Associated Engineering

TOOLE DESIGN





REPORT

Active Transportation Plan Development Strategy and Gaps Assessment

January 2019









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1 Industry Best Practices and Lessons Learned

1.1 INTRODUCTION

1.1.1 What Makes a Successful Place for Walking and Bicycling

There are many indicators of a successful place for walking and bicycling. A successful walking and bicycling city typically has a high rate of walking and bicycling, a low rate of serious injuries and fatalities from crashes, and residents report a high level of satisfaction regarding infrastructure conditions and experience. In 2014 in Copenhagen, Denmark, for example, 30 percent of all trips and 45 percent of work and school trips were made by bicycle, but there was only one bicycling fatality, and 94 percent of bicycling Copenhageners consider the city to be bicycle friendly.[1] Pedestrian friendly environments are closely associated with smart growth policies, livable communities, universal design attributes, and highly desirable residential and employment locations.

The outcomes achieved by successful active transportation plans are derived from a range of inputs. Creating an environment where walking and bicycling are accepted, appealing, safe and convenient choices 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. City 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.

There are many important ingredients to creating a successful walking and bicycling environment. The creation of the excellent walking and bicycling environments relies on consistent and strategic infrastructure adjustments that ensure connectivity and intuitive intersections for all users. Leading European cities have integrated planning for bicycling into the fabric of their transportation departments, established innovative bicycle facility design guidance, and make steady investments in bicycling infrastructure, block by block and curb by curb to build their networks. In some ways, many of these communities have integrated bicycling so deeply into their transportation planning processes that a separate bicycle master plan may, at this point, be superfluous.

1.1.2 How Does a Plan Lead to a Successful Place for Walking and Bicycling?

An active transportation plan is an essential element to create a walk and bicycle friendly place because most cities in the United States and Canada have yet to reach a level of integration into planning processes where a master plan is not needed. The master plan serves as a reference and touchstone during any planning process and can help answer the question of whether a given planning or design decision will help move the community toward the plan's vision. An ideal plan vision reflects the unique priorities of its

[1] Copenhagen City of Cyclists: The Bicycle Account 2014. http://www.cycling-embassy.dk/wp-content/uploads/2015/05/Copenhagens-Bicycle-Account-2014.pdf

community and helps guide development of goals that are served by clear and coherent strategies for improving walking and bicycling conditions. On a functional level, municipal 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.[2] Serious exploration of how projects are implemented must be included in a successful plan, but the plan development process itself should also be viewed as one of its strongest tools for implementation. The plan development process can touch many diverse community members, bringing them together around a shared vision and building the support for change that can be drawn upon as designs, budgeting and other decisions are debated.

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. While planners must understand the context and boundaries they work within today, these should not limit the vision for what a community's active transportation future can be. Focused, realistic recommendations that are easy to implement in the short term pave the way for these more ambitious ideas. As the recommendations of the plan are implemented to improve the active transportation environment over time and spur increased walking and bicycling, more community members will see these visionary ideas as realistic and desirable means of further improving the city.

1.1.3 Understanding Successful Plans

This paper was compiled through review of over a dozen plans for successful walking and bicycling communities and local jurisdictions. The plan elements and key topics described in the following section were identified as those fundamental to creating a successful plan. Reviewed plans include:

[2] In the 1990s, then-Seattle Bike/Ped Coordinator Pete Lagerwey entered the office of a long-time trail planner who had half a dozen bike plans from the past 20 years mounted in his office. Lagerwey was impressed and complimented the planner. "This?," the planner said, "No, this is my wall of shame. None of these great plans ever got implemented."

Municipality	Population	Transit (%)	Walking (%)	Cycling (%)	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 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

Municipality	Population	Transit (%)	Walking (%)	Cycling (%)	Active Mode Share (% Total)	Average Annual Snowfall (cm)	Plans Reviewed
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

1.2 ELEMENTS OF A SUCCESSFUL PLAN

1.2.1 Three 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. Three 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
3. Defining clear implementation tasks and responsibilities, including resources.

1.2.1.1 High Quality Active Transportation Networks

High-quality pedestrian networks are greatly influenced by distance and densities. Most people are willing to walk 5 to 10 minutes at a comfortable pace to reach a destination. The frequency of roadway crossings, including midblock crossings, can significantly impact the distance required to walk to access destinations. Higher density communities and/or compact communities with mixed land-use patterns have higher levels of walking because destinations are more likely to be located within walking distance of homes and businesses. Increasing connectivity in urban areas can increase pedestrian mobility.

While the ease with which pedestrians, including those with mobility disabilities, are able to traverse a route plays a large role in determining the utility of pedestrian routes, the directness of the route between an origin and destination is also part of that determination. Pedestrian routes should provide access to destinations without requiring people to travel excessively out of their way.

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.[3] 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.

The ideal network allows for access to destinations by bicycle without advance planning for a route that avoids major streets or crossings. This network also offers riders multiple choices of routes by which to access destinations. In a complete, connected, low-stress network, people can travel by bicycle from point A to point B as, or nearly as, easily and directly as by automobile. Designing major streets and crossings to accommodate low-stress bicycle travel will enable this ease of travel. Many Dutch and Danish cities have accomplished this goal and, in some locations, even have more extensive bicycle networks than automobile networks where pathways and grade-separated crossings make bike travel easier than in an automobile.

[3] 8 to 80 networks are appropriate for a wide range of ages of riders, from children (age 8) to elderly (age 80). Riders at these ends of the spectrum have increased need for separation from traffic.

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 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. Likewise, higher-quality pedestrian infrastructure often includes sufficient space to accommodate the use of wheelchairs, parents pushing strollers, and people using guide dogs.

1.2.1.2 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. A successful master plan goes beyond infrastructure to address programmatic elements and fosters a culture of walking and bicycling.

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. It is not enough to produce materials for active transportation, such as maps or guides; a successful plan helps identify ways in which those materials can reach and be relevant to all community members.

Active transportation master plans can support a walking and bicycling culture by recommending programs – often done in partnership with community groups or other agencies – to engage a wide range of community members in walking and bicycling activities. It is important to engage agencies that may not consider themselves a player in the transportation or recreation arenas, as they can help agencies such as planning or transportation reach wider audiences. School districts are a key example who may champion a district-wide bicycle education program or walking school buses. Private entities often take the lead in building and sustaining bike culture. Bike shops, clubs, advocacy organizations and health-focused organizations or others may play the most active role in establishing and advancing local bike culture through hosting events and keeping bicycling in the public eye. There are many examples of seniors' groups organizing weekly bike rides and walks for their members to support health and social connectedness.

The enhancement of the culture for walking and bicycling can even start during the planning process. The development of an active transportation plan starts a community dialog. In some ways, the plan document may be less important than the discussions, strategizing, collaboration, public engagement and momentum that is built amongst staff and the community during a planning process. This process 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.

1.2.1.3 Implementation

A plan must lead directly into implementation. It is sometimes said by planners and engineers that their favourite plan is the one that gets built. This requires that practical considerations be made during the planning process that will impact implementation later. Is there, or is there likely to be, sufficient right-of-way in a corridor to fit the proposed facilities or infrastructure? Are there a large number of utilities in a corridor that will make implementation challenging, when another alternative corridor is available? Are there project review policies and design standards that must be changed or made more flexible to accommodate active transportation infrastructure? Are there redevelopment or street reconstructions planned that can create an opportunity to implement a shared use path or other high-quality infrastructure? Are the various local government agencies that will implement and maintain facilities working together and in agreement about the active transportation plan?

Many plans contain detailed information, including project lists, project prioritization criteria, funding sources, and planning level cost estimates to facilitate post-plan implementation. Often times, the implementation of a plan is conducted by someone other than the plan's primary authoring agency. Sufficient internal documentation should be kept by the agency for the implementer to be able to understand how and why decisions were made so that the original goal can be achieved even if some necessary adjustments are made.

It is critical for the planner to understand how projects get implemented by their own agency and others with overlapping jurisdiction. Which department is responsible for the activity? Who owns the right-of-way? 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. The plan itself may also recommend development of new funding structures to ensure a consistent and adequate funding source for plan proposals. Consideration should be given to coordination of funding for projects based on recommendations from other plans such as Vision Zero/Traffic Safety plans, Safe Routes to School, and transportation master plans.

1.3 KEY TOPICS

Active transportation plans can include many topics and important aspects for the implementation of active transportation projects, programs, and infrastructure. The following summarize the key topics that were found during the review that created successful and implementable active transportation plans.

1.3.1 Plan Development and Themes

1.3.1.1 Focused and Strategic Plan

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. They have a plausible theory of change and set the path for progress with each component and recommendation contributing thoughtfully to the whole. Birmingham, Edmonton, Calgary, Howard County, Fort Collins, Lethbridge, Portland, and the Atlanta Region's Plan are examples of plans that are built on a clear vision and theory of change. 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.

1.3.1.2 Public Engagement and Transparency

While most of the recommendations in this paper inform the content of a successful plan, it is also vital to consider the process by which a plan is developed. A more robust, inclusive and thoughtful process can result in a plan that is reflective of community values and goals and is thus more likely to gain support for implementation.

1.3.1.3 Public Engagement

The planning process can be used to build arguments and gain support for walking and bicycling in a community. In advertising community meetings and news media reports related to the development of the plan, an agency has the opportunity to make the case for walking and bicycling to the public and within their own agency. Meetings, surveys, and other opportunities to influence the plan can build community excitement about walking and bicycling that carries over to implementation. Speaker series or events, organized walks or rides, and other events can supplement outreach and help build interest. That excitement can keep momentum up and be utilized to build pressure for actual construction of facilities or commencement of programs.

Often active transportation plans 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.

Agencies should design a public process that brings new people to the table and shows participants how their input was incorporated. Many communities have an existing, vocal, small group of residents who will advocate for walking and bicycling. While these people will continue to be important allies, development of the plan is a chance to bring more people into the tent. A public process that reaches young people, elderly, women, lower-income people, and people of colour will result in a plan that is more reflective of the entire

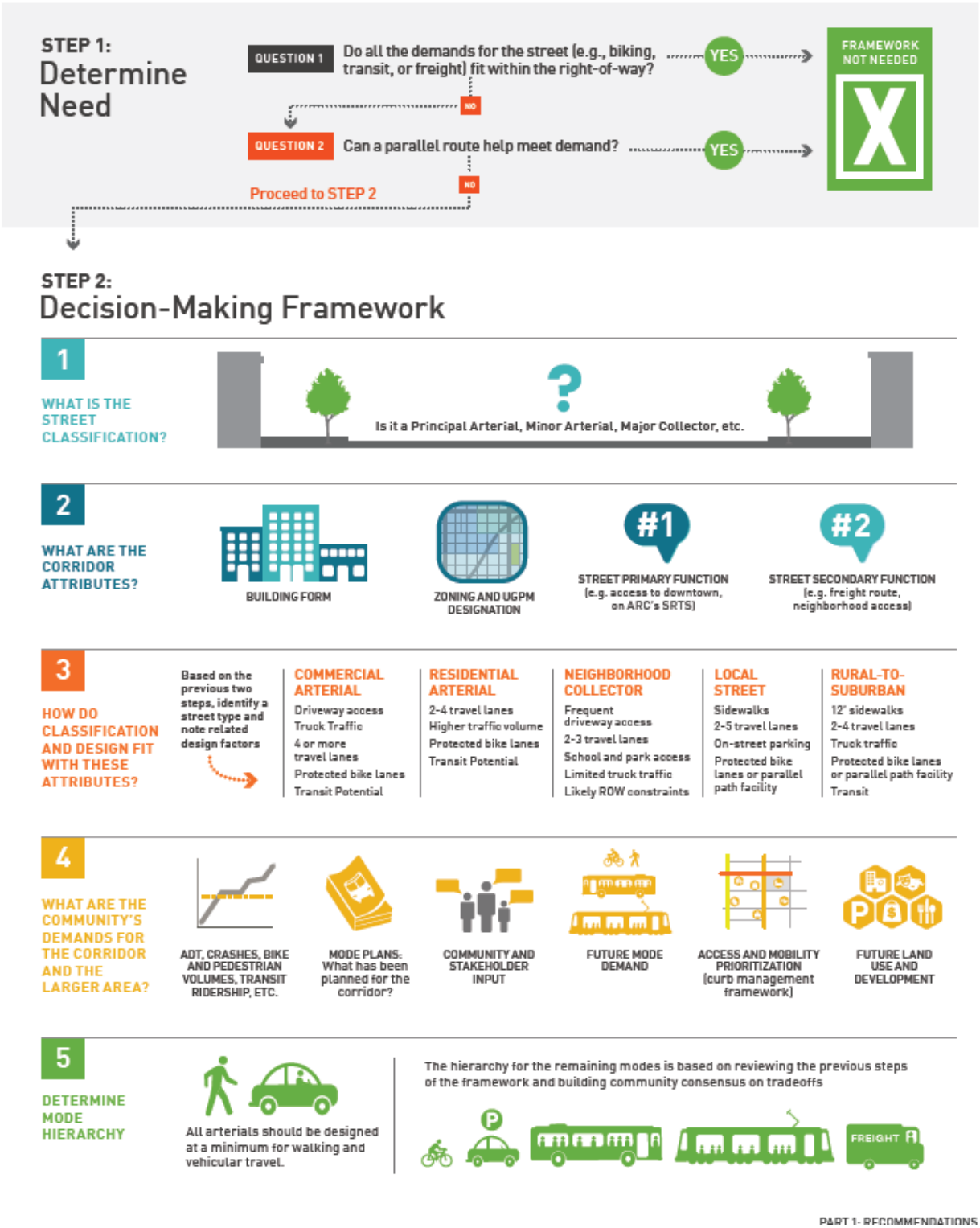
community and more likely to serve this wider audience. By engaging these groups in the process, they will also be exposed to the idea that they, too, can be part of the active transportation community.

In some cases, this may necessitate finding multiple points of entry for the idea of active transportation. For example, some people will be open to the idea of walking or bicycling because their doctor has recommended an increase in physical activity. The process must find these levers that exist across different groups throughout the community and use them to reach a broad audience.

1.3.1.3.1 Transparency

Communities should use clear and understandable methods to arrive at the recommendations in their plan. Some of the best recent plans are extremely transparent about their planning and prioritization process. This sets community expectations, builds trust, and can facilitate implementation. While publishing all supporting data for the public may be impractical, this data should be retained and available to agency staff during the implementation process as routes may need to be adjusted based on real-world constraints.

Quality visuals can help communicate the decision-making process clearly. This table from the Atlanta regional plan *Walk.Bike.Thrive!* shows the agency's decision-making framework.


STEP 1:
Determine Need
QUESTION 1
Do all the demands for the street (e.g., biking, transit, or freight) fit within the right-of-way?
YES
NO
FRAMEWORK NOT NEEDED
QUESTION 2
Can a parallel route help meet demand?
YES
NO
Proceed to STEP 2
STEP 2:
Decision-Making Framework
1
WHAT IS THE STREET CLASSIFICATION?
Is it a Principal Arterial, Minor Arterial, Major Collector, etc.
2
WHAT ARE THE CORRIDOR ATTRIBUTES?
BUILDING FORM
ZONING AND UGPM DESIGNATION
#1
STREET PRIMARY FUNCTION (e.g. access to downtown, on ARC's SRTS)
#2
STREET SECONDARY FUNCTION (e.g. freight route, neighborhood access)
3
HOW DO CLASSIFICATION AND DESIGN FIT WITH THESE ATTRIBUTES?
Based on the previous two steps, identify a street type and note related design factors
COMMERCIAL ARTERIAL
Driveway access
Truck Traffic
4 or more travel lanes
Protected bike lanes
Transit Potential
RESIDENTIAL ARTERIAL
2-4 travel lanes
Higher traffic volume
Protected bike lanes
Transit Potential
NEIGHBORHOOD COLLECTOR
Frequent driveway access
2-3 travel lanes
School and park access
Limited truck traffic
Likely ROW constraints
LOCAL STREET
Sidewalks
2-5 travel lanes
On-street parking
Protected bike lanes or parallel path facility
RURAL-TO-SUBURBAN
12' sidewalks
2-4 travel lanes
Truck traffic
Protected bike lanes or parallel path facility
Transit
4
WHAT ARE THE COMMUNITY'S DEMANDS FOR THE CORRIDOR AND THE LARGER AREA?
ADT, CRASHES, BIKE AND PEDESTRIAN VOLUMES, TRANSIT RIDERSHIP, ETC.
MODE PLANS: What has been planned for the corridor?
COMMUNITY AND STAKEHOLDER INPUT
FUTURE MODE DEMAND
ACCESS AND MOBILITY PRIORITIZATION (curb management framework)
FUTURE LAND USE AND DEVELOPMENT
5
DETERMINE MODE HIERARCHY
All arterials should be designed at a minimum for walking and vehicular travel.
The hierarchy for the remaining modes is based on reviewing the previous steps of the framework and building community consensus on tradeoffs
FREIGHT

Agencies that control funding should publish their project selection criteria. This information can help implementers and the public understand why some projects are prioritized for funding over others. Ideally, these priorities are based on the information gained about community values through the planning process. The Atlanta Regional Commission published a useful table explaining what makes good walking and bicycling projects that is a good example for other agencies.[4]

1.3.1.4 Vision, Goals and Objectives

Having a strong visioning and goals process as part of the planning process can build consensus among stakeholders and the public and establish mutually agreed upon end points to keep conversations on track. The most important outcome of determining a vision, goals, and objectives is to provide an overarching framework for the plan. Planners should determine by what means these components will guide the planning process which will in turn dictate how much effort to put into their development.

A review of vision, goals, and objectives sections showed that these sections range in plans from weak sections with a broad purpose outlined to strong sections that dive into significant detail and result in specific measurable desired outcomes with completion dates, known as performance measures. Performance measures should be considered part of the vision, goals, and objectives section that directs the planning process and they should also be associated with the implementation process and the tracking of progress after the plan is complete. The plan's recommendations should contribute to measurable progress towards the performance measure targets.

1.3.1.5 Data-Driven Planning

Historically, the active modes have not been well documented with the same types of data easily accessible for automobile planning and engineering. Successful plans use data for developing recommendations, prioritizing improvements, and for evaluating outcomes against benchmarks (performance measures). Examples of each of these uses include Level of Traffic Stress Analysis, bicycle and pedestrian level of service analysis, crash frequency and rate calculations, field data collection, and assessments of accessibility via a trail network.

Using data throughout the plan-development process also leads to defensible recommendations that can be upheld under scrutiny. Supporting data is necessary in the implementation process as competing interests vie for funding, roadway space, or other scarce resources. A successful planning process will equip the community with analysis to back up its priorities. Plans should also recommend the implementation of additional routine data collection methods that will provide valuable information to track changes in the pedestrian and bicycle environment, such as pedestrian and bicycle count programs, more detailed crash reporting, and improved database management. For example, a critical reason for collecting pedestrian volume data from continuous counting stations is to develop factoring statistics such as time-of-day, day-of-week, month-of-year, and seasonal factors. Without such factors, short-duration count data

[4] Walk.Bike.Thrive! Atlanta Regional Commission, 2016. http://www.atlantaregional.com/transportation/bicycle--pedestrian

cannot be annualized. Once these factors are applied to short-duration counts, annualized statistics per site can be generated for overall system and network usage.

It should be noted that data need not only be tracked with relation to physical infrastructure or ridership. It is also important to understand the reach of education, encouragement, and enforcement efforts. Several communities today include questions about walking and bicycling on their annual or bi-annual citizen surveys to gauge changing attitudes about these modes. Some communities gather data about resident participation in bicycle classes or group rides as well. See Section 3.3.4 for more information on Monitoring and Evaluation.

1.3.1.6 Incorporating Equity

American and Canadian communities have become increasingly aware that gaps in the walking and bicycling networks are often unevenly distributed. To address this and other inequities, communities are beginning to develop definitions of equity and equity-based goals, performance measures, and gap analyses for inclusion in their active transportation plans. Widespread interest in and acceptance of walking and bicycling is an indication of a successful active transportation community, and ensuring equitable access to all elements of walking and bicycling will help communities reach that point.

As bicycle and pedestrian master plans address equity, they have developed different definitions of the term. The report *Active Transportation Equity: A Scan of Existing Master Plans* by the Alliance for Biking and Walking and League of American Bicyclists provides a wide-ranging review of definitions and incorporation of equity into bicycle and pedestrian plans.[5]

Some plans include equity as a specific goal. For example, Madison, WI's plan includes the following goal:

> *Provide equitable access to the benefits of bicycling*
> *Every individual, regardless of age, gender, income, or race, should have access to bicycle facilities that allow for safe and convenient transportation. Low-income neighborhoods that are isolated from high quality transportation facilities like shared-use paths need to be brought into the system.*

Communities are also developing equity-based performance measures. For example, Eugene, OR measures density of pedestrian and bicycle facilities in areas with higher concentrations of racial and ethnic minorities and low-income households compared to other parts of Eugene.[6] An equity gap analysis evaluates the coverage of an existing or proposed bicycle network based on the ability of different vulnerable populations to access it. Such analyses have been conducted in communities such as Portland, OR, Chicago, IL, Winnipeg, MB, and Calgary, AB. [7]

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[5] *Active Transportation Equity: A Scan of Existing Master Plans,* Advocacy Advance, May 2015
http://www.advocacyadvance.org/docs/ActiveTransportationEquityScan.pdf
[6] Eugene Pedestrian and Bicycle Master Plan, 2012.
http://www.pedbikeinfo.org/pdf/PlanDesign_SamplePlans_Local_Eugene2012.pdf
[7] Equity of Access to Bicycle Infrastructure: GIS methods for investigating the equity of access to bike infrastructure, Rachel Prelog, Texas A&M University, September 2015.
http://www.bikeleague.org/sites/default/files/bike_equity_index_final_2.pdf

Case Study: Portland State University Equity Analysis of Portland's draft Bicycle Master Plan[8]

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.

1.3.1.7 Aesthetics

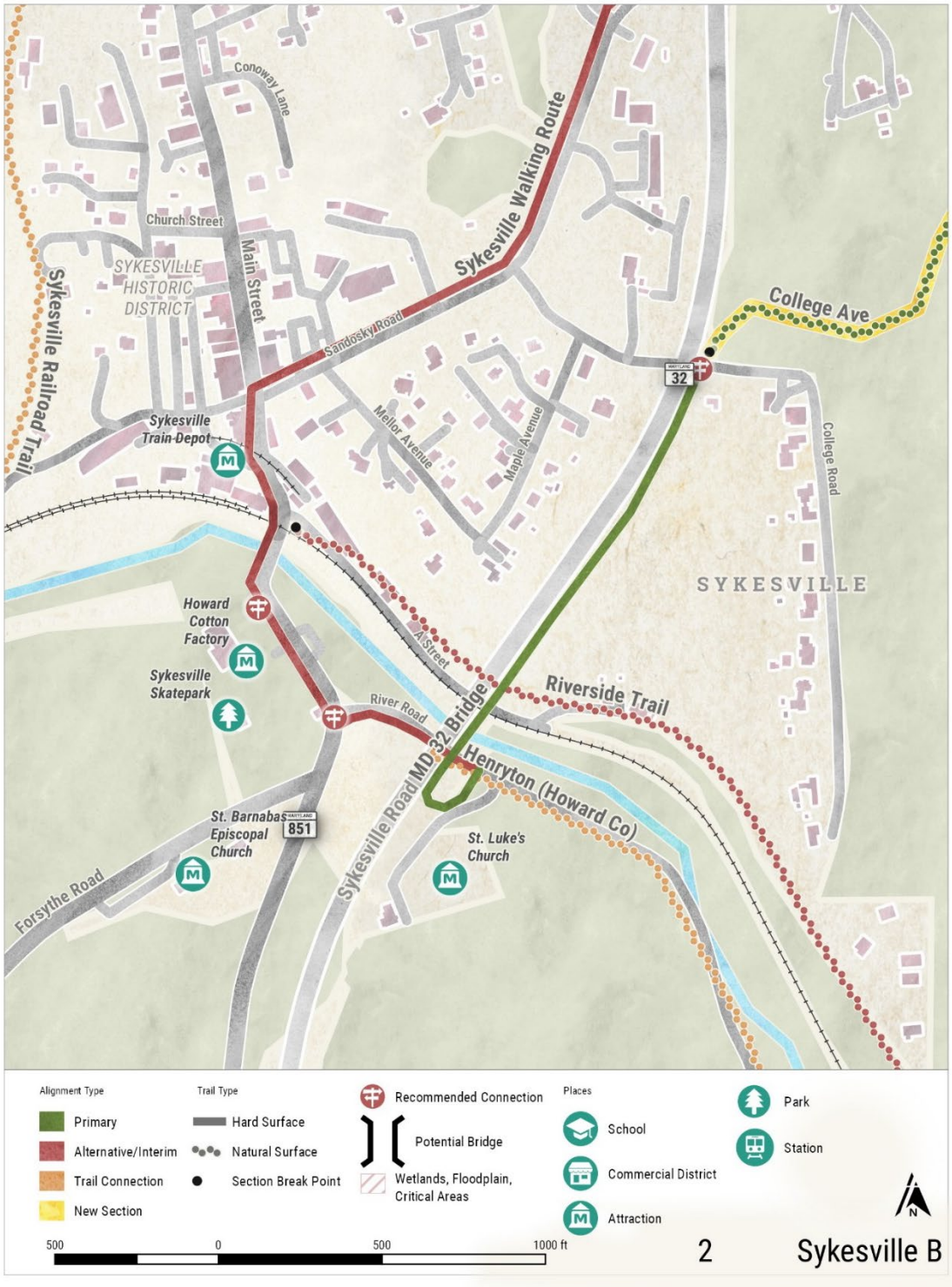
The visual appeal of pedestrian and bicycle plans has improved in recent years. Both the public audience and agency practitioners benefit from clear informative visuals. An attractive document shows an agency is committed to making its plans accessible to the public and can make it easier for the public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

The concept plan for the Patapsco Regional Greenway outside of Baltimore, MD uses a map to show the locations of proposed shared use path alignments, with dark dots showing start and end points of recommendations. Supporting graphics pointed directly to locations along proposed routes and incorporated descriptions of engineering requirements, historic sites, and interesting lookout points.

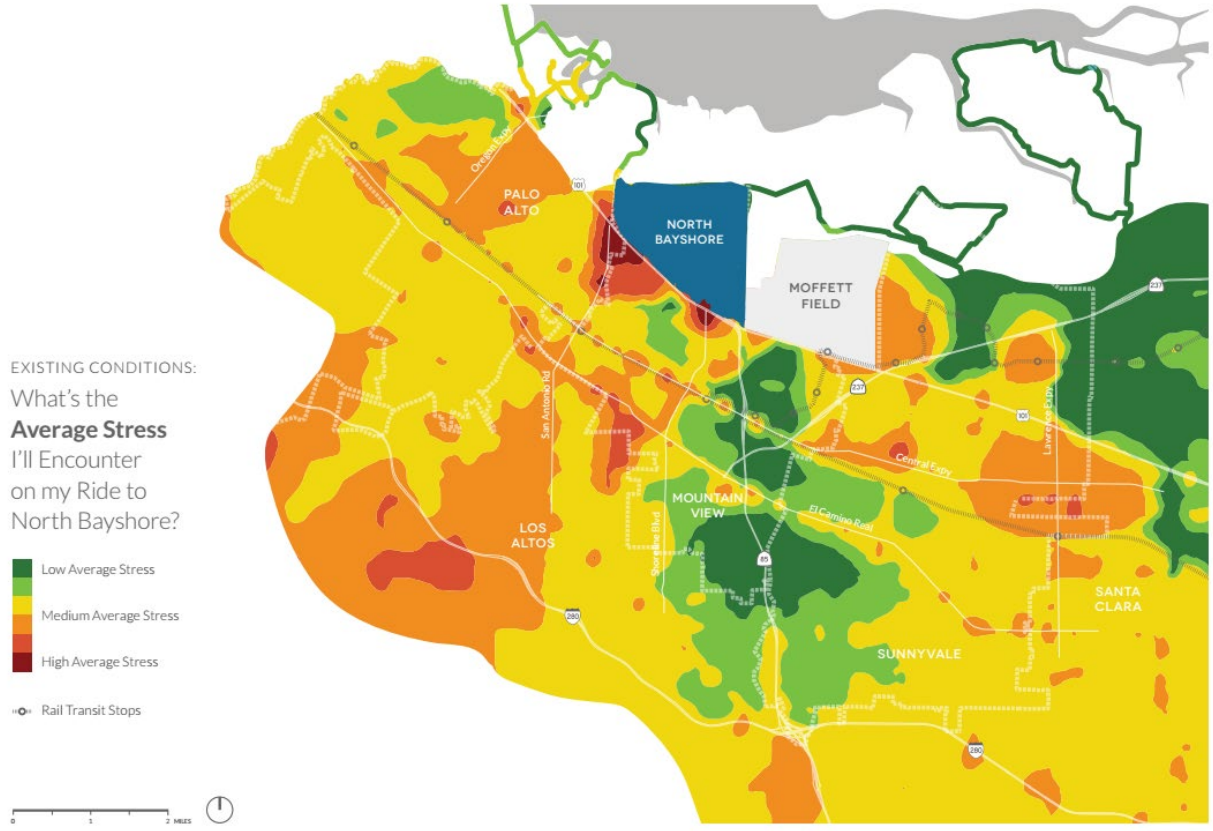
[8] Equity Analysis of Portland's draft Bicycle Master Plan – Findings, Jennifer Dill, Ph.D. and Brendon Haggerty PSU Center for Transportation Studies, September 24, 2009.
http://www.bikeleague.org/sites/default/files/bikeleague/bikeleague.org/programs/bicyclefriendlyamerica/communities/pdfs/portland_bicycle_master_plan_equity_report_final.pdf



Textured, intuitive maps for the Patapsco Regional Greenway Plan show primary and alternative shared use path recommendations, along with important local sites and destinations

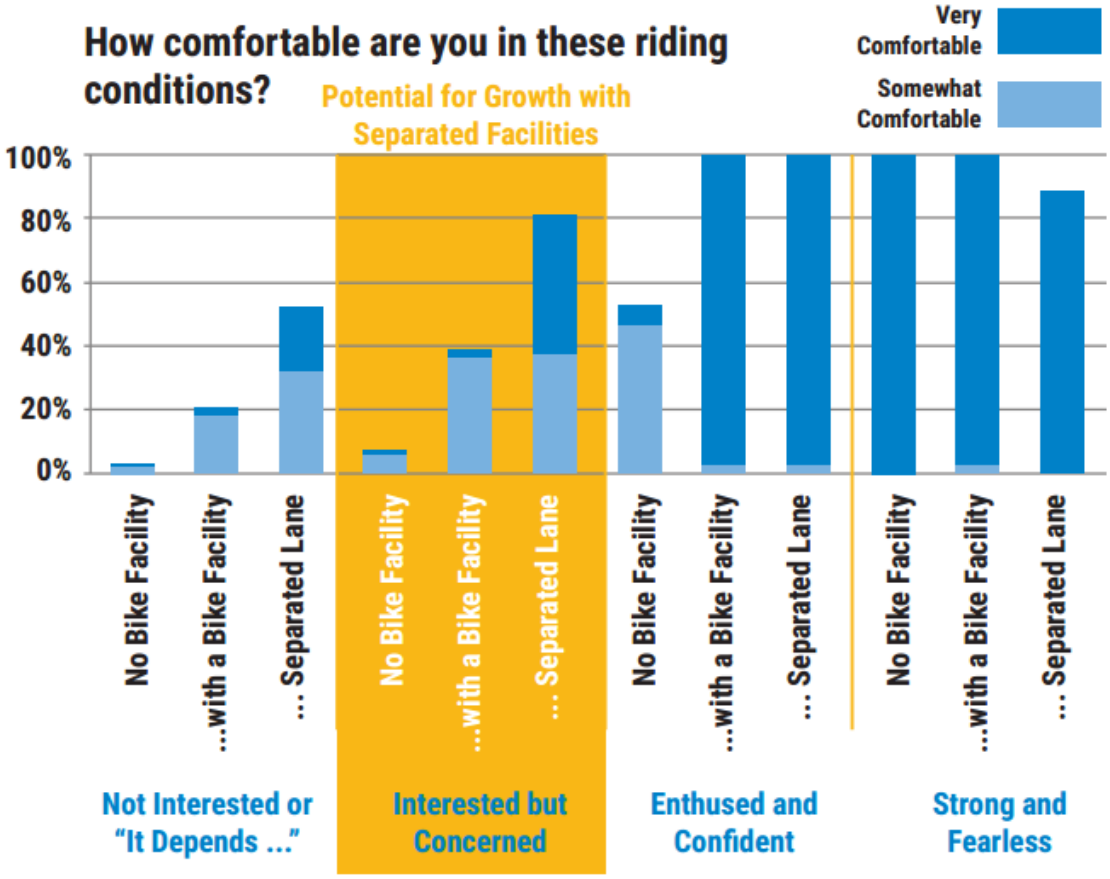
The Google Bike Vision Plan for North Santa Clara County, the Atlanta Regional Commission plan *Walk.Bike.Thrive!*, and the City of Cambridge, MA Bicycle Master Plan are all good examples of plans that are aesthetically attractive and contain information visuals that convey information effectively and in an appealing manner.

Figure 5: What's the Average Stress I'll encounter on my ride to North Bayshore?
This map shows the average stress of any given route to North Bayshore. Areas with bad scores may have short routes, but they also have a high level of stress between the starting point and the North Bayshore.



Clear, appealing maps in the Google Vision Bike Plan tell a story about the amount of stress experienced by bicyclists during their ride to the Google Campus.[9]

[9] http://altaplanning.com/wp-content/uploads/Google-Bike-Vision-Plan_high_res.pdf



This chart from the Cambridge Bicycle Plan clearly conveys attitudes of surveyed residents in the city regarding their comfort level with different facility types.[10]

Most plans are still presented online primarily in PDF form. There is an opportunity for an agency to innovate cutting edge practice for displaying plan information on the web. One step above a static PDF is an interactive PDF which has been employed to good effect by the Ontario Ministry of Transportation in *#CycleOn*, a provincial bike plan, that is a much more navigable document than a simple PDF.[11]

[10] http://www.cambridgema.gov/CDD/Transportation/bikesincambridge/bicyclenetworkplan
[11] http://www.mto.gov.on.ca/english/publications/pdfs/ontario-cycle-strategy.pdf

1.3.2 Physical Infrastructure Elements

Plans identify projects for the construction or implementation of facilities, but they also present an opportunity to comment on the current and future state of facilities. If there are current deficiencies with facility design and implementation, a successful master plan must provide guidance to implementing agencies that helps ensure high-quality facilities.

1.3.2.1 Pedestrian Facility Standards

Personal safety and comfort are key factors in the decision to walk, and walkway design can impact safety and security. Narrow sidewalks, 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 and sidewalk widths that support universal accessibility, and the availability of benches and areas to rest increase their level of comfort.

1.3.2.2 Bicycle Facility Standards

Physical bicycle infrastructure must be high-quality to attract and retain riders from all backgrounds and skill levels; for example, bike lanes designed without gutter seams, separated facilities that are wide enough to accommodate expected bicycle volumes, and off-street facilities that are constructed with materials that will not degrade quickly as they age. 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.

1.3.2.3 Pedestrian Network Planning Methods

The locations of pedestrian facilities are less varied and should be close to ubiquitous on the city scale, but certain elements of the pedestrian network, as mentioned in Section 2.1.1., are critical for useable, safe, and enjoyable walking environments. The critical elements include:

- Distance and Densities
  - Pedestrians are able to reach destinations under 1.6 km since this is generally the limit that most people are willing to travel on foot.[12]
  - The frequency of roadway crossings, including midblock crossings, is maximized to improve access destinations.
- Route Directness
  - Pedestrians are not required to travel excessively out of their way.
  - Direct access impacts the utility of pedestrian trips for all users.

[12] FHWA. *Summary of Travel Trends, 2009 National Household Travel Survey*. FHWA-PL-11-022. Federal Highway Administration, U.S. Department of Transportation, Washington, DC, 2011. Available online at http://nhts.ornl.gov/2009/pub/stt.pdf

  - Travel distance to destinations are minimized.
- Personal Safety and Security
  - Sidewalk widths and buffers are maximized to increase separation from traffic.
  - Signalized intersections are clear and intuitive.
  - Crossing distances are minimized.
  - Pedestrian-scale lighting and open spaces are incorporated in the pedestrian environment.
- Personal Comfort and Attractiveness
  - Elements such as shading, separation from traffic, landscaping, and attractive buildings make walking enjoyable and appealing.

Many factors combine to create an environment that makes walking an easy and natural choice. Generally, areas with high levels of walking share the following characteristics and should be kept in mind when developing recommendations:

- A mix of land uses
- Direct and convenient pedestrian connections between destinations
- Pedestrian facilities adequately separated from fast-moving vehicular traffic
- Safe and convenient street crossings
- Adequate lighting
- A pleasant visual environment
- Perceived high level of safety
- Perceived high level of personal security
- Well-maintained facilities
- Parking management principles that encourage walking and transit use
- Availability and type of transit

Case Study: Edmonton's Proposed Walkability Strategy[13]

Edmonton's walkability strategy considers all the above factors in its walkability action plan that aims to improve on-the-ground implementation of projects that improve the walking environment. The action plan identifies the critical factors, describes the barriers to achieving them and their root causes, and introduces solutions for overcoming these barriers. Barriers and solutions were identified for topics related to density, destinations, connectivity, transit service, parking policy, accessibility, safety and personal security, standards and tools, department integration and operation, and funding and monitoring.

1.3.2.4 Bicycle Network Planning Methods

Strategic network planning is an especially central part of bicycle master plans. Therefore, planners have developed several methods of planning and evaluating bicycling networks. Three example case studies are presented below to illustrate different methods used.

[13] City of Edmonton. *Proposed Walkability Strategy*. City of Edmonton, Edmonton, Alberta, 2010. Available online at https://www.edmonton.ca/transportation/PDF/WalkabilityStrategy200909.pdf

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. It described the qualities of bicycling network: [14]

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

Case Study: Denmark

Planners in Denmark ask the following questions to determine the completeness, or cohesiveness, of a network: [15]

- Does the bicycling infrastructure link residential areas with primary bicycling destinations such as schools, educational institutions and employment centres?
- Are the routes direct?
- Is it easy to get to shops, sports facilities, entertainment venues and traffic terminals?
- Are the residential locations linked, providing bicyclists with shortcuts that make it faster to bike than drive on local journeys?

[14] The Dutch Design Manual for Bicycle Traffic, known as the CROW Manual, page 65

[15] Collection of Cycle Concepts 2012, Cycling Embassy of Denmark, "Is the Plan Cohesive," p. 61. http://www.cycling-embassy.dk/wp-content/uploads/2013/12/Collection-of-Cycle-Concepts-2012.pdf

- Has an overall hierarchy been established (formalized or informal) that gives priority to primary routes rather than side streets and local routes, so that the majority of bicyclists are attracted to primary routes?
- Is the flow broken by poor lighting, annoying barriers, too many signal intersections or poor maintenance?
- Does the existing bicycling infrastructure live up to the newest construction standards?
- Does the plan accommodate experienced as well as vulnerable bicyclists?
- Are school route plans coordinated with the bicycling infrastructure plan?
- Are there recreational options for "Sunday bicyclists" and bicycle tourists?
- If the infrastructure is initially established to a relatively low standard, have provisions been made for improvements over time, so that, for example, signed routes can be upgraded to bicycle lanes, which in turn can be upgraded to actual cycle tracks?
- Is the mesh-size of the urban bicycling infrastructure appropriate?
- Are enough provisions for supplementary segregated off-road tracks included in the plan?
- Are cycle tracks planned for roads with fast moving traffic?
- Perhaps the speed limit can be reduced until bicycle path construction is completed?

Case Study: Portland's three-pronged strategy for a complete network[16]

Portland's plan demonstrated sophisticated network analysis. Portland's network is built around a three-pronged strategy:

1. Form a finer-grained bikeway network
   "A dense bikeway network has the advantages of limiting out-of-direction travel and providing a variety of route options to each destination. Having more route options allows bicyclists of different skill and comfort levels to identify routes best suited to their transportation needs. Streets optimized for bicycle travel translate to savings in time and energy that help to make bicycling more attractive than driving."[17]
2. Emphasize low-stress bicycle routes
   "Many residents who do not bicycle regularly would ride more often if they could minimize their exposure to automobile traffic […] Low-stress bicycle facilities, including trails, low-traffic shared roadways (such as bicycle boulevards) and cycle tracks, are bikeways that are separated either physically or spatially from higher-volume roadways. Emphasizing development of this low-stress network of streets and trails provides an effective strategy for advancing the critical principles of cohesion, comfort, directness, safety, and attractiveness commonly identified as international best practices for bikeway design."[18]
3. Ensure access to common destinations
   "The Portland Bicycle Plan for 2030 promotes bicycle facilities on all main streets and recommends that they be designed to provide as much separation as feasible from the high volumes of traffic.

[16] Portland Bicycle Plan for 2030, part 3: the Bicycle Transportation System, page 41. https://www.portlandoregon.gov/transportation/44597?a=379134
[17] Portland Bicycle Plan for 2030, p41.
[18] Portland Bicycle Plan for 2030, p42.

Facilities such as wide bike lanes, buffered bike lanes, and cycle tracks are appropriate to provide separation between bicyclists and motor vehicle traffic."[19]

1.3.2.5 Multimodal Integration and End of Trip Facilities

1.3.2.5.1 Multimodal and Transit Integration

Active transportation plans in areas with robust transit operations should carefully integrate pedestrian, bicycle, and transit planning. Connecting both walking and bicycling to transit increases the "catchment area" of transit stations and increases the total possible trip length for all users, which replaces longer car trips and can lead to reduced emissions. Some active transportation plans elevate transit integration into a top-level goal and assign a transit integration performance measure to it.

Plans should discuss the importance of transit integration to all transit operations (commuter rail, light rail, intercity and intracity bus, bike share). Accessible sidewalk connections to all stops should be required, and transit stops should be equipped with shelters, signage, and education resources. Boarding and alighting must also be easy for those with mobility issues.

Recommendations should encourage working with transit partners and identify the specific partners. The plan should encourage bikes-on-board transit vehicles. Secure parking should be provided at transit stations. At a minimum, all bike parking at transit should be covered parking. Bike share stations should be located near transit stations and in adjacent neighbourhoods to allow home-to-transit trips. Full integration of bike share payment systems with transit payment systems is the successful ideal.

Plans should recommend bike-transit link studies for high-use transit stations to develop specific bike-transit connection plans for transit hubs and low-stress bicycle routes to transit hubs, rail stations, metro stations and other high capacity transit stations. Attention should be paid to facilitate easy transfers across modes, including wayfinding, signs, pavement striping, and curb cuts. Plans can also encourage bike racks on taxis and car share vehicles.

1.3.2.5.2 End of Trip Facilities

When bicyclists arrive at their destinations, they need to be confident they will have a safe and secure place to park their bike. Planners should work with transit agencies, business districts, and private developers to encourage the provision of convenient and secure bicycle parking. Covered or secure long-term parking should be provided at all transit stations. Short-term bike parking should be plentiful in commercial districts. Additionally, end-of-trip facilities like showers, locker rooms, and bicycle maintenance stations can promote bike commuting and can support recreational and fitness activities during lunch hours or before or after school or work. 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. With respect to existing building stock, successful plans account for and provide policy and implementation guidance to agencies for improving

[19] Portland Bicycle Plan for 2030, p43.

end-of-trip facilities. All communities have older buildings that lack end-of-trip facilities. Successful plans account for and provide guidance to agencies about how policies can improve facilities in these buildings.

Case study: Madison recommendation for showers and bicycle maintenance stations

Madison is already a great place for bicycling, but to make bicycling an easy, everyday choice for more riders, the City recognizes a need for more robust end-of-trip facilities. Implementation of these recommendations would create the environment to make bicycling the easy choice.

- Enact policies and laws to ensure appropriate levels of bicycle parking are provided by private property owners.
- Provide ample, secure, well designed, well lit, attractive, and conveniently located bicycle parking facilities.
- Work with businesses and campuses to locate on-site bicycle parking.
- Expand and improve bicycle sharing.
- Support the provision of facilities such as showers and bicycle maintenance stations.
    - Ensure that all appropriate public buildings include showers and locker facilities in new building projects and in buildings being rehabilitated.
    - Encourage and provide incentives for private developers, building owners, and employers to provide showers and locker room facilities for employees.
    - Work with fitness clubs in or near employment centers to create arrangements whereby, for a small fee, bicyclists could use their shower facilities.
    - Increase the number of bicycle fix-it stations with tire pumps and basic tools located throughout the urban area. In areas where appropriate, build facilities modeled on the Fitchburg Bike Hub with bathrooms, tools, parking, and direct trail access.
    - Develop a downtown Madison bicycle station.
- Build, enhance, and promote multi-modal connections between bicycling and driving.
    - Park–and-pedal lots located on shared-use paths that have direct access to employment centers.
- Enhance multi-modal connections between bicycling and transit.
    - Explore options to increase the bicycle carrying capacity on buses without interfering with transit operations. This may include front exterior racks that hold three bikes, or on-board bicycle space.
    - Provide adequate short-term bicycle parking and long-term bicycle storage for transportation centers like transit transfer points and park-and-ride lots. This may include secure and weather-protected parking.

1.3.3 Non-Infrastructure Elements

One of the most important aspects of cultivating a successful walking and bicycling environment and culture is to make these modes an everyday activity that is visible and accepted throughout the community among all community members. In some communities, the perception is that everybody drives and nobody walks or bikes. Sometimes they are perceived to be too dangerous to replace other transportation modes. High-quality policies and programs can challenge these views by raising the profile of these modes, bringing

more people into the walking and bicycling communities, and employing education and enforcement strategies to improve safety and perceptions of safety.

1.3.3.1 Policy Context

A good plan encourages the integration of active transportation planning into the fabric of a transportation agency. This concept, known as “institutionalization,” means that walking and bicycling are considered as a matter of course through the regular proceedings of agency operations, and not as an add-on or special case. An effective way of achieving this is by ensuring that the jurisdiction’s policies support the plan’s objectives. Active transportation plans should recommend that engineering manuals and standards, funding policies and criteria, and zoning policies should be updated to be consistent with the goals and recommendations of the plan.

A community can pass many policies to support walking and bicycling. These policy types include: speed reduction policies to set design speeds, and lower and enforce speed limits; policies to accommodate walking and bicycling in construction zones; Vision Zero plans that aim to eliminate traffic fatalities; land use and development codes that allow for short block lengths, mixed use developments with street-fronting retail, and a connected network of streets; Complete Streets Policies, Complete Streets Implementation Strategies and Complete Streets Design Guidance; reducing parking requirements; and maintenance policies that prioritize streets in the active transportation network.

Land use planning serves to determine the form and function of land development patterns. It establishes intensities or densities of development, and the allowed relationships between uses, as some may be suitably placed adjacent to each other, while others may not. 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. Non-motorized transportation modes are becoming integral to land use and master planning, as walking serves to further current trends such as sustainable development.

1.3.3.2 Culture, Education, and Enforcement

Pedestrian and bicycle plans benefit from sustained involvement and active participation by members of the public. Public involvement can occur during all stages of development of the plan. Plans should include a section documenting the public involvement activities and feedback that was received and incorporated into the planning process. Sustained public involvement is often a crucial aspect of achieving broad community support for the plan. Education programs improve public (motorist and pedestrian) awareness of safe operating behaviours. For example, the City of Edmonton worked with the Alberta Motor Association, CAN-BIKE, and the Edmonton Police Service in developing their education program for bicycle-related safety to ensure the materials were accessible and useful for people driving, walking, and bicycling.

Bicycle and pedestrian safety action plans can be developed for communities of various sizes and intensely engage a broad range of stakeholders—including concerned citizens, law enforcement, school officials, and others—in addition to transportation agencies. Safety action plans engage stakeholders for input and can also charge them with aiding in the recommended solutions. As the plans identify strategies related to

education, enforcement, and design adjustments, they can also identify the individuals or agencies who will be responsible to follow up on the plans' recommendations.

Case study: Denver's Vision Zero Action Plan

Denver's Vision Zero Action Plan20 is grounded in an extensive all-modes data analysis that explored contributing factors, crash circumstances, crash types, and similarities between locations, with an objective of addressing both hot spots and systemic safety issues. The analysis included the development of a High Injury Network (HIN) and a list of locations to be prioritized for treatment that considers crash numbers, injury severity, and Communities of Concern.

The crash data analysis was complemented through analysis of other relevant data, such as speed cameras and public outreach. Citizens were surveyed about transportation issues at several high-crash intersections along the HIN. The City conducted outreach via an online web survey, and the Vision Zero team held numerous meetings with community stakeholders at various key points in the process. The result is an Action Plan with clear, data-, and community-driven strategies and actions for the City and County as they strive to reduce and eliminate future traffic fatalities and serious injuries.

Davis, CA, is proudly known as America's Bicycling Capital. Portland, OR, has built a reputation as the best city for bicycling in the United States while *Bicycling* magazine had names Minneapolis, MN to be the best city for bicycling in the country. In Canada, Vancouver, BC and Montreal, QC have worked extensively to create a bicycle-friendly environment and create high-quality walkable streets. Other cities are at different stages, but are striving to foster a positive active transportation culture to attract residents and the companies that wish to employ them. This section focuses on non-infrastructure elements that help build a healthy culture around walking and bicycling.

1.3.3.2.1 Walking and Biking Culture & Identity

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 City government, but the City can provide institutional support and facilitate permitting, as needed. One of the most common types of bicycling events is a Cyclovia (also known as Open Streets or Sunday Parkways), which involves closing streets to automobile traffic to show residents a new way to look at and experience their streets. Community rides are also popular. "Tweed rides" remind people that spandex isn't required for riding a bike. For people who do prefer less leisurely riding, hosting charity rides, competitive rides, and even professional races engage large numbers of people.

Jane's Walk, an annual festival in May of every year, encourages people to explore their communities and discuss strategies for making walking easier and more convenient in all over the world. Edmonton's Art Walk invites people in the area to experience a vibrant art scene on foot, reinforcing the role walking plays in exploring urban environments and interacting with others.

[20] City of Denver. *Denver Vision Zero Action Plan*. Denver, Colorado, 2017. Available online at https://www.denvergov.org/content/dam/denvergov/Portals/705/documents/visionzero/Denver-Vision-Zero-Action-Plan-draft-July2017.pdf

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. This is also reflected visually in the public realm. Some of the most pedestrian and bicycle friendly places in North America and abroad have taken opportunities to create the following highly-visible infrastructure for active transportation:

- Collaboration with architects to develop bike-oriented buildings and architecture [21]
- Visible, iconic sculptures and support facilities[22] and iconic, architectural non-motorized bridges[23]
- Artful, whimsical wayfinding that makes it easy and memorable to explore a city

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.

1.3.3.2.2 Education and Information

Almost all active transportation plans include recommendations related to pedestrian, bicyclist, or motorist education. Popular recommendations include: good road user behavior programs, bicycle safety awareness campaigns, adult and child bicycle education, bicyclists legal training (classes, guides, handouts), bike and transit education and training, local Safe Routes to School programs, and legal quick guides and how to report a crash. Ensuring that all grade school children receive bicycle education is an excellent way to build a safe bicycling culture for years to come. 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. Mobile technology is pushing the envelope for bicycle route finding. Route mapping is being developed that allows the user to control for the stress-level of the route. Plans could also recommend interactive wayfinding kiosks with real time weather, traffic, and routing information.

1.3.3.2.3 Enforcement

Enforcement programs target specific unlawful operations by pedestrians, bicyclists, and motorists. Common enforcement recommendations include partnering with police on three-foot 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.

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[21] https://veloapartments.prospectportal.com/; http://www.archdaily.com/83307/8-house-big; http://www.wsj.com/articles/developers-build-luxury-bike-friendly-buildings-1411660659
[22] http://www.fastcodesign.com/1663586/a-bike-rack-that-rises-in-the-sky-like-a-ferris-wheel http://www.gizmodo.com.au/2013/06/5-robotic-bike-parking-systems-that-solve-an-urban-dilemma/
[23] https://en.wikipedia.org/wiki/Tilikum_Crossing; https://goo.gl/fYq2O2

1.3.3.2.4 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. Cities can leverage existing partnerships to develop a campaign or program to try to discourage and reduce impaired and distracted driving. While this action has farther-reaching benefits than just active transportation, making streets safer can help achieve plan goals. Lastly, 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.

1.3.3.2.5 Program Leadership

It can be very important to identify a single government entity that will take responsibility for bicycle programming. In Fort Collins, City staff in the FCBikes team coordinate both infrastructure implementation and programs, including working with local employers to host bicycling classes, partnering with the school district, overseeing a bicycle ambassador program, organizing open streets events, and other efforts to improve bicycling in the city. FCBikes is housed within the transportation planning department. Bike Arlington is another example of this type of government effort and is part of Arlington County Commuter Services and Walkable Edmonton is within the City of Edmonton's City Planning Department. These types of government-led efforts are critical to building active transportation culture when capacity and leadership are not present from outside groups and to be a link to outside groups where they are present.

Plans commonly call for partnerships with community organizations to deliver targeted programs for groups such as women, new residents, seniors, families, people of colour, members of the LGBT community, people with disabilities, and recent immigrants or refugees. The Washington Area Bicyclists Association's (WABA) Women on Bicycles Program is a national model for this type of program. Partnership with individual community members can come through development of a bicycle ambassadors program where residents volunteer to take on the role of disseminating bicycle information to neighbors, friends, coworkers and others. Fort Collins' Bicycle Ambassadors program is a model with a wide reach and suite of programming. Likewise, Bike Edmonton's "You Can Ride 2" program provides bicycles and support for children with physical and cognitive disabilities to learn to ride a bicycle. The Westend Seniors Activity Centre in Edmonton also organizes group bicycle rides for their members and they have been more actively involved in advocating for safe bicycling infrastructure in the city.

1.3.3.3 Monitoring and Evaluation

Monitoring and evaluation is often overseen by local government. Pedestrian and bicycle monitoring programs typically include volume counts but can include behavioral and demographic data, as well. Analogous to motor vehicle traffic monitoring programs, active transportation monitoring programs can provide transportation agencies with ways to accurately quantify and establish existing and historical system usage as well as provide pedestrian volume trends.

Successful evaluation can help push the boundaries of the field of bicycle planning and engineering. Count data collection is an area that is growing in the leading cities and towns. The development of a robust

counting program of continuous automated counters provides benchmarks for ridership, helps calculate crash exposure rates, and can aid in making the case for infrastructure improvements.[24] 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.

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. Agencies should consider issuing a public Implementation Report Card based on this information. Several years after Seattle adopted its bicycle master plan, it released its follow-up Implementation Plan 2015-2019, which included "goals table" with status updates.

A successful standard for evaluation is the Bicycle Account from Copenhagen, Denmark.[25] The Bicycle Account relies on public data and public opinion surveys to evaluate bicycling conditions in the city. It provides a biannual comprehensive review of the city's bicycle network, including public satisfaction surveys regarding maintenance of the network (surface quality and snow removal), availability of bicycle parking and bikeway facility width. Bicyclists are also questioned about perceived safety, so planners can track the impact of improved infrastructure on residents' sense of safety. The Bicycle Account has been adapted for U.S. and Canadian communities including Calgary, AB.[26]

1.3.4 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.

1.3.4.1 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. For instance, projects in areas with high opportunities for walking and bicycling should be prioritized (i.e. areas with a higher density of diverse land uses, high percentages of short trips made by other modes, and good connectivity to existing infrastructure) and those that address locations with safety issues. This said, all projects in the network should be considered for implementation when opportunities such as resurfacing or redevelopment occur.

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[24] Programs in Boulder, CO and Minneapolis, MN are of note on the city scale. The Delaware Valley Regional Planning Commission has an exemplary regional program.
[25] Bicycle Account from Copenhagen. http://www.cycling-embassy.dk/2015/05/06/new-bicycle-account-from-copenhagen/
[26] Bicycle Account Guidelines: Measuring, tracking and reporting progress to inspire better biking in your community http://bikeleague.org/sites/default/files/Bicycle_Account_Guidelines.pdf

1.3.4.1.1 Methodology for Prioritization

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 prioritization of these elements may necessarily be more qualitative, a successful plan with ambitious recommendations will need to determine which warrant investment first. It is important to consider which programs would change the character of walking and biking in the community, such as district-wide education. It is also very important to consider whether there are policy changes that must occur to enable or ease implementation of projects. For instance, some requirements for traffic studies may indirectly make it more difficult to construct bicycle projects. Projects requiring these policy changes may be high priorities and thus spur action to execute changes.

A typical pedestrian or bicycle network prioritization process will flow directly from the plan's performance measures and will consider how well each recommendation addresses the plan's vision as defined by its goals and objectives. While this process varies from community to community, a national resource has been developed through the NCHRP 803 report Pedestrian and Bicycle Transportation Along Existing Roads, which is adaptable by communities and provides a clear, easily explainable process by which to prioritize infrastructure projects. 27

Data are often most readily available for prioritizing infrastructure projects. Prioritization of programs and policies should be done through discussion with stakeholders about 1) community priorities, and 2) identifiable roadblocks to implementation.

Case Studies: Fort Collins, CO

The City of Fort Collins prioritized infrastructure projects and program recommendations in its bicycle master plan. Both types of recommendations were scored using an existing "Triple Bottom Line" framework that the City employs for all types of projects. Specific questions in the three areas of economic, environmental, and social impacts were developed for infrastructure and program recommendations. For instance, one question in the environmental impacts category asked, "Does the project limit the need for additional impervious pavement?" The yes/no answers to questions were summed, and these tallies placed projects into high, medium or low priority categories qualitatively.

Additionally, a quantitative score was developed for infrastructure recommendations based upon criteria important to stakeholders. The criteria were demand analysis, crash history, removal of barriers, and public input.

Separate methodologies were used to prioritize corridors and intersections since some difficult locations were not located on identified routes. These were often major intersections where experienced riders using bike lanes on major streets still felt uncomfortable or unsafe. The intersections of local streets with arterial roadways were also highly prioritized where the local street was part of a low-stress network. Many of these locations had unsafe crossings which would inhibit the success of the low-

[27] Pedestrian and Bicycle Transportation Along Existing Roads—ActiveTrans Priority Tool Guidebook, NCHRP 803, 2015 http://www.pedbikeinfo.org/pdf/PlanDesign_Tools_APT_Guidebook.pdf

stress network if not improved. Corridors were placed into year-long tiers of implementation based on the assumed City budget for project implementation. Corridors were identified with consideration of providing logical start and end points to improve low-stress network connectivity.

1.3.4.1.2 Project List and Documentation

Project lists should include planning-level cost estimates. Some communities use cost as a prioritization criterion in developing a cost-benefit analysis for each project. Communities may also choose to prioritize projects exclusive of cost in order to identify the projects that provide the most value to the community. Regardless of their place on in the prioritization list, “low-hanging fruit” projects, such as paint-only projects (e.g., lane diet, road diet, crosswalks) on streets with upcoming resurfacing, should be programmed right away. This sends a message that the plan is already having an impact on the ground. Initial planning, and sometimes design, work can be complete for high-priority projects that be used to strengthen grant applications later.

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, and
- Public outreach process.

Case Study: Portland’s three-part implementation strategy: immediate, the 80 percent plan, and the successful plan[28]

The Portland Bicycle Plan for 2030 recommends three implementation strategies: the immediate implementation strategy, the ‘80 percent’ implementation strategy, and the ‘successful’ implementation strategy. Each is associated with funding scenarios that provide a starting point for projects that the City of Portland can expect to build in the future.

The immediate implementation strategy presents a suite of projects to be implemented within five years of plan adoption. This suite was selected to meet expected funding levels ($10-14 million) and includes projects that are relatively economical (bike boulevards, striping) that address equity issues, expand access, and overcome barriers.

The **80 percent plan** is not tied to a timeline and focuses on spreading funding over a wide geographic area such that 80 percent of Portlanders are within a quarter mile (400 m) of a low-stress bikeway. This strategy again focuses on bike boulevards but also includes some signature trail projects.

[28] Strategic implementation plan, Portland Bicycle Plan 2030
https://www.portlandoregon.gov/transportation/44597?a=379136

The **successful plan** is based on implementation of separated and buffered bike lanes on main commercial streets and other high-volume roadways. It is understood that this strategy will be costly and that its implementation depends upon a large shift in funding priorities. The plan makes clear that projects in the 80 percent and successful lists can be implemented at any time if funds are available, and indeed, the implementation of projects in Portland since the adoption of this plan has included some projects from each list and some that were not proposed in the 2010 plan.

1.3.4.2 Maintenance Strategies

Consistent maintenance of pedestrian and bicycle facilities is critical to keeping them accessible, usable and desirable, and a successful master 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. Some places, such as Oakville, ON, have even considered having season active transportation networks as some of the off-road trails and pathways are closed in the winter months.[29] Regardless, roadways and facilities with high volumes of users should be identified to receive priority maintenance in all seasons.

Sidewalks that are in poor repair or are poorly maintained are a trip and fall hazard for all residents. People with disabilities and people who are 65+ are particularly vulnerable. According to the Center for Disease Control and Prevention, one out of three adults age 65 and older falls each year.[30] For people of this age, it is easy to break hips during falls, and these severe injuries can be very hard to overcome. Sidewalks that are in poor repair also pose a fall risk for pedestrians with disabilities. For example, a person with a vision disability might trip on a crack or step into a hole and sustain a serious injury.

As separated bicycle facilities (on-street protected bike lanes and off-street shared-use paths) are becoming more common, transportation agencies are tasked with developing more sophisticated strategies for maintaining bicycle facilities separate from standard roadway maintenance. Some communities empower residents to report bicycle facility maintenance issues which can lessen agency burden of tracking locations and indicates a concerted interest in ensuring the usability of bike facilities.

Some communities choose to incorporate maintenance costs into project cost estimates. Plan stakeholders should determine whether that strategy or an alternative of estimating an overall maintenance budget for planned facilities will better serve future funding requests.

A well-functioning system of pedestrian and bicycle facility repair and maintenance helps extend the life of sidewalks. Because this infrastructure presents a significant up-front cost to cities, it is important to protect the initial investment. Effective sidewalk asset management, for example, can incorporate city policies that use small outlays of maintenance funds which “elongate the life of pedestrian facilities and in some cases

[29] https://www.oakville.ca/images/Oakville-ATMP-Update-2017-Optimized.pdf
[30] “Falls Among Older Results: An Overview.” Centers for Disease Control and Prevention. September 20, 2012. http://www.cdc.gov/homeandrecreationalsafety/falls/adultfalls.html

avert significant future outlays."[31] Additionally, 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-waited repair is made. This is a problem for all users but is especially problematic for people who could find even small defects a limiting factor in trip-making.

1.4 CONCLUSIONS

St. Albert is primed with elements for becoming a successful place for walking and bicycling with 85 km of recreational trails. The trail system, along with its extensive sidewalk network and roadways must be studied and developed further to create intuitive, efficient connections for all users.

By considering and incorporating best practices in pedestrian and bicycle infrastructure, policy, programming, education, equity, and data evaluation, a successful plan can help residents, leaders, and staff buy into a vision for ultimate implementation. Development of this plan will be another step toward creating the walking and bicycling culture that will help St. Albert become a successful place for active transportation.

The findings in this best practice review identify key components of active transportation plans that should be considered for St. Albert. The information will support the scoping and development of an effective strategy for the City of St. Albert to create an Active Transportation Plan and prioritize its implementation. A successful active transportation plan for St. Albert of the approaches used by other communities including the following key focus areas:

- Establishing the need for walking and bicycling through demonstration of the factors that will contribute to successful walking and biking in the community, why it is important, and how it contributes to broader community goals
- Developing high-quality networks
- Fostering the culture and appeal of walking and bicycling
- Outlining clear steps to project and program implementation

[31] *A Guide for Maintaining Pedestrian Facilities for Enhanced Safety*. Federal Highway Administration. October 2013. https://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa13037/fhwasa13037.pdf

2 Active Transportation Plan Development Strategy

2.1 INTRODUCTION

2.1.1 What is an Active Transportation Plan (ATP)

An Active Transportation Plan (ATP) is a strategic document that provides direction on policies, programs, and practices to create a community that is safe, accessible, and convenient for walking, bicycling, and other forms of active travel (including for recreation). Active Transportation Plans include a vision, goals, objectives, and performance measures as well as recommendations and/or requirements for planning, designing, operating, and maintaining active transportation facilities and supporting programs. Many include discrete actions to implement and some are approved by local government as policies or master plans for the community that must be followed by the public and private sectors.

2.1.2 What are the Characteristics of Successful ATPs?

A Best Practices Review was conducted of active transportation planning in communities in the United States, Canada, and Europe to identify the common characteristics of successful plans. The Best Practices Review summarized guiding principles and case studies that are fundamental to creating a safe, accessible, and connected network of walking and bicycling infrastructure.

Best practices in active transportation planning and design are important to consider and incorporate into local active transportation plans, as it is often hard to know where or how to start when initiating strategies for programming, education, equity, data evaluation, or the development of design standards. The Best Practices Review brings these ideas together into a narrative that can help residents, leaders, stakeholders, and staff to buy in and support the implementation of St. Albert's ATP.

The Best Practices Review in Section 1 identifies three critical characteristics of successful active transportation plans:

1. Developing a high-quality network;
2. Fostering a culture of and an appealing environment for walking and bicycling; and
3. Defining clear implementation tasks and responsibilities, including resources.

2.1.3 Who is Responsible for Developing and Implementing ATPs?

ATPs are typically developed by local government, with input from the public and internal and external stakeholders. The strategies and actions presented in an ATP are implemented through a combination of government-led and external organization-led initiatives. For example, designing and building sidewalks can be completed by both the City and the development industry, legislation changes may be led by the

Provincial government, and community advocates or businesses may lead encouragement activities. Successful ATPs bring together the relevant partners to create the plan and carry out its implementation.

2.1.4 What is the Purpose of this Document?

The ATP Development Strategy outlines the framework for an Active Transportation Plan for the City of St. Albert. A Proposed Vision for active transportation is presented in Section II based on approved vision statements from the City of St. Albert's existing policy framework. The proposed vision has been used as a guide for the Development Strategy and in evaluating gaps within the existing active transportation network.

The focus of the Development Strategy is the documentation of the Strategies, and their associated Actions, that should be part of the high-level strategic plan for St. Albert's active transportation system. The Strategies are documented in Section III. These Strategies and their associated Actions can be implemented by the City as discrete items or as a complete initiative. It is anticipated that development of the St. Albert ATP will be phased and compiled over time to create a complete plan due to the related nature of active transportation with other transportation and City projects, programs, and initiatives, and the need for external stakeholders to lead and/or partner in the implementation of its Strategies and Actions.

One of the Strategies outlined in Section III is Planning the Active Transportation Network. This is contained in the "St. Albert Active Transportation Gaps Assessment," which is infrastructure-focused. The preparation of this Strategy has been completed in parallel with the ATP Development Strategy.

2.2 A PROPOSED VISION FOR ACTIVE TRANSPORTATION IN ST. ALBERT

The City of St. Albert has several Council-approved vision statements for plans that are related to active transportation including those of the Transportation Master Plan, Transportation Safety Plan, and Complete Streets Guidelines and Implementation Strategy. This policy framework provides a starting point to create a proposed Vision for the Active Transportation Plan.

- *Transportation Master Plan* – "St. Albert's vision for transportation considers the diverse needs of our population with many ways to move around in a safe, efficient, affordable, and accessible manner which fosters economic prosperity, sustains the beauty of our environment and culture, and provides all residents with the sense that St. Albert is truly a livable community."
- *Transportation Safety Plan* – "A community working together so your family arrives safely." The Transportation Safety Plan also includes a mission statement that includes "the elimination of fatalities and major injuries within its transportation system."

  In addition, the Transportation Safety Plan identified the following principles:
  - Integration
  - Network
  - Sustainability
  - Protection of the Most Vulnerable
  - Innovative

  - Respect
  - Evidence-based
- *Complete Streets Guidelines and Implementation Strategy* – "A community designed to promote safety, connectivity, and attractiveness through a transportation network that accommodates all modes, all ages, and all abilities."

Using the above and information found in the Best Practices Review, the following Proposed Vision for active transportation in St. Albert was created.

> *St. Albert's active transportation system is planned and designed to create a safe, connected, inclusive, accessible, and affordable network for walking and bicycling by people of all ages and abilities.*

The Proposed Vision for active transportation in St. Albert was used as a guide in the development of the ATP Scope in this ATP Development Strategy and the analysis and recommendations are shown in Section 3.

2.3 ACTIVE TRANSPORTATION PLAN SCOPE

Active Transportation Plans (ATPs) include a broad scope of high-level strategic direction that influences the work completed by City departments and external partners. An ATP will include: a vision, goals, objectives, and performance measures; policy direction and guidance on planning, design, operations, and supporting programs; and, implementation priorities and maintenance practices. The following presents the scope for St. Albert's ATP.

2.3.1 What are the Strategies Required for an ATP?



Strategies present direction for a key component of an ATP to support creating a better community for walking and bicycling. They represent the pillars required for a comprehensive ATP. As part of each Strategy, there are also Actions. Actions are specific tasks that support the implementation or realization of the policy direction defined by a Strategy.

The St. Albert ATP's scope should include the following Strategies:

- Developing the ATP Foundation
- Planning the Active Transportation Network
- Designing Active Transportation Infrastructure
- Operating the Active Transportation System
- Creating a Culture of Support for Active Transportation

- Implementing & Maintaining the Active Transportation System

2.3.2 ATP Strategies

The following presents the Strategies for the St. Albert ATP and the associated Actions that would be part of each Strategy.

Table 2-1
Developing the ATP Foundation

	ATP Foundation Strategy
What is the Strategy?	Developing direction and priorities for active transportation starts with a coherent story about where the community is going and how it will get there. The foundation of the ATP requires identifying the specific goals and objectives by building off the community values and vision for the active transportation system and the vision for St. Albert as a city. Central to this is the creation of an approach to public engagement and communication that will be used to create the ATP foundation, develop the ATP's other Strategies, and implement the Strategies and their associated Actions.
Who leads it and is involved?	Led by City of St. Albert with input from public and stakeholders.
Which City of St. Albert plans/programs support or guide the Strategy?	• Municipal Development Plan (MDP) – guides the overall development strategy and growth planning for the next stage to 100K population, to which facilities and infrastructure should be planned to accommodate the needs of the community. • Transportation Master Plan – supports land use decisions and accessible facilities that promote walking and bicycling and emphasizes public consultation as a strategy for aligning with local demand for active transportation projects. • Complete Streets Guidelines and Implementation Strategy – presents design guidelines and strategies for improving roadways for all users and supports community engagement strategies that clearly communicate trade-offs and impacts of complete streets projects. • Transportation Network Improvement Strategy – ranks roadway improvements based on level of service, travel times, and safety. • Transportation Safety Plan – presents a strategic, prioritized approach to improving road safety for all users. • Public Participation Policy – provides direction to the City on how to involve stakeholders in decision making that affect the community. • Social Master Plan – supports advocating for public transportation that crosses geographic boundaries and developing a public education and awareness strategy for transportation services.
What are recommended actions to support the Strategy?	1. Create a Public Engagement and Communication Approach for the ATP and Active Transportation Projects. 2. Refine the Proposed ATP Vision. 3. Develop Goals, Objectives, and Performance Measures.
Risks/Challenges	• Expectations for public and stakeholder involvement in City projects may vary depending on the person or organization. For example, some may feel engagement should just be sharing information while others may feel co-creation of projects is more appropriate. • There may be conflicting opinions in the community about the goals and objectives for active transportation in St. Albert. • Goals, objectives, and performance measures for active transportation should align with other City plans and strategies but there may be conflicting direction in approved plans. • The progress toward goals and objectives are difficult to track without measurable targets.

ATP Foundation Strategy	
Relevant Resources	• Atlanta Regional Commission – Walk, Bike, Thrive! • B Active – Birmingham Active Transportation Plan • Denver Vision Zero Action Plan • Edmonton Bicycle Transportation Plan
Potential Deliverables	• Public Involvement Policy for active transportation projects • Active Transportation Plan Policy • Active Transportation Advisory Group (internal & external members) • First chapter of the Active Transportation Plan

Table 2-2
Planning the Active Transportation Network

ATP Planning Strategy	
What is the Strategy?	Network planning is a central part of active transportation plans. Networks are based on guiding principles such as safety, connectivity, equity, etc. which are established to reflect the ATP Vision. The principles are used to create network maps for walking and bicycling, including new infrastructure and enhancements to existing infrastructure. Planning the ATP Network also includes an evaluation of priorities and establishing a capital works program for the City.
Who leads it and is involved?	Led by City of St. Albert with input from public and stakeholders.
Which City of St. Albert plans/programs support or guide the Strategy?	• Municipal Development Plan – includes a four-phase planning process that identifies necessary considerations for city growth, develops scenarios for Downtown and commercial areas, and develops policies related to factors including transportation, housing, economic development, culture, and recreation. • Transportation Master Plan – includes a proposed active transportation network with designated hierarchies for routes based on route function (Primary, Secondary, Other) and supports integrated land use and transportation planning including bicycling, walking, and transit access. • Household Travel Surveys – provides a basic understanding of trip purposes, distances, and other travel behaviors. • Transportation Impact Assessment (TIA) Guidelines – provides details on how different TIAs should address pedestrian and bicycle connectivity. • Complete Streets Guidelines and Implementation Plan – provides details for bicycle and pedestrian facilities by roadway type, supports strategic analysis of land uses for making decisions related to pedestrian and bicycle infrastructure (e.g. when to consider removing on-street parking), and suggests adjustments be made to the Land Use Bylaw and land use maps to incorporate new cross sections and design principles. • Land Use Bylaw – describes bicycle parking requirements for residential, commercial, park, and Public School Districts. • Recreation Master Plan - provides synergies with an active transportation network as the priorities of ensuring community health and well being and investing in recreation infrastructure • Area Structure Plans and Park Master Plans - have a direct impact on the trail planning of the active transportation network. • Transportation System Bylaw – documents all existing or planned network roadway infrastructure; a supplemental schedule in the document could be added to identify existing / planned active mode facilities and infrastructure.

ATP Planning Strategy	
What are recommended actions to support the Strategy?	1. Develop bicycle and pedestrian network planning principles. 2. Evaluate the current active transportation network for gaps and opportunities; inclusive of development of criteria for prioritization of addressing gaps. 3. Develop prioritized ATP Network Map. 4. Review land use bylaws and development regulations for active transportation network and infrastructure requirements.
Risks/Challenges	• Bicycle and pedestrian network planning principles should not be grouped together. It is important to make clear that two processes should be investigated with separate criteria for infrastructure placement and prioritization due to the differences in travel behaviour and trip characteristics between walking and bicycling. • Network needs and priorities – there are varying and competing priorities for use of the network (from recreational to commuting use); addressing the large-scale needs may be prioritized strategically; however public or stakeholder opinion and demand may vary from proposed strategies.
Relevant Resources	• Edmonton Walkability Strategy • Edmonton Bicycle Transportation Plan Update • FHWA (Federal Highway Administration) Guidebook for Measuring Multimodal Network Connectivity • Portland Bicycle Plan for 2030 • The Dutch Design Manual for Bicycle Traffic • Transportation Association of Canada Geometric Design Guide for Canadian Roads (Integrated Bicycle Design and Integrated Pedestrian Design chapters) • Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County • Durham Bike + Walk Implementation Plan
Potential Deliverables	• Active Transportation Network Map • Short- and Long-Term Project Lists • Capital Project Charter • Minimum walkability and active transportation connectivity requirements for new developments/neighbourhoods (e.g., minimum walkscore) • Incorporate active transportation network connectivity requirements into the Area Structure Plan review. • Updated Land Use Bylaw to incorporate active transportation end of trip facility requirements (e.g., bicycle parking, change facilities, showers, etc.) for new developments and create a development review checklist. • Network Planning chapter of the Active Transportation Plan • Updated Transportation System Bylaw to identify existing and planned active mode infrastructure. NOTE: Most of this Strategy will be delivered through the Active Transportation Plan (ATP) Gaps Assessment project which is being completed concurrently with the ATP Development Strategy. Actions related to land development and associated bylaws are not part of the ATP Gaps Assessment project scope.

Table 2-3
Designing Active Transportation Infrastructure

	ATP Design Strategy
What is the Strategy?	The quality of the design of active transportation infrastructure is one of the primary and largest influences of safety performance and the number of walking and bicycling trips taken in a community. Design standards for St. Albert's active transportation infrastructure should be evidence-based and data-driven to reflect the latest research and industry knowledge. Design of active transportation infrastructure needs to reflect the needs of people of all ages and abilities including seniors, children, and people with disabilities. The active transportation infrastructure design strategy must also provide direction on walking and bicycling connections to transit.
Who leads it and is involved?	Led by City of St. Albert with input from public and stakeholders. Implementation of the design will be completed by the City and external partners (e.g., land development industry).
Which City of St. Albert plans/programs support or guide the Strategy?	• Transportation Master Plan – includes general descriptions of bicycle facility types and supports development of accessibility guidelines in the short term (one to three years). • Complete Streets Guidelines and Implementation Strategy – presents basic design guidelines, including recommended widths for the pedestrian realm, bicycle facilities, and transit areas and supports incorporation of accessibility guidelines into all infrastructure, including street retrofit projects and transit access projects. • Universal Access Plan – details recommended actions for the City to implement and prioritizes them through a phased improvement program. • Transit Bylaw – includes requirement that transit service should be equally accessible to all people. • Transportation Impact Assessment Guidelines – Provides overview for developers of pedestrian and bicycle infrastructure considerations at transit stops.
What are recommended actions to support the Strategy?	1. Define design user(s) for active transportation. 2. Refine design requirements for streets and off-street active transportation infrastructure including universal design. 3. Review and refine design requirements to support multimodal integration.
Risks/Challenges	• The Complete Streets Guidelines and Implementation Strategy was just completed which provided updated design guidance for walking and bicycling. Careful messaging will be required to discuss why further work may be required. • Changes in design standards and bylaw requirements will require an active process to communicate, and potentially train, the design industry including internal departments and external private sector design professionals and the land development industry.
Relevant Resources	• City of Cambridge Bicycle Plan • Portland Bicycle Plan for 2030 • B Active – Birmingham Active Transportation Plan • Edmonton Walkability Strategy • Durham Bike + Walk Implementation Plan • Transportation Association of Canada Geometric Design Guide for Canadian Roads (Integrated Bicycle Design and Integrated Pedestrian Design chapters) • Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County • City of Calgary Access Design Standards • Age-Friendly Edmonton Access Design Guide • City of Burlington Accessibility Design Standards
Potential Deliverables	• Complete Streets Policy • Updated Design Standards that reflects evidence-based universal design and active transportation best practices. • Parking lot design standards to incorporate walkability.

	ATP Design Strategy
	• Walkability and accessibility audit of transit stops to supplement the short- and long-term project lists (see ATP Planning Strategy) and the capital budget (see ATP Implementation Strategy) • Accessibility audit of the pedestrian network to supplement the short- and long-term project lists (see ATP Planning Strategy) and the capital budget (see ATP Implementation Strategy) • Infrastructure Design chapter of the Active Transportation Plan

Table 2-4
Operating the Active Transportation System

	ATP Operating Strategy
What is the Strategy?	The ATP Strategy for operating the active transportation system includes all elements related to the regulations, bylaws, and operational practices that would support or affect walking and bicycling in St. Albert. Regulations and bylaws related to the operation and rules of the road, as well as their enforcement, greatly impact walking and bicycling behaviours and safety performance and are set through both municipal and provincial legislation. The City's practices for traffic operations also contribute to the safety and efficiency of the active transportation network including approaches for signal timing and traffic controls. Similarly, the City's procedures for seasonal maintenance such as street, sidewalk, and trail sweeping and snow clearing can impact the comfort, safety, and accessibility of the active transportation system. Small things like tree trimming can also impact visibility.
Who leads it and is involved?	Led by City of St. Albert with input from public and stakeholders. Some legislative review and revision will be required by other governments (e.g., Alberta Traffic Safety Act), in which case the City will act as a stakeholder. Changes in enforcement will primarily be led by RCMP but will have a role for City Peace Officers as well.
Which City of St. Albert plans/programs support or guide the Strategy?	• Traffic Bylaw – permits bicycling in the City which can occur on both streets and sidewalks and outlines requirement for all bicyclists to wear a helmet. • Transportation Safety Plan – includes engineering and enforcement-related strategies with estimated time frames and costs. • Alberta Traffic Safety Act and Use of Highway and Rules of the Road Regulation (Province of Alberta) – details province-wide rules for the operation of users within the street environment including right of way and yielding. • Pedestrian Crossing Guidelines – provides guidance in required accommodation for pedestrians and cyclists that may be used for existing or planned network accommodation. • Intelligent Transportation System Strategy – provides guidance on implementation of technology to improve network data collection and management (inclusive of active modes).
What are recommended Actions to support the Strategy?	1. Review of Traffic Bylaw and Traffic Safety Act to support and prioritize people walking and bicycling due to their vulnerability in the transportation system and ensure regulations do not impact potential use, safety, and compliance. 2. Review intersection traffic control practices and procedures to assess their support for walking and bicycling. 3. Review safety performance of the transportation system for pedestrians and bicyclists to identify high crash locations for auditing and improvement as well as opportunities for positive and proactive enforcement. 4. Review active transportation maintenance policies, procedures, and practices related to sweeping and snow clearing.
Risks/Challenges	• City bylaws can be revised based on recommendations; however, provincial legislation will require collaboration and coordination with the Province and other Alberta municipalities.

ATP Operating Strategy	
	• There are other bylaws and regulations in place for different communities within the Edmonton Metro Region. Collaboration is required to harmonize the laws and rules in place for pedestrians and bicyclists in communities throughout the Region. • Changes to bylaws and right of way legislation must be accompanied by education to implement the changes and increase awareness. For Alberta- or Region-wide changes, this will require a coordinated approach with other communities. • Enforcement policies should be balanced with appropriate education and encouragement strategies to build a culture of walking and bicycling.
Relevant Resources	• Denver Vision Zero Action Plan • Edmonton Walkability Strategy • Minneapolis Pedestrian and Bicycle Winter Maintenance Study
Potential Deliverables	• Updated Traffic Safety Act and Use of Highway and Rules of the Road legislation to clarify right of way at multi-use trail crossings of streets at intersections and mid-block through pending updates instigated by the Alberta Bicycle Design Guide. • Updated intersection or pedestrian crossing control warrants to support active traffic control devices that improve conditions, increase safety, and reduce delay for people walking and bicycling. • Updated active transportation sweeping and snow clearing policies and procedures and establishment of hierarchy of all seasons priority walking and bicycling routes. • Updated Traffic Bylaw to harmonize helmet use regulations with other Edmonton Metro Region communities. • Positive enforcement campaign to alert St. Albert residents and visitors • Focused enforcement at high crash locations or locations with higher numbers of vulnerable users (e.g., schools). • Active Transportation Safety and Accessibility Audit Process. • Completing safety and accessibility audits with the results used to supplement the short- and long-term project lists (see ATP Planning Strategy) and the capital budget (see ATP Implementation Strategy). • Establishing active transportation working group with Edmonton Metro Region partners through the Capital Region Intersection Safety Partnership. • Network Operations chapter of the Active Transportation Plan.

Table 2-5
Creating a Culture of Support for Active Transportation

	ATP Culture Strategy
What is the Strategy?	The ATP Strategy for creating a culture of walking and bicycling provides direction on the supporting programs that foster an environment that makes walking and bicycling convenient, comfortable, and legible for all people. Fostering a supportive culture for walking and bicycling involves designing and building infrastructure as well as programs which are specifically created and administered to address barriers to walking and bicycling. This includes collaboration between the City and partnering organizations to produce education and encouragement programs that reach different populations throughout the community.
Who leads it and is involved?	Instigated by the City, the Strategy will identify opportunities for the City to collaborate with partner organizations (e.g., CAN-BIKE, Alberta Motor Association, Schools and parent associations, bicycle shops, seniors organizations, etc., In many cases the programs will be delivered by the partner organizations.
Which City of St. Albert plans/programs support or guide the Strategy?	• Complete Streets Guidelines and Implementation Plan – supports active transportation as a means for improving access to cultural facilities and attracting a diversity of residents. • Transportation Safety Plan – includes encouragement strategies for reaching safety goals. • Universal Access Plan – details recommended actions for the City to implement and prioritizes them through a phased improvement program. • Neighbourhood Traffic Calming Program – includes a process that involves communication and collaboration with communities to result in improved traffic safety (inclusive of addressing active mode accommodation). • Safe Journeys to School – includes a program designed around engagement with public and stakeholders to address connectivity and safety in and around school sites.
What are recommended actions to support the Strategy?	1. Review walking and bicycling education programs offered for residents and children and update, expand, and promote existing City programs. 2. Review walking, bicycling, and active living encouragement programs to identify existing programs and opportunities to expand or create programs that promote walking and bicycling.
Risks/Challenges	• Much of the responsibility of delivering encouragement and education programs will occur via partnerships with external organizations. This may pose a challenge related to coordination of resources and, where delivered by non-profit organizations or volunteers, limited resources to expand existing programs.
Relevant Resources	• Utrecht - We All Cycle! Action Plan • Durham Bike + Walk Implementation Plan • AMA Roadside Assistance Program (including support for bicyclists) • CAN-BIKE Bicycle Skills Training
Potential Deliverables	• Produce and distribute attractive, easy to read walking and bicycling network maps at schools, businesses, recreation facilities, libraries, and other City facilities. • Establish active transportation wayfinding standards and deploy signs. • Collaborate with School Districts, AMA, and CAN-BIKE in developing supplemental curriculum for health or physical education classes at schools for bicycle skills training and teaching rules of the road. • Support bicycle shops and community organizations by promoting community walks and bike rides or other initiatives (e.g., Coffee Outside). • Expand outreach and promotion of Bike to Work and School Days. • Promote public workshops on topics such as bicycle maintenance and winter bicycling. • Promotion of locations with end of trip facilities that can be used by people that commute using active transportation (e.g., fitness clubs, City recreation centres). • Establish bike maintenance stations at key locations and improve bicycle parking at City facilities. • Supporting Programs chapter of the Active Transportation Plan.

Table 2-6
Implementing & Maintaining the Active Transportation System

	ATP Implementation Strategy
What is the Strategy?	The ATP Strategy for implementing and maintaining the active transportation system provides strategic direction related to funding and evaluating/monitoring the active transportation network and support programs. The Strategy provides direction for capital and operating budgets for active transportation as well as incorporating active transportation infrastructure into the City's asset management program. Finally, tied to the ATP Vision, goals, objectives, and performance measures, this Strategy describes the monitoring and evaluation approach to inform the ATP Strategies related to planning, design, operations, and culture and allow the City to adjust its implementation if performance is not meeting set targets.
Who leads it and is involved?	Led by the City.
Which City of St. Albert plans/programs support or guide the Strategy?	• Capital and Operating Budget – City budgeting occurs on a three-year cycle for the Capital Budget, which includes funding for active transportation. • Transportation Master Plan – supports development of a program of capital projects based on needs, benefits (priority), and budget; recommends using the travel demand model as an on-going evaluation tool; and recommends a comprehensive asset management strategy for transportation infrastructure. • Transportation Safety Plan – recommends a formalized monitoring and evaluation plan for meeting city-wide safety goals. • Complete Streets Guidelines and Implementation Strategy – supports adjustments to maintenance and operations programs that align with complete streets design objectives. • Asset management – collaboration between the Engineering, Public Works and other departments to monitor, evaluate, prioritize and administer the City's asset management program for the City's buildings, facilities, and infrastructure. • Sidewalk/trail maintenance – addresses on a priority basis according to sidewalk/trail classification by land use, severity of disrepair, legal constraints, budget, and drainage issues. • Transportation Data Collection & Management Strategy – provides documentation of existing network needs and demands to assist in prioritization for planned improvements or capital investment.
What are recommended actions to support the Strategy?	1. Develop Capital and Operating Budgets for active transportation projects and programs identified in the ATP and its Strategies including consideration of available funding sources. 2. Refine the City's existing asset management framework to better incorporate active transportation assets including maintenance and repair standards and schedules. 3. Develop an active transportation system monitoring and evaluation program that is linked to other City strategic plans.
Risks/Challenges	• The Asset Management framework for active transportation should be created in a similar way and using a similar system to other City assets to ensure consistency and ease clarity for the public and elected officials. • A coordinated approach for all transportation infrastructure (as well as parks) related to asset management and project identification will allow for budget, prioritization, and project delivery synergies. • Obtaining hospital admissions data to expand on motor vehicle-related crash data will require coordination with Alberta Health Services. This may best be tackled through partnering with other Edmonton Metro Region municipalities that would also benefit from these data. • Data for active modes within the network is lacking and thus demand is not clear. Applying ITS strategies related to network sensors to capture volumes may assist with prioritization and program justification.

ATP Implementation Strategy	
Relevant Resources	• Edmonton Walkability Strategy • Oakville Active Transportation Master Plan • FHWA Guide for Maintaining Pedestrian Facilities for Enhanced Safety • Bicycle Account Guidelines (League of American Bicyclists) • Denver Vision Zero Action Plan • Minneapolis Bicycle Master Plan • Seattle Bicycle Master Plan • FHWA Strategies for Accelerating Multimodal Project Delivery
Potential Deliverables	• Coordinated capital and operating budget requests for active transportation infrastructure and programs with other transportation and parks projects/programs. • Incorporate active transportation asset condition rating into GIS and repair priority to support coordinated project delivery. • Active transportation asset management repair and maintenance schedule and completion of maintenance and repair activities to support walking and bicycling. • Review mode choice questions in City Census and Travel Surveys. • Collaborate with Alberta Health Services to obtain hospital admission records for pedestrians and bicyclists that have been involved in non-motor vehicle crashes. • Promote use of BikeMaps.org for people to log locations of near misses and safety concerns in St. Albert. • Develop annual active transportation reports, coordinated with transportation safety, that documents safety, use, public opinion, and other factors identified in the monitoring and evaluation program. • Implementation and Maintenance chapter of the Active Transportation Plan. • Network volume / demand map (which may influence or support maintenance programs / priorities).

2.3.3 ATP Priorities

The Actions identified for each ATP Strategy are listed below and have been prioritized to support the efficient and targeted development of the ATP by focusing on the Strategies and their associated Actions that are most critical to create a successful ATP.

ATP Action	ATP Strategy	Priority	Tasks	Completion and Undertaking Project	Cost	Lead	Support
Create a Public Engagement and Communication Approach for the ATP and active transportation projects	ATP Foundation Strategy	High	Develop a Public Involvement Policy for active transportation projects Create Active Transportation Advisory Group including internal & external members	In Progress (MDP Update)	Funded	Planning	Engineering Rec & Park Communications Utilities & Environment Transit
Refine the Proposed ATP Vision	ATP Foundation Strategy	High	Involve Active Transportation Advisory Group Develop Active Transportation Plan Policy	Delivered with ATP (2021)	Low (<$25,000)	Engineering	Planning Rec & Park Transit Public Works Utilities & Environment
Develop Goals, Objectives, and Performance Measures	ATP Foundation Strategy	High	Involve Active Transportation Advisory Group Develop Active Transportation Plan Policy	Delivered with ATP (2021)	Low (<$25,000)	Engineering	Planning Rec & Park Transit Public Works Utilities & Environment
Develop bicycle and pedestrian network planning principles	ATP Planning Strategy	Medium	Develop Active Transportation Plan Policy	In Progress (ATP Gaps Assessment)	Funded	Engineering	Planning Rec & Park Transit Public Works Utilities & Environment
Evaluate the active transportation for gaps and opportunities	ATP Planning Strategy	High	Complete gaps assessment and identify opportunities for improvement. Complete walkability assessment of transit stops.	In Progress (ATP Gaps Assessment)	Funded	Engineering	Planning Rec & Park Transit Public Works
Develop prioritized ATP Network Map	ATP Planning Strategy	High	Create Active Transportation Network Map. Create short- and long-term project lists.	In Progress (ATP Gaps Assessment)	Funded	Engineering	Planning Rec & Park

ATP Action	ATP Strategy	Priority	Tasks	Completion and Undertaking Project	Cost	Lead	Support
Review land use bylaws and development regulations for active transportation requirements	ATP Planning Strategy	High	Develop minimum walkability and active transportation connectivity requirements for new developments / neighbourhoods (e.g., minimum walkscore).	In Progress (MDP Update)	Funded	Planning	Engineering Rec & Park Transit
			Update Area Structure Plan Terms of Reference to incorporate active transportation network connectivity requirements and create an ASP review checklist.	TBD by Planning Department	High (>$50,000)	Planning	Rec & Park Engineering
			Update the Land Use Bylaw to incorporate active transportation end of trip facility requirements (e.g., bicycle parking, change facilities, showers, etc.) for new developments and create a development review checklist.	TBD by Planning Department	High (>$50,000)	Planning	Rec & Park Engineering
			Identify additional bike maintenance stations at key locations and improve bicycle parking at City facilities.	TBD by Rec & Park Department	Moderate ($25,000-$50,000)	Rec & Park	Planning Engineering
			Develop the Network Planning chapter of the Active Transportation Plan.	Delivered with ATP (2021)	Moderate ($25,000-$50,000)	Engineering	Planning Rec & Park Transit Public Works
Define design user(s) for active transportation	ATP Design Strategy	High	Define design user for cyclists and pedestrians.	Delivered with ATP (2021)	Low (<$25,000)	Engineering	Planning Rec & Park Transit
			Develop Infrastructure Design chapter of the Active Transportation Plan.				

ATP Action	ATP Strategy	Priority	Tasks	Completion and Undertaking Project	Cost	Lead	Support
Refine and review design requirements to support multimodal integration	ATP Design Strategy	Medium	Develop Infrastructure Design chapter of the Active Transportation Plan.	Delivered with ATP (2021)	Moderate ($25,000-$50,000)	Engineering	Planning Rec & Park Transit Public Works
Refine and review design requirements active transportation infrastructure	ATP Design Strategy	High	Update Complete Streets Policy, parking lot design standards, and other relevant design standards to reflect evidence-based universal design and active transportation best practices.	Delivered with Accessibility Guideline (2020)	High (>$50,000)	Engineering	Planning Rec & Park Transit Public Works
			Accessibility audit of transit stops.		High (>$50,000)		
			Accessibility audit of the pedestrian network.		High (>$50,000)		
Review of Traffic Bylaw and Traffic Safety Act	ATP Operating Strategy	High	Update the Traffic Safety Act and Use of Highway and Rules of the Road legislation.	Pending	NA	Engineering	Province
			Update Traffic Bylaw to coordinate helmet use regulations with other communities.	In Progress (Traffic Bylaw Update)	NA (In-house)	Engineering	Planning Rec & Park
Review traffic control practices and procedures	ATP Operating Strategy	Medium	Update intersection control warrants to support active traffic control devices.	In Progress (Pedestrian Crossing Warrant Update)	NA (In-house)	Engineering	NA
			Establish active transportation wayfinding standards and deploy signs.	Ongoing (Park Signage)	Moderate ($25,000-$50,000)	Rec & Park	Engineering

ATP Action	ATP Strategy	Priority	Tasks	Completion and Undertaking Project	Cost	Lead	Support
Review safety performance of the transportation system for pedestrians and bicyclists	ATP Operating Strategy	High	Complete active transportation safety audits.	Ongoing (Traffic Safety Plan Implementation)	High (>$50,000)	Engineering	Rec & Park
			Focused enforcement at high crash locations or locations with higher number of vulnerable users.		High (>$50,000)	Engineering	RCMP Municipal Enforcement
			Positive enforcement campaign to alert St. Albert residents and visitors. Align with "Share the Road" education campaign.		Low (<$25,000)	Engineering	Rec & Park Communications Culture
Review active transportation maintenance policies, procedures, and practices	ATP Operating Strategy	Medium	Update active transportation sweeping and snow clearing policies and establish hierarchy of all seasons priority walking and bicycling routes.	Delivered with ATP (2021)	Low (<$25,000)	Public Works	Engineering Rec & Park
			Develop Network Operations chapter of the Active Transportation Plan.			Engineering	Rec & Park Public Works Transit
Review walking and bicycling education programs	ATP Culture Strategy	Low	Update and distribute attractive, easy to read walking and bicycling network maps.	Ongoing (Trail Map Update)	Low (<$25,000)	Communications & IT	Rec & Park
			Collaborate with school districts, AMA, and CAN-BIKE in developing supplemental curriculum for health or physical education classes at schools.	Ongoing (Traffic Safety Plan Implementation)	Moderate ($25,000-$50,000)	Engineering	RCMP Communications Culture School Boards
			Promote public workshops on topics such as bicycle maintenance and winter bicycling.	Ongoing (Traffic Safety Plan Implementation)	Low (<$25,000)	Communications	Engineering Rec & Park Public Works Province (Provincial Safety Calendar)

ATP Action	ATP Strategy	Priority	Tasks	Completion and Undertaking Project	Cost	Lead	Support
Review walking, bicycling, and active living encouragement programs	ATP Culture Strategy	Low	Promote community walks and bike rides or other similar active living initiatives.	Ongoing (Bike Month)	Low (<$25,000)	Environment Rec & Park	Engineering Planning
			Expand outreach and promotion of Bike to Work and School Days.	Ongoing (Bike Month)	Low (<$25,000)	Environment Rec & Park	Engineering Planning
			Promote locations with end of trip facilities that can be used by people that commute using active transportation.	Ongoing (Bike Month)	Low (<$25,000)	Environment Rec & Park	Engineering Planning Transit
			Complete a Supporting Programs chapter of the Active Transportation Plan.	Delivered with ATP (2021)	Low (<$25,000)	Engineering	Rec & Park Transit Planning Utilities & Environment
Develop Capital and Operating Budgets for active transportation	ATP Implementation Strategy	High	Coordinate capital and operating budget requests for active transportation infrastructure and programs with other transportation and parks projects/programs.	Ongoing (part in progress with ATP Gaps Assessment)	NA (In-house)	Engineering	Planning Rec & Park Transit Public Works Utilities & Environment
Develop and Refine the City's existing asset management framework for active transportation assets	ATP Implementation Strategy	High	Build an active transportation asset management system as part of City's asset management program, including sidewalk, trail, benches, etc.	Ongoing (Engineering Asset Management)	High (>$50,000)	Engineering	Public Works Rec & Park Transit Corporate GIS
			Incorporate active transportation asset condition rating into GIS and repair priority.	Ongoing (Transportation Infrastructure Asset Management)	NA (In-house)	Engineering	Public Works
			Complete an active transportation asset management repair and maintenance schedule and complete said activities.	Ongoing (Transportation Infrastructure Asset Management)	NA (In-house)	Engineering	Public Works Rec & Park

ATP Action	ATP Strategy	Priority	Tasks	Completion and Undertaking Project	Cost	Lead	Support
Develop an active transportation system monitoring and evaluation program	ATP Implementation Strategy	Medium	Review mode choice questions in City Census and Travel Surveys.	In Progress (ATP Gaps Assessment)	Funded	Engineering	Strategic Services & IT Legal & Legislative Services
			Collect pedestrian volume data to support pedestrian warrant studies, intelligent transportation system strategy and planning analysis, etc.	Ongoing (Traffic Management System)	Pending on analysis depths and equipment requirement	Engineering	NA
			Collaborate with Alberta Health Services to obtain hospital admission records for pedestrians and bicyclists involved in non-motor vehicle crashes.	Ongoing (Traffic Safety Plan Implementation)	NA (In-house)	Engineering	RCMP Communications Province
			Promote use of BikeMaps.org for people to log locations of near misses and safety concerns.	Ongoing (Traffic Safety Plan Implementation)	NA (In-house)	Communications	Engineering
			Develop annual active transportation reports that document safety, use, public opinion, etc.	Ongoing (part in progress with Traffic Collision Annual Report)	Moderate ($25,000-$50,000)	Engineering	Strategic Services & IT

2.4 IMPLEMENTING & MANAGING CHANGE

Implementing changes to a system requires thoughtful consideration and development of an approach to manage the change. In the context of changing the way the transportation system is planned, designed, and operated, change management needs to consider both internal City stakeholders as well as external stakeholders and the public. The following provides important considerations for change management related to implementing the Active Transportation Plan.



2.4.1 Leadership

Senior management within the City of St. Albert are the individuals who set the direction for City staff and support staff including direction related implementing change. They are also responsible for informing decision making by elected officials and providing them with clear rationale for why change is necessary. Strong and continuous leadership from senior management is essential to transform the streets, trails, bylaws, procedures, and policies to create a safer, more equitable, and more accessible community for walking and bicycling.

2.4.2 Reflecting Community Values

Successful changes require alignment of the proposed change to the community's values. Community values are reflected in a plan's/project's/program's vision, goals, and objectives. As an ongoing project, Municipal Development Plan (MDP) Update would align with work to reflect community values. The community – the public, internal City stakeholders, and external partners – must be able to see their values reflected in the changes being proposed or, at minimum, that their values were considered. This does not mean every idea must be incorporate or accommodated in the proposed changes; rather, the long-term success of St. Albert as a community needs to be clearly framed such that it includes walking and bicycling as important aspects of its future in a way that is embraced by the community. In so doing, we can create ownership and buy-in throughout the community.

2.4.3 Informing Community Values

We are continually learning as individuals, professionals, and as a society. Our opinions and values evolve as research and data informs our thinking, perspective, and priorities. In some cases, a community's values may need to shift, and the proposed change may be related to a need to shift thinking. Framing for a shift in values must be data driven and objective. The reason for a change must be clearly defined and framed in relation to a community's future. To do that successfully, we need to be open to challenging our own biases and opinions and be willing to shift our thinking based on evidence-based research. Deploying pilot projects and demonstrations and offering training opportunities are important tactics to inform and shift community values, while also listening and improving.

2.4.4 Clear Communication

Clear communication of changes is a critical aspect for both internal and external stakeholders. While changes need to be supported by data and framed with respect to the community's future, the information that is used to communicate the need for change must be accessible to the community and use plain language. The right information must be provided in the right way and in multiple ways. Communication must occur top-down and bottom-up within the City and flow in and out of the City to external stakeholders, the public, and City staff.



2.4.5 Listening & Continuously Improving

Changes will impact the transportation system and will also be felt at a personal level. Great care must be given to creating opportunities to listen to concerns, treat them as valid, and transparently work to resolve them. Listening and making improvements through a data-driven approach is an important part of involving the community in identifying problems, crafting solutions, and creating ownership. Demonstration projects, using adaptable materials, have been very effective at testing ideas when changes are particularly contentious.



3 Gaps Assessment

3.1 INTRODUCTION

This report presents the Gaps Assessment for St. Albert's Active Transportation Plan (ATP). The report documents the gaps in St. Albert's existing active transportation network, presents strategies to address the gaps, and recommends implementation priorities for the City of St. Albert.

3.1.1 Overview

Network planning is a central part of active transportation plans. Networks are based on guiding principles which are established to reflect the ATP Vision. The principles are used to create network maps for walking and bicycling, including identification of locations for new infrastructure and enhancements to existing infrastructure.

This ATP Gaps Assessment report includes evaluation of the existing gaps in St. Albert's active transportation network, evaluation of priorities to address the gaps, and provides recommendations that can be used by the City to establish and/or coordinate a capital works program for active transportation infrastructure.

3.1.2 Best Practices Findings

A Best Practices Review was conducted of active transportation planning in communities in Canada, the United States, and Europe to identify the common characteristics of successful plans. The Best Practices Review summarized guiding principles and case studies that are fundamental to creating a safe, accessible, and connected network of walking and bicycling infrastructure.

Best practices in active transportation planning and design are important to consider and incorporate into local active transportation plans, as it is often hard to know where or how to start when initiating strategies for programming, education, equity, data evaluation, or the development of design standards. The Best Practices Review brings these ideas together into a narrative that can help residents, leaders, stakeholders, and staff to buy in and support the implementation of St. Albert's ATP.

The Best Practices Review shown in Section 1 identified three critical characteristics of successful active transportation plans:

1. Developing a high-quality network;
2. Fostering a culture of and an appealing environment for walking and bicycling; and
3. Defining clear implementation tasks and responsibilities, including resources.

The ATP Gaps Assessment report directly addresses the first critical characteristic of success, "Developing a high-quality network," while the implementation recommendations are also a component of addressing the third critical characteristics related to implementation.

Pedestrian and bicycle networks that are suitable for a wide range of users separate pedestrians and bicyclists from motor vehicle traffic when automobile speeds and/or volumes are high. Higher-quality bike facility design often includes wider spaces for bicyclists to accommodate people with varying riding speeds. Thus, the facilities are made safer through reducing the chance of conflicts between high- and low-speed users, including on shared use paths. Likewise, higher-quality pedestrian infrastructure often includes sufficient space to accommodate the use of wheelchairs, parents pushing strollers, and people using guide dogs or walking dogs. The following sections separate and outline more specific characteristics of high-quality pedestrian networks and bicycle networks because there are different needs between these two networks due to the features of the users and trips being made.

3.1.3 High-Quality Pedestrian Networks

From the Best Practices Review, high-quality pedestrian networks are greatly influenced by distance and densities. Most people are willing to walk five to 10 minutes at a comfortable pace to reach a destination (typically considered a distance of 400 m to 800 m for an average adult). The frequency of roadway crossings, including midblock crossings, can significantly impact the distance required to walk to access destinations. Higher density communities and/or compact communities with mixed land use patterns have higher levels of walking because destinations are more likely to be located within walking distance of homes and businesses. Increasing connectivity in urban areas can increase pedestrian mobility.

The ease with which pedestrians, including those with mobility disabilities, are able to traverse a route, as well as the directness between an origin and destination, determine overall quality. Pedestrian routes should provide access to destinations without requiring people to travel excessively out of their way.

3.1.4 High-Quality Bicycle Networks

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.[32] Without a bicycle network that accommodates the widest range of riders, all other programmatic elements of a plan 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.

The ideal network allows for access to destinations by bicycle without the need for advanced planning in selecting a route that avoids major streets or crossings. A high-quality network also offers riders multiple choices of routes by which to access destinations. In a complete, connected and low-stress network, people can travel by bicycle from point A to point B as, or nearly as, easily and directly as by automobile. Designing major streets and crossings to accommodate low-stress bicycle travel will enable this ease of travel.

[32] 8 to 80 networks are appropriate for a wide range of ages of riders, from children (age 8) to elderly (age 80). Riders at these ends of the spectrum have increased need for separation from traffic.

3.1.5 How Does This Relate to the Active Transportation Plan?

The ATP Development Strategy outlines the framework for an Active Transportation Plan for the City of St. Albert and can be found in Section 2. The ATP Development Strategy presents a package of Strategies, and their associated Actions, that should be part of the high-level strategic plan for St. Albert's active transportation system, which would ultimately be compiled under a single cover and entitled the "St. Albert Active Transportation Plan."

The ATP Gaps Assessment contributes to one of the ATP Development Strategies, "Planning the Active Transportation Network", which will form part of the comprehensive ATP over time as the various Strategies are completed. There are four Actions noted for the Active Transportation Network Planning Strategy:

1. Develop bicycle and pedestrian network planning principles;
2. Evaluate the current active transportation network for gaps and opportunities;
3. Develop a prioritized ATP Network Map; and
4. Review land use bylaws and development regulations for active transportation network and infrastructure requirements.

The ATP Gaps Assessment delivers on the first three Actions of the Planning the Active Transportation Network Strategy. Further work will be required to complete the fourth and final step involving the review of the land use bylaws which has been captured within the ATP Development Strategy.

3.2 VISION & NETWORK PLANNING PRINCIPLES

3.2.1 A Proposed Vision for Active Transportation in St. Albert

The City of St. Albert has several Council-approved vision statements for plans that relate and influence active transportation, including those of the Transportation Master Plan, Transportation Safety Plan, and Complete Streets Guidelines and Implementation Strategy. This policy framework provides a starting point to create a proposed Vision for the Active Transportation Plan.

- Transportation Master Plan – "St. Albert's vision for transportation considers the diverse needs of our population with many ways to move around in a safe, efficient, affordable, and accessible manner which fosters economic prosperity, sustains the beauty of our environment and culture, and provides all residents with the sense that St. Albert is truly a livable community."
- Transportation Safety Plan – "A community working together so your family arrives safely." The Transportation Safety Plan also includes a mission statement that includes "the elimination of fatalities and major injuries within its transportation system."
- In addition, the Transportation Safety Plan identified the following principles:
    - Integration
    - Network
    - Sustainability
    - Protection of the Most Vulnerable

  - Innovative
  - Respect
  - Evidence-based
- Complete Streets Guidelines and Implementation Strategy – "A community designed to promote safety, connectivity, and attractiveness through a transportation network that accommodates all modes, all ages, and all abilities." The following goals were identified through the Guidelines to deliver on a balanced network for users and needs:
  - Streets should safely accommodate users of all ages and abilities.
  - The street network should be well-connected, provide direct paths of travel and should not act as barriers.
  - Streets should provide mobility, access to homes, businesses and schools, and civic space for leisure, recreation and other activities.
  - Streets should provide choices for all users and be fair in their allocation of space for all users.
  - Streets should be aesthetically attractive, reflecting St. Albert's appreciation of nature, unique architecture, and the botanical theme.
  - Streets should support the land use, economic development, environmental sustainability, personal security, public health, cost-effectiveness and other objectives.

Using the above and information found in the Best Practices Review, the following Proposed Vision for active transportation in St. Albert was created.

St. Albert's active transportation system is planned and designed to create a safe, connected, inclusive, accessible, and affordable network for walking and bicycling by people of all ages and abilities.

The Proposed Vision for active transportation in St. Albert was used as a guide in the development of the ATP Development Strategy and the analysis and recommendations documented in this report pertaining to the ATP Gaps Assessment. The vision from Municipal Development Plan Update, which will be finalized after this report, should also be considered in finalizing ATP Vision.

3.2.2 Active Transportation Network Planning Principles

3.2.2.1 Pedestrian Network Planning Principles

a) Personal Safety and Security
   - Sidewalk and trail widths are wide enough to accommodate users using walking aids, strollers or other devices comfortably
   - Buffers are used to separate active modes from traffic and in some cases to separate different user types (pedestrians / bicyclists)

- Signalized intersections are clear and intuitive.
- Crossing distances are minimized.
- Pedestrian-scale lighting and open spaces are incorporated into the pedestrian environment.

b) Route Directness and Distance to Destinations

- Pedestrians are able to reach all destinations under 1.6 km (15-minute walk)
- This is an identified limit that most people are willing to travel on foot.
- Crosswalks are provided at all intersections to encourage direct travel.
- The frequency of midblock crossings is maximized to improve access to destinations.
- Trails provide walking alternatives to certain destinations and minimize crossings.
- Walking connections are provided to link public right of way through private property to building entrances.

c) Personal Comfort and Attractiveness

- Providing elements such as shade, separation from traffic, landscaping, and attractive buildings make walking enjoyable and appealing.

3.2.2.2 Bicycle Network Planning Principles

a) Safety

- Conflicts with crossing traffic are avoided.
- Vehicle types are separated where speed differentials are high; shared environments only occur on low-volume, low-speed roadways.
- Speed at conflict points is reduced.
- Bicycling treatments are uniform.

b) Connectivity

- The “mesh width” – the distance between parallel routes in the bicycle network– is no more than 250 m. With lower mesh widths, network density increases and creates more opportunities for bicyclists to freely choose an itinerary.
- Centres and important amenities and destinations are interconnected.

c) Route Directness and Distance to Destinations

- The average detour time and distance is minimized.
- The number of intersections where bicyclists do not have the right of way is minimized.
- The need for bicyclists to stop is minimized.
- Destinations are easy to find.

d) Comfort

- Encounters between bicyclists and cars are minimized.

- The network is legible (i.e., bicyclists can easily make a mental map of their route).

e) Attractiveness
- Network provides “social safety” (i.e., a feeling of personal safety).
- Elements such as shade, separation from traffic (including landscaping, and vertical separation using varied materials), creative bike parking, and attractive buildings make bicycling enjoyable, appealing, and accommodated.

3.3 EXISTING NETWORK ANALYSIS

The following section outlines the analysis methodology and results for the ATP Gaps Assessment of the existing network.

3.3.1 Methodology

The Gaps Analysis, Safety and Comfort Analysis, and Travel Patterns Analysis relied on data from Open Street Map, the City’s GIS files and plan documents, WikiMap survey input, and data collected for the City of St. Albert through the 2014 Household Travel Survey. Each analysis integrated this data to develop maps and tables that, when interpreted together, could be used to assess existing conditions and develop strategies for active transportation infrastructure according to best practice network planning principles. The following provides a summary of the analyses conducted, as well as data limitations.

3.3.1.1 Gaps Analysis

In coordination with the Safety and Comfort Analysis, the Gaps Analysis identified locations where sidewalks and trails were disconnected or lacking, both in general and in proximity to critical infrastructure such as transit stops, schools and retails. High-stress roadways and intersections from the Safety and Comfort Analysis were incorporated into this assessment of key issues with the walking and bicycling environment. Public feedback obtained through a WikiMap site, where residents provided input on walking and bicycling barriers and difficult walking and bicycling routes, were also included. Several of the outputs (Figure 3-2, 3-3, 3-4, 3-7) were ultimately combined to produce an aggregated map of gaps (Figure 3-10) that could be used to understand overall active transportation needs for St. Albert’s network.

Data Used:
- Roadway layers (Open Street Map, City of St. Albert)
- Sidewalk, connector and park trail layers (City of St. Albert)
- Walking and bicycling barrier points (WikiMap feedback)
- Difficult walking and bicycling routes (WikiMap feedback)

Limitations:
- Condition rating for sidewalk and trails is excluded from this project so the City needs to coordinate work plan resulting from this project and the sidewalk condition assessment project.

- No data on curb ramp locations or conditions, reflective of what could be a functional gap due to physical barriers.
- No data on the conditions or accessibility of transit stop infrastructure, also reflective of what could be a functional gap due to physical barriers.

3.3.1.2 Safety and Comfort Analysis

The Safety and Comfort Analysis used the Level of Traffic Stress analysis for all streets, to identify the streets and intersections that have characteristics which have been shown to impact both perceived and observed, or substantive, safety (e.g., high traffic volume, high traffic speed, large crossing distances). While level of traffic stress is derived based on the safety and comfort of bicyclists, the analysis also identifies intersections that have safety and comfort issues for pedestrians.

Following the Level of Traffic Stress analysis, a Bicycle Network Analysis has been completed to determine how well that network connects locations to one another. By understanding which areas are both underserved by the network and isolated by high-stress roadways, the recommendations for roadway and intersection improvements can then be provided.

Data Used:

- Roadway layers (Open Street Map, City of St. Albert)
- Trails layers (City of St. Albert)
- Traffic Volumes and Speeds (City of St. Albert)
- Destinations: schools, parks, commercial centres (Open Street Map, City of St. Albert)
- Population and employment (Census by postal code)

3.3.1.2.1 Process for Bicycle Level of Traffic Stress Calculations:

The concept of Level of Traffic Stress (LTS) is a useful way to think of bicycle facilities in terms of the types of users who would be comfortable riding on them in a given situation. The LTS Analysis uses tags found in Open Street Map data and data provided by the City that represent different elements of a roadway (e.g., posted or operating motor vehicle speeds, width of roadway or number of lanes, motor vehicle traffic volumes) and different types of destinations. Once the bicycling network is built from the roadway and trails data using Open Street Map and received City data, every link of the street network and intersection is rated for level of traffic stress. Level of Traffic Stress is scored on a one to four-point scale and is related to the “Four Types of Bicyclists” developed by Roger Geller of the Portland Department of Transportation and validated by researchers at Portland State University (see Figure 3-1).

Level of Traffic Stress 1: Tolerable for users from eight (children) to 80 (seniors)

Level of Traffic Stress 2: Tolerable for the mainstream adult population (“interested but concerned”)

Level of Traffic Stress 3: Tolerable for adult population comfortable in shared traffic but who may prefer some separation (“enthused and confident”)

Level of Traffic Stress 4: Tolerable for adult population comfortable in shared traffic with no separation ("strong and fearless")

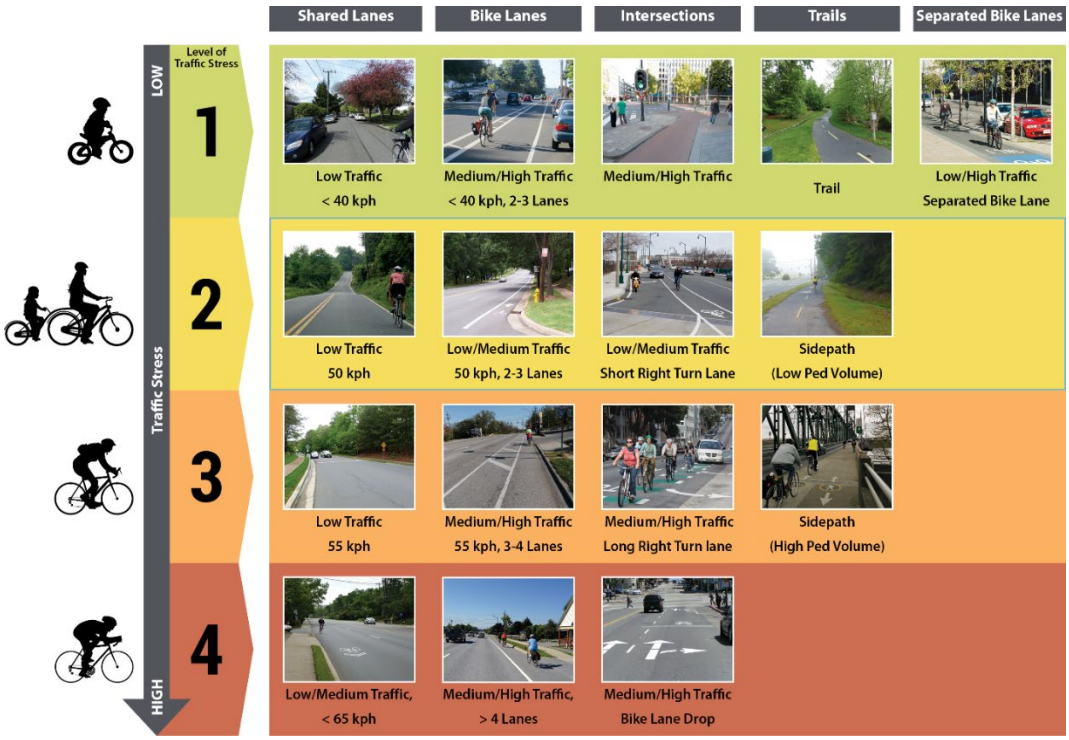


Figure 3-1
Bicycle Level of Traffic Stress

3.3.1.2.2 Process for Bicycle Network Analysis Calculations by Postal Code Area

Once the stress ratings are established, every postal code area is evaluated to determine which other postal code areas are within biking distance and can be reached on the low-stress network. The Bicycle Network Analysis (BNA) assumes a biking distance of 10 minutes at an average speed of 16 km/h. The analysis also does not allow out-of-the-way travel by more than 25 per cent compared to a normal car trip. Lastly, postal code areas are connected if and only if there is an unbroken low-stress connection between them.

The BNA calculates routes from each postal code area to every other postal code area within a 10-minute biking distance, or approximately 2,680 meters. The number and types of destinations within in each postal code area are also summarized. Using this information paired with the knowledge of which postal code areas are connected on the low-stress network, the total number of destinations accessible on the low-stress network is compared to the total number of destinations that are within biking distance regardless of whether they are accessible via the low-stress network.

Low-stress connectivity is scored on a scale of zero to 100 for each destination type based on the number of destinations available on the low-stress network. The scoring places higher value on the most proximate low-stress destinations by assigning points on a stepped scale. Beyond the most proximate, low stress destinations, points are prorated up to 100 based on the ratio of low-stress to high-stress. Table 3-1 summarizes the BNA Scoring System. The BNA result is shown in Figure 3-6.

Table 3-1
BNA Scoring System

Category	Weight Scoring	
Schools	20	15 pts for one school, 5 points for the next school
Parks	20	10 pts for one park, 5 for each of the next two parks
Population	30	10 pts for serving at least 30% of surrounding people, 20 pts for at least 40%, 30 pts for at least 50%
Employment	20	10 pts for serving at least 30% of surrounding people, 20 pts for at least 40%
Commercial Centres	10	7 pts for one commercial centre, 3 for the next commercial centre
Total	100	

3.3.1.3 Travel Patterns Analysis

The Travel Patterns Analysis used the 2014 Household Travel Survey on both individual travelers and households to understand travel behaviours in St. Albert and the region. This work complements existing analysis conducted in the City's Transportation Master Plan (2015), which identified estimated mode splits, travel purposes, and main travel routes. The analysis sought to understand major destinations and their potential overlap with areas that are underserved by the current network; this would aid in the prioritization of walking and bicycling infrastructure gaps. Other important factors include areas with households that do not own a car, which would emphasize the need for safe and comfortable walking and bicycling options in those particular areas.

Data used:

- 2014 Household Travel Survey data tables
- Transportation Analysis Zone (TAZ) boundaries

Limitations:

- Data collected through the Household Travel Survey is a relatively small sample size.
  - Number of households surveyed: 847
  - Number of persons surveyed: 2,163
- Information from respondents regarding destinations, modes, and other behaviours are stated preference (i.e. self-reported) and may not be complete or always precise.

3.3.2 Results

The following presents a summary of the results of the above analyses, which were consolidated to create a final map of Aggregated Gaps (Figure 3-10) that could be addressed to improve the safety and connectivity of the active transportation network according to priorities based on varying prioritization factors.

3.3.2.1 The Existing Walking Network

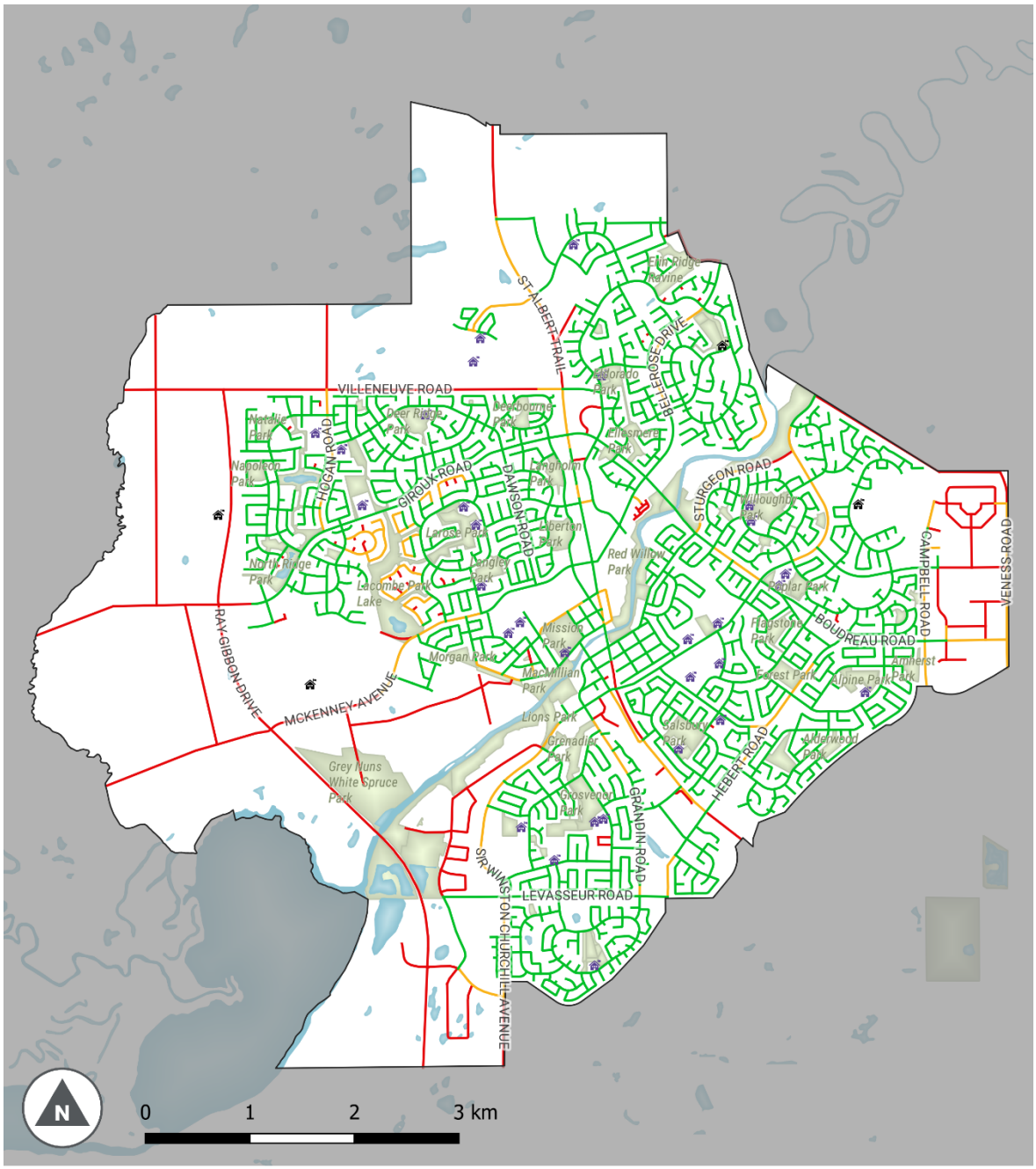
Using available data, an assessment of sidewalk and trail connectivity was conducted, with emphasis on understanding where infrastructure is missing near important destinations, such as transit stops and schools. Over three-quarters of roadways in St. Albert have a sidewalk on both sides, nine percent have sidewalks on one side, and 14 per cent are missing sidewalks on both sides of the road. Sidewalk connectivity in St. Albert was found to be at a relatively high standard; filling gaps and ensuring adequate crossings of high-stress roadways will be critical for encouraging walking trips to destinations such as schools, shopping, and community amenities (e.g., libraries) as well as recreational walking.

Table 3-2
Sidewalks Along Roadways

Sidewalks Along Roadways	Percentage of Roadway
Both Sides of Road	77%
One Side of Road	9%
Neither Side of Road	14%

The assessment of sidewalks and trails also found that some transit facilities are not connected by sidewalk infrastructure. Approximately 7 per cent of in-service bus stops do not have a sidewalk or trail within a 10-metre radius. This represents instances where pedestrians may decide not to use public transit because of the difficulty of walking, instances where a pedestrian is exposed to motor vehicle traffic while walking along a roadway where a sidewalk is missing, or instances where residents with mobility impairments cannot access transit service.

Additionally, 98 per cent of proposed or future bus stops do not have a sidewalk or trail within a 10-metre radius. In implementing and prioritizing active transportation infrastructure, it will be critical to prioritize connectivity to the proposed transit stops. The analysis of sidewalks and trails around schools found that only one proposed school site (located off McKenney Avenue) lacks direct access to a sidewalk or a trail.



City of St. Albert
ATP Gaps Assessment

Presence of Sidewalks Along Roadways

Sidewalks Along Roadways
- Both Sides
- Neither Side
- One Side

- Existing Schools
- Future Schools
- Parks
- Water

Figure 3-2
Presence of Sidewalks Along Roadways

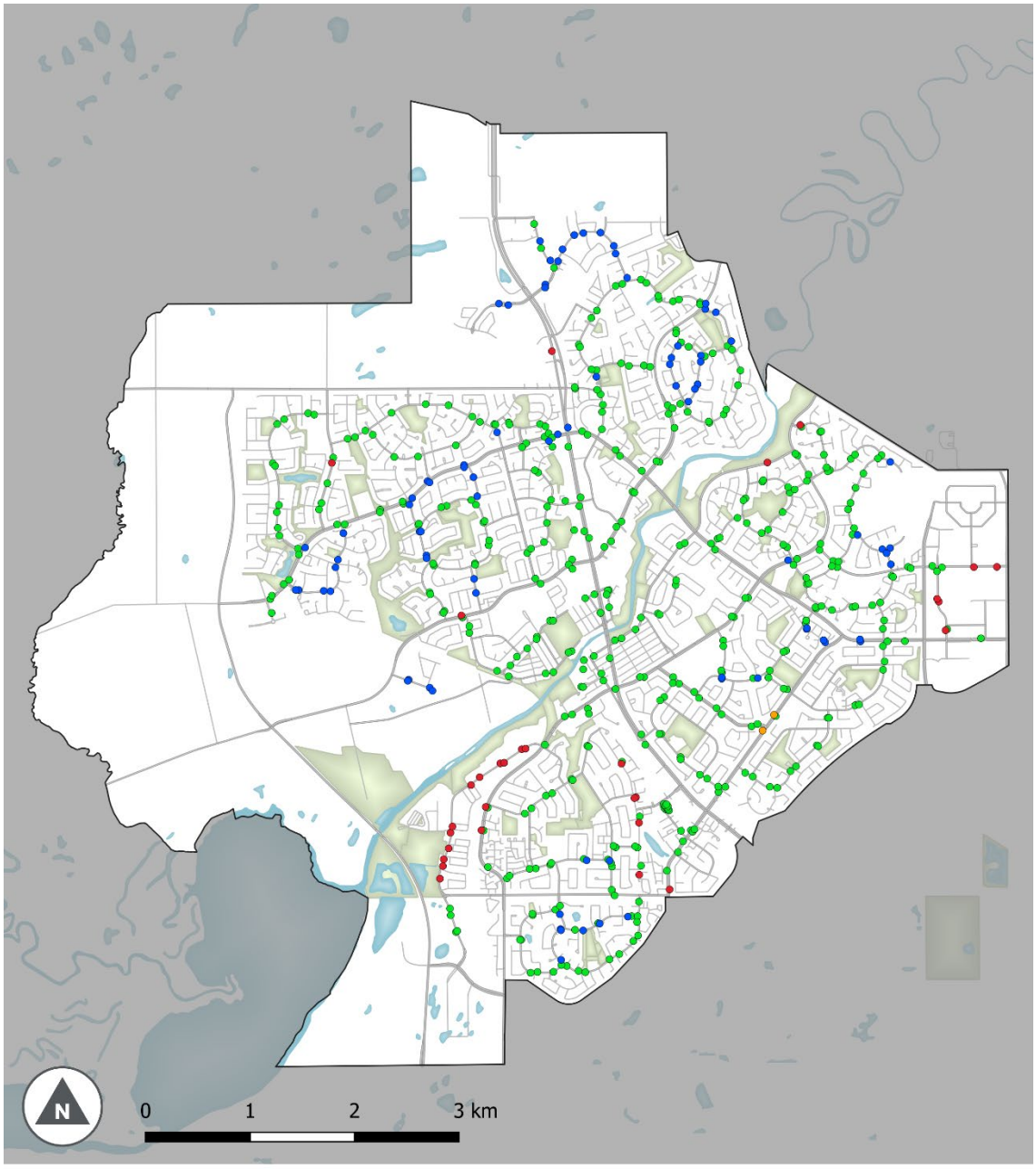


Figure 3-3
Transit Stop Access

3.3.2.2 The Existing Bicycling Network

St. Albert's existing bicycling network is composed of off-street trails that are designated as shared use along roadways and through parks and the river valley. In addition, people can ride bicycles on all streets in St. Albert as well as along sidewalks (although sidewalks are typically not designed to support the operating characteristics and speeds of bicyclists).

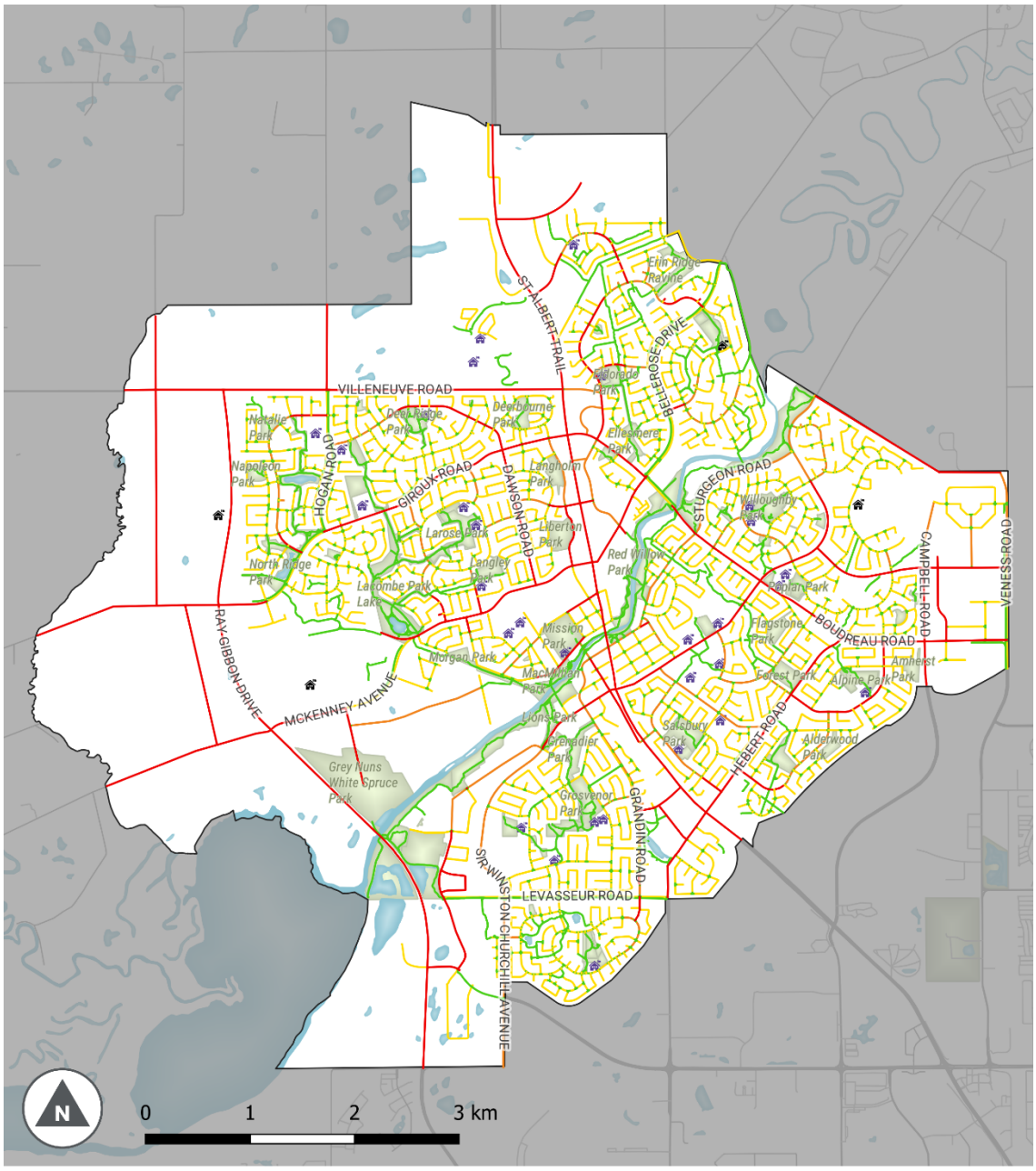
Analysis of the current bicycling network using the Level of Traffic Stress (LTS) Analysis revealed a number of roadways and intersections that can be improved to encourage both short trips within St. Albert as well as regional commuting connections. The LTS Analysis is based on current conditions including existing roadways, bicycle facilities, and motor vehicle traffic volumes and speeds (see Figure 3-4). While the LTS Analysis focuses on bicycling, results showing high-stress roadways and intersections also provide valuable information for understanding the potential for pedestrian improvements, as high-stress roadways often equate to barriers discouraging daily walking trips, such as difficult roadway crossings.

The LTS analysis was also compared to the publicly-reported barriers through the project WikiMap. A comparison shows that reported barriers and difficult corridors align with corridors and intersections that have high LTS scores.

Figure 3-5 shows the locations of high-stress roadways and intersections (LTS 3 and 4) along with the locations of proposed bicycle routes from the Transportation Master Plan. While some of these high-stress roadways have proposed routes, bikeway improvements should be considered along additional roadways that enhance north-south and east-west connections to serve community destinations and meet bicycle network planning principles. It will be especially important to consider on- and off-street bikeways that provide parallel alternatives to St. Albert Trail.

For example, connections along Grandin Road, Liberton Drive, and across the river will be critical for ensuring direct north-south bicycling options that connect bicyclists to residential areas, employment, schools, and recreational destinations. Additionally, ensuring low-stress east-west bikeways along McKenney Avenue, Bellerose Drive, Sir Winston Churchill Avenue, Hebert Road, and Giroux Road will be important for minimizing the effect St. Albert Trail has on creating a barrier to walking and bicycling within the St. Albert to destinations on either side of this corridor.

It is also clear from the analyses that schools are well-connected via sidewalks and trails, but not via on-street bicycling options. Most existing schools in St. Albert are located on narrow, low-stress streets that are surrounded by high-stress roadways. This means that, while the environment immediately around the school properties is low-stress and trail connections provide inter-roadway connections, schools that have larger catchment areas and are therefore connected to the broader community, are not well-connected for bicycling.



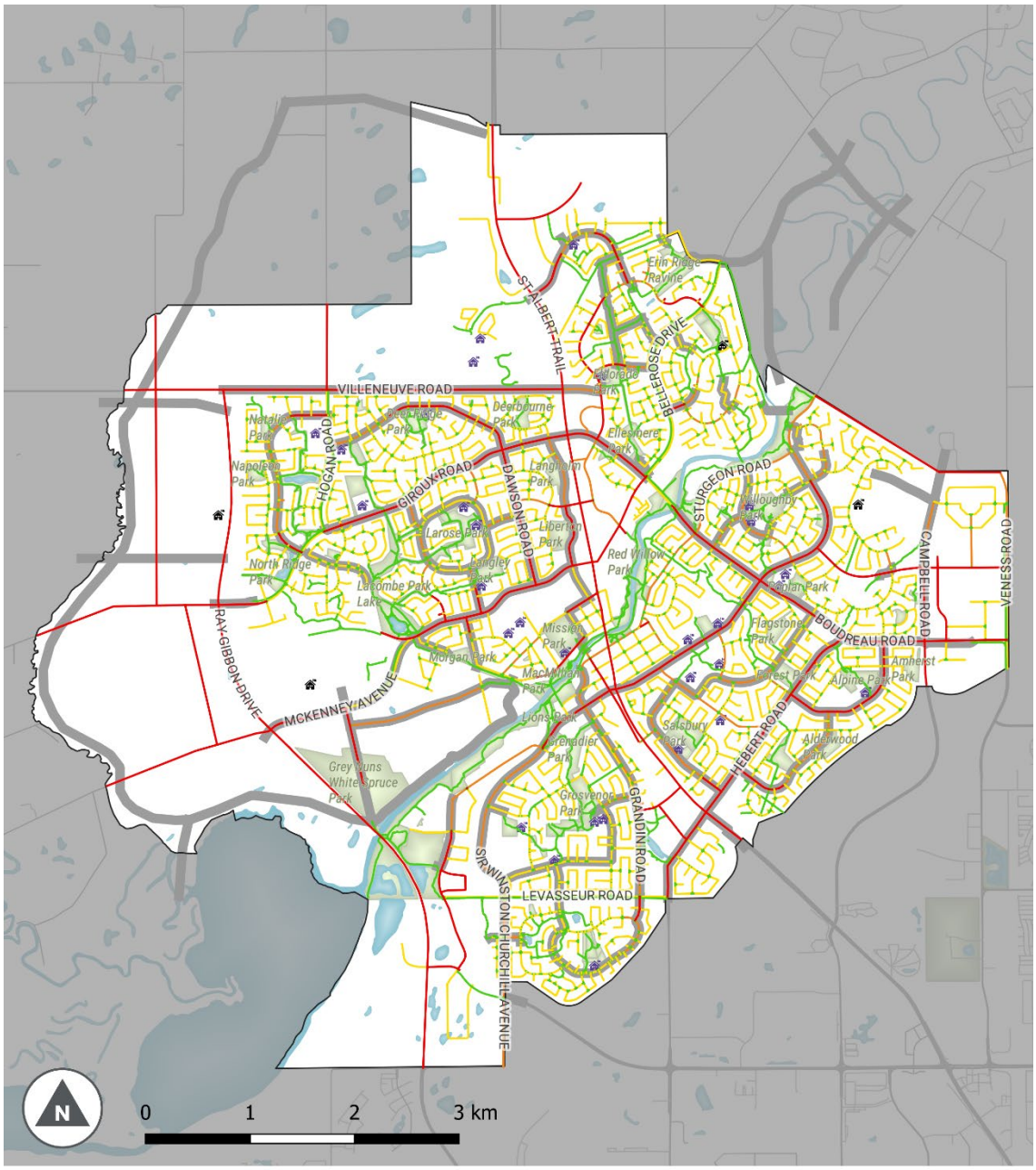
City of St. Albert
ATP Gaps Assessment

Bicycle Level of Traffic Stress

Level of Traffic Stress
- LTS 1
- LTS 2
- LTS 3
- LTS 4

- Existing Schools
- Future Schools
- Parks
- Water

Figure 3-4
Bicycle Level of Traffic Stress



City of St. Albert
ATP Gaps Assessment

Bicycle Level of Traffic Stress

Level of Traffic Stress
- LTS 1
- LTS 2
- LTS 3
- LTS 4
- Proposed Bike Routes from Previous Plans

- Existing Schools
- Future Schools
- Parks
- Water

Figure 3-5
Bicycle Level of Traffic Stress with Proposed Bike Routes

3.3.2.3 Areas Served by the Current Bicycling Network

The Bicycle Network Analysis (BNA) builds on the results of the Level of Traffic Stress Analysis by determining which parts of the city, down to the postal code level, are connected by the current low-stress network (see BNA methodology in previous section).

In addition to providing a basis for understanding network connectivity, comfort, and effectiveness, the BNA conducted for St. Albert supports findings from the WikiMap data and the Household Travel Survey. Areas noted as having barriers to walking and bicycling also received low BNA scores. Additionally, major destinations identified through the Household Travel Survey are in poor-scoring areas. This presents a potential opportunity for further prioritizing improvements in areas with high demand for active transportation.

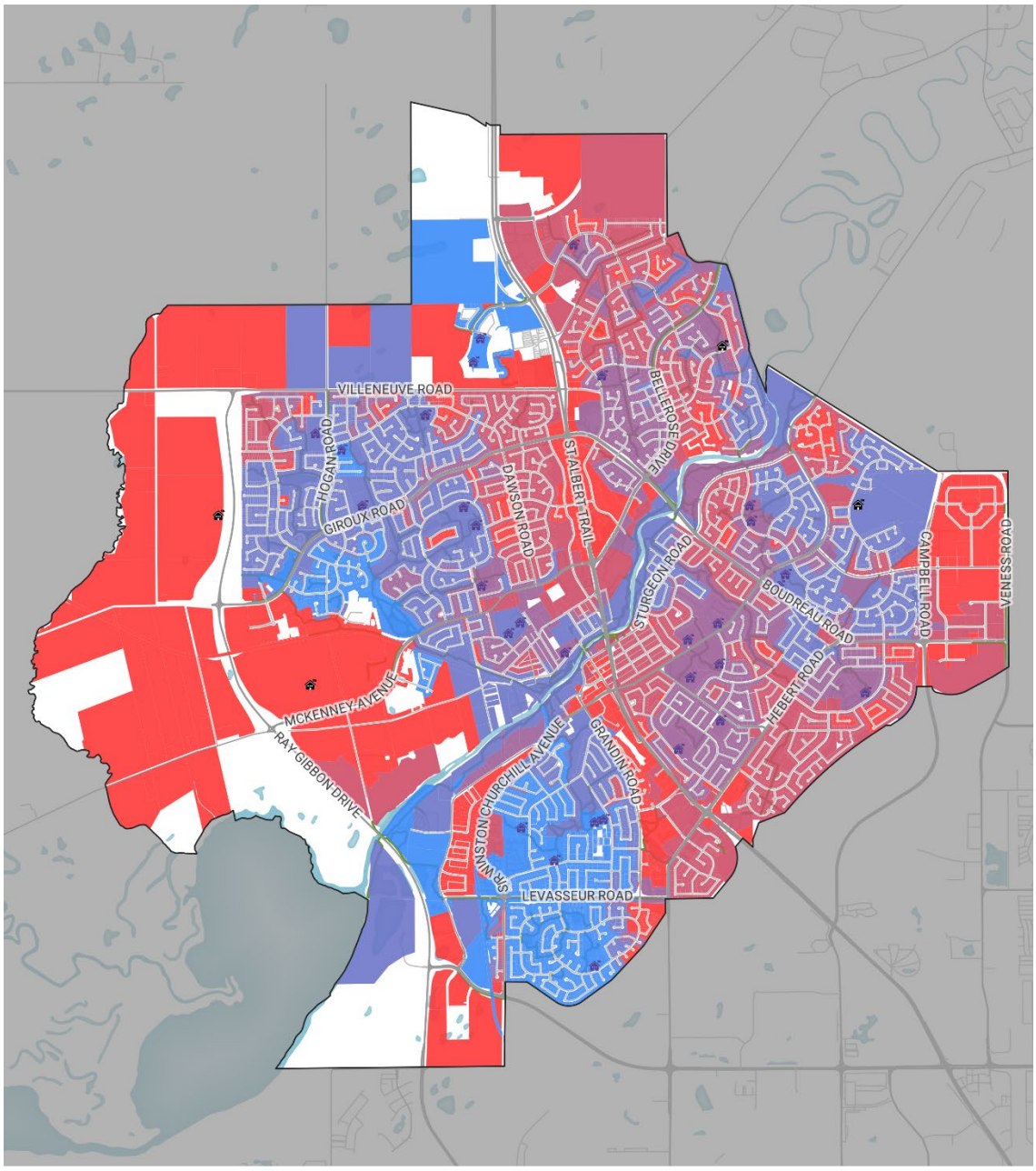


Figure 3-6
Bicycle Network Analysis

3.3.2.4 Walking and Bicycling Challenges and Barriers from WikiMap Feedback

WikiMap feedback provided important metadata regarding the specific factors that make walking and bicycling challenging in St. Albert. Approximately 70 per cent of respondents prefer to bike on trails or in dedicated bike lanes. Over 50 per cent of bicycling routes categorized as difficult were due to a lack of adequate separation of motor vehicles and/or high motor vehicle speeds. Supporting findings from the Gaps Analysis, 55 per cent of difficult walking routes were categorized as such due to disconnected sidewalks and trails. Approximately 20 per cent of respondents marked walking barriers as being an issue due to lack of marked crosswalks. See the below Tables for further details on the public input.

The following Figure shows, according to WikiMap feedback, the routes that are currently used for walking and bicycling, the routes that are difficult, and the point locations of walking and bicycling barriers. Reflecting the LTS Analysis, St. Albert Trail represents a desired north-south route that is currently high-stress and challenging for walking and bicycling along as well as a significant barrier for pedestrians and bicyclists to cross. Barrier points clustered along St. Albert Trail and at crossings of St. Albert Trail and McKenney Avenue, for example, highlight the need for improvements along these corridors to increase connectivity between neighbourhoods.

Table 3-3
Difficult Bicycling Routes

Responses for Difficult Bicycling Routes	Percentage
Too much traffic on road	20.6%
Traffic too fast	19.0%
No off-street path	12.7%
No painted on-street bike lane	11.1%
No barrier between me and car	11.1%
Road in poor condition	4.8%
Other	4.8%
Snow on road/sidewalk/trail	4.8%
Safety hazard on surface	3.2%
Sidewalk in poor condition	3.2%
Not enough lighting	3.2%
Path too narrow for my bike	1.6%
Too much traffic on sidewalk/trail	0.0%

Table 3-4
Difficult Walking Routes

Responses for Difficult Walking Routes	Percentage
Sidewalk does not connect	35.8%
Trail does not connect	18.9%
Snow on sidewalk/trail	7.5%
No crosswalk	7.5%
Other	6.6%
Too much traffic on road	4.7%
Traffic too fast	4.7%
No curb ramps	3.8%
No barrier between me and car	2.8%
Sidewalk/trail too narrow	1.9%
Safety hazard on surface	1.9%
Trail in poor condition	1.9%
Sidewalk in poor condition	1.9%

Table 3-5
Barriers to Bicycling

Barriers to Bicycling	Percentage
Sight lines are unclear or obstructed	29.6%
Trail does not connect	25.9%
Sidewalk does not connect	22.2%
Railroad tracks/highway/stream/river	11.1%
Wait too long at signal	7.4%
Road does not connect	3.7%

Table 3-6
Barriers to Walking

Barriers to Walking	Percentage
Other (e.g. uneven grades, needs signals, poor sight lines)	22.0%
No marked crosswalk	19.8%
Sidewalk does not connect	19.8%
No pedestrian crossing signal	11.0%
Trail does not connect	11.0%
Sight lines are unclear or obstructed	6.6%
No curb ramps	4.4%
No sidewalk to bus stop	3.3%
Walking time too short at signal	1.1%
Railroad tracks/highway/stream/river	1.1%

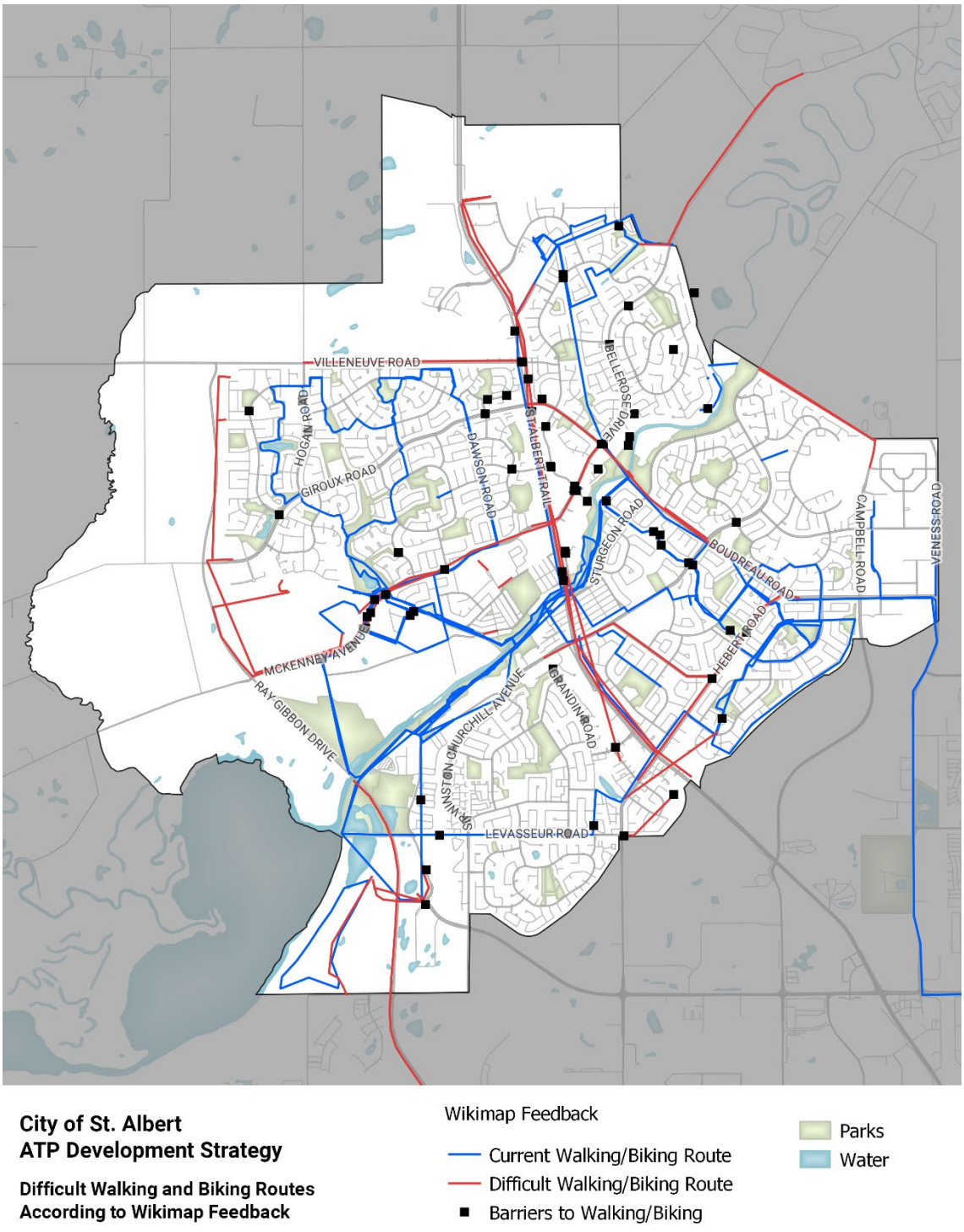


Figure 3-7
WikiMap Feedback Relating to Routes and Barriers

3.3.2.5 Travel Patterns and How They Are Useful

WikiMap feedback and the Household Travel Survey provided data on walking and bicycling behaviours, destinations via all modes, trip purposes, and relevant household characteristics. This data can ultimately be used by the City to help identify targeted groups for outreach, develop performance measures, and, in combination with results of the BNA, develop specific goals for areas that are underserved or are more likely to walk or bike.

Owing to the existing trail system, according to the WikiMap input, almost 50 per cent of respondents currently walk or bike daily for recreation. Approximately 26% of respondents walk or bike daily for transportation. According to the Household Travel Surveys, 85 per cent of trips are currently made by car, while only approximately six per cent of trips are made by walking and biking.

Distances between origins and destinations from the Household Travel Survey demonstrate the potential for converting driving trips to walking or bicycling. Out of all trips (excluding recreation), 19 per cent were less than approximately a 15-minute walk (one km) and 60 per cent were less than a 15-minute bicycle ride (four km).

The Household Travel Survey demonstrates the highest demand destinations in the following areas:

- Servus Place
- Grocery stores and shopping centres at the intersection of McKenney Avenue and St. Albert Trail
- Bellerose High School, Larose Park, Lacombe Park
- Shopping centre at intersection of Villeneuve Road and St. Albert Trail
- Costco located off St. Albert Trail (north end)

The analysis of travel patterns can be overlaid with the BNA to understand the need for improvements in areas with poor connectivity by low-stress infrastructure. Almost all these high demand destinations are in areas with low BNA scores representing a need for improved active transportation infrastructure to ensure these destinations can be reached by walking and bicycling.

In addition, special attention should also be paid to providing active transportation infrastructure in areas with higher percentages of zero-car households. These roads or areas include Dawson Road, east of Sturgeon Road, and West of Hebert Road.

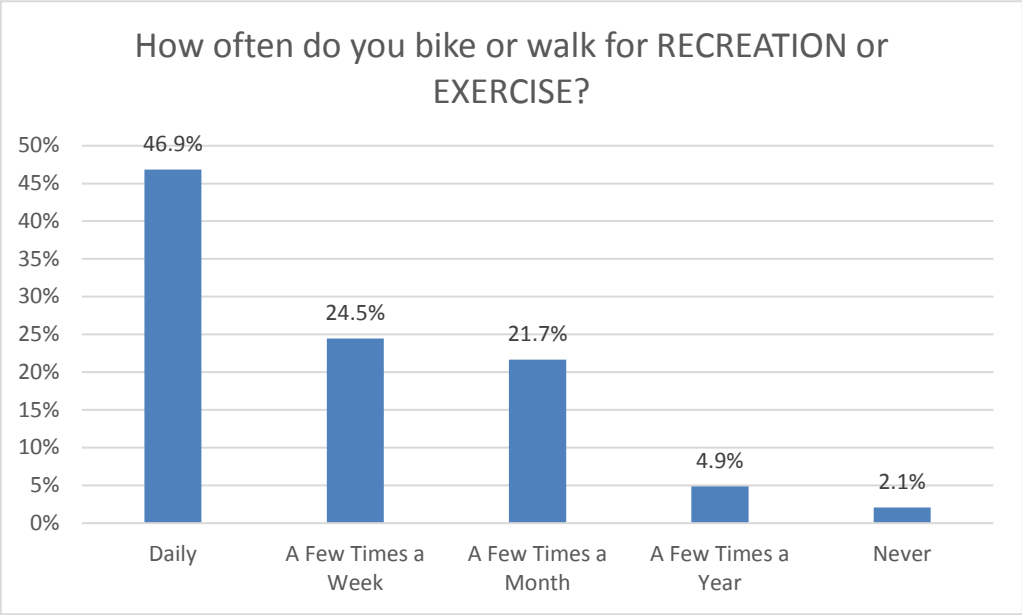


Table 3-7
Walking and Biking for Recreation or Exercise

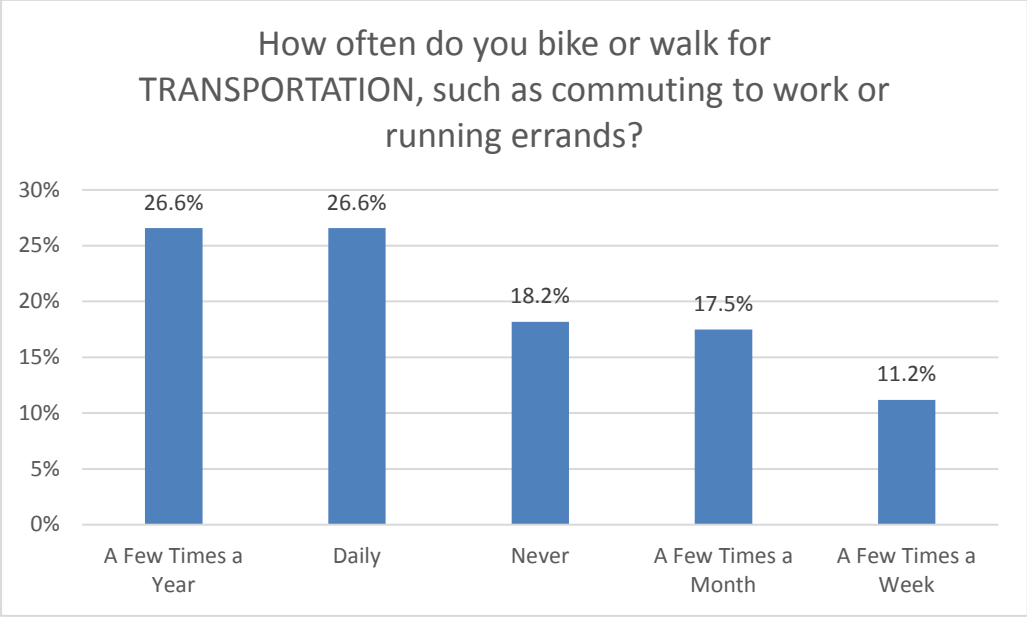


Table 3-8
Walking and Biking for Transportation

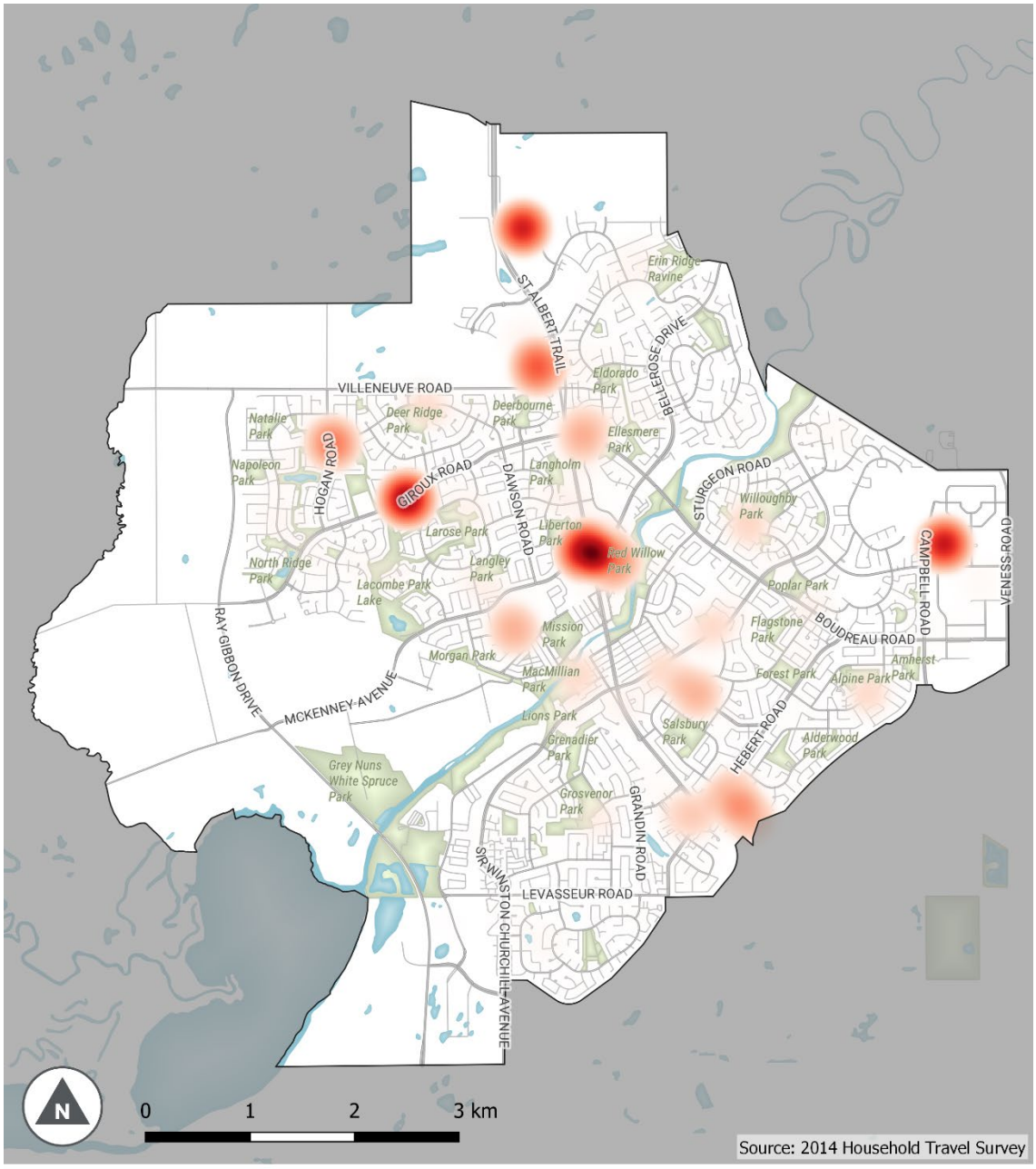


Figure 3-8
Household Travel Survey Destinations

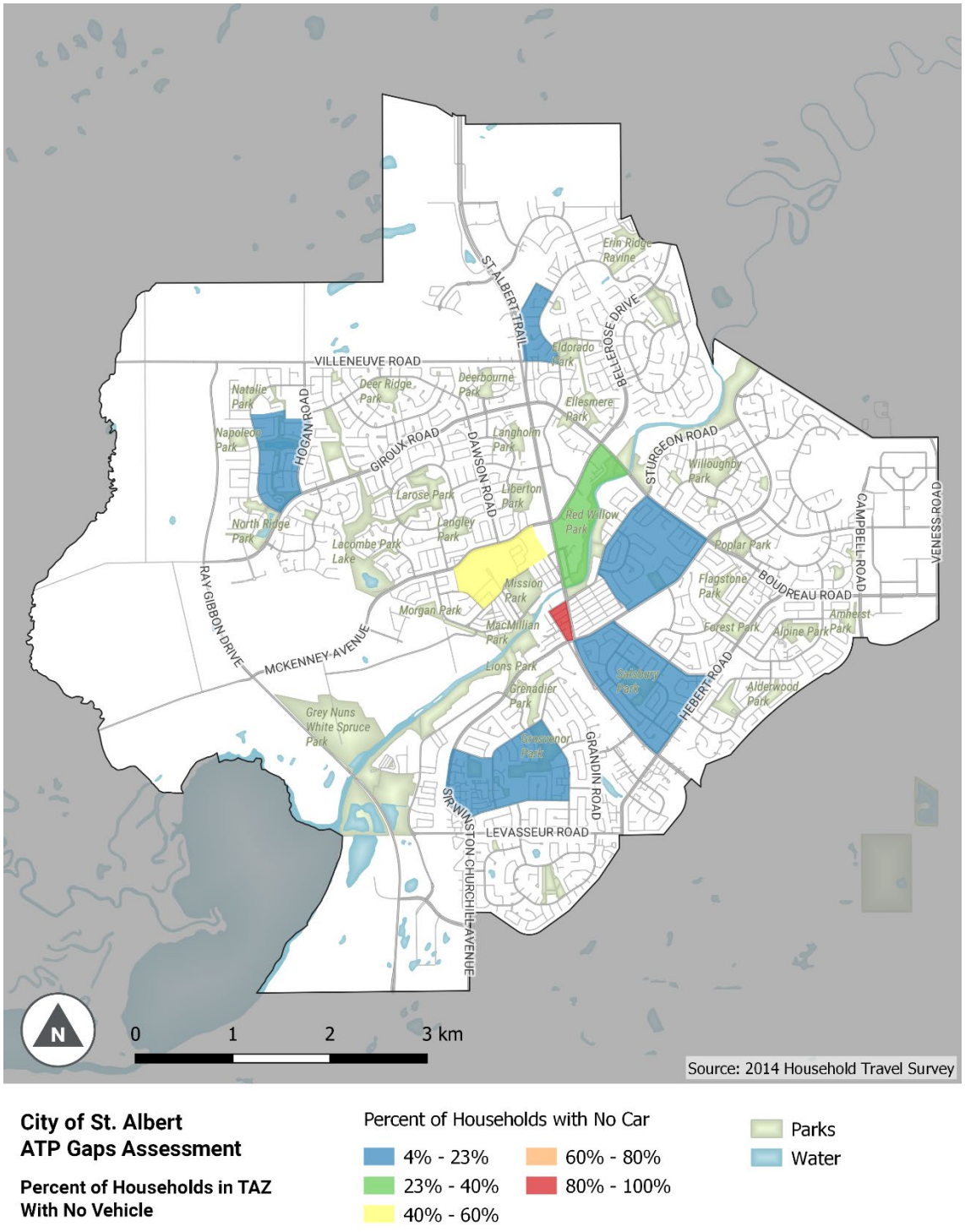


Figure 3-9
Percent of Households with No Car by Traffic Analysis Zone

3.3.2.6 Aggregated Gaps

The analyses outlined in the Methodology and Results sections were factored into the development of a consolidated map showing Aggregated Gaps. These Aggregated Gaps represent locations and opportunities for projects that would improve the connectivity and safety of the active transportation network in St. Albert. Results relating to travel patterns, destinations, household characteristics, will facilitate prioritization of projects, along with the prioritization factors introduced in the next section. The Aggregated Gaps in Figure 3-10 display the following elements:

- Walking-related gaps
  - Roadways with a sidewalk on only one or neither side
- Bicycling-related gaps
  - Roadways scored as LTS 3 or 4
- Gaps with both walking and bicycling factors
  - LTS 3 or 4 and sidewalk on only one or neither side

St. Albert's current active transportation network has a robust foundation of trail alignments which follow the river and branch off to reach schools and neighbourhoods but reaching these trails from other neighbourhoods is inhibited by existing high-stress roadways that prevent both east-west and north-south connections. Routes parallel to the river and to St. Albert Trail will provide direct connections to clusters of low-stress neighbourhood routes with parks and schools as well as high-demand destinations along St. Albert Trail. Intersection improvements at key locations will help to overcome walking and bicycling barriers that end up isolating neighbourhoods from crossing these wide, high-volume and higher-speed roadways. Lastly, key trail crossings and locations of trail gaps will need to be addressed in order to make the entire active transportation network reliable.

The next section of the report provides a framework to approach project prioritization consistent with the pedestrian and bicycle network planning principles and the active transportation plan vision defined in previous sections.

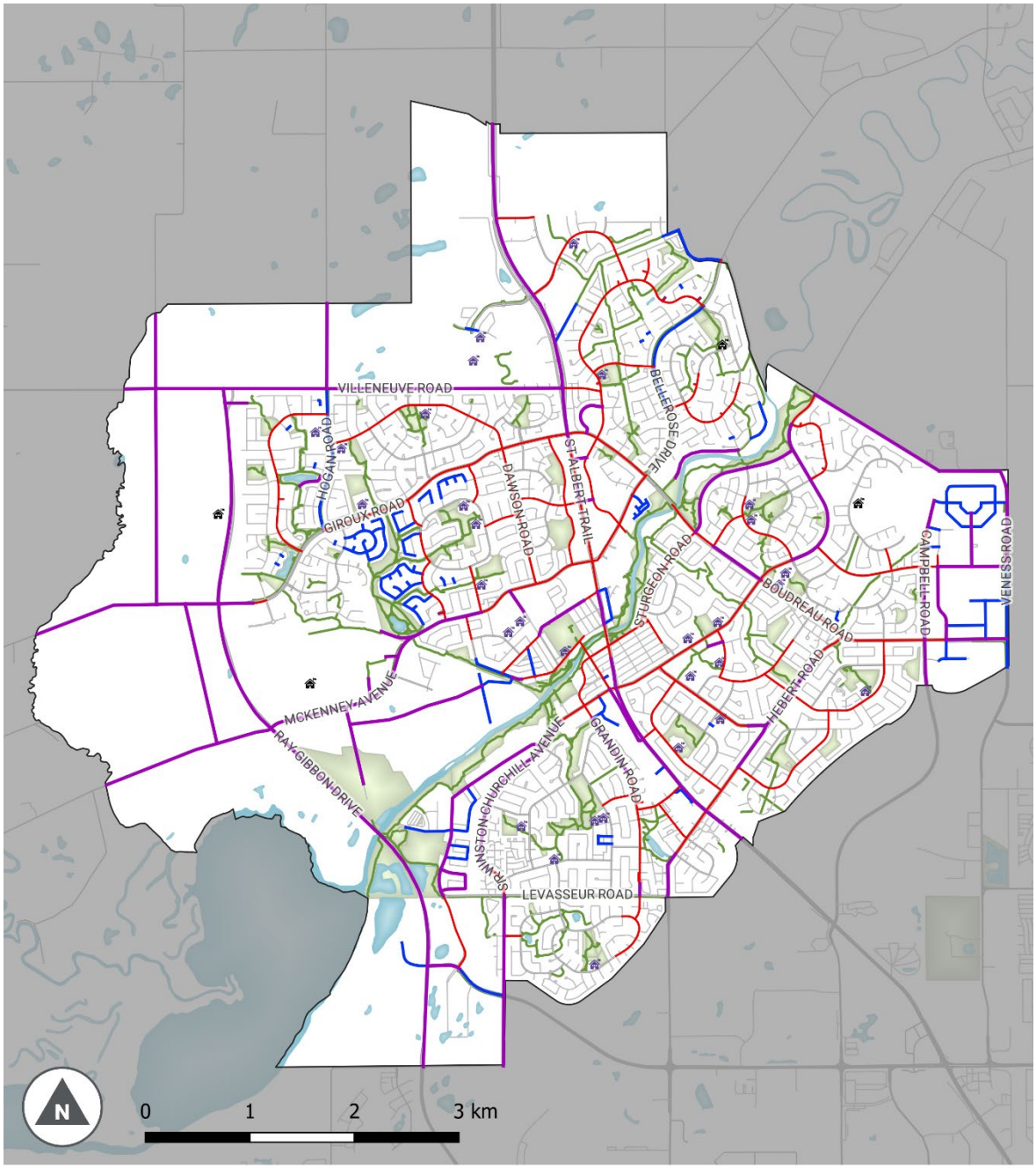


Figure 3-10
Aggregated Gaps

3.4 PRIORITIZATION & RECOMMENDATIONS

The Aggregated Gaps map reveals that high-stress roadways for bicycling are also roadways that function as main crosstown and local connectors within St. Albert. The structure of St. Albert's roadway network provides few options for parallel low-stress routes to avoid these roadways. Using best practices in bicycle network development, it will therefore be necessary for the City to work with the existing roadway network to understand how it can be best translated into one that provides safe and comfortable active transportation options. At the same time, the high-stress roadways also present barriers to walking, particularly at major arterials such as St. Albert Trail, and there are also streets currently undergoing urbanization, such as Ray Gibbon Drive, that are completing lacking sidewalks or trails.

A network philosophy that conveys the intentions of each of these roadways for pedestrians and bicyclists can be used to frame prioritization and implementation of active transportation improvements. Moreover, the St. Albert Complete Streets Guidelines and Implementation Strategy identifies typologies and suggested cross sections for the road network that can be applied and adapted to fit the active transportation needs identified through the analyses documented as part of the ATP Gaps Assessment.

3.4.1 Network Philosophy

St. Albert has the basis for developing and improving an active transportation network using a "Spine," "Rib," and "Neighbourhood Connector" structure as outline in the below figure. The figure also illustrates the location of critical intersections that have been noted as barriers by the public, connect to major destinations, or have past history of crashes.

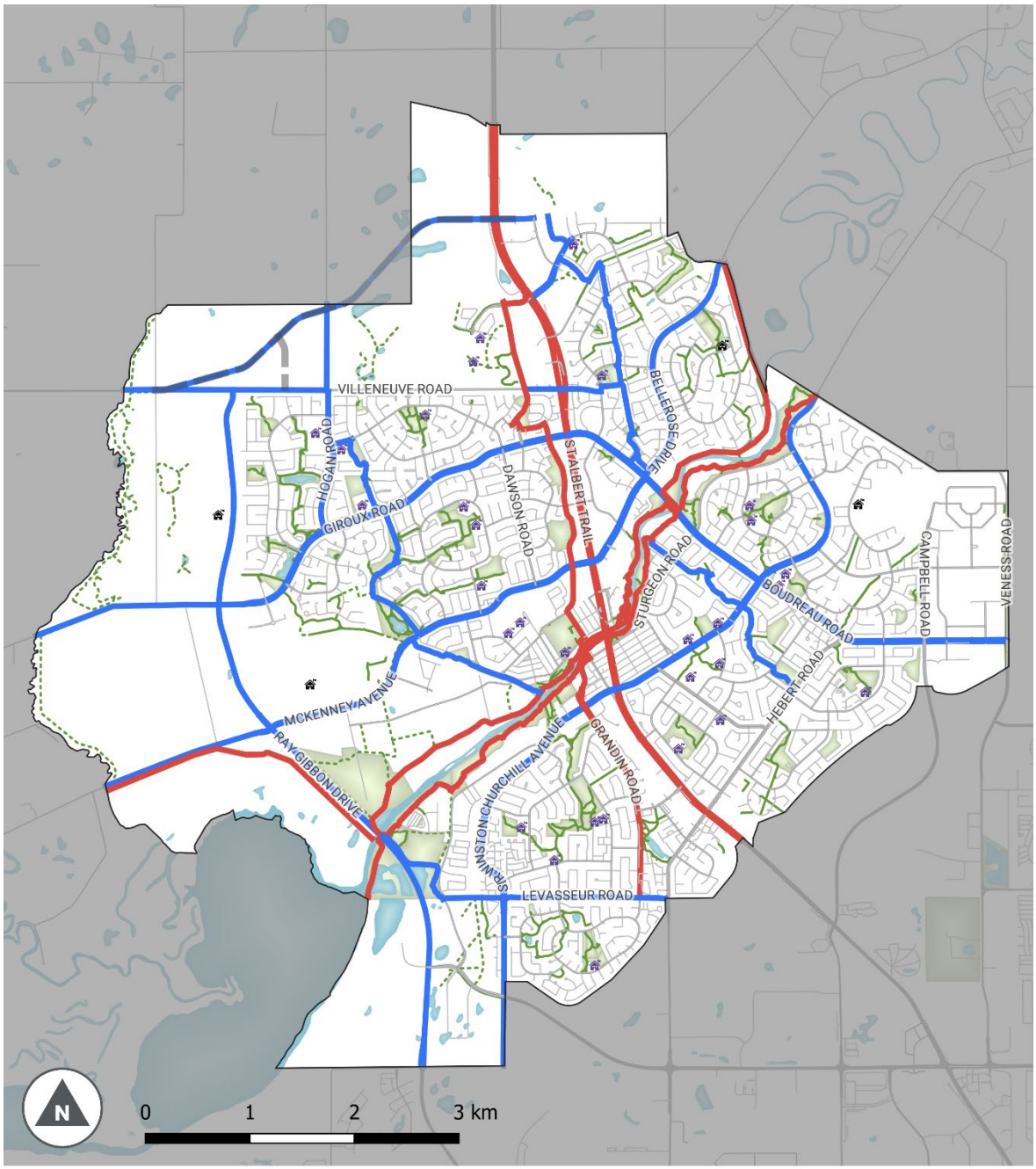


Figure 3-11
ATP Priority Network Map

3.4.1.1 Spine Routes

- What it is: Shared use paths or trails following linear corridors along largely uninterrupted routes across large sections of a community. Spine routes frequently rely on rail, utility, or river corridors.
- Trips Accommodated: Since the spine routes are generally fully separated from motor vehicle traffic, it accommodates a wide range of users, including children and seniors; however, connectivity to destinations is often limited, reducing usefulness for transportation trips such as shopping or commuting to school or work.
- Current Conditions: St. Albert has an existing spine route along the Sturgeon River.
- How this relates to the Plan: This existing spine, if well-maintained, can provide an essential corridor that the rest of the network feeds into and out of. An additional north-south spine, even if not as direct due to constraints, will be necessary for improving both local and regional connections. St. Albert Trail, with its high demand destinations and central location, would be a logical location for the north-south spine; however, the frequency of driveways and poor public realm/built environment pose challenges that may require a parallel route as an alternate such as Grandin Road/Liberton Drive. St. Albert Trail is designated as a Boulevard Street in the Complete Streets Guidelines and Implementation Strategy. The Transportation Master Plan includes the Sturgeon River Trail as a City-Wide Primary Route.

3.4.1.2 Rib Routes

- What it is: While the spine routes support uninterrupted longer-distance trips, rib routes provide connections to major community destinations. The ribs are often on-street facilities connecting to a trail-based spine but may also be in the form of off-street trails.
- Trips Accommodated: The rib routes enhance the spine routes by providing transportation (not just recreational) connections to and from the spines.
- Current Conditions: While some trail alignments branch off the main Sturgeon River trail corridor, roadways with the potential to function as ribs are currently high-stress and are crossed by other high-stress roadways.
- How this relates to the Plan: The following roadways could function as rib routes: Giroux Road, Boudreau Road, McKenney Avenue, Bellerose Drive, Sir Winston Churchill Avenue, Ray Gibbon Drive, and Fowler Way. Most ribs are designated as Crosstown Streets in the Complete Streets Guidelines and Implementation Strategy except for Ray Gibbon Drive, which is a Boulevard. The Transportation Master Plan defines most of these corridors as City-Wide Primary Routes with some defined as Connector Secondary Routes and making use of the existing Red Willow Park Trail System.

3.4.1.3 Neighbourhood Routes

- What it is: Local, low-stress streets between rib and spine routes that feature wayfinding and traffic calming and provide direct access to local destinations.
- Trips Accommodated: Short walking and bicycling trips to schools, other homes, and to rib routes or spine routes for longer trips.

- Current Conditions: Schools and parks in St. Albert are generally found on these quiet streets that currently serve as neighbourhood routes. The issue is getting from one neighbourhood to another, as they are currently isolated by high-stress roadways.
- How this relates to the Plan: Safe Journeys to School can help improve the active transportation environment in the immediate vicinities while facilitating access to the ribs and spines. Neighbourhood Routes are typically designated as Connector or Neighbourhood Streets in the Complete Streets Guidelines and Implementation Strategy. The Transportation Master Plan defines most neighbourhood routes as Connector Secondary Routes or as part of the Red Willow Park Trail System.

3.4.1.4 Barrier Busting

In addition to the network structure, St. Albert will require an approach that facilitates the continuity of this network structure. A “Barrier Busting” approach places focus on overcoming barriers, such as highways, arterial roadways, railroad tracks, and rivers that discourage daily walking and bicycling trips. By addressing the largest barriers in a community, this approach has the potential to connect communities and their clusters of low-stress neighbourhood streets and regional trails and increase the potential for more active transportation and recreation trips.

3.4.2 Prioritization Approaches

The following approaches can be used to implement the active transportation network structure, remove barriers, and create a safe and comfortable active transportation network for all ages and abilities.

3.4.2.1 Intersection Safety

Intersections along St. Albert Trail should be prioritized, with special attention paid to those with spine and rib route crossings. Improving safety at key intersections will be critical for developing a connected bicycle network along the current high-stress routes and making it possible for pedestrians to safely reach all destinations. In general, the most effective treatments are those that reduce vehicle speeds and those that reduce the pedestrian and bicyclist exposure to vehicle traffic as outlined in the St. Albert Transportation Safety Plan.

3.4.2.2 Safe Journeys to School

Projects within and near Safe Journeys to School projects identified in the 2018 Implementation Plan should also be prioritized. Given the high density of schools in St. Albert, active transportation infrastructure within a ten-minute bicycle ride and a ten-minute walk to/from each school in a community can be used to develop a well-connected city-wide network.

3.4.2.3 Safe Journeys to Transit

A similar methodology should be applied to transit stops. Bicycling and walking facilities can expand the "catchment area" for transit service. As with schools, connecting bikeways and sidewalks to bus stops and transit centres will result in good network coverage, mutually benefiting active transportation and transit.

3.4.2.4 Overlapping Projects

Projects in adopted and proposed project charters should factor into their scopes the active transportation gaps outlined in the Aggregated Gaps map. For example, arterial and collector intersection improvements, neighbourhood traffic calming strategies, the sidewalk program, and arterial or collector street design and construction projects (e.g., Fowler Way, Ray Gibbon Drive, St. Albert Trail) that are funded between 2019 and 2028 should be assessed for integration with the ATP Network and Gaps Assessment.

3.4.2.5 Equity

Locations with relatively high concentrations of zero-car households should be prioritized for active transportation connections, as this demographic is among the most likely to not only desire active transportation options but require them for basic transportation mobility and access. The areas with the highest percentage of zero-car households are:

- The Inglewood neighbourhood south of McKenney Avenue
- Mission neighbourhood east of Malmo Avenue and north of St. Vital Avenue
- Sturgeon Heights neighbourhood, the Braeside neighbourhood east of Bishop Street
- Grandin neighbourhood west of Grosvenor Boulevard, north of Gainsborough Avenue, and south of Grenfell Avenue/Gatewood Avenue

3.4.3 Recommended Priorities

The ATP Gaps Assessment has evaluated the existing gaps and barriers in St. Albert's active transportation network. The safety, connectivity, and comfort gaps for bicycling and walking in the city form a network that, when coupled with the existing trail system and extensive sidewalk network, is very consistent with the findings of other strategic plans including the Transportation Master Plan and the Complete Streets Guidelines and Implementation Strategy. The following presents recommendations based on the previous sections of this report and by applying the prioritization approaches outlined above to the ATP Priority Network Map and the ATP Aggregated Gaps Map. The following figure illustrates the prioritization of the gaps and additions to the cycling network.

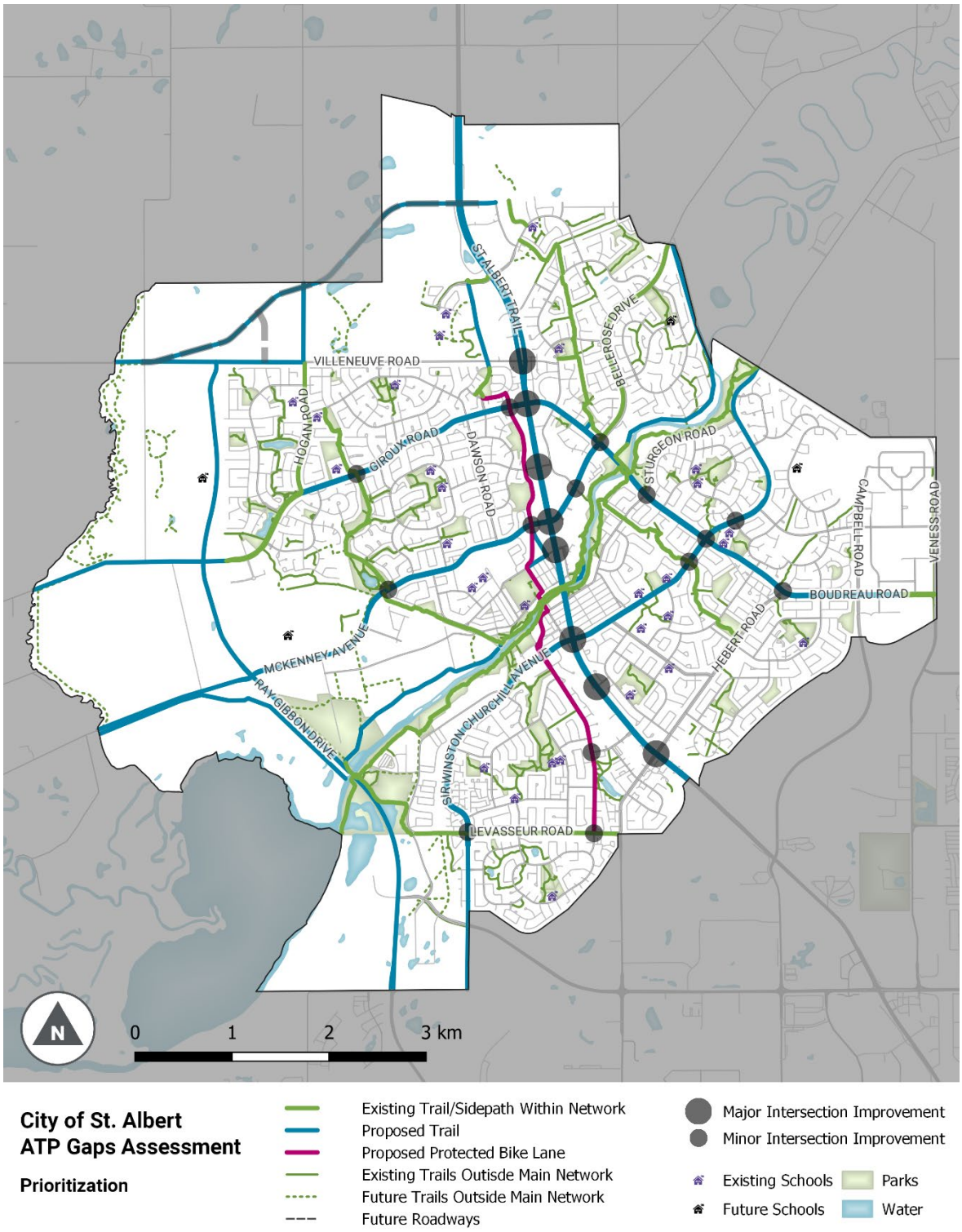


Figure 3-12
ATP Recommended Priorities

3.4.3.1 Sidewalks, Trails, Bicycle Routes

The sidewalk network is significant and there are few existing gaps in the network. Likewise, the existing trail system, along the Sturgeon River and the Red Willow Park Trail System, is extensive and provides useful recreational trips and some transportation trips. The following actions should be taken:

1. Implement the priority spine and rib routes and coordinate with other capital projects, where possible, or through an Active Transportation Plan Implementation program (ENGS-068). The initial priorities are as follows based on the considerations outlined in the Prioritization section of this report:
   - Complete Studies for facilities along St. Albert Trail, Fowler Way, and Ray Gibbon Drive
   - Design and Construct Facilities along:
     - St. Albert Trail (or parallel alternate north-south route, e.g., Grandin Road/St. Anne Street/Perron Street/Mission Avenue/Muir Drive/Liberton Drive)
     - McKenney Avenue/Bellerose Drive
     - Sir Winston Churchill Avenue
     - Giroux Road/Boudreau Road
     - Hogan Road

2. Complete a full safety audit and functionality analysis of the existing trail network to identify and verify gaps and barriers identified by the public during the ATP Gaps Assessment via the WikiMap site. Gaps that can be addressed through maintenance and rehabilitation may be able to be incorporated as part of the Multi-Use Trail Rehab Program (ENGS-006) and Sidewalk Program (ENGS-007) if they relate to the safety or accessibility of existing sidewalks/trails.

3. Add sidewalk and trails to all major collector and arterial street construction and rehabilitation projects including projects completed by the private sector (e.g., land development). This includes arterials and collectors in new neighbourhoods. Example capital projects that should incorporate the ATP Gaps Assessment and Network Map findings include Ray Gibbon Drive Improvements (ENGS-074), Fowler Way Design and Contract (ENGS-073), Villeneuve Road Rebuild (ENGS-075), and North St. Albert Trail Corridor Management (ENGS-070).

4. Implement walking and bicycling projects that serve local destinations through existing capital programs such as the Safe Journey to School Implementation Strategies (ENGS-063), Neighbourhood Traffic Calming Strategies (ENGS-058), and Local Roadway (ENGS-003). Use the following priority order:
   - Missing Sidewalks within 400m of a School or adjacent to Transit Stops
   - Missing Sidewalks not within 400m of a School or adjacent to Transit Stops

5. Coordinate with the City of Edmonton, Sturgeon County and Alberta Transportation to improve active transportation connectivity to/from Edmonton, Sturgeon County and Anthony Henday Drive.

3.4.3.2 Intersections and Crossings

In addition to corridor-based projects, safety improvements and removing barriers to walking and bicycling should be applied at intersections or midblock crossings. These projects may be advanced and implemented prior to full corridor projects, for example constructing a multi-use trail, to address more immediate concerns related to safety.

1. Complete safety audits of intersections along the spine and rib routes to identify countermeasures that will improve the safety and comfort of people walking and bicycling across the intersections. Example capital projects/programs that could implement the findings include Arterial and Collector Intersection Improvements (ENGS-054), Transportation Systems Management (ENGS-008), and ITS Strategy Implementation (ENGS-069). Immediate priorities should focus on intersections along the following corridors (23 intersections in total):

    - St. Albert Trail
    - McKenney Avenue/Bellerose Drive
    - Sir Winston Churchill Avenue
    - Boudreau Road
    - Hebert Road

2. Address walking and bicycling safety gaps/barriers as part of all major collector and arterial street construction and rehabilitation projects. Example capital projects that should be used to improve intersection safety include Ray Gibbon Drive Improvements (ENGS-074), Fowler Way Design and Contract (ENGS-073), Villeneuve Road Rebuild (ENGS-075), and North St. Albert Trail Corridor Management (ENGS-070).

3. Implement walking and bicycling safety improvements at intersections and midblock crossings that serve local destinations through existing capital programs such as Permanent Line Marking (ENGS-005), Safe Journey to School Implementation Strategies (ENGS-063) and Neighbourhood Traffic Calming Strategies (ENGS-058).

3.4.3.3 Accessibility

The ATP Gaps Assessment focused analysis of gaps on those related to sidewalks, trails, bicycle routes, and intersection safety. The scope of the analysis did not include evaluation of accessibility of the active transportation network.

The City of St. Albert's Universal Access Plan provides recommendations and actions to improve the accessibility of the community. We recommend an accessibility review be completed for the entire pedestrian network, including its connections to the transit system at bus stops and transit centres by completing the following three steps.

1. Create and adopt universal design standards. As identified in the City of St. Albert Universal Access Guide, the City of Burlington's Accessibility Design Standards is a good resource. The creation and adoption of standards could be included in the Municipal Engineering Standards Update project (ENGS-072);

2. Complete a city-wide walkability and accessibility audit for the active transportation network. The scope of the audit would include identifying the location of intersections with missing curb ramps, inaccessible bus stops, and sidewalks and trails with poor condition ratings that would impact accessibility.

3. Update the short- and long-term capital project lists and incorporate accessibility infrastructure into existing capital funding programs/projects.

3.4.4 Cost Estimates

The tables on the following pages illustrates the estimated costs for concrete sidewalks associated with closing the gaps on various routes. The low and high ranges are shown for each of the locations. The routes are shown in the following order:

- Transit within 10 m and school within 400 m
- Transit within 10 m and school outside 400 m
- Transit outside 10 m and school within 400 m
- Transit outside 10 m and school outside 400 m

The table for the Gaps Assessment Cost Estimate for Paved Trails follows. This illustrates the estimated costs for trails and displays the low and high ranges for each location.

Note: The cost estimates are subject to change based on inflation and/or market fluctuations; the estimates do not include detailed design cost, mobilization charge or replacement charge.

Gaps Assessment Cost Estimate - Sidewalks

PHASING	STREET	TYPE	FROM STREET	TO STREET	NEIGHBOURHOOD	LENGTH (M)	SIDEWALK WIDTH (M)*	SIDEWALK	SCHOOL WITHIN 400 M	TRANSIT WITHIN 10 M	COST ESTIMATE ($) LOW	COST ESTIMATE ($) HIGH
											$ 25,050,000	**$ 29,971,000**
Short-Term	MISSION PLACE	R	ST VITAL AVENUE	MURAL CRESCENT	Mission	159.0	1.8	N	within 400 m	Yes	$ 35,756	$ 42,781
	ST ALBERT TRAIL	AR	STERLING STREET	SIR WINSTON CHURCHILL AVENUE	Arterial	59.7	2.2	N	within 400 m	Yes	$ 16,417	$ 19,643
Short-Term	MCKENNEY AVENUE	AR	LAYDON DRIVE	MISSION AVENUE	Arterial	174.5	2.2	S	within 400 m	Yes	$ 47,970	$ 57,395
	MISSION AVENUE	C	ST VITAL AVENUE	MALMO AVENUE	Mission	108.9	1.8	S	within 400 m	Yes	$ 24,494	$ 29,307
Short-Term	SIR WINSTON CHURCHILL AVENUE	AR	SIR WINSTON CHURCHILL AVENUE	GATEWOOD AVENUE	Arterial	655.2	2.2	S	within 400 m	Yes	$ 180,096	$ 215,481
	CUNNINGHAM ROAD	AR	STANLEY DRIVE	HEBERT ROAD	Arterial	243.1	2.2	S	within 400 m	Yes	$ 66,816	$ 79,944
Short-Term	HOGAN ROAD	AR	GIROUX ROAD	DELWOOD PLACE	Arterial	505.8	2.2	S	within 400 m	Yes	$ 139,049	$ 166,369
	HOGAN ROAD	AR	DELWOOD PLACE	DEER RIDGE DRIVE	Arterial	324.1	2.2	S	within 400 m	Yes	$ 89,082	$ 106,585
Short-Term	ST VITAL AVENUE	C	MADONNA DRIVE	MOUNT ROYAL DRIVE	Mission	738.4	1.8	S	within 400 m	Yes	$ 166,081	$ 198,712
										Total Estimated Cost	**$ 765,800**	**$ 916,300**
Short-Term	ST ALBERT TRAIL	AR	STERLING STREET	SIR WINSTON CHURCHILL AVENUE	Arterial	492.2	2.2	N	not within 400 m	Yes	$ 135,308	$ 161,893
	RIEL DRIVE	C	ROWLAND CRESCENT	RENAULT CRESCENT	Riel Business Park	121.5	1.8	N	not within 400 m	Yes	$ 27,320	$ 32,688
Short-Term	RIEL DRIVE	C	RAYBORN CRESCENT	ROWLAND CRESCENT	Riel Business Park	148.2	1.8	N	not within 400 m	Yes	$ 33,332	$ 39,881
	RIEL DRIVE	C	ROWLAND CRESCENT	ROWLAND CRESCENT	Riel Business Park	121.5	1.8	N	not within 400 m	Yes	$ 27,331	$ 32,701
Short-Term	RIEL DRIVE	C	RAYBORN CRESCENT	RODEO DRIVE	Riel Business Park	477.1	1.8	N	not within 400 m	Yes	$ 107,314	$ 128,398
	RIEL DRIVE	C	SIR WINSTON CHURCHILL AVE	RAYBORN CRESCENT	Riel Business Park	850.3	1.8	N	not within 400 m	Yes	$ 191,248	$ 228,824
Short-Term	CORRIVEAU AVENUE	AR	CHEVIGNY STREET	VENESS ROAD	Arterial	333.9	2.2	N	not within 400 m	Yes	$ 91,783	$ 109,816
	CORRIVEAU AVENUE	AR	CARNEGIE DRIVE	CHEVIGNY STREET	Arterial	325.2	2.2	N	not within 400 m	Yes	$ 89,400	$ 106,966
Short-Term	LAYDON DRIVE	R	LAYDON DRIVE	LAYDON DRIVE	Lacombe Park	49.9	1.8	N	not within 400 m	Yes	$ 11,229	$ 13,436
	CARNEGIE DRIVE	C	CHISHOLM AVENUE	CORRIVEAU AVENUE	Campbell Business Park	588.2	1.8	N	not within 400 m	Yes	$ 132,297	$ 158,290
Short-Term	STURGEON ROAD	AR	WOODLANDS ROAD	SIR WINSTON CHURCHILL AVE	Arterial	319.6	2.2	N	not within 400 m	Yes	$ 87,860	$ 105,123
	RIEL DRIVE	C	RENAULT CRESCENT	RENAULT CRESCENT	Riel Business Park	217.2	1.8	N	not within 400 m	Yes	$ 48,846	$ 58,443
Short-Term	HEBERT ROAD	AR	ARLINGTON DRIVE	CUNNINGHAM ROAD	Arterial	967.3	2.2	S	not within 400 m	Yes	$ 265,910	$ 318,155
	HEBERT ROAD	AR	CUNNINGHAM ROAD	AKINS DRIVE	Arterial	779.7	2.2	S	not within 400 m	Yes	$ 214,337	$ 256,449
Short-Term	MISSION AVENUE	C	ST VITAL AVENUE	MALMO AVENUE	Mission	494.9	1.8	S	not within 400 m	Yes	$ 111,303	$ 133,172
	MISSION AVENUE	C	MEADOWVIEW DRIVE	ST VITAL AVENUE	Mission	212.5	1.8	S	not within 400 m	Yes	$ 47,804	$ 57,197
Short-Term	GRANDIN ROAD	AR	GLEN MEADOW CRESCENT	GLEN MEADOW CRESCENT	Arterial	545.4	2.2	S	not within 400 m	Yes	$ 149,933	$ 179,392
	BOUDREAU ROAD	AR	CHATELAIN DRIVE	CARNEGIE DRIVE	Arterial	752.7	2.2	S	not within 400 m	Yes	$ 206,897	$ 247,547
Short-Term	CARNEGIE DRIVE	C	BOUDREAU ROAD	CHISHOLM AVENUE	Campbell Business Park	269.6	1.8	S	not within 400 m	Yes	$ 60,643	$ 72,558
	SIR WINSTON CHURCHILL AVENUE	AR	KINGSWOD DRIVE	STURGEON ROAD	Arterial	664.9	2.2	S	not within 400 m	Yes	$ 182,785	$ 218,698
Short-Term	SIR WINSTON CHURCHILL AVENUE	AR	POIRIER AVENUE	KINGSWOOD DRIVE	Arterial	659.8	2.2	S	not within 400 m	Yes	$ 181,374	$ 217,010
	HOGAN ROAD	AR	GIROUX ROAD	NELSON COURT	Arterial	458.3	2.2	S	not within 400 m	Yes	$ 125,980	$ 150,733
Short-Term	HOGAN ROAD	AR	NELSON COURT	DUNFIELD CRESCENT	Arterial	122.5	2.2	S	not within 400 m	Yes	$ 33,675	$ 40,292
	RIVERCREST CRESCENT	C	ST ALBERT TRAIL	ST ALBERT TRAIL	Inglewood	824.1	1.8	S	not within 400 m	Yes	$ 185,338	$ 221,753
Short-Term	GERVAIS ROAD	AR	GOODRIDGE DRIVE	LEVASSEUR ROAD	Arterial	851.0	2.2	S	not within 400 m	Yes	$ 233,941	$ 279,905
											$ 2,984,000	**$ 3,570,000**
Long-Term	LASALLE POINTE	R	LEONARD DRIVE	LASALLE POINTE	Lacombe Park	58.1	1.8	N	within 400 m	No	$ 13,063	$ 15,630
	MCKENNEY AVENUE	AR				700.3	2.2	N	within 400 m	No	$ 192,506	$ 230,329
Long-Term	VILLENEUVE ROAD	AR	ST ALBERT TRAIL	DENNISON DRIVE	Arterial	916.8	2.2	N	within 400 m	No	$ 252,020	$ 301,537
	NORTHSTAR CLOSE	R			North Ridge	52.6	1.8	N	within 400 m	No	$ 11,830	$ 14,154
Long-Term	LARKSPUR CRESCENT	R	LARKSPUR CRESCENT	LARKSPUR CRESCENT	Lacombe Park	78.5	1.8	N	within 400 m	No	$ 17,660	$ 21,129
	LUCINDA TERRACE	R	LEONARD DRIVE	LUCINDA TERRACE	Lacombe Park	52.7	1.8	N	within 400 m	No	$ 11,860	$ 14,191
Long-Term	LARKSPUR CRESCENT	R	LARKSPUR CRESCENT	LARKSPUR CRESCENT	Lacombe Park	39.6	1.8	N	within 400 m	No	$ 8,914	$ 10,665
	LEONARD DRIVE	R	LEONARD DRIVE	LEONARD DRIVE	Lacombe Park	25.0	1.8	N	within 400 m	No	$ 5,631	$ 6,737
Long-Term	GRENIER PLACE	R	ST ALBERT TRAIL	GRENIER PLACE	Grandin	108.3	1.8	N	within 400 m	No	$ 24,352	$ 29,136
	HOGAN ROAD	R	STURGEON RIVER	MEADOWVIEW DRIVE	Arterial	312.6	1.8	N	within 400 m	No	$ 70,304	$ 84,117
Long-Term	GARDEN CRESCENT	R	GROSVENOR BOULEVARD	GARDEN CRESCENT	Grandin	130.2	1.8	N	within 400 m	No	$ 29,295	$ 35,050
	GARDEN CRESCENT	R	GROSVENOR BOULEVARD	GARDEN CRESCENT	Grandin	128.8	1.8	N	within 400 m	No	$ 28,973	$ 34,666
Long-Term	GARDEN CRESCENT	R	GARDEN CRESCENT	GARDEN CRESCENT	Grandin	72.4	1.8	N	within 400 m	No	$ 16,289	$ 19,489
	HOGAN ROAD	R	MEADOWVIEW DRIVE	McKENNEY AVENUE		175.8	1.8	N	within 400 m	No	$ 39,534	$ 47,301
Long-Term	NOBLE CLOSE	R	NORTH RIDGE DRIVE	-	North Ridge	41.3	1.8	N	within 400 m	No	$ 9,283	$ 11,106
	NEIL ROSS ROAD	AR	ELEMENT DRIVE NORTH		Erin Ridge North	222.2	2.2	N	within 400 m	No	$ 61,068	$ 73,066
Long-Term	MEADOWVIEW DRIVE	C	HOGAN ROAD	MEADOWVIEW LANE	TIMBERLEA	430.5	1.8	N	within 400 m	No	$ 96,826	$ 115,850
	STURGEON ROAD	AR	WOODLANDS ROAD	SIR WINSTON CHURCHILL AVE	Arterial	160.3	2.2	N	within 400 m	No	$ 44,057	$ 52,714

Gaps Assessment Cost Estimate - Sidewalks

PHASING	STREET	TYPE	FROM STREET	TO STREET	NEIGHBOURHOOD	LENGTH (M)	SIDEWALK WIDTH (M)*	SIDEWALK	SCHOOL WITHIN 400 M	TRANSIT WITHIN 10 M	COST ESTIMATE ($) LOW	COST ESTIMATE ($) HIGH
Long-Term	NEWPORT CRESCENT	R	NEWMARKET WAY	NEWMARKET WAY	North Ridge	35.4	1.8	N	within 400 m	No	$ 7,960	$ 9,524
	LORRAINE CRESCENT	R	LORRAINE CRESCENT	LORRAINE CRESCENT	Lacombe Park	50.6	1.8	N	within 400 m	No	$ 11,384	$ 13,621
Long-Term	LORRAINE CRESCENT	R	LORRAINE CRESCENT	LORRAINE CRESCENT	Lacombe Park	50.6	1.8	N	within 400 m	No	$ 11,382	$ 13,619
	VILLENEUVE ROAD	AR	DENNISON DRIVE	HOGAN ROAD	Arterial	156.4	2.2	N	within 400 m	No	$ 42,992	$ 51,439
Long-Term	ST ALBERT TRAIL	AR	VILLENEUVE ROAD	EDGE OF CITY	Arterial	158.9	2.2	N	within 400 m	No	$ 43,689	$ 52,273
	LORRAINE CRESCENT	R	LORRAINE CRESCENT	LORRAINE CRESCENT	Lacombe Park	451.2	1.8	S	within 400 m	No	$ 101,479	$ 121,417
Long-Term	LUCERNE CRESCENT	R	LUCERNE CRESCENT	LUCERNE CRESCENT	Lacombe Park	228.1	1.8	S	within 400 m	No	$ 51,295	$ 61,374
	BELLEROSE DRIVE	AR	OAKLAND WAY	ERIN RIDGE DRIVE	Arterial	140.9	2.2	S	within 400 m	No	$ 38,731	$ 46,340
Long-Term	LODGEPOLE CRESCENT	R	LODGEPOLE CRESCENT	LODGEPOLE CRESCENT	Lacombe Park	453.5	1.8	S	within 400 m	No	$ 101,990	$ 122,029
	MCKENNEY AVENUE	AR				119.8	2.2	S	within 400 m	No	$ 32,931	$ 39,401
Long-Term	SIR WINSTON CHURCHILL AVENUE	AR	POIRIER AVENUE	KINGSWOOD DRIVE	Arterial	755.6	2.2	S	within 400 m	No	$ 207,701	$ 248,510
	LEONARD DRIVE	R	L'HINRONDELLE COURT	LARONGE WAY	Lacombe Park	216.5	1.8	S	within 400 m	No	$ 48,687	$ 58,253
Long-Term	SIR WINSTON CHURCHILL AVENUE	AR	PARK AVENUE	POIRIER AVENUE	Arterial	543.5	2.2	S	within 400 m	No	$ 149,412	$ 178,768
	L'HIRONDELLE COURT	R	LEONARD DRIVE	LARONGE WAY	Lacombe Park	195.3	1.8	S	within 400 m	No	$ 43,924	$ 52,554
Long-Term	MCKENNEY AVENUE	AR	MISSION AVENUE	LANGLEY AVENUE	Arterial	301.8	2.2	S	within 400 m	No	$ 82,958	$ 99,258
	BOUDREAU ROAD	AR	SIR WINSTON CHURCHILL AVENUE	BRUNSWICK CRESCENT	Arterial	430.8	2.2	S	within 400 m	No	$ 118,435	$ 141,705
Long-Term	ST VITAL AVENUE	C	MAPLE DRIVE	MADONNA DRIVE	Mission	37.7	1.8	S	within 400 m	No	$ 8,469	$ 10,132
	MISSION PLACE	R	MURAL CRESCENT	MISSION AVENUE	Mission	255.6	1.8	S	within 400 m	No	$ 57,490	$ 68,786
Long-Term	LARONGE WAY	R	LEONARD DRIVE	L'HIRONDELLE COURT	Lacombe Park	255.7	1.8	S	within 400 m	No	$ 57,508	$ 68,807
	LEONARD DRIVE	R	LARONGE WAY	LASALLE POINTE	Lacombe Park	174.7	1.8	S	within 400 m	No	$ 39,296	$ 47,016
Long-Term	LEONARD DRIVE	R	LASALLE POINTE	LEONARD DRIVE	Lacombe Park	211.3	1.8	S	within 400 m	No	$ 47,527	$ 56,864
	STURGEON ROAD	AR	BOUDREAU ROAD	WOODLANDS ROAD	Arterial	513.2	2.2	S	within 400 m	No	$ 141,084	$ 168,804
Long-Term	LEONARD DRIVE	R	LACOMBE DRIVE	LEONARD DRIVE	Lacombe Park	173.3	1.8	S	within 400 m	No	$ 38,984	$ 46,644
	ST ALBERT TRAIL	AR	GATE AVENUE	GRENIER PLACE	Arterial	485.8	2.2	S	within 400 m	No	$ 133,532	$ 159,768
Long-Term	ST ALBERT TRAIL	AR	GRENIER PLACE	STERLING STREET	Arterial	668.9	2.2	S	within 400 m	No	$ 183,885	$ 220,014
	SIR WINSTON CHURCHILL AVENUE	AR	GATEWOOD AVENUE	GLENHAVEN CRESCENT	Arterial	136.5	2.2	S	within 400 m	No	$ 37,531	$ 44,905
Long-Term	ST ALBERT TRAIL	AR	GERVAIS ROAD	GATE AVENUE	Arterial	66.3	2.2	S	within 400 m	No	$ 18,229	$ 21,811
	GREEN GROVE DRIVE	C	GREEN GROVE DRIVE	STERLING STREET	Grandin	109.7	1.8	S	within 400 m	No	$ 24,666	$ 29,513
Long-Term	GREEN GROVE DRIVE	C	SIR WINSTON CHURCHILL AVE	GREEN GROVE DRIVE	Grandin	7.4	1.8	S	within 400 m	No	$ 1,660	$ 1,986
	LORRAINE CRESCENT	R	LORRAINE CRESCENT	LORRAINE CRESCENT	Lacombe Park	169.7	1.8	S	within 400 m	No	$ 38,165	$ 45,663
Long-Term	HOGAN ROAD	AR	NELSON COURT	DUNFIELD CRESCENT	Arterial	290.8	2.2	S	within 400 m	No	$ 79,927	$ 95,631
	LORRAINE CRESCENT	R	LORRAINE CRESCENT	LORRAINE CRESCENT	Lacombe Park	303.0	1.8	S	within 400 m	No	$ 68,155	$ 81,546
Long-Term	LUCERNE CRESCENT	R	LUCERNE CRESCENT	LUCERNE CRESCENT	Lacombe Park	148.8	1.8	S	within 400 m	No	$ 33,473	$ 40,050
	HOGAN ROAD	AR	DARTMOUTH CRESCENT	VILLENEUVE ROAD	Arterial	429.6	2.2	S	within 400 m	No	$ 118,106	$ 141,311
Long-Term	HOGAN ROAD	AR	DEER RIDGE DRIVE	DARTMOUTH CRESCENT	Arterial	583.6	2.2	S	within 400 m	No	$ 160,423	$ 191,942
	L'HIRONDELLE COURT	R	LARONGE WAY	L'HIRONDELLE COURT	Lacombe Park	380.6	1.8	S	within 400 m	No	$ 85,593	$ 102,410
Long-Term											**$ 3,403,000**	**$ 4,071,000**
	GLENVIEW CRESCENT	R	GRANDIN PLACE	GRANDIN ROAD	Grandin	97.9	1.8	N	not within 400 m	No	$ 22,021	$ 26,348
Long-Term	MEADOWVIEW DRIVE	C	HOGAN ROAD	MEADOWVIEW LANE	TIMBERLEA	895.9	1.8	N	not within 400 m	No	$ 201,487	$ 241,075
	MEADOWVIEW LANE	R	MEADOWVIEW DRIVE	STURGEON RIVER	TIMBERLEA	357.6	1.8	N	not within 400 m	No	$ 80,435	$ 96,239
Long-Term	GRANDIN PLACE	R	GLENVIEW CRESCENT	GRANDIN PLACE	Grandin	201.2	1.8	N	not within 400 m	No	$ 45,245	$ 54,134
	GLENVIEW CRESCENT	R	SIR WINSTON CHURCHILL AVE	GRANDIN PLACE	Grandin	190.9	1.8	N	not within 400 m	No	$ 42,926	$ 51,361
Long-Term	MEADOWVIEW DRIVE	C	MEADOWVIEW LANE	MISSION AVENUE	TIMBERLEA	344.7	1.8	N	not within 400 m	No	$ 77,524	$ 92,756
	MEADOWVIEW LANE	R	MEADOWVIEW DRIVE	CN RAILWAYS	TIMBERLEA	113.8	1.8	N	not within 400 m	No	$ 25,601	$ 30,631
Long-Term	ST ALBERT TRAIL	AR	SIR WINSTON CHURCHILL AVENUE	ST ANNE STREET	Arterial	284.5	2.2	N	not within 400 m	No	$ 78,210	$ 93,576
	ST THOMAS STREET	R	PERRON STREET	ST ALBERT TRAIL	Downtown	44.6	1.8	N	not within 400 m	No	$ 10,035	$ 12,006
Long-Term	ROWLAND CRESCENT	R	RIEL DRIVE	RIEL DRIVE	Riel Business Park	507.7	1.8	N	not within 400 m	No	$ 114,187	$ 136,623
	RENAULT CRESCENT	R	RIEL DRIVE	RIEL DRIVE	Riel Business Park	615.1	1.8	N	not within 400 m	No	$ 138,343	$ 165,525
Long-Term	RAYBORN CRESCENT	R	RIEL DRIVE	RIEL DRIVE	Riel Business Park	624.2	1.8	N	not within 400 m	No	$ 140,390	$ 167,973
	HOGAN ROAD	R	STURGEON RIVER	MEADOWVIEW DRIVE	Arterial	269.5	1.8	N	not within 400 m	No	$ 60,606	$ 72,514
Long-Term	RODEO DRIVE	R	RIEL DRIVE	-	Riel Business Park	397.4	1.8	N	not within 400 m	No	$ 89,378	$ 106,938
	ST ALBERT TRAIL	AR	-	GERVAIS ROAD	Arterial	428.1	2.2	N	not within 400 m	No	$ 117,674	$ 140,794
Long-Term	RIEL DRIVE	R	RIEL DRIVE	RIEL DRIVE	Riel Business Park	1.8	1.8	N	not within 400 m	No	$ 407	$ 486
	LANCASTER CRESCENT	R	LANCASTER CRESCENT	LANCASTER CRESCENT	Lacombe Park	100.2	1.8	N	not within 400 m	No	$ 22,533	$ 26,960
Long-Term	LANCASTER CRESCENT	R	LANCASTER CRESCENT	LANCASTER CRESCENT	Lacombe Park	52.8	1.8	N	not within 400 m	No	$ 11,867	$ 14,199

Gaps Assessment Cost Estimate - Sidewalks

PHASING	STREET	TYPE	FROM STREET	TO STREET	NEIGHBOURHOOD	LENGTH (M)	SIDEWALK WIDTH (M)*	SIDEWALK	SCHOOL WITHIN 400 M	TRANSIT WITHIN 10 M	COST ESTIMATE ($)	
											LOW	HIGH
	CALDER PLACE	R	CHATELAIN DRIVE	-	Campbell Business Park	138.4	1.8	N	not within 400 m	No	$ 31,132	$ 37,248
Long-Term	CALDER PLACE	R	VENESS ROAD	CHATELAIN DRIVE	Campbell Business Park	205.4	1.8	N	not within 400 m	No	$ 46,206	$ 55,284
	LANCASTER CRESCENT	R	LANCASTER CRESCENT	LANCASTER CRESCENT	Lacombe Park	34.7	1.8	N	not within 400 m	No	$ 7,800	$ 9,333
Long-Term	CHEVIGNY STREET	C	CORRIVEAU AVENUE	-	Campbell Business Park	382.7	1.8	N	not within 400 m	No	$ 86,083	$ 102,997
	LANCASTER CRESCENT	R	LANCASTER CRESCENT	LANCASTER CRESCENT	Lacombe Park	51.3	1.8	N	not within 400 m	No	$ 11,536	$ 13,802
Long-Term	NICOLET COURT	R			North Ridge	22.2	1.8	N	not within 400 m	No	$ 4,990	$ 5,971
	LUCINDA TERRACE	R	LEONARD DRIVE	LUCINDA TERRACE	Lacombe Park	65.5	1.8	N	not within 400 m	No	$ 14,725	$ 17,619
Long-Term	CURIAL DRIVE	C	BOUDREAU ROAD	CARSWELL STREET	Campbell Business Park	182.6	1.8	N	not within 400 m	No	$ 41,068	$ 49,136
	CARSWELL STREET	R	-	CURIAL DRIVE	Campbell Business Park	182.2	1.8	N	not within 400 m	No	$ 40,983	$ 49,035
Long-Term	CARSWELL STREET	R	CURIAL DRIVE	-	Campbell Business Park	70.5	1.8	N	not within 400 m	No	$ 15,858	$ 18,973
	CHATELAIN DRIVE	C	CHISHOLM AVENUE	BOUDREAU ROAD	Campbell Business Park	130.9	1.8	N	not within 400 m	No	$ 29,445	$ 35,230
Long-Term	CHATELAIN DRIVE	C	CALDER PLACE	CHISHOLM AVENUE	Campbell Business Park	235.2	1.8	N	not within 400 m	No	$ 52,905	$ 63,300
	CHISHOLM AVENUE	C	CARNEGIE DRIVE	CHATELAIN DRIVE	Campbell Business Park	374.7	1.8	N	not within 400 m	No	$ 84,263	$ 100,819
Long-Term	PALLADIUM POINT	R	PARKWOOD DRIVE	PALLADIUM POINT	Pineview	92.0	1.8	N	not within 400 m	No	$ 20,703	$ 24,771
	LAFONDE CRESCENT	R	LAFONDE CRESCENT	LAFONDE CRESCENT	Lacombe Park	46.3	1.8	N	not within 400 m	No	$ 10,419	$ 12,466
Long-Term	LAFLEUR DRIVE	R	LACOMBE DRIVE	LAFLEUR DRIVE	Lacombe Park	25.8	1.8	N	not within 400 m	No	$ 5,795	$ 6,934
	LEE PLACE	R	LEONARD DRIVE	LEE PLACE	Lacombe Park	41.6	1.8	N	not within 400 m	No	$ 9,363	$ 11,202
Long-Term	ST ALBERT TRAIL	AR	VILLENEUVE ROAD	EDGE OF CITY	Arterial	281.7	2.2	N	not within 400 m	No	$ 77,448	$ 92,664
	VILLENEUVE ROAD	AR	HOGAN ROAD	EDGE OF CITY	Arterial	1931.3	2.2	N	not within 400 m	No	$ 530,900	$ 635,211
Long-Term	VILLENEUVE ROAD	AR	DENNISON DRIVE	HOGAN ROAD	Arterial	622.9	2.2	N	not within 400 m	No	$ 171,224	$ 204,865
	EDWIN CRESCENT	R			Erin Ridge	20.8	1.8	N	not within 400 m	No	$ 4,684	$ 5,604
Long-Term	ENGLISH WAY	R			Erin Ridge	23.9	1.8	N	not within 400 m	No	$ 5,374	$ 6,430
	ERIN RIDGE DRIVE	R	ERIN RIDGE DRIVE	ERIN RIDGE DRIVE	Erin Ridge	34.8	1.8	N	not within 400 m	No	$ 7,828	$ 9,366
Long-Term	ERIN RIDGE DRIVE	R	ERIN RIDGE DRIVE	ERIN RIDGE DRIVE	Erin Ridge	37.6	1.8	N	not within 400 m	No	$ 8,447	$ 10,106
	EASTPARK DRIVE	R	EASTPARK DRIVE	EASTPARK DRIVE	Erin Ridge	27.6	1.8	N	not within 400 m	No	$ 6,213	$ 7,434
Long-Term	ST ALBERT TRAIL	AR				882.8	2.2	N	not within 400 m	No	$ 242,662	$ 290,340
	VENESS ROAD	AR	POUNDMAKER ROAD	CORRIVEAU AVENUE	Arterial	310.7	2.2	N	not within 400 m	No	$ 85,402	$ 102,182
Long-Term	VILLENEUVE ROAD	AR	ST ALBERT TRAIL	DENNISON DRIVE	Arterial	331.6	2.2	N	not within 400 m	No	$ 91,151	$ 109,061
	GIROUX ROAD	AR	NORTH RIDGE DR	-	Arterial	324.4	2.2	N	not within 400 m	No	$ 89,166	$ 106,685
Long-Term	MCKENNEY AVENUE	AR				413.4	2.2	N	not within 400 m	No	$ 113,631	$ 135,956
	OTTER CRESCENT	R	OTTER CRESCENT	OTTER CRESCENT	Oakmont	32.7	1.8	N	not within 400 m	No	$ 7,358	$ 8,804
Long-Term	CARLETON DRIVE	C			Campbell Business Park	381.5	1.8	N	not within 400 m	No	$ 85,805	$ 102,663
	CHEVIGNY STREET	C			Campbell Business Park	128.4	1.8	N	not within 400 m	No	$ 28,886	$ 34,561
Long-Term	CARLETON DRIVE	C			Campbell Business Park	389.6	1.8	N	not within 400 m	No	$ 87,621	$ 104,836
	CIRCLE DRIVE	C			Campbell Business Park	160.9	1.8	N	not within 400 m	No	$ 36,196	$ 43,308
Long-Term	CIRCLE DRIVE	C			Campbell Business Park	164.6	1.8	N	not within 400 m	No	$ 37,016	$ 44,289
	NICOLET COURT	R			North Ridge	26.4	1.8	N	not within 400 m	No	$ 5,945	$ 7,113
Long-Term	SIR WINSTON CHURCHILL AVENUE	AR	-	HAWTHORNE CRESCENT	Arterial	656.2	2.2	N	not within 400 m	No	$ 180,381	$ 215,822
	RIEL DRIVE	C	RENAULT CRESCENT	LEVASSEUR ROAD	Riel Business Park	49.3	1.8	N	not within 400 m	No	$ 11,089	$ 13,268
Long-Term						314.4	1.8	N	not within 400 m	No	$ 70,708	$ 84,600
	NEIL ROSS ROAD	AR	ELEMENT DRIVE NORTH		Erin Ridge North	361.5	2.2	N	not within 400 m	No	$ 99,364	$ 118,887
Long-Term	RAY GIBBON DRIVE	AR	GIROUX ROAD	VILLENEUVE ROAD	Northwest Lands	2073.6	2.2	N	not within 400 m	No	$ 570,014	$ 682,009
	LANCASTER CRESCENT	R	LANCASTER CRESCENT	LANCASTER CRESCENT	LACOMBE PARK	70.9	1.8	N	not within 400 m	No	$ 15,937	$ 19,068
Long-Term	POUNDMAKER ROAD					583.4	1.8	N	not within 400 m	No	$ 131,204	$ 156,983
	MCKENNEY AVENUE	R				323.0	1.8	N	not within 400 m	No	$ 72,644	$ 86,917
Long-Term	MEADOWVIEW DRIVE					1128.1	1.8	N	not within 400 m	No	$ 253,716	$ 303,566
	RAY GIBBON DRIVE	AR				1351.3	2.2	N	not within 400 m	No	$ 371,458	$ 444,441
Long-Term	RAY GIBBON DRIVE	AR				1140.9	2.2	N	not within 400 m	No	$ 313,628	$ 375,249
	RAY GIBBON DRIVE	AR				1292.4	2.2	N	not within 400 m	No	$ 355,259	$ 425,060
Long-Term	POUNDMAKER ROAD					1396.6	1.8	N	not within 400 m	No	$ 314,099	$ 375,813
	OLD MCKENNEY AVENUE					1192.6	1.8	N	not within 400 m	No	$ 268,229	$ 320,930
Long-Term	COAL MINE ROAD	C	EASTGATE WAY	BELLEROSE DRIVE		734.3	1.8	N	not within 400 m	No	$ 165,162	$ 197,612
	CUST AVE	C				133.2	1.8	N	not within 400 m	No	$ 29,951	$ 35,836
Long-Term	RAY GIBBON DRIVE	AR				1355.0	2.2	N	not within 400 m	No	$ 372,470	$ 445,652
	OLD MCKENNEY AVENUE					321.9	1.8	N	not within 400 m	No	$ 72,395	$ 86,619

Gaps Assessment Cost Estimate - Sidewalks

PHASING	STREET	TYPE	FROM STREET	TO STREET	NEIGHBOURHOOD	LENGTH (M)	SIDEWALK WIDTH (M)*	SIDEWALK	SCHOOL WITHIN 400 M	TRANSIT WITHIN 10 M	COST ESTIMATE ($)	
											LOW	HIGH
Long-Term	CARLETON DRIVE	C			Campbell Business Park	750.9	1.8	N	not within 400 m	No	$ 168,882	$ 202,063
	CENTRE STREET	C			Campbell Business Park	123.9	1.8	N	not within 400 m	No	$ 27,859	$ 33,332
Long-Term	CENTRE STREET	C			Campbell Business Park	132.0	1.8	N	not within 400 m	No	$ 29,690	$ 35,523
	ST ALBERT TRAIL	AR				396.2	2.2	N	not within 400 m	No	$ 108,912	$ 130,310
Long-Term	RANGE ROAD 260					703.5	1.8	N	not within 400 m	No	$ 158,230	$ 189,319
	RANGE ROAD 255					816.4	1.8	N	not within 400 m	No	$ 183,620	$ 219,698
Long-Term	OLD MCKENNEY AVENUE					272.8	1.8	N	not within 400 m	No	$ 61,359	$ 73,415
	RANGE ROAD 260					2066.6	1.8	N	not within 400 m	No	$ 464,799	$ 556,122
Long-Term	MEADOWVIEW DRIVE					537.3	1.8	N	not within 400 m	No	$ 120,845	$ 144,588
	RANGE ROAD 260					1372.5	1.8	N	not within 400 m	No	$ 308,678	$ 369,327
Long-Term	COAL MINE ROAD					421.7	1.8	N	not within 400 m	No	$ 94,854	$ 113,491
	GRANDIN ROAD	AR	GLEN MEADOW CRESCENT	GREENWOOD PLACE	Arterial	382.9	2.2	S	not within 400 m	No	$ 105,255	$ 125,936
Long-Term	GREEN GROVE DRIVE	C	SIR WINSTON CHURCHILL AVE	GREEN GROVE DRIVE	Grandin	1106.0	1.8	S	not within 400 m	No	$ 248,749	$ 297,623
	SIR WINSTON CHURCHILL AVENUE	AR	GRESHAM BOULEVARD	TACHE STREET	Arterial	602.3	2.2	S	not within 400 m	No	$ 165,563	$ 198,093
Long-Term	GRANDIN ROAD	AR	GROSVENOR BOULEVARD	GLENVIEW CRESCENT	Arterial	257.1	2.2	S	not within 400 m	No	$ 70,667	$ 84,552
	GRANDIN ROAD	AR	GREENWOOD PLACE	GROSVENOR BOULEVARD	Arterial	75.5	2.2	S	not within 400 m	No	$ 20,752	$ 24,830
Long-Term	CUNNINGHAM ROAD	AR	STANLEY DRIVE	HEBERT ROAD	Arterial	88.5	2.2	S	not within 400 m	No	$ 24,317	$ 29,095
	HEBERT ROAD	AR	AKINS DRIVE	AMBER CRESCENT	Arterial	759.8	2.2	S	not within 400 m	No	$ 208,861	$ 249,897
Long-Term	CAMPBELL ROAD	AR	-	BOUDREAU ROAD	Arterial	828.3	2.2	S	not within 400 m	No	$ 227,682	$ 272,416
	VENESS ROAD	AR	BOUDREAU ROAD	-	Arterial	549.0	2.2	S	not within 400 m	No	$ 150,916	$ 180,567
Long-Term	SIR WINSTON CHURCHILL AVENUE	AR	LEVASSEUR ROAD	SIR WINSTON CHURCHILL AVENUE	Arterial	688.2	2.2	S	not within 400 m	No	$ 189,180	$ 226,349
	ST ALBERT TRAIL	AR	GERVAIS ROAD	GATE AVENUE	Arterial	619.2	2.2	S	not within 400 m	No	$ 170,222	$ 203,667
Long-Term	SIR WINSTON CHURCHILL AVENUE	AR	SIR WINSTON CHURCHILL AVENUE	GATEWOOD AVENUE	Arterial	9.6	2.2	S	not within 400 m	No	$ 2,637	$ 3,155
	SIR WINSTON CHURCHILL AVENUE	AR	GATEWOOD AVENUE	GLENHAVEN CRESCENT	Arterial	430.6	2.2	S	not within 400 m	No	$ 118,366	$ 141,622
Long-Term	SIR WINSTON CHURCHILL AVENUE	AR	GLENHAVEN CRESCENT	GRESHAM BOULEVARD	Arterial	972.7	2.2	S	not within 400 m	No	$ 267,388	$ 319,924
	LANCASTER CRESCENT	R	LAYDON DRIVE	LANCASTER CRESCENT	Lacombe Park	200.3	1.8	S	not within 400 m	No	$ 45,045	$ 53,896
Long-Term	LANCASTER CRESCENT	R	LAYDON DRIVE	LANCASTER CRESCENT	Lacombe Park	245.3	1.8	S	not within 400 m	No	$ 55,169	$ 66,009
	VENESS ROAD	AR	CORRIVEAU AVENUE	CALDER PLACE	Arterial	657.2	2.2	S	not within 400 m	No	$ 180,660	$ 216,155
Long-Term	LANCASTER CRESCENT	R	LANCASTER CRESCENT	LANCASTER CRESCENT	Lacombe Park	855.8	1.8	S	not within 400 m	No	$ 192,472	$ 230,288
	LANCASTER CRESCENT	R	LANCASTER CRESCENT	LANCASTER CRESCENT	Lacombe Park	186.2	1.8	S	not within 400 m	No	$ 41,870	$ 50,097
Long-Term	LANCASTER CRESCENT	R	LAYDON DRIVE	LAYDON DRIVE	Lacombe Park	194.0	1.8	S	not within 400 m	No	$ 43,640	$ 52,214
	BOUDREAU ROAD	AR	SIR WINSTON CHURCHILL AVENUE	BRUNSWICK CRESCENT	Arterial	219.9	2.2	S	not within 400 m	No	$ 60,451	$ 72,328
Long-Term	VENESS ROAD	AR	POUNDMAKER ROAD	CORRIVEAU AVENUE	Arterial	1219.6	2.2	S	not within 400 m	No	$ 335,269	$ 401,142
	CAMPBELL ROAD	AR	CORRIVEAU AVENUE	-	Arterial	531.0	2.2	S	not within 400 m	No	$ 145,973	$ 174,654
Long-Term	LANCASTER CRESCENT	R	LANCASTER CRESCENT	LANCASTER CRESCENT	Lacombe Park	407.1	1.8	S	not within 400 m	No	$ 91,566	$ 109,556
	LINDBERGH CRESCENT	R	LINDBERGH CRESCENT	LINDBERGH CRESCENT	Lacombe Park	613.6	1.8	S	not within 400 m	No	$ 138,000	$ 165,114
Long-Term	LEONARD DRIVE	R	L'HINRONDELLE COURT	LARONGE WAY	Lacombe Park	249.3	1.8	S	not within 400 m	No	$ 56,064	$ 67,080
	LEONARD DRIVE	R	LEE PLACE	L'HIRONDELLE COURT	Lacombe Park	277.8	1.8	S	not within 400 m	No	$ 62,480	$ 74,756
Long-Term	L'HIRONDELLE COURT	R	LEONARD DRIVE	LARONGE WAY	Lacombe Park	757.8	1.8	S	not within 400 m	No	$ 170,448	$ 203,937
	BOUDREAU ROAD	AR	BRUNSWICK CRESCENT	BEAVERBROOK CRESCENT	Arterial	448.6	2.2	S	not within 400 m	No	$ 123,304	$ 147,530
Long-Term	CAMPBELL ROAD	AR	BOUDREAU ROAD	CORRIVEAU AVENUE	Arterial	1408.1	2.2	S	not within 400 m	No	$ 387,068	$ 463,118
	MCKENNEY AVENUE	AR	MORGAN CRESCENT	LAYDON DRIVE	Arterial	597.5	2.2	S	not within 400 m	No	$ 164,248	$ 196,519
Long-Term	BOUDREAU ROAD	AR	VENESS ROAD	CHATELAIN DRIVE	Arterial	408.0	2.2	S	not within 400 m	No	$ 112,143	$ 134,176
	VENESS ROAD	AR	CALDER PLACE	BOUDREAU ROAD	Arterial	728.7	2.2	S	not within 400 m	No	$ 200,316	$ 239,673
Long-Term	ST ALBERT TRAIL	AR	MUIR DRIVE	MADISON AVENUE	Arterial	201.9	2.2	S	not within 400 m	No	$ 55,497	$ 66,401
	MCKENNEY AVENUE	AR	LAYDON DRIVE	MISSION AVENUE	Arterial	220.5	2.2	S	not within 400 m	No	$ 60,601	$ 72,508
Long-Term	RIVERCREST CRESCENT	C	ST ALBERT TRAIL	ST ALBERT TRAIL	Inglewood	121.4	1.8	S	not within 400 m	No	$ 27,294	$ 32,657
	ST ALBERT TRAIL	AR	MISSION AVENUE	MUIR DRIVE	Arterial	100.6	2.2	S	not within 400 m	No	$ 27,666	$ 33,101
Long-Term	ST ALBERT TRAIL	AR	MADISON AVENUE	ST VITAL AVENUE	Arterial	327.4	2.2	S	not within 400 m	No	$ 89,987	$ 107,667
	LAFONDE CRESCENT	R	LAFONDE CRESCENT	LAYDON DRIVE	Lacombe Park	867.4	1.8	S	not within 400 m	No	$ 195,079	$ 233,407
Long-Term	ST VITAL AVENUE	C	MAPLE DRIVE	MADONNA DRIVE	Mission	210.2	1.8	S	not within 400 m	No	$ 47,286	$ 56,577
	OTTER CRESCENT	R	OAKBAY POINT	OLIVIER CLOSE	Oakmont	849.4	1.8	S	not within 400 m	No	$ 191,036	$ 228,570
Long-Term	SIR WINSTON CHURCHILL AVENUE	AR	STURGEON ROAD	KINGSWOOD DRIVE	Arterial	507.2	2.2	S	not within 400 m	No	$ 139,421	$ 166,814
	LEONARD DRIVE	R	LEE PLACE	LACOMBE DRIVE	Lacombe Park	175.8	1.8	S	not within 400 m	No	$ 39,538	$ 47,307
Long-Term	STURGEON ROAD	AR	BOUDREAU ROAD	WOODLANDS ROAD	Arterial	1290.1	2.2	S	not within 400 m	No	$ 354,633	$ 424,310

Gaps Assessment Cost Estimate - Sidewalks

PHASING	STREET	TYPE	FROM STREET	TO STREET	NEIGHBOURHOOD	LENGTH (M)	SIDEWALK WIDTH (M)*	SIDEWALK	SCHOOL WITHIN 400 M	TRANSIT WITHIN 10 M	COST ESTIMATE ($) LOW	COST ESTIMATE ($) HIGH
	LODGEPOLE CRESCENT	R	LOCKHART DRIVE	LODGEPOLE CRESCENT	Lacombe Park	179.3	1.8	S	not within 400 m	No	$ 40,337	$ 48,263
Long-Term	LINDBERGH CRESCENT	R	LAROSE DRIVE	LINDBERGH CRESCENT	Lacombe Park	199.5	1.8	S	not within 400 m	No	$ 44,866	$ 53,681
	IRONWOOD POINT	R	BELLEROSE DRIVE	IRONWOOD POINT	Inglewood	198.0	1.8	S	not within 400 m	No	$ 44,534	$ 53,284
Long-Term	ST ALBERT TRAIL	AR	INGLEWOOD DRIVE	BOUDREAU ROAD	Arterial	289.7	2.2	S	not within 400 m	No	$ 79,636	$ 95,283
	INGLEWOOD DRIVE	C	ST ALBERT TRAIL	INGLEWOOD DRIVE	Inglewood	253.8	1.8	S	not within 400 m	No	$ 57,087	$ 68,303
Long-Term	VILLENEUVE ROAD	AR	ST ALBERT TRAIL	DENNISON DRIVE	Arterial	464.1	2.2	S	not within 400 m	No	$ 127,585	$ 152,652
	BELLEROSE DRIVE	AR	OAKMONT DRIVE	OAKLAND WAY	Arterial	887.5	2.2	S	not within 400 m	No	$ 243,975	$ 291,910
Long-Term	BELLEROSE DRIVE	AR	OAKLAND WAY	ERIN RIDGE DRIVE	Arterial	553.3	2.2	S	not within 400 m	No	$ 152,094	$ 181,977
	SIR WINSTON CHURCHILL AVENUE	AR	-	HAWTHORNE CRESCENT	Arterial	532.8	2.2	S	not within 400 m	No	$ 146,460	$ 175,236
Long-Term	ST ALBERT TRAIL	AR				1910.9	2.2	S	not within 400 m	No	$ 525,286	$ 628,493
	LODGEPOLE CRESCENT	R	LODGEPOLE CRESCENT	LODGEPOLE CRESCENT	Lacombe Park	282.6	1.8	S	not within 400 m	No	$ 63,554	$ 76,040
Long-Term	MCKENNEY AVENUE	AR				901.5	2.2	S	not within 400 m	No	$ 247,807	$ 296,496
	MISSION AVENUE	C	MISSION PLACE	MEADOWVIEW DRIVE	Mission	174.6	1.8	S	not within 400 m	No	$ 39,279	$ 46,997
Long-Term	LAFONDE CRESCENT	R	LAYDON DRIVE	LAFONDE CRESCENT	Lacombe Park	348.7	1.8	S	not within 400 m	No	$ 78,431	$ 93,842
	LUCERNE CRESCENT	R	LUCERNE CRESCENT	LUCERNE CRESCENT	Lacombe Park	122.7	1.8	S	not within 400 m	No	$ 27,601	$ 33,024
Long-Term	ST ALBERT TRAIL	AR	INGLEWOOD DRIVE	BOUDREAU ROAD	Arterial	292.1	2.2	S	not within 400 m	No	$ 80,303	$ 96,080
	ST VITAL AVENUE	C	MUIR DRIVE	MAPLE DRIVE	Mission	120.2	1.8	S	not within 400 m	No	$ 27,036	$ 32,348
Long-Term	ST ALBERT TRAIL	AR	BOUDREAU ROAD	VILLENEUVE ROAD	Arterial	881.9	2.2	S	not within 400 m	No	$ 242,434	$ 290,067
	BELLEROSE DRIVE	AR			Arterial	871.6	2.2	S	not within 400 m	No	$ 239,601	$ 286,677
Long-Term	HOGAN ROAD	AR	DARTMOUTH CRESCENT	VILLENEUVE ROAD	Arterial	58.2	2.2	S	not within 400 m	No	$ 15,989	$ 19,130
		R	SERVUS PLACE NW ENTRANCE	-	Campbell Business Park	259.0	1.8	S	not within 400 m	No	$ 58,261	$ 69,708
Long-Term	SIR WINSTON CHURCHILL AVENUE	AR	HAWTHORNE CRESCENT	HERITAGE BOULEVARD	Arterial	640.7	2.2	S	not within 400 m	No	$ 176,116	$ 210,719
	SIR WINSTON CHURCHILL AVENUE	AR	HERITAGE BOULEVARD	LEVASSEUR ROAD	Arterial	772.5	2.2	S	not within 400 m	No	$ 212,350	$ 254,073
Long-Term	GRANDIN ROAD	AR	LEVASSEUR ROAD	GORDON CRESCENT	Arterial	219.4	2.2	S	not within 400 m	No	$ 60,298	$ 72,146
	MCKENNEY AVENUE	AR				91.6	2.2	S	not within 400 m	No	$ 25,172	$ 30,118
Long-Term	CUST AVE	C				227.5	1.8	S	not within 400 m	No	$ 51,172	$ 61,226
	MCKENNEY AVENUE	AR				269.0	2.2	S	not within 400 m	No	$ 73,956	$ 88,487
											$ 17,897,000	**$ 21,413,000**

Note: the cost estimate is based on a range of $124.95/m^2 (min) to 149.50 m^2 (max)

* based on St. Albert's Complete Streets Guidelines

LEGEND:

AR	Arterial Roadway
C	Collector Roadway
R	Residential Roadway
N	No Sidewalk
S	Sidewalk On One Side

Gaps Assessment Cost Estimate - Trails

CLOSEST ROADWAY	FROM STREET	TO STREET	LENGTH (M)	TRAIL WIDTH (M)*		COST ESTIMATE ($)	
				MIN	MAX	LOW	HIGH
Sir Winston Churchill Av	HERITAGE BOULEVARD	LEVASSEUR ROAD	241.5	3.0	6.0	$ 43,472	$ 173,886
SH 633	HOGAN ROAD	RAY GIBBON DRIVE	903.5	3.0	6.0	$ 162,639	$ 650,554
Sir Winston Churchill Av	HAWTHORNE CRESCENT	HERITAGE BOULEVARD	320.3	3.0	6.0	$ 57,662	$ 230,645
St Vital Av	MUIR DRIVE	MADONNA DRIVE	122.1	3.0	6.0	$ 21,980	$ 87,919
Muir Dr	ST VITAL AVENUE	MCKENNEY DRIVE	351.8	3.0	6.0	$ 63,333	$ 253,330
Sir Winston Churchill Av	CITY BOUNDARY	137 AVENUE	662.9	3.0	6.0	$ 119,317	$ 477,266
Rge Rd 255	VILLENEUVE ROAD	CITY BOUNDARY	821.6	3.0	6.0	$ 147,890	$ 591,560
Old McKenney Av	RANGE ROAD 260	RANGE ROAD 260	272.8	3.0	6.0	$ 49,102	$ 196,408
Twp Rd 540A	RANGE ROAD 260	CARROT CREEK	1203.8	3.0	6.0	$ 216,688	$ 866,752
Ray Gibbon Dr	RAY GIBBON DRIVE	GIROUX ROAD	1148.3	3.0	6.0	$ 206,687	$ 826,747
Old McKenney Av	RAY GIBBON DRIVE	RANGE ROAD 260	322.4	3.0	6.0	$ 58,036	$ 232,143
St Albert Tr	ST ALBERT TRAIL TURNING BAY	COAL MINE ROAD	388.7	3.0	6.0	$ 69,958	$ 279,829
St Albert Tr	JENSEN LAKES BLVD	COAL MINE ROAD	434.9	3.0	6.0	$ 78,276	$ 313,102
St Albert Tr	EVERITT DRIVE NORTH	NEIL ROSS ROAD	486.7	3.0	6.0	$ 87,607	$ 350,426
St Albert Tr	NEIL ROSS ROAD	HWY 2 SERVICE ROAD	741.7	3.0	6.0	$ 133,500	$ 533,997
Hwy 2	CITY BOUNDARY	HWY 2 SERVICE ROAD	498.9	3.0	6.0	$ 89,809	$ 359,236
Hwy 2	HWY 2 SERVICE ROAD	CITY BOUNDARY	499.5	3.0	6.0	$ 89,904	$ 359,613
Giroux Rd	GIROUX ROAD	RAY GIBBON DRIVE	240.2	3.0	6.0	$ 43,243	$ 172,969
Giroux Rd	DUNFIELD CRESCENT	HOGAN ROAD	173.6	3.0	6.0	$ 31,254	$ 125,013
Giroux Rd	HOGAN ROAD	LACOMBE DRIVE	174.8	3.0	6.0	$ 31,469	$ 125,875
Giroux Rd	LACOMBE DRIVE	BELLEROSE HIGH DRIVEWAY	189.9	3.0	6.0	$ 34,183	$ 136,730
Giroux Rd	BELLEROSE HIGH DRIVEWAY	DUNFIELD CRESCENT	186.2	3.0	6.0	$ 33,509	$ 134,033
Giroux Rd	BELLEROSE HIGH DRIVEWAY	BELLEROSE HIGH DRIVEWAY	168.4	3.0	6.0	$ 30,308	$ 121,231
Giroux Rd	BELLEROSE HIGH DRIVEWAY	BELLEROSE HIGH DRIVEWAY	171.4	3.0	6.0	$ 30,846	$ 123,381
Giroux Rd	BELLEROSE HIGH DRIVEWAY	LOCKHART DRIVE	341.0	3.0	6.0	$ 61,388	$ 245,552
Giroux Rd	DUFFERIN STREET	BELLEROSE HIGH DRIVEWAY	334.2	3.0	6.0	$ 60,158	$ 240,630
Giroux Rd	DURHAM AVENUE	DUFFERIN STREET	299.2	3.0	6.0	$ 53,848	$ 215,392
Giroux Rd	LOCKHART DRIVE	DURHAM AVENUE	302.4	3.0	6.0	$ 54,433	$ 217,731
Giroux Rd	DURHAM AVENUE	LARSON AVENUE	386.2	3.0	6.0	$ 69,520	$ 278,077
Giroux Rd	LARSON AVENUE	DURHAM AVENUE	392.3	3.0	6.0	$ 70,615	$ 282,458
Giroux Rd	DEER RIDGE DRIVE	LARSON AVENUE	369.4	3.0	6.0	$ 66,494	$ 265,973
Giroux Rd	LARSON AVENUE	DAWSON ROAD	368.5	3.0	6.0	$ 66,334	$ 265,333
Giroux Rd	DELBROOK BOULEVARD	DEER RIDGE DRIVE	197.3	3.0	6.0	$ 35,510	$ 142,039
Giroux Rd	DAWSON ROAD	LEXINGTON DRIVE	198.4	3.0	6.0	$ 35,712	$ 142,845
Giroux Rd	DUNBAR STREET	DELBROOK BOULEVARD	264.3	3.0	6.0	$ 47,571	$ 190,284
Giroux Rd	LEXINGTON DRIVE	LIBERTON DRIVE	265.4	3.0	6.0	$ 47,770	$ 191,078
Giroux Rd	ST ALBERT TRAIL	DUNBAR STREET	187.8	3.0	6.0	$ 33,806	$ 135,221
Giroux Rd	LIBERTON DRIVE	ST ALBERT TRAIL	189.3	3.0	6.0	$ 34,066	$ 136,263
SH 633	HOGAN ROAD	EDGE OF CITY	305.2	3.0	6.0	$ 54,945	$ 219,779
St Albert Tr	BOUDREAU ROAD	GRANDIN PARK PLAZA	246.4	3.0	6.0	$ 44,360	$ 177,437
St Albert Tr	GRANDIN PARK PLAZA	ERIN RIDGE ROAD	194.4	3.0	6.0	$ 35,000	$ 139,999
St Albert Tr	VILLENEUVE ROAD	ST ALBERT TRAIL	222.8	3.0	6.0	$ 40,112	$ 160,447
St Albert Tr	ST ALBERT TRAIL	GIROUX ROAD	224.4	3.0	6.0	$ 40,392	$ 161,567
Ray Gibbon Dr	RAY GIBBON DRIVE	MEADOWVIEW DRIVE	170.9	3.0	6.0	$ 30,761	$ 123,042
Ray Gibbon Dr	MCKENNEY AVENUE	RAY GIBBON DRIVE	169.5	3.0	6.0	$ 30,510	$ 122,037
St Albert Tr	INGLEWOOD LOCAL ROAD	BOUDREAU ROAD	250.6	3.0	6.0	$ 45,114	$ 180,455
St Albert Tr	INGLEWOOD DRIVE	INGLEWOOD LOCAL ROAD	415.1	3.0	6.0	$ 74,720	$ 298,878
St Albert Tr	GIROUX ROAD	LENNOX DRIVE	668.7	3.0	6.0	$ 120,359	$ 481,436
St Albert Tr	LENNOX DRIVE	MCKENNEY AVENUE	575.9	3.0	6.0	$ 103,666	$ 414,662
St Albert Tr	BELLEROSE DRIVE	INGLEWOOD DRIVE	578.0	3.0	6.0	$ 104,037	$ 416,145
St Albert Tr	MCKENNEY AVENUE	ST VITAL AVENUE	302.1	3.0	6.0	$ 54,386	$ 217,542
St Albert Tr	RIVERCREST CRESCENT	BELLEROSE DRIVE	304.5	3.0	6.0	$ 54,812	$ 219,248
St Albert Tr	ST VITAL AVENUE	MADISON AVENUE	153.5	3.0	6.0	$ 27,626	$ 110,503
St Albert Tr	MADISON AVENUE	MUIR DRIVE	65.2	3.0	6.0	$ 11,729	$ 46,915
St Albert Tr	MUIR DRIVE	MISSION AVENUE	50.6	3.0	6.0	$ 9,109	$ 36,436
St Albert Tr	MISSION AVENUE	ST ANNE STREET	98.0	3.0	6.0	$ 17,632	$ 70,526
St Albert Tr	STURGEON ROAD	RIVERCREST CRESCENT	60.4	3.0	6.0	$ 10,869	$ 43,476
St Albert Tr	RIVERCREST CRESCENT	RIVERCREST CRESCENT	315.9	3.0	6.0	$ 56,859	$ 227,434
St Albert Tr	ST ANNE STREET	GREEN GROVE DRIVE	773.5	3.0	6.0	$ 139,232	$ 556,928
St Albert Tr	STERLING STREET	STURGEON ROAD	965.3	3.0	6.0	$ 173,747	$ 694,985
St Albert Tr	GREEN GROVE DRIVE	GRENIER PLACE	341.0	3.0	6.0	$ 61,373	$ 245,491
St Albert Tr	GRENIER PLACE	STERLING STREET	338.9	3.0	6.0	$ 60,999	$ 243,993
St Albert Tr	GRENIER PLACE	GATE AVENUE	250.7	3.0	6.0	$ 45,130	$ 180,520
St Albert Tr	GATE AVENUE	GRENIER PLACE	252.0	3.0	6.0	$ 45,354	$ 181,416
St Albert Tr	GATE AVENUE	VILLAGE LANDING N ENTRANCE	194.3	3.0	6.0	$ 34,977	$ 139,907
St Albert Tr	HEBERT ROAD	GATE AVENUE	346.6	3.0	6.0	$ 62,384	$ 249,534
St Albert Tr	GERVAIS ROAD	MCDONALDS TURNOFF	143.6	3.0	6.0	$ 25,850	$ 103,398
St Albert Tr	GATEWAY VILLAGE S EXIT	HEBERT ROAD	166.6	3.0	6.0	$ 29,981	$ 119,923
St Albert Tr	MCDONALDS TURNOFF	CITY BOUNDARY	159.6	3.0	6.0	$ 28,722	$ 114,887
St Albert Tr	CITY BOUNDARY	SUPERSTORE S ENTRANCE	88.2	3.0	6.0	$ 15,872	$ 63,485
Bellerose Dr	ST ALBERT TRAIL	ST ALBERT CENTRE ENTRANCE	103.3	3.0	6.0	$ 18,597	$ 74,388
Bellerose Dr	INGLEWOOD SQUARE ENTRANCE	ST ALBERT TRAIL	226.8	3.0	6.0	$ 40,819	$ 163,274
Bellerose Dr	ST ALBERT CENTRE ENTRANCE	INGLEWOOD DRIVE	224.9	3.0	6.0	$ 40,486	$ 161,943
Bellerose Dr	INGLEWOOD DRIVE	INGLEWOOD SQUARE ENTRANCE	225.4	3.0	6.0	$ 40,572	$ 162,287
Bellerose Dr	INGLEWOOD DRIVE	IRONWOOD POINT	305.8	3.0	6.0	$ 55,051	$ 220,201

Gaps Assessment Cost Estimate - Trails

CLOSEST ROADWAY	FROM STREET	TO STREET	LENGTH (M)	TRAIL WIDTH (M)*		COST ESTIMATE ($)	
				MIN	MAX	LOW	HIGH
Bellerose Dr	IRONWOOD POINT	INGLEWOOD DRIVE	309.7	3.0	6.0	$ 55,741	$ 222,962
Bellerose Dr	IRONWOOD POINT	IRONWOOD DRIVE	67.7	3.0	6.0	$ 12,186	$ 48,743
Bellerose Dr	IRONWOOD DRIVE	IRONWOOD POINT	71.8	3.0	6.0	$ 12,920	$ 51,680
Bellerose Dr	IRONWOOD DRIVE	BOUDREAU ROAD	160.5	3.0	6.0	$ 28,899	$ 115,593
Bellerose Dr	BOUDREAU ROAD	IRONWOOD DRIVE	162.2	3.0	6.0	$ 29,188	$ 116,750
McKenney Av	ST ALBERT TRAIL	LIBERTON DRIVE	191.3	3.0	6.0	$ 34,436	$ 137,742
McKenney Av	MUIR DRIVE	ST ALBERT TRAIL	190.7	3.0	6.0	$ 34,320	$ 137,280
McKenney Av	LIBERTON TERRACE	DAWSON ROAD	266.3	3.0	6.0	$ 47,939	$ 191,755
McKenney Av	DAWSON ROAD	CATHOLIC PARISH LOCAL ROAD	207.5	3.0	6.0	$ 37,346	$ 149,383
McKenney Av	CATHOLIC PARISH LOCAL ROAD	MUIR DRIVE	198.4	3.0	6.0	$ 35,718	$ 142,870
McKenney Av	DAWSON ROAD	LANGLEY AVENUE	401.4	3.0	6.0	$ 72,259	$ 289,033
McKenney Av	LANGLEY AVENUE	DAWSON ROAD	394.6	3.0	6.0	$ 71,031	$ 284,121
McKenney Av	LANGLEY AVENUE	MISSION AVENUE	147.8	3.0	6.0	$ 26,608	$ 106,432
McKenney Av	LANGLEY AVENUE	MISSION AVENUE	149.4	3.0	6.0	$ 26,897	$ 107,585
McKenney Av	MISSION AVENUE	LAYDON DRIVE	204.9	3.0	6.0	$ 36,875	$ 147,499
McKenney Av	LAYDON DRIVE	MISSION AVENUE	205.8	3.0	6.0	$ 37,039	$ 148,153
McKenney Av	LAYDON DRIVE	LACOMBE LAKE PARK	303.3	3.0	6.0	$ 54,591	$ 218,363
McKenney Av	MORGAN CRESCENT	LAYDON DRIVE	299.8	3.0	6.0	$ 53,959	$ 215,834
McKenney Av	LACOMBE LAKE PARK	MCKENNEY AVENUE	349.7	3.0	6.0	$ 62,947	$ 251,788
McKenney Av	MCKENNEY AVENUE	MORGAN CRESCENT	340.9	3.0	6.0	$ 61,367	$ 245,467
McKenney Av	RIVERSIDE DRIVE	HOGAN ROAD	559.1	3.0	6.0	$ 100,645	$ 402,579
McKenney Av	HOGAN ROAD	MCKENNEY AVENUE	544.1	3.0	6.0	$ 97,936	$ 391,744
McKenney Av	RAY GIBBON DRIVE	MCKENNEY AVENUE	199.2	3.0	6.0	$ 35,861	$ 143,444
McKenney Av	MCKENNEY AVENUE	RAY GIBBON DRIVE	203.2	3.0	6.0	$ 36,582	$ 146,326
Meadowview Dr	RAY GIBBON DRIVE	MEADOWVIEW DRIVE	151.1	3.0	6.0	$ 27,201	$ 108,804
Meadowview Dr	MEADOWVIEW DRIVE	RAY GIBBON DRIVE	155.1	3.0	6.0	$ 27,919	$ 111,674
Meadowview Dr	MEADOWVIEW DRIVE	RANGE ROAD 260	394.6	3.0	6.0	$ 71,028	$ 284,111
Meadowview Dr	RANGE ROAD 260	CARROT CREEK	1138.7	3.0	6.0	$ 204,964	$ 819,855
Boudreau Rd	ERIN RIDGE DRIVE	STURGEON HOSPITAL	115.0	3.0	6.0	$ 20,699	$ 82,796
Boudreau Rd	STURGEON HOSPITAL	INGLEWOOD DRIVE	114.3	3.0	6.0	$ 20,567	$ 82,268
Boudreau Rd	STURGEON HOSPITAL	ST ALBERT TRAIL	103.2	3.0	6.0	$ 18,577	$ 74,305
Boudreau Rd	ST ALBERT TRAIL	STURGEON HOSPITAL	183.2	3.0	6.0	$ 32,970	$ 131,879
Boudreau Rd	ELLESMERE DRIVE	ERIN RIDGE DRIVE	247.8	3.0	6.0	$ 44,607	$ 178,427
Boudreau Rd	INGLEWOOD DRIVE	IRONWOOD DRIVE	250.7	3.0	6.0	$ 45,125	$ 180,498
Boudreau Rd	BELLEROSE DRIVE	ELLESMERE DRIVE	351.1	3.0	6.0	$ 63,196	$ 252,782
Boudreau Rd	INGLEWOOD DRIVE	BELLEROSE DRIVE	349.9	3.0	6.0	$ 62,989	$ 251,954
Boudreau Rd	BELLEROSE DRIVE	FIRE STATION 2	138.4	3.0	6.0	$ 24,909	$ 99,634
Boudreau Rd	FIRE STATION 2	BELLEROSE DRIVE	139.7	3.0	6.0	$ 25,140	$ 100,560
Boudreau Rd	STURGEON ROAD	FIRE STATION 2	256.6	3.0	6.0	$ 46,192	$ 184,765
Boudreau Rd	FIRE STATION 2	STURGEON ROAD	257.8	3.0	6.0	$ 46,399	$ 185,594
Boudreau Rd	WESTWOOD DRIVE	STURGEON ROAD	227.4	3.0	6.0	$ 40,933	$ 163,731
Boudreau Rd	STURGEON ROAD	BEAVERBROOK CRESCENT	231.8	3.0	6.0	$ 41,718	$ 166,869
Boudreau Rd	BEAVERBROOK CRESCENT	BRUNSWICK CRESCENT	231.3	3.0	6.0	$ 41,627	$ 166,507
Boudreau Rd	BRUNSWICK CRESCENT	SIR WINSTON CHURCHILL AVENUE	324.5	3.0	6.0	$ 58,402	$ 233,608
Boudreau Rd	SIR WINSTON CHURCHILL AVENUE	WESTWOOD DRIVE	553.9	3.0	6.0	$ 99,702	$ 398,807
Boudreau Rd	SIR WINSTON CHURCHILL AVENUE	FRASER DRIVE	118.0	3.0	6.0	$ 21,238	$ 84,949
Boudreau Rd	FRASER DRIVE	FOREST DRIVE	480.3	3.0	6.0	$ 86,451	$ 345,804
Boudreau Rd	PRIMEAU LANE	SIR WINSTON CHURCHILL AVENUE	597.3	3.0	6.0	$ 107,521	$ 430,083
Boudreau Rd	HEBERT ROAD	PRIMEAU LANE	369.3	3.0	6.0	$ 66,475	$ 265,899
Boudreau Rd	FOREST DRIVE	HEBERT ROAD	370.8	3.0	6.0	$ 66,748	$ 266,989
Boudreau Rd	HEBERT ROAD	ASPEN CRESCENT	154.4	3.0	6.0	$ 27,797	$ 111,185
Boudreau Rd	ASPEN CRESCENT	AKINS DRIVE	255.0	3.0	6.0	$ 45,909	$ 183,635
Boudreau Rd	PAGE DRIVE	HEBERT ROAD	400.0	3.0	6.0	$ 72,000	$ 287,998
Boudreau Rd	AKINS DRIVE	CAMPBELL ROAD	389.2	3.0	6.0	$ 70,053	$ 280,212
Boudreau Rd	CAMPBELL ROAD	PAGE DRIVE	390.5	3.0	6.0	$ 70,287	$ 281,148
Boudreau Rd	CAMPBELL ROAD	CURIAL DRIVE	217.4	3.0	6.0	$ 39,131	$ 156,523
Boudreau Rd	CARNEGIE DRIVE	CAMPBELL ROAD	217.5	3.0	6.0	$ 39,159	$ 156,633
Boudreau Rd	CURIAL DRIVE	BOUDREAU ROAD	244.2	3.0	6.0	$ 43,955	$ 175,818
Boudreau Rd	BOUDREAU ROAD	CARNEGIE DRIVE	243.7	3.0	6.0	$ 43,868	$ 175,470
Sir Winston Churchill Av	KINGSWOOD DRIVE	POUNDMAKER ROAD	368.4	3.0	6.0	$ 66,309	$ 265,236
Sir Winston Churchill Av	STURGEON ROAD	KINGSWOOD DRIVE	257.6	3.0	6.0	$ 46,377	$ 185,506
Sir Winston Churchill Av	WALDEN PARK	STURGEON ROAD	131.5	3.0	6.0	$ 23,675	$ 94,699
Sir Winston Churchill Av	WAVERLY DRIVE	WALDEN PARK	188.9	3.0	6.0	$ 34,003	$ 136,011
Sir Winston Churchill Av	POIRIER AVENUE	SIR WINSTON CHURCHILL AVENUE	123.3	3.0	6.0	$ 22,196	$ 88,782
Sir Winston Churchill Av	SIR WINSTON CHURCHILL AVENUE	POIRIER AVENUE	122.2	3.0	6.0	$ 22,001	$ 88,003
Sir Winston Churchill Av	SIR WINSTON CHURCHILL AVENUE	WAVERLY DRIVE	590.7	3.0	6.0	$ 106,334	$ 425,336
Sir Winston Churchill Av	POIRIER AVENUE	WOODLANDS ROAD	273.1	3.0	6.0	$ 49,164	$ 196,656
Sir Winston Churchill Av	PARK AVENUE	POIRIER AVENUE	274.8	3.0	6.0	$ 49,467	$ 197,866
Sir Winston Churchill Av	WOODLANDS ROAD	BOUDREAU ROAD	379.9	3.0	6.0	$ 68,378	$ 273,509
Sir Winston Churchill Av	BOUDREAU ROAD	PARK AVENUE	372.9	3.0	6.0	$ 67,127	$ 268,507
Sir Winston Churchill Av	BOUDREAU ROAD	BRUNSWICK CRESCENT	240.2	3.0	6.0	$ 43,228	$ 172,910
Sir Winston Churchill Av	FLAGSTONE CRESCENT	BOUDREAU ROAD	239.9	3.0	6.0	$ 43,174	$ 172,696
Sir Winston Churchill Av	BRUNSWICK CRESCENT	RIDGEWOOD TERRACE	125.2	3.0	6.0	$ 22,531	$ 90,122
Sir Winston Churchill Av	RIDGEWOOD TERRACE	RIDGEWOOD TERRACE	110.1	3.0	6.0	$ 19,812	$ 79,247
Sir Winston Churchill Av	FRANKLIN PLACE	FLAGSTONE CRESCENT	235.0	3.0	6.0	$ 42,299	$ 169,194

Gaps Assessment Cost Estimate - Trails

CLOSEST ROADWAY	FROM STREET	TO STREET	LENGTH (M)	TRAIL WIDTH (M)*		COST ESTIMATE ($)	
				MIN	MAX	LOW	HIGH
Sir Winston Churchill Av	RIDGEWOOD TERRACE	FAIRVIEW BOULEVARD	171.2	3.0	6.0	$ 30,823	$ 123,291
Sir Winston Churchill Av	FAIRVIEW BOULEVARD	FRANKLIN PLACE	176.2	3.0	6.0	$ 31,715	$ 126,860
Sir Winston Churchill Av	FAIRVIEW BOULEVARD	SIR A MACKENZIE SCHOOL	261.4	3.0	6.0	$ 47,058	$ 188,232
Sir Winston Churchill Av	SCHOOL BOARD	FAIRVIEW BOULEVARD	261.8	3.0	6.0	$ 47,119	$ 188,475
Sir Winston Churchill Av	SIR A MACKENZIE SCHOOL	BISHOP STREET	221.2	3.0	6.0	$ 39,808	$ 159,229
Sir Winston Churchill Av	BISHOP STREET	SCHOOL BOARD	223.0	3.0	6.0	$ 40,148	$ 160,592
Sir Winston Churchill Av	BISHOP STREET	CUNNINGHAM ROAD	195.8	3.0	6.0	$ 35,246	$ 140,984
Sir Winston Churchill Av	CUNNINGHAM ROAD	BISHOP STREET	194.1	3.0	6.0	$ 34,931	$ 139,721
Sir Winston Churchill Av	CUNNINGHAM ROAD	PERRON STREET	512.9	3.0	6.0	$ 92,318	$ 369,272
Sir Winston Churchill Av	GREEN GROVE DRIVE	CUNNINGHAM ROAD	514.1	3.0	6.0	$ 92,533	$ 370,130
Sir Winston Churchill Av	PERRON STREET	ST ANNE STREET	294.1	3.0	6.0	$ 52,938	$ 211,751
Sir Winston Churchill Av	GRANDIN ROAD	GREEN GROVE DRIVE	293.7	3.0	6.0	$ 52,863	$ 211,450
Sir Winston Churchill Av	ST ANNE STREET	TACHE STREET	180.4	3.0	6.0	$ 32,467	$ 129,865
Sir Winston Churchill Av	TACHE STREET	GRANDIN ROAD	180.9	3.0	6.0	$ 32,558	$ 130,229
Sir Winston Churchill Av	TACHE STREET	FIRE STATION 1	196.6	3.0	6.0	$ 35,394	$ 141,575
Sir Winston Churchill Av	FIRE STATION 1	TACHE STREET	190.8	3.0	6.0	$ 34,342	$ 137,365
Sir Winston Churchill Av	FIRE STATION 1	FIRE STATION 1	64.6	3.0	6.0	$ 11,626	$ 46,504
Sir Winston Churchill Av	FIRE STATION 1	FIRE STATION 1	65.3	3.0	6.0	$ 11,757	$ 47,025
Sir Winston Churchill Av	FIRE STATION 1	RIEL DRIVE	156.0	3.0	6.0	$ 28,088	$ 112,352
Sir Winston Churchill Av	GRESHAM BOULEVARD	FIRE STATION 1	156.6	3.0	6.0	$ 28,194	$ 112,775
Sir Winston Churchill Av	RIEL DRIVE	GLENHAVEN CRESCENT	486.8	3.0	6.0	$ 87,626	$ 350,502
Sir Winston Churchill Av	GLENHAVEN CRESCENT	GRESHAM BOULEVARD	490.6	3.0	6.0	$ 88,312	$ 353,247
Sir Winston Churchill Av	GLENHAVEN CRESCENT	GATEWOOD AVENUE	294.2	3.0	6.0	$ 52,959	$ 211,834
Sir Winston Churchill Av	GATEWOOD AVENUE	GLENHAVEN CRESCENT	288.9	3.0	6.0	$ 51,997	$ 207,986
Sir Winston Churchill Av	GATEWOOD AVENUE	GRANDIN VILLAGE	173.0	3.0	6.0	$ 31,146	$ 124,584
Sir Winston Churchill Av	GRANDIN VILLAGE	GATEWOOD AVENUE	156.0	3.0	6.0	$ 28,074	$ 112,296
Sir Winston Churchill Av	GRANDIN VILLAGE	GRANDIN VILLAGE	83.9	3.0	6.0	$ 15,099	$ 60,395
Sir Winston Churchill Av	GRANDIN VILLAGE	GRANDIN VILLAGE	139.4	3.0	6.0	$ 25,093	$ 100,372
Sir Winston Churchill Av	GRANDIN VILLAGE	GRANDIN VILLAGE	139.7	3.0	6.0	$ 25,146	$ 100,581
Sir Winston Churchill Av	GRANDIN VILLAGE	GRANDIN WOODS	317.6	3.0	6.0	$ 57,163	$ 228,651
Sir Winston Churchill Av	GRANDIN VILLAGE	GRANDIN VILLAGE	305.5	3.0	6.0	$ 54,985	$ 219,940
Sir Winston Churchill Av	GRANDIN WOODS	GAINSBOROUGH AVENUE	145.1	3.0	6.0	$ 26,125	$ 104,499
Sir Winston Churchill Av	GAINSBOROUGH AVENUE	GRANDIN VILLAGE	153.3	3.0	6.0	$ 27,596	$ 110,381
Sir Winston Churchill Av	GAINSBOROUGH AVENUE	LEVASSEUR ROAD	148.3	3.0	6.0	$ 26,694	$ 106,773
Sir Winston Churchill Av	LEVASSEUR ROAD	GAINSBOROUGH AVENUE	152.8	3.0	6.0	$ 27,510	$ 110,038
Sir Winston Churchill Av	LEVASSEUR ROAD	SIR WINSTON CHURCHILL AVENUE	149.9	3.0	6.0	$ 26,989	$ 107,956
Sir Winston Churchill Av	SIR WINSTON CHURCHILL AVENUE	LEVASSEUR ROAD	150.7	3.0	6.0	$ 27,121	$ 108,481
Sir Winston Churchill Av	SIR WINSTON CHURCHILL AVENUE	HAWTHORNE CRESCENT	104.7	3.0	6.0	$ 18,853	$ 75,412
Sir Winston Churchill Av	137 AVENUE	SIR WINSTON CHURCHILL AVENUE	145.0	3.0	6.0	$ 26,101	$ 104,401
Ray Gibbon Dr	STURGEON RIVER BRIDGE	MEADOWVIEW DRIVE	1406.9	3.0	6.0	$ 253,240	$ 1,012,957
Ray Gibbon Dr	LECLAIR WAY	STURGEON RIVER BRIDGE	1367.7	3.0	6.0	$ 246,190	$ 984,760
Ray Gibbon Dr	RAY GIBBON DRIVE	LECLAIR WAY	666.9	3.0	6.0	$ 120,043	$ 480,171
St Albert Tr	COAL MINE ROAD	EVERITT DRIVE NORTH	438.4	3.0	6.0	$ 78,918	$ 315,670
St Albert Tr	SMART CENTRE NORTH ENTRANCE	SMART CENTRE SOUTH ENTRANCE	253.3	3.0	6.0	$ 45,597	$ 182,388
St Albert Tr	SMART CENTRE SOUTH ENTRANCE	VILLENEUVE ROAD	262.7	3.0	6.0	$ 47,278	$ 189,109
St Albert Tr	ERIN RIDGE DRIVE	SMART CENTRE TURNING BAY	140.7	3.0	6.0	$ 25,335	$ 101,339
St Albert Tr	SUPERSTORE S ENTRANCE	SUPERSTORE TURNOFF	72.1	3.0	6.0	$ 12,972	$ 51,886
St Albert Tr	SUPERSTORE TURNOFF	GATEWAY VILLAGE S EXIT	104.5	3.0	6.0	$ 18,803	$ 75,210
Ray Gibbon Dr	GIROUX ROAD	VILLENEUVE ROAD	2086.0	3.0	6.0	$ 375,479	$ 1,501,914
St Albert Tr	VILLAGE LANDING N ENTRANCE	GERVAIS ROAD	156.0	3.0	6.0	$ 28,074	$ 112,293
McKenney Av	LIBERTON DRIVE	LIBERTON TERRACE	48.4	3.0	6.0	$ 8,707	$ 34,826
McKenney Av	LIBERTON TERRACE	LIBERTON TERRACE	89.4	3.0	6.0	$ 16,085	$ 64,339
McKenney Av	DAWSON ROAD	LANGLEY AVENUE	211.9	3.0	6.0	$ 38,147	$ 152,586
McKenney Av	LANGLEY AVENUE	DAWSON ROAD	220.4	3.0	6.0	$ 39,677	$ 158,706
St Albert Tr	ST ANNE STREET	GREEN GROVE DRIVE	199.4	3.0	6.0	$ 35,889	$ 143,555
St Vital Av	MUIR DRIVE	MADONNA DRIVE	58.8	3.0	6.0	$ 10,581	$ 42,323
St Vital Av	MUIR DRIVE	MADONNA DRIVE	62.1	3.0	6.0	$ 11,172	$ 44,686
Bellerose Dr	ST ALBERT TRAIL	ST ALBERT CENTRE ENTRANCE	99.0	3.0	6.0	$ 17,821	$ 71,284
St Albert Tr	GERVAIS ROAD	MCDONALDS TURNOFF	127.7	3.0	6.0	$ 22,986	$ 91,942
Boudreau Rd	STURGEON HOSPITAL	ST ALBERT TRAIL	83.0	3.0	6.0	$ 14,935	$ 59,740
St Albert Tr	MUIR DRIVE	MISSION AVENUE	18.0	3.0	6.0	$ 3,246	$ 12,981
Hwy 2	HWY 2 SERVICE ROAD	HWY 2	406.8	3.0	6.0	$ 73,226	$ 292,902
SH 633	VILLENEUVE ROAD	EDGE OF CITY	505.1	3.0	6.0	$ 90,923	$ 363,689
St Albert Tr	COAL MINE ROAD	HWY SERVICE ROAD	126.8	3.0	6.0	$ 22,824	$ 91,293
St Albert Tr	EVERITT DRIVE NORTH	NEIL ROSS ROAD	240.8	3.0	6.0	$ 43,346	$ 173,384
Neil Ross Rd	COSTCO N ENTRANCE	ELEMENT DRIVE NORTH	177.0	3.0	6.0	$ 31,861	$ 127,442
St Albert Tr	HWY 2 SERVICE ROAD	EVERITT DRIVE N	129.2	3.0	6.0	$ 23,251	$ 93,002
St Albert Tr	HWY 2 SERVICE ROAD	NEIL ROSS ROAD	410.3	3.0	6.0	$ 73,847	$ 295,385
Boudreau Rd	FIRE STATION 2	STURGEON ROAD	266.1	3.0	6.0	$ 47,894	$ 191,574
Boudreau Rd	FIRE STATION 2	STURGEON ROAD	58.4	3.0	6.0	$ 10,513	$ 42,050
Boudreau Rd	STURGEON ROAD	FIRE STATION 2	266.0	3.0	6.0	$ 47,876	$ 191,504
Boudreau Rd	STURGEON ROAD	FIRE STATION 2	58.4	3.0	6.0	$ 10,504	$ 42,013
St Albert Tr	STURGEON ROAD	RIVERCREST CRESCENT	104.7	3.0	6.0	$ 18,855	$ 75,420
St Albert Tr	MISSION AVENUE	ST ANNE STREET	55.5	3.0	6.0	$ 9,992	$ 39,965
St Albert Tr	ST ALBERT TRAIL	ST ALBERT TRAIL	59.5	3.0	6.0	$ 10,710	$ 42,839

Gaps Assessment Cost Estimate - Trails

CLOSEST ROADWAY	FROM STREET	TO STREET	LENGTH (M)	TRAIL WIDTH (M)*		COST ESTIMATE ($)	
				MIN	MAX	LOW	HIGH
St Albert Tr	ST ALBERT TRAIL	ST ALBERT TRAIL	55.5	3.0	6.0	$ 9,982	$ 39,925
SH 633	RAY GIBBON DRIVE	VILLENEUVE ROAD	231.9	3.0	6.0	$ 41,743	$ 166,969
McKenney Av	MCKENNEY AVENUE	RIVERSIDE DRIVE	141.5	3.0	6.0	$ 25,475	$ 101,897
Sir Winston Churchill Av	GATEWOOD AVENUE	GRANDIN VILLAGE	71.6	3.0	6.0	$ 12,893	$ 51,569
Ray Gibbon Dr	RAY GIBBON DRIVE	137 AVENUE	301.1	3.0	6.0	$ 54,200	$ 216,799
Ray Gibbon Dr	137 AVENUE	RAY GIBBON DRIVE	300.4	3.0	6.0	$ 54,075	$ 216,297
SH 633	HOGAN ROAD	RAY GIBBON DRIVE	903.5	3.0	6.0	$ 162,639	$ 650,554
						$ 12,133,181	$ 48,532,368

Note: the cost estimate is based on a range of $60.00/$m^2$ (min) to 120.00 m^2 (max)

* based on St. Albert's Complete Streets Guidelines

Closure

This report was prepared to:

- prepare a Best Practice for active transportation
- bring forth an ATP Development Strategy
- prepare a Gaps Assessment

for the City of St. Albert active transportation network.

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