

# Sturgeon Valley Trails System

## The Path Forward

DECEMBER 2021



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# Acknowledgments

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# Executive Summary

A connected, comfortable, and maintained active transportation network is an essential element to encourage people to walk, bike, or use modes other than a vehicle for transportation and recreation. In July 2021, Sturgeon County retained Toole Design to help re-envision active transportation in the community by identifying existing network gaps and determining a future network to promote both recreational use and use for daily activities such as running errands and commuting.

The project consisted of three phases, which are reflected in this report: Background Review and Existing Conditions, Connectivity Assessment, and Path Forward. The project also included public engagement, which involved an online survey and three in-person pop-up engagement sessions. Further information on the public engagement activities and feedback can be found in Appendix B.

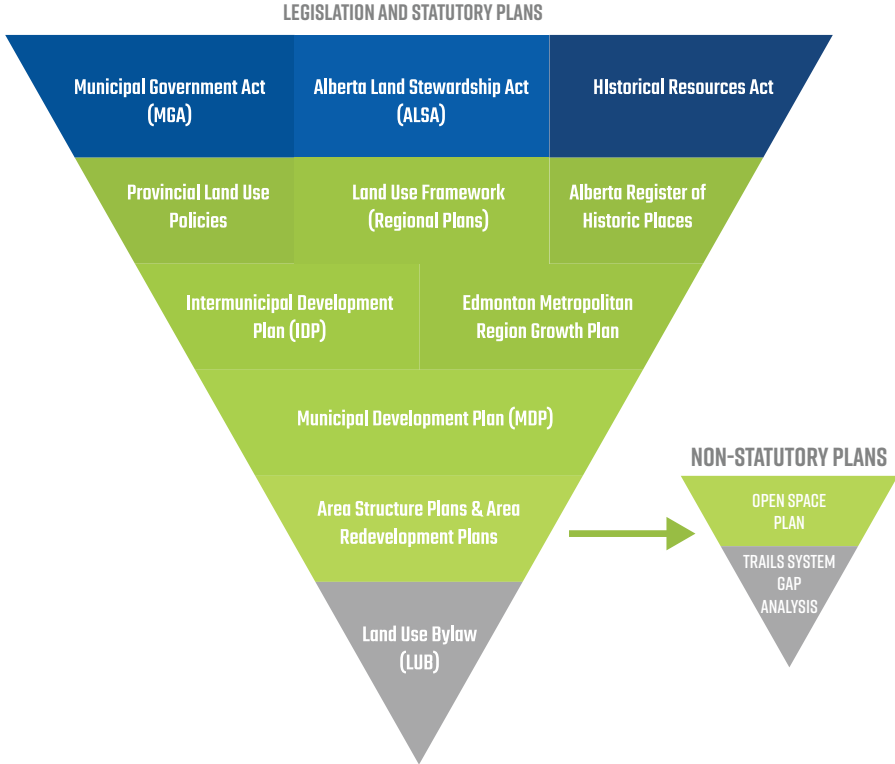
In the Background Review and Existing Conditions phase, the current trail network conditions, as well as past trail plans were assessed. This also included the identification of regional trail connections and destinations. The Background Review also involved a review of Active Transportation Best Practices to help inform the recommendations provided.

The Connectivity Assessment phase included a deeper analysis of the places that people wanted to go and identify the barriers or gaps to them doing so. This resulted in the Proposed Active Transportation Network as shown in this report.

Lastly, the Path Forward phase provides a plan for the County to begin to address the gaps in the trails system. This phase developed a vision and principles for the Sturgeon Valley Trails System, identified and project prioritization matrix, and included some details on funding support and maintenance strategies. A conceptual level cost estimate has also been provided to demonstrate an opinion of probable cost for the trail segments identified.

The Path Forward is intended to be used for planning purposes in future trail development and is a non-statutory in its authority.

Figure 1. Planning Hierarchy





# Background Review



# Background Review

To effectively evaluate gaps in the Sturgeon Valley trail system, an important first step is to understand where trails currently exist, where trails have been proposed in the past, and the destinations residents may want to access. Summarizing this context is the objective of the first section of this background review. The second section of this review outlines best practices for the development of active transportation plans. The section also describes existing guidance on the types of trails or other active transportation facilities suitable for a rural context to guide the development of Sturgeon Valley’s future network.

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## Trails and Destination Review

### Existing and Proposed Trails

In 2004, Sturgeon County developed the Sturgeon Valley Trails Plan, a document that included a comprehensive plan for trails throughout the valley, prioritization for implementation over time, and a hierarchy of different trail types to be built. While a few of the high-priority trails have since been built, most of the plan has not been actioned. Other proposed trails have also been mapped and are catalogued in the County’s database. However, the origin of these proposed routes is unknown and does not appear to have been part of a formal process or adopted by the County.

All existing and proposed trails in and around the study area are shown in Map 1.

### Key Destinations

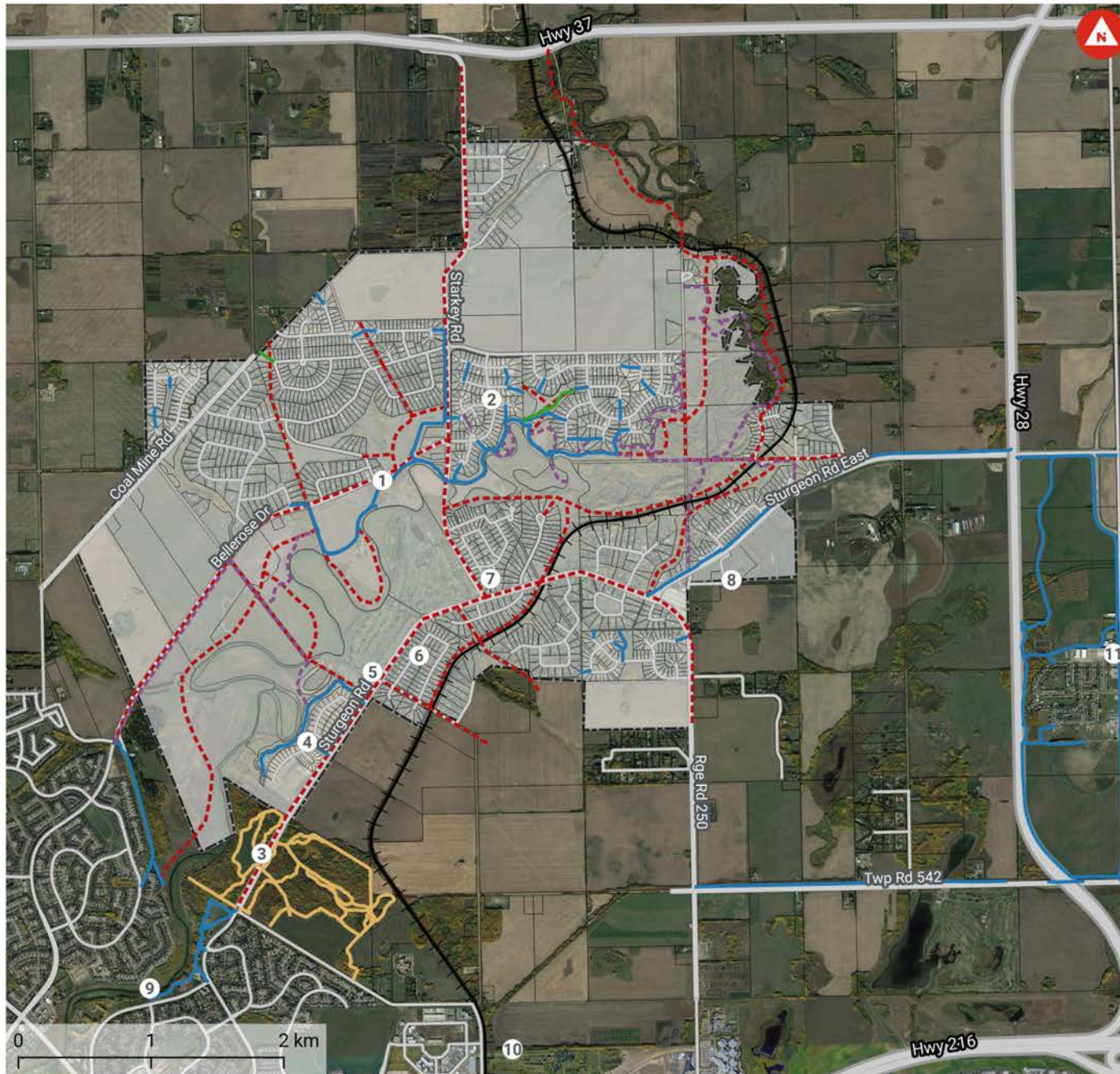
Although Sturgeon Valley has largely been developed as a residential area, there are a few key destinations where residents can gather or visit. These include major destinations outside the Valley itself, such as the City of St. Albert, the City of Edmonton, and the Edmonton Garrison, as well as important recreation opportunities within the Valley, such as the Bellerose River Walk and the Sturgeon Valley Golf and Country Club. These major destinations as well as other local destinations are also shown in Map 1.

### What We Heard: Destinations

During September 2021 engagement, participants were asked which destinations were most important to them and whether any destinations had been missed. The results showed that over 50% of respondents thought St. Albert and the main recreation opportunities, such as the Bellerose River Walk and the Sturgeon Valley Golf and Country Club, were important or very important destinations. Conversely, over 50% of respondents thought local shopping opportunities, the Edmonton Garrison, the City of Edmonton, and small neighbourhood attractions were not important or did not respond to the question.

In addition to the listed destinations, some respondents indicated an interest in connecting to Cardiff and Morinville, outside the study area. Others also indicated that they do not necessarily have a destination in mind, but rather want to access walking or bicycling loops that can be used for recreation.

Map 1. Existing and Previously Proposed Trails, and Local Destinations in Sturgeon Valley



### Legend

#### Context

Study Area

#### Existing Trails

- Asphalt or Concrete
- Gravel or Shale
- Dirt

#### Previously Proposed Trails

- 2004 Trails Plan
- Underdetermined Origin

#### Main Destinations

- 1 Bellerose River Walk
- 2 Pinnacle Ridge Community League
- 3 Riverlot 56 Natural Area
- 4 River's Gate Plaza
- 5 Sturgeon Valley Golf and Country Club
- 6 Manor Estates II Outdoor Rink
- 7 Bristol Oaks Playground
- 8 Peas on Earth Organic Farm
- 9 St. Albert
- 10 Edmonton
- 11 Edmonton Garrison

# Active Transportation Best Practices Review

## Best Practices in Planning for Active Transportation

An active transportation plan is a foundational element to creating a walk and bicycle friendly place and identifying where investments in infrastructure and programming is most needed.

A successful active transportation plan should support the specific goals of the community it serves, determined by a thoughtful community input process and careful analysis. Four critical aspects of an active transportation plan are:

1. Developing a high-quality network
2. Fostering the culture and appeal of walking and bicycling (and other forms of active transportation)
3. The development process of the plan itself
4. Defining clear implementation tasks and responsibilities, including resources

This section touches on some aspects of the creation of high-quality networks, with a particular focus on network principles and facility selection. More information on the development of a successful active transportation plan is provided in Appendix A.

## Network Development and Facility Selection

High-quality guidance to develop active transportation networks and facilitate the selection of specific facility types has multiplied in recent years. A very high proportion of this guidance is geared towards urban or suburban locations that do not correspond to Sturgeon Valley's largely rural context. A small number of resources specifically target rural networks and facilities; this section focuses on two in particular:

- Small Town and Rural Multimodal Networks, U.S. Department of Transportation, Federal Highway Administration, 2016.
- Trails in Alberta Highway Rights-of-Way. Policies, Guidelines and Standards, Government of Alberta, 2015.

## Network Principles

To be fully functional and cater to the needs of the highest number of potential users, a series of six main principles is identified in the Small Town and Rural Multimodal Networks guide. Different jurisdictions can choose to modify or add other principles, but this core list has been found to be most important in the development of a high-quality network.

- » **Cohesion:** The network is connected in terms of density of destinations and routes.
- » **Directness:** The network provides direct and convenient access to destinations.
- » **Accessibility:** The network accommodates travel for all users, regardless of ages, income level, or ability.
- » **Alternatives:** There are different route choices available within the network.
- » **Safety and Security:** Routes in the network minimize the risk of injury, danger, and crime.
- » **Comfort:** The network appeals to a broad range of age and ability levels, and consideration is given to user amenities.

## What We Heard: Safety

During the September 2021 engagement, participants were asked about barriers to walking or bicycling they currently experience. By far the most common responses related to a lack of safety and comfort, with respondents indicating safety concerns about having to walk on the road without separation from traffic, and general comments about feeling unsafe, were the most important barriers for them.



## Facility Selection

There are three main considerations when selecting a facility type: the speed and volume of adjacent motor vehicle traffic, the type of roadway, and the adjacent land uses. Depending on the mix of conditions, three broad types of facilities can be considered: mixed traffic (Table 1 below), visually separated facilities (Table 2 on page 6), and physically separated facilities (Table 3 on page 7). The three tables describe the applicable context and type of infrastructure for each category of facilities.

In addition to the type of linear facility, it is important to consider crossing locations. Where regular conflict is anticipated due to the volume of people walking, bicycling, and driving, measures to facilitate road crossings may be necessary. These typically include marked crosswalks, signs, and where high volumes of people crossing are expected, flashing beacons. Options for crossings are also discussed in more detail in the Small Town and Rural Multimodal Networks guide.

Table 1. Mixed Traffic Facilities




			
	<b>Yield Roadway</b>	<b>Bicycle Boulevard</b>	<b>Advisory Shoulder</b>
<b>Description</b>	Roadway that serves all road users in a slow-speed environment. There are no lane markings.	Offers a low-stress shared roadway bicycle facility with sharrow markings and bicycle route signs that indicate priority for people bicycling	A two-way roadway is converted to have delineated (marked) shoulders and a two-way centre travel lane. Drivers enter the shoulder only when nobody is bicycling in it, when an oncoming vehicle is passed.
<b>Applicable Context</b>	Very low volume and low speed roads Narrow roadways Residential land uses	Very low volume and low speed roads Local roadways	Low to moderate volumes and moderate speed roads Constrained collector connections between built-up areas
<b>Additional Notes</b>	Could be appropriate within some subdivisions with narrow roadways	Could be appropriate within subdivisions with wider roadways if traffic calming measures are added	Still seldom used design in Canada

Table 2. Visually Separated Facilities

		
	<p style="text-align: center;"><b>Paved Shoulder</b></p>	<p style="text-align: center;"><b>Bike Lane</b></p>
Description	<p>Paved shoulders on the edge of the road with a minimum width varying from 1.5 to 2.4 m depending on local speed and volumes</p>	<p>Exclusive space for bicycling delineated with pavement markings and signs, ideally with a minimum width of 2 m and an optional buffer zone</p>
Applicable Context	<p>Moderate to high volumes and speeds Roadways that serve longer-distance and regional travel Outside and within built-up areas</p>	<p>Moderate volume and speed roads Local and collector roadways Outside and within built-up areas</p>
Additional Notes	<p>Rumble strips can be used to better delineate the shoulder space, but should be constructed to be bicycle-friendly, including gaps to access and exit the paved shoulder and possibly widening the shoulder to account for the width of the rumble strips</p>	<p>Since exclusive use for bicycling, a separate facility needs to be provided for people walking</p>

Table 3. Physically Separated Facilities

					
	Shared Use Path	Sidepath*	Sidewalk	Separated Bike Lane	Pedestrian Lane
Description	Paths outside road rights-of-way that serve all active modes with widths varying from 2.4 to 4.2 m depending on volume and user mix	Bidirectional shared use path located adjacent or parallel to a roadway with widths varying from 3.0m to 6.0m	Separated and dedicated space for people walking separated from the roadway by curbs or an unpaved buffer space	Facility located within or directly adjacent to the roadway and physically separated from traffic with a vertical element	Delineated space with vertical elements on the shoulder for exclusive walking use. Includes markings indicating pedestrian use only. Designs can be modified to include both walking and bicycling operations.
Applicable Context	Based on opportunity and available space on a dedicated corridor away from roadway rights-of-way	High volume and moderate to high-speed roads Arterial and regional roadways Outside and within built-up areas	All but the most low-speed and low-volume roads Locations where pedestrians are expected	High volumes and moderate to high-speed roads Primary connections through and across communities Locations where a high volume of people walking and bicycling are expected	Considered an interim or temporary measure for roadways lacking sidewalks, but where they would be indicated
Additional Notes	Can be used for long distances or to create shortcuts between facilities where no roadway exists	Separation is typically achieved by the presence of landscaping between the roadway and sidepath (1.5 m minimum) or a vertical barrier. Detailed information on geometric design is available in Trails in Alberta Highway Rights-of-Way.	Since exclusive use for walking, a separate facility needs to be provided for people bicycling	Since exclusive use for bicycling, a separate facility needs to be provided for people walking	Local example: adaptive sidewalks in Calgary.

\*For the purpose of this report, sidepaths are referred to as shared use paths as the only marked difference in the final facility type is its location along a roadway.

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# Connectivity Assessment

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# Connectivity Assessment

Current gaps in the trails system exist as a result of the lack of a holistic, long-term vision for active transportation in the Valley. Going forward, the trails system of Sturgeon Valley will be developed using industry best practices and available statutory and non-statutory plans, including this gaps analysis. This approach will be taken for addressing gaps in the current trails system as well as implementing trails for future growth areas in and around Sturgeon Valley.

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## Existing Network and Gaps Assessment

The existing trails within and around Sturgeon Valley are shown in Map 2.

As the map shows, trails are currently disconnected from one another and do not form a network. Several subsystems exist in isolation:

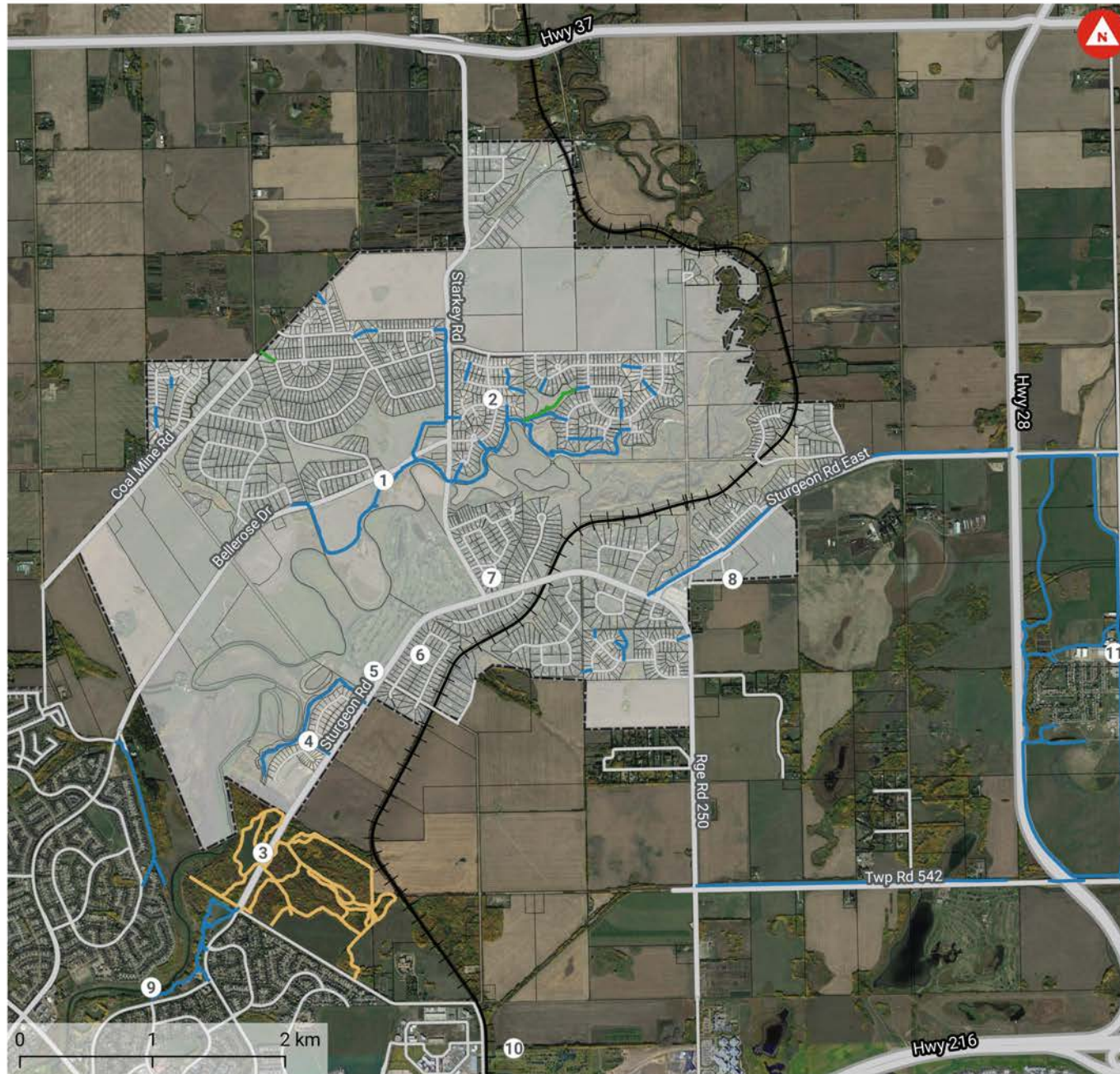
- The Bellerose River Walk system, connected to some neighbourhoods north of the Sturgeon River.
- The Riverlot 56 Natural Area, which connects south to St. Albert trails.
- The shared use paths along Sturgeon Road East and Township Road 542 that connect to the Edmonton Garrison (with the exception of a very short gap along Township Road 542 west of the Hwy 28 bridge).
- The newly built linear path along the River's Gate development, though it lacks a connection to Riverlot 56

In addition to these isolated subsystems, there are several short breezeways, typically in public utility lots, that connect internal neighbourhood streets for people walking and bicycling or connect neighbourhoods to main roads.

### What We Heard: Gaps

During the September 2021 engagement, participants were asked about barriers to walking or bicycling they currently experience. The absence of trails or sidewalks in many locations was a notable barrier, including the lack of trails between neighbourhoods. Other gaps noted by respondents are disconnected, unfinished or dead-end trails, and the absence of crossings over the Sturgeon River.

Map 2. Existing Trails In and Around Sturgeon Valley



**Legend**

Context  
 [ ] Study Area

Existing Trails  
 — Asphalt or Concrete  
 — Gravel or Shale  
 — Dirt

**Main Destinations**

- 1 Bellerose River Walk
- 2 Pinnacle Ridge Community League
- 3 Riverlot 56 Natural Area
- 4 River's Gate Plaza
- 5 Sturgeon Valley Golf and Country Club
- 6 Manor Estates II Outdoor Rink
- 7 Bristol Oaks Playground
- 8 Peas on Earth Organic Farm
- 9 St. Albert
- 10 Edmonton
- 11 Edmonton Garrison

## Desire Lines

As noted in the best practices review, developing and applying a set of core principles ensures that an active transportation network can be successful and functional. Among these core principles, cohesion (which includes connectivity and density), directness, and the inclusion of alternative routes are the three most important that influence the layout of the overall trail network. These principles can be embodied by connecting existing trails and creating a grid of trails that connects to itself and to important destinations. Integrating elements from the background review and public engagement, an initial high-level potential network was developed in this fashion for Sturgeon Valley and is shown in Map 3.

### What We Heard: Routes

During the September 2021 engagement, participants were asked about routes they would like to take in Sturgeon Valley. Those who participated in pop-up in-person engagement could draw their desired routes on a map. Some of the most mentioned routes are along Bellerose Drive and Sturgeon Road, and along the Sturgeon River. Detailed results of the pop-up engagement, including a map of desired routes, are available in the What We Heard Report in Appendix B.

People who participated to the online survey largely reflected these priorities, mentioning routes to St. Albert along both Sturgeon Road and Bellerose Drive most often. Other frequently mentioned routes include connecting neighbourhoods together, particularly south of Sturgeon River, and routes that include river crossings. While it is not within the study area, the engagement also reflected a desire to connect Cardiff to Morinville.

## Connections

The connectivity review included assessing the future growth plans for the Sturgeon Valley area and considering the important connections in and around the Valley. The Sturgeon Valley South Area Structure Plan and the Sturgeon Valley Core Area Structure Plan provide detail on the proposed build out of the Valley, including important transportation connections.

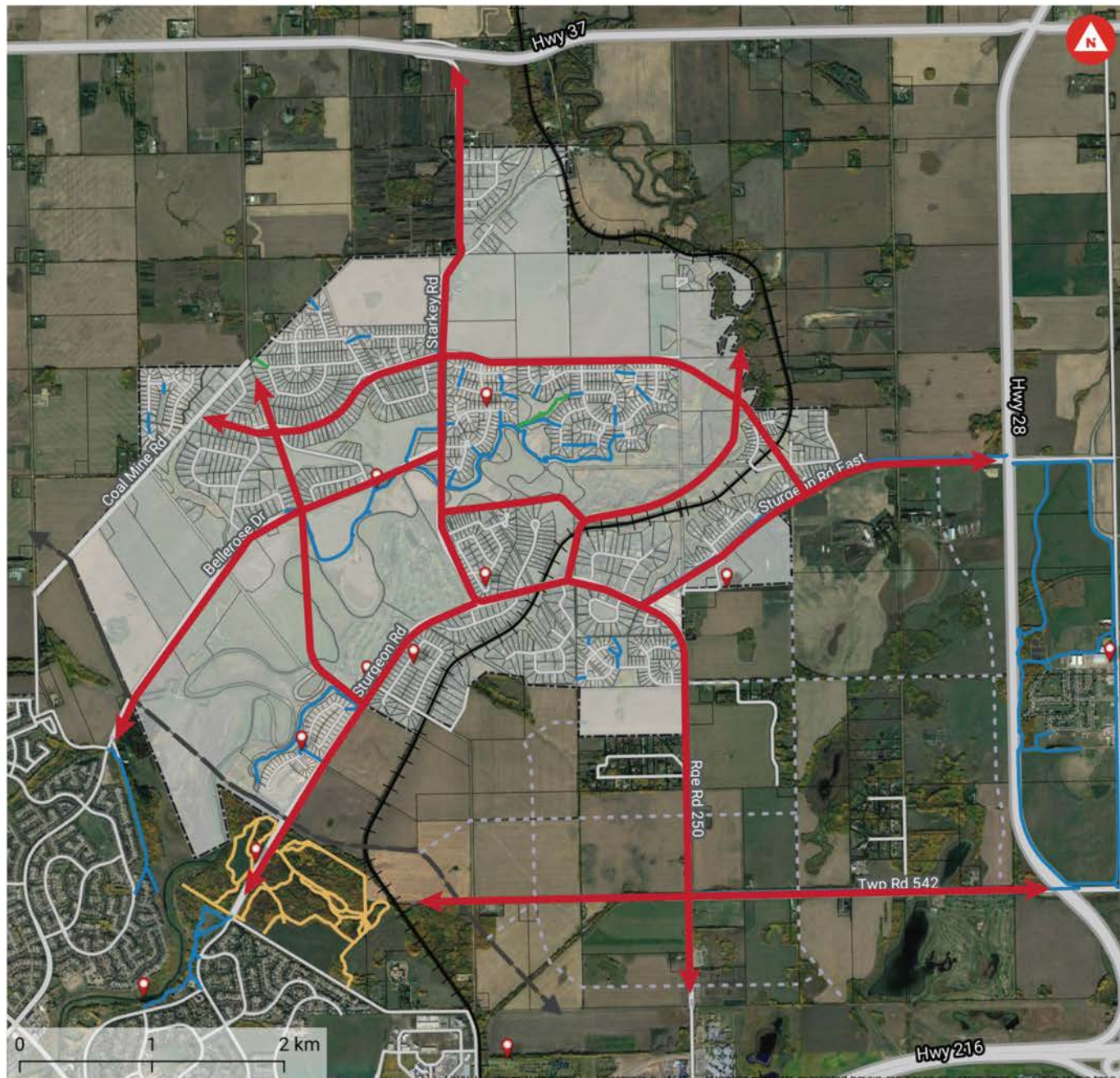
The high-level network as shown in Map 3 provides connectivity to existing neighbourhoods and destinations within the Valley and considers the future growth for the area.

Additional maps showing the proposed connections and transportation network are included in Appendix C.

Another future key connection is the planned extension of 127 Street. There is a prime opportunity to include a shared use path as part of the street extension to create a strong connection from Edmonton to St. Albert. As the build out is unknown, it is recommended to maintain the trails identified in this document that overlap with the planned alignment. Once the future construction has been confirmed, the complete 127 Street trail connection can then be determined by the design consultant. Therefore, the 127 Street shared use path has not been costed as part of the project.



Map 3. Initial High-Level Network



Legend

Context

- Study Area
- Destinations

Existing Trails

- Asphalt or Concrete
- Gravel or Shale
- Dirt

Transportation

- Provincial Highways
- Arterial - Surfaced
- Collector - Surfaced
- Local Road - Surfaced
- Others Outside Study Area
- Railways

Future Development

- Planned 127 Street Alignment
- Proposed Transportation Network

High-Level Network

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**Path Forward**

**3**

# Path Forward

## Trail System Vision and Principles

As active transportation plans have become more common in recent years, several vision statements and network principles have been developed across jurisdictions in North America. Common sets of principles have emerged, often informed by research in active transportation identifying elements that encourage walking and bicycling.

Having a vision and principles provides direction to a plan and influences the physical form of the active transportation network as well as the policies, programs and maintenance strategies that support it.

Based on feedback from survey respondents and internal engagement with County staff involved in active transportation, the following vision and principles were developed for Sturgeon Valley:

### What We Heard: Principles

During the September 2021 engagement, participants were presented with a list of potential trail principles based on a review of common principles found in network design guidance documents and existing plans. The four most important principles identified by respondents were:

- All-season access
- Trails physically separated from traffic
- Recreation-focused trails (meandering, scenic)
- Safe and convenient trails for kids and older adults

## Vision

*"The Sturgeon Valley Trails System is one that is designed to create a safe and connected network of trails for all ages in all seasons."*

## Principles

### A Safe Trails System

Creating a trails system that is safe and comfortable for all ages and abilities. This includes separating users from vehicle traffic on high-speed, high-volume roadways, and providing comfortable experiences for people walking, bicycling, wheeling, or using other forms of active transportation.

### A Connected Trails System

The trails system provides access to places where people want to go without gaps or missing links and includes a diverse range of route options and experiences for users.

### An All-Seasons Trails System

The trails system is maintained to allow for comfortable use in all seasons by a variety of users.



# Final Proposed Network

Using the background review and the feedback received from public engagement, Map 4 shows the recommended trails network for Sturgeon Valley, including additional considerations. This network addresses the gaps in the current network by providing missing links between neighbourhoods and to existing trails to create the type of active transportation network desired in the Valley.

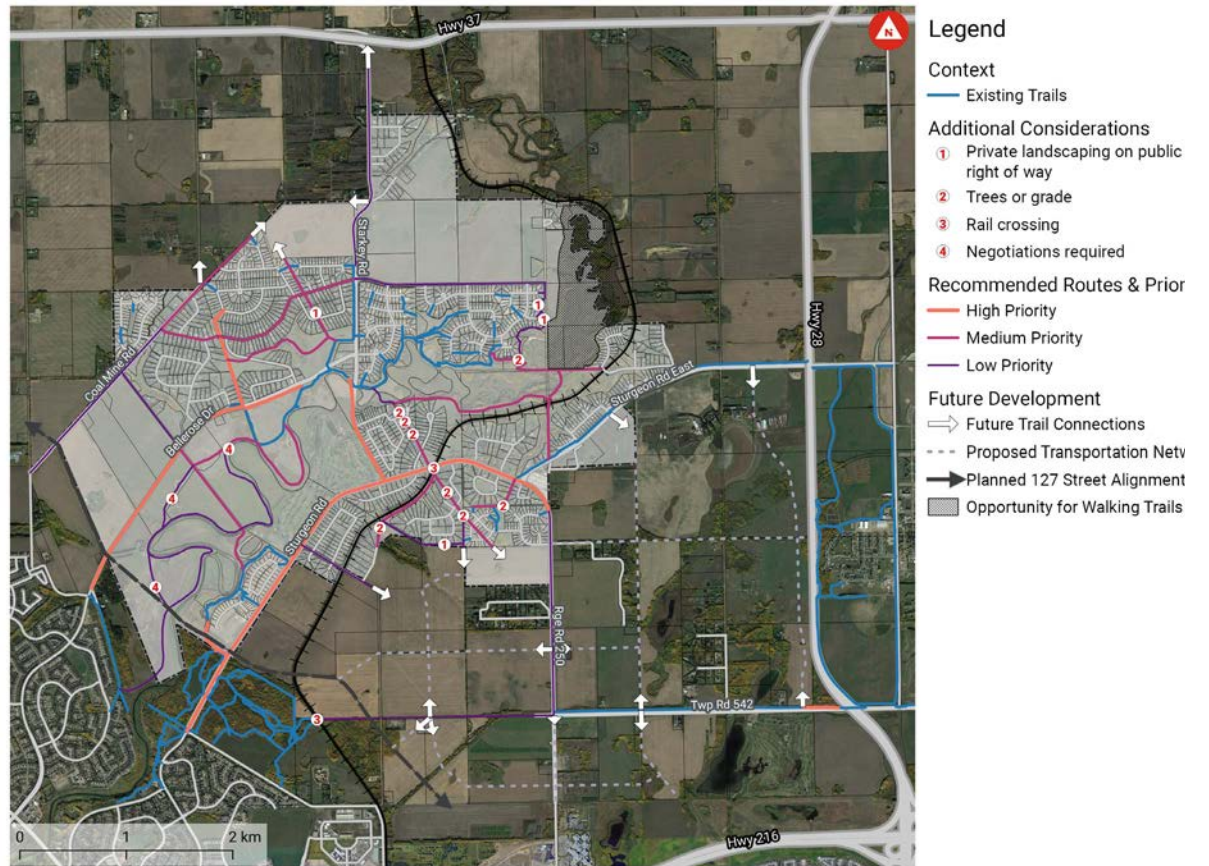
The network includes both on- and off-road trails as well as a balance between recreation-focused trails and more direct trails that provide connectivity to surrounding municipalities and important destinations.

Aligned with the Vision and Principles developed for the network, recommended trail types, as shown in Map 5, allow safe access for people of all ages in all seasons.

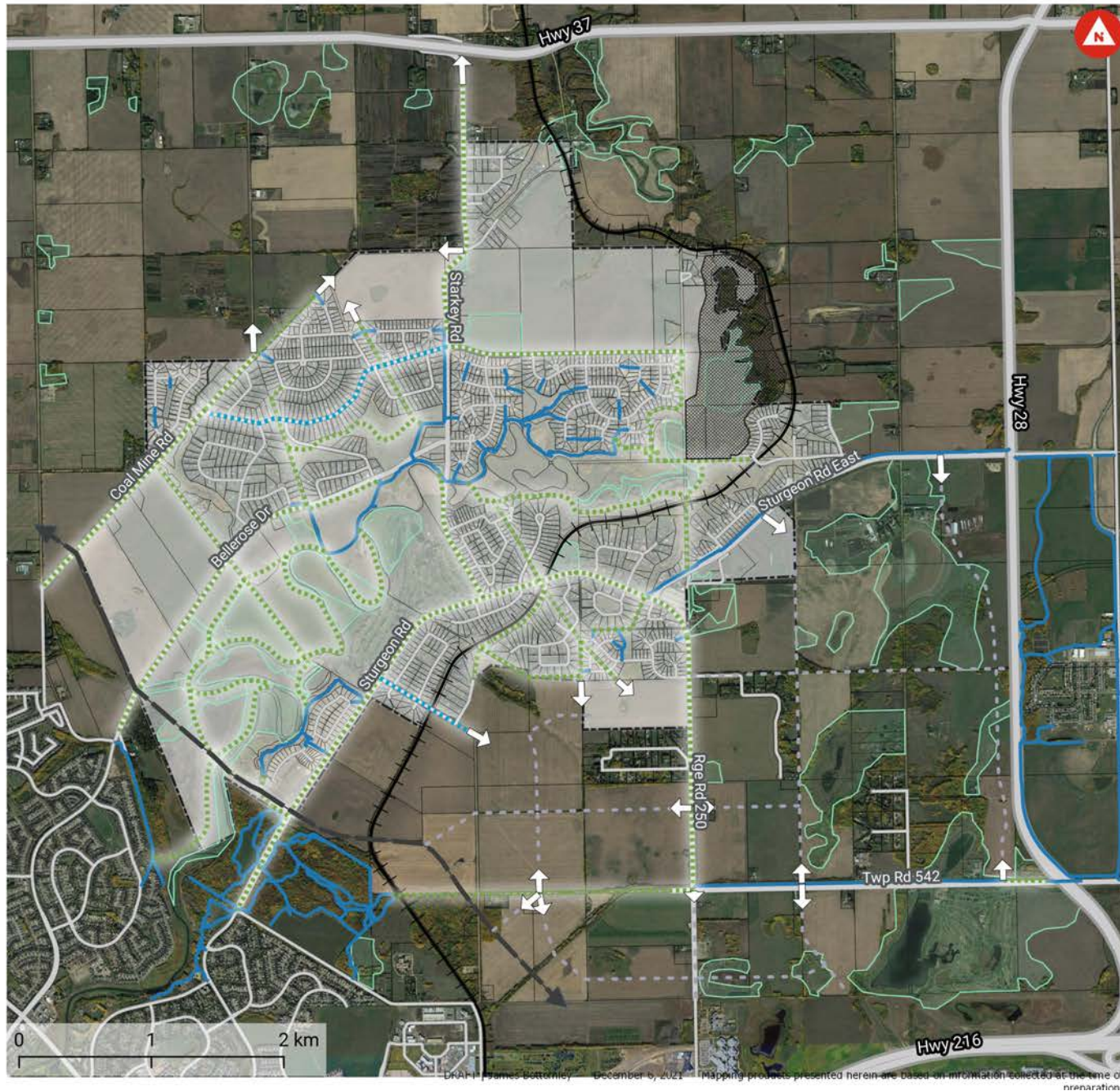
Cost estimates for each trail segment can be found in Appendix D.

There are a number of trail networks in close proximity to the Sturgeon River. It should be noted that some lie in proximity to the 1:100 yr. floodplain or within wetland or other environmentally sensitive areas and may need additional considerations for construction and maintenance. The existing natural features are shown in Appendix C.

**Map 4. Prioritized Trails and Active Transportation Network with Location Where Additional Considerations Are Required**



Map 5. Trails and Active Transportation Network by Trail Type



## Legend

### Context

- Study Area
- Wetlands
- Existing Trails

### Recommendations

- Advisory Shoulder
- Shared Use Path\*

### Future Development

- Opportunity for Walking Trails
- Planned 127 Street Alignment
- Proposed Transportation Network
- Future Trail Connections

\*Wetland areas shown are approximate. Shared use paths in suspected wetland areas may be required to be constructed as boardwalks. Further investigation will be required in future stages.

## Crossings

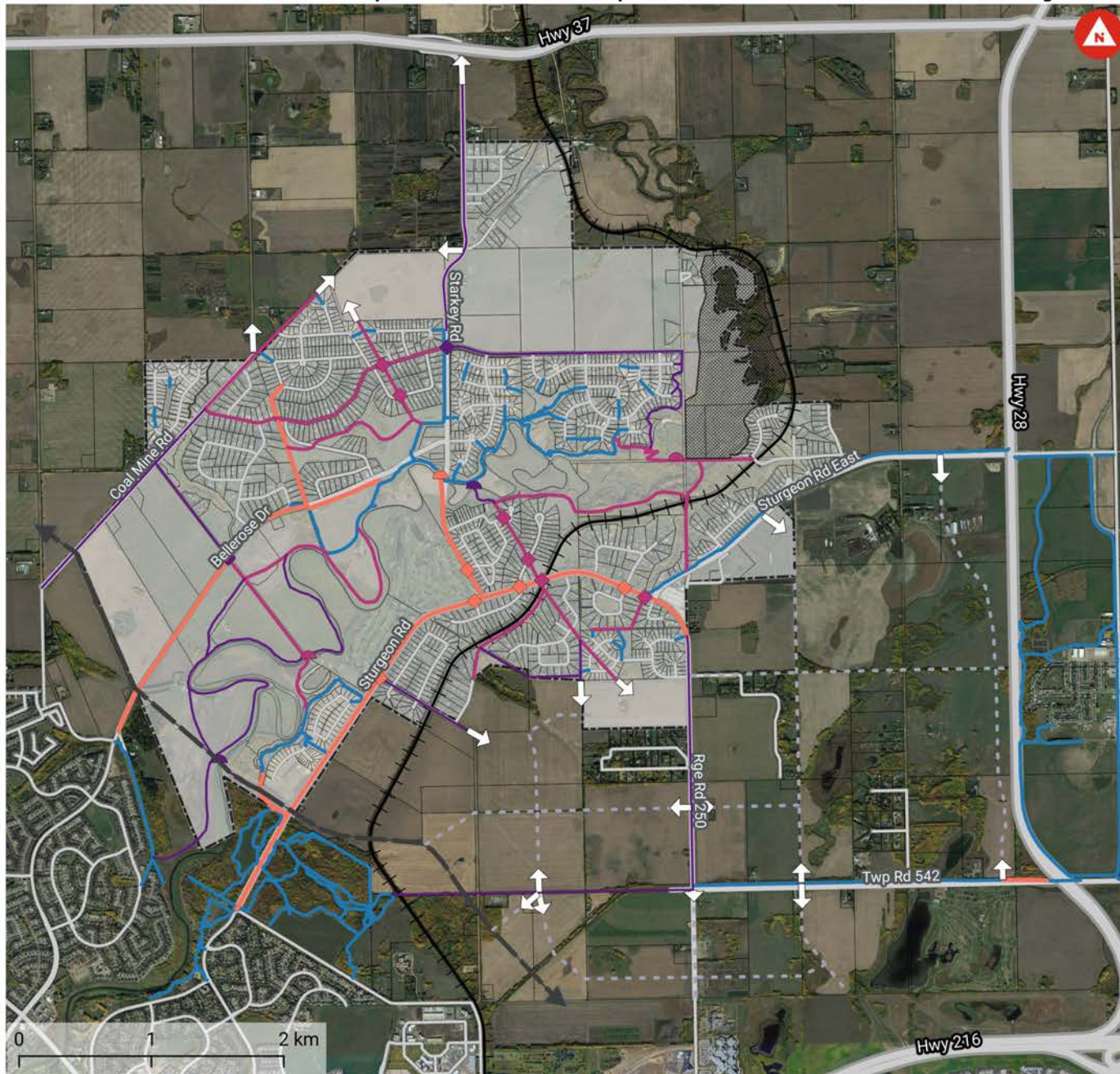
For network segments located on-street and at roadway crossings, street and crossing design must accommodate low-stress bicycle travel and comfortable travel on foot by ensuring visibility, and, where necessary, providing signalization.

Providing crossings at intersections and between intersections where destinations exists or where pathways cross the road is also important from a pedestrian safety standpoint.

A number of recommended crossings have been identified in Map 6. The crossings are sorted into two categories: Marked or signed crossings and river crossings. Marked or signed crossings are located at locations where the trails need to cross the roadways. Crossings on low-speed, low-volume roadways are conducive to indicators such as signage and/or pavement markings to alert drivers of users crossing. Crossings on high-speed, high-volume roads, such as Sturgeon Road, Starkey Road, or Bellerose Drive, may require additional interventions, such as high-visibility signage and pavement markings and/or the consideration of pedestrian crossing beacons.



Map 6. Trails and Active Transportation Network with Recommended Crossings



## Legend

### Context

- Study Area
- Existing Trails

### Recommendations

#### Recommended Routes & Priority

- High Priority
- Medium Priority
- Low Priority

#### Recommended Crossing and Priority

- High Priority Marked or Signed Crossing
- Medium Priority Marked or Signed Crossing
- Low Priority Marked Crossing
- High Priority River Crossing
- Medium Priority River Crossing
- Low Priority River Crossing

#### Future Development

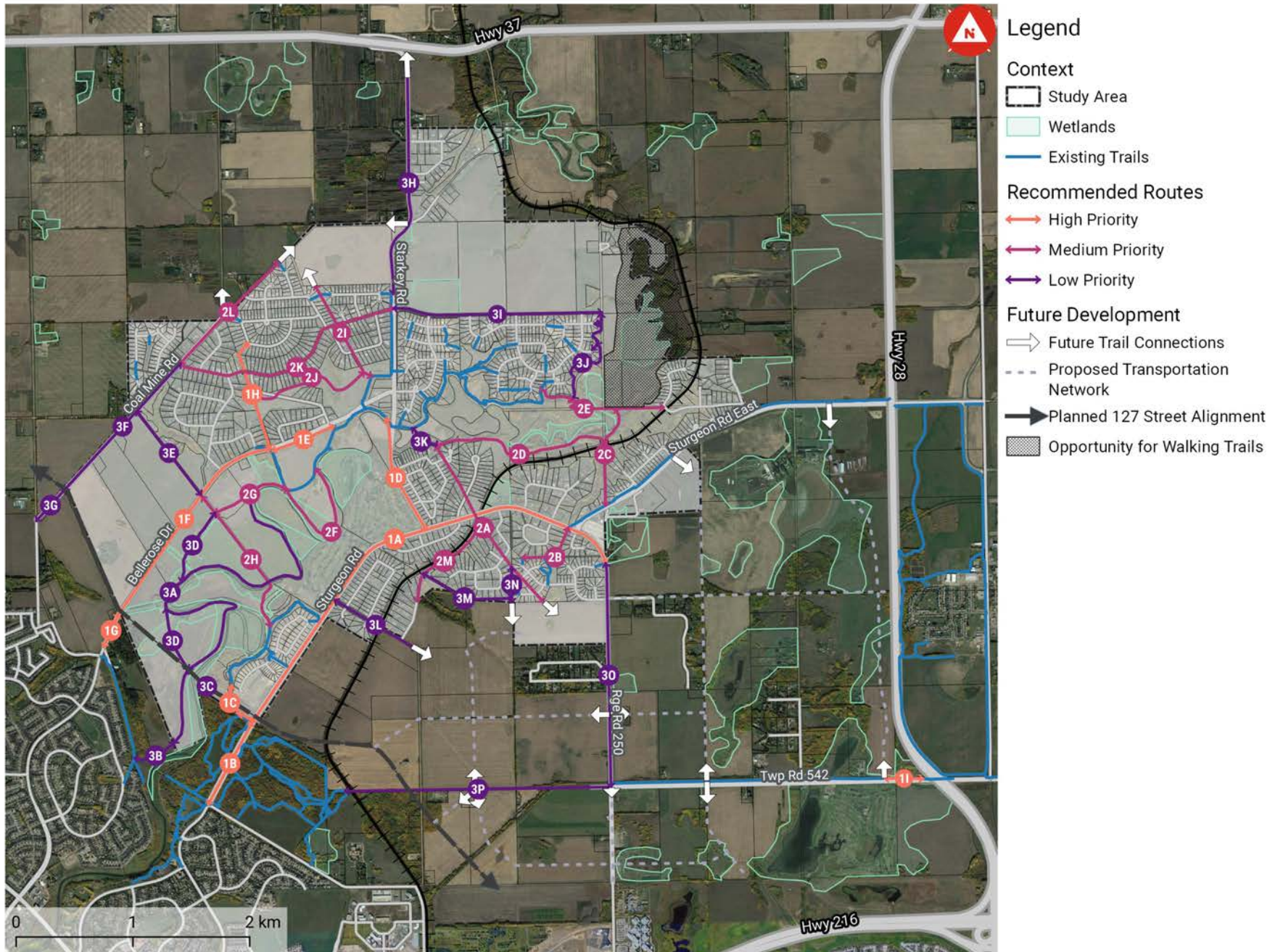
- Opportunity for Walking Trails
- Planned 127 Street Alignment
- Proposed Transportation Network
- Future Trail Connections

## Prioritization

Three levels of priority were identified for each route or trail in the network, as shown in Map 7. High priority trails and routes should be implemented first, while low priority trails and routes can be implemented last, or as development in the area occurs. The rationale for each level of priority is detailed below, along with a description of each trail. When planning the network staging, care was taken to ensure that trails would always be connected to a destination or to other trails such that the vision of a connected trail system would be respected through each phase of implementation.

Additional maps showing the overview of the network after complete of each priority level are provided in Appendix C.

Map 7. Trails and Active Transportation Network by Priority



## High Priority

The highest priority is notably given to routes and trails that address safety issues by making active transportation safer along high-volume and high-speed roads. Having at least one north-south connection across the Sturgeon River was also a priority. Some of the high-priority trails are also “quick wins”, closing short missing links to connect trails together and neighbourhoods to the existing trail system where there are few current additional considerations (grades, landscaping, etc.).

Map ID	Facility Type	Description
1A	Shared Use Path	Frequently requested connection on high-speed and high-volume road. Connects to shared use path at Tuscany Hills, shared use path on Sturgeon Road East, Starkey Road and southwest boundary of St. Albert.
*1B	Shared Use Path	Continuation of trail 1A from Sturgeon Valley boundary to trail system in St. Albert. Will require coordination with St. Albert.
1C	Shared Use Path	Missing link between shared use path at River's Gate and Riverlot 56 trails. Includes connection to Riverlot 56 trails and connection to the recommended shared use path on Sturgeon Road (1A).
1D	Shared Use Path	Connection on west side of Starkey Road from Sturgeon Road to Bellerose Park trail system. Includes a dedicated active transportation bridge over Sturgeon River at the north end.
1E	Shared Use Path	Closes trail loop in Bellerose Park. Shared Use Path to be constructed on both north and south sides of Bellerose Drive to connect from the existing crossing west of Fernwood Crescent to the existing Bellerose Park parking lot (south side) and the existing crossing east of Villa Drive (north side).
1F	Shared Use Path	Frequently requested connection on main road from west end of Bellerose Park to Sturgeon County boundary. Shared Use Path to be on north side of Bellerose Drive.
*1G	Shared Use Path	Continuation of trail 1F from Sturgeon Valley boundary to trail system in St. Albert. Will require coordination with St. Albert.
1H	Shared Use Path	Off-road connection between Bellerose Park trails and northern neighbourhoods through open space with no evident additional considerations identified (quick win).
*1I	Shared Use Path	Short missing connection on Twp Rd 542 west of Hwy 28 bridge (quick win).

\* Trails denoted with an asterisk (\*) are partially or fully outside of the project study area, however form important linkages to address the gaps in the existing trails system.

## Medium Priority

The second phase of implementation targets adding recreational trails in the open space in the Valley as well as connecting neighbourhoods together and to the existing trail system. The medium priority trails also include additional river crossings.

Map ID	Facility Type	Description
2A	Shared Use Path	Off-road connection between southern neighbourhoods and Sturgeon Road and new valley trails.
2B	Shared Use Path	Off-road connection from Tuscany Hills shared use paths to Sturgeon Road and the shared use path on Sturgeon Road East. Located on north side of fence.
2C	Shared Use Path	Off-road connection from Sturgeon Road East into Sturgeon Valley connecting to new trails (2D and 2E).
2D	Shared Use Path	Recreational trail in Sturgeon Valley along cleared area and top of bank north of Lower Manor Estates and Bristol Oaks.
2E	Shared Use Path	Recreational trail and connection in Sturgeon Valley largely along undeveloped road right-of-way. Connects neighbourhoods Crossing at River's Edge (east) and Riverstone Pointe (west). Includes active transportation bridge over the Sturgeon River.
2F	Shared Use Path	Additional recreational loop in Bellerose Park.
2G	Shared Use Path	Connection from Bellerose Park trails to new north-south trail (2H). Shorter and more direct connection than scenic trail along the river (3A). On privately owned agricultural land and will require coordination.
2H	Shared Use Path	Connection from Bellerose Drive to River's Gate shared use path. Includes active transportation bridge over the Sturgeon River.
2I	Shared Use Path	Off-road connection from Upper Manor Pointe neighbourhood to existing trail.
2J	Shared Use Path	Off-road east-west connection to other trails through open field. Creates walking or bicycling loop opportunity.
2K	Advisory Shoulder	On-road east-west connection through northern neighbourhoods. Connects west to Coal Mine Road and east to Starkey Road.
2L	Shared Use Path	Shared Use Path connecting three neighbourhoods: Greystone, Summerbrook and The Banks.
2M	Shared Use Path	Off-road connection between Upper Viscount Estates (trail 2A) and Manor Estates II.

## Low Priority

The low priority routes mainly include routes on the edges of currently developed areas and are intended to connect to new developments as they occur. Some of the routes are also recreational in nature and aim to provide more opportunities to enjoy the open space in the Sturgeon River valley. Some of these lower priority routes present more challenges to implementation, including steeper grades, existing private landscaping on County owned land, or trails recommended on privately owned land that will require the negotiation of agreements.

Map ID	Facility Type	Description
3A	Shared Use Path	Winding, scenic recreational trail along the Sturgeon River extending to the southern boundary of Sturgeon County and offering connections to Bellerose Park and River's Gate. On privately owned agricultural land and will require coordination.
*3B	Shared Use Path	Connection from scenic river's edge trail (3A) to existing trails in St. Albert. Will require coordination with St. Albert.
3C	Shared Use Path	Connection from scenic river's edge trail (3A) to River's Gate and Riverlot 56 connection. Includes active transportation bridge over the Sturgeon River.
3D	Shared Use Path	Connections between winding sections of trail 3A for more direct off-road route through the Valley. On privately owned agricultural land and will require coordination.
3E	Shared Use Path	Direct north-south connection between Bellerose Drive and Coal Mine Road. To be built when road is paved.
3F	Shared Use Path	Connection from Greystone neighbourhood to edge of Sturgeon County boundary.
*3G	Shared Use Path	Connection from Coal Mine Road to potential future trails in St. Albert. To be coordinated with St. Albert.
*3H	Shared Use Path	Connection towards the north from trail on Starkey Road to Green Acres and future developments. Potential to extend north to provide connection to Cardiff/Morinville.
3I	Shared Use Path	Direct connection to Starkey Road and northwest neighbourhoods on northern edge of current development boundary.
3J	Shared Use Path	Recreational trail along top of bank connecting Riverstone to Valley trails. Includes two short shared use path branches between properties to connect within Riverstone neighbourhood.
3K	Shared Use Path	North-south connection across river, including active transportation bridge.
*3L	Advisory Shoulder	Connection from Sturgeon Road through Manor Estates II and towards future developments.
3M	Shared Use Path	Off-road east-west connection from trail 2M to 2N between Upper Viscount and future developments.
3N	Shared Use Path	North-south connection from trail 2A to future developments south of Tuscany Hills and Upper Viscount.
*3O	Shared Use Path	Connection from Tuscany Hills south to North Point and existing shared use path on Twp Rd 542.
*3P	Shared Use Path	East-west connection through future developments from Riverlot 56 to shared use path on Twp Rd 542.

\* Trails denoted with an asterix (\*) are partially or fully outside of the project study area, however form important linkages to address the gaps in the existing trails system.

## Funding Sources

Local active transportation projects are typically funded directly from local (city, town, county) budgets, unless they are part of major transportation investments, typically in urban contexts such as major roadways and transit projects. In these cases, cost sharing between municipalities and other orders of government is possible. Offsite levy collection could also be considered for funding trails.

One of the only external funding avenues for active transportation specifically available as of Fall 2021 is through Canada's National Active Transportation Strategy announced in 2021 by the Government of Canada. The associated active transportation fund has \$400 M available over five years to build new and expanded networks of pathways, bike lanes, trails and pedestrian bridges.

The program includes timed intakes with open and close dates as well as rolling intakes with continuous assessment. Applications must be submitted through Infrastructure Canada's online Applicant Portal. There are two streams of eligible projects: planning projects and capital projects

### Planning and Design Projects (Grant Program)

Includes research and data collection, engagement, education and encouragement activities, policy development (including active transportation strategies or the active transportation component of a larger planning document), and feasibility studies.

Projects can be funded up to 100%, with the maximum payable amount not exceeding \$50,000.

### Capital Projects (Contribution Program)

Infrastructure construction, including enhancing existing infrastructure without net gain in kilometres of infrastructure. This stream includes the following types of infrastructure:

- Linear infrastructure
  - » Multi-use paths, sidewalks, footbridges, separated bicycle lanes, and connections to other roadways. Can include nature trails if they reflect evaluation criteria.
- Supporting infrastructure
  - » Storage facilities, lighting, greenery, shade, and benches
- Safety infrastructure
  - » Crosswalks, medians, speed bumps, and wayfinding signage

The maximum program contribution varies depending on the scale of the project. For local governments, the maximum program contribution is typically up to 60%.

More information regarding this funding source, including evaluation criteria and eligible expenses can be found in the applicant guide .

## Maintenance Strategies

The long-term performance of bicycle and pedestrian networks depends on both the construction of new facilities and an investment in continued maintenance. Maintaining bicycle and pedestrian facilities is critical to ensuring those facilities are accessible, safe, and functional.

## Life Cycle Cost

Whenever trails are constructed, maintenance funding is needed. This is often not considered and maintenance is absorbed within existing staff resources and operating budgets. A lack of maintenance can then result in higher long-term costs, with premature replacements required due to a lack of regular maintenance.

For trails, the primary maintenance consideration is pavement preservation. Over the life cycle of a trail, there are different strategies for pavement preservation, and lower-cost preventative maintenance or rehabilitation may defer more costly reconstruction. Preventative maintenance includes strategies such as patching, grinding, concrete raising, and surface replacement. The responsibility entity for maintenance should keep consistent records of pavement conditions of trails to track maintenance performed and predict future needs.

Another typical maintenance cost of shared use paths is plowing in winter. In order to allow safe access to trails year round, winter maintenance of the trails is critical.

## Frequency

The first step to approaching maintenance is to understand how often maintenance should be performed. Many activities, such as signage updates or replacements, are performed as needed, while other tasks such as snow removal are seasonal (see Table 4). Creating a winter maintenance approach is important to encourage year-round travel by walking and bicycling. One key component of this approach should be identifying priority routes for snow removal. More information on winter maintenance such as types of equipment needed for different facility types and how to consider snow removal in the design of facilities can be found in [Toole Design's Winter Maintenance Resource Guide](#).

Table 4. Sample Maintenance Activity Frequency

Frequency	Maintenance Activity
<b>As Needed</b>	Tree/brush clearing and mowing
	Sign replacement
	Map/signage updates
	Trash removal/litter clean-up
	Replace/repair trail support amenities (parking lots, benches, restrooms, etc.)
	Repair flood damage: silt clean-up, culvert clean-out, etc.
	Patching/minor regrading/concrete panel replacement
	Sweeping
<b>Seasonal</b>	Snow and Ice Control
	Planting/pruning/beautification
	Culvert/drainage cleaning and repair
	Installation/removal of seasonal signage
<b>Yearly</b>	Surface evaluation to determine need for patching/reggrading/re-striping of bicycle facilities
	Evaluate support services to determine need for repair/replacement
	Perform walk audits to assess ADA compliance of facilities
<b>5-year</b>	Repaint or repair trash receptacles, benches, signs, and other trail amenities, if necessary
	Sealcoat asphalt shared use paths
<b>10-year</b>	Resurface/regrade/re-stripe shared use paths
<b>20-year</b>	Assess and replace/reconstruct shared use paths/ sidewalks



## Maintenance Activities

Different facility types require different types of strategies to be maintained. Table 5 breaks down maintenance activities and strategies for each by facility type.

Table 5. Maintenance Strategy Recommendation

	Maintenance Activity	Strategy
Shared Use Paths	Pavement Preservation	Develop and implement a comprehensive pavement management system for shared use path network.
	Snow and Ice Control	Design shared use paths to accommodate existing maintenance vehicles.
	Drainage Cleaning/Repairs	Clear debris from all drainage devices to keep drainage features functioning as intended and minimize trail erosion and environmental damage.
		Check and repair any damage to trails due to drainage issues.
	Sweeping	Implement a routine sweeping schedule to clear shared use paths of debris.
	Vegetation Management	Implement a routine vegetation management schedule to ensure user safety.
		Trim or remove diseased and hazardous trees along trails.
Accessibility Requirements	Preserve and protect vegetation that is colorful and varied, screens adjacent land uses, provides wildlife habitats, and contains prairie, wetland and woodland remnants.	
Advisory Bike Lanes	Pavement Markings	Conduct walk and bike audits to assess accessibility of new, proposed, and existing shared use paths.
		Explore approaches to routinely inspect pavement markings for bicycle infrastructure and replace as needed.
		Monitor wear on pavement markings and replace as soon as possible if deteriorated.
	Snow and Ice Control	Clear all signed or marked shoulder bicycle facilities after snowfall on all facilities.
	Sign Replacement	Repair or replace damaged or missing signs as soon as possible.
Sweeping	Implement a routine sweeping schedule to clear high-volume routes of debris.	

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# **Appendix A**

## **Active Transportation Plan Best Practices Review**

# Planning for a Successful Walking and Bicycling Community

## Characteristics of Successful Walking and Bicycling Communities

Communities where walking and bicycling are widely used for transportation and leisure have a certain number of common characteristics:

- A high rate of walking and bicycling
- A low rate of serious injuries and fatalities from crashes
- Residents report a high level of satisfaction regarding infrastructure conditions and experience

Creating an environment where walking and bicycling are accepted, appealing, safe and convenient choices for transportation and recreation requires a strategic package of infrastructure, policy, and programming. First, it is important that a comprehensive and connected network of high quality, low-stress infrastructure exists to encourage walking and bicycling. Local policies such as zoning that requires bicycle parking and showering facilities, as well as winter maintenance procedures that ensure infrastructure is accessible and free of ice, make active transportation more convenient. Promotional campaigns and programs that foster a culture of walking and bicycling are also effective.

## The Need for a Plan

An active transportation plan is an essential element to create a walk and bicycle friendly place because most municipal jurisdictions in Canada, including Sturgeon County, do not systematically provide for active transportation needs in their current planning processes.

On a functional level, local governments typically require active transportation projects to be identified through a formal planning process to be eligible for funding whether the funds are from federal, provincial, or local sources.

The ultimate impact of a well-made plan, however, is dependent on the degree

to which it is implemented. The plan development process itself should be viewed as one of its strongest tools for implementation as it can touch many diverse community members, bringing them together around a shared vision and building the support for change.

Perhaps most importantly, a successful plan sets the tone for a successful place. These plans are ambitious and forward-looking, planning for a future where walking and bicycling are inclusive, widespread, easy, comfortable and efficient. Focused, realistic recommendations that are easy to implement in the short term pave the way for more ambitious ideas that, over time, more community members see are realistic and desirable.

## Elements of a Successful Plan

The plan elements and key topics described in the following section were identified through review of over a dozen plans for successful walking and bicycling communities and local jurisdictions as detailed in the table below.

Municipality	Population	Transit (%)	Walking (%)	Bicycling (%)	Active Mode Share (% Total)	Average Annual Snowfall (cm)	Plans Reviewed
Birmingham, Alabama	212,157	1.8	2.1	0.2	4.1	5	B Active - Active Transportation Plan
Boston, Massachusetts	673,184	32.8	13.5	2.4	48.7	111	City of Cambridge Bicycle Plan
Calgary, Alberta	1,239,220	15.6	5.4	1.3	22.3	129	Calgary Pathway & Bikeway Plan Report 2018 (under development)
Copenhagen, Denmark	583,525	36.0	10.0	30.0	76.0	0	Copenhagen City of Cyclists
Davis, California	68,111	6.8	4.0	16.6	27.4	0	City of Davis Bicycle Action Plan City of Davis Bicycle Plan
Denver, Colorado	693,060	6.3	4.5	3.2	14.0	163	Denver Vision Zero Action Plan
Durham, North Carolina	263,016	4.5	2.3	0.5	7.3	10	Durham Bike+Walk Implementation Plan
Edmonton, Alberta	932,546	14.5	4.0	1.1	19.6	123	Proposed Walkability Strategy Bicycle Transportation Plan Update The Bike Plan Sidewalk Strategy
Eugene, Oregon	166,575	3.6	6.4	6.2	16.2	10	Eugene Pedestrian and Bicycle Master Plan 2012
Fort Collins, Colorado	164,207	2.2	4.0	5.3	11.5	145	Bicycle Plan
Fredericton, New Brunswick	58,220	4.3	9.3	1.4	15.0	252	City of Fredericton Trails/Bikeways Master Plan
Howard County, Maryland	58,220	3.0	0.8	0.1	3.9	48	The Patapsco Regional Greenway
Lethbridge, Alberta	92,729	3.4	4.0	1.5	8.9	130	City of Lethbridge Cycling Master Plan
London, England	8,136,000	37.0	24.0	2.0	63.0	47	City of London Cycling Master Plan
Madison, Wisconsin	252,551	8.6	8.5	4.9	22.0	109	Bicycle Transportation Plan for the Madison Metropolitan area and Dane County
Minneapolis, Minnesota	413,651	14.2	7.3	3.7	25.2	137	Access Minneapolis: Minneapolis Bicycle Master Plan
Nelson, British Columbia	10,230	1.3	25.5	5.0	31.8	70	City of Nelson Active Transportation Plan 2010
Oakville, Ontario	193,832	16.7	3.3	0.6	20.6	121	Active Transportation Master Plan
Philadelphia, Pennsylvania	1,568,000	24.0	8.3	2.2	34.5	57	Pedestrian and Bicycle Plan
Portland, Oregon	639,863	12.9	5.8	6.3	25.0	8	Portland Bicycle Plan for 2030
Seattle, Washington	704,352	21.0	11.1	3.5	35.6	13	Seattle Bicycle Master Plan
Utrecht, Netherlands	334,176	34.0	3.0	34.0	71.0	0	Utrecht - we all cycle! Action Plan

## Four Fundamentals

A successful active transportation plan should support the specific goals of the community it serves, determined by a thoughtful community input process and careful analysis. Four critical aspects of an active transportation plan are:

1. Developing a high-quality network
2. Fostering the culture and appeal of walking and bicycling
3. The development process of the plan itself
4. Defining clear implementation tasks and responsibilities, including resources

## High Quality Active Transportation Networks

Pedestrian and bicycle networks that are suitable for a wide range of users require facilities that separate pedestrians and bicyclists from motor vehicle traffic where automobile speeds and/or volumes are high. Higher-quality bike facility design, both on and off-road, often includes wider space for bicyclists to accommodate people with varying riding speeds. Thus, the facilities are made safer through lessening the chance of conflicts between high- and low-speed users, including on shared use paths and trails. Likewise, higher-quality pedestrian infrastructure often includes sufficient space to accommodate the use of wheelchairs, parents pushing strollers, and people using guide dogs. For network segments located on-street and at roadway crossings, street and crossing design must accommodate low-stress bicycle travel and comfortable travel on foot by ensuring visibility, and, where necessary, providing signalization.

High-quality bicycle networks should accommodate the wide range of bicyclists and potential bicyclists in the community – these are known as All Ages and Abilities, 8 to 80, or low-stress bicycle networks. Without a bicycle network that accommodates the widest range of riders, all other plan elements will fail to increase bicycling. No level of programs and policies related to encouragement, education and enforcement can overcome the barrier presented by a disconnected, high-stress network for many bicyclists.

In an urban context, a quality pedestrian network is determined by short block distances that enable direct routes and a high density of crossings that allow to

reach destinations with minimal detour, typically within a 10 to 15 minute walk. These considerations tend not to apply to the same extent in a rural context, with the exception of villages and town cores. In other areas, providing a dedicated space along or next to the road, preferably with physical separation from motor vehicle traffic (sidewalk or off-street pathway) marks a quality network. Providing crossings at intersections and between intersections where destinations exist or where pathways cross the road is also important from a pedestrian safety standpoint.

## Walking and Bicycling Culture

Creating a successful active community requires more than just repairing sidewalks and building a bicycle network. These modes need to be promoted and supported by a vibrant walking and bicycling culture.

Indicators of a healthy active transportation culture can include high profile events, popular and festive group rides or walks, having a reputation as a bicycling destination, or simply a common acceptance amongst most people that walking and bicycling is a normal, practical, and useful mode of transportation and a healthy, pleasant recreational activity.

Partnering with community groups and agencies helps engage a wide range of community member in walking and bicycling activities. Examples include private entities such as bike shops, clubs, and health-focused organizations that can host events or senior's groups organizing weekly bike rides and walks for their members to support health and social connectedness.

The preparation of an active transportation plan is an opportunity to enhance the active transportation culture through the discussions, collaborations, and public engagement that take place during the planning process. It brings active transportation and recreation to the forefront of public discourse for a time, which can create a mini-surge in the walking and bicycling culture, leading to more public and political support, and making the topic more top-of-mind for staff across agencies.

## Plan Development

### Focused and Strategic

The weakest plans in the scan of pedestrian, bicycle, and active transportation plans amount to lists of tasks, lacking context and the sense that the whole is greater than the sum of its parts. The strongest plans tell a coherent story about where the community is going and how they are going to get there. These plans have a clear approach to the pedestrian and/or bicycle environments/networks, embrace innovative design, call for strategic and supportive policies and programs, and have a specific implementation plan.

### Public Engagement and Transparency

A robust, inclusive, and thoughtful engagement process can result in a plan that is reflective of community values and goals and is thus more likely to gain support for implementation. Agencies should design a public process that brings new people to the table and shows participants how their input was incorporated. A public process that reaches young people, elderly, women, people with lower incomes, and people of colour as well as existing walking and bicycling organizations and advocates will result in a plan that is more reflective of the entire community and more likely to serve this wider audience. This is particularly important when establishing a vision, goals, and objectives as they provide an overarching framework for the plan. Strong plans also have performance measures and timelines to measure progress towards the established goals. The plan's recommendations should contribute to measurable progress towards the performance measure targets.

Having clear and understandable methods to arrive at the plan recommendations sets community expectations, builds trust, and can facilitate implementation. Some of the best recent plans are extremely transparent about their planning and prioritization process and communicate them using quality visuals.

Lastly, active transportation plans often include sections on making the case for walking and bicycling in the plan; however, these materials are often more useful during the planning process itself to explain to the public, agency staff, and elected officials why the process, the plan, and the resulting outcomes are important. Materials that make the case for walking and bicycling, such

as benefits to the local economy, are put to good effect by successful cities during individual project implementation processes as well.

### Data-Driven Planning and Equity

Using data throughout the plan development process leads to defensible recommendations that can be upheld under scrutiny. A successful planning process will equip the community with analysis to back up its priorities. Particularly in smaller jurisdictions, the active modes have not historically been well documented with the same types of data easily accessible for automobile planning and engineering. In this case, field data collection is particularly valuable. The collection of further data should be integrated in the recommendations. These can include pedestrian and bicycle count programs and assessments of facility state of repair. In time and with more data, plans can be updated to incorporate recommendations based on more complex analyses such as Level of Traffic Stress Analysis, bicycle and pedestrian level of service analysis, and crash analysis.

American and Canadian communities have become increasingly aware that gaps in the walking and bicycling networks are often unevenly distributed. Understanding population distribution and barriers to access is another aspect of data-driven planning. Some plans include equity as a specific goal and measuring progress toward that goal requires the collection of specific data.

#### Case Study: Portland State University Equity Analysis of Portland's draft Bicycle Master Plan

In 2009, the City of Portland hired Portland State University to conduct an equity analysis to make bicycling more attractive to historically disadvantaged groups. The analysis identified areas where disadvantaged populations live, work, learn, play, and shop for groceries. Because the built-out 2030 network would ultimately cover the entire city, the question of equity in the future was more about project priority and timing of implementation than about network coverage or lack of coverage. The report, therefore, made recommendations about project phasing.

## Aesthetics

The visual appeal of pedestrian and bicycle plans has improved in recent years. Both the public audience and agency practitioners benefit from clear informative visuals. An attractive document shows an agency is committed to making its plans accessible to the public and can make it easier for the public to support a plan.

Informational visuals can be almost as impactful on an external audience as the narrative of the plan. The use of visuals in active transportation plans includes:

- Maps
- Tables
- Photos
- Renderings
- Infographics

## Implementation

Many plans contain detailed information, including project lists, project prioritization criteria, funding sources, and planning level cost estimates to facilitate post-plan implementation. However, implementation only occurs if the person or agency creating the plan understands how projects get implemented within their jurisdiction. Which department is responsible for the activity? Who owns the right-of-way or land parcel? On what timeframe do important actions (e.g., repaving) take place? The more the active transportation plan can align its recommendation with the daily operating procedures of the implementing agencies, the more likely implementation is to occur efficiently.

Lastly, finding funding is a key determinant as to whether a plan will be implemented. Finding early opportunities to build proposed projects can set a precedent for implementation – rather than a period of inactivity following the release of the plan.

# Key Topics of an Active Transportation Plan

## Physical Infrastructure Elements

Plans typically identify projects for future construction, but they should also address any deficiencies with current facility design and maintenance. Successful plans provide guidance to implementing strategies that help ensure high-quality facilities, both new and existing.

## Bicycle Elements

### Facility Standards

Physical bicycle infrastructure must be high-quality to attract and retain riders from all backgrounds and skill levels. Design and construction of these facilities indicates a community's level of interest and investment in bicycling, and they must be high to create a successful experience. Standards vary for different contexts; for on-road segments, physical separation from fast-moving or high-volume traffic is essential, for example. Off-street facilities must be constructed with materials that will not degrade quickly as they age. In both cases, facilities should be wide enough to accommodate expected bicycle volumes and allow safe passing.

Many guidance documents provide more details on specific types of bikeway design, including:

- Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, Chapter 5 (2017)
- British Columbia Active Transportation Design Guide (2019)
- Federal Highway Administration (FHWA) Small Town and Rural Multimodal Networks (2016)
- Alberta Bicycle Facilities Design Guide (Upcoming)

## Network Planning Methods

Strategic network planning is a central part of any active transportation plan. Two example case studies are presented below to illustrate different methods used.



## Case Study: Netherlands

Dutch bicycle networks are widely regarded as successful in their facilitation of easy bicycle travel. The CROW Manual provides engineering guidance for Dutch traffic engineers. While some elements are more suited to urban environments, such as mesh width, the qualities of bicycling network described are generally applicable or adaptable to rural environments:

Principle	Description
<b>Cohesion</b>	<p>The “mesh width” – the distance to the next network segment – is no more than 250 m.</p> <p>Centres and important amenities are interconnected.</p> <p>At least 70 percent of all bicycle journeys are made on the bicycle network.</p>
<b>Directness</b>	<p>The average detour time is minimized.</p> <p>The number of intersections where cyclists do not have the right of way is minimized.</p> <p>Stopping for bicyclists is minimized.</p>
<b>Safety</b>	<p>Conflicts with crossing traffic are avoided.</p> <p>Vehicle types are separated.</p> <p>Speed at conflict points is reduced.</p> <p>Road classifications are recognizable to the road users.</p> <p>Bicycling treatments are uniform (solutions that are characteristic of one road type should not be used on another).</p> <p>Encounters between bicyclists and cars are minimized.</p>
<b>Comfort</b>	<p>Destinations are easy to find.</p> <p>The network is comprehensible (bicyclists can easily make a mental map of their route).</p>
<b>Attractiveness</b>	<p>Network provides “social safety” (feeling of personal safety).</p>

## Case Study: City of Edmonton

The Bike Plan, adopted in 2020, outlines six network principles to guide planning and design of the network. They largely overlap with Dutch principles presented above:

Principle	Description
<b>Health and Comfort</b>	The network maximizes the feeling of comfort and minimizes stress and safety concerns related to vehicle traffic, noise, lack of visibility, etc.
<b>Connectivity</b>	The network provides access to destinations without gaps or missing links
<b>Directness</b>	The network prioritizes direct routes and minimizes detours and unnecessary stops
<b>Network Density</b>	The mesh width is adapted to demand
<b>Attractiveness</b>	The network routes are aesthetically attractive
<b>Integration</b>	The network routes fit in the area’s context and within the broader transportation network

Edmonton’s network planning also relies on a hierarchy of route types that together form a “network of networks” that serve different purposes while being integrated together to form a cohesive and connected network. These include:

- District connector routes
  - » Bicycling “arterials” that are continuous across longer distances, connecting various districts
  - » Prioritize directness and connect to major destinations
- Neighbourhood routes
  - » Smaller-scale routes that provide local access to the district connector network and to local destinations
- River Valley district connector routes and shared pathways
  - » Located off-street and act both as recreational routes and as connectors between districts

## End-of-Trip Facilities

The single most essential end-of-trip facility is the availability of safe and secure bike parking when bicyclists arrive at their destination. Additional facilities such as bicycle maintenance stations enhance the bicycling environment. In a rural context, facilities such as showers and locker rooms may be beneficial in select locations where bicycle commuting is expected to occur, such as places of employment.

Successful bicycling communities help ensure the provision of high-quality parking through the inclusion of bike parking standards in zoning codes. Provision of additional amenities may be incentivized through elements in the development review process or through special incentive programs to retrofit existing buildings.

## Pedestrian Elements Facility Standards

Personal safety and comfort are key factors in the decision to walk, and walkway design can impact safety and security. Narrow sidewalks and paths, or those not separated from moving traffic by space or buffering elements result in reduced perceptions of safety for pedestrians. A street or pathway with pedestrian-scale lighting, open spaces, and the presence of other pedestrians tends to encourage walking and create a sense of safety and security. Elements such as shading along the route, separation by space or barrier from vehicle traffic, attractive buildings nearby, visually appealing landscape, walkable distances to destinations, signalized crossings of busy streets, curb ramps, sidewalk and pathway widths that support universal accessibility, and the availability of benches and areas to rest increase their level of comfort.

## Network Planning Methods

Typically, pedestrian facilities of some form should be provided as universally as possible. However, the long distances and comparatively low use in rural areas tend to make systematic sidewalk provision less appealing or economically viable. Nonetheless, basic network principles should guide the development of rural networks, many of which overlap with bicycle network planning principles. In particular, the Small Town and Rural Multimodal

Networks Guide (U.S. Department of Transportation, Federal Highway Administration, 2016) lists the following principles:

Principle	Description
<b>Cohesion</b>	Connectivity of the network in terms of concentration of destinations and routes
<b>Directness</b>	Direct and convenient access to destinations
<b>Accessibility</b>	The network accommodates travel for all users, regardless of age, income level and ability
<b>Alternatives</b>	There are a number of different route choices available within the network
<b>Safety and Security</b>	The network design minimizes the risk of injury, danger and crime
<b>Comfort</b>	The network appeals to a broad range of people and amenities are available to support them

## Non-Infrastructure Elements

Cultivating a successful walking and bicycling environment and culture is required to ensure the built facilities are known and used by the community they serve. There are several avenues to work together to raise the profile of active transportation and make walking and bicycling an everyday activity.

## Policy Context

Institutionalizing active transportation planning, meaning that walking and bicycling are automatically considered as a matter of course in the planning process, is the best way to ensure long-term network completeness. Adopting a Complete Streets policy and using Complete Streets design standards can help in the process of institutionalization.

Other policies can also support walking and bicycling in the shorter term. These can include lowering and enforcing speed limits, and adopting policies to ensure short, safe and convenient detours are available whenever the active transportation network is impacted by construction activities.

Finally, land use planning plays a critical role in how a community develops over time and how well it serves to incorporate walking and bicycling into the community design.

## Culture

Many plans recommend hosting events to build walking and bicycling culture. Hosting walking and bicycling events – both small-scale and large – is great way to cultivate a culture of active transportation. These do not have to be hosted by the local government, but it can provide institutional support and facilitate permitting, as needed. Hosting charity rides, competitive rides, and even professional races engage large numbers of people.

Successful communities for walking and bicycling also celebrate walking and bicycling as part of their identity. This is reflected in marketing for the community, whether to tourists or developers or people relocating to the area.

Demonstration or pop-up infrastructure projects can build support among the public for walking and bicycling projects and provide a temporary highly visible place for walking and bicycling in the community. Demonstration events can also help convince skeptics, both internal and external, that a given facility could actually exist in a particular location without feared impacts on other modes.

## Education and Information

Almost all active transportation plans include recommendations related to pedestrian, bicyclist, or motorist education. Popular recommendations include: good road user behaviour programs, bicycle safety awareness campaigns, adult and child bicycle education, bicyclists legal training (classes, guides, handouts), and legal quick guides and how to report a crash. Education can also be critical for agency staff across the board to ensure they understand and are invested in what makes a successful bicycling environment.

Providing maps and trip planning tools can make bicycling feel more accessible to more people. Route mapping should help people identify routes that are appropriate for their comfort level, identifying steep grades and locations where mixing with traffic is necessary, for example. Strategically located wayfinding also participates in creating a positive experience, particularly for people who are trying out new routes for the first time.

## Enforcement

Good enforcement programs target specific unlawful operations that create

clear safety concerns. Common enforcement recommendations include partnering with police on one-metre bike passing, speeding enforcement, and motorist stopping behaviour. Positive enforcement programs, such as handing out “tickets” worth a free ice cream to children for good bicycling or walking behaviour, can build community support and good will, while reinforcing legal operation and behaviours.

## Programs and Partnerships

Partnerships with local and regional business, non-profits, and public authorities can be essential to acquiring more funding for bicycle and pedestrian projects, especially when local funding is not readily accessible. Strategic relationships with non-traditional partners, such as health departments and school districts, can advance shared goals and objectives to increase safety, improve individual and community health, and provide educational resources.

## Monitoring and Evaluation

The monitoring and evaluation step is often overseen by local government. Without a monitoring program, agencies have to guess at the system usage and traffic patterns on their systems when making planning, operation, and maintenance decisions to accommodate users. Pedestrian and bicycle monitoring programs typically include volume counts but can include behavioural and demographic data, as well.

Evaluation strategies provide a way for both the public and the implementing agency to monitor progress on implementation over time. Performance measurement plans offer a clear, publicly accessible, and consistent format to track and report progress. The performance measures should connect back to the plan’s goals and objectives. A tracking matrix typically includes the performance measure, baseline measure, performance target, status, and information on the data source.

## Planning for Implementation

The process used during the creation of the plan and the strategy for implementation after the plan is adopted can determine the amount of community and agency buy-in and help or hinder implementation.

## Prioritization

A large list of un-prioritized projects and programs is not a useful outcome of an active transportation plan; by creating a prioritized list, a community can move forward from the plan with concrete steps and identifying the agency, department, or group who is responsible. Each community should develop their own prioritization process based on local conditions and plan objectives. Prioritization methodologies vary from plan to plan. Most often, infrastructure recommendations are prioritized into a clear, tiered list, and programmatic and policy recommendations are not.

While creating the prioritization should mainly rely on achieving plan objectives, other elements should also be considered in the sequencing, including:

- Need for a policy change, land acquisition, or other prior actions before the plan element (infrastructure or non-infrastructure) can be implemented
- The existence of an opportunity, such as a planned road reconstruction
- Availability of funding through special programs and cost of the proposed project

## Documentation

Both the publicly available and non-publicly available documentation used to develop the plan should provide enough information for implementers who did not participate in the planning process to understand the rationale behind the recommendations.

Some of the things that should be documented include:

- Recommendations and actions with priority and responsibility
- Project list, estimated cost, length
- Project cost assumptions
- Existing conditions summary
- Public outreach process

## Maintenance Strategies

Consistent maintenance of pedestrian and bicycle facilities is critical to keeping them accessible, usable and desirable, and a successful active transportation plan considers maintenance strategies in its review of the current and future active transportation environment. Maintenance includes pavement marking and signage maintenance, sweeping, snow removal, and surface repairs and assessments from potholes to gutter seams to root intrusion on sidewalks and trails.

Poorly maintained trails are a trip and fall hazard for all residents. People with disabilities and people who are 65+ are particularly vulnerable. A well-functioning system of active transportation facility repair and maintenance helps reduce these safety risks for users and extend the life of the infrastructure. Because this infrastructure presents a significant up-front cost to cities, it is important to protect the initial investment. By making small repairs incrementally, facilities remain in good condition for more immediate use. Waiting to make repairs might not only lead to more costly repairs, but will leave facilities in poor condition while only getting worse before a long-awaited repair is made. Some communities empower residents to report facility maintenance issues which can lessen agency burden of tracking locations and indicates a concerted interest in ensuring the usability of trail facilities.

## Conclusions

Sturgeon Valley has many of the elements required to make it a successful place for walking and bicycling, not the least of which is a strong interest from the community and local leaders. The development of a system gap analysis report also constitutes a crucial step in identifying needs and creating a vision for the future network in this area. By considering and incorporating best practices in pedestrian and bicycle infrastructure and planning, an active transportation plan can help residents, leaders, and staff on the road to implementation.

# **Appendix B**

## **What We Heard Report**

## PURPOSE OF ENGAGEMENT

To enhance safety and connectivity for active transportation in the developed areas of the Sturgeon Valley, the County undertook a trail system gap analysis. The project includes reviewing the existing trail network, existing planning documents, and engaging with the public on the vision for the trails system in the Valley. The engagement activities sought to understand priority principles for the active transportation network, desired destinations, and routes through the Valley.

## ENGAGEMENT ACTIVITIES

Two types of engagement activities took place in September 2021: online engagement and in-person pop-up engagement.

### ONLINE ENGAGEMENT

Online engagement took place from September 8 to September 19, 2021. Signs with a QR code leading respondents to the survey were posted throughout the Valley along existing trails and at the entrance of many neighbourhoods.

The survey contained four main questions. The first question asked respondents to select the most important principles from a list when thinking of trails in Sturgeon Valley. In the second question, respondents were asked how important different destination types were to them. Participants could also add other destinations not mentioned in the list. The third question asked respondents to describe routes where they would like to walk or bike, and the last question asked what barriers currently exist when getting to places they want to go using active modes.

### POP-UP ENGAGEMENT

Pop-up engagement took place on September 8, 9, and 11, 2021. Members of the project team walked through or stationed themselves at various locations in the Valley, including along existing trails, major roads, and through some neighbourhoods to intercept people as they walked or biked passed.

The themes explored in the pop-up engagement were largely the same as the online engagement, although open discussion was encouraged. Participants were asked to identify important principles and destinations from the same list as the online engagement. Instead of describing routes, the project team had copies of a map where participants could draw their desired routes and note barriers.

## ANALYSIS OF INPUT COLLECTED

### LEVEL OF PARTICIPATION

There was a high level of participation to the engagement activities. The project team received 185 responses to the online survey and held 36 pop-up discussions.

### FINDINGS

The findings were sometimes combined and sometimes analyzed separately for online and pop-up engagement. Details are provided in each of the sections below for the four main themes explored.

### Principles

The principles selected as most important by both online and pop-up participants are shown in Figure 1. Over 60% of respondents indicated that all-season access and trails that are physically separated from traffic are important to them. Participants indicated a certain preference for recreation-focused trails (48%) over functional trails (37%). Safety and convenience for kids and older adults also ranked amongst the most important principles (47%).

It should be noted that while accessibility was not deemed among the most important principles, the people who self-selected to participate in the survey are more likely to be able-bodied and can already use Sturgeon Valley's trails and streets. Discussions with residents with different mobility needs are being held separately to understand their needs.

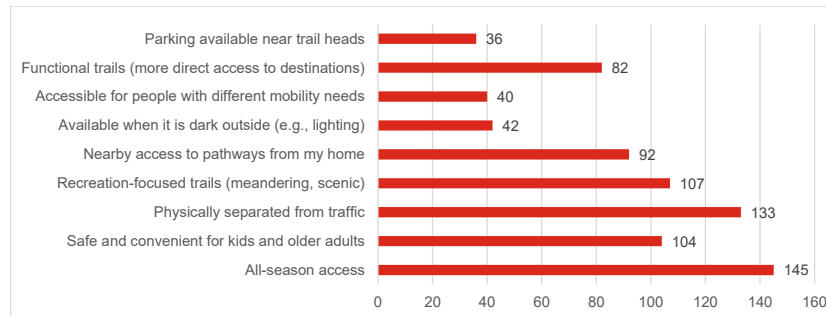


Figure 1. Most Important Principles When Thinking of Trails in Sturgeon Valley (n = 221)

### Destinations

Respondents were asked to indicate the level of importance of various destinations on a scale from Not Important to Very Important. The results are shown in Figure 2. Note that the destinations chosen by pop-up participants were classified as "important" and those not selected were left blank.

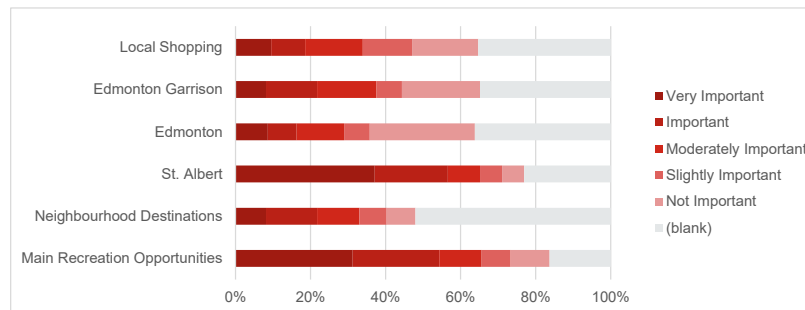


Figure 2. Level of importance of various destinations (n = 221)

More than half of respondents indicated that St. Albert and main recreation opportunities such as the golf course, Bellerose River Park and Riverlot 56 were important or very important destinations. These were by far the most important destinations identified in the survey. Respondents also had the opportunity to add other destinations they would like to access and 25 reiterated that St. Albert was an important destination to them.

Several other destinations were mentioned by respondents, the most noteworthy being Cardiff and Morinville with 26 mentions. While these destinations are outside the study area for the Sturgeon Valley Gap Analysis, this finding will be incorporated in future active transportation planning efforts.

### Routes

Routes were captured graphically for pop-up engagement participants and the results are shown in Figure 3.

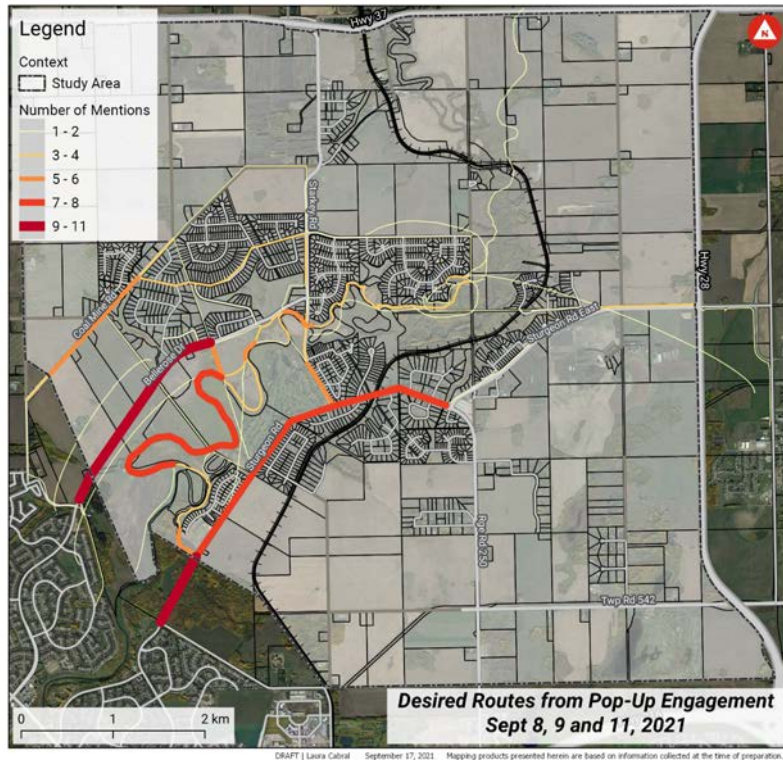


Figure 3. Desired Routes from Pop-Up Engagement (n = 36)

The most mentioned routes are along Sturgeon Road and Bellerose Drive, going towards St. Albert. There is also a desire for a more scenic route, notably along the Sturgeon River. Other routes also aim to connect or complete the network, such as along Coal Mine Road and along Starkey Road, as a north-south connection.

These findings are largely reflected in the online survey: the two routes most often described by participants were to St. Albert along Sturgeon Road (55 mentions) and along Bellerose Drive (34 mentions). A route to Cardiff/Morinville was also often described (24 mentions). Other types of routes mentioned at least 10 times by respondents include:

- River crossings (20 mentions)
- Connecting neighbourhoods together, notable south of Sturgeon River (20 mentions)
- A route to the Edmonton Garrison (12 mentions)
- A connection to Riverlot 56 (10 mentions)

### Barriers

Barriers to walking and biking in Sturgeon Valley were explicitly discussed in the online survey and noted during discussions for the pop-up engagement. Responses were grouped into themes for analysis, as shown in Figure 4.

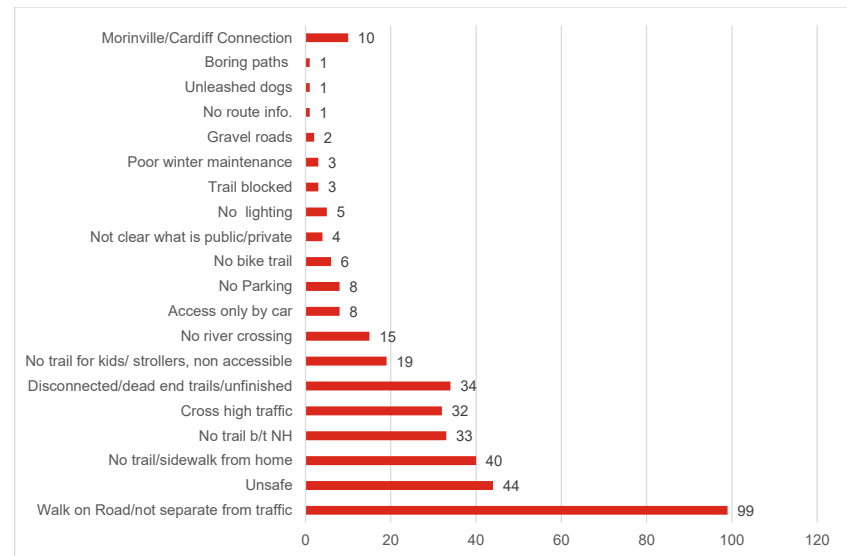


Figure 4. Barriers to Walking and Biking in Sturgeon Valley (n = 221)

The most cited concern, by far, was the lack of separation from traffic for people walking and biking. The second most mentioned concern was closely related: respondents indicated that it feels unsafe to walk or bike in the Valley. Another related concern includes having to cross high volumes of traffic.

Another theme that emerged as a barrier was the lack of available infrastructure (no trails/sidewalk from home, no trail between neighbourhoods, disconnected, unfinished or dead-end trails, etc.). The lack of feeling of safety can be associated to the low availability of infrastructure. In addition, the lack of infrastructure can hinder active transportation and recreation by increasing the level of route planning involved in going for a walk or bike ride or requiring the use of a vehicle to get to amenities that support walking and riding.

## RELATION TO OTHER ENGAGEMENT FINDINGS

In recent years, Sturgeon County has been engaging residents on a number of related topics, including large scale planning projects such as the development of Area Structure Plans for the core and south areas of Sturgeon Valley and smaller scale activities such as Wellness on Wheels. These previous engagement activities yielded findings that are well aligned with the conclusions from engagement on the gap analysis. Some of the main findings included:

- A desire for more trails that are regularly maintained
- A desire to connect subdivisions together and for a walking connection across the Sturgeon River
- A need for safe connections to St. Albert
- A view of trails as gathering spaces as well and as destinations in and of themselves

## NEXT STEPS

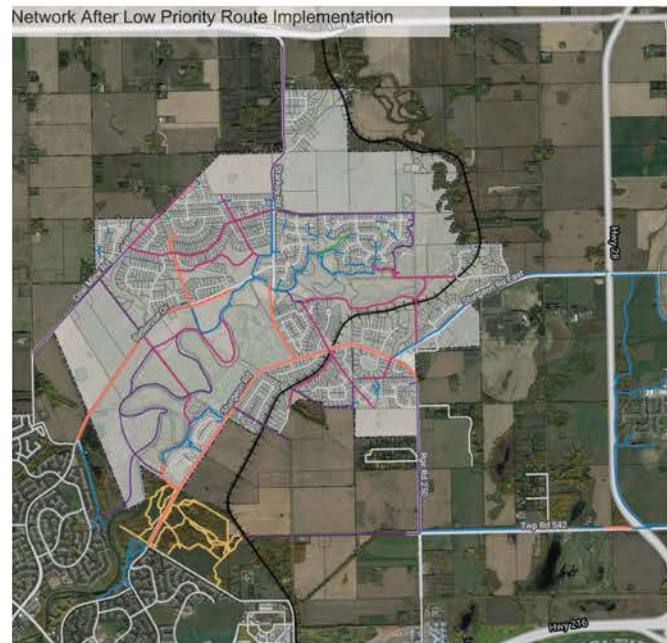
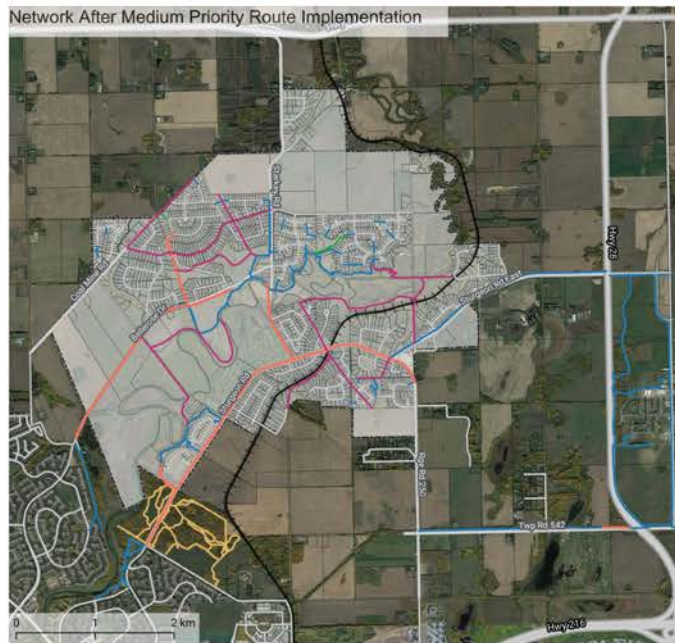
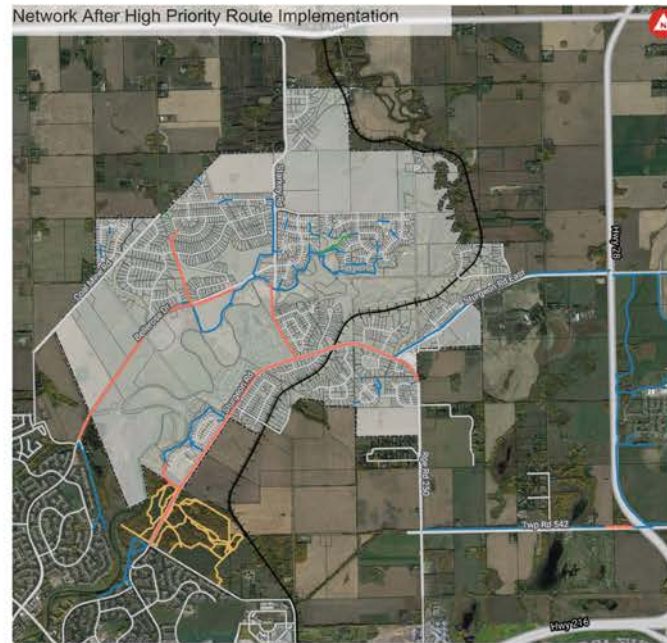
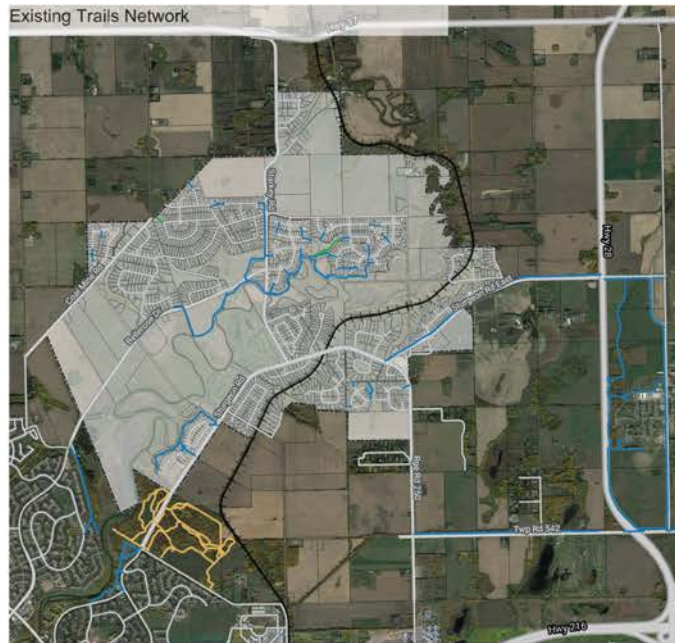
The input received during engagement will be combined to other sources of information to create a map of gaps to be filled in order to create a more complete trail network in Sturgeon Valley. The feedback on trail principles will also shape the vision for the trail network. The project team will review previous planning documents, conduct further site visits to observe conditions on the ground, and engage with various departments within the County administration to determine the feasibility of various routes and treatments.



# **Appendix C**

## **Additional Maps**

**Map 8. Network Overview after Priority Level**



**Legend**

Context

□ Study Area

Existing Trails

— Asphalt or Concrete

— Gravel or Shale

— Dirt

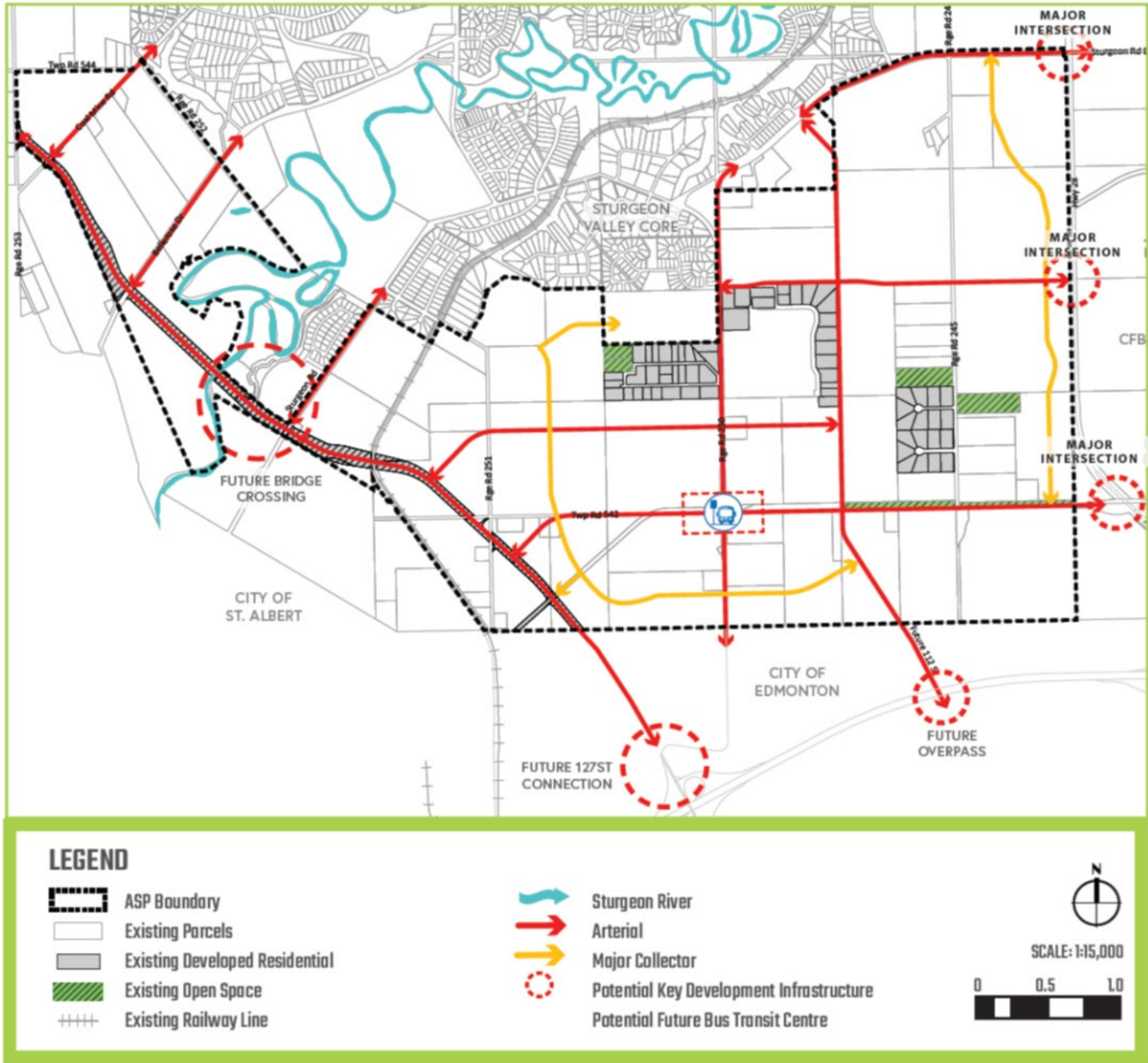
Recommended Routes

— High Priority

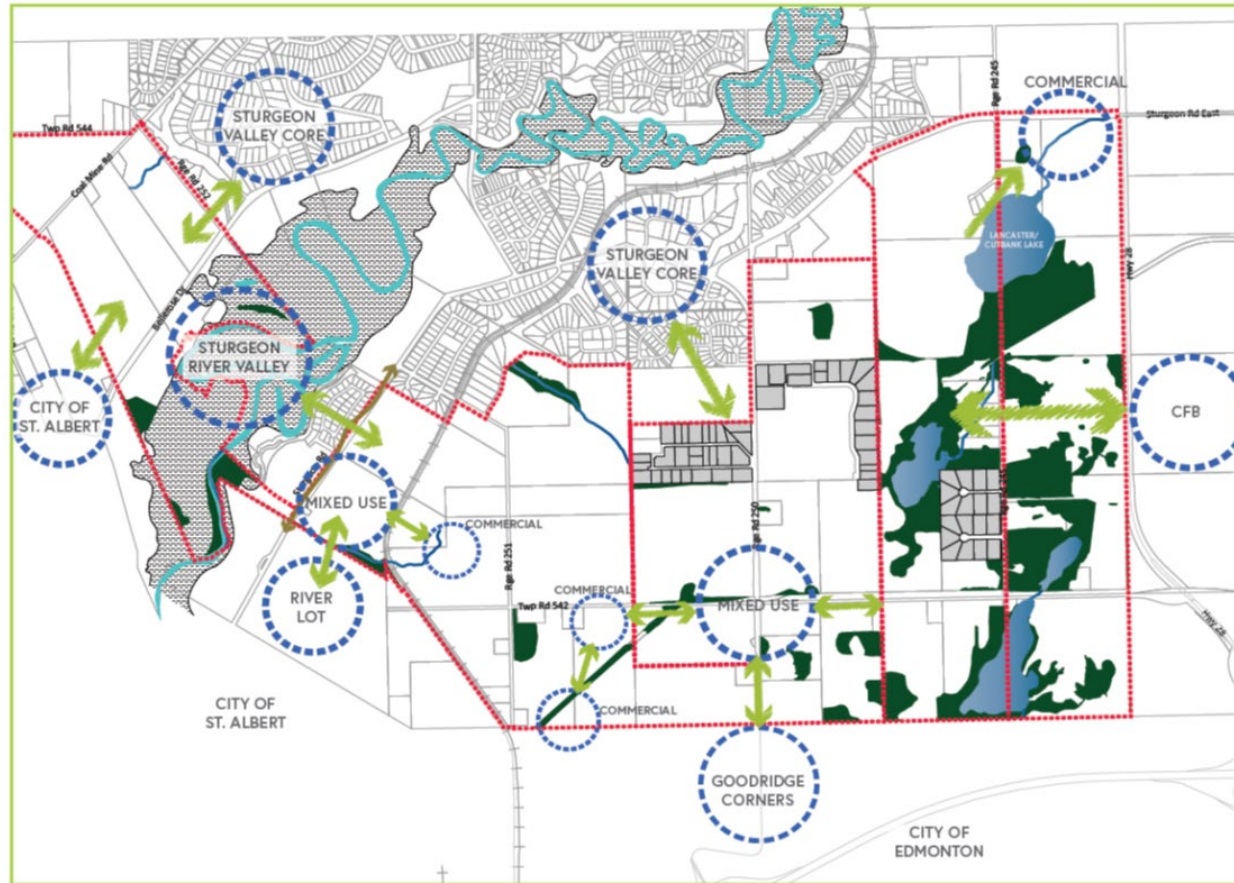
— Medium Priority

— Low Priority

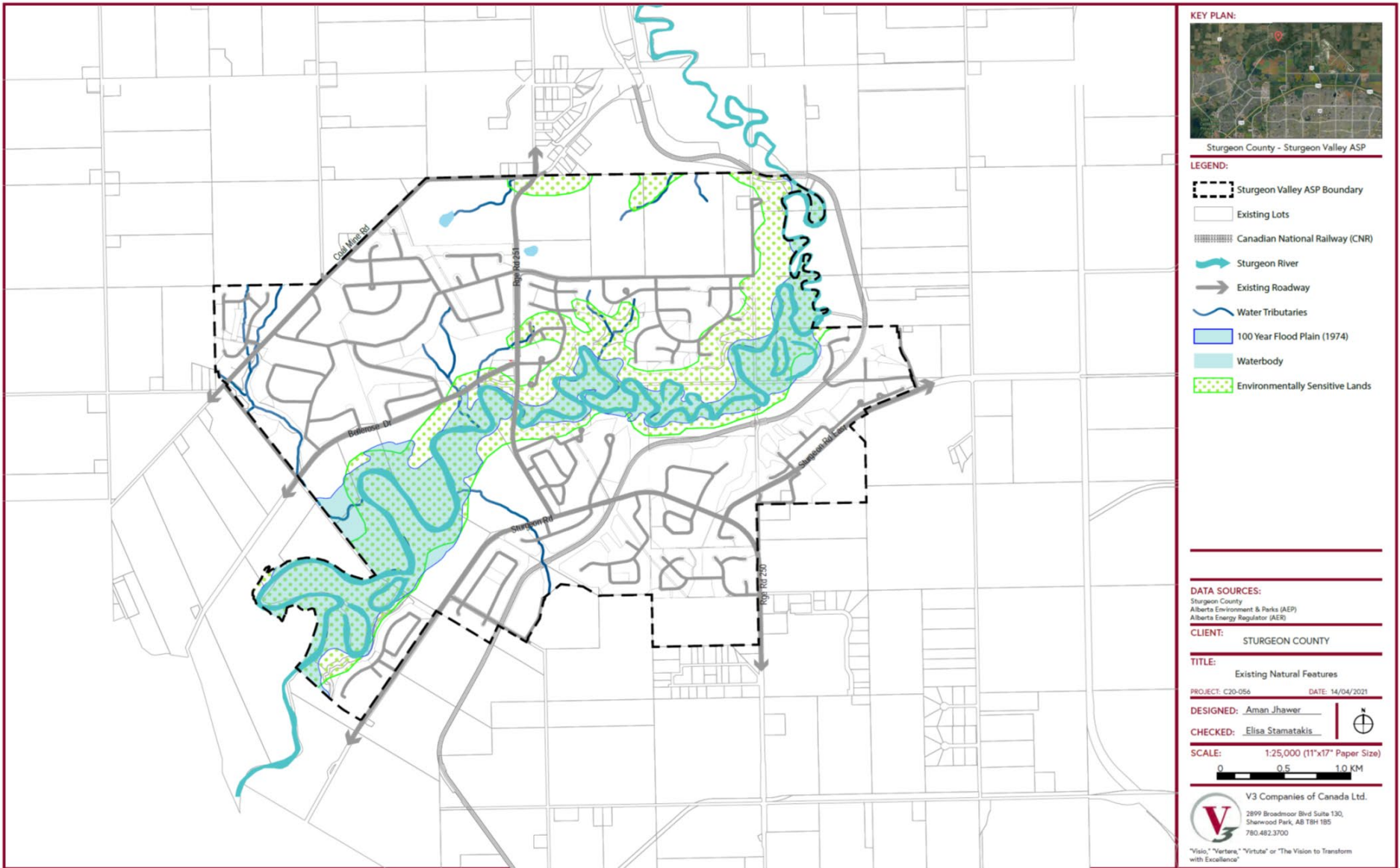
Map 9. Sturgeon Valley South ASP | Transportation Connections



Map 10. Sturgeon Valley South ASP | Key Trail Connections



Map 11. Sturgeon Valley Core ASP | Existing Natural Features



Sturgeon County - Sturgeon Valley ASP

- LEGEND:
- Sturgeon Valley ASP Boundary
  - Existing Lots
  - Canadian National Railway (CNR)
  - Sturgeon River
  - Existing Roadway
  - Water Tributaries
  - 100 Year Flood Plain (1974)
  - Waterbody
  - Environmentally Sensitive Lands

DATA SOURCES:  
 Sturgeon County  
 Alberta Environment & Parks (AEP)  
 Alberta Energy Regulator (AER)

CLIENT:  
 STURGEON COUNTY

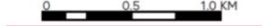
TITLE:  
 Existing Natural Features

PROJECT: C20-056      DATE: 14/04/2021

DESIGNED: Aman Jhawar

CHECKED: Elisa Stamatakis

SCALE: 1:25,000 (11"x17" Paper Size)



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# **Appendix D**

## **Cost Estimate**

# Cost Estimate

The following table shows the estimated costs to construct the trail segments identified on the prioritization map below. This cost estimate is a concept level, Class 4 cost estimate (-30% to +50%). The costs are for supply and install of trail materials only and do not include consulting services, land acquisition, wetland review, mitigation, compensation, or restoration, tree removals, road signage, railway crossings, trail furnishings, or other costs incidental to future work. Trail lengths shown are approximate and to be confirmed during future design stages. All costs include 30% contingency.

Item	Approximate Unit Cost
Asphalt Trail	\$180 / lin.m.
Elevated Boardwalk	\$1,000 / lin.m.
Pedestrian Bridge	\$25,000 / lin.m.
Paint for Advisory Bike Lanes	\$250 / lin.m.
Paint for Roadway Crossings	\$1,000 each

Map ID	Trail Type	Material	Other Considerations	Approximate Trail Length	Approximate Cost
1A	Shared Use Path along Roadway	Asphalt	Four roadway crossings	4,045m	\$951,730
1B	Shared Use Path along Roadway	Asphalt	Outside of Sturgeon County boundary	800m	\$187,200
1C	Shared Use Path	Asphalt	None	435m	\$101,790
1D	Shared Use Path along Roadway	Asphalt	Includes dedicated active transportation bridge over Sturgeon River	985m Asphalt 50m Bridge	\$1,855,490
1E	Shared Use Path along Roadway	Asphalt	None	885m (north side) 570m (south side)	\$340,470
1F	Shared Use Path	Asphalt	None	1,980m	\$463,320
1G	Shared Use Path	Asphalt	Outside of Sturgeon County boundary	310m	\$72,540
1H	Shared Use Path	Asphalt	None	980m	\$229,320
1I	Shared Use Path	Asphalt	None	330m	\$77,220
2A	Shared Use Path	Asphalt	Three roadway crossings, including railway crossing Removal of forested areas for trail	1,630m	\$385,320
2B	Shared Use Path	Asphalt	One roadway crossing Removal of forested areas for trail	560m	\$132,340
2C	Shared Use Path	Asphalt and Boardwalk	Potential wetland areas May need boardwalk surface in low / wetland areas	630m Asphalt 250m Boardwalk	\$472,420
2D	Shared Use Path	Asphalt	Assess conditions at top of bank. May need to use granular trail instead.	1,575m	\$368,550
2E	Shared Use Path	Asphalt and Boardwalk	Includes dedicated active transportation bridge over Sturgeon River. Potential wetland areas. May need boardwalk surface in low / wetland areas. Removal of forested areas for trail.	1,280m Asphalt 35m Boardwalk 50m Bridge	\$1,970,020
2F	Shared Use Path	Asphalt and Boardwalk	Potential wetland areas. May need boardwalk surface in low / wetland areas.	430m Asphalt 750m Boardwalk	\$1,075,620
2G	Shared Use Path	Asphalt and Boardwalk	Potential wetland areas. May need boardwalk surface in low / wetland areas.	340m Asphalt 340m Boardwalk	\$521,560

Map ID	Trail Type	Material	Other Considerations	Approximate Trail Length	Approximate Cost
2H	Shared Use Path	Asphalt and Boardwalk	Includes dedicated active transportation bridge over Sturgeon River. Potential wetland areas. May need boardwalk surface in low / wetland areas.	940m Asphalt 370m Boardwalk 50m Bridge	\$2,325,960
2I	Shared Use Path	Asphalt	Two roadway crossings. Coordination with private landscaping on public property.	930m	\$220,220
2J	Shared Use Path	Asphalt	None	1,115m	\$260,910
2K	Advisory Shoulder	Paint	Signage and public education	4,140m (2,070m x 2)	\$1,829,880
2L	Shared Use Path along Roadway	Asphalt	None	1,210m	\$283,140
2M	Shared Use Path	Asphalt	Removal of forested areas for trail	910m	\$212,940
3A	Shared Use Path	Asphalt and Boardwalk	In wetland / lowland areas. On privately owned agricultural land and will require coordination.	815m Asphalt 3580m Boardwalk	\$4,844,710
3B	Shared Use Path	Asphalt	Outside of Sturgeon County boundary	385m	\$90,090
3C	Shared Use Path	Asphalt and Boardwalk	Includes dedicated active transportation bridge over Sturgeon River. Potential wetland areas. May need boardwalk surface in low / wetland areas.	320m Asphalt 60m Boardwalk 50m Bridge	\$1,777,880
3D	Shared Use Path	Asphalt and Boardwalk	In wetland / lowland areas. On privately owned agricultural land and will require coordination.	765m Asphalt 475m Boardwalk	\$796,510
3E	Shared Use Path along Roadway	Asphalt	To be built when road is paved.	905m	\$211,770
3F	Shared Use Path along Roadway	Asphalt	None	1,470m	\$343,980
3G	Shared Use Path along Roadway	Asphalt	Outside of Sturgeon County boundary	360m	\$84,240
3H	Shared Use Path along Roadway	Asphalt	None	2,020m	\$472,680
3I	Shared Use Path along Roadway	Asphalt	One roadway crossing	1,790m	\$420,160
3J	Shared Use Path	Asphalt	Coordination with private landscaping on public property.	1,065m	\$249,210
3K	Shared Use Path	Asphalt	Includes dedicated active transportation bridge over Sturgeon River.	235m Asphalt 50m Bridge	\$1,679,990
3L	Advisory Shoulder	Paint	Signage and public education	1,640m (820m x 2)	\$533,000
3M	Shared Use Path	Asphalt	Coordination with private landscaping on public property.	825m	\$193,050
3N	Shared Use Path	Asphalt	None	300m	\$70,200
3O	Shared Use Path along Roadway	Asphalt	None	1,915m	\$448,110
3P	Shared Use Path along Roadway	Asphalt	One roadway crossing Railway crossing	2,275m	\$533,650