The Bike Plan

Implementation Guide | 2021 – 2026

February 2021

SHARE YOUR VOICE
SHAPE OUR CITY

Edmonton


EXCEPT
BICYCLES

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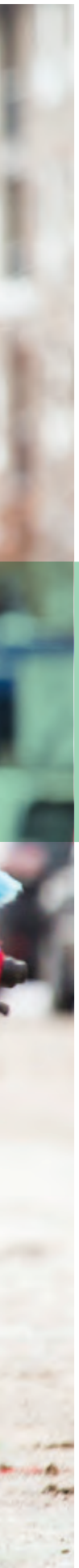


Edmonton can become a place where biking is practical and inviting for people of all ages and abilities and where people can choose to bike for any reason, and in any season. The Bike Plan lays the foundation for a network that is accessible, predictable, and intuitive for both experienced and inexperienced riders and which supports active transportation as an integral part of Edmonton's mobility system.

The Bike Plan (September 2020) provides strategic direction for how the City plans, designs, implements, operates, and maintains bike infrastructure and programs. This Bike Plan Implementation Guide 2021–2026 continues to build on these directions, outlining next steps and processes to building out the bike network and implementing supportive programs and initiatives. Any referenced maps from the Bike Plan are also included in **Appendix A.**

The Bike Plan Implementation Guide 2021–2026 focuses on five areas:

+ Implementation Resources and Timelines
+ Project and Program Prioritization
+ Bike Route Planning Process
+ All-Seasons Network
+ Monitoring and Evaluation

The Bike Plan Implementation Guide 2021–2026 is intended to guide the implementation of the bike network and supporting programs leading up to and through the 2023–2026 Capital Budget. The guidance outlined in this document is based on practices and assumptions associated with bike planning and design in Edmonton. As these practices grow and evolve and assumptions are confirmed, the content in this document should also be updated to ensure that it continues to be applicable and allows Edmonton to be bold in expanding the bike network and initiating and sustaining supporting programs.

The guidance in the document focuses on practices around planning, designing and engaging on bike projects, but is also intended to guide capital programs and budget considerations. As such, the Bike Plan Implementation Guide should be updated prior to each Capital Budget cycle.

1.0 Implementation Resources and Timelines

EDMONTON'S FUTURE BIKE NETWORK

The district connector network (the Bike Plan, Figure 7, page 38) 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.

Edmonton's bike network includes different route types including district connector routes, neighbourhood routes and routes in the River Valley (described in the Bike Plan, Section 7.0: The Future Bike Network). The Bike Plan and the Implementation Guide focuses on district connector routes and neighbourhood routes. A detailed version of the district connector network is illustrated in **Figure 1.**

The Future Bike Network Implementation Strategy (the Bike Plan, Figure 10, page 72) indicates the level of planning required for future bike routes. These route types—future bike routes, missing links, substandard bike routes and planned bike routes—also serve as the basis for much of the discussion in this Guide. A detailed version of the future bike network implementation strategy is illustrated in **Figure 2.**

FIGURE 1: District Connector Network (Detailed)

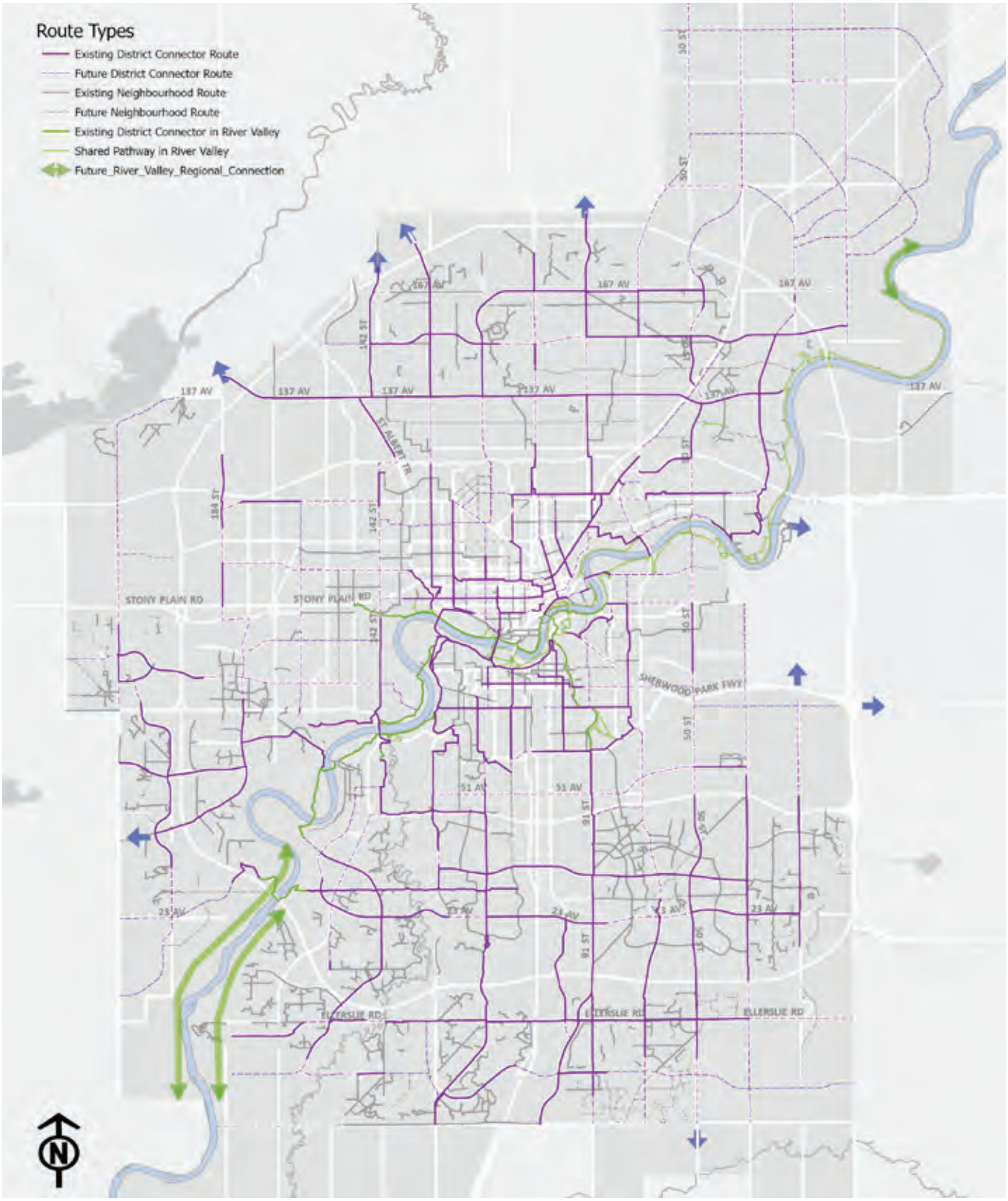
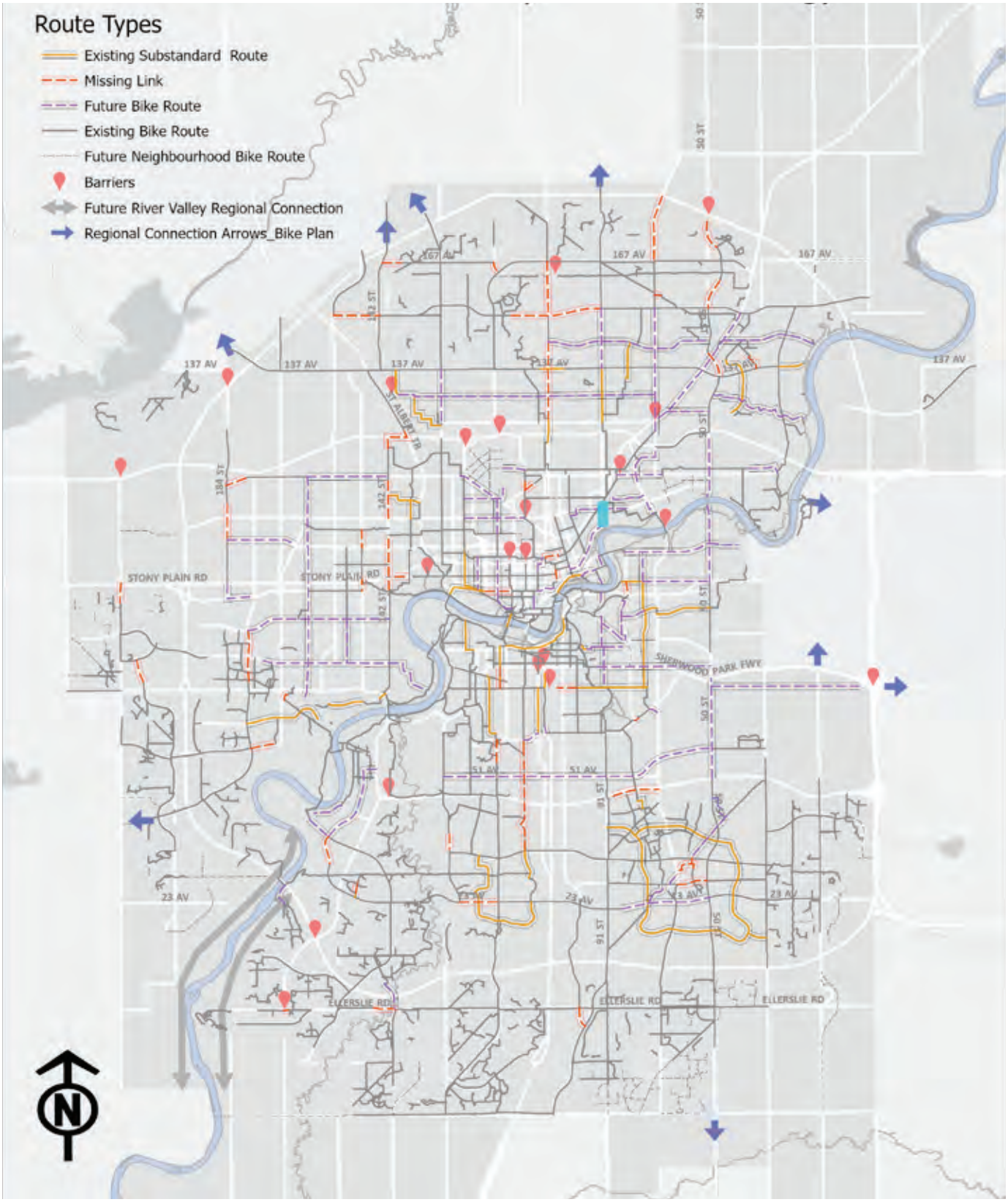


FIGURE 2: Future Bike Network Implementation Strategy (Detailed)



1.1 How many kilometres of future bike routes are there?

Table 1 summarizes the number of kilometres of bike network additions and improvements that are identified or implied through the Bike Plan. All lengths are considered centreline length.

TABLE 1: Length of Future and Improved Bike Routes Identified or Implied through the Bike Plan

IMPLEMENTATION ROUTE TYPE	DISTRICT CONNECTOR ROUTES (km)	NEIGHBOURHOOD ROUTES (km)	TOTAL (km)
Redeveloping Area			
New Routes			
Future Bike Routes	88	39	**127**
Missing Links	31	10	**41**
Planned Bike Routes	28	5	**33**
New Routes Subtotal	**147**	**54**	**201**
Implied Neighbourhood Routes		151	**151**
Existing Substandard Routes	22	34	**56**
Redeveloping Area Total	**169**	**239**	**408**
Developing and Future Growth Area			
Routes Identified + Implied	120	150	**270**
Future and Improved Routes Grand Total	**289**	**389**	**678**

NOTE THE FOLLOWING ABOUT TABLE 1:

- **Redeveloping areas,** as outlined in The City Plan, generally describes the area bounded by Anthony Henday Drive.
- **Developing and future growth areas,** as outlined in The City Plan, describe the areas of the City which are newly developed or undeveloped. Most of these areas include Area Structure Plans to guide the development of the area and road network.
- **Substandard Routes** are part of the existing network but require improvements to meet the all ages and abilities threshold. Substandard routes were identified through a desktop review. The majority of the substandard routes identified through the Bike Plan are shared street – higher traffic routes plus other routes that are deemed substandard for a range of reasons including below standard pathway widths. The routes identified are not considered a complete list and more may be identified through project-level assessment.
- **Most neighbourhood routes,** such as those located within a single or a small cluster of neighbourhoods located between arterials, may not be identified on the district connector network (the Bike Plan, Figure 7, page 38) given the scope of the Bike Plan as a city-wide strategy. These routes are, however, implied through route spacing, as guided by the Route Spacing and Bike Trip Potential (the Bike Plan, Figure 9, page 41). For the purposes of the order of magnitude estimate, it is assumed that for every 1 kilometre of district connector route, there will be, on average, 1.25 kilometres of neighbourhood routes. This factor of 1.25 is based on the existing split of district connector and neighbourhood routes and applies to both developed areas and ASP areas.

The future bike network includes about 678 kilometres of new and improved bike routes to be added to Edmonton's bike network, of which 270 kilometres are comprised of the future bike network in developing and future growth areas. Considering Edmonton's current urban boundary, the Bike Plan outlines an additional 408 kilometres of bike routes to be added to the current network within the redeveloping area.

FUTURE ROUTES BY AREA

When implementing bike routes, context matters. The urban form of an area influences the alignment and design of a bike route. Some streets, often those in higher density and mature neighbourhoods, may have more constrained rights-of-way and other challenges, such as higher level of crossing control, requiring additional design and construction considerations. It is important that the impact these constraints may have on costs are reflected in the order of magnitude cost estimate.

Future and improved routes are grouped into three location categories:

+ **Central –** Central generally describes higher-density areas in the city in which there are the most competing demands associated with implementing bike infrastructure. Examples of neighbourhoods that exhibit these qualities include Downtown, Oliver and Strathcona.
+ **Urban –** Urban describes an urban form which includes a range of densities and a roadway network that, for the most part, follows a grid pattern. Examples of neighbourhoods that exhibit these qualities include Bonnie Doon, Strathearn, Alberta Avenue and Westmount.
+ **Suburban –** Suburban areas, generally, are lower density neighbourhoods that include meandering collector and local roads, framed by a gridded arterial road network. Bike routes in suburban areas are predominantly provided by way of shared pathways. Bike routes located in the area outside of the Yellowhead Trail–170 Street–Whitemud Drive–75 Street inner loop, including developing and future growth areas, are considered suburban routes.

Table 2 summarizes the length of new and improved bike routes by urban form category.

TABLE 2: Length of Future and Improved Bike Routes by Urban Form Category

IMPLEMENTATION ROUTE TYPE	LENGTH (km)			
	CENTRAL	URBAN	SUBURBAN	TOTAL
Future Bike Route	8	53	66	**127**
Missing Link	2	11	28	**41**
Planned	0	12	21	**33**
Substandard	8	10	38	**56**
Implied Neighbourhood	10	40	101	**151**
Developing and Future Growth Areas	0	0	270	**270**
Total	**28**	**126**	**524**	**678**

As summarized in Table 2, of the approximately 678 kilometres of new and improved bike routes, about 28 kilometres are located in the central context, about 126 kilometres are located in the urban context, and about 524 kilometres are located in the suburban context.

1.2 How much will it cost to expand the network?

In order to continue to grow Edmonton's bike network and improve biking through program initiatives, resources will need to be allocated to bike-related projects. An order of magnitude cost estimate provides a sense of the cost and level of effort required to implement the Bike Plan; as projects are initiated, more detailed cost and resource estimates will be prepared.

Given the flexibility afforded in the Bike Plan in terms of route alignment and facility design, the cost of the network cannot be assessed by simply adding the cost of each, individual bike route. Instead, blended unit costs for each urban form category have been developed and applied to the length of future and improved routes for each area by implementation route type. The blended unit costs developed for each implementation route type are based on context-specific unit costs for a range of bike facilities, in addition to the relative mix of bike facilities likely to be constructed in each context.

Table 3 summarizes the blended costs for each implementation route type by urban form category. The blended unit costs generally include all construction materials (e.g,. asphalt, concrete for medians, lane markings, and signs), signalization (for facility types where it has historically been required such as protected bike lanes) and transit stop. Costs associated with more substantial remedies needed to accommodate / improve a bike connection (e.g., bridge maintenance or upgrades) are not considered as part of the estimate. All blended costs are rounded to the nearest $10,000 while all total costs are rounded to the nearest $100,000. These costs represent the capital costs to construct bike lanes and do not include maintenance costs. Note that inflation is not factored into these costs.

TABLE 3: Bike Network Cost by Area

AREA	LENGTH (km)	BLENDED UNIT COST (PER km)	TOTAL COST
Central	28	$650,000 to $790,000	**$20,000,000**
Urban	126	$500,000 to $720,000	**$73,300,000**
Suburban			
Redeveloping Area	254	$365,000 to $495,000	$97,500,000
Developing and Future Growth Areas	270		$115,700,000
Suburban Subtotal	**524**		**$213,200,000**
TOTAL	**678**		**$306,500,000**

The expansion of the bike network is anticipated to cost in the order of about $306,500,000, of which, $115,700,000 is associated with implementing the bike network in the developing and future growth areas, a cost that will be predominantly borne by developers. The cost to implement bike routes within redeveloping areas, a cost predominantly borne by the City, is $190,800,000. As previously noted, these costs represent capital costs and do not include maintenance costs.

FUNDING AND DELIVERY METHODS

The network costs are based on the assumption that the bike network will be implemented as stand-alone, retro-fit projects; however, many bike route projects are implemented through a range of delivery methods including roadway and neighbourhood renewal, and other capital projects. One of the key bike route delivery methods is roadway and neighbourhood renewal projects, where the costs of the bike and other active transportation infrastructure (e.g., shared pathways) is often covered, in part, by the growth component of the project budget. Growth is investment in new assets (or projects) that enhance existing infrastructure by adding functionality. Enhancing infrastructure through growth provides an opportunity to deliver new infrastructure and/or improve the existing infrastructure for a lower cost than if the project was to be considered on its own.

+ + + +

The bike network is implemented through a range of delivery methods and requires funding approaches beyond the growth component.

+ + + +

In recent years, most new bike routes have been implemented through the growth program. However, this approach may not be sustainable as bike infrastructure is just one of the competing interests for the limited growth funding available and it may not be possible to implement extensive bike infrastructure within the current growth limits. In addition, implementing the future bike network predominantly through these methods leaves some gaps in terms of delivering a connected network that accommodates riders of all ages and abilities. For example, when routes are constructed along an arterial or through a neighbourhood, project limits may prevent a proper connection to the existing network.

One approach to mitigate these gaps is to initiate a capital profile to augment existing funding to find efficiencies in delivery, similar to active transportation profiles previously relied upon. Initiating a capital profile for bike network construction and improvements can support the implementation of the bike network by:

+ Aligning with engagement, design and construction processes driven by reconstruction, renewal and micro surfacing projects to develop a more complete network more efficiently and quickly. In some cases, the additional funds may augment renewal projects by providing necessary engagement opportunities.

+ Better facilitating spot or link additions and improvements to the network (such as improved crossings or filling in missing links), particularly in areas where other delivery methods such as roadway reconstruction or neighbourhood renewal is not available to support implementation.

One risk associated with this approach is solely relying on the capital profile rather than using it to augment capital projects. This may lead to competition amongst projects and, depending on the size of the capital profile, certain improvements not receiving funding, resulting in lost opportunities to construct the bike network as part of other capital projects. The most efficient way to construct future bike routes is to leverage opportunities to align with other capital projects, but not having to solely rely on those opportunities.

In terms of implementing the bike network in the growth and future development areas, Edmonton's Complete Streets Design and Construction Standards will guide how the roadway network is designed in these areas. Assuming that bike routes are incorporated into the design of the roadway network, these costs will be included as part of roadway construction, which is typically the responsibility of developers.

Funding for projects that will address barriers are not included in the order of magnitude cost estimate (Table 3). Given that these projects generally represent significant capital projects (such as a bridge), the need for them is often driven by another project, such as LRT. Barriers are simply noted to ensure that if there are changes in infrastructure, accommodations for bicycle traffic should be included to remove the barrier.

1.3 Implementation Timelines

THE CITY PLAN

The City Plan outlines how growth and change will occur city-wide but higher anticipated residential unit growth and higher density development will occur in the redeveloping area and, in particular, at nodes and along corridors. The development and redevelopment mix for housing more people within the current urban boundary means that more than 35 per cent net housing unit growth is anticipated to be realized through redevelopment for 1.25 million people. For 1.5 million people, 50 per cent net housing unit growth is anticipated to be realized through redevelopment. Focusing growth on redevelopment will require more efficient use of the land resources in Edmonton and will involve welcoming more people into areas that are already well served by mobility infrastructure such as the bike and active transportation network.

+ + + +

As residential growth begins to reflect the shift in development outlined in The City Plan, the district connector network will serve as the base future bike network to allow for additional bike routes to be constructed in redeveloping areas, increasing network density to respond to growing demand.

+ + + +

Although some specific locations in the city will see higher and more concentrated levels of development, it is anticipated and necessary that growth continues to happen throughout the entire city. Alongside the anticipated growth in all areas of the city, different types of activation will be initiated by the City to support intentional growth. In terms of the bike and active transportation network, it means investment in developing capital programs and completing related design concepts to construct the city-wide district connector network. As residential growth begins to reflect the shift in development outlined in The City Plan, the district connector network will serve as the base future bike network to allow for additional bike routes to be constructed in redeveloping areas, increasing network density to respond to growing demand.

Strategizing for 1.25 million people also means building momentum through advanced preparation and strategy development by completing technical studies, preparing business cases, developing area network plans and/or advancing other planning and funding strategies.

ENERGY TRANSITION STRATEGY

Implementation timelines for the Bike Plan are also connected to the *Energy Transition Strategy*. The *Energy Transition Strategy* outlines how we achieve the transformational change to a low carbon city as outlined in ConnectEdmonton and The City Plan.

Edmonton still has one of the highest per capita greenhouse gas emissions levels in the world (18 tonnes/person) with transportation accounting for 31 per cent of Edmonton's total emissions. The *Energy Transition Strategy* identifies actions to reduce transportation emissions, including building out the active transportation network. The strategy identified that with rapid and significant actions, Edmonton's emissions could be reduced by up to 85 per cent with up to 28 per cent of the reduction coming from transportation.

Increasing and improving walking and cycling infrastructure and offering customized transportation planning is anticipated to contribute in achieving this 28 per cent reduction. Preliminary modelling by the Energy Transition Strategy project team indicates that the district connector network described in the Bike Plan should be fully implemented by 2030. Modelling suggests that between 2030 and 2050, neighbourhood routes should be further expanded to increase the density of the network. Not only would this reduce greenhouse gas emissions, it would also generate average annual savings of more than 60 per cent of the average annual investment through avoided health care costs associated with inactivity, and savings to Edmontonians on vehicle fuel and maintenance and carbon tax. It would also improve air quality, reduce traffic congestion, and provide safer transportation options to people of all incomes and abilities.

Assuming a 10- to 15-year timeline, the cost to implement the future bike network is anticipated to be in the range of about $12,700,000 to $19,100,000 per year assuming that the bike network will be implemented by way of stand-alone, retro-fit projects. Numerous planning, design and construction efficiencies can be realized by implementing the bike network through the delivery methods associated with roadway and neighbourhood renewal and other capital and maintenance projects.

2.0 Project and Program Prioritization

Given the scope and breadth of the Bike Plan, funding and resources will not allow building the entire future network and implementing all program area actions at once. Instead, both network improvements and program area actions will be implemented over a period of years. The prioritization process aims to guide which actions should be implemented first to realize the objectives of the Bike Plan as quickly and effectively as possible.

The decision-making process to identify high-priority actions relies heavily on the alignment of each program area action or bicycle route in the network with the aspiration and values of the Bike Plan. The prioritization also integrates considerations of how effective each potential investment is in "moving the needle" towards the objectives of the Bike Plan while taking into account project dependencies and opportunities. The exercise relies both on quantitative analyses and judgment.

2.1 Bike Route Prioritization

Building out Edmonton's complete bicycle network will require a series of projects and interventions over time. The network prioritization process will determine which projects should be implemented first, a critical task to ensure the objectives of the Bike Plan can be realized in a timely and effective manner. The network prioritization process was completed in two stages, a preliminary assessment and a refined assessment. This process was documented to serve as both a record of what was done and provide a framework and guide for future bike network prioritization exercises.

The Bike Plan identifies close to three hundred network segments needing attention including future bike routes, substandard routes and missing links. All links are valuable to the network and prioritization is not a listing of what's important and not important. Rather, the prioritization helps to guide how the network should grow to best provide a connected, city-wide network recognizing that not all routes can go in at once. Identifying near-term priorities is not intended to limit future projects to only the routes highlighted. The implementation of bike routes that are not identified as near-term priorities may occur through opportunities presented by other projects through renewal and reconstruction.

The aspiration, values and network principles outlined in the Bike Plan are used to guide the prioritization of network projects. Specifically, the prioritization relies on four main considerations:

1 Equity

Equity is one of the values of the Bike Plan. Analysis of equity considerations such as age, gender, race, ethnicity and household income was completed as part of the Bike Plan. Household income was most strongly associated with a disproportionate exposure to crashes and lack of bicycle facilities. Giving higher priority to projects located in low-income neighbourhoods ensures the new infrastructure prioritizes access for historically disadvantaged individuals where safe transportation options may be lacking and affordable transportation is particularly important.

2 Ridership Potential

Not all areas of the city are likely to generate the same level of bike trips. Areas with a higher concentration of people, jobs, schools, and shopping are more likely to see cycling activity. The Bike Trip Potential map (the Bike Plan, Figure 6, page 30), illustrates the ridership potential, highlighting which high-quality bicycle infrastructure projects should be prioritized because they are more likely to generate and support higher cycling demand within today's land use patterns.

3 Safety

Providing a safe environment for cycling is embedded in the Bike Plan. Areas of the city where, historically, more crashes have occurred are given a higher priority as they have a high potential to improve the safety of people cycling. The High Injury Network developed as part of the *Safe Mobility Strategy* was used to assess projects that may address existing safety issues.

4 Connectivity

Connectivity was assessed through the Bike Network Analysis. The Bike Network Analysis provides a rating to measure how accessible key destinations are in each neighbourhood by way of the low-stress bike network. Neighbourhoods that are better connected have a higher Bike Network Analysis rating while neighbourhoods in need of connectivity rate lower. This scoring encourages a focus on projects that are more likely to improve connectivity in disconnected areas.

Higher priority projects were further assessed to confirm connectivity to the existing network and alignment with the nodes and corridors approach outlined in The City Plan. This type of assessment is a manual, visual exercise carried out by the Bike Plan project team. Assessing connectivity at this stage is also an opportunity to prioritize projects based on route dependency and to link projects with other upcoming construction projects (e.g., arterial renewal, streetscape projects, neighbourhood renewal, collector renewal, parks projects).

Figure 3 illustrates the near-term priorities identified through the Bike Plan. These routes are also summarized in **Appendix B.**

Generally, the near-term priorities align with The City Plan's 1 to 1.25 million population horizon priority growth areas and activation approach and can be characterized by the following:

+ Increasing the network density in Downtown and south central areas.
+ Continuing to extend the high-quality bike network out from the central areas with a focus on the south-central, west-central and east-central areas.
+ Providing stronger district connector routes to North Edmonton by way of 127 Street, 97 Street, and Fort Road.

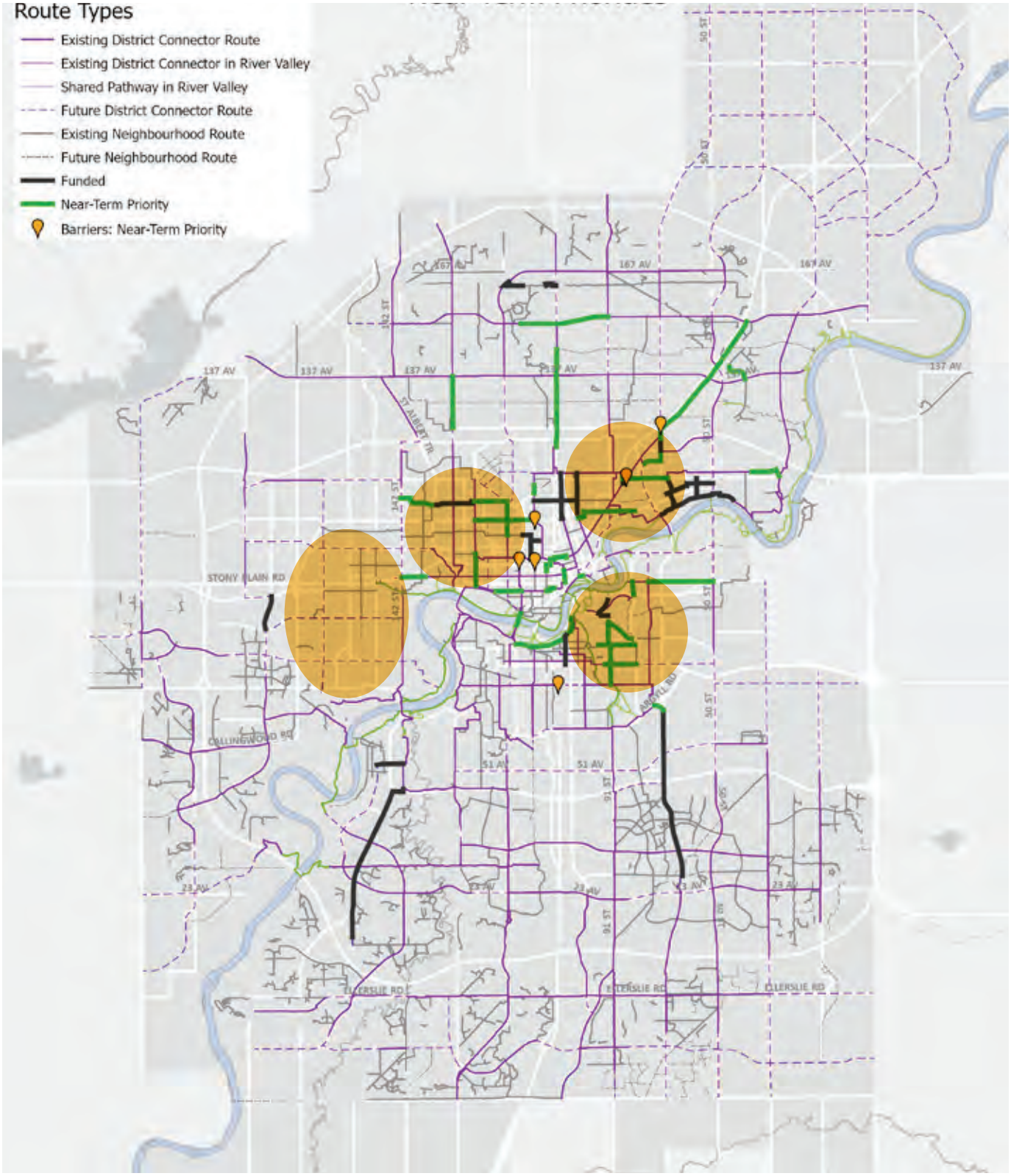
While these projects will be implemented through a range of delivery methods including transit and corridor capital projects, Building Great Neighbourhoods program, and renewal and micro surfacing programs, a cohesive planning framework is needed. While many projects can stand alone, other projects could be grouped together through an area network plan, providing the benefit of a single planning exercise to ensure alignment. Creating area networks for these clusters of neighbourhoods would ensure that planning is consistent and aligned across neighbourhood boundaries, even if individual projects may only be able to deliver discrete portions of the area network. This approach is further discussed in Section 3.

Areas where this approach could be applicable are circled and highlighted in Figure 3. They include:

+ South-central area (Bonnie Doon, Strathearn, Holyrood and Idylwylde)
+ West-central area (Oliver, Westmount, Glenora, North Glenora, Woodcroft and Inglewood)
+ East-central area (connecting areas east, west and north of the Northlands site)

The central-west area (Glenwood, West Jasper Place, Crestwood, Meadowlark Park, Sherwood, Jasper Park and Parkview) includes several future bike routes; however, many of these scored just outside of being deemed near-term priority routes. The City Plan indicates growth for this area from 1–1.25 million people, outlining a "strategize" activation treatment for several nodes and corridors. Strategizing for this area, from a bike and active transportation perspective, means developing an area network plan, completing supplemental technical studies and identifying funding strategies including leveraging opportunities with future capital projects in the area.

FIGURE 3: Near-Term Priority Bike Routes



2.2 Near-Term Implementation Cost

The near-term priority routes include 36.1 kilometers of bike network additions and improvements to substandard bike routes. **Table 4** summarizes the cost of implementing the near-term priority routes by context. The near-term implementation costs were developed based on the same process to develop the network costs.

TABLE 4: Near-Term Priority Implementation Cost

CONTEXT	LENGTH (km)	COST
Central	6.0	$4,400,000
Urban	18.5	$11,400,000
Suburban	11.6	$4,600,000
TOTAL	36.1	$20,400,000

The cost associated with constructing the near-term priority bike routes is anticipated to be in the order of $20,400,000.

2.3 Program Areas Prioritization

While each program area has an important role to play in developing and sustaining a culture of cycling in Edmonton, it is simply not possible to implement all at once. Therefore, this work also needs to be prioritized to better focus implementation.

The nine program areas and associated actions detailed in the Bike Plan all aim to support the aspiration and values in the plan (the Bike Plan, Section 9.0):

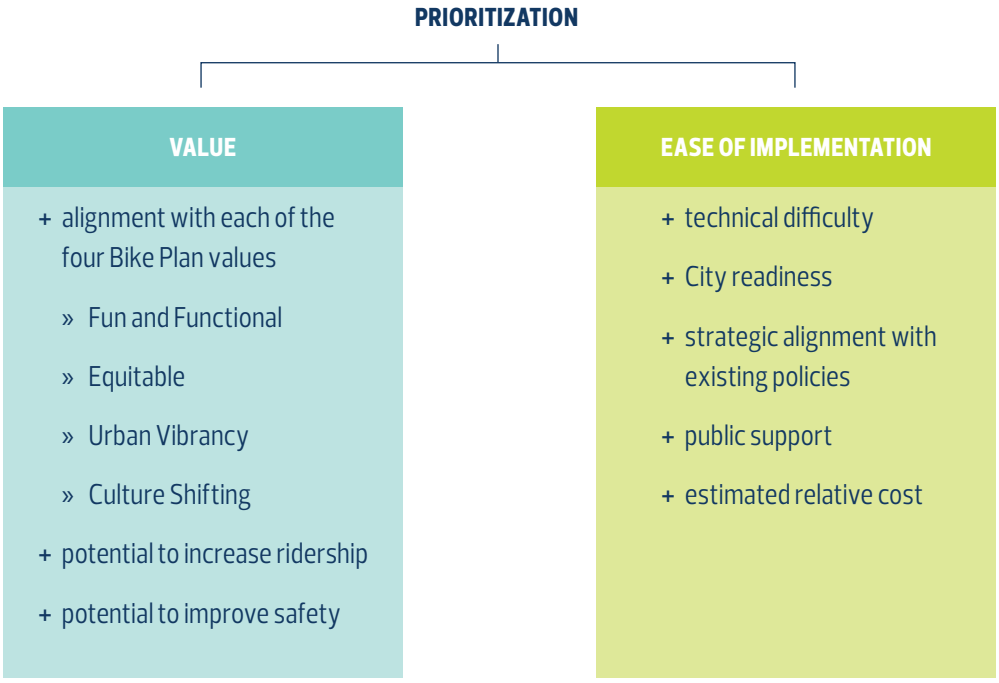
+ 9.1 Integration with Transit
+ 9.2 End-of-trip Facilities
+ 9.3 Bike Share and Shared Micromobility
+ 9.4 Wayfinding
+ 9.5 Lighting
+ 9.6 Maintenance
+ 9.7 Education
+ 9.8 Encouragement
+ 9.9 Laws and Policies

Note that each program area is preceded by its section number identified in the Bike Plan for ease of cross-referencing with the Bike Plan.

These nine program areas include 82 actions that are rolled up into 25 action groups. This prioritization is focused on action groups. An example of a program area, action group and specific actions is provided below for clarity.

Program Area	9.1 Integration with Transit
Action Group	9.1.1 Accommodating Bikes on LRT
Actions	(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. (b) Review how other municipalities accommodate bikes on LRT trains in terms of seat configurations, boarding requirements, bike placement and supporting equipment.

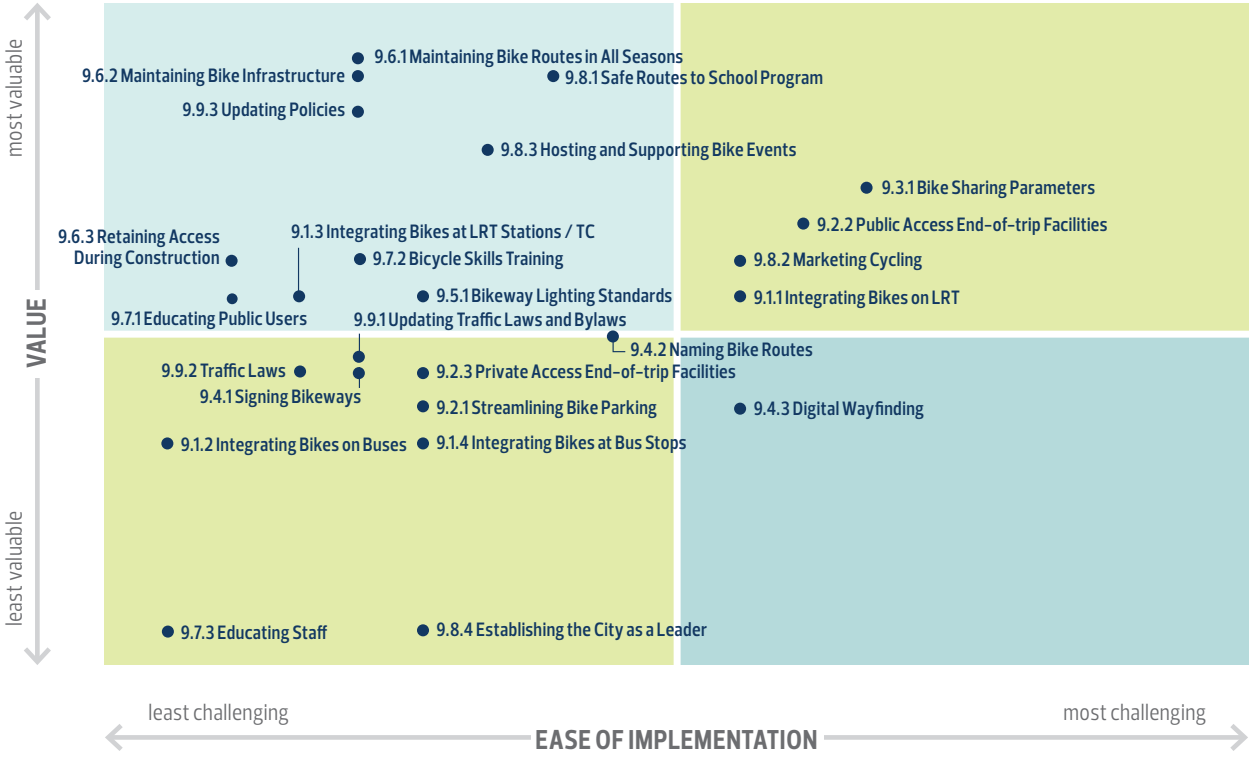
Two main considerations drive the prioritization of action groups: value and the ease of implementation.



Under ease of implementation, public support is divided between general support of biking and support from people who bike often based on the feedback provided during the Bike Plan Phase 3 engagement.

Each action group is plotted in a value–ease of implementation prioritization matrix, as illustrated in **Figure 4,** to guide, at a high level, the allocation of time and resources to actions based on their potential benefit.

FIGURE 4: Action Group Value–Ease of Implementation Prioritization Matrix



The highest priority is given to actions that have both a high value and high relative ease of implementation (upper left quadrant). The second highest priority is given to actions that are assessed as having a high value, but for which the implementation is not as easy (upper right quadrant). The third highest priority is given to "low hanging fruit," actions that are relatively easy to implement, but for which the value is not assessed as highly (lower left quadrant). Finally, the last priority goes to projects that have lower value and are harder to implement.

2.4 Assessing Higher Priority Program Areas

The program areas were further assessed to highlight the potential impact that each may have on developing and sustaining Edmonton's bicycle culture. This assessment differs from prioritizing the action groups in that its purpose is to identify those program areas that have the potential to significantly "move the needle". The assessment was completed by a panel of experts with experience in implementing similar plans and initiatives in other cities throughout Canada and the United States, but have not been directly involved in the development of the Bike Plan.

The assessment exercise was first carried out by expert panel members individually. The panel then met to compare outcomes and come to a consensus regarding relative levels of priority between program areas. **Table 5** summarizes the relative ranking of the program areas in developing and sustaining cycling culture.

TABLE 5: Ranking of Program Area Potential to Develop and Sustain Cycling Culture

PROGRAM AREA	RELATIVE RANKING
9.3 Bike Share and Shared Micromobility	high
9.6 Maintenance	high
9.5 Lighting	medium (high)
9.8 Encouragement	medium
9.9 Laws and Policies	medium
9.2 End-of-trip Facilities	medium (low)
9.1 Integration with Transit	medium (low)
9.4 Wayfinding	low
9.7 Education	low

Each of these prioritization assessments are independent. The prioritization of the action groups may outline a more practical approach to implementing the actions while the further assessment highlights the "big moves" needed to develop and sustain a culture of biking in Edmonton. As part of the implementation process, each action should be reviewed further to highlight opportunities, either through partnerships (internally or externally) and/or alignment with other projects, and establish a pathway to completing the action.

3.0 Bike Route Planning Process

There are different types of projects that may include the planning and delivery of bike infrastructure and different levels of route planning completed as part of the Future Bike Network Implementation Strategy (the Bike Plan, Figure 10, page 72). This section provides specific guidance by both project type and route implementation type to help inform how the process might unfold and some of the key planning considerations to be included.

The bike route planning process is generally informed by three key inputs:

1 Policy Direction | Why is this project important?

The City's policy structure, starting with ConnectEdmonton: Edmonton's Strategic Plan and the City Plan, has been designed to advance the vision, guiding principles and strategic goals that align with how people would like to experience and engage with their city. Developed on a foundation of extensive engagement with the public, our policies and strategies guide and support the work we do by answering the question: why is this project important?

The City Plan highlights how active mobility contributes to a high quality of life in cities. Communities that are bike, walk and roll-friendly result in greater joy, fitness and a wider range of transportation options for people and businesses. The provision of high quality bike infrastructure, integrated with public spaces with an aim to reduce traffic congestion, creates better environmental outcomes and improve public health.

The City Plan outlines numerous outcomes, intentions and directions to ensure that Edmontonians live closer to what they need and are supported by active transportation networks and greater connectivity across all travel modes. Those outcomes, intentions and directions serve as the foundation for the Bike Plan and Implementation Guide.

The City Plan

+ What kind of city will Edmonton be in the future?
+ 2 million people
+ The City Plan will replace The Ways documents

The Bike Plan

+ sets the direction for biking in Edmonton
+ future bike network map
+ program areas and actions

The Bike Plan Implementation Guide

+ project prioritization
+ costs
+ monitoring and evaluation

Implementation Projects

+ new bike routes
+ program initiatives
+ additional engagement required

Other strategic documents, such as the Bike Plan, Gender Based Analysis +, WinterCity, Safe Mobility Strategy, the Complete Streets Design and Construction Standards, and the Accessibility Policy (Access Design Guide), build on the direction outlined and provide the steps to achieve that shared vision. The direction provided in the Bike Plan guides how to make biking in Edmonton better from a city-wide perspective by identifying the role of a particular route in the broader context of the network.

While this is a critically important consideration to understand why a project is important, it is complementary to other inputs including design opportunities and constraints and localized feedback from the public and stakeholders.

The section Planning & Design Considerations by Implementation Type provides further guidance as to how the direction outlined in the Bike Plan should be interpreted and applied.

2 Design | What should we do and what can we do?

Translating policy into a project is not easy. Often, there are realities that need to be reconciled between policy goals and practical limitations. To identify what's envisioned, the City's policy must be applied appropriately. To appreciate what's possible, the project limitations and constraints must be understood and communicated. These may include resource limitations, usually identified through the project scope, and right-of-way opportunities and constraints, usually identified by assessing the physical space of the roadway and public realm.

The section Process by Project Type identifies numerous considerations to guide the application of policy and to communicate what's possible for a range of implementation delivery methods.

3 Localized Public Engagement | What's important to the community?

While the City's strategies are developed through extensive engagement, it is important to differentiate between city-wide engagement and project engagement. Engagement at the city-wide level focuses on people's experiences and preferences more broadly to shape the direction and approach in achieving the City's strategic goals. Engagement at the project level provides local context and understanding that is often difficult to incorporate into planning decisions at the city-wide level.

Localized public engagement should be an input to decision making regarding both route location and facility type. However, this input must be considered within a broader understanding of the bicycle network and the principles of the Bike Plan and other City policies. Both types of feedback are necessary to support planning and designing projects, and one cannot replace the other (i.e., city-wide engagement cannot be substituted for localized engagement).

Public engagement best supports informed decision-making when there is a process that considers localized tradeoffs holistically with community needs and desires while ensuring that the solution is safe and aligned with the bicycle network principles.

The section Notes on Localized Engagement for Bike Routes provides engagement considerations to ensure that the input of the public and stakeholders is considered as an essential part of the bike route planning equation.

3.1 Planning & Design Considerations by Implementation Type

The components of the future bike network are identified in the Future Bike Network Implementation Strategy (the Bike Plan, Figure 10, page 72). The identified implementation type for each route provides a starting point in identifying the relevant considerations in the planning and design process. This section requires guidance on what to consider based on the type of bike route. The processes outlined in this section are intended to guide rather than be prescriptive. Each project includes a unique set of circumstances and conditions and the process may have to be adjusted to meet the specific needs of each project.

EXISTING BIKE ROUTES

The existing bike network layer shows bike routes of various facility types that currently exist including a range of facilities from shared roadways to protected bike lanes. The goal of implementing a project along an existing bike route is to verify if the route supports all ages and abilities and considers opportunities for improvement.

Planning considerations for projects incorporating existing bike routes include:

Review Context

Review route type, including traffic volume and speed data. Does the existing infrastructure type meet the requirements of the Complete Street Design and Construction Standards? If no – the existing route should be treated as a substandard route.

Opportunities for Improvements

Consider opportunities for adjustments that will improve alignment with the Bike Plan. Opportunities may include signage/wayfinding, intersection and crossing treatments, upgraded facility types, removal of obstructions to improve sight lines, etc. along the current route. Alternatively, this may include an investigation of potential alternative routes that will provide a similar or improved level of connectivity.

Engagement

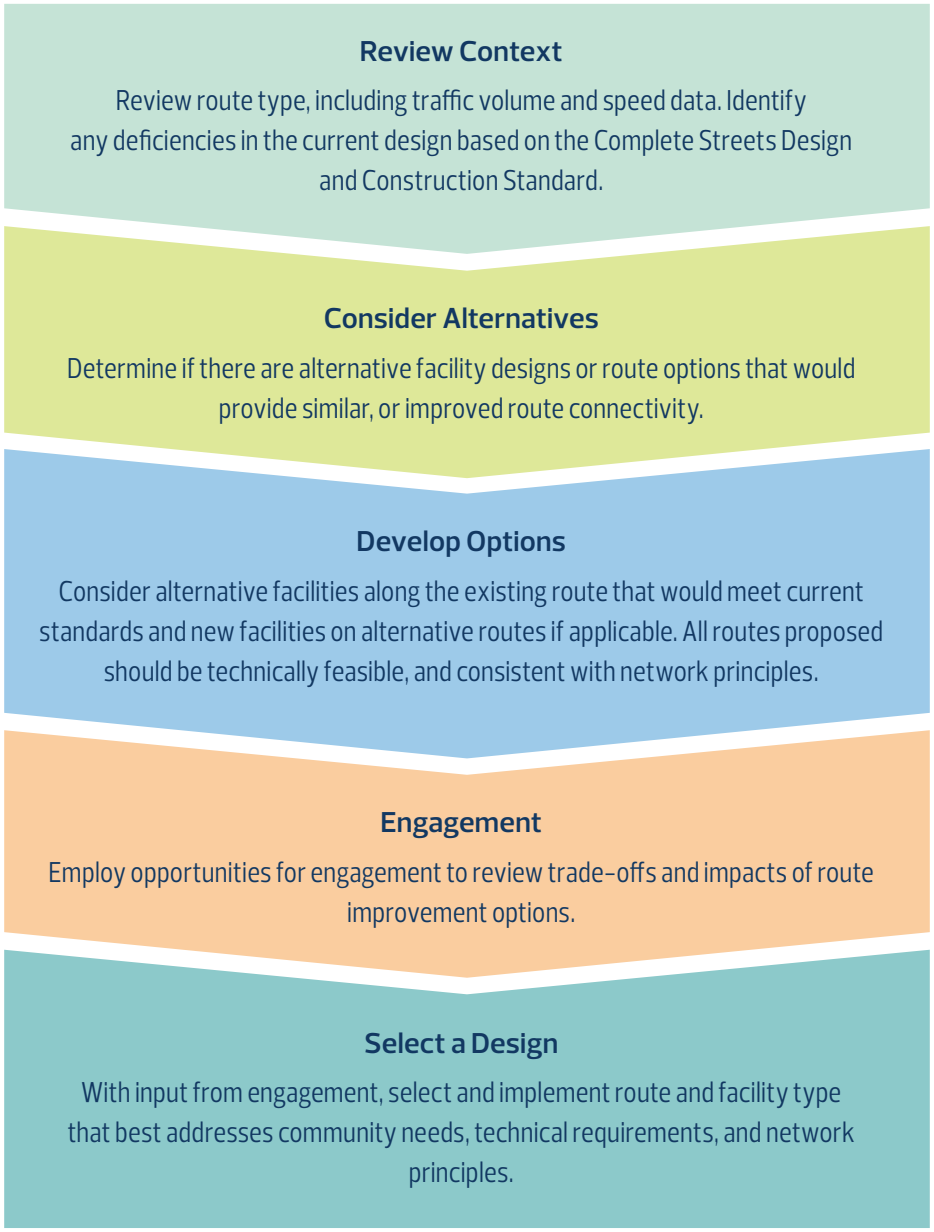
Employ opportunities for engagement to review options for improvements and identify any other existing safety/operational concerns to be addressed.

SUBSTANDARD ROUTES

Substandard routes are routes that are currently designated as part of the bike network but do not meet the current City of Edmonton standards. These routes often require upgrades, improvements, or relocation to ensure they are inviting to users of all ages and abilities.

The goal of implementing a project along a substandard bike route is to find a way to ensure that the network connectivity is maintained and enhanced to support users of all ages and abilities.

Planning considerations for projects incorporating existing bike routes include:



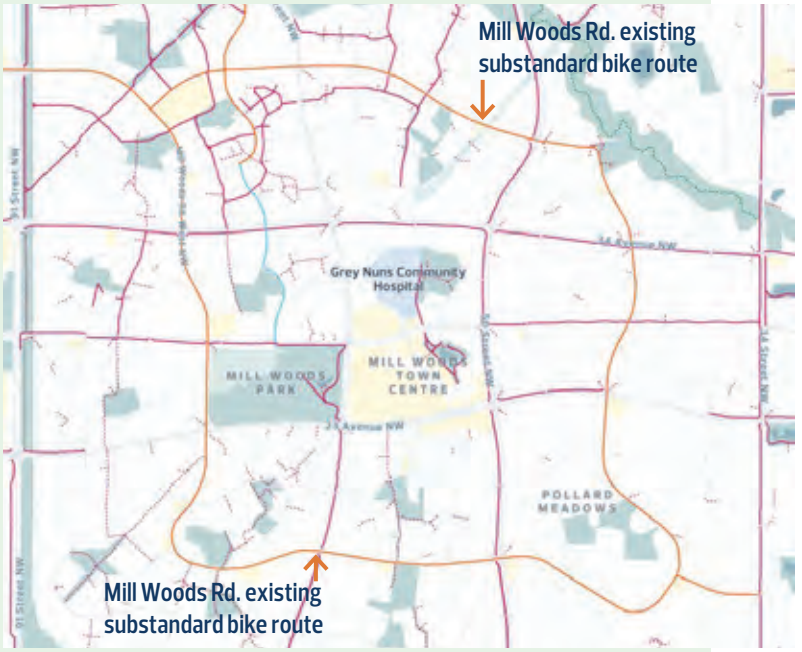
EXAMPLE 1: Project on Mill Woods Road

Mill Woods Road is an existing on-street bike route along a collector road. The route treatment includes a combination of arrows and signage. Due to vehicle speeds and volumes along Mill Woods Road, in addition to poor speed limit compliance along certain sections, it is not in alignment with the direction provided in the Complete Streets Design and Construction Standards and is therefore shown as a substandard route.

Checking traffic volumes shows that most segments of Mill Woods Road have an average of 5,500 to 6,000 vehicles per day. There are existing bus routes along portions of the road, and parking is permitted in some areas. A review of the design and construction standards suggests that a protected bike lane or shared pathway would be required on a roadway with this volume and curbside activity. Design and construction standards should also be reviewed with respect to the current design for other modes such as pedestrian space and lane widths. In this case, the road appears to be wider than necessary, providing an opportunity to consider re-allocation of space.

Mill Woods Road as a bike route provides access to many schools, neighbourhood commercial areas and provides opportunities to cross arterial roadways. Given the circuitous nature of the roadway network in this area, there are limited opportunities to provide alternative routes with the same level of connectivity.

Considering the context and the directions of the design and construction standards, the options to be investigated for Mill Woods Road might include protected bike lanes, raised bike lanes, or a shared pathway (which would also require a review of pedestrian volumes to confirm suitability).



The conceptual trade offs of the redesigned options can be discussed as part of public engagement to confirm the preferred solution for design and delivery.

Given the length of Mill Woods Road relative to other reconstruction projects, it may not be possible, from a coordination or funding perspective, to reconstruct the corridor as a single, stand-alone project. One way to mitigate this challenge would be to develop a plan for the entire corridor, and then construct as neighbourhood renewal is completed throughout the area.

PLANNED ROUTES

Planned routes include any bike-related infrastructure (e.g., shared pathways, on-street bike lanes) that are currently planned or designed through the engineering design process but are currently unfunded and are waiting to be constructed.

The goal of implementing a project along a planned route is to ensure that the engineering design supports all ages and abilities and is integrated with the rest of the bike network.

Planning considerations for projects incorporating planned bike routes include:

Review Context

Review proposed route type, including traffic volume and speed data. Confirm that proposed infrastructure type is in alignment with Complete Streets Design and Construction Standards.

Opportunities for Improvements

Consider opportunities for design improvements to better improve safety and operations along the route. Considerations may include separating movements between people walking and people biking, adding signage/wayfinding, intersection treatments, etc.

Confirm Connections to Existing and Future Network

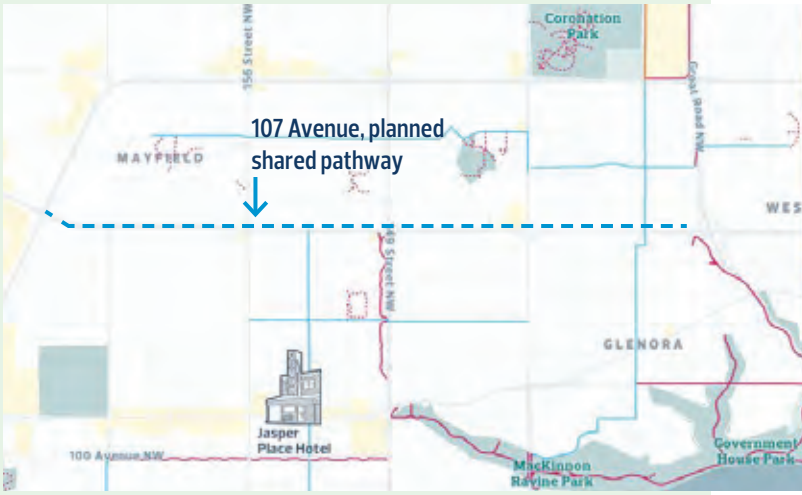
Review key connection points from the planned route and the rest of the bicycle network for potential improvements that ensure the planned route is well integrated and connected to adjacent and intersecting routes.

EXAMPLE 2: Project on 107 Avenue

There is an existing concept plan in place for 107 Avenue which includes a shared pathway between Mayfield Road and Groat Road. Because the cycling facility is separated from traffic, the shared pathway as proposed already aligns with the Complete Streets Design and Construction Standards. The concept plan is also consistent with typical practice of including shared pathways along arterial roadways. The facility type and location proposed are both valid.

The future bike plan implementation strategy shows potential tie-ins with existing bike routes at Groat Road, 136 Street, 149 Street, and 153 Street. A future connection is also expected at 142 Street.

Engineering design of 107 Avenue should ensure functional connections with all intersecting routes, and consideration for future connections for routes that do not yet exist. The western terminus is identified as a future bike route, so the detailed location and facility type is not yet confirmed. However, the eastern terminus at Groat Road should also consider the opportunities to cross over Groat Road and provide connectivity to the bicycle network in the Westmount neighbourhood.



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.

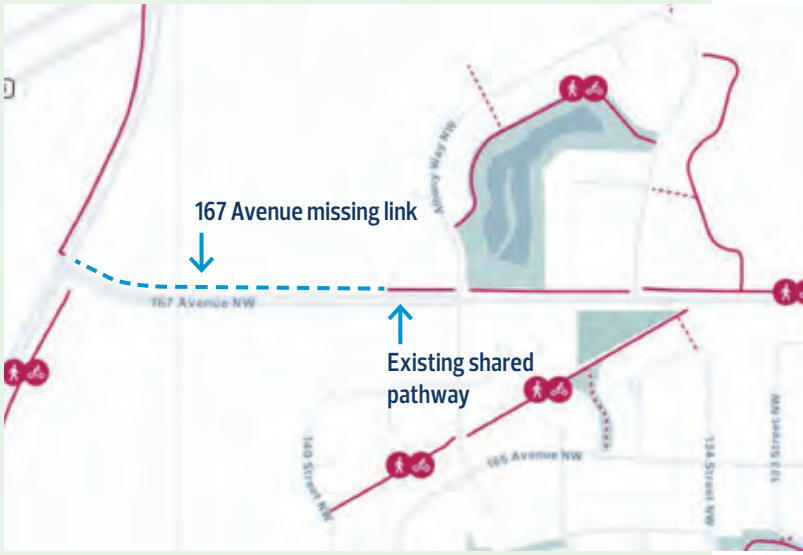
The goal of implementing a project along a corridor identified as a missing link is to complete the link in a manner that is integrated and consistent with the network on both sides of the link.

Planning considerations for projects incorporating planned bike routes include:

EXAMPLE 3: 167 Avenue and 142 Street

The north side of 167 Avenue includes a shared pathway along most of the corridor between 127 Street and 148 Street, except for a 300-metre section between west of 138 Street to 142 Street.

Shared pathways are separated from traffic and are therefore appropriate facilities along arterial roadways. Because the connections on both sides of the missing link are shared pathways, the preferred solution would be to complete the missing link with a shared pathway for consistency.

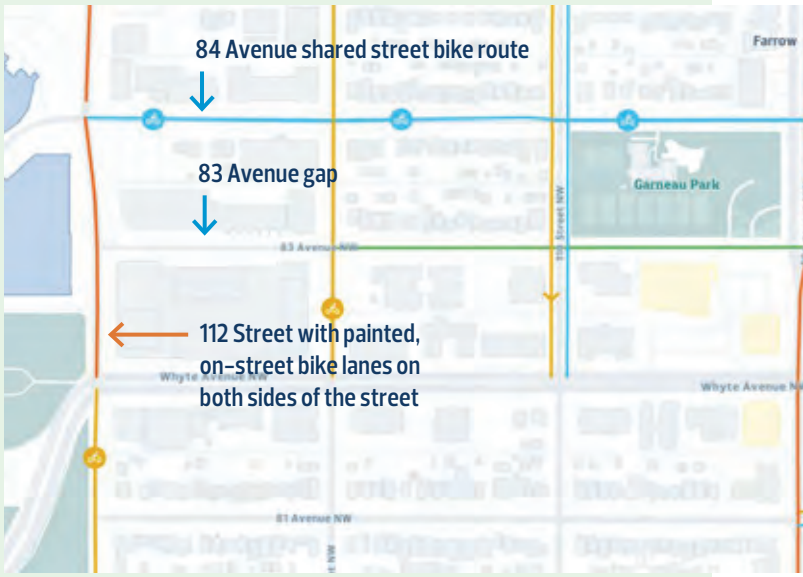


EXAMPLE 4: 83 Avenue from 110 Street to 112 Street

The existing protected bike lane along the north side of 83 Avenue extends from 96 Street to 111 Street, resulting in a missing link in the connection to the 112 Street on-street shared bike lanes.

Continuing the 83 Avenue bike lane to 112 Street was not feasible because of utility conflicts along the segment between 111 Street and 112 Street. In addition, there was no desire to add another crossing to tie-into the southbound bike lane on the west side of 112 Street. Recognizing the challenges of completing the missing link on 83 Avenue, alternative alignments were considered. Specifically, 84 Avenue between 111 Street and 112 Street, via a new bike route on 111 Street between 83 Avenue and 84 Avenue.

This alignment provides an opportunity to connect to 112 Street, taking advantage of the crossing at the 84 Avenue / 112 Street intersection. The 111 Street route also provides better access for the higher density buildings along 82 Avenue and 111 Street, as well as maintains the option to use the existing crossing at 111 Street and 82 Avenue.

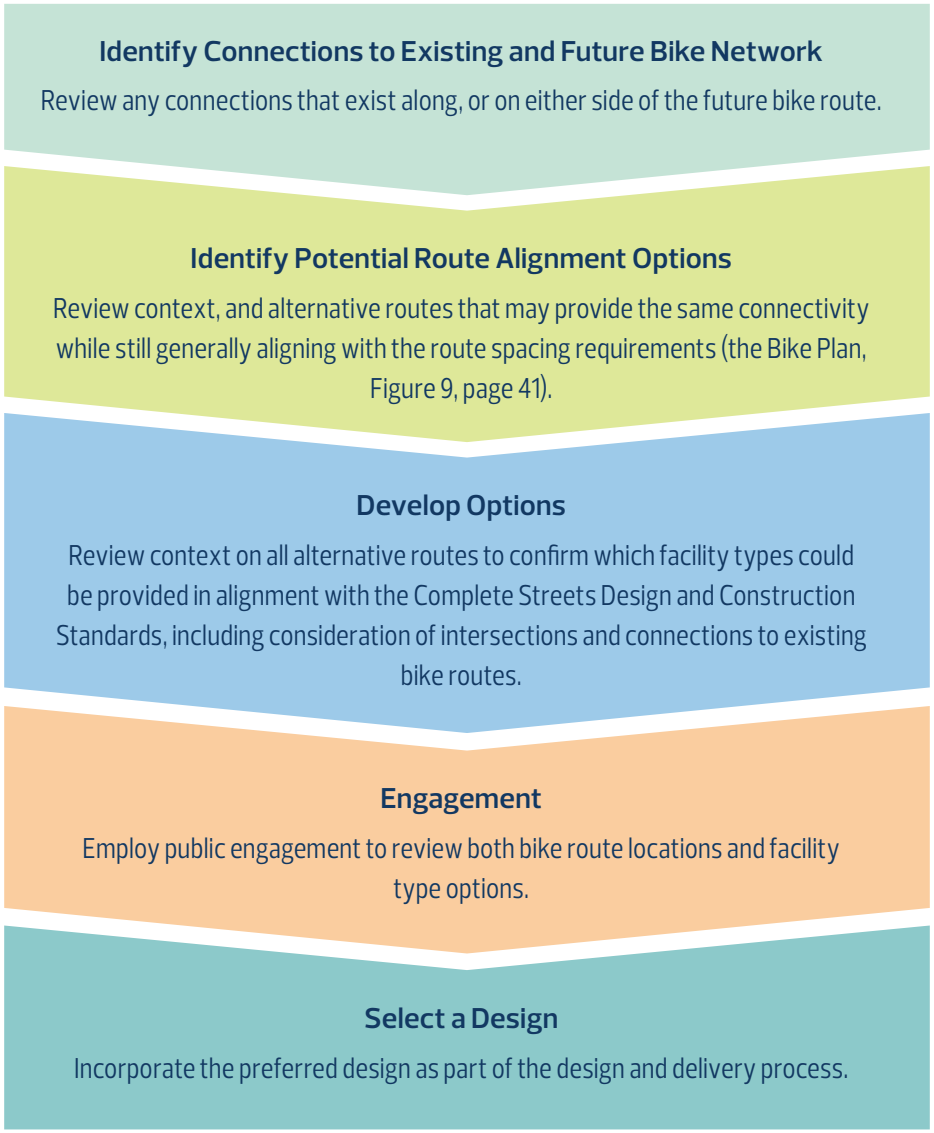


FUTURE BIKE ROUTES

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 bike infrastructure, but also include neighbourhood bike routes, connections to the River Valley and ravines and routes required to achieve the recommended network density.

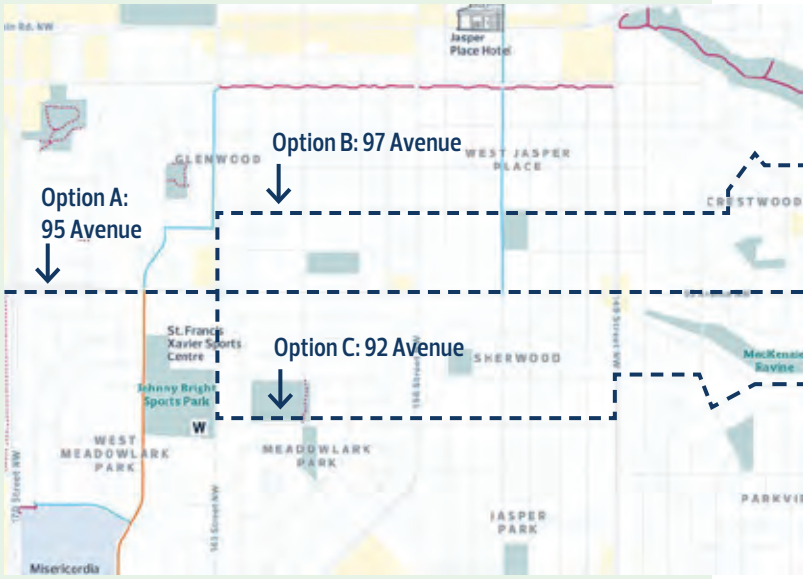
The goal of implementing a project along a future bike route corridor is to confirm the preferred location of the bike route, potential facility types, and implement the bike route.

Planning considerations for projects incorporating future bike routes include:



EXAMPLE 5: 95 Avenue

There is currently an east-west connectivity gap within west Edmonton. There are no consistent and direct connections between the neighbourhoods around 170 Street, and the areas near 142 Street and the bike network in the central area. Based on the required network spacing, an east-west route in the vicinity of 95 Avenue would help improve the network in this part of the city. This route could be constructed along 95 Avenue, but there may also be alternative routes on adjacent roadways that will provide the same network connections.



A project along 95 Avenue should consider how the route might be provided along 95 Avenue to align with the Complete Streets Design and Construction standards and Bike Plan network principles. The project should also consider what other routes might work, such as 97 Avenue and 92 Avenue, and consider how each of the routes align with the network principles. For example, due to inconsistencies in the local street network, 97 Avenue or 92 Avenue would provide a less direct route, but may be more attractive.

When considering alternative route alignments and facilities, the role of the route in the network must be considered. For example, district connector routes prioritize the network principles of directness and connectivity over attractiveness. Therefore, if the route is identified as a district connector route in the Bike Plan, any alternative route alignments and facilities considered should align with those principles. Alternatively, neighbourhood routes prioritize the network principles of attractiveness and health and comfort. Therefore, if the route is identified as a neighbourhood route in the Bike Plan, any alternative route alignments and facilities considered should align with those principles.

Ensuring that a proposed bike route aligns with the principles of its designated route type, and the values and preferences of the community, should guide the route alignment and corridor design.

BARRIERS

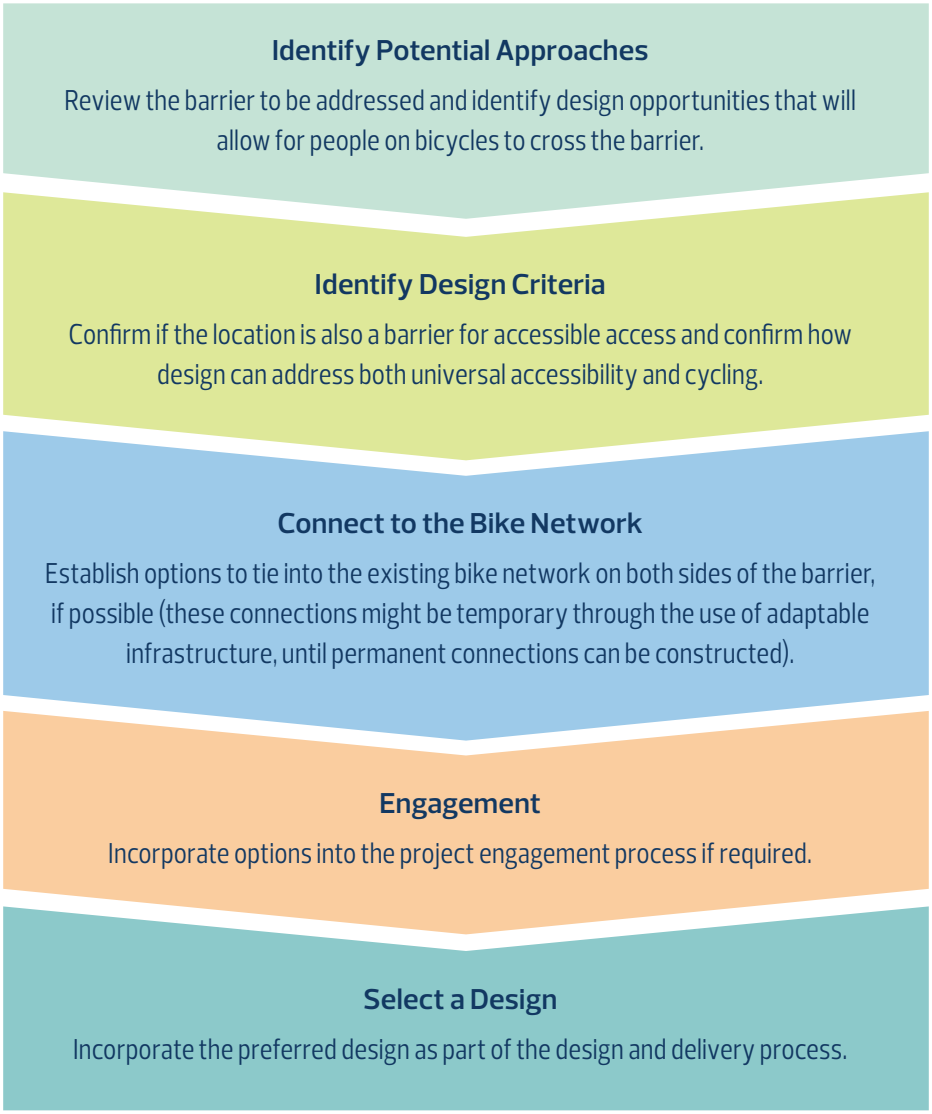
Barriers are locations where there is an obstacle in the way of a well connected network which is unlikely to be overcome for bicycle projects alone. Examples of barriers include railway crossings and bridge/interchange connections. Overcoming a barrier may not necessarily be driven solely by the need to complete a cycling connection; rather, the need may be driven by the accommodation of another mode (e.g., a train or vehicle bridge). Barriers are noted to ensure that if there are changes

in infrastructure, accommodation for bicycles 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.

The goal of implementing a project at a barrier location is to ensure that people on bicycles are able to cross the barrier. If cycling connections to the new infrastructure are not present, the project should complete the connections, even through the implementation of temporary infrastructure.

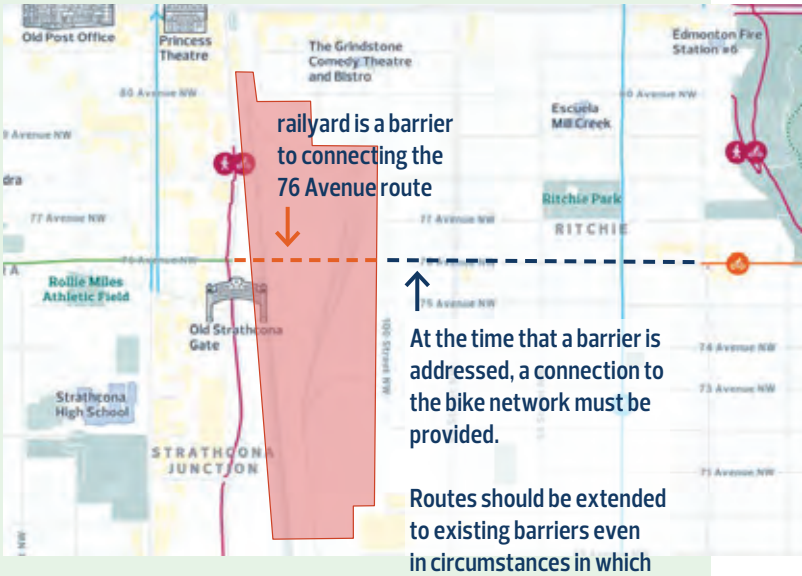
If a project results in the potential creation of a barrier, such as an intersection closure, the project is responsible for mitigating any negative network impacts through additional pedestrian/bicycle infrastructure or a route diversion.

Planning considerations for projects addressing barriers include:



EXAMPLE 6: Rail & 76 Avenue

76 Avenue is an existing bike route that provides connections from the River Valley in Belgravia to Gateway Boulevard. The major barrier preventing continuity of a 76 Avenue route to the east is the railyard east of Gateway Boulevard, and associated land permissions required. Any project that addresses this location should ensure that people riding a bicycle are able to cross this barrier, even if there is not yet a bike route immediately east of the tracks. If the project includes a roadway, crossing solutions may include continuation of the protected lanes to the east. Even if a motor vehicle crossing is not part of the project, separated bicycle and pedestrian facilities, or a shared pathway crossing if space constraints exist, would be solutions considered to cross the barrier.



REGIONAL CONNECTIONS

Regional connections represent conceptual opportunities to ensure that the bicycle 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 bicycle 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. Addressing regional connections will require collaboration with adjacent municipalities through a process similar to implementing a future bike route.

3.2 Process by Project Type

There will be opportunities to implement portions of the future bike network as stand-alone bikeway infrastructure projects to improve cycling connections. There will also be implementation opportunities through coordination with capital projects such as roadway reconstruction, neighbourhood renewal, open space projects, and major transit and corridor projects like LRT expansion.

AREA BIKE NETWORK PLANS

The individual project-types described in this section outline general approaches to expanding the bike network on a single route or corridor. It is important to recognize that the decisions made on a project could have a domino effect on future bike-related projects, potentially limiting planning and design opportunities. While coordinating the different delivery methods is very important for implementing the future bike network, it could also stall the process as projects wait for the first "domino" to fall, particularly given the flexibility that is afforded in the Bike Plan in terms of route alignment and facility design.

One way to help projects advance is to consider an area beyond the subject corridor to plan and design an area bike network. Expanding the planning purview may:

+ Better consider how the area is best served by bike-related infrastructure
+ Leverage opportunities where active transportation modes can be prioritized on certain streets or corridors (i.e., alternative routes)
+ Establish more connectivity points to the existing network
+ Rationalize design limitations on a given street or corridor

Expanding the planning scope does not does not necessarily mean expanding the construction scope of a project. Even if the planned routes remain out-of-scope for a particular project, this approach establishes a single, cohesive plan for how biking will be accommodated in the area in the future.

It's not always obvious when this approach should be employed, but here are a few potential scenarios in which it could benefit implementation:

+ the Bike Plan identifies and prioritizes numerous future routes in an area
+ multiple roadways in the area are scheduled for renewal and/or rehabilitation
+ major development(s) or redevelopment(s) in the area have been initiated
+ multiple adjoining neighbourhoods are scheduled for renewal
+ Major infrastructure projects that will impact the local mobility system (e.g., LRT)
+ Or any combination of the above

Examples of projects where this type of approach has been successfully employed include:

+ The Downtown Bike Network (Bicycle Grid for Downtown Edmonton Feasibility Study: Edmonton FastTracks)
+ The Southside Neighbourhoods Bike Network (Southside Core Neighbourhoods Bike Network Feasibility Analysis)
+ 127 Street protected bike lane where the entire corridor was designed, then implemented neighbourhood by neighbourhood through renewal

The studies for each of these area networks supported discussion and decisions on a minimum grid of protected bike lanes by including:

+ A practice and policy review
+ Current state analysis
+ Assessment of suitable routes, including a gap assessment, facility design assumptions and route screening analysis summary
+ Financial assessment
+ Engagement approach considerations
+ Recommendations

MAJOR TRANSIT AND CORRIDOR CAPITAL PROJECTS

Major Transit and Corridor Capital Projects include new infrastructure, reconstruction and major renewal on arterial roadways, major collector roadways, addition of mass transit, or other projects that will have a substantial impact on the city-wide mobility system. Because they typically consider mobility networks beyond a local neighbourhood level, these projects often impact the district connector bike routes, but may sometimes provide opportunities for neighbourhood route connections as well.

Accommodating the movement of people walking and biking will, and should, influence other aspects of a project such as traffic operations, road operations (e.g., on-street parking), intersection operations, crossings, and landscaping (among others). The delivery of an effective and valued active transportation link relies upon prioritizing walking and biking.

1 Project Scoping & Strategic Direction:

+ Where are the connections to the existing bicycle network and key destinations? Don't stop at the intersections—does a crossing need to be improved to connect to the existing bicycle network?
+ Review current conditions along existing routes (such as roadway characteristics, vehicle volumes and speeds). Do the routes meet the all ages and abilities standard outlined in the Complete Streets Design and Construction Standards?
+ Does this project present an opportunity to complete a missing link, establish a future route, upgrade a substandard route, or transcend an existing barrier? Are there opportunities to improve consistency and integration to links on either end of the route by improving transitions or crossings? Will the route serve as part of the all-seasons network?
+ Does the recommended route spacing suggest a need for an additional cycling connection in the vicinity of the project?
+ Does the scope of the capital project in question allow for the completion of a portion of the network that provides value according to the bike network principles? If not, justification for not including bike infrastructure should be well-documented and viable alternatives should be identified through a process which includes all other internal stakeholders that may be impacted.

Definition of alternatives:

+ What alternatives may exist (if any) for the bike infrastructure needed in the area and which of these alternatives would be in/out of scope for the existing capital project? Alternatives may include different route alignments and/or different facility types.
+ What constraints (e.g., right-of-way limitations) or conditions (vehicle speed and volumes) exist for the alternatives, and considering these constraints or conditions, how might these alternatives align with the Bike Plan's network principles?
+ Which alternatives are both technically feasible and aligned with strategic direction?
+ If any options would be out of the scope of the current project, what options may exist for future implementation? What are the timelines for these options? Can the design

include measures that might help to better accommodate future implementation of a bike route (e.g., constructing wider curb ramps, installing extra conduits for future bike signals) and avoid measures that would limit future implementation?

2 Engagement & Alternative Selection:

+ What do area and local residents and business owners / operators value from a transportation perspective? What are the competing community values?

+ With an understanding of the parameters and tradeoffs, do the alternatives align with public and stakeholder values? Why or why not? How can the ideas and opinions of the public and stakeholders be incorporated into the design so the alternatives better align with the values?

+ What other information or input is needed to select a preferred alternative? Are there secondary operational impacts such as crossing improvements for bikes that may impact intersection or roadway operations? How Can those impacts be mitigated if possible? What are the costs associated with the alternatives?

Design and Delivery:

+ How can the decisions and findings be incorporated into the design and delivery of the capital project? Or,

+ How can the decisions and findings be summarized and preserved for incorporation in future work (if delivery is out of scope)?

NEIGHBOURHOOD LEVEL PROJECTS

Neighbourhood level projects typically include work on local and collector roadways or other projects that are planned and designed within a local neighbourhood context. Neighbourhood level projects will likely include some district connector routes and the majority of neighbourhood level routes.

1 Project Scoping & Strategic Direction

+ Where are the connections to the existing bicycle network and key destinations? Don't stop at the intersections—does a crossing need to be improved to connect to the existing bicycle network?
+ Review current conditions along existing routes (such as roadway characteristics, vehicle volumes and speeds). Do the routes meet the all ages and abilities standard outlined in the Complete Streets Design and Construction Standards?
+ Does this project present an opportunity to complete a missing link, establish a future route, re-consider a substandard route, or transcend an existing barrier?
+ Does the recommended route spacing suggest a need for an additional cycling connection in the project area? Recommended route spacing can be determined from the Route Spacing and Bike Trip Potential (the Bike Plan, Figure 9, page 41).
+ How do local residents envision an improved mobility network in the area? What do they value?
+ Does the scope of the project in question allow for the completion of a portion of the network that provides value according to the bike network principles (upgrading outside of road right-of-way pathways can improve health and comfort; completing links through parks can make routes more attractive; improving roadway crossings can increase connectivity)?

2 Definition of alternatives

+ What alternatives may exist (if any) for the infrastructure identified on the future bike network implementation strategy, and which of these alternatives would be in/out of scope for the existing capital project? Alternatives may include different route alignments and/or different facility types.
+ What constraints (e.g., right-of-way limitations) or conditions (vehicle speed and volumes) exist for the alternatives, and considering these constraints or conditions, how might these alternatives align with the Bike Plan's network principles?
+ Which alternatives are both technically feasible and aligned with strategic direction? What are the costs associated with the alternatives?
+ If any options would be out of the scope of the current project, what options may exist to aid future implementation? What are the timelines for these options?

3 Engagement & Alternative Selection

+ How can the needed bike infrastructure support the values of the community? What are the competing community values?
+ With an understanding of the parameters and tradeoffs, do the alternatives align with public and stakeholder values? Why or why not? How can the ideas and opinions of the public and stakeholders be incorporated into the design so the alternatives better align with the values?

+ What other information or input is needed to select a preferred alternative? Are there secondary operational impacts such as crossing improvements for bikes that may impact intersection or roadway operations? How can those impacts be mitigated if at all?

+ Note: If stakeholders suggest/request additional cycling connections, these may be considered in addition to those required to meet the direction for the minimum network proposed in the Bike Plan. The Bike Plan does not preclude the addition of cycling connections where desired and supported by local communities.

4 Design and Delivery

+ How can the decisions and findings be incorporated into the design and delivery of the capital project ? **Or**

+ How can the decisions and findings be summarized and preserved for incorporation in future work (if delivery is out of scope)?

RENEWAL AND OTHER LIMITED SCOPE PROJECTS

The roadway renewal program and micro surfacing program may provide limited opportunities to improve the cycling network due to their constrained scope, lack of engagement activities, and/or minimal planning. Rather than assessing each limited scope project for opportunities to implement the bike network, the program should be reviewed in the context of the existing and future bike network to identify candidate corridors for further consideration. Candidate corridors may require additional resources to augment the scope of work.

1 Review Program Projects

+ Are any projects located along an existing or future bike route as defined in the future bike network implementation strategy?

+ What are the limitations of the scope of those project and to what extent might the scope meaningfully improve the bicycle network?

+ Is there anything within the project's scope that should be considered to allow for future implementation of bike routes?

+ Does the scope/context of the project suggest a further review of opportunities is needed?

+ Are there opportunities to reconsider the scope of the project to support more substantial changes to support bicycle network implementation?

+ If a limited scope project presents an opportunity to complete bike route implementation in any substantial way, additional resources may be needed to augment the project scope, bumping it to a corridor capital project or neighbourhood level project depending on the context.

DEVELOPING AREAS

Developing areas provide a key opportunity to implement bike plan principles as part of construction of new neighbourhoods. Applying the bike plan principles as part of the planning process will ensure effective integration of new neighbourhoods into the city's bicycle network.

1 Review active network proposed with area and/or neighbourhood structure plans considering the bike plan principles.

+ Does the roadway meet Complete Streets Design and Construction Standards?
+ How do network spacing requirements impact the need for additional cycling facilities? Note that bicycle trip potential (the Bike Plan, Figure 9, page 41) may not yet be available for developing areas. Assume Tier 1 for developing areas with higher density, and mixed uses and Tier 2 for lower density residential uses.
+ Are cycling connections available between neighbourhood destinations such as commercial centres, schools, parks, higher order transit facilities and the arterial/district connector network?
+ Are cycling network connections available for recreational use that provide connections to Storm Water Management Facilities, River Valley Access Points, and parks?
+ What bicycle infrastructure is required, in addition to shared pathways along arterial roads? Additional network density may be required and may be achieved by adding protected bike lanes and shared roadways to fulfill connectivity and permeability needs?

STREET CROSSINGS

As outlined in the City of Edmonton *Safe Mobility Stategy 2021–2025*, street crossings can be places of vulnerability for people walking, rolling and biking due to conflicts with vehicles. Street crossings that are bike-friendly play a critical role in creating a network that is connected and accessible for everybody.

The objectives of designing bike-friendly crossings are to:

+ better organize intersection movements in a way that increases safety or highlights conflicts between people walking, biking and driving
+ eliminate or minimize delay for people biking (and using other active modes)

Bike-friendly crossings can create more awareness of the different ways people pass through an intersection and provide clarity to road users about how to navigate the intersection. Bike-friendly crossings typically provide shorter crossing distances, reduce turning conflicts and make intersections more intuitive to pass through. Bike-friendly intersections also may improve the pedestrian experience.

Most importantly, designing and constructing bike and pedestrian-friendly crossings sends a message to people: walking, rolling and biking are recognized and valued as ways that people move through and experience our city.

NACTO Urban Bikeway Design Guide outlines three ways to change the street. These also apply, generally, to implementing bike-friendly intersections:

Change the Crossing or Intersection Design

+ **Shorten crossing distances** by reducing the carriageway of the road (i.e., removing vehicle lanes), modifying intersection geometry (i.e., adding curb extensions, adding refuge islands, or reducing curb return radii).
+ **Reduce traffic stress** by better organizing vehicle movements (removing vehicle lanes, repurposing through–left lanes to left-turn only lanes or bays, restricting particular vehicle turn movements).
+ **Slow vehicle traffic** by raising the intersection or crossing, narrowing lanes, eliminating or mitigating vehicle weaving and lane changes (by removing vehicle lanes), reducing the curb return radii to slow turning speeds.
+ **Make people who bike and walk visible** by adding curb extensions, restricting or removing curbside parking near the intersection, providing lighting.

Change the Crossing or Intersection Operation

+ **Reducing conflicts and traffic stress** by introducing or upgrading traffic control (crossings may require signalization but other types of traffic control can be considered depending on the operating characteristics such as vehicle volume, operating speeds, etc.) and restricting particular vehicle turn movements.

+ **Make it easy for people biking** by installing signal detection and activation to improve intersection efficiency, increase convenience and reduce delay for people biking, encourage compliance (detection tends to discourage red-light running), and better recognize biking as a way that people move around Edmonton.

+ **Make people who bike and walk visible** by implementing measures such as leading bicycle (and pedestrian) intervals at intersections with high vehicle turn volumes to give people biking and walking a head start before vehicles get a green signal.

Change the Network

+ **Reduce traffic stress and create capacity** to better accommodate people walking and biking by diverting vehicle traffic from a street or changing upstream or downstream intersections (i.e., restricting turns) to better manage queues spilling back.

For each of these approaches to be applicable, it is key that crossings, particularly arterial crossings, are identified early in the project and the design and operations of the crossings are integrated as part of the planning and design process. If addressing the crossing is left too late in the process, opportunities to change the intersection geometry and/or network, may be challenging, resulting in changing the operations as being the only remaining approach.

PROJECT COORDINATION

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 can and should support the planning and design of bike routes. Depending on the type of project, scope, timing (of the project and relative to other projects), and proximity to other capital projects, this process may differ. The process should consider the following:

Project Awareness

What related work is planned nearby? What is the timing of that work? Which groups are leading that work?

Opportunities for Collaboration

Are there opportunities for collaboration? Does collaboration potentially result in cost savings or better use of City resources (i.e., combined engagement)?

Decision-Making

How can we make decisions? Is there a process or tool that can help the decision-making process? Which criteria should be used to guide decision making? Who should participate in this process? Does feedback from the public have a role in the decision-making process?

Communicate the Decision

How can we document the decision so it can be easily communicated internally and publicly?

To address these questions, collaboration at the project level should continue to be emphasised, along with implementing a project-specific process that encourages decision-making through a transparent and well thought out process. Depending on the type of project, scope, proximity and timing relative to other capital projects, this process may differ.

WHEN IS ADDING A BIKE ROUTE A NO-GO?

Capital projects are often the most cost-effective ways to implement a bike route, or a portion of a bike route. However, there may be situations where it is not appropriate to complete the route. These situations might include:

Construction of disconnected bike routes

If the route does not connect to the rest of the bike network, construction may result in a disconnected portion of infrastructure with little practical use. Potential disconnected bike routes need to be considered in the context of the existing and future bike network and the potential timing of adjacent future projects.

Construction of a short segment of an extended corridor

If the scope of a project only includes a short segment of a bike route extension, the scope of the project may limit the ability to implement an appropriate bike facility. For example, a shared pathway may be the only feasible design in the context of the shorter segment, but the corridor may be better served by adding a protected bike lane. In this case, the addition of the shared pathway may limit design options of the bike route in the future. In such a case, the project may proceed without considering a bike route. If possible, consideration could be given to delaying the project until such time that the corridor is to undergo a more significant renewal or reconstruction.

Limited Project Scope

The corridor requires substantial additional planning work, engagement, and trade-off discussions that cannot reasonably be incorporated into the scope of the project, such is often the case with renewal and micro surfacing projects. Rather than review bike network implementation opportunities on a project basis, these programs should be reviewed annually, and at least one year in advance of construction, to identify candidate projects that should be elevated to a more significant renewal or reconstruction.

While retrofitting bike routes is challenging, implementing bike routes as part of some capital projects can be cost-effective, offering efficiencies in the planning, design and construction processes. While every project should endeavour to add to the bike network, there are instances in which that is simply not possible. If a project proceeds without the inclusion of bike accommodation, justification for doing so should be well-documented and viable alternatives should be identified through a process which includes all other internal stakeholders that may be impacted. The results of this process must be clearly communicated and coordinated.

In addition, the design should consider measures that might help to better accommodate future implementation of a bike route (e.g., constructing wider curb ramps, installing extra conduits for future bike signals) and avoid measures that would limit future implementation.

3.3 Notes on Localized Engagement for Bike Routes

The Bike Plan recognizes that the input of the public and stakeholders is an essential part of the equation to ensure bike routes align with the aspiration and values of the Bike Plan. Engagement provides local context and understanding that is often difficult to incorporate into planning decisions at the city-wide level. While local engagement opportunities may be more apparent when planning neighbourhood routes, district connector routes are not divorced from their local context. Localized neighbourhood understanding can provide valuable insight to the planning and design of all route types.

Public engagement should be an input to decision making as local knowledge can inform route selection, facility type, and considerations for design. However, this input must be considered within a broader understanding of the bicycle network and the principles of the Bike Plan. Public engagement is best incorporated into informed decisions where there are multiple options that are both technically feasible and strategically aligned. Engagement is a process to ensure that localized tradeoffs are considered holistically with community needs and desires while ensuring that the solution is safe and aligned with the bicycle network principles.

The following steps provide a guide for how to approach transportation projects such as future bike routes:

STEP 1 APPLY GBA+

As outlined in the City of Edmonton's *The Art of Inclusion: Our Diversity and Inclusion Framework*, to better understand our own perspectives, who we've talked to, and who we need to hear from, the City adopted Gender-Based Analysis Plus (GBA+) as a process that can be used to become ready, willing and able to take individual and collective action toward our Shared Goal for Inclusion.

By using GBA+ we can better understand diverse perspectives, experiences and needs and create services that best serve everyone. The goal of GBA+ is to reduce inequality, reduce discrimination and ensure equality of outcomes for the communities we serve. The "plus" in GBA+ is critical, because it emphasizes that there are many identity factors to consider – all of which combine and layer to make up diversity.

GBA+ is a process that prompts us to:

+ reflect on our own perspectives and biases
+ understand how perspectives and biases can impact our work
+ understand the experiences of groups and individuals who are marginalized
+ identify how we can do our work in more inclusive ways

We use it to assess how our work might impact diverse groups of people and ask:

+ Who is excluded?
+ What contributes to this exclusion?
+ What will we do about it?

A The GBA+ process starts by understanding who we have talked to and who we need to talk to. Start by assessing and researching:

+ What perspectives the project team brings and, perhaps more importantly, which perspectives are not present.
+ The diversity of the people in the subject area or neighbourhood through demographic data and meeting with community organizations and leaders.
+ Who we heard from through engagement on related projects, from strategy-level to corridor projects, by reviewing What We Heard reports.
+ Any findings through academia or technical guides about individuals or groups of people whose perspectives need to be heard.
    - » These might be from specific bike-related research work, more broad and general research and publications, or even research or publications about another topic where key principles can be applied.

The Bike Plan, section 8.1 "Who are we planning for" is a good starting point for this work. However, it is important to understand that it is not a checklist; rather, it identifies groups of people whose perspectives are important to understand and/or groups of people who we may not hear from through traditional engagement approaches. It is the responsibility of each project team to identify the groups of people whose perspectives and experiences need to be heard and understood for their project. It may include all or some of the groups listed in the Bike Plan, but it is also not limited to just those groups.

B **Identify factors, or intersectionalities, that overlap and contribute to the ways in which people experience our city and engage with people who have those identity factors to gain a fuller, more complete understanding of the barriers of inclusion.**

For example, from the City of Edmonton's *The Art of Inclusion: Our Diversity and Inclusion Framework*, an organization may focus on increasing the representation of women in leadership. However, without understanding the different needs of racialized women or women with disabilities, there may be barriers to inclusion that are not addressed. GBA+ leads us through a process to understand and address intersectionality.

When exploring these intersectionalities, more intimate engagement tactics should be considered such as a community conversation, where the project team engages directly with a small group of people by way of an intimate conversation. Community conversations can be held with a group of individuals, a community organization, and organizations that represent or work with a group of people (while no single organization can speak for the entire neighbourhood, these organizations can help to better understand the community but cannot replace community conversations with members of the community). It's also important for the project team to understand and appreciate ongoing conversations in the community (Neighbourhood Resource Coordinators are a good resource for this, as well as other project teams with experience in the area). The conversation could include topics and questions such as:

+ How do they experience the neighbourhood or other parts of the city?
+ What parts of their neighbourhood's social and physical environment makes them feel uncomfortable? What parts make them feel comfortable?
+ Which parts of their neighbourhood's social and physical environment support their needs and activities? What parts create barriers or challenges?
+ What amenities / design features do they value in their neighbourhood and other parts of the city?
+ How do they travel within their neighbourhood and to other parts of the city?
+ What parts of their neighbourhood make them feel uncomfortable travelling through? What parts make them feel comfortable travelling through?

STEP 2 VALUES AND VISION

Livability is the combination of factors that add up to the quality of life that a neighbourhood can provide. The way that neighbourhoods are planned, designed and built can enhance or detract from liveability. Transportation is one of the factors that contribute to liveability. Whether it enhances or detracts from liveability depends on the efficiency of the transportation network, and also the level of stress that the transportation network may cause for people using it.

Learning and understanding what people value for their neighbourhood is the foundation of the planning and design process. To achieve liveability, we need to understand the needs and values of people that live in the neighbourhood and how they envision their streets working.

A **Start by reviewing existing conditions with people from the neighbourhood to more fully understand how people use the transportation network, what works well, and what needs to be improved.**

B **The network principles outlined in the Bike Plan are a good place to start the conversation about what people value for their neighbourhood. It also provides an opportunity to share more about the broader bike network and the role that a particular route might have for people that do not reside in the neighbourhood (i.e., commuters). Do people value being comfortable and feeling secure when walking to destinations in the neighbourhood which might mean safe crossings and slower vehicle speeds (walkability)? Is it being able to drive out of the neighbourhood without significant amounts of delay (drivability)? Is it being able to bike throughout the neighbourhood and beyond without having to ride with vehicle traffic (bikeability)? Is it ensuring that there are adequate places to park on the street to support local businesses / neighbourhood amenities?**

At this point, specific plans are not discussed as it may negate the opportunity to learn about what people in the neighbourhood value. Centering the discussion on values is important to ensure that the feedback guides the technical work rather than replaces it. For example, the feedback, "I value walkability" vs. "I want a shared pathway" may elicit two quite different responses from the project team and how they approach the design of the corridor, street or neighbourhood.

Understanding people's attitudes about biking can also help focus the conversation around new bike routes. First, it is important to differentiate between identity factors, as outlined in Step 1, and attitudes. For the purposes of engagement, identity and attitude are not connected. Focusing on identity factors is a process for inclusion whereas focusing on attitudes helps to understand what people value.

The Bike Plan engagement and survey results showed differences in attitudes about biking, which provides insights into how people might support (or be challenged by) changes to the transportation network in their neighbourhood. 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 infrastructure.
+ **Supporters** understand and promote the benefits of biking infrastructure 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 infrastructure 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 infrastructure and would prefer that the City not prioritize spending on bike infrastructure and programs.

By understanding the attitude of a person, group of people, organization, or the community in general, we can have more focused and constructive conversations around biking.

For example, talking to "concerned" people is an opportunity to understand what the limits for their support are (e.g., will accept one-way travel but won't accept a loss of on-street parking). Concerned people generally understand trade-offs but don't want their support to be taken advantage of and pushed to its limits. Conversations with "supporters", on the other hand, might be more focused on what improvements can improve the biking experience. "Champions" are often deeply knowledgeable about different routes and facility types and can help to anticipate challenges and identify solutions based on their own experience and that of others they're connected with. "Non-Supporters" will want to understand how impacts can be mitigated.

STEP 3 DEVELOP OPTIONS AND SHARE

It's time for the planners, engineers and designers to translate the feedback received into design options through the design process including:

+ Exploring and understanding the design opportunities and constraints
+ Researching best practices and other bike route designs
+ Identifying potential design measures to address the barriers to inclusion, support what people value, and align with role of the route in the network
+ Developing design options for consideration
+ Reviewing, refining and assessing design options

Through the course of this work, it's likely that many options may be developed. When sharing back with the public, only feasible options, those that align with policy direction and are technically feasible, should be shared. When presenting options, the conversation should be framed around barriers to inclusion and values.

The goal of those conversations are to:

+ Confirm what we heard around barriers to inclusion and values
  - » Barriers to inclusion and values should be clearly highlighted in the What We Heard report, along with who was engaged, and how.
+ Confirm whether the measures to address inclusion barriers are reflected in the plan
  - » Highlight the measures used to address barriers to inclusion.
  - » Ask questions:
    - · Is the measure used to address the inclusion barrier appropriate?
    - · If not, how else can this be addressed?
    - · Are there any unforeseen consequences that may result from the implementation of this measure?
+ Confirm that the design aligns with the values of the community
  - » Highlight the design elements that align with the stated values.
  - » Ask questions:
    - · How does this plan align or not align with the community values?

If the conversation is not centered on addressing barriers to inclusion and values, the discussion could be perceived as a vote. This is problematic because other considerations in the decision-making process are overlooked (i.e., policy alignment, design constraints), thereby mismanaging people's expectations about how their feedback may influence the project.

STEP 4 REVISE AND REVISIT

For some projects, it may be necessary to revise the design options or develop additional options based on the feedback received during Step 3.

If multiple options are initially shared with the public, the preferred option should be shared publicly once decided upon and the decision-making process should be transparent, well documented, and easily communicated. Analysis tools, such as Multiple-Criteria Decision Analysis (MCDA) are usually a good approach to sound decision making, allow the process to be well documented, and are relatively straightforward to communicate out.

Other Considerations: Pop-Up and Pilot Bike Lanes

Pop-ups and pilots are ways of temporarily reconfiguring a street to show the value of bike lanes by providing a new way for people to experience it. Pop-ups serve as demonstrations for a short period of time, like one month or less, helping people reimagine the street design while pilots are used to prove the viability of a project for a relatively longer period of time, like less than one year. Both approaches use low-cost, non-permanent materials including, but not limited to, pylons, barricades, curb stops, concrete barriers, flexposts and chalk / paint.

Pop-ups and pilots are especially effective at highlighting design benefits to vulnerable road users and the extent of inconveniences to vehicle travel. Candidate projects are typically those with the objective of making the street more accessible for people walking and rolling including improved street crossings, traffic calming, road diets and bike lanes.

Pop-ups and pilots can serve as a way to more actively engage a community on a project by:

+ Encouraging residents, local businesses and community organizations to participate and collaborate in the design and implementation (perhaps more in the case of pop-ups) of the demonstration, which can strengthen relationships within the community and with the City.
+ Providing an opportunity for people to better understand their community's needs.
+ Highlighting any gaps or shortcomings in policy and design practices.

Effective pop-ups and pilots include a few common elements:

+ A clearly stated purpose, generally agreed to by the community. Is it to demonstrate what is possible? Is it to get community buy in? Is it to test a new idea?
+ Work with the community—use it as an opportunity to actively engage residents, local businesses and community organizations.
+ Gather real-world data before and after to communicate project benefits and impacts.
+ Manage expectations—what is the path to a permanent solution?
+ Have fun and celebrate!

4.0 Maintaining an All-Seasons Network

Maintaining Edmonton's all-seasons network is a significant part of realizing the Bike Plan's aspiration of inviting people to bike for all reasons, in all seasons. The Bike Plan provides an opportunity to strategically consider how Edmonton's all-season bike network could better serve those that do ride in the winter and to make winter riding a practical choice for those who may not ride year-round right now. Envisioning Edmonton's all-season network includes reviewing maintenance levels, identifying opportunities to expand the all-seasons network, and identifying financial implications.

4.1 Bike Network Principles and the All-Seasons Network

The bike network principles and how they relate to maintaining the all-seasons network are highlighted below.

BIKE PLAN PRINCIPLE	AS IT RELATES TO THE ALL-SEASONS 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.	In the winter context, the principles of health and comfort are paramount. For biking to be inviting in the winter, the network needs to provide predictable riding conditions by way of routes that are maintained to minimize slipping, ruts and other hazards. Bike-car conflict points need to be clearly highlighted through lighting and design (i.e., clear sight lines, highlighting street crossings through lighting).
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.	The all-seasons network is best considered as a sub-network of Edmonton's bike network, generally consisting of the district connectors. While the all-seasons network may not be able to provide as diverse a range of route options and experiences, it must be connected.
DIRECTNESS	
The cycling network prioritizes direct and straight routes and minimizes out-of-direction travel and unnecessary stops.	The all-seasons network will consider directness in route selection, however there may be instances where other principles, such as health and comfort are prioritized over directness in the context of the all-seasons route.
NETWORK DENSITY	
Grid size (distance between parallel routes in a network) is dependent on demand—higher demand areas have higher density.	To ensure effective resource management, only select routes will be designated for priority maintenance, particularly in the winter. As a result, the all-season bike network may have reduced network density but should still ensure basic connectivity and support high-demand routes.
ATTRACTIVENESS	
The cycling network is composed of routes that are aesthetically attractive, interesting, or pass through sociable places.	It's not uncommon for people riding in the winter to prioritize comfort (i.e., a cleared route) over attractiveness; therefore, principles such as health and comfort may be prioritized over attractiveness in the context of the all-seasons network. Recognizing that many people do ride for recreation year-round and value the benefits of an attractive route, reliable all-seasons routes to recreation destinations, such as the River Valley, is important and will continue to be included.

BIKE PLAN PRINCIPLE	AS IT RELATES TO THE ALL-SEASONS NETWORK
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.	The value that bike routes add to a neighbourhood should be considered and evaluated for all four seasons. Bike routes, particularly shared pathways, also serve more than just people biking. People walking and wheeling also benefit from a well-maintained bike network as shared pathways provide valuable connections into, out of and through many neighbourhoods.

4.2 Maintenance Levels

Similar to snow clearing the roadway network, maintenance for the bike and active modes network will be organized into a hierarchical classification system. This approach is similar to current practices, which are summarized in Appendix C. District connector routes are best compared to arterial roadways, and the seasonal maintenance requirements should be considered in a similar manner, ensuring reliable connectivity along major routes.

Generally, the maintenance levels are applied to the network by way of the following:

+ **Level 1** is comparable to the current (2020-2021) maintenance level associated with prioritized bike routes with additional maintenance considerations in the shoulder season. Routes that are maintained to a Level 1 maintenance standard will generally include key district connector routes and River Valley district connector routes.

+ **Level 2** is comparable to the current standard associated with most shared pathways with additional maintenance considerations in the shoulder season for select routes. Routes that are maintained to a Level 2 maintenance standard include all other district connector routes and most shared pathways. Most shared pathways are currently cleared, and will continue to be cleared, within 48 hours. Level 2 routes are considered part of the all-seasons network. Discussions to prioritize some of these routes within the Level 2 category is recommended..

+ **Level 3** is comparable to the current standard associated with non-prioritized on-street bike routes. Level 3 routes are not considered part of the all-seasons network and include most neighbourhood routes.

Although each season may present unique maintenance challenges from snow clearing to sweeping, the greatest barriers are typically associated with issues of clearing snow and ice to ensure that the bike routes are passable. **Table 6** outlines proposed maintenance levels. The details associated with each maintenance level will require further refinement in coordination with the operations teams.

TABLE 6: Proposed Maintenance Level Classification

	ALL-SEASONS NETWORK STANDARDS		
SEASON	**LEVEL 1**	**LEVEL 2**	**LEVEL 3**
Spring	sweeping (ideally completed in early spring to ensure safe riding conditions at the start of the fair-weather riding season)	sweeping, likely at the same time as roadway sweeping, and early spring snow / slush management	sweeping, likely at the same time as roadway sweeping
Summer	not applicable	not applicable	not applicable
Fall	bike routes with significant tree canopies are swept and encroaching vegetation is cleared back	bike routes with significant tree canopies are swept and encroaching vegetation is cleared back	not applicable
Winter	**Snow Clearing** maintain level 1 bike routes and shared pathways to bare pavement within 24 hours from end of snowfall, including freeze/thaw ruts & slush management **Brining** brining does not take place on routes that are adjacent to or through the River Valley, ravines and natural areas **Sanding** includes sanding	**Snow Clearing** maintain level 2 bike routes and shared pathways to bare pavement or a maximum 2 cm snowpack within 48 hours from end of snowfall (context sensitive), including freeze/thaw ruts & slush management **Brining** does not include brining **Sanding** includes sanding	**Snow Clearing** plow or blade snow from designated bicycle routes with the roadway plowing, to the same service level designated for that roadway **Brining** does not include brining **Sanding** includes sanding as part of roadway sanding

4.3 The All-Seasons Bike Network

The current priority network has been established based on protected bike routes and other high-quality bike infrastructure projects coming online. That approach has worked well as much of the high-quality bike infrastructure is located in the central areas and is somewhat connected. As more high-quality bike infrastructure projects come online, particularly those in neighbourhoods beyond central Edmonton, a strategic approach for designating bike routes as part of the all-seasons network is needed to ensure that:

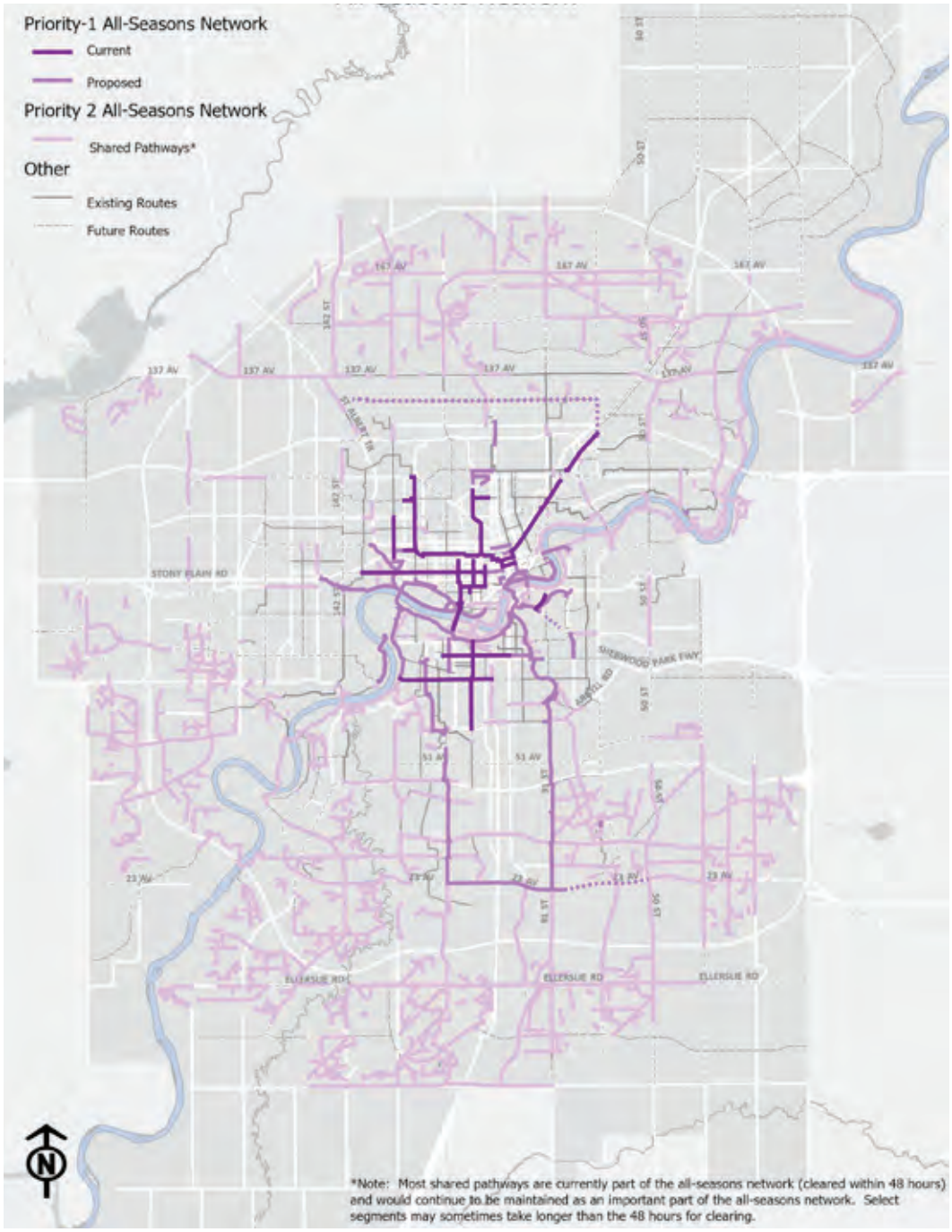
+ a connected network is provided to allow people to comfortably get to where they want to bike

+ system efficiencies, from a maintenance operations perspective, are leveraged

All routes play an important role in a well-connected network; however, only some will be designated an all-seasons route because of the realities of resource management and other constraints, such as the design of the facility. The district connector network outlined in the Bike Plan can be considered the all-seasons network outline, providing guidance about the general alignment and spacing for new bike routes.

The next step for Edmonton's all-season network is to continue to extend and expand the network of Level 1 routes from Central Edmonton. **Figure 5** highlights the current and proposed all-seasons network. Most proposed Level 1 routes identified have simply been upgraded from a Level 2 maintenance standard, while others represent new routes that should be designed to ensure that they can be maintained to the Level 1 standard.

FIGURE 5: Current and Proposed All-Seasons Network



The changes to the all-seasons network can be characterized by the following:

+ Increased density of Level 1 routes in Central Edmonton, where ridership is higher
+ Additional north-south Level 1 routes extending from Central Edmonton to Northwest Edmonton and South Edmonton
+ Addition of east-west Level 1 routes in North and South Edmonton

4.4 Financial Impact

The all-seasons network, as highlighted, includes 95 kilometres of bike routes. Considering the 38 kilometres of currently prioritized (Level 1) routes, this represents an additional 57 kilometres of Level 1 routes. Assuming a unit cost of $8,800 per kilometre to maintain routes to the Level 1 standard, a prioritized network of 95 kilometres is anticipated to cost about $500,000 for snow clearing, in addition to the current cost of clearing the prioritized (Level 1) bike network. The estimate is considered conservative given that the majority of the additional routes are shared pathways, which are currently maintained to the non-prioritized pathway standard (Level 2).

4.5 Other Considerations

The all-seasons network should be updated annually as new infrastructure is added to the network. The all-seasons network should be reviewed from a strategic and network connectivity perspective regularly (e.g., every two to three years) to ensure that it continues to serve Edmontonians in a way that is meaningful to them while aligning with dedicated resources.

SNOW CLEARING CHALLENGES AND EXAMPLES

The implementation and construction of a range of bike facilities has provided many learnings around how to deliver bike infrastructure that meets the needs of Edmontonians in all-seasons. Below are just a few examples of some of the snow clearing challenges that need to be considered in the design and implementation of new bike routes.

The Challenge: Differing levels of maintenance between on-street bike facilities (shared roadway, painted bike lanes, raised bike lanes) and the roadway on which they are located causes snow to creep into the bike route, making it uncomfortable or impassable.

Example: 83 Avenue from 95a Street to 99 Street
This segment of the 83 Avenue bike route is a district connector route which includes an on-street bike facility (a westbound painted bike lane and an eastbound shared road)on a local residential street). For 83 Avenue to serve as an all-seasons route, this section of the route should be cleared to the same standard as the protected bike lane on 83 Avenue west of 99 Street. The on-street bike route creates a challenge from a maintenance perspective resulting in one of two outcomes:

+ The roadway is cleared based on the local roadway standard making this segment of the route impassable for people biking, forcing them onto the sidewalk or to a parallel route (i.e., 82 Avenue); or
+ The roadway is cleared based on the bike priority standard resulting in public confusion and frustration about why a local roadway is cleared to a higher standard comparable to an arterial roadway.

In order to maintain a comfortable bike route in the winter, the adjacent local roadway should be cleared to the level 1 standard. For future on-street bike routes that are to be maintained to the level 1 standard, the operations impact should include the resources required to respond to 311 (and other public) inquiries and to create and deliver a local marketing campaign to communicate how and why the route and roadway will be maintained.

This example highlights how the design of a bike route can affect how it is maintained. All bike projects should include an operations assessment to outline potential maintenance resource requirements, including considerations of handling inquiries and creating supplemental marketing campaigns, to maintain the infrastructure in alignment with the Bike Plan principles of health and comfort and network connectivity.

The Challenge: The design of the bike facility limits the type of equipment or treatment that can be used, causing snow and ice build-up, or an increase in maintenance costs to clear these areas manually.

Example: 76 Avenue from 105 Street to 109 Street
The unidirectional protected bike lanes on 76 Avenue include segments which weave around parking spaces, creating narrow jogs in the route. As a result of the design, some sections of the route must be cleared manually because the equipment cannot be accomodated. This results in additional maintenance resources needed to maintain the bike route to the specified standard. This example underlines how design can affect maintenance practices and may prevent or hinder a specific segment from being maintained to a level that aligns with the Bike Plan Principles of Health & Comfort and Connectivity.

5.0 Monitoring and Evaluation

The overarching goal of the Bike Plan is to increase cycling in Edmonton, with the aspiration that biking is "inviting for people of all ages and abilities, for all reasons, in all seasons." The overarching goal is informed by ConnectEdmonton and The City Plan which include the following indicators, targets, and measures:

+ **ConnectEdmonton Indicator** for the transportation system is transportation mode and identifies the breakdown of Edmontonians' modes of transportation for daily need through the City of Edmonton Community Perception Survey.
+ **The City Plan target** that aims for 50% of trips to be made by transit and active transportation
+ **The City Plan strategic measures** for the transportation system related to biking are:
  - » daily trips using transit and active transportation by district
  - » bicycle paths/lanes per 100,000 population

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. Monitoring and evaluation programs can also gauge the effectiveness of how the plan and its associated programs are being delivered. To do this, two areas must be measured:

+ **Program Outputs —** The institutional products and activities such as policy, programs, infrastructure operation, maintenance, and construction which the City is responsible for delivering or that are delivered by partner agencies

+ **Community Outcomes —** The performance, behaviour, and perceptions of Edmontonians to the changes that are made in the community because of the programs and actions taken by the City or partner agencies.

Metrics aim to measure these program outputs and community outcomes. Some of the metrics were inspired by monitoring frameworks from other cities because of their content and brevity. By focusing on meaningful metrics that are not too onerous to collect, the monitoring and evaluation framework will be easier for the City to implement and consistently receive necessary support for the duration of the Plan.

5.1 Metrics

The program output and community outcome metrics summarized include a proposed data source and frequency of evaluation. The frequency of evaluation is proposed based on the availability of the data, the level of effort required to calculate the metric, and the utility of the data in informing near-term or long-term adjustments. The metrics are also accompanied by a stated utility (i.e., why are we measuring this?). The stated utility typically refers to monitoring overall ridership goals, components of the aspiration and values, the network principles, or the program areas.

Some of the proposed data sources do not currently exist. The data sources that should be developed so appropriate monitoring can occur are:

+ **Asset Management Database –** To be created in line with Bike Plan action 9.6.2 Maintaining Bicycle Facility Infrastructure and Equipment

+ **Community Partner Survey –** To be deployed yearly to track the activities of community partners related to cycling. Community partners should be notified a year in advance of the first survey of the type of metrics they will be asked about to maximize the quality of the collected data.

+ **Transportation Survey –** To be implemented bi-annually in conjunction with the Traffic Safety Culture survey. The survey will provide interim travel information between Household Travel Survey years.

PROGRAM OUTPUT METRICS

Program Output metrics monitor the implementation of the Bike Plan. Some program areas of the Bike Plan may have a limited number of metrics since tracking may be difficult due to data availability or the nature of the metrics (e.g., qualitative vs quantitative). Alternatively, some program areas could have numerous metrics (e.g., Maintenance Program Area) and in those cases a concise list of metrics is suggested. Program output metrics are listed in **Table 7.**

TABLE 7: Program Output Metrics

METRIC	UTILITY	DATA SOURCE	FREQUENCY
length of bike network by facility type (i.e., protected bike lanes, shared pathways, shared streets) per 100,000 population	tracks progress of network construction	network GIS data	yearly
percent of population within 400m of the bike network	tracks expansion of the network into less connected locations	network GIS data, census data	every 3 years
percent of new network length in low-income neighbourhoods	tracks equitable expansion of the network in underserved communities (short term)	network GIS data, census data	yearly
percent increase in bicycle network analysis score	tracks progress in relative accessibility	network GIS data, Land use data	every 3 years
proportion of transit stations, LRT stations and bus stops where bikes are accommodated to the current standard (to be developed)	tracks overall progress in integrating bicycles and transit	network and transit GIS data	yearly
total number of new bike parking spaces	tracks increase in provision of end-of-trip facilities	asset management database	yearly
proportion of bike network signed to the current wayfinding standard	tracks progress in providing up-to-date on road wayfinding	network GIS data, asset management database	yearly
proportion of the bike network illuminated to the current standard	tracks progress in providing properly illuminated facilities	network GIS data, asset management database	yearly
proportion of the bike network with pavement condition index better than specified threshold	tracks quality of the pavement throughout the network	network GIS data, asset management database	yearly
proportion of the bike network maintained for all-seasons riding	tracks extent of winter maintenance Network GIS data	asset management database	yearly
proportion of elementary school children who receive bicycle skills training	tracks progress towards building a strong educational foundation	community partner survey	yearly
proportion of elementary schools with Safe Routes to School programs	tracks progress towards ensuring a safer cycling environment and bicycle education	community partner survey	yearly
number of bicycle-related events supported or instigated by the City or a community partner	tracks culture shift, vibrancy, and health of the cycling community	community partner survey	yearly
average number of bicycle parking spaces provided at major events	tracks culture shift and normalization of cycling	community partner survey	yearly

5.2 Community Outcome Metrics

Community Outcome metrics are focused on changes in behaviour, perceptions, and performance of the people who are using or will use a bicycle to travel around the city. Community Outcome Metrics are listed in **Table 8.**

TABLE 8: Community Outcome Metrics

METRIC	UTILITY	DATA SOURCE	FREQUENCY
percent trips (for any purpose) made by bicycle (breakdown by gender, age, income, neighbourhood)	tracks progress towards The City Plan target and the aspiration of all ages and abilities and all reasons, in addition to value of equity (the Household Travel Survey is the only existing source of data with all trip purposes for each mode with a high level of reliability)	household travel survey	every 10 years
percent of use of bicycle to journey to work (breakdown by gender, age, income)	tracks progress towards The City Plan target and the aspiration of all ages and abilities and all reasons, in addition to value of equity (monitoring this metric requires minimal effort and provides a high level of consistency while measuring long term shifts in the main mode for commuting to work)	Canadian census	every 5 years
percent bicycle use at least 2–3 times per week as mode of transportation (breakdown by gender, age, income, neighbourhood, season, and purpose)	tracks progress towards the City Plan target and the aspiration of all ages and abilities and all reasons, in addition to value of equity (thereliability of this data will likely be lower than the Household Travel Survey, but the higher frequency will provide interim progress data to help adjust implementation in the short term)	transportation survey	every 2 years
count volume, recorded by location and supplemented by crowd-sourced data (e.g., Strava, Google travel data), analyzed by time of day, weekday / weekend, month and season	tracks network usage spatially which can notably inform priority routes for maintenance; tracking by season informs winter retention (all seasons) and time of day can reveal purpose profiles (all reasons)	automated counters (Eco-Counter)	yearly
total number of entering/ exiting cyclists into the central business district (breakdown by observed gender and age (under 18, 18–65, over 65) and use of non-conventional bike or mobility aid in bike lane)	tracks progress towards The City Plan target and the aspiration of all ages and abilities and all reasons, in addition to value of equity; also tracks network usage spatially	cordon counts (manual or video)	every 2 years
number of major injury and fatal collisions involving cyclists (analyze by gender and age)	tracks progress towards making biking a safer transportation option; gender and age analysis can help track equity of outcome issues	collision data and hospitalization data	yearly

TABLE 8 CONTINUED: Community Outcome Metrics

METRIC	UTILITY	DATA SOURCE	FREQUENCY
percent agreement that cycling is accessible, comfortable, and/or easy in Edmonton (breakdown by gender, age, income, neighbourhood)	tracks progress towards ensuring that the network and supporting programs/initiatives provides a comfortable and inviting environment for cycling	transportation survey	every 2 years
percent occupancy of bicycle parking at transit centres and major events (e.g., festivals) where bicycle parking is provided	tracks culture shift and normalization of biking	community partner survey	yearly
percent observations of unlawful riding	tracks progress of compliance with laws and bylaws (direct observations are less subject to bias than infraction numbers or self reported unlawful behavior such as through the Traffic Safety Culture Survey)	cordon counts (manual or video)	every 2 years
gap in self-reported unlawful behaviour by mode and acceptability of unlawful behaviour (see Traffic Safety Culture Survey)	tracks changes in culture around traffic safety and acceptable behaviours	traffic safety culture survey	every 2 years
total number of bike lane obstruction complaints (vehicle, construction or other)	tracks progress in compliance with laws and bylaws and with construction site policies	311 data	yearly
total number of maintenance and snow removal complaints	tracks progress in perceived quality of maintenance	311 data	yearly
proportion of children declaring riding to school	tracks the progress towards making cycling a comfortable and accepted way to move around Edmonton for everyday trips	community partner survey	yearly
number of minutes of physical activity by biking	tracks progress in how biking contributes to people's level of physical activity	transportation survey	every 2 years

5.3 Input Metrics

In addition to the program outputs and community outcomes, a third category of indicators can be measured: inputs. Inputs describe the financial and organizational resources made available to reach the desired outcomes and support the implementation of the Bike Plan. Examples of Inputs include leadership, strategies & policies, resources, research & training, and partnerships. Examples of inputs that can be measured are provided, but not to the same extent as the program outputs and community outcomes since many of these qualitative indicators would benefit from further dialogue and engagement.

Inputs include funding spent on implementing the Bike Plan and can also be used in comparison to funding for other activities or modes. Two metrics are suggested:

+ **Dollar amount of spending to support cycling annually** (includes capital funding, for a bike capital profile and capital funding through other projects), operations costs and program funding)
+ **Funding for cycling as a percent of total transportation spending**

5.4 Setting the Monitoring Foundation

Edmonton currently measures and reports on several of the metrics highlighted in the previous section. While some of the metrics identified are currently not measured and reported, many of these metrics, such as percent trips made by bike, are measured through other monitoring programs and will serve as the foundation for the bike network monitoring program. Over time, it is envisioned that the program will expand through opportunities to modify or add to other monitoring programs and by administering new surveys to measure the metrics highlighted in the previous section.

Table 9 summarizes the metrics which are currently included as part of other monitoring programs that can serve as the foundation for the bike network monitoring program.

TABLE 9: Currently Measured Metrics Related to the Bike Network

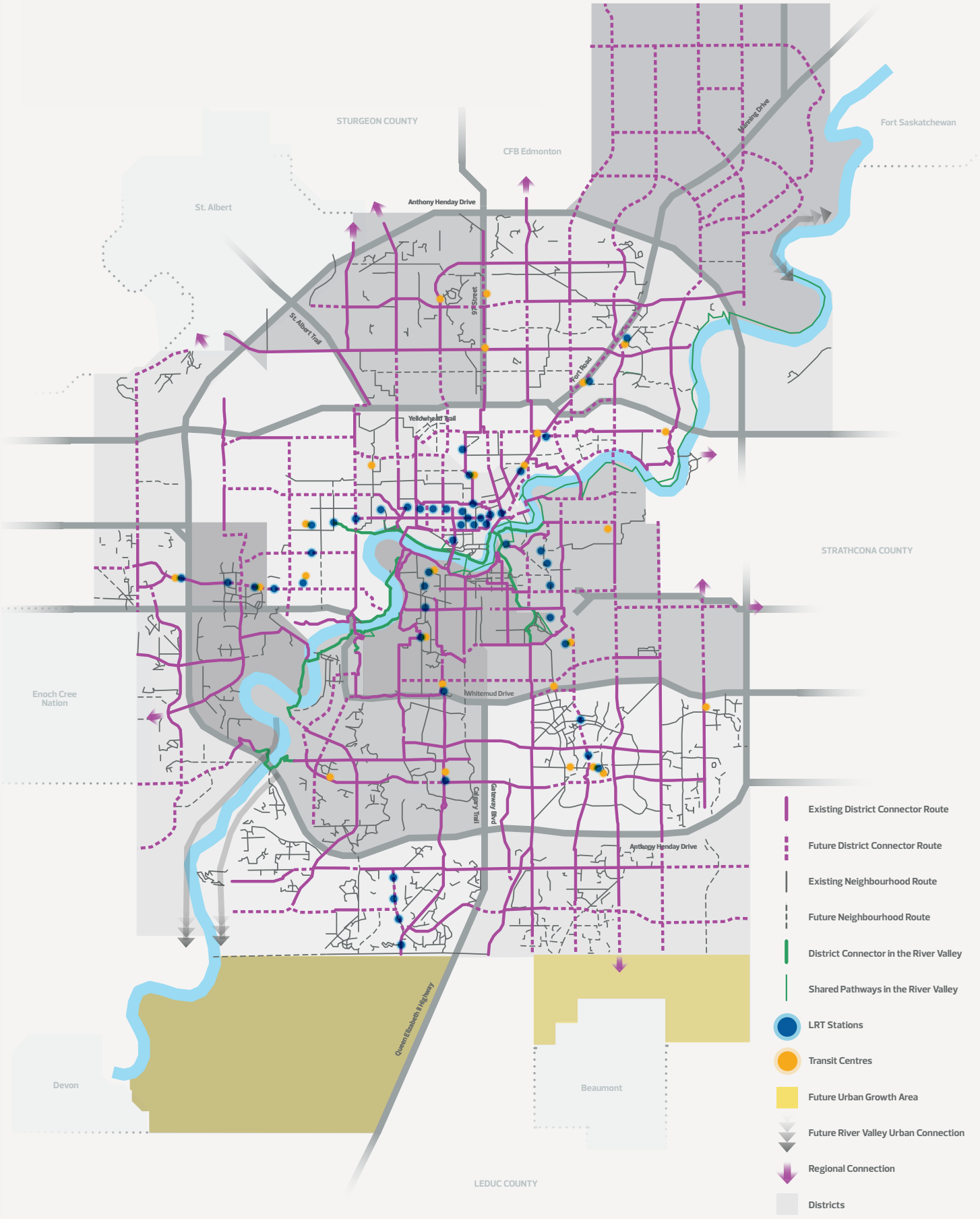
METRIC	SOURCE	YEAR
Length of bike network by facility type (i.e., protected bike lanes, shared pathways, shared streets) per 100,000 population	Network GIS data	2019, 2020, yearly thereafter
Proportion of the bike network maintained for all-seasons riding	Network GIS data	2020, yearly thereafter
Percent trips (for any purpose) made by bicycle (by gender, age, income, neighbourhoods)	Household Travel Survey	2005, 2015, every 10 years thereafter
Percent bicycle use for journey to work (by gender, age and income)	Canadian Census	2006, 2011, 2016, every 5 years thereafter
Count volume recorded by location (by time of day and season)	Eco-Counter data	2018, 2019, 2020, every year thereafter
Total number of entering/exiting cyclists into the central business district (by observed gender and age and bike or mobility aid category)	Central Business Cordon Report	2014, 2016, report when next count re-initiated, every two years thereafter
Number of major injury and fatal collisions involving cyclists (by gender and age)	Collision data	2015, 2016, 2017, 2018, 2019, every year thereafter
Total number of bike lane obstruction complaints (vehicle, construction or other)	311 data	2021 (previous years if data is available), every year thereafter
Total number of maintenance and snow removal complaints	311 data	2021 (previous years if data is available), every year thereafter
Dollar amount of spending to support cycling annually	capital project data	annually
Funding for cycling as a percent of total transportation spending	capital project data	annually

The bike network monitoring program provides an opportunity to highlight the state of the network relative to previous years. and the changes in how people use it to guide how we plan and design bike routes and better highlight the need for bike accommodation throughout the City. The bike network monitoring program should be updated and reported annually to ensure that the most up-to-date data is published and that Administration is referencing the same data for consistencies in communications and reports.

In addition to implementing the bike network monitoring program, being part of an awards program, such as the national program offered by Bicycle Friendly Communities, may provide another opportunity to self-assess the state of Edmonton's bike network. These types of programs can provide a sense of how Edmonton's progress compares to other cities across the province, country and world, and will better highlight areas where improvement is needed. Perhaps even more importantly, they recognize and celebrate Edmonton's achievements around biking, which is also an important part growing biking in Edmonton.

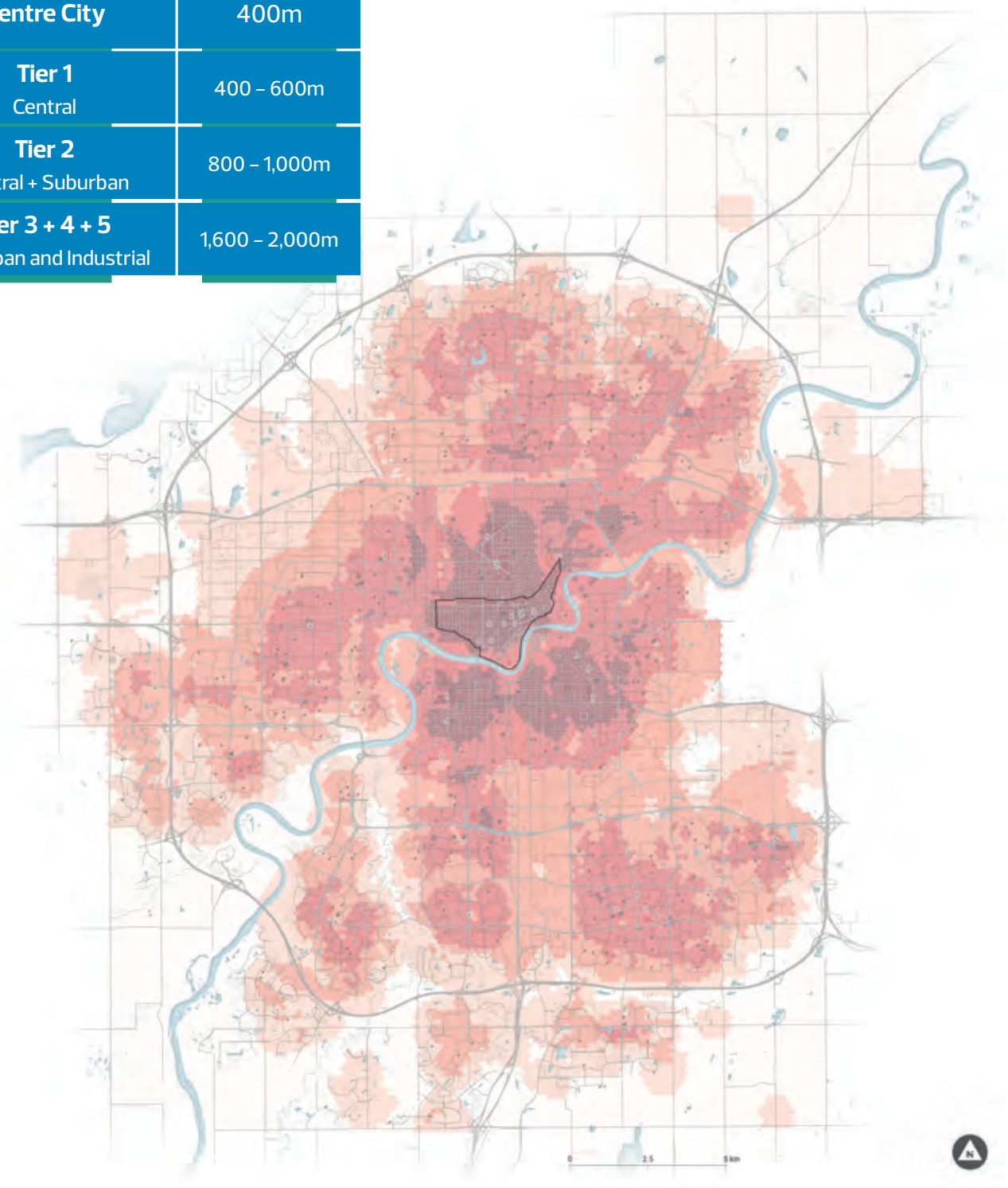
APPENDIX A
The Bike Plan Maps

DISTRICT CONNECTOR NETWORK

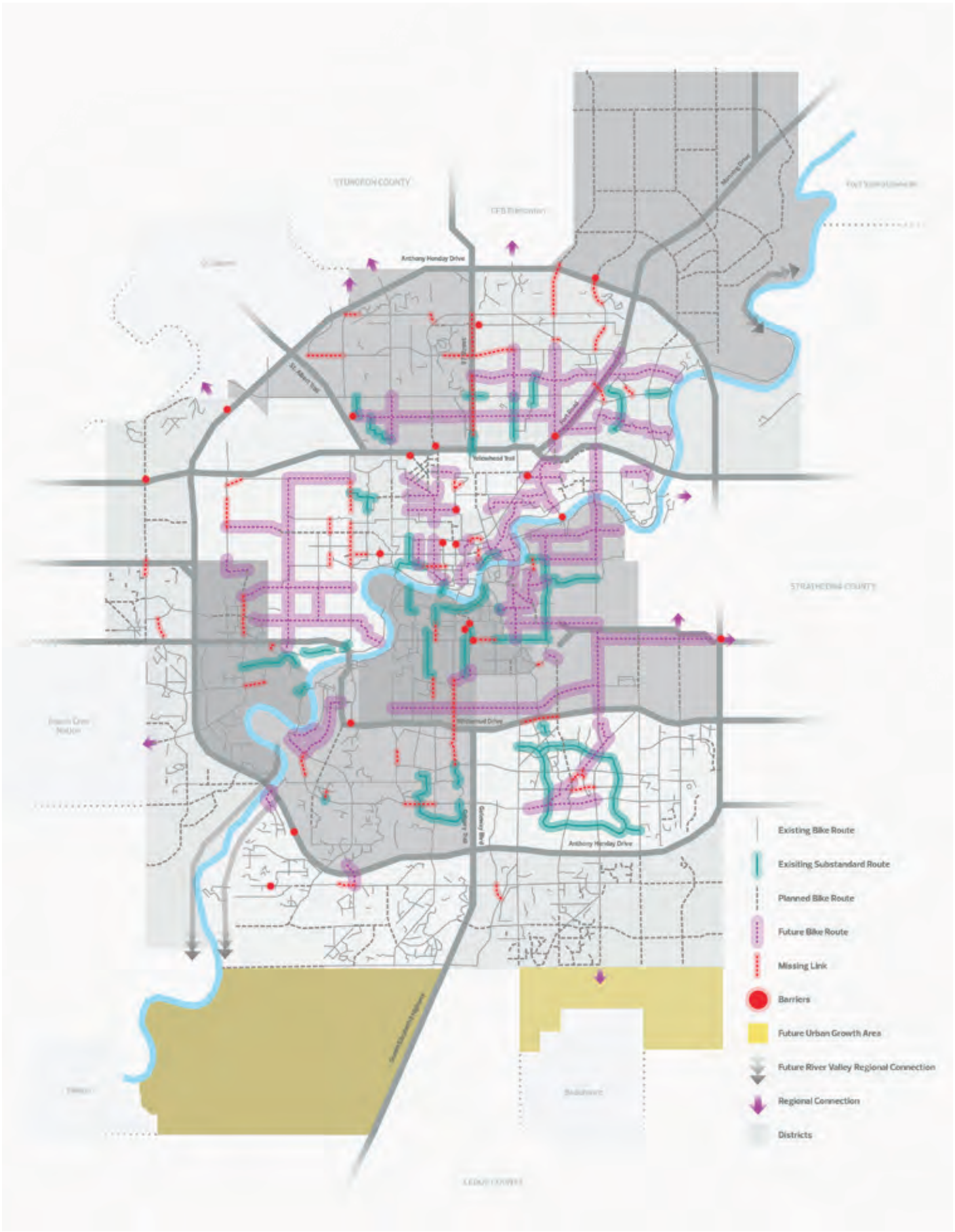


ROUTE SPACING AND BIKE TRIP POTENTIAL

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



FUTURE BIKE NETWORK IMPLEMENTATION STRATEGY



APPENDIX B
Near–Term Priority Bike Routes Summary

NEAR–TERM PRIORITY ROUTES

CONTEXT	ROUTE	FROM	TO	LENGTH (M)	CONNECTOR TYPE	IMPLEMENTATION TYPE	NOTES
central	99 Street	102A Avenue	101A Avenue	306	District Connector	Missing Link	Downtown
central	MacDonald Drive / 100 Avenue	100 Street	103 Street	564	District Connector	Future Bike Route	Downtown
central	103 Street / 102 Street	103 Avenue	105 Avenue	476	Neighbourhood Connector	Future Bike Route	Downtown
central	105 Avenue	101 Street	97 Street	488	District Connector	Missing Link	Downtown
central	100 Avenue	116 Street	W of 109 Street	803	District Connector	Missing Link	West-Central
central	121 Street	100 Avenue	106 Avenue	1,001	District Connector	Substandard	West-Central
central	101 Avenue path	95 A Street	96 Street	89	District Connector	Substandard	
central	High Level Bridge	97 Avenue	Saskatchewan Drive	375	District Connector	Substandard	
central	Saskatchewan Drive	109 Street	Gateway Blvd	1,850	District Connector	Substandard	
urban	102 Avenue	142 Street	135 Street	421	District Connector	Missing Link	West-Central
urban	106 Street	Princess Elizabeth Avenue	S of 118 Avenue	252	District Connector	Missing Link	West-Central
urban	113 Street	Kingsway Avenue	109 Avenue	1,067	District Connector	Future Bike Route	West-Central
urban	114 Avenue	120 Street	113 Street	1,461	District Connector	Future Bike Route	West-Central
urban	111 Avenue	120 Street	Kingsway Avenue	1,795	Neighbourhood Connector	Future Bike Route	West-Central
urban	114 / 115 Avenue	Groat Road	142 Street	1,093	Neighbourhood Connector	Substandard	West-Central
urban	118 Avenue	78 Street	64 Street	1,393	District Connector	Future Bike Route	East-Central
urban	110 Avenue	90 Street	92 Street	200	Neighbourhood Connector	Future Bike Route	East-Central
urban	112 Avenue	E of 76 Street	90 Street	1,595	Neighbourhood Connector	Future Bike Route	East-Central
urban	78 Street	119 Avenue	117 Avenue	346	District Connector	Planned	East-Central
urban	90 Street	112 Avenue	110 Avenue	161	Neighbourhood Connector	Future Bike Route	East-Central

NEAR-TERM PRIORITY ROUTES CONTINUED

CONTEXT	ROUTE	FROM	TO	LENGTH (M)	CONNECTOR TYPE	IMPLEMENTATION TYPE	NOTES
urban	82 Avenue	93 Street	83 Street	1,195	District Connector	Future Bike Route	South-Cental
urban	84 Street	101 Avenue	98 Avenue	415	District Connector	Missing Link	South-Cental
urban	91 Street	76 Avenue	88 Avenue	1,243	District Connector	Future Bike Route	South-Cental
urban	92 Street	88 Avenue	Connors Road	724	District Connector	Future Bike Route	South-Cental
urban	Connors Road	95 Avenue	92 Avenue	555	District Connector	Future Bike Route	South-Cental
urban	88 Avenue	85 Street	83 Street	223	Neighbourhood Connector	Planned	South-Central
urban	88 Avenue	85 Street	95 Street	923	Neighbourhood Connector	Future Bike Route	South-Cental
urban	Connors Road	92 Avenue	90 Avenue	354	Neighbourhood Connector	Future Bike Route	South-Cental
urban	101 Avenue	50 Street	79 Street	2,036	District Connector	Future Bike Route	
urban	97 Street	128 Avenue	124 Avenue	726	District Connector	Substandard	
urban	Crossing Canadian Pacific Railway	Argyll Road	75 Street	318	District Connector	Future Bike Route	
suburban	121 Avenue	66 Street (122 Avenue)	Wally Footes Trail	701	District Connector	Future Bike Route	East-Central
suburban	119 Avenue	38 Street	118 Avenue via Abbotsfield Road	985	District Connector	Future Bike Route	
suburban	127 Street	137 Avenue	127 Avenue	1,607	District Connector	Future Bike Route	
suburban	153 Avenue	Griesbach Road	82 Street	2,750	District Connector	Missing Link	
suburban	66 Street	127 Avenue	125 Avenue	450	District Connector	Future Bike Route	
suburban	97 Street	144 Avenue	128 Avenue	2,325	District Connector	Missing Link	
suburban	Fort Road / Manning Drive	127 Avenue	153 Avenue	2,105	District Connector	Future Bike Route	
suburban	139 Avenue / 40 Street	Clareview Transit Centre East	Hermitage Road	725	Neighbourhood Connector	Substandard	

NEAR–TERM PRIORITY BARRIERS

CONTEXT	BARRIERS	FROM	TO
central	Grant MacEwan campus	N of 104 Avenue	110 Street
central	Grant MacEwan campus	N of 104 Avenue	106 Street
urban	railyard	Approx 76 Avenue	E of Gateway Blvd
urban	challenging intersection (LRT crossing, congested vehicle traffic, skewed intersection)	106 Street	111 Avenue
urban	path disrupted because of LRT overpass at 118 Avenue	118 Avenue	E of 78 Street
suburban	challenging intersection (skewed intersection, >4 legs)	127 Avenue	Fort Road

APPENDIX C
Current Maintenance Practices

CURRENT MAINTENANCE LEVELS

The updated Snow and Ice Control Policy (C409J), approved in October 2018, directed to maintain prioritized bike lanes to bare pavement within 24 hours from the end of snowfall, with the goal of improving safety and accessibility for people riding throughout winter.

These prioritized bike routes include 19.7 kilometres of protected bike lanes and 18.3 kilometres of shared pathways, for a total inventory of 38 kilometres of prioritized routes. The City's bike network also includes non-prioritized bike lanes, including contra-flow bike lanes, painted bike lanes, shared roadways and shared pathways. Many on-street bike lanes, that are not part of the the prioritized bike routes, are serviced at the same level, and at the same time, as the rest of the roadway, while bike lanes on non-prioritized shared pathways and sidewalks are serviced to the same level as other pedestrian infrastructure. **Table C1** summarizes the City's maintenance standards by season.

TABLE C1: City of Edmonton Maintenance Standards

SEASON	PRIORITIZED BIKE LANES	NON-PRIORITIZED SHARED PATHWAYS	NON-PRIORITIZED ON-STREET BIKE LANES
Spring	includes sweeping	includes sweeping	swept when street is swept
Summer	N/A	N/A	N/A
Fall	N/A	N/A	N/A
Winter	maintain prioritized sidewalks, trails and bike routes to bare pavement within 24 hours from end of snowfall	plow snow from shared pathways and sidewalks adjacent to city-owned land within 48 hours of a snowfall where there is an accumulation of 2 cm or more	plow snow from designated bicycle lanes with the roadway plowing to the same service level designated for that roadway

PRIORITIZED BIKE LANES FOR SNOW AND ICE CONTROL

The network of prioritized bike lanes generally focuses on central and west-central Edmonton. The current network of prioritized bike lanes is illustrated in **Figure C1.**

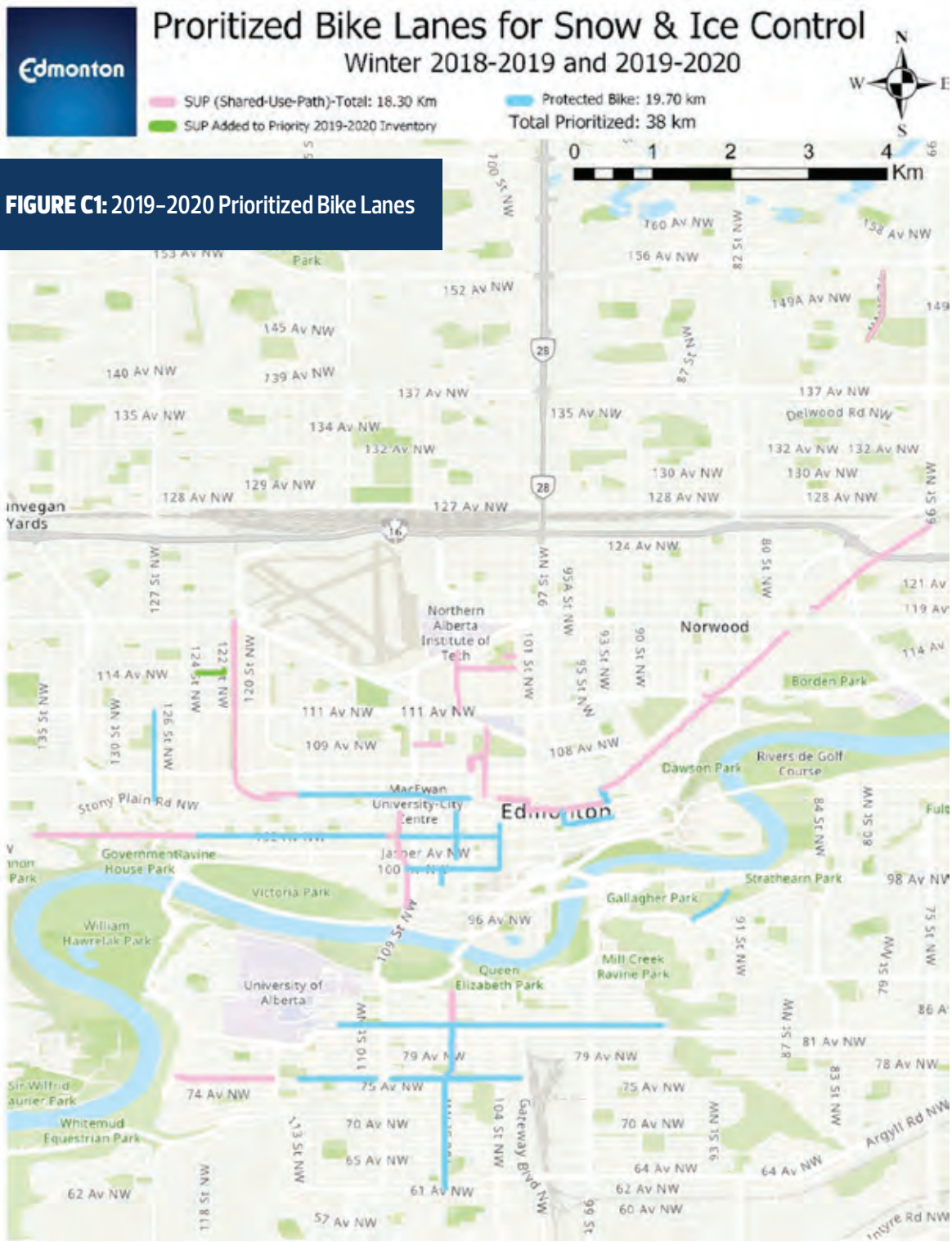


FIGURE C1: 2019–2020 Prioritized Bike Lanes

FINANCIAL IMPLICATIONS

Table C2 summarizes the breakdown of the total costs associated with clearing snow and ice from the 38 kilometres of prioritized bike lanes during the winter of 2018–2019 and 2019–2020.

TABLE C2: Winter Maintenance Costs for 2018–19 and 2019–20

SEASON	LABOUR COSTS	EQUIPMENT COSTS	MATERIALS & OTHER COSTS	TOTAL COSTS
2018–2019	$338,358.85	$111,968.35	$12,732.31	$463,059.51
2019–2020	$207,850.94	$106,851.17	$20,315.17	$335,017.28

Source: CR_8194 Cost of Clearing Bike Lanes

While there weren't any substantial changes to the prioritized bike lanes network over this period, there was a 28 per cent reduction in the total costs in the 2019–2020 season. Although most of this reduction can be attributed to the decrease in labour costs, it should be noted that these costs are also influenced by the weather and can fluctuate year to year. Based on the 2019–2020 costs, the unit cost to clear a bike lane is estimated to be in the order of about $8,800 per kilometre; however, the unit cost can vary depending on the type and design of the facility.

The Snow and Ice Control budget for 2018–2019 was $63.7 million and for 2019–2020 was $60.0 million. The total cost of snow clearing the 38-kilometre network of prioritized bike lanes was $463,059.51 (0.7 per cent) for the 2018–2019 winter season and $335,017.28 (0.5 per cent) for the 2019–2020 winter season. Those costs represent 0.7 per cent and 0.5 per cent of the total snow clearing budget in 2018–2019 and 2019–2020, respectively.

The Bike Plan

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