Territory and within the Métis homelands and Métis Nation of Alberta Region 4.

We acknowledge this land as the traditional territories of many First Nations such as the Nehiyaw (Cree), Denesuliné (Dene), Nakota Sioux (Stoney) and Niitsitapi (Blackfoot). The city owes its strength and vibrancy to these lands and the diverse Indigenous peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Edmonton home. Together we call upon all our collective honoured traditions and spirits to work in building a great city for today and future generations.



Thank You!

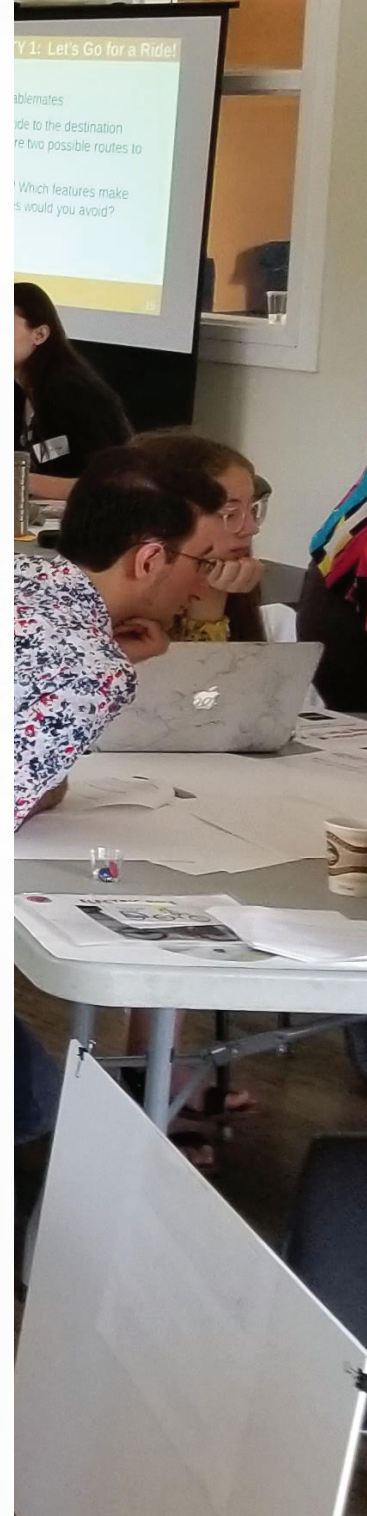
This document is the culmination of two years of engagement with residents of Edmonton. Through 62 public events including workshops, pop up events, drop in sessions, surveys and community conversations, just over 11,500 Edmontonians gave us their feedback about biking in Edmonton. Thank you to everyone who helped us create the Bike Plan and who supports safe, convenient cycling in Edmonton.

We heard from so many people – those who are avid cyclists and those who don't support bike lanes. Those who would love to bike more but are nervous and those who will probably never ride a bike.

All of their comments were considered as we developed the Bike Plan, and a few of the stories we heard are included in this plan. Thank you Edmontonians!

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1.0 Introduction

The Bike Plan is a plan for all Edmontonians. Edmonton can become a place where biking is practical and inviting for people of all ages and abilities and where people can choose to bike for any reason, and in any season. This represents a transformational change for our city, one that is both exciting and essential.

The Bike Plan lays the foundation for a network that is accessible, predictable, and clear for the inexperienced rider and the most experienced rider alike and supports active transportation as an integral part of Edmonton's mobility system. It supports safe and direct routes for people commuting to work or running errands, strong connections to the River Valley for recreational trips, and improved neighbourhood networks to connect people to local destinations.

The Bike Plan is an update to the 2009 Bicycle Transportation Plan and provides strategic direction for how the City plans, designs, implements, operates, and maintains bike infrastructure and programs. The Bike Plan is based on learnings and advancements from the past ten years, including recent changes to Edmonton's bike network and the rapid evolution of bike planning best practices. Alongside these learnings, the plan is informed by extensive engagement with Edmontonians, who shared their rich experiences, their ideas and their vision for the future.



The City Plan's five "Big City Moves" define bold, transformative priorities for Edmonton. They set the direction for change as the city welcomes one million more people.

1 Greener As We Grow

sets environmental goals around carbon emissions budgeting and net-zero greenhouse gas emissions per person relying in part on increasing the importance of active transportation including cycling.

4 Inclusive and Compassionate

sets a target for a reasonable level of household expenditure on transportation (with transit and active transportation positioned as cost-effective modes of transportation for households).

2 Rebuildable City

encourages the rethinking and reuse of existing land and infrastructure assets (like road rights-of-way) in order to adapt to a changing future. Being a rebuildable city means that efforts are always moving towards a better and more efficient city.

5 Catalyze and Converge

is about attracting talent and supporting businesses by continually creating the conditions and places that improve competitiveness. Improving greater opportunity of access to various locations and businesses helps facilitate this Big Move.

3 Community of Communities

calls for a structure of compact districts and sets a goal of 50 per cent of all trips to be made by transit and active transportation (up from 23 per cent today).



2.0 Bike Plan Foundation

2.1 The City Plan

Communities that are bike, walk and roll-friendly result in greater joy, fitness and a wider range of transportation options.

Mobility is a foundational system in The City Plan and provides direction to the development of three networks: active transportation, transit, and roadway and goods movement. The plan states that the active transportation network will "create critical connections using walking, wheeling, or biking that allow people to access amenities, daily needs, and recreational opportunities."

The active transportation network is integral to achieving the overall goals of The City Plan by facilitating a broader array of mobility options. This is achieved by improving and creating new opportunities for active mobility "through the provision of high quality infrastructure" to "reduce traffic congestion, create better environmental outcomes, and improve public health." Biking is identified as an important way to support the system of nodes and corridors as places with a strong convergence of transit, walking and cycling. The Green and Blue Network (of parks, ravines, and the river valley) is also identified as a place for people to bike and walk, connecting them to destinations, and to recreate and relax.

Specific policies aimed to improve access directly address the development and enhancement of biking and active transportation infrastructure and programs and are further supported in the Bike Plan.

The Bike Plan will provide a strategic planning framework to support the implementation of The City Plan's intentions and directions related to cycling by outlining actions that invite Edmontonians to cycle for all reasons, in all seasons.





ENGAGEMENT PROFILE:
Putting my bike to work, for work
 by Nadia Berg

2.2 Community Energy Transition Strategy

Edmonton's Community Energy Transition Strategy aims to address and mitigate climate change through the reduction of greenhouse gas emissions, increasing energy efficiency and promoting renewable energy systems. Actions are required across all sectors and addressing future transportation development is necessary to ensure Edmonton is resilient and sustainable in the long-term.

The strategy calls for Edmonton to:

- + Expand on-street biking facilities to make active transportation safer and more convenient.
- + Assess the costs and benefits of a bike sharing program in high density areas as well as to and from transit centres and LRT stations.
- + Significantly increase biking infrastructure beyond what is currently planned.

2.3 WinterCity Strategy

Edmonton's WinterCity Strategy sets the stage to take advantage of our northern location, transforming Edmonton into a more inviting, vibrant and prosperous place for Edmontonians, business, industry and tourists throughout the winter months. Similar to bike planning, this change in outlook around winter requires a cultural shift.

The WinterCity Strategy emphasizes the City's commitment to **"Improve Winter Transportation for Pedestrians, Cyclists and Public Transit Users."**

The strategy calls for Edmonton to:

- + Implement best winter snow removal and transportation practices
- + Explore innovative, barrier-free ideas to ease the challenges, inconveniences and dangers of winter mobility.

Nadia Berg uses her bike and trailer year-round for her landscape maintenance business here in Edmonton.

I'm the sole proprietor of a successful landscape maintenance business here in Edmonton, and whether I'm clearing snow or mowing lawns I use my bicycle for every job.

If I owned a truck to do my job I'd have to work more to pay for it, and of course for the gas, insurance, maintenance, and repairs as well. Doing business on my bike allows me to work less and have more free time.

Despite what some people think, it's not difficult to do my work without a vehicle. Hauling all my lawn maintenance and spring/fall cleanup equipment around with my bicycle trailer does not feel heavy; I just use different gears and accelerate more slowly. In the winter I do snow removal, but without the trailer. I attach a shovel to the frame of my bike, have a blow-pack on my back (resting on a shelf in my basket while I ride), studded tires, and the gas can in the basket. Adding a minute onto some of my commutes is no big deal since the properties I maintain are all less than 1km away from my home. Also, properly dressed winter cyclists are never cold - we have to dress so that we don't sweat instead, even at -40C!

I'm very grateful that my parents taught me the value of active living, respecting the environment, living within my means, and having a good work ethic. Using a bike for work allows me to work less, save more, and have a higher quality of life. I only need enough money to have financial security, but I don't need much for that because I keep my expenses low. I don't even have or want a smartphone because my nine-year-old, \$20/month cell phone works just fine and only needs to be charged once or twice a week, even when I'm outside in the cold all day.



2.4 Safe Mobility Strategy

The Safe Mobility Strategy 2021–2025 is Edmonton's new approach to advancing Vision Zero. Ensuring safe mobility is a mechanism for supporting a healthy city, liveable urban places, climate resilience and a prosperous regional economy. This supports that the Bike Plan holds safety as an overarching, uncompromised, foundational aspect of bike infrastructure and programming.

The initial principles of the Safe Mobility Strategy include explicit recognition that everyone “moves,” and that we all deserve to move safely.

2.5 Live Active Strategy

The Live Active Strategy is a collaborative strategy to encourage Edmontonians of all ages, abilities and interests to enjoy the benefits of physical activity. Living active is an essential component to a healthy lifestyle and contributes to many long-term and short-term physical, emotional and mental health benefits.

The development and creation of biking infrastructure in Edmonton supports a broader active transportation outcome of the Live Active Strategy.

- + Having safe and designated infrastructure provides more opportunities for Edmontonians to build active travel into their daily lives and continues to support healthy city outcomes.



| 3.0 Why Biking Matters

Action on Climate Change



Increasing the number of people biking and the number of biking trips advances our contribution to reducing the global greenhouse gas impact. In 2018, vehicles in Edmonton emitted 5.73 megatonnes of greenhouse gases, which constituted 31 per cent of the city's total emissions. Vehicle emissions need to be reduced by 50 per cent by 2030, and by at least 95 per cent by 2050, if the city is going to do its part in keeping global temperature rise to 1.5 degrees Celsius.

Shifting trips from auto to biking trips eliminates the greenhouse gas emissions associated with those trips and is an effective way of achieving some of the necessary reductions. Cities in locations as diverse as Winnipeg, Göteborg (Sweden), and Xiamen (China), are dedicating significant funds to large-scale bike infrastructure projects, regulatory changes and marketing programs to help achieve climate change goals.

Creating a Healthy Community

Increasing biking is an important way to improve the health and wellbeing of residents. Currently, 43 per cent of Albertans do not achieve the minimum daily recommended levels of physical activity. Active lifestyles have always been promoted for healthy living. Health advocates and local governments have realized that the built environments can influence people's everyday choices for active living. Changes in neighbourhood, street and building design can encourage regular daily physical activity, such as biking. These opportunities to encourage increased activity can be a part of the solution to reduce risk factors and incidence of chronic disease and illness.



43%

of Albertans are **NOT** getting enough physical activity to achieve health benefits.



ENGAGEMENT PROFILE:

Growing a New Generation of Riders: Ever Active Schools

Part of creating a positive bike culture in Edmonton is empowering children and youth to ride freely and safely – for transportation, for exercise and for fun. Ever Active Schools, a provincial initiative, works with Edmonton students to do just that. Through bike and scooter rodeos and City Cycling Strategies clinics, they are helping to grow riding skills – including road safety, route mapping and bike maintenance – and building community around safe mobility. Most importantly, they are creating enthusiasm and passion amongst youth to advocate for and promote cycling in their city – and growing a new generation of riders.

“Nellie Carlson School has held a bike rodeo for our students the last couple years and as a parent I have really enjoyed watching the kids practice the skills they need to be safe on their bikes while still having fun. Even better is seeing very little vehicle traffic on those days at the school – the bike racks are spilling over with bikes and families riding to school together.”

– Shauna Shaker, Nellie Carlson School parent

Supporting Vibrant Urban Places

Vibrant urban places have transportation options that connect people and places. While land use factors play an important role in influencing how people travel, vibrant urban places are only possible where a range of transportation options are accessible and comfortable.

Many of the daily trips made in Edmonton are shorter than 5 km. And these trips are not just in Edmonton's core zone, they occur throughout the City as illustrated in **Figure 1: Vehicle Trips Shorter than 5 km**. While a distance of 5 km can be walked and biked by most people, most of these short trips continue to be made by driving. For a person travelling by bike, these short trips take about 15 to 25 minutes.

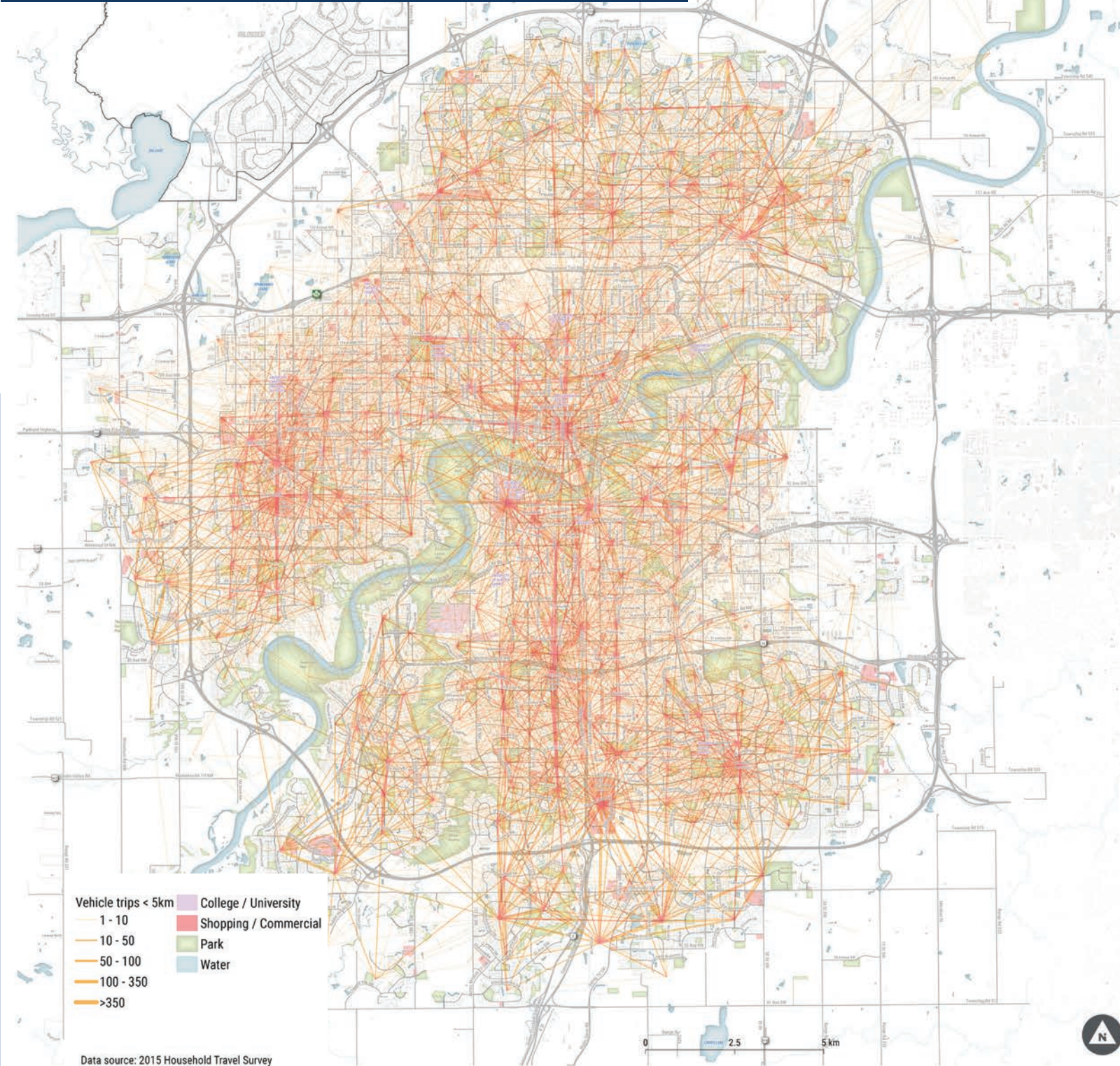
And to support a population of 2 million people, Edmonton needs more space-efficient mobility solutions. Streets can generally accommodate five people biking in the same space that a single car takes up. Coupled with the fact that over half of Edmonton households have at least one bicycle, providing space for biking can contribute to creating a more efficient transportation system and supporting urban vibrancy throughout the entire city.



Edmonton's investment in biking infrastructure and supporting programs has increased the number of people riding a bike for transportation and recreation. Daily bike trips have more than doubled since 2005, growing from 25,300 daily trips to 54,800 in 2015. This is 227,100 km ridden each day by Edmontonians.

Winter cycling continues to grow in popularity with approximately one out of six people who ride in the summer continuing to ride throughout the winter.

Figure 1: Vehicle Trips Shorter than 5 km
 Many short car trips occur in neighbourhoods across Edmonton, investing in cycling has the potential to reduce the number of these vehicle trips.





65%
of daily bike trips are **NOT** for work
(Household Travel Survey)

Edmontonians ride bikes for many reasons. The 2015 Edmonton and Region Household Travel Survey reported that about 35 per cent of bike trips were to and from work and about 50 per cent of bike trips were categorized as commuting trips when school trips are included. People bike as their primary mode of transportation for many reasons including enjoyment, environmental stewardship, fitness and health outcomes, and cost.

While commuting trips might be focused more in central areas, recreational and social trips occur across the city. Also, many households in Edmonton are car-free, whether by choice or by circumstance. This highlights the need to plan a bike network that considers more than just the central areas.



1 IN 6
cyclists continue to ride during the winter months
(High Level Bridge Counts, 2017-19)

Biking is a Low-Cost Transportation Option

Cars are a relatively expensive way to move around in big cities. Nationally, spending on transportation is the second highest household expense after housing. The Alberta Motor Association estimates the annual cost for operating a mid-size car, including the cost of the vehicle, fuel, maintenance, and insurance, can be \$9,500 per year.

Overall, suburban and rural commuters have higher transportation costs than commuters who live closer to downtown. And commuters who rely on transit and active modes have the lowest transportation costs. Biking provides a low-cost transportation option with an estimated annual operating cost of around \$350.

Safety

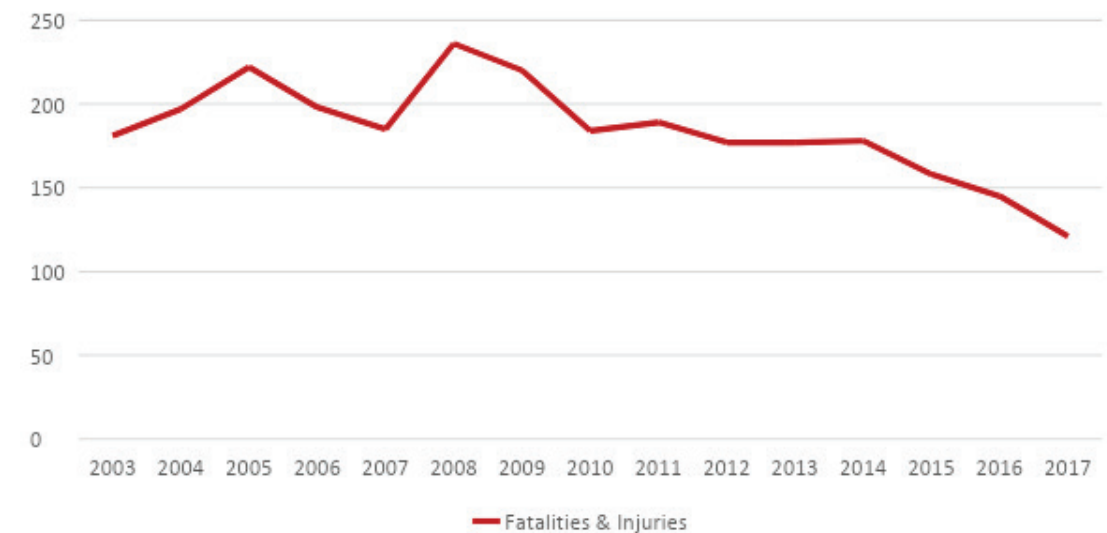
Edmonton's bike network has changed a lot over the past few years with the implementation of the protected bike lane network including the Downtown bike network, the southside bike routes and the west-central bike routes. These routes represent a new direction for Edmonton's bike network by providing specially designed, physically separated bike lanes suitable for riders of all ages and abilities.

fatalities in Edmonton are trending downwards, as illustrated in **Figure 2: The Annual Number of Cycling Injuries and Fatalities in Edmonton**, the data still indicates that incidences happen approximately every third day.

The 2018 *Annual Vision Zero Report* identifies a 27 per cent decline in bicycle collisions and a 29 per cent decrease in cycling injuries since 2015. While the number of cycling injuries and

To ensure these incidences continue to decline, improved safety for people cycling will remain a top priority. Delivering high quality bike infrastructure and programs supports fewer fatalities and injuries. We all—elected officials, transportation professionals and road users—have a responsibility in achieving Vision Zero of eliminating fatal and serious injury collisions.

Figure 2: The Annual Number of Cycling Injuries and Fatalities in Edmonton





The Bike Plan supports the implementation of The City Plan policies related to cycling. It was developed through an evidence-based, data-driven approach, which was informed by broad public engagement.

Community and stakeholder engagement provided critical input to the development of the Bike Plan. Through three engagement phases and a diversity of in-person and online engagement opportunities, community members helped create key elements of the plan:

- + Aspiration and Values
- + Refinement of the Network Principles
- + Network Map
- + Program Area Actions

The public engagement process was designed to reach diverse Edmontonians and specifically hear from both people who ride a bike and those who don't. Engagement opportunities included registered public workshops, drop-in and pop-up sessions at busy public places (including recreation centres, festivals, parks, farmers markets and bike routes), community conversations, ride-alongs, online surveys and interactive maps. Joint engagement was also coordinated with other City projects.

In all, over 11,000 Edmontonians and 34 organizations participated in the project.

4.1 Setting the Stage

The Bike Plan considers the experiences of other cities and leading research about biking as a component of city building. These considerations have shaped plan recommendations with an aim to increase all types of bicycle trips, the proportion of trips taken by bicycle, and overall safety.

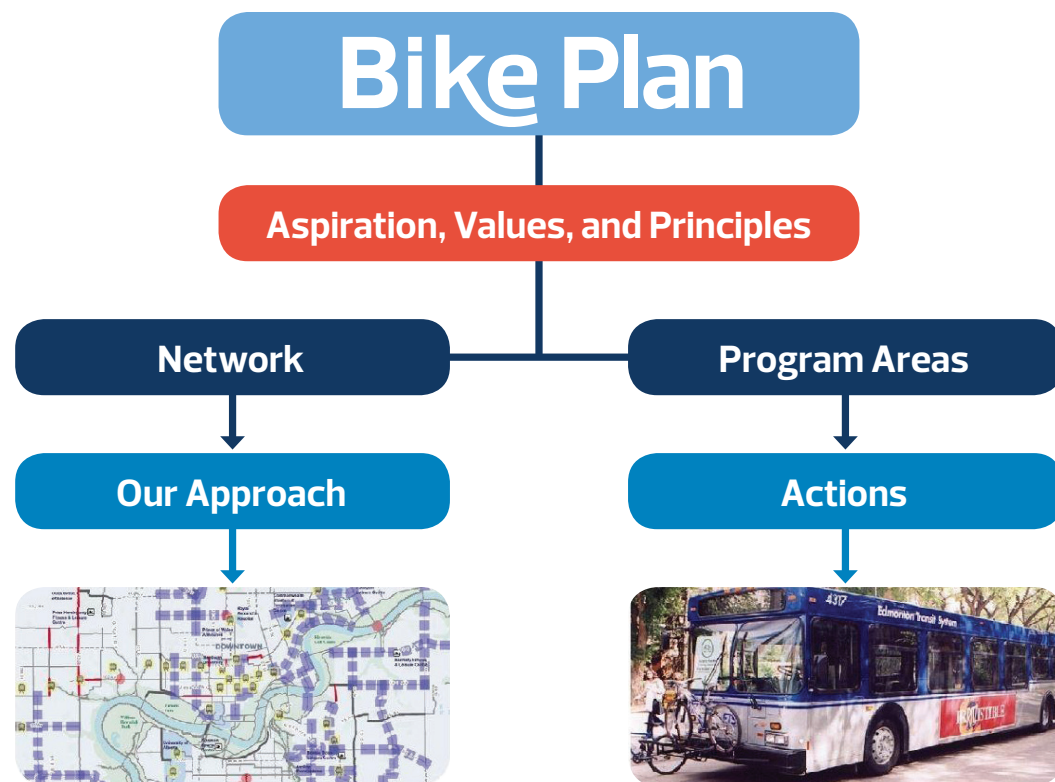
The Bike Plan engagement and survey results showed differences in attitudes about biking, which influence people's decisions about whether or not to ride a bike. The Bike Plan describes people's attitudes about biking by considering four different population segments:

- + **Champions** are generally active riders themselves, and are often well-connected community advocates for biking.
- + **Supporters** understand and promote the benefits of biking to the wider community, and includes people who are active riders and those who don't ride.
- + **Concerned** are people that appreciate the benefits of biking but they also express some concerns about the potential impacts of bike infrastructure on other modes of transportation.
- + **Non-supporters** are people that do not see the value of biking and would prefer that the City not prioritize spending on bike infrastructure and programs.

4.0 Developing The Bike Plan

The Bike Plan was developed in two steps:

- + **Setting Direction:** Aspiration + Values + Network Principles
- + **Identifying Actions:** Future Bike Network Map + Supporting Program Areas



Although the segments may have different opinions about biking in Edmonton, they all provide valuable insight into opportunities to improve cycling and concerns that need to be addressed or mitigated.

The recommendations of the Bike Plan were informed by approaches of other best-in-class bike plans from communities across Europe and the United States, broader national Danish and Dutch approaches, and public engagement. This work confirmed three fundamentals for success:

A High Quality Bike Network

This includes considerations of infrastructure development and changes to the built environment. Recommendations include bicycle routes, secure bike parking, transit integration, land use policies, and speed limit reductions.

Support of Biking Culture

These recommendations include promotional /encouragement programs that support the development of biking culture including initiatives such as safe routes to school, individualized marketing, open streets and bikeshare.

Strong Implementation

This includes recognition that infrastructure and cultural initiatives must be supported by a strong implementation strategy identifying priorities and funding.

In addition to these fundamentals, making biking easy and practical requires the development of a future bike network map to envision the future state of biking in Edmonton. It also requires strong program areas that show a commitment to issues such as maintenance, integration with transit, wayfinding and encouragement to establish a strong biking culture. These supportive program areas are detailed in Section 9.

Edmontonians also stressed that the Bike Plan should address biking both for transportation and recreation. The Bike Plan will focus on connections to and from the River Valley and parks and trails in the rest of the city. Breathe (Edmonton's Green Network Strategy) and Ribbon of Green address specific bike routes and facilities within the River Valley and parks and trails system.

4.2 Learning From Our Past

Biking in Edmonton has evolved since the 2009 Bicycle Transportation Plan Update .

The City of Edmonton and community organizations have expanded the bike network, developed and started operating a range of programs, and evolved the way bicycle routes are implemented. This also included enhanced public engagement.

The following practices evolved since the adoption of the 2009 plan:

- + The scope of decisions the public and stakeholders are involved in during the planning and design of bicycle routes expanded to include supporting decisions related to route location, facility type, and design details.
- + Research and evaluation confirmed that protected bike lanes, shared pathways, and quiet streets are the preferred bicycle facility types for Edmontonians, which is consistent with international best practices.
- + New approaches to public engagement emerged, such as pop-up activities and using pilot projects to test ideas.
- + Experience has indicated that physically separated infrastructure, such as protected bike lanes and shared pathways, is easier and more efficient to maintain in winter.
- + Bicycle infrastructure design practices changed to focus on facilities that are safe and comfortable for people of all ages and abilities, and to emphasize supporting all types of trips, maximizing use, and minimizing collisions.
- + Emphasis on education efforts aimed at drivers, cyclists and pedestrians is effective in improving understanding of how to operate on streets with bicycle facilities, as well as improving path user etiquette.





ENGAGEMENT PROFILE:

Helping Businesses Adapt to New Bike Infrastructure

Photo Credit: thenorthedge.ca

As new bike lanes emerged in downtown communities, businesses adapted to some significant changes. This included impacts to parking and access for customers and deliveries. Bike lanes are a game changer for the development of healthy, vibrant communities and for businesses and while many are enjoying the benefits of the new bike lanes, for some, it has been a challenging transition.

Whether it's providing supporting bike facilities, such as bike racks, or sharing stories from other businesses about the challenges and benefits of being bike friendly, it's important for the City and business associations to set businesses up for success as biking evolves in our community.



5.0 Biking in Edmonton Today

5.1 Edmonton's Bike Network

Since 2009, bikeability in Edmonton has improved. Edmonton's existing bike network by facility type is illustrated in **Figure 3: Edmonton's Existing Bike Network**. Edmonton's bike network includes several types of facilities including:

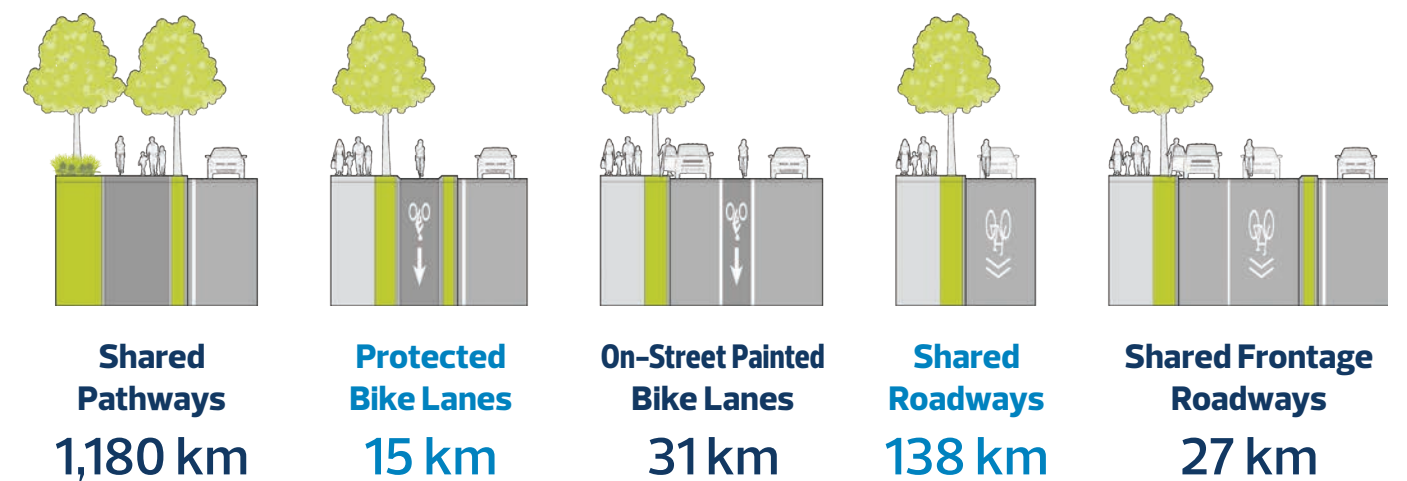
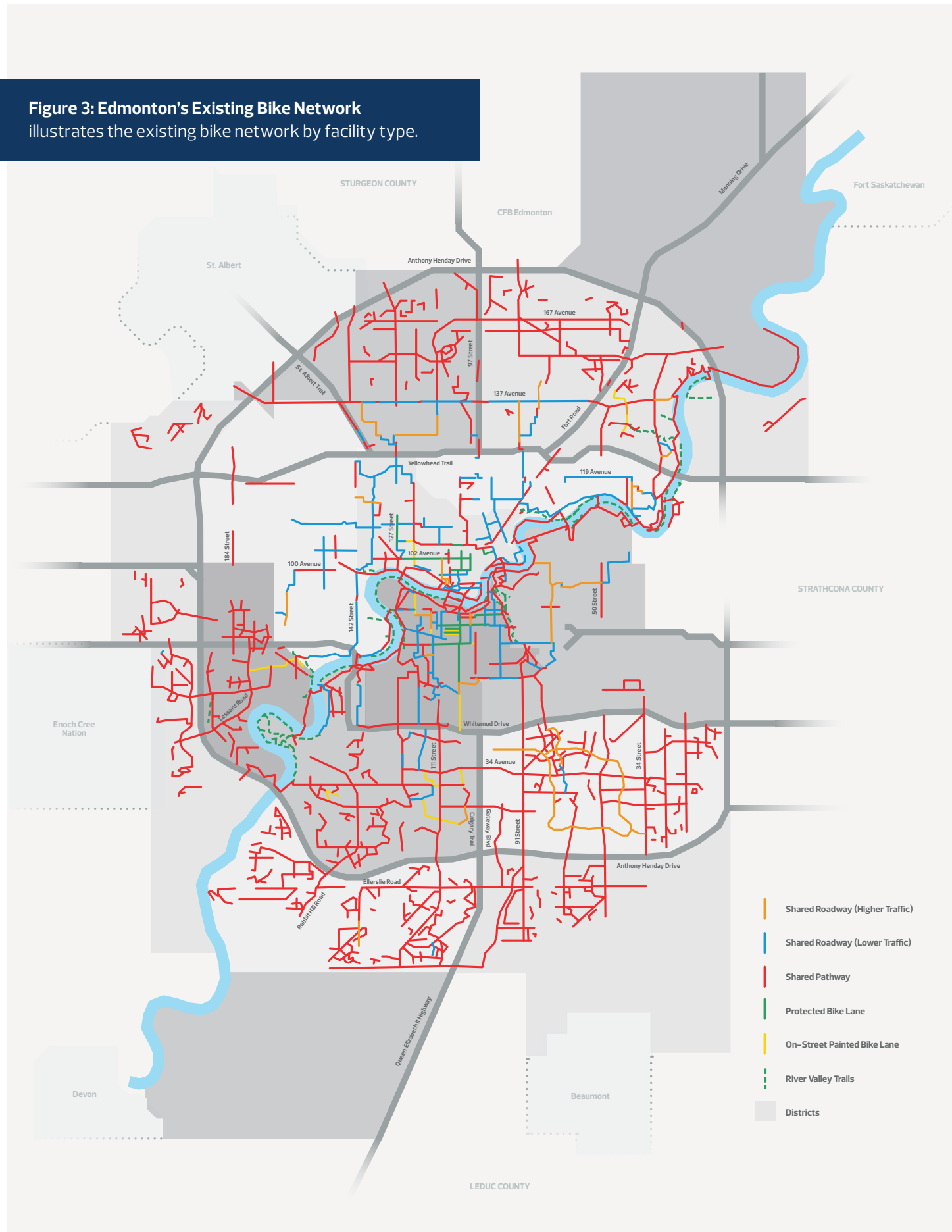


Figure 3: Edmonton's Existing Bike Network illustrates the existing bike network by facility type.



Edmonton's existing bike and transportation network was evaluated to consider bikeability and identify areas with higher potential to generate bicycle trips. The analysis was completed considering:

1. **Level of Traffic Stress (LTS)**
2. **Bike Network Analysis**
3. **Bike Trip Potential**



This analysis provided insight on current network characteristics and the need for future network implementation and actions.

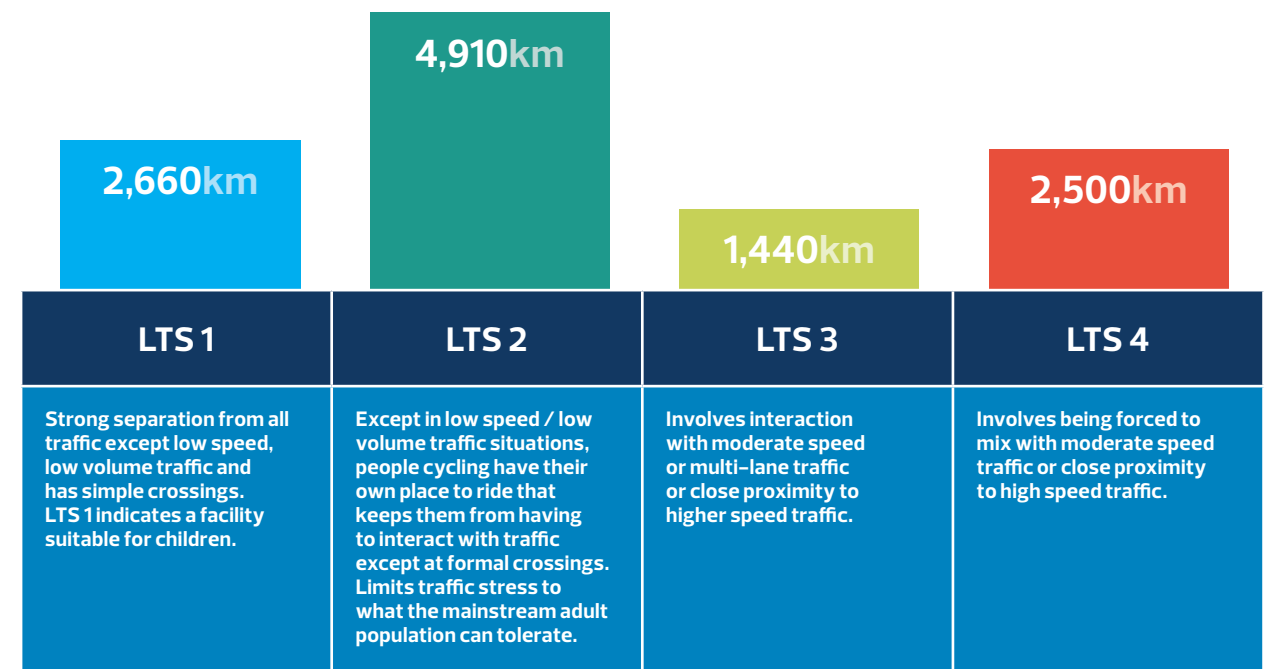
5.2 Level of Traffic Stress

Level of Traffic Stress (LTS) is a measure of how stressful an environment is for someone biking based on interactions with vehicle traffic. LTS tries to assess the quality of a bike route and/or network and its ability to serve the diverse needs of all its users.

LTS is evaluated based on the 4-point LTS scale and focused on the following aspects of Edmonton's transportation network:

- + bike routes
- + streets without bicycle infrastructure
- + intersections and mid-block crossings

Edmonton's transportation network includes:



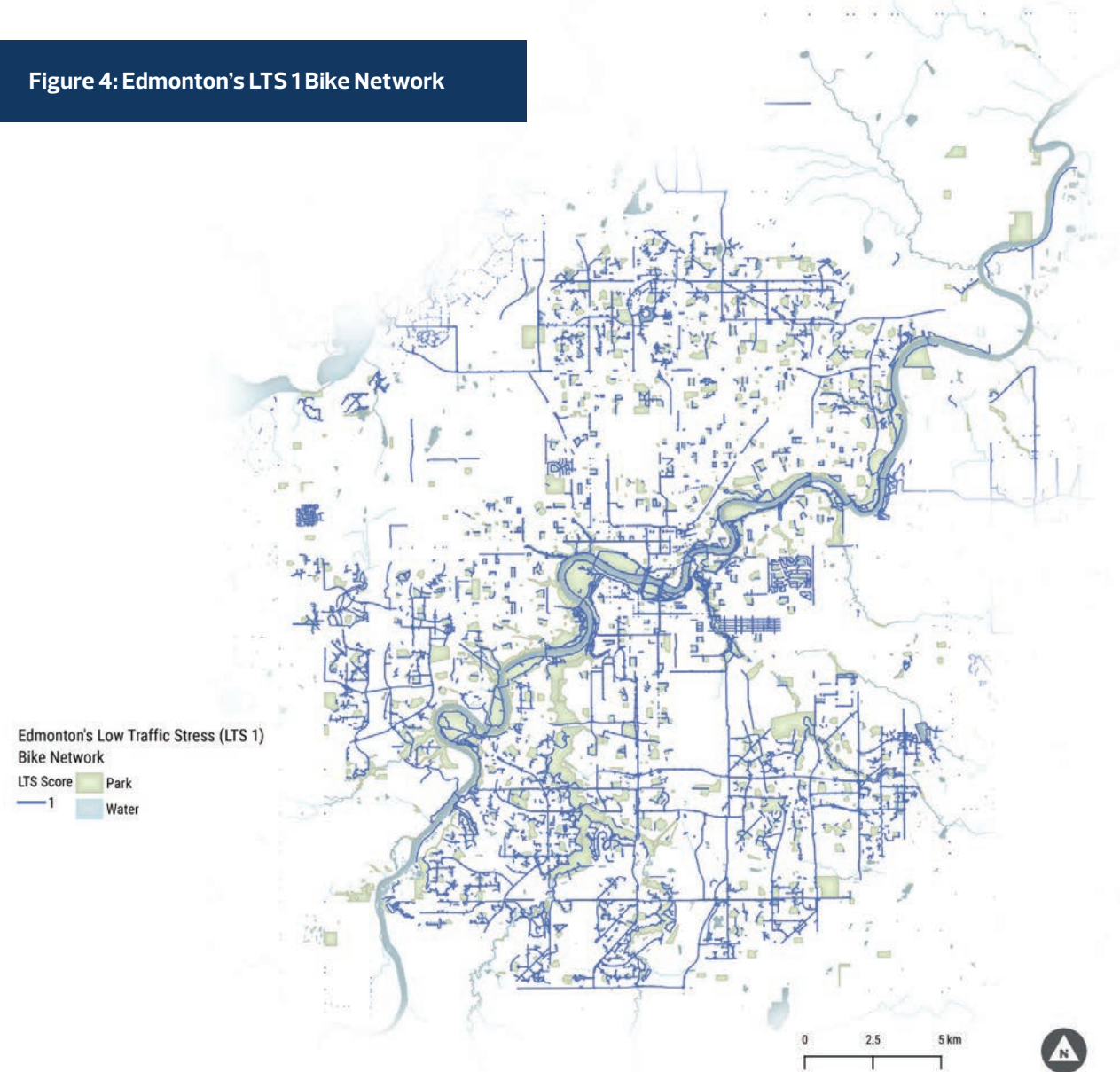
¹Furth, P. G. (2017). Level of traffic stress criteria for road segments, version 2.0. *Northeastern University College of Engineering*.

5.2.1 Edmonton's LTS 1 Network

Creating a less stressful bike network can help to make bicycling more appealing to more people which would result in more trips by bike and an increased diversity of users. Edmonton's LTS 1 bike network is illustrated in **Figure 4: Edmonton's LTS 1 Bike Network**.

There is a reasonably well-connected LTS 1 network in south, west and north Edmonton. This network is made up of shared pathways along arterial streets, through parks, and along utility corridors. There are significant gaps between central and north, west, and south Edmonton. The LTS 1 network in southeast Edmonton is fairly comprehensive in the Millwoods-Meadows area, but has little connectivity through the Roper and Pylypow Industrial Areas to the north. There are also LTS 1 routes along the River Valley with connections along many of the ravines. LTS 1 routes also exist in neighbourhoods with lower residential speed limits (e.g., King Edward Park, Ottewell), along light rail lines that include shared pathways, and the Downtown Bike Network.

Figure 4: Edmonton's LTS 1 Bike Network

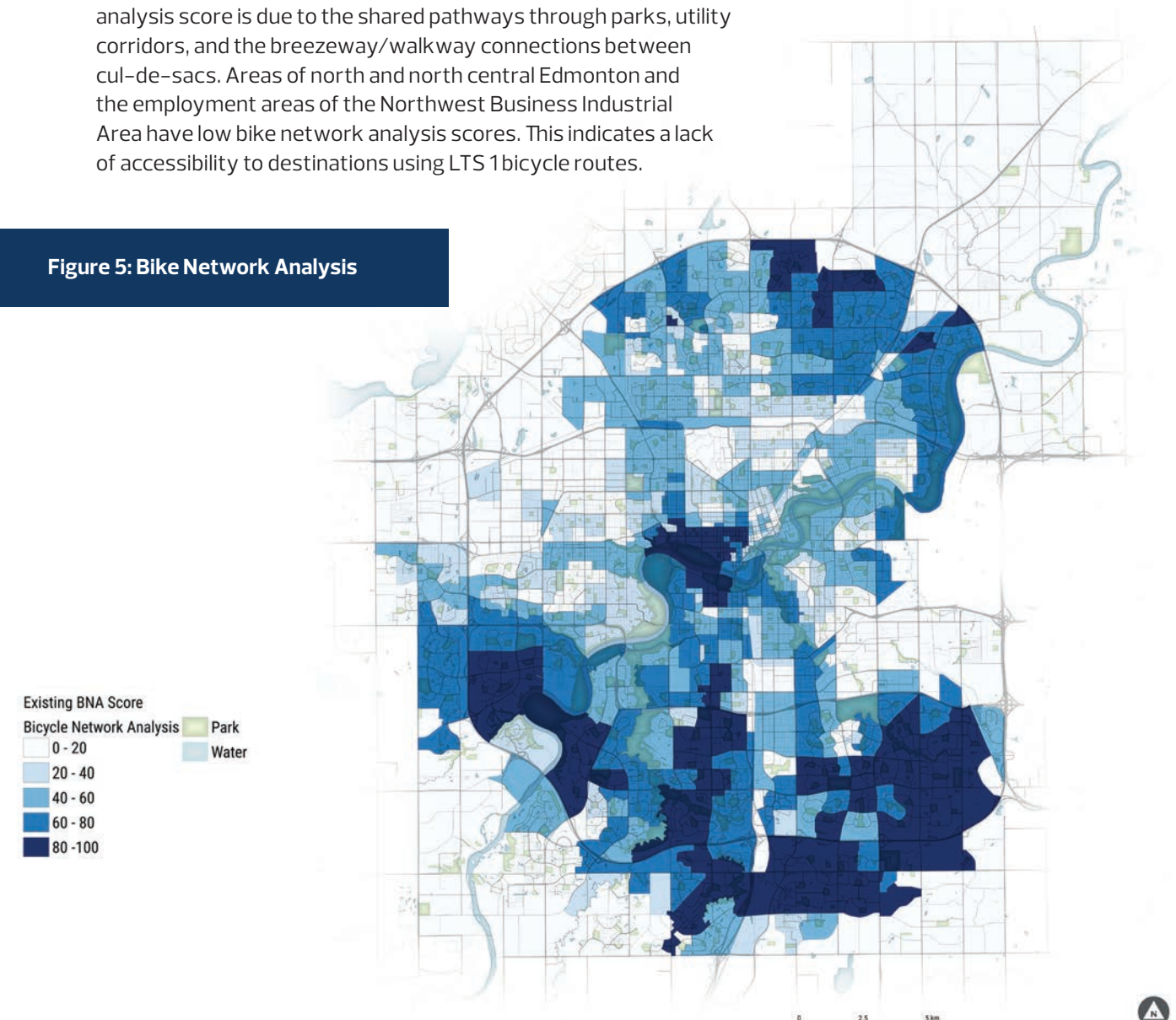


5.3 Bike Network Analysis

A continuous low-stress network is essential to make biking practical and comfortable for users of all ages and abilities. Bike network analysis is a tool that measures how accessible area destinations are by bike on the low-stress network. Bike network analysis is not a measure of the number of destinations in an area, only how accessible the destinations are by way of low stress routes. A high bike network analysis score indicates an area that is very accessible by bike on LTS 1 routes. As an example, areas with connecting pathways tend to have higher bike network analysis scores. Areas that are very accessible by bike on LTS 1 routes are shown in dark blue in **Figure 5: Bike Network Analysis**.

Central Edmonton, including downtown and the University of Alberta, and neighbourhoods with access to shared pathways and bicycle lanes along the South LRT have high bike network analysis scores. Suburban areas including Millwoods, areas south of Anthony Henday Drive, and some west Edmonton areas also have high bike network analysis scores. This high network analysis score is due to the shared pathways through parks, utility corridors, and the breezeway/walkway connections between cul-de-sacs. Areas of north and north central Edmonton and the employment areas of the Northwest Business Industrial Area have low bike network analysis scores. This indicates a lack of accessibility to destinations using LTS 1 bicycle routes.

Figure 5: Bike Network Analysis



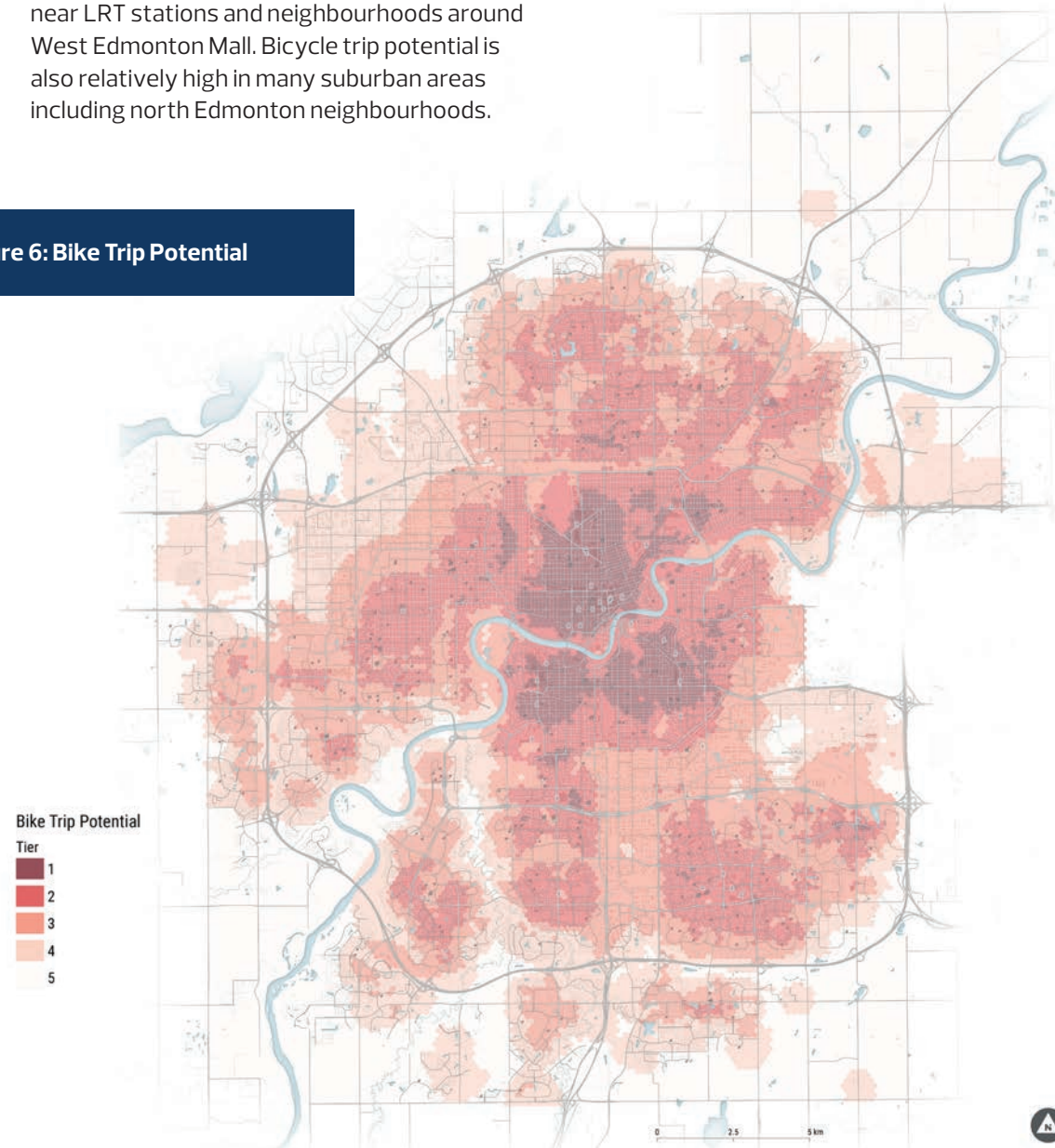
5.4 Bike Trip Potential

Bicycle trip potential analysis determines which areas of a community are more likely to generate cycling trips for transportation, such as commuting, school or shopping.

The analysis is based on data for current population, employment, and important destinations (e.g., schools, shopping, transit, and universities). **Figure 6: Bike Trip Potential** illustrates the results of the bicycle trip potential analysis. Areas with high bicycle trip potential (i.e., tier 1 and tier 2) are shaded darker, while areas of low potential are white.

The bicycle trip potential analysis highlights a number of areas with high potential for generating bicycle trips such as Central Edmonton, including Downtown and the University areas, and areas near LRT stations and neighbourhoods around West Edmonton Mall. Bicycle trip potential is also relatively high in many suburban areas including north Edmonton neighbourhoods.

Figure 6: Bike Trip Potential



ENGAGEMENT PROFILE:
The Existing and Growing Potential of Year-Round Riding

“Cycling year round is easy, fun, and extremely rewarding. I wish more people gave it a try.” – Sheldon Bauld

Sheldon doesn't consider himself an avid cyclist but now that his family sold one of their two cars he commutes from the southwest to downtown by bicycle year-round. Sheldon says riding year-round is not difficult. Winter requires preparation and a bit more gear but he insists it's not hard, or even expensive. Sheldon rides the same bike throughout the year which means he has to go a bit slower in the snow but says that uncleared paths are still rideable, even with skinny tires. During the winter, Sheldon adjusts his route to accommodate his bike and sometimes includes the LRT to lessen his commute time because of a slower pace.

Sheldon's taken a few tumbles in the winter but never anything serious. His biggest concern is cars as visibility is low given there is no sunlight during rush hours and drivers don't seem to expect people biking during the winter. His other concern is fear of returning after work only to realize his bike has been stolen after locking it up at the LRT station.

The benefits of cycling are life changing for Sheldon. He feels healthy and energized, he enjoys the sights and sounds around him, he saves money and he feels good about reducing vehicle emissions. Sheldon adds that it's also incredibly relaxing, especially in the winter time, when it's dark outside and you're all bundled up.



6.0 Setting Direction

6.1 Aspiration

“Edmonton: Where biking is inviting for people of all ages and abilities, for all reasons, in all seasons.”

INVITING

Creating an environment where biking is a safe, enjoyable and a practical option for people of **all ages and abilities**.

ALL REASONS

There are a lot of reasons to travel by bike, and those reasons are different for each person. People make choices based on where they are biking to, when they are biking, who they are biking with, and their abilities and comfort levels.

ALL SEASONS

Increasingly people ride their bikes through the winter. The bike network needs to be designed to accommodate year-round riding.

6.2 Values

Each value is a lens through which we examine our actions and make our decisions. They guide our thinking and are foundational to all aspects of the plan.

FUN AND FUNCTIONAL

Biking enriches the lives of Edmontonians and sparks joy by being a safe, enjoyable and practical way to get around.

URBAN VIBRANCY

Weaving biking into our city-building and design makes Edmonton a vibrant, attractive city that we're proud of and that others are drawn to.

EQUITABLE

Biking is a valid and practical option for people of all ages, abilities, backgrounds and walks of life.

CULTURE SHIFTING

Biking is a highly-valued part of Edmonton's mobility system and is welcomed as an everyday way to move around and enjoy our city.

6.3 Network Principles

Network principles guide planning and design decisions related to Edmonton's bike network:

HEALTH AND COMFORT

Providing a bike network grounded in safety provides people with a comfortable and secure way of getting around by bike. The network minimizes stress, anxiety, or concerns over personal safety and security and other health and safety-related issues such as noise, vehicle pollution, headlight dazzle and spray from passing vehicles.

NETWORK DENSITY

Grid size (distance between parallel routes in a network) is dependent on demand—higher demand areas have higher density.

CONNECTIVITY

The cycling network provides access to places where people want to bike without gaps or missing links. The network provides a diverse range of route options and experiences for users and opportunities to link to other modes of transportation.

ATTRACTIVENESS

The cycling network is composed of routes that are aesthetically attractive, interesting, or pass through sociable places.

DIRECTNESS

The cycling network prioritizes direct and straight routes and minimizes out-of-direction travel and unnecessary stops.

INTEGRATION

The function, design and use of a bike route is carefully considered so that it provides added value to the neighbourhood and users from an economic, social and safety perspective. Bike routes fit into an area's and/or street's context and are integrated into the road network in a way that makes sense to people who walk, roll, bike, take transit or drive.



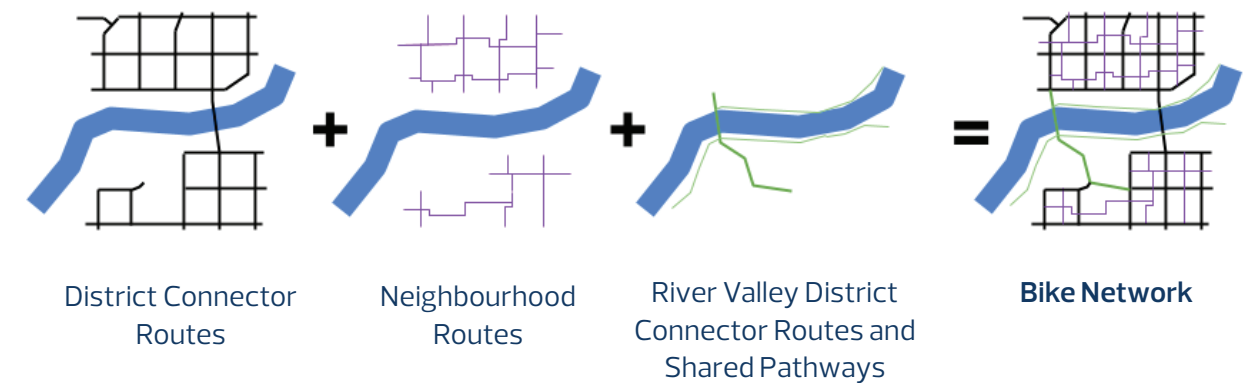
7.0 The Future Bike Network

The future bike network map will guide the expansion of Edmonton's bike network by identifying the general location of future bike routes in the city. The future bike network is guided by the network principles and will continue to adapt and expand over time in response to community feedback, empirical evidence and changes to demographics or technology.

While some routes and missing link connections may be location-specific, many will require further review, analysis and engagement with the community and stakeholders. The location and alignment of many routes and missing link connections are considered preliminary at this stage and further refinement may be explored during the visioning and design stages.

7.1 A Network of Networks

The future network will have different types of routes:



No one route type is more important than another, instead all route types must be considered as important pieces of a holistic bike network. All route types will exhibit the features of the network principles, but the application and prioritization of the principles may vary based on route type and local context. The result is that each type of route will provide a different riding experience--district connector routes might be more direct but located on busier streets while neighbourhood routes might be more attractive but less direct. For most bike trips, people will likely ride on a combination of these route types.

7.1.1 District Connector Routes

District connector routes are bike routes that serve as cycling arteries extending across multiple neighbourhoods, connecting districts. District connector routes generally prioritize directness. The type of infrastructure provided may vary, but because they are often located along corridors with higher vehicle volume and speeds, district connector routes are often separated from vehicle traffic (i.e., protected bike lanes or shared pathways). District connectors also provide access to major city-wide and regional destinations.

When a project is planned along or in the vicinity of a future district connector route, the project should endeavour to confirm the location of the bike route, and complete the infrastructure changes as required. The local context should be reviewed to assess what connections are needed in the area and consider how network principles can be applied. Alternative routes may be considered and include connections through neighbourhood streets, green spaces, utility rights-of-way or along arterial or collector roadways. However, alternative routes should not be moved too far as to substantially alter bike network spacing or aligned such that its role within the network is substantially compromised (ie. considering a parallel route for a district connector through a neighbourhood could impact its directness).

The district connector network map does not identify the facility type for future bike routes. Similar to the alignment of the bike route, the facility type considerations for a particular route should be evaluated through further technical analysis and input from the community and stakeholders.



7.2 Regional Network

7.2.1 Regional Connections

Regional connections represent conceptual opportunities to ensure that the bike network provides access not only within Edmonton, but also includes broader connections to form a regional network. Regional connections allow users to access regional destinations, expanding the reach of bicycle trips for both recreation and transportation. Regional connections are shown based on apparent opportunities where the bike network may align across jurisdictional borders while also considering opportunities to traverse some of the most significant barriers between the City of Edmonton and adjacent municipalities and counties.

7.2.2 Future River Valley Regional Connections

Future River Valley regional connections describe planned future trails that will provide bike network connections to adjacent communities and into the region.



7.1.2 Neighbourhood Routes

Neighbourhood routes provide local access, opportunities for recreational cycling and connections to destinations outside of the district connector network. These routes will be focused on local connections and are best planned and designed at a local neighbourhood level. Unlike district connector routes, neighbourhood routes may not be continuous across multiple neighbourhoods. The infrastructure for neighbourhood routes will vary depending on the local context.

Neighbourhood routes may be planned through local or district-level planning. Neighbourhood routes serve a more localized role in the bike network and therefore the application of network principles may be slightly different than for district connector routes. It is necessary to ensure that neighbourhood routes connect to other routes across neighbourhood boundaries and to work with local communities to identify neighbourhood destinations that need to be considered.

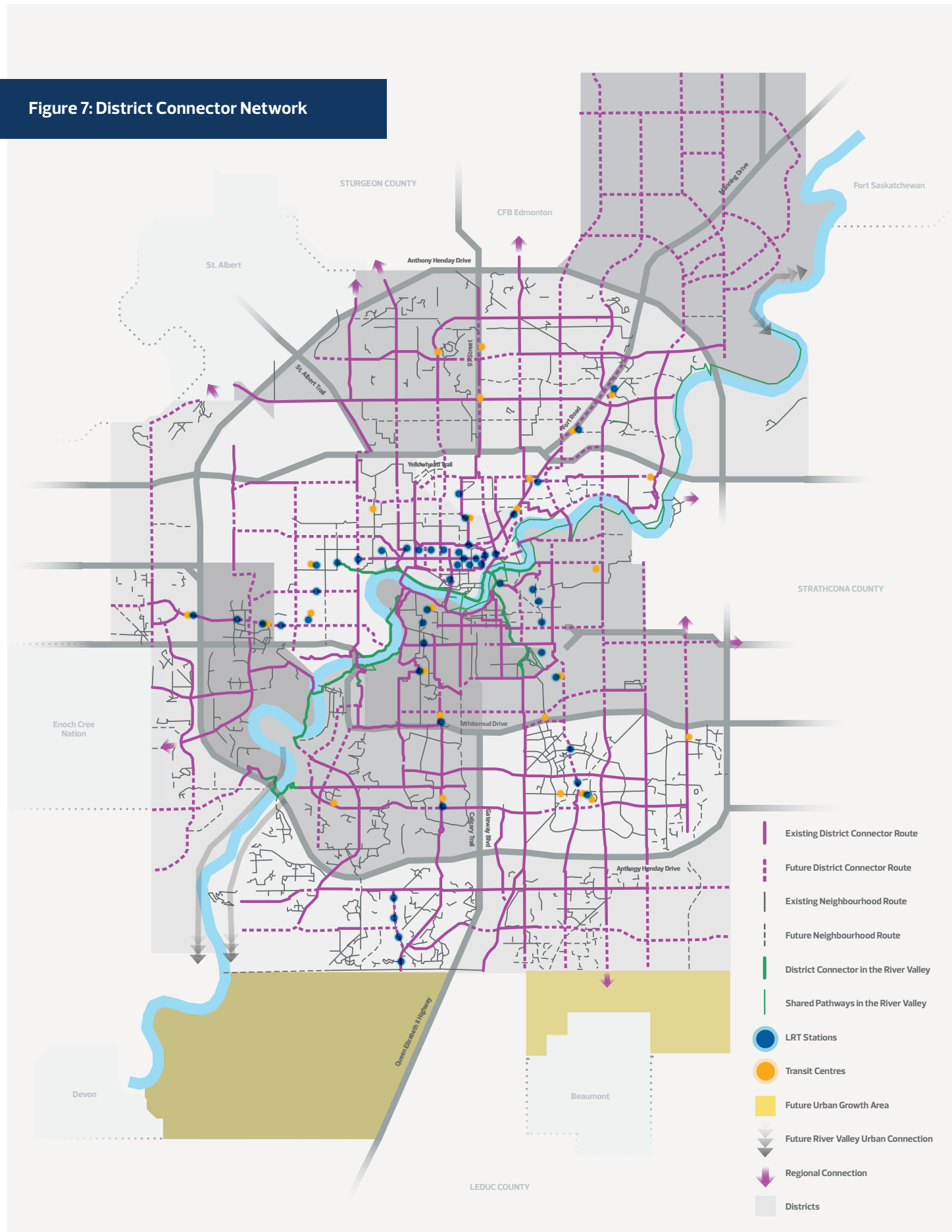
The general location of neighbourhood routes may be identified through the application of the network density principle. As part of local/neighbourhood review, route spacing can be used to identify how many additional routes are required within a neighbourhood. If the existing network already meets density targets, stakeholders may still consider additional routes that will serve the needs of local residents and provide important connections to neighbourhood routes.

7.1.3 River Valley District Connector Routes and Shared Pathways

River Valley district connector routes also provide important bike network connections. These routes typically operate as shared pathways and fall under the planning framework of the Ribbon of Green Plan. Because these routes also provide valuable connections as part of the district connector network, they are identified to highlight their role in the connectivity of the urban bike network.

Edmonton's River Valley also includes shared pathways (paved) that extend from the northeast to the southwest. The network of shared pathways in the River Valley play an important role as part of a comprehensive recreational network and to provide active transportation connections such as commuter routes and links across the river and ravines. Similar to district connector routes in the River Valley, these routes fall under the planning framework of the Ribbon of Green.

Figure 7: District Connector Network



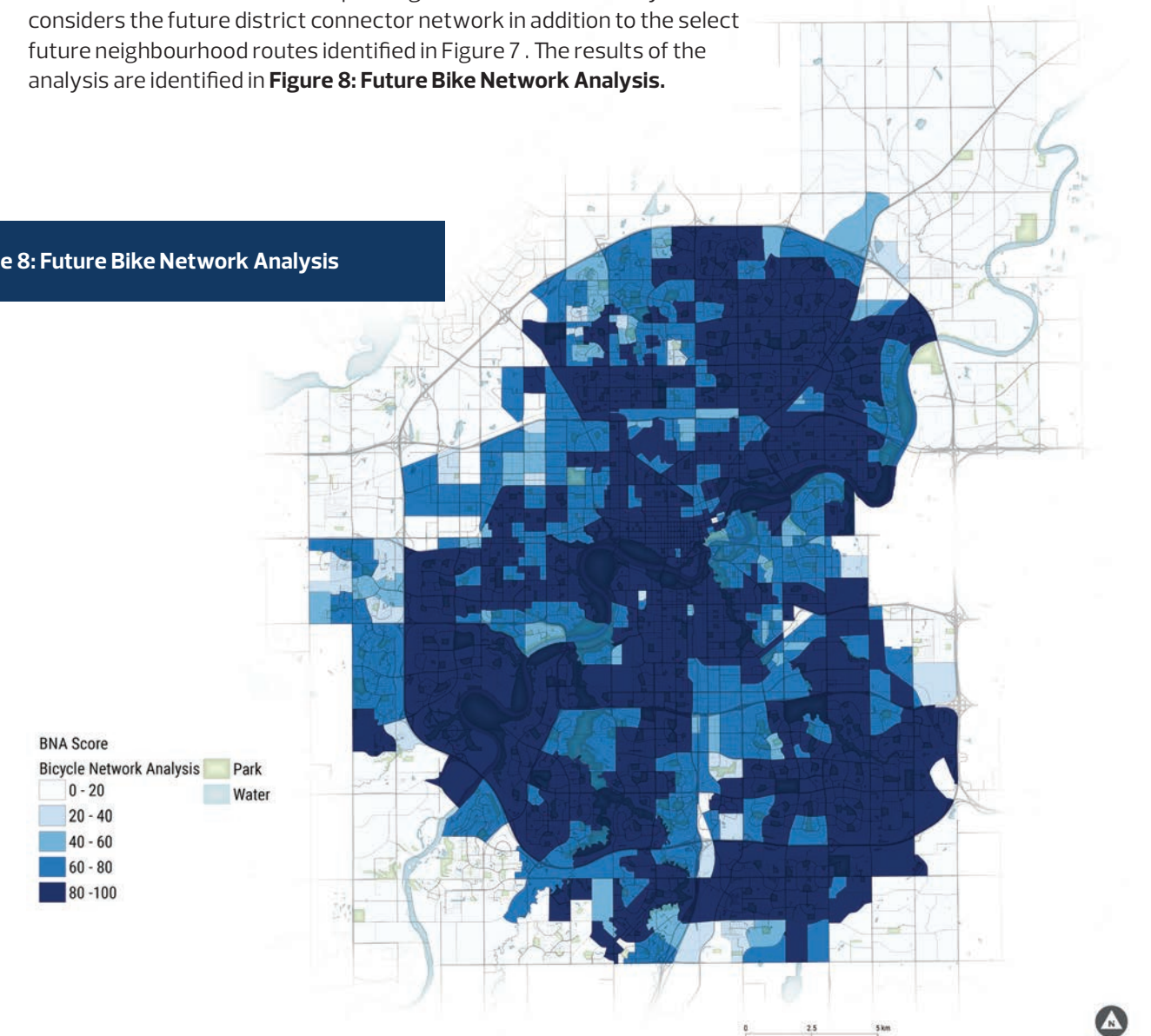
7.3 District Connector Network

Figure 7: District Connector Network highlights existing and future district connector routes along with existing neighbourhood routes to illustrate connectivity between the neighbourhood routes and district connectors. The majority of future neighbourhood routes are not shown as they will be planned and designed at a local level based on network spacing requirements and input from residents. Potential future neighbourhood routes are identified where they provide continuous biking opportunities across neighbourhood boundaries.

7.3.1 Future Bike Network Analysis

A bike network analysis was applied to the future bike network to understand the effects of an expanding bike network. The analysis considers the future district connector network in addition to the select future neighbourhood routes identified in Figure 7. The results of the analysis are identified in **Figure 8: Future Bike Network Analysis**.

Figure 8: Future Bike Network Analysis



Given that the future bike network does not identify many of the future neighbourhood routes, the analysis is considered conservative. The inclusion of neighbourhood routes would increase neighbourhood scores.

Areas outside Anthony Henday Drive have low bike network analysis scores as current land uses (i.e., population density and the number of destinations) were not changed. This means the minimum number of destinations threshold of 10 used in the analysis was not met in many developing neighbourhoods. Extensive bicycle facilities are planned in new neighbourhoods, particularly in northeast and southwest Edmonton, and it is expected that high comfort biking accessibility will be achieved as these areas are developed. This will happen in particular with the application of *Complete Streets Design and Construction Standards*.

Compared to the bike network analysis of the existing network (Figure 5), the accessibility to destinations by bicycle on high comfort routes across Edmonton is significantly increased in the Future Network. With only a few exceptions, all neighbourhoods within Anthony Henday Drive have a high bike network analysis score. The exceptions are usually in areas with a low density of streets and some industrial areas.

7.4 Bike Route Spacing

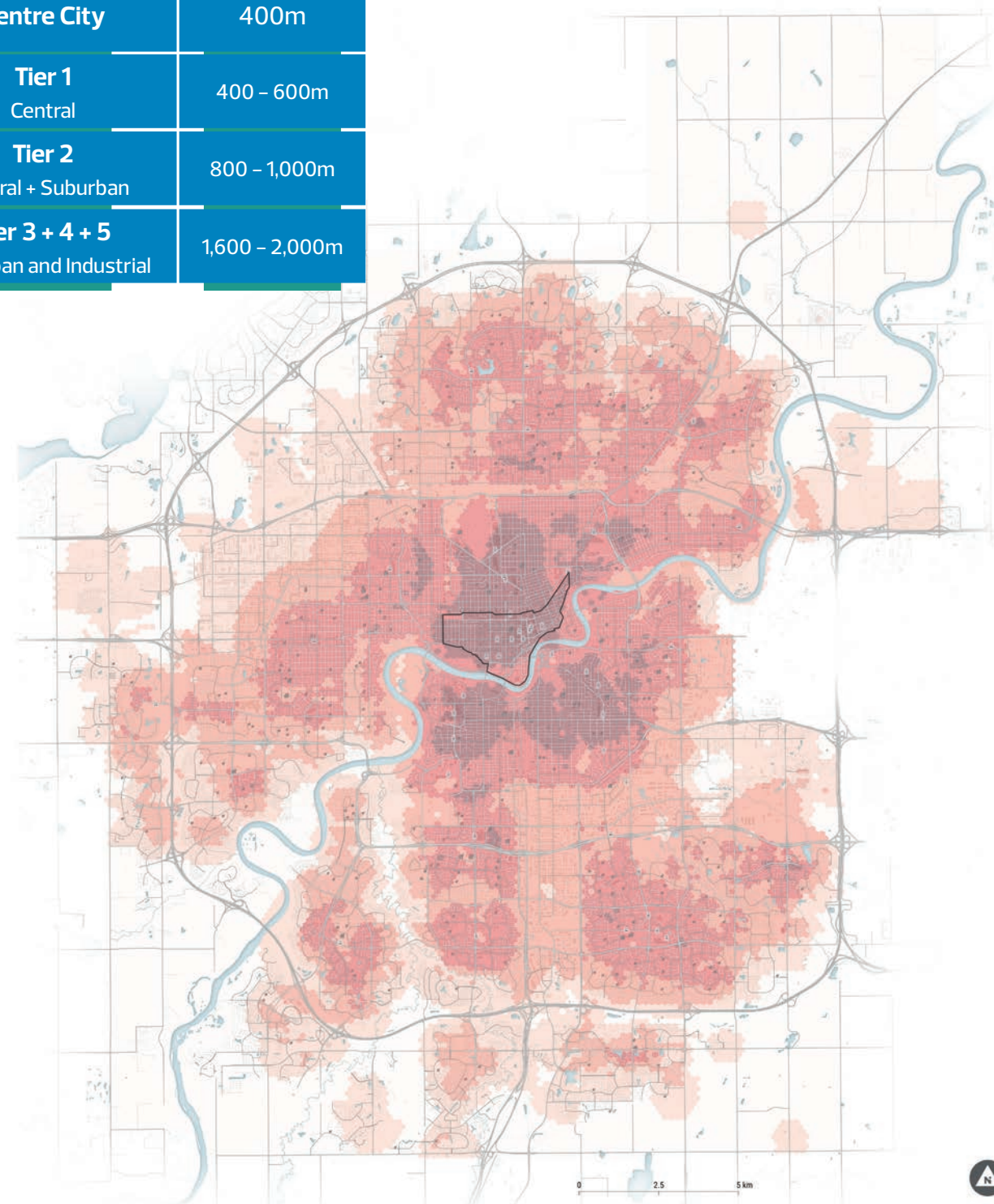
The Bike Trip Potential analysis serves as the basis for establishing recommended network density.

Figure 9: Route Spacing and Bike Trip Potential identifies the recommended route spacing.



Figure 9: Route Spacing and Bike Trip Potential

	Area	Route Spacing
	Centre City	400m
	Tier 1 Central	400 - 600m
	Tier 2 Central + Suburban	800 - 1,000m
	Tier 3 + 4 + 5 Suburban and Industrial	1,600 - 2,000m



7.5 All-Seasons Network

Ensuring that a bike network is available in all seasons is a vital part of achieving the aspiration of Edmonton's bike network. Additional resources are required to ensure bicycle routes remain inviting for users of all ages and abilities in all seasons. The all-seasons network is developed as part of the implementation approach.

Identifying an all-seasons network signals prioritization for snow clearing and removal to ensure a reliable level of connectivity is maintained in the winter season. The all-seasons network identifies a subset of the bike network and associated standards for winter maintenance. As the network continues to expand the all-seasons network will continue to be updated alongside the future bike network map, or when significant new routes are added. Identification of the all-seasons network will help inform discussions of detailed corridor selection and facility type by ensuring that all-seasons routes are planned and designed with extra emphasis on accommodating winter maintenance.

7.6 Building Biking for a Future of 2 Million

7.6.1 Network Map Updates

The future bike network map presents a network based on the current attributes of Edmonton. As the city continues to grow, population densities, destinations, and demographics will continue to change. The future bike network map will receive appropriate and regular updates to respond to these changes.

Regular updates will allow the network map to be continually refined with additional routes added to address changes in the growing city. For example, as some areas continue to develop higher population, employment, and destination densities, it may be necessary to add additional routes to maintain network densities. Completing an updated Bicycle Trip Potential analysis based on updated destination/demographic information prior to each update may be necessary to inform how the map may need to evolve.

7.6.2 Planning for Redeveloping Areas

In areas where the City of Edmonton is focused on supporting urban growth, it is important to plan the bike network in advance of urban redevelopment. As planning and investment advances in priority growth areas, bike network planning ensures that infrastructure planning and investment provides appropriate connections to district connector routes and access to area destinations with neighbourhood routes. Future land use plans, including population and employment targets, can be used to adjust required network densities and identify when additional routes should be considered.

7.6.3 Planning for Developing Areas

The standard for arterial roads includes shared pathways on both sides of the street which supports a basic network of district connector routes in developing areas. These areas will include both neighbourhood and district connector routes provided through pipeline corridors, stormwater management facilities, and top-of-bank river valley trails. Any revisions to neighbourhood plans should ensure that the active transportation and bike network is aligned with network principles, including consideration of additional neighbourhood routes in road right-of-way to ensure connectivity.

7.6.4 Planning for Future Growth Areas

The bike network in future growth areas will be established through the land use and transportation planning process for new neighbourhoods. Bike network principles, including route spacing recommendations and bicycle facility types, should be used to inform the planning and development of the network in these areas. This applies to district connector routes, neighbourhood routes, and River Valley and ravine shared pathways.





8.0 What Does All Ages and Abilities Mean?

During the development of the Bike Plan, input received from Edmontonians, stakeholders, City of Edmonton staff, and partner agencies highlighted the need to provide bicycle infrastructure that is comfortable for people of all ages and abilities. Designing for all ages and abilities requires an approach that considers both the safety and comfort of a broad range of potential users.

8.1 Who are we planning for?

Many existing bicycle facilities do not feel safe for people who might otherwise ride. An all ages and abilities network and associated programs must consider the unique circumstances and needs of a broad range of potential users. The following list of potential users is based on the *Who is the "All Ages & Abilities" User?* developed by the National Association of City Transportation Officials.



Children

Encouraging and enabling children to ride is especially important as it helps create habits of sustainable travel at an early age and makes it more likely they will continue these behaviours later in life. School-age children are an essential biking demographic but face unique risks because they are smaller and less visible to driver's and often have less ability to detect risks or avoid conflicts. School transportation can play an important role in increasing a child's physical activity levels, but the journey to school has changed significantly over the past generation. Encouraging active school travel can help students become more physically active and will encourage them to develop good habits for an active lifestyle.

Seniors

The population of Edmontonians aged 65 and older is expected to increase by 55 per cent over the next decade. With the increasing senior population, an increasingly age-friendly transportation system is required to allow seniors to maintain a greater level of mobility. As a low impact activity, seniors often see positive impacts from cycling but they are also greatly affected by the quality of cycling infrastructure. Seniors may require bicycle facilities designed for riders with slower riding speeds and that have a harder time seeing people, signs and movement outside of their direct line of sight. Safe and comfortable cycling infrastructure designed for people of all ages and abilities allows community members both young and old to access the services and social networks that are essential for maintaining both physical and mental health.



Women

Increasing the proportion of female cyclists is important. Women are consistently under-represented as a share of total bicyclists in Edmonton and other cities. Concerns about personal safety including and beyond traffic stress are often particularly relevant for women. Research from other cities shows that enhanced cycling infrastructure such as separated bike lanes can increase the proportion of female cyclists.



Racialized People

Racialized people often face unique barriers to cycling. A recent study in the United States found that fear of exposure to theft or assault, fear of traffic collisions, or being a target for enforcement are barriers to bicycling for some visible minority populations. In Edmonton, more work needs to be done to understand the unique barriers faced by people of minority ethnocultural communities, and to provide safe access for newcomers.



People Riding Bike Share or E-Scooter Share

Riders often use bike share or e-scooter share to link to other transit or make spontaneous one-way trips. Riders that move in this way place a premium on comfortable and easily understandable bike infrastructure. Bike share users range widely in stress tolerance, but overwhelmingly prefer to ride in high-quality bikeways. All ages & abilities networks are essential to bike share and e-scooter share viability.



People with a Low Income

Affordable and accessible transportation choices for youth, seniors and others who may not have access to an automobile can be provided by building safe and comfortable bicycle facilities for all ages and abilities. According to the *2015 Edmonton and Region Household Travel Survey*, about 11 per cent of Edmonton households are zero-vehicle households. While some of these households could purchase a vehicle but voluntarily choose not to, others simply cannot afford to own or lease a vehicle and are reliant on other modes of transportation. In addition, basic infrastructure is often lacking in low-income neighborhoods, increasing safety concerns.



People Moving People, Goods or Cargo

Bicycles and tricycles outfitted to carry multiple passengers or cargo, or bicycles pulling trailers, increase the types of trips that can be made by bike, and are not well accommodated by bicycle facilities designed to minimal standards.



People with Disabilities

People with disabilities may use adaptive bicycles including tricycles and recumbent handcycles. These often operate at lower speeds, are lower to the ground, or are wider than other bicycles. High-comfort bicycling conditions provide mobility, health, and independence but often require a higher standard of bike infrastructure.



Confident Cyclists

The small percentage of the bicycling population who are very experienced and comfortable riding in mixed motor vehicle traffic conditions are also accommodated by, and often prefer, All Ages & Abilities facilities, though they may still choose to ride in mixed traffic.



8.2 What does All Ages and Abilities design look like?

Comfort and safety on bicycle infrastructure is impacted by the volume and speed of the various types of traffic making use of a corridor. As the volume and speed of motor vehicles increases, separation between bicycles and motor vehicles needs to increase to ensure the route is safe and comfortable. Interactions with larger vehicles, including buses, also contributes to the need to separate bicycles from vehicle traffic.

In locations where the speed and volume of motor vehicles can be limited, a shared roadway may be an appropriate design. In higher speed, higher volume corridors greater degrees of separation may be required. Similarly, shared pathways may not be appropriate in locations with high pedestrian volumes, a high density of intersections/accesses or adjacent on-street parking.

Guidance on types of bike routes as it relates to all ages in abilities is currently provided within the *City of Edmonton Complete Streets Design and Construction Standards*.

8.3 Elements of Bike Design for All Ages and Abilities

All ages and abilities design parameters should be considered as part of future bike facility implementation, and should guide future updates to *Edmonton's Complete Streets Design and Construction Standards*.

1. Design so that everyone will enjoy biking

- + Designing for all ages and abilities requires an approach to design that considers both the safety and comfort of all users by applying Gender-based Analysis Plus (GBA+) and other inclusive practices
- + The type of bike facility aligns with the roadway operating characteristics
 - separation where required, shared streets where appropriate
 - on higher speed/higher volume streets, focus on separation
 - on lower speed/lower volume streets, focus on target motor vehicle volume and target motor vehicle speed
 - consider the impacts parking may have on bicycles
 - provide smooth and paved travel surfaces
- + Bike route design should be consistent based on roadway type to allow all road users to better understand how they should operate and behave
- + Consistent bike facility design along bike route corridors provides a better riding experience

2. Design for interactions with other transportation modes

- + Create separate spaces for walking and cycling when pedestrian and cycling volumes warrant
- + Reduce speed at points of conflict, for both people driving and biking, and provide adequate sight lines

2. Design for interactions with other transportation modes *continued*

- + Bus stops are designed so most conflicts between transit vehicles and bicyclists are reduced or eliminated and typically include refuge areas for transit users to provide a comfortable experience for boarding and alighting
- + Strive to reduce clutter and confusion from excessive signing of bike facilities

3. Design considering all users

- + Consider the operating characteristics of different types of bikes (e.g. e-bikes, cargo bikes, tricycles, quadricycles, recumbent bikes, bikes with trailers)
- + Consider the needs of users beyond people who bike (e.g., people using powered micromobility devices)
- + Provide opportunities for people biking to pass other users
- + Provide opportunities for social riding (side-by-side)

4. Design for effective maintenance

- + Simplify designs for snow removal and sweeping, acknowledging that snow removal and sweeping may require special equipment
- + Design bike lanes such that debris deposits caused by vegetation and drainage is minimized wherever possible, and recognize the impact debris accumulation has on bicycle operations (e.g., routes that have a higher potential to collect debris are designed wider)

5. Designing intersections

- + Design intersections to reduce conflicts, increase visibility and provide clear direction of movement
- + Make large intersections more manageable by breaking them into smaller parts by way of medians and/or refuge islands that contribute to an improved crossing experience for people walking and biking (channelized right turn islands may provide a refuge island but allow cars to turn at high speeds creating an unsafe condition for people crossing)
- + Traffic signals that prioritize biking and walking can make users more visible and provide conflict-free crossings
- + At smaller intersections, calm motor vehicle traffic so that cycling with motor vehicle traffic is comfortable, albeit with prioritization techniques (providing specialized facilities for all bike movements may overly complicate intersection operations)
- + Maximize opportunities for unhindered through travel by bicycle by providing a clear view of the road or bike route to be crossed so that they can proceed without having to stop. If stopping is unavoidable, minimize wait times.



ENGAGEMENT PROFILE:

**Bikes of All Shapes and Sizes:
Accommodating Non-Conventional Bikes**

The Paralympic Sports Association is a local non-profit organization that promotes physical activity and recreation, and gives people with disabilities the opportunity to be active in the Edmonton River Valley and neighbouring communities.

With a fleet of 10 handcycles of various styles available for anyone interested in riding, they lead weekly rides for both beginners and more experienced riders. Members ride for lots of reasons: for exercise, to socialize and enjoy the outdoors, to push themselves, for good mental health and for the pure enjoyment of riding. They need to choose their routes with care to avoid overly steep inclines, construction and trails in poor condition. They stress the importance of accessible access to the River Valley from the rest of the city's bike network.

“I first tried biking out of curiosity. I was able to test drive a bike from a local shop and fell in love. I like being able to physically challenge myself and really push my body to the limits. There’s nothing like conquering a big hill although going down that hill at ridiculous speed may be a close second. It’s something I can do independently or as a group and helps me stay active and control my weight. I love being able to get out on a sunny day and just enjoy the local trails by myself or with friends.”

– Paralympic Sports Association member

8.4 Other Considerations: Sharing Space

Communities are experiencing an evolution in the types of people who use bike routes. Those using bicycles, in-line skates, skateboards, and scooters are being joined by those using powered micromobility vehicles such as e-bikes, e-scooters, and power-assisted cargo bikes. Considering how people rolling and walking share space will ensure the safety and comfort of both groups.

8.4.1 Sharing Bike Lanes

During engagement, many Edmontonians shared positive aspects of using an e-bike including that they are fun for the user and enable people of all abilities to ride more often and for longer trips. In addition, goods delivery is evolving with many international shipping companies starting to use cargo bikes for urban freight delivery. In communities across Europe and North America, including Edmonton, the use of bicycle routes by users of e-bikes, e-scooters, and cargo bikes is on the rise.

People using manual wheelchairs, electric wheelchairs, and electric mobility scooters also use protected bike lanes at times. Based on engagement, some of the reasons people choose to use these devices in protected bike lanes include smoother pavement surface, fewer ramps to navigate, operating at higher speeds than people walking, and clearance of snow and ice to a better standard than sidewalks.

Planners, designers, and operators of bicycle infrastructure need to consider the impacts of their design on many users operating in bicycle facilities. In the case of bicycle facilities operating in both directions such as shared pathways and protected bike lanes, passing impacts with oncoming users must be a consideration. The mix of a variety of users, including those on foot, those on wheels and those with disabilities must also be a consideration in the design of shared pathways. Of particular concern is mixing people on wheels with people who have visual impairments.

The evolving mix of active transportation, powered micromobility, and shared mobility is starting a conversation about the best way to manage and regulate these interactions. Those conversations include consideration of laws and bylaws that would accommodate a diversity of users to use bike lanes.



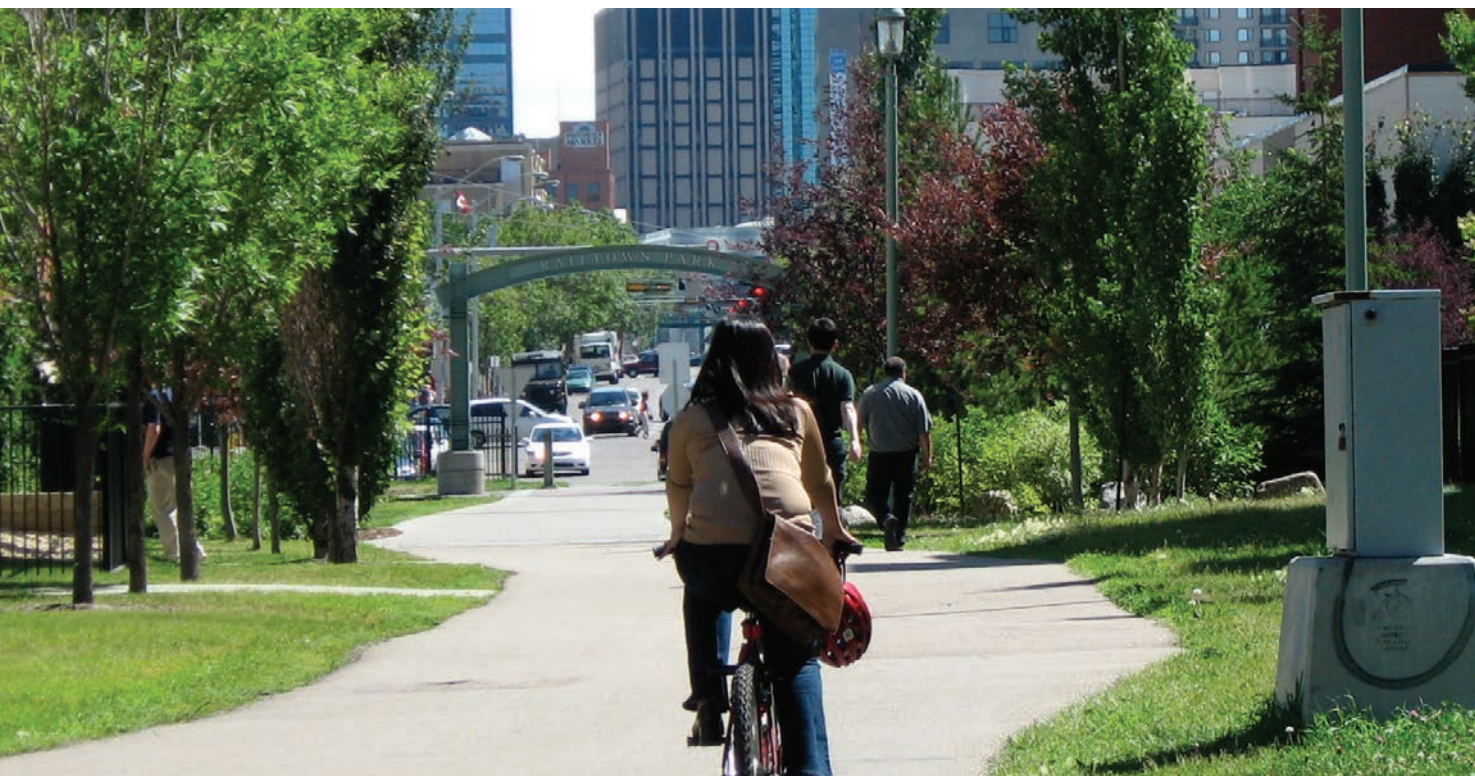


8.4.2 Sharing Sidewalks

Sharing space also includes bikes on sidewalks. While riding a bike on a sidewalk in Edmonton is restricted to bikes with a wheel diameter of 50 cm or less, people sometimes violate this bylaw and choose to ride on the sidewalk because:

- + They perceive riding on the sidewalk as a safer option
- + Sidewalk riding is the only alternative to riding on a road where high traffic volumes and/or speeds create an uncomfortable riding experience
- + The sidewalk provides a hard, even, and often cleared surface in the winter allowing people to avoid riding on snow-rutted streets

It is important for people who bike, as well as planners and designers, to understand and appreciate the risks associated with riding on the sidewalk. Without appropriate design treatments, intersection crossings from a sidewalk may result in limited visibility for people riding and people driving. This condition can be exacerbated by vehicle turning speeds. Sidewalk riding can also degrade the pedestrian experience by compromising the safety and comfort of people walking along a corridor.



| 9.0 Program Areas

The physical bike network is supported by program areas that help make biking an easier, safer and more enjoyable option. The program areas of focus include:



9.1 Integration with Transit

Biking and public transit have a complementary relationship. Transit can increase the distance of trips that can be accomplished using a bicycle. Biking can connect transit users to origins and destinations at both ends of a trip. This is known as the “first and last kilometer” of a transit trip

Integrating biking and public transit can include:

- + Support for people to park their bike at the LRT Station/Transit Centre.
- + Support for people to access a bike or other transportation mode at the destination end of their transit ride. This could involve bike share, ride-hail, or walking to the destination.
- + Support for people to take their bike on the transit vehicle (bus or LRT).

The Bike Plan calls for a balanced approach to integration with transit, encompassing all of the inter-related elements listed, rather than just one approach.

9.1.1 Accommodating Bikes on LRT

(a) Consider initiating a pilot project to allow bikes on the LRT at all times, including weekday peak hours. A pilot project could help to better understand uptake, challenges and consequences by measuring impacts to ridership and collecting feedback from Edmontonians and operators. Feasibility of this pilot project could be assessed by:

- + identifying an appropriate study period and time of year in which to conduct the pilot project (e.g., during periods of lower ridership)
- + identifying resources and costs required to complete the pilot project (e.g., sign replacement, operator training)
- + identifying potential impacts of accommodating bikes on the LRT and at LRT stations/transit centres during peak hour operations and revise if needed (e.g., bike placement within each car or train, potential physical changes to create space for bikes, mitigating conflicts with other users in areas that experience above-average crowding)
- + developing a communications approach outlining purpose, target audiences, messaging, tactics and resources

(b) Review how other municipalities accommodate bikes on LRT trains in terms of seat configurations, boarding requirements, bike placement and supporting equipment.

9.1.2 Accommodating Bikes on Buses

- (a) Continue the current program of bike racks on all full-sized buses.
- (b) Monitor advancements in bike rack design, or cost-effective modification, to accommodate a broader range of bikes such as fat-tire bikes or cargo bikes.
- (c) Investigate the potential for using higher-capacity racks on high-demand routes.

9.1.3 Accommodating Bikes at LRT Stations/Transit Centres

- (a) Re-establish a program to provide secure and well-designed bike parking at LRT stations and transit centres.
- (b) Develop a hierarchy of bike parking configurations to be implemented in stages according to bike parking demand, including bike lockers and secure parking structures. These should be integrated with transit smart card payment systems when feasible.

9.1.4 Accommodating Bikes at Bus Stops

- (a) Update the Complete Streets and Design Standards to require high quality design configurations, such as the floating bus stops and raised bike lanes, where bike lanes traverse bus stop locations.
- (b) Pilot the incorporation of bike parking (basic racks, weather-protected racks) at selected transit stops to support first/last-kilometer accessibility, particularly along frequent transit network bus routes.

9.2 End-of-Trip Facilities

End-of-trip facilities refers to amenities, physical features and sometimes services, at bike trip destinations. These amenities make cycling more convenient and feasible for a broad range of trip purposes. Often these facilities are provided by employers or in commercial buildings.

An exemplary set of end-of-trip facilities could include many or most of the following attributes:

- | | | |
|----------------------------|------------------------------|---------------------------------|
| + proximity to destination | + showers and changing rooms | + mechanical services |
| + good wayfinding | + towels | + water fountain/refill station |
| + good security | + drying room | + charging station for e-bikes |
| + bike parking | + bike repair stand | |
| + lockers | | |

The recommended approaches for program elements related to end-of-trip facilities include:

9.2.1 Streamlining and Managing Bike Parking

- (a) Update design standards for on and off-street bike parking to accommodate a range of bicycle types.
- (b) Bike parking program alignment/consolidation:
 - + Determine program ownership within the City of Edmonton and collaborate to consolidate internal resources to support interim activities
 - + Align the operating budget to support program management and maintenance activities for bike parking facilities on City-owned land
 - + Establish capital funding to support the ongoing procurement and installation of bike parking infrastructure
- (c) Develop guidelines and specifications to support the provision of bike parking equipment on City-owned land, including:
 - + Incorporate bike rack standards in the City's Design and Construction Manual
 - + Update bike rack installation guidelines
 - + Establish prioritization and evaluation criteria (allowing for possible relocation of under-used racks).
 - + Finalize Downtown Streetscape Manual
 - + Incorporation of bike parking in the City's Transit Passenger Facility Design Guidelines

9.2.2 Increasing Public Access End-of-Trip Facilities

- (a) Continue the Bike Rack Request program
 - + Continue support for programs associated with bike parking on road right-of-way in business districts, main streets and transit centres
 - + Explore options for expanding existing programs through sponsorships or partnerships
- (b) Continue provision of bike parking facilities with capital projects:
 - + Continue to deliver bike parking elements in Transportation, Facility, Open Space, and LRT capital projects
 - + Align bike parking specifications in capital projects with City of Edmonton standards once they are available

- (c) Expand the Bike Corral program which installs bike parking on-street in areas of high demand, typically in the space of one or two motor vehicle parking stalls.
- (d) Assess the feasibility of expanding public bike parking facilities to include secure parking and maintenance services for bikes, as well as showers and changing facilities for riders, including gender-based analysis of appropriate design features.
- (e) Explore provision of secure bike parking facilities within the city's transportation network.
- (f) Explore opportunities for operation of secure bike parking facilities through third-party relationships.

9.2.3 Increasing Private Access End-of-Trip Facilities

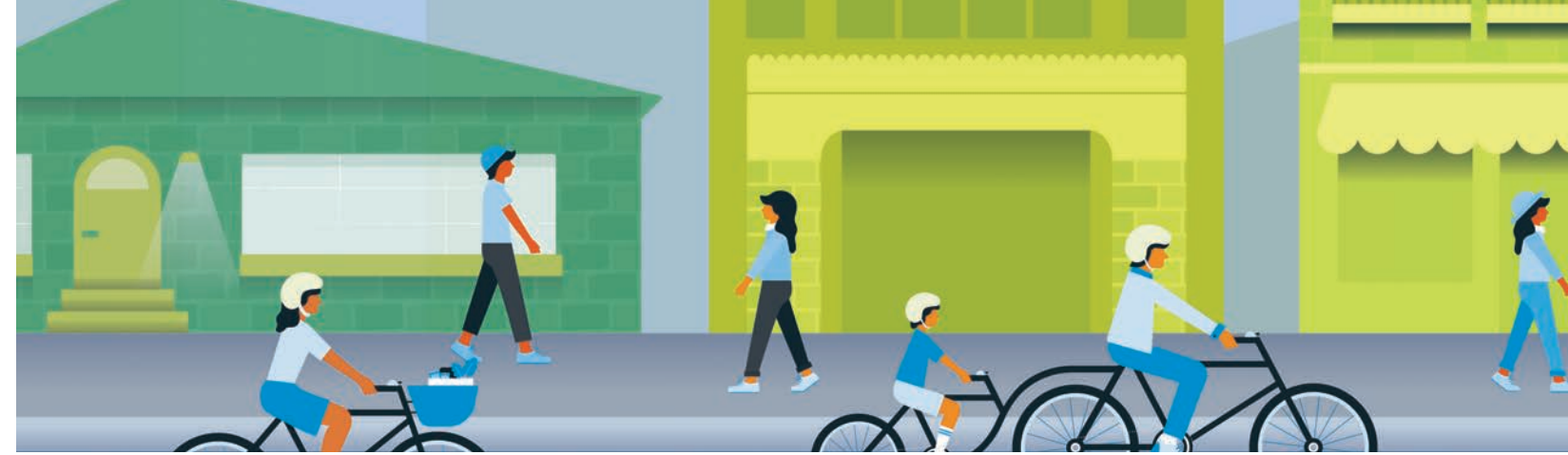
- (a) Revise the Zoning Bylaw to update the quantity, location, and design of bicycle parking required in private developments to support City strategic objectives such as mode shift. Increase enforcement and encouragement of implementing such parking, including design and installation guidance to make it easier to provide suitable parking.
- (b) Revise bylaws to require private non-residential buildings to provide secure bike parking and amenities such as changing rooms, lockers, and showers.
- (c) Pilot a retrofit program to support, encourage, and facilitate the creation of secure bicycle parking and end-of-trip facilities in existing non-residential developments to meet the updated bylaws and design standards.

9.3 Bike Share and Shared Micromobility

Bike share or bike sharing refers to a system in which a user has temporary access to a bicycle in locations distributed across a specified geographic area. More specifically, it allows users to make short trips at low cost by picking up a bicycle at one location and dropping it off at another. The user accesses the bicycle through a payment system, which unlocks the bicycle directly in a dockless system or at a designated location in a station-based (docked) bike share system.

Broadly speaking, the objectives of bike share systems are to:

- | | |
|---|---|
| + Improve transportation choice and lower the cost of transportation | + Reduce greenhouse gas emissions and traffic congestion |
| + Support multi-modal transportation by providing an important connection option for the first and last kilometre of trips | + Improve people's health by being more physically active |
| + Provide cycling opportunities to those who do not feel comfortable bringing their bicycle into an urban area due to fear of bicycle theft | + Support local tourism |
| | + Increase demand for more dedicated cycling infrastructure and improve cycling culture |

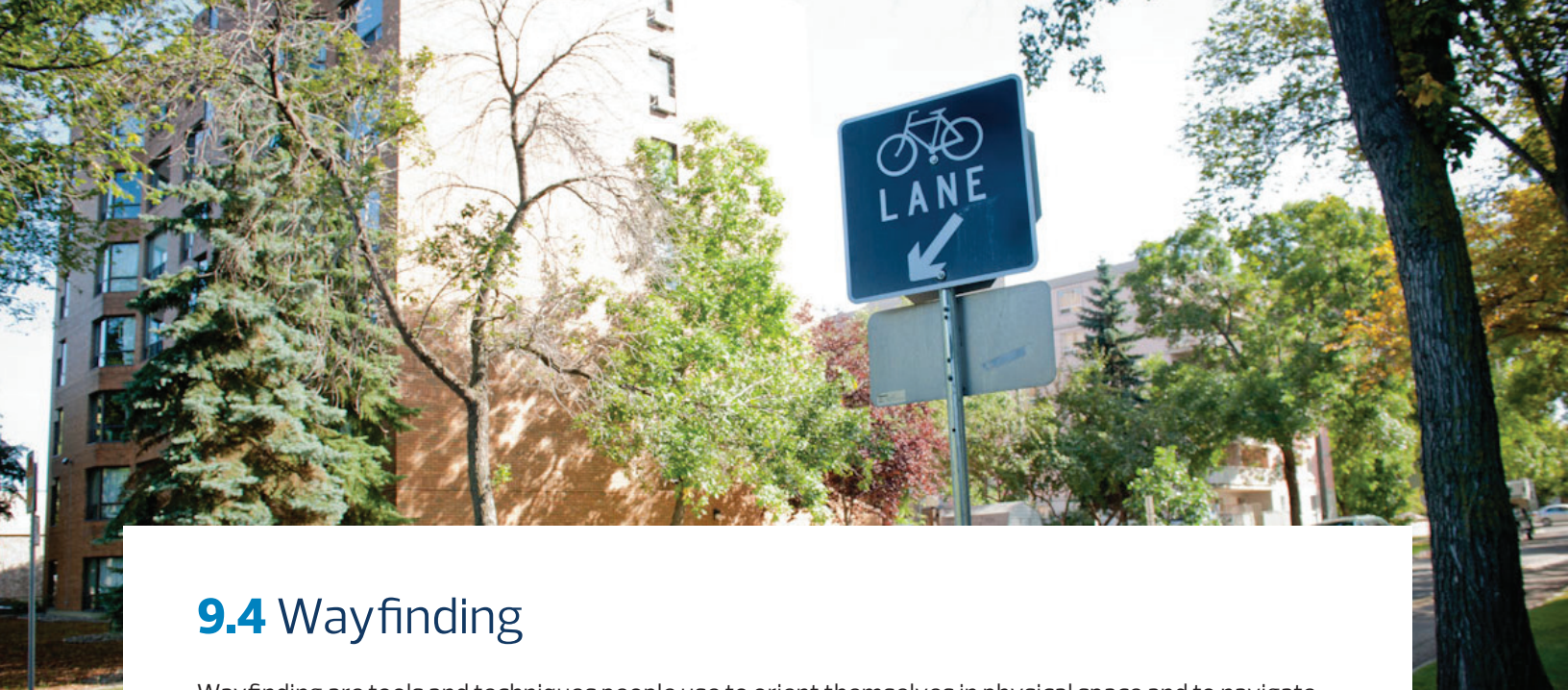


In addition to bike share systems, the Bike Plan addresses shared micromobility more broadly, which encompasses shared fleets of vehicles such as e-bikes and e-scooters. Shared micromobility is a rapidly evolving industry, which has the potential to increase demand for bike routes and provide more affordable alternatives to trips by car.

The recommended approaches for program elements related to bike share and shared micromobility include:

9.3.1 Developing Parameters for Bike/Micromobility Sharing

- (a) Assess bike share and e-scooter share services for their ability to improve transportation access and support city-building goals.
- (b) Conduct a feasibility study to understand:
 - + the specific type of shared systems (e.g., docked vs. dockless)
 - + the costs versus benefits of each system
 - + how ownership and operations could work
 - + the overall scale of the system including the number of pedal bikes, e-bikes, and e-scooters along with how many docking stations (if that is the chosen system)
 - + payment methods and service areas to support equal access to residents
 - + data sharing requirements
- (c) Establish principles of what bike/micromobility sharing should broadly deliver to Edmontonians.
- (d) Establish role and degree of direct involvement of City of Edmonton in relation to implementing bike/micromobility sharing.
- (e) Develop specific parameters for bike/micromobility sharing, including:
 - + Fleet size for each system (e.g., bike, e-bike, e-scooter)
 - + Desired parking areas including the designated parking zones, signage and pavement markings.
 - + Criteria for where to site bike share docking stations.
 - + Safety criteria, such as where to operate within the street cross-section, operating speed.



9.4 Wayfinding

Wayfinding are tools and techniques people use to orient themselves in physical space and to navigate in places they are not familiar with. The term wayfinding is often used interchangeably with signage, but is much broader and includes maps, signs, web applications and even the design of buildings and spaces.

It is important that wayfinding provides simple, clear and intuitive information to help people navigate spaces effectively. It helps people identify how they can navigate a city, neighbourhood, or active transportation network from their present location to their destination.

The objectives of wayfinding include:

- + Familiarizing users with the bike route network
- + Identifying the best routes to destinations
- + Overcoming a “barrier to entry” for infrequent cyclists
- + Reducing the tendency to overestimate the amount of time it takes to travel by bicycle
- + Helping to alert people driving that they are near a bike route and may encounter people riding
- + Passively marketing the bike network by providing unique and consistent imagery throughout the jurisdiction
- + Helping make biking appealing as a convenient, effective mode of transportation
- + Guiding recreational users to explore and access desirable destinations

The recommended Bike Plan approach for program elements related to wayfinding are:

9.4.1 Signing Bikeways

(a) Develop and implement a bicycle wayfinding system, integrated with other City wayfinding systems, that includes bikeway network signing with information on destinations, distances or travel times, and route orientation.

(b) Remove existing bicycle wayfinding elements that are not consistent with the system (e.g., potentially remove old bike route signs).



9.4.2 Naming Bike Routes

(a) Establish a practice for naming bike routes in Edmonton, based generally on building cycling culture, by defining a process to accommodate grassroots informal names rather than institutionalizing a formal naming system.

(b) Partner with broadly-established user organizations (e.g., Bike Edmonton, Paths For People) to assist in vetting appropriate informal names and potential ways to incorporate informal naming into bike wayfinding.

9.4.3 Digital Wayfinding

(a) Evaluate the costs and benefits of increasing Edmonton's digital capabilities for bikeway network wayfinding (e.g., trip planning integrated across all modes of transportation; wayfinding integrated in real-time with user preferences or needs such as accessibility).

(b) Ensure that existing digital wayfinding is functioning well (e.g., suitable technology) and kept up-to-date.

9.5 Lighting

Lighting is a critical component of bicycle transportation infrastructure. Lighting can enhance the aesthetics of the built environment, increase comfort and safety, and assist with wayfinding. The most important areas for lighting are intersections which need to be illuminated to allow a person biking enough time to see the intersection and take appropriate action in advance of the crossing. Lighting enables cyclists to be seen, and to see others, while crossing the intersection. Bridges, under and over passes, crossings, and tunnels are other examples of candidate locations for lighting in the transportation network.

The objectives of lighting are to:

- + Enhance both real and perceived comfort, security, and safety
- + Complement and enhance the design of cycling facilities
- + Help improve and complement wayfinding, navigation and observation
- + Improve the character and attractiveness of the public realm that surrounds bicycle facilities

The recommended approach for program elements related to lighting:

9.5.1 Developing Lighting Standards for Bikeways

(a) Assess current lighting for on-street bikeway facilities to understand how they compare to best practices and Edmonton lighting standards.

(b) Assess current lighting for off-street facilities including shared pathways to understand how they compare to best practices and Edmonton lighting standards.

(c) Update the Complete Streets Design and Construction Standards to indicate the specific lighting design standards for all bikeway facility types in the city, including:

- + **Illuminance levels**
- + **Type of lighting (e.g., pedestrian-scale lamps) including location, placement, and height.**
- + **Colour and Uniformity including specific hues of LED lighting for personal safety and maximizing visibility.**
- + **Power sources including potential for solar or renewable-powered lighting.**
- + **Adherence to City of Edmonton energy efficiency policy and principles.**

(d) Establish specific lighting standards for shared pathways and trails that indicate locations and lighting illuminance levels to mitigate adverse effects on wildlife and natural ecosystems.

9.6 Maintenance

Bike routes, whether on-street such as bicycle boulevards, bike lanes, or protected bike lanes or off-street such as shared pathways or trails, require regular maintenance to ensure they provide safe cycling conditions for existing and potential riders.

Maintenance is required in all four seasons and includes numerous activities:

- + **Seasonal maintenance activities including:** sweeping and removing gravel, debris, and leaves; trimming adjacent vegetation; and adjusting bollards and other elements related to protected bike lane delineators.
- + **Strategies for construction zones including:** detour and temporary accommodations through work zone management and temporary traffic control plans as well as maintaining accessibility for people cycling as well as those walking.
- + **Winter seasonal maintenance activities including:** setting up and removing snow fence, clearing and removing snow, and treating and removing ice or slippery conditions.
- + **Asset management activities including:** repairing pavement surfaces and other road surface appurtenances such as utility covers; replacing worn pavement markings, signs, and signals; mitigating locations with pooling water or drainage issues; replacing broken delineators; replacing and maintaining planters; maintaining street and path lighting; and repairing and maintaining bikeway maintenance equipment.

The recommended Bike Plan approach for program elements related to maintenance include:

9.6.1 Maintaining Bike Routes In All-Seasons

(a) Sweep on and off-street bike routes to remove leaves, gravel, glass, sticks and other debris on a regular basis. Online or 311-system reporting by bicycle users can help the City target sweeping activities.

(b) Trim trees, shrubs, bushes, and other plants to ensure horizontal clearances from the edge of a bikeway and adequate sightlines are provided at intersections.

(c) Create a prioritized network of bike routes for winter maintenance, define maintenance standards, publicize the prioritized bike route locations and when they have been cleared, and report on winter maintenance performance.

(d) Establish a minimum cleared width for bikeway facilities during winter to direct the timing of snow removal operations.

9.6.2 Maintaining Bicycle Facility Infrastructure and Equipment

(a) Establish a long-term asset management program and capital and operating budget to maintain, repair, and replace the bike route surface, medians, adaptable infrastructure (e.g., parking curbs and mini barriers), pavement markings, and signs for both on-street and off-street facilities.

(b) Maintain and repair bicycle signals and actuation infrastructure as part of the traffic signal asset management program.

(c) Maintain, repair, and replace bike facility maintenance equipment as part of the equipment asset management program.

9.6.3 Retaining Access During Construction

(a) Update the On-Street Construction and Maintenance (OSCAM) permitting and temporary traffic control plan requirements to ensure temporary bike routes provide a similar level of comfort, safety, and travel distance to users of the existing facility when construction activities close or disrupt the operation of existing bike routes. This includes on-street and off-street bike routes.

(b) Update reconstruction requirements for restoring bike routes to their full pre-construction condition, including surface materials and pavement markings, when underground work (by City or external agencies) disrupts the bike route surface.



9.7 Education

Bicycles are an increasingly important and prominent part of urban transportation systems. It is important that everyone who uses the transportation system, whether they drive, walk, bike, ride transit, or use other modes, understands how to interact safely with people biking. The regulations and best practices that govern all users can be taught through various education programs, training classes, and awareness campaigns.

Education as part of the Bike Plan is intended to:

- + **Increase knowledge of the safe and appropriate use of bicycles and powered micromobility for transportation or recreation**
- + **Increase knowledge of the safe and appropriate behaviour of people walking and other people using bikeways**
- + **Increase knowledge of the safe and appropriate use of motor vehicles, including interactions with people riding bicycles and along streets with bicycle infrastructure**
- + **Improve bicycle operating skills**
- + **Increase knowledge of bicycle planning, design, and operations practices for City staff and staff of partner agencies**

The recommended Bike Plan approach for program elements related to education include:

9.7.1 Educating Public Users

- (a) Identify agencies and community groups that will collaborate on developing and delivering educational materials, including multilingual materials, where appropriate.
- (b) Expand and support existing and new bicycle education programs for people cycling and driving through partnerships with community organizations such as the Alberta Motor Association and the Edmonton Police Service, to teach defensive driving and cycling techniques and the rules of the road.
- (c) Continue education materials and interactions to support opening new bike routes using a street team and online resources.
- (d) Work with other Alberta municipalities and Alberta Transportation to develop, update, and include educational materials regarding motor vehicles and bicycles in driver's training and the Alberta Driver's Guide.
- (e) Develop an enhanced shared pathway and trail etiquette campaign to promote friendly behaviour on off-street paths and trails by all users.

9.7.2 Bicycle Skills Training

- (a) Establish or support in-school resources for elementary school ages covering basic bicycle skills training and safety in partnership with Edmonton school districts or non-governmental organizations.
- (b) Support skills and safety training programs for adults and older adults offered by community organizations.

9.7.3 Educating Staff

- (a) Implement training programs on industry bicycle infrastructure design and operations guidelines and standards (Transportation Association of Canada Geometric Design Guide for Canadian Roads, Transportation Association of Canada Manual of Uniform Traffic Control Devices for Canada, and others) for City staff in planning, design, and operations departments.
- (b) Provide and/or encourage training on bike infrastructure and operations for contractors and consultants involved in the Bike Plan implementation.
- (c) Support City staff in ongoing technical training through low-cost, creative ways such as webinars and courses through transportation industry organizations (e.g. Transportation Association of Canada (TAC), Institute of Transportation Engineers (ITE), National Association of City Transportation Officials (NACTO), Association of Pedestrian and Bicycle Professionals (APBP), Federal Highway Administration (FHWA), American Association of State Highway Transportation Officials (AASHTO)).
- (d) Support City staff in focused technical training to address specific major issues (e.g., potential on-site visits to successful/leading cities for bike facilities, bike share).

9.8 Encouragement

Creating a supportive culture for cycling requires addressing barriers people face and the fears people have of cycling. This has been shown to help normalize riding a bicycle for transportation or recreation for people of all ages and abilities. Encouragement programs and events help create and maintain a strong and fun bicycle culture and community. They are focused on generating enthusiasm and excitement for cycling and often include a social element, such as a community bike ride. Encouragement actions aim to reach all types of potential bicycle riders, but especially those who are interested in bicycling more but currently do not ride regularly.

Encouragement as part of the Bike Plan is intended to:

- + **Provide opportunities for people to see cycling in a new light and possibly change their attitudes toward cycling**
- + **Offer a comfortable, low-stress opportunity for people to try cycling**
- + **Create incentives to ride a bicycle to work, school, or for other reasons**
- + **Offer partnership opportunities with other organizations and groups with common objectives related to health and well-being, safety, economic development, community vitality, and more**
- + **Reinforce the features of and investments in the built environment, for example protected bike lanes, shared pathways, and bike parking, that support riding a bicycle.**

The recommended Bike Plan approach for program elements related to encouragement include:

9.8.1 Developing and Implementing Safe Routes to School Program

(a) Establish a sustainable transportation mode share goal for trips to and from elementary, junior high, and high schools in partnership with Edmonton-based school districts, Alberta Health Services, and Alberta Education and conduct annual surveys of travel modes for students and staff to track progress toward goals over time.

(b) Create Safe Routes to School programs for all schools in partnership with School Districts, Alberta Education, Alberta Health Services, Edmonton Police Service, and parent associations. The Safe Routes to School programs would include identifying infrastructure needs and creating and implementing encouragement and promotion initiatives.

9.8.2 Marketing Cycling

(a) Create targeted marketing, personalized travel planning, and incentive programs with neighbourhoods, businesses, and user groups to increase awareness of and comfort with cycling (e.g., with employers, community leagues, women, older adults). Use available international and

local research (e.g., University of Alberta), to inform the marketing campaigns that speak to all users (people walking, cycling, driving, and riding transit) and support choosing to ride and route choice.

(b) Organize a program to provide personalized bike travel planning and encouragement.

(c) Create a Bicycle-Friendly Business Districts Program that promotes cycling and local businesses. Partnering with Business Associations, local businesses that provide amenities in support of cycling, such as bicycle parking, discounts, and rewards for cycling, would be identified and promoted, thus encouraging people to shop at these businesses.

(d) Support organizations that offer bicycle parking at community events by promoting their services and publicizing cycling as an option to travel to and from events.

(e) Align the Bike Plan marketing with other City initiatives (e.g., Live Active Strategy, WinterCity Strategy, Child Friendly Edmonton, Wayfinding) which have common objectives and strategies in support of biking.

9.8.3 Hosting and Supporting Bicycle Events

(a) Implement an Open Streets program of events in partnership with community and business organizations and seek ways to ensure participation from neighbourhoods across the city. Open Streets locations should be chosen based on the popularity of surrounding destinations, ease of controlling access points, street surface condition, and anticipated support from implementing partners.

(b) Organize, host, and support events to increase people's comfort with cycling to work including events and activities for Bike Month, Bike-to-Work Day, and Winter Bike-to-Work Day.

(c) Support and promote activities that support recreational riding offered by other community organizations, advocacy groups, and other organizations such as group bike rides for seniors, women, or children, and community bicycle tours of neighbourhoods or areas of the city, all of which can also be targeted to specific demographics, if desired.

(d) Increase partnerships with community organizations to support coordinated encouragement programs that maximize the impact of each organization's investment, reduce redundancies, and increase efficiency and reach. This could include facilitating and supporting existing bicycle promotion events and activities and creation of new ones.

9.8.4 Establishing the City as a Leader

(a) Implement and/or continue actions where the City of Edmonton can lead by example in encouraging a bike-friendly culture in its operations and activities, from staff commuting policies and incentives, to policies ensuring good bike facilities at municipal sites.



ENGAGEMENT PROFILE:

Coffee Outside: Get to know your fellow rider

by Glenn Kubish

There's a quiet invitation toward sociability built into the open frame of the bicycle. No windshield or roof. Parking is pretty straightforward. On a bike, it's easy to stop and talk with people you come across.

For more than five years, Coffee Outside has accepted this invitation, and, in the process, built itself into a unique collection of some of the unique people who ride bicycles in Edmonton. Coffee Outside meets once a week on Friday mornings in Constable Ezio Faraone Park at the north end of the High Level Bridge. The idea is to stop, share stories, admire the view, ask how each other is doing, listen, laugh, support charity drives, compare notes on the state of cycling infrastructure in the city—and then head back on the road toward the day. The door is open to all. There is no door. That's the point.

Weather is not a factor. Bring your own coffee in a thermos, maybe bring a little extra for newcomers. The artisanal in the group grind their own beans and brew on the spot. Some people bring tea. Coffee Outside does not screen for tea.

If you're lucky, you'll stop by on a Friday when the Handlebarista is there. The Handlebarista modified a cargo bike into a giant coffee machine from which he gifts coffee until the beans run out. Follow the community at [@coffee_outside](https://twitter.com/coffee_outside).

9.9 Laws and Policies

A community's laws and policies can deter or support people who currently bike or would like to bike. Ensuring laws and policies create a supportive environment to ride a bicycle can help reduce barriers to cycling recreationally or for transportation for people of all ages and abilities.

Laws and Policies as part of the Bike Plan are intended to:

- + Regulate user interactions and create a safer transportation system
- + Ensure regulations and laws are known to all road users
- + Ensure land use patterns make cycling a reasonable and desirable transportation alternative for common trips
- + Reinforce the features of and investments in the built environment, such as protected bike lanes, shared pathways, and bike parking, with laws and policies that support bicycle-friendly communities.

The recommended Bike Plan approach for program elements related to laws and policies are:

9.9.1 Updating Traffic Laws and Bylaws

Because some cycling regulations are set by provincial legislation, partnering with Alberta Transportation and other Alberta municipalities will be necessary to update the Traffic Safety Act and clarify the Rules of the Road. Some actions can be taken independently by the City of Edmonton through bylaw updates. The following actions will enhance the regulatory framework regarding cycling:

- (a) Define what constitutes a reasonable passing distance by adopting a minimum passing distance law or bylaw, and address the need to reinforce this.
- (b) Establish lower speed limits to enhance safety for people who bike in accordance with the Vision Zero approach to safe mobility.
- (c) Incorporate crossrides into the Traffic Safety Act and the Use of Highway and Rules of the Road Regulation to explicitly permit cyclists to use crossings without dismounting. Calgary has established a local bylaw to legislate right-of-way at crossrides, which could be an alternative.
- (d) Adopt legislation to allow side-by-side riding to permit social cycling.
- (e) Examine the adoption of an Idaho stop policy, where people cycling can yield at a stop sign rather than come to a full stop.
- (f) Examine the adoption of an anti-harassment bylaw, where fines or other actions can be taken against drivers who harass other people who are using the street.
- (g) Review and define the types of users that can operate in bikeways including powered micromobility devices, wheelchairs, and others and the regulations for their operation, in general.

9.9.2 Increasing Public Awareness and Compliance with Traffic Laws

- (a) Target enforcement campaigns on issues that are more likely to result in collisions or hinder the development of a positive cycling culture. The specific laws and bylaws to be enforced should be determined by analyzing data regarding common infractions and their effect on the safety of people cycling and all road users.
- (b) Develop a holistic enforcement strategy that considers community involvement, driver feedback signs, automated enforcement, and EPS enforcement to support Vision Zero and create a Safe System that manages red light running and speeding.
- (c) Encourage compliance with equipment requirements for people cycling (bells, lights, helmets for children) by distributing free equipment during cycling-related events or offering it at a very low cost, particularly to new riders or Edmontonians with a low income.
- (d) Offer diversion programs in lieu of traffic fines, or in exchange for a lower traffic fine for some bicycle-related offenses, particularly first-time offenders. Diversion programs could include taking a bicycle traffic safety course to increase their awareness of applicable laws and regulations. This approach can also be more equitable enforcement solution for offenders with a low income.
- (e) Maintain or expand the presence of police officers patrolling on bikes to model behaviour and provide positive enforcement and education to people driving and people cycling.

9.9.3 Updating Land Use and Transportation Policies

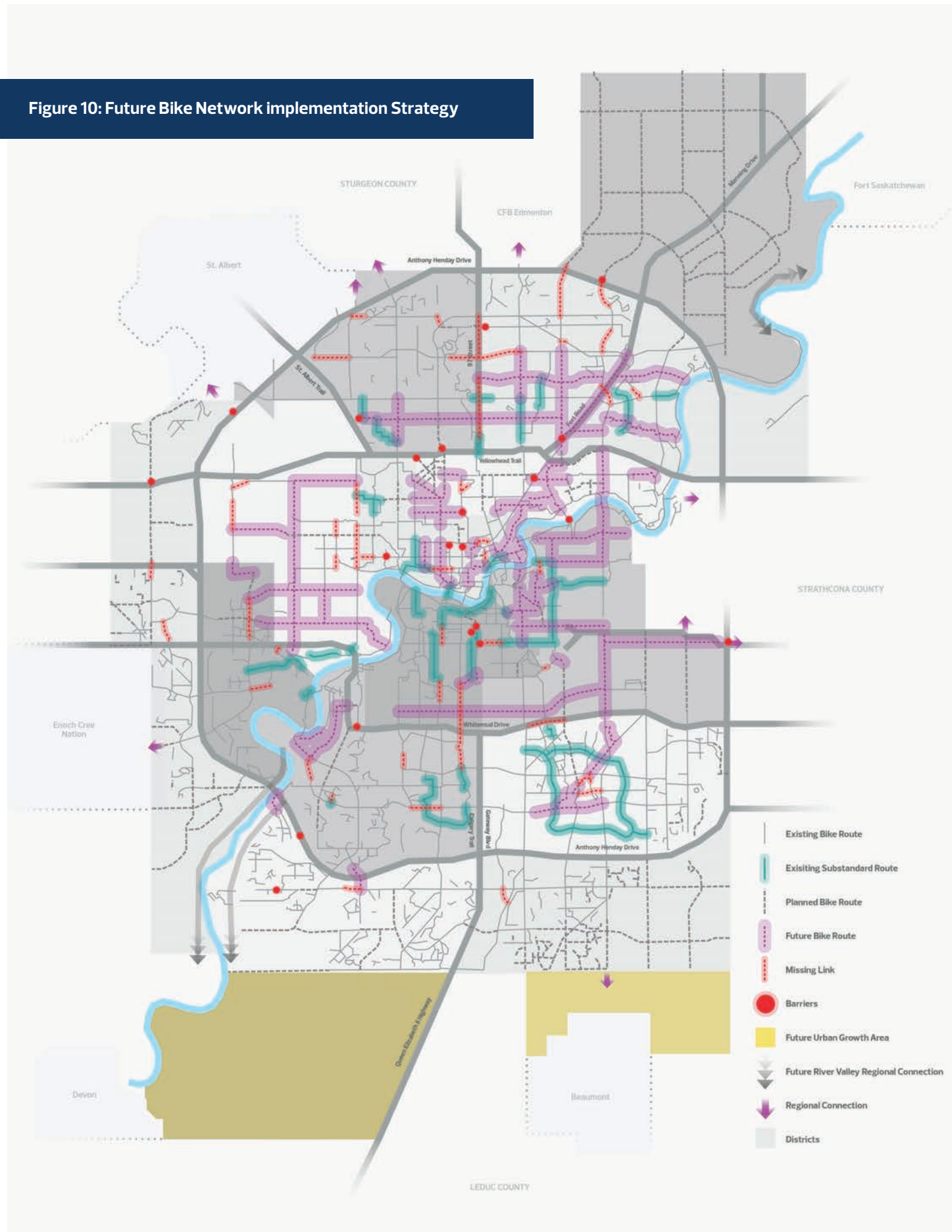
- (a) Review and update policies and guidelines that regulate increasing density and land use mix and in creating welcoming neighbourhoods.
- (b) Apply existing policies, guidelines, and processes in a consistent and rigorous manner to achieve their stated goals, including increasing density and land use mix and creating welcoming streets and neighbourhoods.



10.0 Implementation



Figure 10: Future Bike Network implementation Strategy



10.1 Bike Plan to Bike Route

The future bike network implementation strategy guides engagement, planning and the design of future bike routes while recognizing there will be varied opportunities for bike network improvement and expansion.

Implementation of the future bike network may happen as stand-alone bikeway infrastructure projects to improve cycling connections. It may also be implemented in coordination with capital projects such as arterial roadway construction and renewal, neighbourhood renewal, open space projects, and major infrastructure projects like LRT expansion. When a capital project is initiated along or near the bike network, the scope of the project should be reviewed at an early stage to identify the extent to which the project should support the planning and design of bike routes.

Figure 10: Future Bike Network Implementation Strategy identifies which portions of the future bike network are planned and designed, existing but substandard, missing links within existing routes, or new future routes. The Future Bike Network Implementation Strategy also illustrates other aspects of the future network such as substantial barriers and future regional connections. Each of these components of the future bike network requires a different level of detail and approach to planning and design.

The Future Bike Network implementation strategy focuses primarily on district connector routes but it also depicts locations of existing neighbourhood routes to illustrate connectivity between the neighbourhood routes and district connectors. However, the majority of future neighbourhood routes are not shown as they will be planned and designed at a local level based on network spacing requirements and input from residents. Potential future neighbourhood routes are identified where they would provide continuous cycling opportunities across neighbourhood boundaries, and the need for project coordination between adjacent neighbourhoods.



1. Existing Bike Routes

The existing bike network includes bike routes of various facility types that currently exist from shared roadways to protected bike lanes. The existing bike routes are the starting point for the future bike network and provides the base network that can be expanded and improved. Understanding the locations of existing routes highlights where elements of the bike network are already in place. Building on the existing network helps ensure resources can be efficiently allocated and allows the future bike network to incorporate existing bike routes wherever possible.

1 Approach:

When projects are planned on or near an existing bike route, the continued accommodation of bicycles should be included as part of any changes to infrastructure. This is also an opportunity to confirm whether the existing infrastructure is appropriate and meets current standards. If it is determined that the existing route does not meet current standards, the approach for substandard bike routes should be applied.

Engagement may focus on validating existing routes and identifying any refinements or improvements. The location and need for the route are already established but there may be opportunities to consider adjusting route locations if the validation process suggests alternative alignments may better serve the community and broader network.

2. Substandard Routes

Substandard routes are portions of the bike network that currently exist but require upgrades, improvements, or relocation. Not all existing bike routes meet the current City of Edmonton standards. Examples may include:

- + **shared road – high traffic routes**
- + **narrow shared pathways**
- + **painted bike lanes on high volume, high speed roadways**
- + **locations where there are high volumes of people walking and cycling in a shared space**

Routes may also be identified as substandard if there are concerns about the state of the infrastructure, like pavement quality, or the location of the route, such as existing on-street routes that may not align well with the future network.

2 Approach:

When projects are planned on or near a substandard bike route, the project should review the state of the existing infrastructure and its connections with the rest of the bike network. The review will consider how the existing route could be improved/relocated to better achieve the network principles, and identify the steps required to make this change. This may include reviewing potential alternative corridors and infrastructure options similar to the locations identified as future bike routes.

Engagement may focus on the benefits/impacts and preferences related to infrastructure and location options that would bring the route up to existing standards. The need for the route is already established but community input can help inform how the route will change, including discussion of alternative corridors if applicable.



3. Planned Routes

Planned routes include any bike-related infrastructure like shared pathways and on-street bike lanes that are currently planned or designed through the engineering design process. Planned bike infrastructure describes routes that are a part of capital projects or that are currently designed or in the design process. Not all planned bike routes are currently funded and timelines for implementation may vary. Recognizing these projects as elements of the future bike network ensures that other bike routes can be planned to ensure connectivity with planned or designed routes.

3 Approach:

Planned bikeways have alignment and facility type confirmed. As such, the work for these projects is typically already envisioned to be part of an existing capital project. When a project proceeds in the location of a planned bike route, the suitable facility type should be reconfirmed, and any necessary connections to the rest of the network included. The improvements to the bike network that are included as part of planned capital projects should be considered as project benefits to support project funding and prioritization.

Engagement will likely have already occurred as part of the planning and design process. The need for the route, the location, and the majority of the design details will be established through past engagement.

4. Missing Links

Missing links are segments that connect to an existing bike route on one or both ends. Missing link connections are also described as being location specific meaning that the connection should be located along the road specified on the map in order to maintain network principles of directness and connectivity.

4 Approach:

When any projects are planned along a route identified as a missing link, the project should complete the missing link. The completion of missing links should consider the context of the project area as well as the network on either side of the gap. This will include consistent facility types whenever possible and minimizing transitions including switching sides of the street.

Engagement may focus on design, facility type and integration with the existing network. The need for the bike route and corridor location are already established.

5. Future Bike Routes

Future routes are new bike routes that would contribute to creating a comprehensive city-wide bike network. Future routes are mostly new district connector routes in areas currently underserved by cycling infrastructure, but also include neighbourhood bike routes, connections to the River Valley and ravines and routes required to achieve the recommended network density.

5 Approach:

The identification of a future bike route is intended to communicate a need for a connection in the vicinity of the line shown, but the specific alignment for each route is not yet determined. Potential bike route alignments should be explored and constraints identified (e.g., right-of-way constraints) prior to considering bikeway facility design options. Bike route location and facility type options should be evaluated with respect to achieving the network principles using technical analyses to understand and communicate the trade-offs associated with each option. This work will support the engagement with the community and stakeholders.

Engagement starts with developing a vision for the corridor/area by understanding the values of the community and stakeholders, gaining a better appreciation for existing conditions (e.g., travel patterns, desire lines, challenges, nearby destinations) and understanding the role the route has within the overall network (e.g., city-wide travel or neighbourhood travel). Potential alignments and facility design options are shared for validation and feedback. Refined bike route location and facility type options are evaluated and a preferred option is shared with the community.



ENGAGEMENT PROFILE: *Bike Plan to Bike Lane: The Value of Community-Driven Bike Planning*

After several months of advocacy from the QA Crossroads Committee of the Queen Alexandra community, in April 2015, the City of Edmonton partnered with seven communities on Engage 106-76. This pilot project explored how 106 Street and 76 Avenue could become walkable, bikeable and livable public spaces. Julie Kusiek, a passionate and energetic community leader and connector, was a major force behind the community-led initiative.

She emphasizes the need for community engagement that brings people with different perspectives together to find common ground, and values the lived experience of Edmontonians. In her mind, success also hinges on mutual respect and trust between City staff and citizens. Engage 106-76 took more than four years from planning to completion, but the community now has raised crosswalks, protected bike lanes and quieter streets: the livable public spaces they envisioned. Perhaps most importantly, the project has strengthened connections between community members, laying a foundation for future conversations.

“As we’re planning for active transportation, we need to recognize that there is a contribution that community volunteers can make that cannot be effectively or efficiently substituted by City staff.”

– Julie Kusiek

6. Barriers

Barriers are locations where there is an obstacle in the way of a well connected network which is unlikely to be overcome for bicycle projects alone. Examples of barriers include railway crossings and bridge/interchange connections. Barriers are noted to ensure that if there are changes in infrastructure, accommodations for bicycle traffic should be included to remove the barrier. While some barriers present an obstacle over an extended distance, such as freeways and ravines, only the locations where bicycle accommodation is needed for connectivity are identified. Smaller barriers such as complex intersections may be identified and mitigated as part of individual infrastructure projects.

Approach:

When any capital project includes a barrier location, opportunities to accommodate bicycle riders should be prioritized even if the connecting bicycle routes are not yet in place. This ensures that when future or planned bicycle routes are completed, the substantial obstacles have been removed. Examples may include rail crossings and/or rail removal, bridge reconstruction/rehabilitation and intersection reconstruction or reconfiguration.

Engagement should be part of public engagement activities planned for the larger capital project to address the barrier. The identification of a barrier on the bike network confirms the need for bicycle accommodation, even if the route connections on either side are not continuous. Engagement may focus on how best to accommodate bicycle riders as part of the barrier crossing.

7. Regional Connections

Regional connections represent conceptual opportunities to ensure that the bike network provides access not only within Edmonton, but also includes broader connections to form a regional network. Regional connections are shown based on apparent opportunities where the bike network may align across jurisdictional borders while also considering opportunities to traverse some of the most significant barriers between the City of Edmonton and adjacent municipalities and counties.

Approach:

Regional connections will require ongoing coordination between the City of Edmonton and regional partners. In some cases, the connections are not currently established on either side of the jurisdictional boundary. Any route connecting to a location identified as a potential regional connection should consider how the routes will connect, and ensure that the relevant regional partners are open to ensuring the network will be connected while recognizing that the planning and construction timelines may not always align for all partners.

Engagement will emphasize ongoing coordination with the regional partners to ensure connections are functional across jurisdictional lines.

10.2 Monitoring and Evaluation

The purpose of a monitoring and evaluation program is to determine if changes made in the bike network, supporting infrastructure, or programs are having the intended outcomes on the community conditions. Monitoring and evaluation programs can also gauge the effectiveness of how the plan and its associated programs are being delivered. Two areas must be measured: program outputs and community outcomes. Interim and ultimate goals should be set by the City to allow for learning and adaptation of the policies, procedures, and implementation of the Bike Plan. Implementing a monitoring and evaluation program will result in more effective, deliberate, and impactful interventions and modifications to the implementation of the Bike Plan. The precise measures and methods of evaluation are further explored in the Bike Plan Implementation Approach.

What to Measure

The program outputs and community outcomes associated with the Bike Plan should be measured. Program outputs are associated with the institutional products and activities such as policy, programs, infrastructure operation, maintenance, and construction that the City is responsible for delivering or that are delivered by partner agencies. Community outcomes are related to the performance, behaviour, and perceptions of Edmontonians towards the program outputs that are implemented by the City. Examples of performance measures related to each of these areas are shown below.

Program Outputs	Community Outcomes
+ Amount of bicycle infrastructure constructed	+ Usage of the infrastructure and programs by gender, age, ability
+ Connectivity of the network	+ Lawful behaviours by all transportation users
+ Access and availability to the network by distance and/or time	+ Safety performance (e.g., collision rates)
+ Access and availability to the network by distance and/or time with consideration to equity	+ Comfort levels with cycling for people by gender, age, ability
+ Maintenance and Operation performance	

The performance areas above should be reported on a city-wide scale; however, comparisons and regional analysis (e.g., allocation based on factors associated with equity) can be completed when the performance measures are reported at a city-wide, district, or neighbourhood scale. Measurement can also be done annually as well as over longer periods of time to provide an indication of long term progress/performance.

How to Measure

There are a variety of methods that could be deployed to collect the data that would support the Monitoring and Evaluation Program.

- + **Expand the use of fixed counting devices (inductive loop detectors, motion detection) at key locations within the network to monitor usage year-round**
- + **Develop partnerships with local organizations to conduct a field count campaign to supplement the fixed counting devices (annually or semi-annually) and evaluate the share of men/women/children etc.**
- + **Use in-person and online engagement to obtain qualitative data related to experiences, comfort levels, near misses, perceptions, and behaviours**
- + **Engage local academic institutions to analyze the cycling data and develop insights that could inform future infrastructure deployment**
- + **Leverage and expand citizen reporting of maintenance issues to the 311 system**
- + **Obtain collision and near miss data from various sources (e.g., BikeMaps.org, Alberta Health Services, Edmonton Police Service).**

The methods described above can be deployed to determine the usage of a piece of infrastructure or a specific corridor, or can be deployed in a coordinated manner for evaluation of an area (e.g., cordon counts of key activity areas).

Some aspects of monitoring will correspond to the trial initiatives identified as recommended actions. For example, relative to the Integration With Transit program area, monitoring activities should include:

- + **number of bikes using racks on buses**
- + **magnitude and patterns of bikes passed-up by buses with full racks**
- + **magnitude and patterns of bikes on LRT (during pilot)**
- + **magnitude and patterns of bikes passed-up by full LRT vehicles**
- + **magnitude and patterns of bikes parking at LRT Stations / Transit Centres**



10.3 Other Implementation Considerations

Implementing the Bike Plan, in particular the Program Areas, will seek to establish partnerships with community groups and external agencies. The Bike Plan implementation is addressed under separate cover, and identifies:

- + **Network implementation approach examples**
- + **Future projects including high-level cost estimates**
- + **Project prioritization criteria and results**
- + **The all-season bike network including operations assessments**
- + **Resource requirements, including the potential of designating program managers to implement specific program areas.**

The implementation plan is intended to be updated with each budget cycle.

11.0 Glossary and Acronyms

11.1 Glossary

Term	Description
active transportation	Any mode of transportation by which people use primarily their own energy to power their motion.
All Ages and Abilities (AAA)	A benchmark of perceived bike-friendliness applied to a city's bike network to be attractive as a safe, equitable mode for the majority of people (including barrier-free, age-friendly, and universal design).
bike	A vehicle with two or three wheels, operable pedals and brakes, handlebars for steering, and solely human-powered. (Also referred to as: bicycle)
bike infrastructure	Infrastructure supporting biking. (See also: <i>bikeway facility</i> .)
bike network	The set of bike routes in a geographic location such as Edmonton.
bike route	In Edmonton, a designated line of travel between two points, comprised of one or more AAA bikeway facilities.
bikeway	In Edmonton, a thoroughfare for bicycles (and other designated compatible transportation modes), suitable for all ages and abilities of users. (Also referred to as: <i>bikeway facility</i>)
biking, cycling, bicycling	Biking is the use of a bicycle for transport or recreation. Biking is also called cycling or bicycling. People biking are sometimes referred to as cyclists or bicyclists.
crossride	A type of pavement marking showing the intended path of people cycling across an intersection or another zone of potential conflict. A crossride is usually adjacent to a crosswalk where a shared pathway intersects a street. Crossride markings are two parallel square dashed lines, sometimes referred to as "elephant's feet."
gender-based analysis plus	A process of examining how different genders and diverse people experience policies, programs and initiatives. (Commonly referred to as: <i>GBA+</i>)
goods movement	Shipments and services that move on the transportation network, including goods and service movements by people who travel as part of their job.

Term	Description
infrastructure	The physical assets developed and used to support people and activities. Edmonton's infrastructure inventory includes such diverse assets as drainage, roads and right-of-way infrastructure, parks and green spaces, buildings, fleet vehicles, LRT and transit facilities, buildings, traffic control infrastructure, recreation facilities, computer networks, affordable housing and library resources.
micromobility	See: powered micromobility vehicle
mobility aid devices	Equipment to support travel by mobility-impaired people. Primarily refers to manual wheelchairs, electric wheelchairs, or electric mobility scooters.
mode	In the context of transportation, the means by which people or goods achieve mobility. In Edmonton, modes of transportation include walking, biking, taking transit, and driving (with or without passengers), among others.
mode share	The proportion of all trips made by each transportation mode. (Sometimes referred to as: <i>mode split</i>)
powered micromobility vehicle	A category of powered vehicle with weight <227 kg and a top speed of 48 km/h or less, includes powered bicycles (also referred to as: <i>pedal-assisted or throttled e-bikes</i>), powered non-self-balancing board (also referred to as: <i>e-board, e-skateboard</i>), powered self-balancing board/scooter—with or without a handle (also referred to as: <i>hoverboard, segway, e-unicycle</i>), powered seated scooter (as distinct from <i>electric mobility scooter</i>), powered standing scooter (also referred to as: <i>e-scooter</i>). Reference: SAE International J3194.
protected bike lane	A type of AAA bikeway that is on-street, separated and protected from adjacent motor vehicle traffic by a horizontal and/or vertical delineator designed to minimize or prevent encroachment by motor vehicles.
shared pathway	A type of AAA bikeway that is off-street and shared with pedestrians (either within the same pathway, or segregated in adjoining pathways). (Sometimes referred to as: <i>shared-use path or multi-use path</i>)
shared roadway	A type of AAA bikeway that is located on the street in space shared with low-volume, low-speed motor vehicle traffic, including speed and volume management techniques to maintain an operating environment suitable for all ages and abilities. (Sometimes referred to as: <i>bicycle boulevard or neighbourhood greenway</i>).
sidewalk	An off-street pathway for pedestrians, generally hard-surfaced and parallel to a roadway.

11.2 Acronyms

Acronym	Stands For
AAA	All Ages and Abilities (also see Glossary)
AASHTO	American Association of State and Highway Transportation Officials
APBP	Association of Pedestrian and Bicycle Professionals
BNA	Bike Network Analysis (see Spatial Analysis section)
BTP	Bike Trip Potential (see Spatial Analysis section)
FHWA	Federal Highway Administration (US)
GBA+	Gender-Based Analysis Plus (also see Glossary)
ITE	Institute of Transportation Engineers
LRT	Light Rail Transit
LTS	Level of Traffic Stress (see Spatial Analysis section)
NACTO	National Association of City Transportation Officials
OSCAM	On-Street Construction and Maintenance
TAC	Transportation Association of Canada





For more information please visit edmonton.ca/bikeplan