CENTRE IN THE PARK

Transportation Master Plan

STRATHCONA COUNTY

November 2019
Final

Sign-off Sheet

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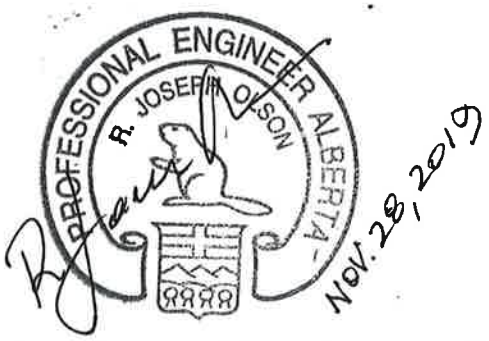

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1 INTRODUCTION

This document supports the Centre in the Park Area Redevelopment Plan through focusing on the transportation goals and objectives for the area, understanding the implications of existing conditions and plans, and identifying a preliminary updated street network to support the long-term implementation of the ARP. Should the Area Redevelopment Plan be amended, this supporting document should be amended as well.

1.1 Area Redevelopment Plan

Background

Centre in the Park has long been the core of Sherwood Park, prior to any official Area Redevelopment Plan (ARP). In the 1970s, Sherwood Park Mall, the Kinsmen Leisure Centre, and other major developments took place in the area, drawing people from across Sherwood Park and beyond. By 1990, plans were underway to integrate some of these pre-existing developments into a cohesive “Centre” for the County.

The original Centre in the Park ARP was adopted in 1990 and set the stage for developments such as Festival Place, a Civic Centre, and higher density housing. The Plan has been amended on several occasions, with the most recent version approved in 2015. Presently, Centre in the Park is a bustling mixed-use area, with approximately half of its area occupied by open space and the other half by residential, institutional, and commercial uses. As of 2018, the population of Centre in the Park is approximately 1008, with about half of the existing residents over the age of 65.

As development continues, the 1990 ARP is becoming outdated. This updated plan will set the stage for the future vision and development for the area in alignment with Strathcona County’s Municipal Development Plan (MDP), approved in 2017. The MDP, titled *“Forwarding our Future. Together.”* provides a vision for Strathcona County as an energetic, thriving community which welcomes all people, is a model for ecological integrity, and invests in quality services and amenities for residents. Centre in the Park is part of the Urban Centre Policy Area, which prescribes an update to the ARP to ensure consistency with the MDP. This ARP aims to ensure that the future trajectory of Centre in the Park is in alignment with the MDP and the broad goals it applies for the future of Strathcona County.

The Transportation Master Plan will provide tools to support implementation and focus on transportation goals and infrastructure decisions.

Plan Authority

The Centre in the Park Area Redevelopment Plan (ARP) is a Council-approved statutory document in accordance with the higher-level Strathcona County Municipal Development Plan and the Municipal Government Act (MGA). The ARP is a long-term planning document intended to provide an overall concept and vision for the area. The Transportation Master Plan is a non-

statutory supporting document that provides guidance on implementation around the transportation components of the ARP.

Policy Structure

The ARP is divided into individual policy areas and are defined by a unique character, enforced by a combination of land uses, site and building design, and public realm. The transportation plan has been developed with the ARP policies in mind; street types are intended to support the overarching goals for the plan area by providing appropriate facilities, access, design speed, and mobility connections. There are seven identified policy areas, summarized below and illustrated in **Figure 1**.

Main Street Policy Area

The Main Street Policy Area is focused at the intersection of Granada Boulevard and Sherwood Drive, extending north and south along Sherwood Drive. The intent for this area is a pedestrian-oriented main street, with commercial fronting Sherwood Drive and opportunities for medium to high density residential development above the ground floor or within larger development areas. The area will incorporate plazas and pedestrian routes that lead to open spaces. This area will serve as the critical character district within the Centre, establishing the framework that is to be continued throughout the other policy areas.

Urban Centre Policy Area

The Urban Centre Policy Area applies to two areas of land, one in the north-central portion of the plan area and the other in the south eastern portion. These are intended to provide for commercial-focused mixed-use development that may also include large-format commercial uses with an urban character, standalone residential, and mixed uses. These areas have the greatest opportunity for high density development.

Community Policy Area

The Community Policy Area applies to areas intended for residential-focused mixed-use development. The character of these areas will be community based, with ancillary commercial and other non-residential uses intended to increase neighbourhood walkability. Development within this policy area is expected to be similar to the recent redevelopment within the central portion of Centre in the Park.

Neighbourhood Policy Area

The Neighbourhood Policy Area applies to residential areas on the periphery of the plan area, which are intended to continue to accommodate low to medium density residential development including row housing, townhouses and duplexes that provide a transitional interface with adjacent single-detached neighbourhoods. This area will also support live/work units and home-based businesses.

Public Service Policy Area

The Public Service Policy Area includes County facilities and property intended for continued civic uses and public amenities. This area is intended to also include limited commercial and community housing uses that improve the activation of these facilities.

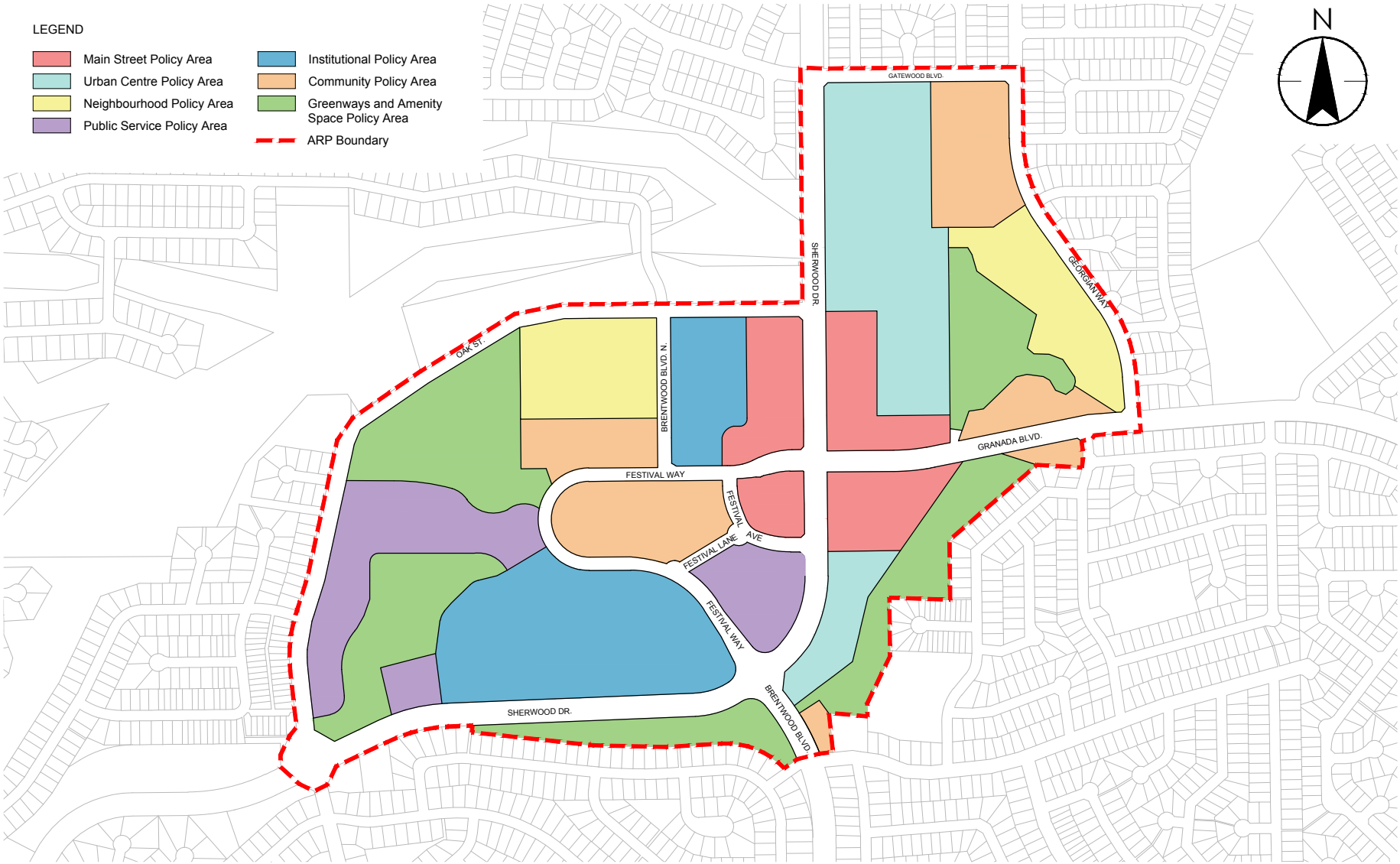
Institutional Policy Area

The Institutional Policy Area applies to existing school sites and associated open spaces within the Centre. The intent for this policy area is to accommodate the continued operation of these schools.

Greenways and Amenity Spaces Policy Area

Throughout the plan area, Greenways and Amenity Spaces are used to provide key path connections as well as public amenity spaces for daily recreation and special event use. These areas provide important gathering space and social interaction opportunities for the community.

FIGURE 1 LAND USE CONCEPT



STRATHCONA COUNTY

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Note: This map is conceptual in nature. The exact location and alignment of land uses, facilities, roadways and services will be determined by the future development subject to Strathcona County's approval.

1.2 Vision and Principles

The driving forces behind the overall ARP are the combination of the Strathcona County Vision and the Centre in the Park Vision, summarized below.

Strathcona County Vision

"Strathcona County is an energetic and thriving community. We use our energy to power our new tomorrow. We are a specialized municipality and work cooperatively with our urban and rural residents to govern as a single municipality. We are a welcoming place to live and attract all people to join us. We strive to be a model of ecological integrity, protecting our environment and preserving our agricultural heritage. Investment in infrastructure, quality services, cultural and recreational programs, and facilities is a priority and sets us apart."

Centre in the Park Vision

"Centre in the Park is the heart of our community. Our mix of public services, open spaces, schools, employment opportunities, and residents make it a key destination and gathering space both locally and within the region. Its continuing evolution will reflect our commitment to sustainable local and regional growth by developing an urban centre with a unique character that attracts people through vibrant streets, compact and diverse land uses and areas encouraging social interaction."

Principles/Core Ideas

The ARP includes three core principles which guide the policies.

Principle 1: Aspire to Increased Densities

Principle 2: Diversify the Land Use Composition

Principle 3: Enhance Urban Centre Design and Character

Of these principles, Principle 3 guides the direction of the TMP.

Principle 3: Enhance Urban Centre Design and Character

The Centre in the Park ARP encompasses Sherwood Park's community, cultural and commercial core that forms a diverse and distinctive character for the area. At its core, the area will be designed and scaled for people. The Centre in the Park street network should be attractive and provide opportunities for residents and visitors to walk or cycle. The implementation of streetscape improvements, character defining elements, pedestrian infrastructure and addition of pedestrian and bicycle linkages, and the elimination of visual and

physical barriers will facilitate the unification of the area. To this end, development guided by this ARP will:

- Provide redevelopment with a strong public realm component to create active frontages and vibrant streetscapes.
- Integrate character defining elements into open spaces, streetscapes and integrated amenity spaces.
- Prioritize and improve active transportation connections in Centre in the Park and from surrounding districts and neighbourhoods into the area.
- Provide parking that is organized to minimize the effect on pedestrians and the street scape and maximize developable area.
- Prioritize safety within transportation systems and embrace the concepts of vision zero and complete streets.
- Accommodate the continued operation of the existing district energy facility or other opportunities for alternative energy.
- Identify four-season design measures to be incorporated, where feasible, into the street design, infrastructure upgrades, and building design guidelines.
- Use the principles of smart growth including compact forms and complete communities.
- Create a convenient, easy to use and affordable transit service using transit-oriented design principles.

The principles noted above are represented across the design in several ways including:

- Minimizing lane widths where possible to keep design speeds slow and re-allocate space across existing rights-of-way to users on bicycles and users walking or using mobility aids;
- Improve intersection crossings for people on bikes and walking or using mobility aids;
- Provide a cycling network through that site that connects to existing facilities at the boundary of the study area;
- Plan for transit through adequate lane widths and opportunities for transit stops; and
- Provide on-street parking where appropriate which can be a flexible space that accommodates transit stops, higher order transit in certain contexts, bicycle parking, commercial deliveries, and parklets.

1.3 Street Design Domain

Designing streets requires an understanding of the operational requirements of people and their various modes of transportation. Design Users and Design Vehicles define the operating space required which informs the design domain (range of values) for the varying street elements. Design Domain can be thought of as a range of values that a design element might take such as sidewalk width, lane width, design speed, or horizontal curvature in order to accommodate the design user or vehicle. Road classification and desired function inform whether a sidewalk width, for example, should be wider (e.g. Arterial Main Street) or narrower (e.g. Local Streets). The street cross-sections identified in this document have been specialized to the specific needs of Centre in the Park the area within the existing defined rights-of-way. In certain cases,

some street elements may fall near the lower end of the design domain range to accommodate all users within a constrained, existing right of way.

For additional design guidance, the Strathcona County Design & Construction Standards and the Center in the Park Design & Construction Standards should be consulted. Where further design guidance is required for street and intersection design, the following additional guiding design documents should be consulted:

- Geometric Design Guidelines for Canadian Roads, Transportation Association of Canada (TAC GDG);
- Manual of Traffic Control Devices for Canada (MUTCD-C), Transportation Association of Canada;
- Bikeway Traffic Control Guidelines for Canada, Transportation Association of Canada
- Canadian Guide to Neighbourhood Traffic Calming, Transportation Association of Canada; and
- Pedestrian Crossing Control Guide, Transportation Association of Canada
- Main Streets Guidelines (City of Edmonton).

2 EXISTING CONDITIONS

This section includes a summary of previously completed reports and study area existing conditions.

2.1 Transportation Reports and Plans

Strathcona County Integrated Transportation Master Plan (2012)

The integrated Transportation Master Plan is a document intended to support a shift to a more sustainable and resilient transportation system. References to CITP identify it as a centre for sustainable transportation use (transit, walking and cycling), and provide an overall recommendation to support modal change over time.

Strategies which may impact the Centre in the Park Plan include:

- Increase the proportion of municipal investment in transit and active transportation modes;
- Support public transit as a viable transportation mode for both local and longer distance trips;
- Coordinate land use, transportation, and other infrastructure plans to support the wider community vision;
- Incorporate context-sensitive planning solutions;
- Integrate urban development and transportation (land use intensification, mixed uses, compact and complete communities, sustainable built form practices); and
- Establish a higher frequency transit corridor between CITP and Strathcona's existing transit centres.

Strathcona County Transit Master Plan

The purpose of the updated 2018 Transit Master Plan is to provide direction to the County on the delivery of transit service over a ten-year period. It reviews existing services and translates that into an evaluation of needs and opportunities, review of public input, and identifies recommendations for future transit service. The Transit Master Plan aligns with the Strathcona County MDP (Urban Service Area) which identifies Centre in the Park as an intensification area which should be planned to follow the principles of TOD with the potential integration of a future on-street, at-grade transit transfer facility.

2.2 Safety

A Safety Audit was completed on the Centre in the Park area in 2012, which identified traffic safety, pedestrian safety, and traffic management issues and identified mitigation strategies to address concerns. The audit focused on the intersections of Sherwood Drive/Granada Boulevard; Sherwood Drive/Festival Ave; and Sherwood Drive/Brentwood Boulevard, as well as the linear road sections of Festival Way/Brentwood Boulevard from Sherwood Drive to Sherwood Drive and Festival Lane/Ave from Sherwood Drive to the roundabout at Broadmoor Boulevard.

This study included several recommendations which focus on providing adequate pedestrian infrastructure, geometric changes to intersections to improve sight lines, and signal phasing to separate movements.

Recent collision data (2012-2016) within the study area is summarized in **Figure 2**.

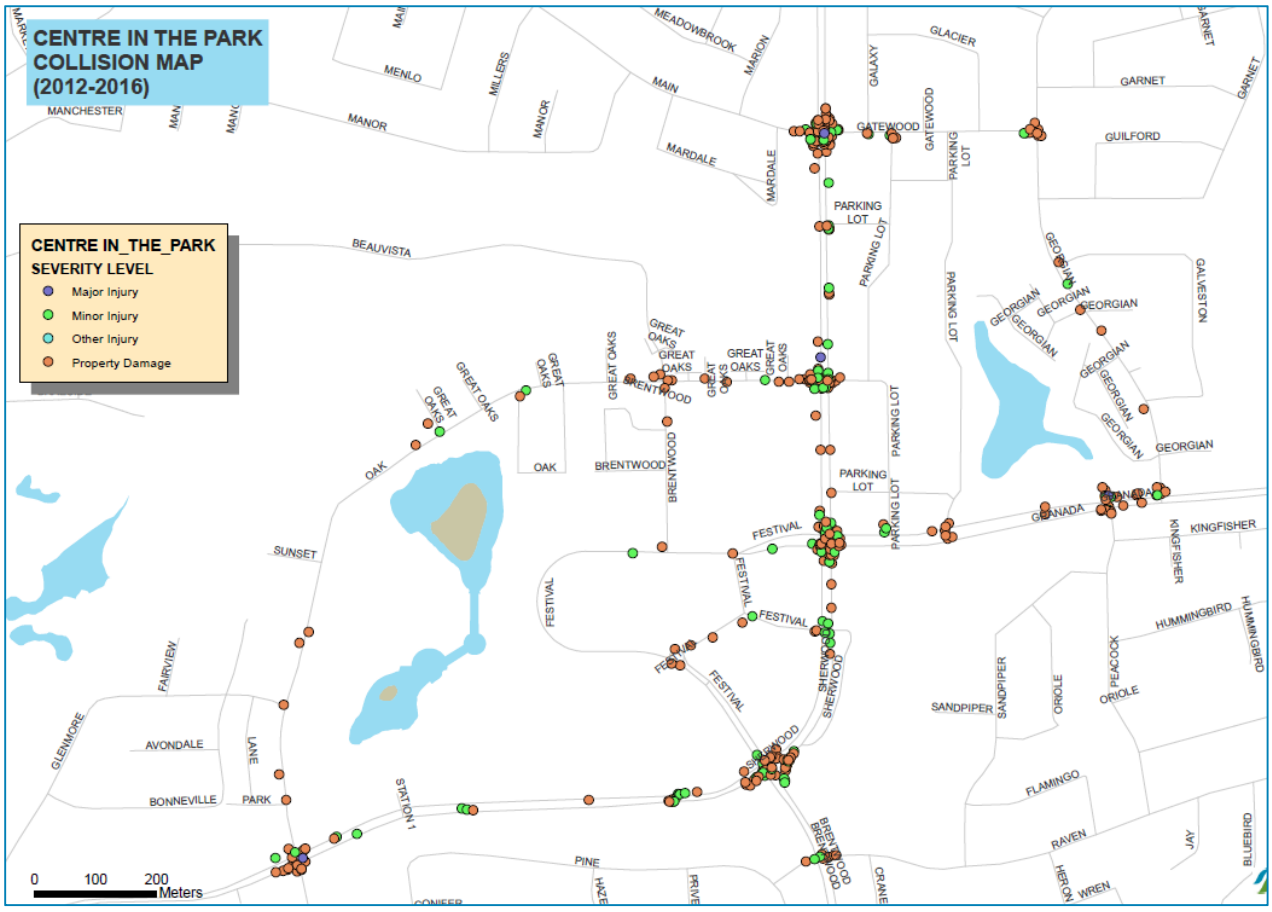


FIGURE 2: FIVE YEAR COLLISION HISTORY

In addition, Strathcona County's Traffic Collision Statistics (2018) identified the following:

- The Sherwood Drive/Brentwood Boulevard South and Sherwood Drive/Gatewood Boulevard intersections were listed within the top 10 intersections for collision frequency

within Strathcona County in 2016. Sherwood Drive/Brentwood Boulevard intersection remained in the top 10 in 2017.
- Both of those intersections were also identified within the 2016 top 10 intersections for rear-end collisions.
- Five of the top collision frequency locations within the study area are located on Sherwood Drive.
- The Sherwood Drive/Gatewood Boulevard intersection was listed within the top 10 intersections for frequency of fatal/major injury collisions between 2008 and 2019; however, no fatalities were recorded at this location.
- The Sherwood Drive/Granada Blvd and Sherwood Drive/Oak Street (North) intersections were listed as some of the top pedestrian/bicycle collision locations between 2009 and 2018.
- With the exception of one intersection, the Sherwood Drive/Granada Boulevard intersection had more than double the amount of pedestrian or bicycle collisions than any other location within Strathcona County (2009-2018).

Though this data does not provide specific details of each of the collisions, it is apparent that collisions are most present at intersections along the higher volume and higher speed roadways.

Starting at the planning level for Centre in the Park, all design decisions that impact users, must incorporate the Safe Systems Approach and consider the needs of all street users, regardless of age, ability, and income. Safe Systems include four key principles:

- People make mistakes
- People are vulnerable
- Everyone shares responsibility
- The system needs redundancies.

Design approaches which will support a safe system approach in CITP include:

- Physically separating users of different modes to protect vulnerable users for higher speed users,
- Use signal phases to separate conflict movements including leading intervals for people walking and protecting turns.
- Improve sightlines for pedestrians by making intersections compact with curb extensions.
- Support a lower design speed on all streets, especially in locations where there is a high probability of people walking and cycling crossing paths with people driving and transit vehicles.

Signal timing and phasing changes implemented in 2017 and 2018 have greatly improved pedestrian safety and reduced collision frequencies.

2.3 Streets

The current street network in Centre in the Park is highly varied. The site is bisected by Sherwood Drive, a 4 to 6 lane arterial running north-south through the plan area. Two additional arterials (Brentwood Boulevard and Granada Boulevard) also feed high volumes of traffic into and through the study area. Within the existing Centre in the Park area, lower speed streets like Festival Way, Festival Lane and Festival Ave provide a more urbanized area with on-street parking and wider sidewalk areas. Existing residential streets like Gatewood Boulevard, Georgian Way and Oak Street provide residents with direct access to their homes. Oak Street is also the primary access to recreation facilities including the Kinsmen Leisure Centre, Sherwood Park Arena, Salto Gymnastics Club, Broadmoor Arena, Broadmoor Public Golf Course, Broadmoor Tennis Club, and St. Teresa School and sports fields.

The existing streets generally provide a high level of service to people driving, and some service for people taking transit and walking, but limited options for people cycling. A description of the streets and facilities are summarized in **Table 1**.

TABLE 1: CENTRE IN THE PARK EXISTING STREETS

Street	Existing ROW	Travel Lanes (directional)	Existing Speed Limit	AADT	Active Transportation Facilities	Transit
Sherwood Drive	40 m	2 to 3 with dedicated turn lanes	60 km/h	12,000 – 22,000	Mono-walk, boulevard walk, and multi-use trail from Brentwood Blvd South to Oak Street South	Local routes 450, 443A, 443, 442, 492, 493, 494
Granada Blvd	36.5 m	2 with dedicated turn lanes	50 km/h	13,000 – 15,000	Mono-walk, separate walk, and multi-use trail	Local routes 443, 442, 443B, 492, 494
Georgian Way	24 m	1 lane with on street parking	50 km/h	3,500 – 8,000	Mono-walk	None
Festival Way	25 – 28 m	Varies, generally 1 lane, 1-way, mix of angle and parallel parking	30 km/h	1,000 – 4,000	Wide mono-walk and separate walk	Local routes 443B, 450, 443A, 493 (none from Brentwood Blvd to Festival Lane)
Festival Lane	29 m	1 lane, angle and parallel parking	30 km/h	2,500	Wide separate walk	Local routes 450, 443A, 493
Festival Ave	25 m	1 lane, angle and parallel parking	30 km/h	1,500	Wide separate walk	None
Brentwood Blvd North	24 m	1 lane, parallel parking, bus bay	50 km/h	1,500	Mono-walk	Local 443B
Oak Street	24 m	1 lane, parallel parking	50 km/h	3,000 – 5,000	Mono-walk	Local 443B, 450, 493
Gatewood Blvd	24 m	1 lane, parallel parking	50 km/h	3,000 – 7,000	Mono-walk	Local 443, 443B, 493

Sherwood Drive is a four to six-lane arterial street running north-south through most of the study area and bends at Brentwood Boulevard South to run east-west through the south portion of the study area. The street also accommodates additional left and right turn capacity at intersections along the corridor. A combination of separate and mono-walks are constructed along Sherwood Drive for most of the corridor with the exception of a multi-use trail constructed along the south side of Sherwood Drive between Oak Street South and Brentwood Boulevard South. Parking is currently not permitted along Sherwood Drive and the posted speed limit along Sherwood Drive is 60 km/h.

Granada Boulevard is a four-lane arterial roadway running east-west in the central-east portion of the study area. Granada Boulevard provides an east-west connection between Sherwood Drive and Clover Bar Road and provides access to the Brentwood, Glen Allen, and Nottingham neighbourhoods. A combination of separate and mono-walks are constructed along both sides of Granada Boulevard east of Sherwood Drive, transitioning to multi-use trails on both sides of the street east of the study area. Parking is currently not permitted along Granada Boulevard and the posted speed limit is 50 km/h.

Georgian Way is a two-lane looping collector roadway located along the east boundary of the study area north of Granada Boulevard. Parking is currently permitted along both sides of Georgian Way; however, Georgian Way is identified as a snow route and parking is not permitted when parking bans are declared for snow clearing. Mono-walks are currently provided along both sides of Georgian Way and the posted speed limit is currently 50 km/h. Road reconstruction was completed along Georgian Way in 2019 and the posted speed limit was reduced to 40 km/h.

Festival Way is a two-lane roadway looping through the Centre in the Park area providing access to the developments within Centre in the Park. Festival Way operates as a two-way street in the north between Sherwood Drive and Brentwood Boulevard North and in the south between Sherwood Drive and Festival Lane. The remaining section of Festival Way between Brentwood Boulevard and Festival Lane operates as a one-way street in a counter-clockwise direction. Angled parking is provided within the inside of the one-way looping street, and parallel bus parking is permitted along most of the outside of the one-way portion of the street. A combination of separate and mono-walks are currently constructed along both sides of Festival Way. The posted speed limit is 30 km/h.

Festival Ave and Festival Lane are two-lane local roadways within the central portion of Centre in the Park. Both streets are relatively short segments providing additional two-way access between Festival Way and Sherwood Drive to the developments within Centre in the Park. Separate walks are constructed along both sides of both streets and the posted speed limit is 30 km/h.

Brentwood Boulevard North is a two-lane local roadway running north-south within the northwest portion of the study area. Brentwood Boulevard North connects Festival Way and Oak Street as well as provides access to residential and institutional uses along the street. Mono-walks are currently constructed on both sides of the street. Parking is permitted on both sides of Brentwood Boulevard North and the posted speed limit is currently 30 km/h.

Oak Street is a two-lane collector roadway running north-south west of Sherwood Drive in the north portion of the study area and bends to the south to connect back to Sherwood Drive in the southwest portion of the study area. Oak Street provides access to the residential and civic land uses along the street. Mono-walks are constructed on both sides of the street. Parking is permitted on both sides and the posted speed limit is 50 km/h.

Gatewood Boulevard is a two-lane collector roadway extending east from Sherwood Drive and terminating at Georgian Way. Mono-walks are constructed on both sides of Gatewood Boulevard. Parking is permitted on most of the corridor; however, Gatewood Boulevard is identified as a snow route and parking is not permitted during snow parking bans to allow for snow clearing. The current speed limit along Gatewood Boulevard is 50 km/h.

2.4 Transit Network

Centre in the Park is serviced by three main local transit routes, and three evening and weekend routes, all of which connect to either Bethel Transit Terminal or Ordze Transit Centre. Direct routes into the City of Edmonton are accessible at the Transit Centres. The existing local transit map is summarized in **Figure 3**.

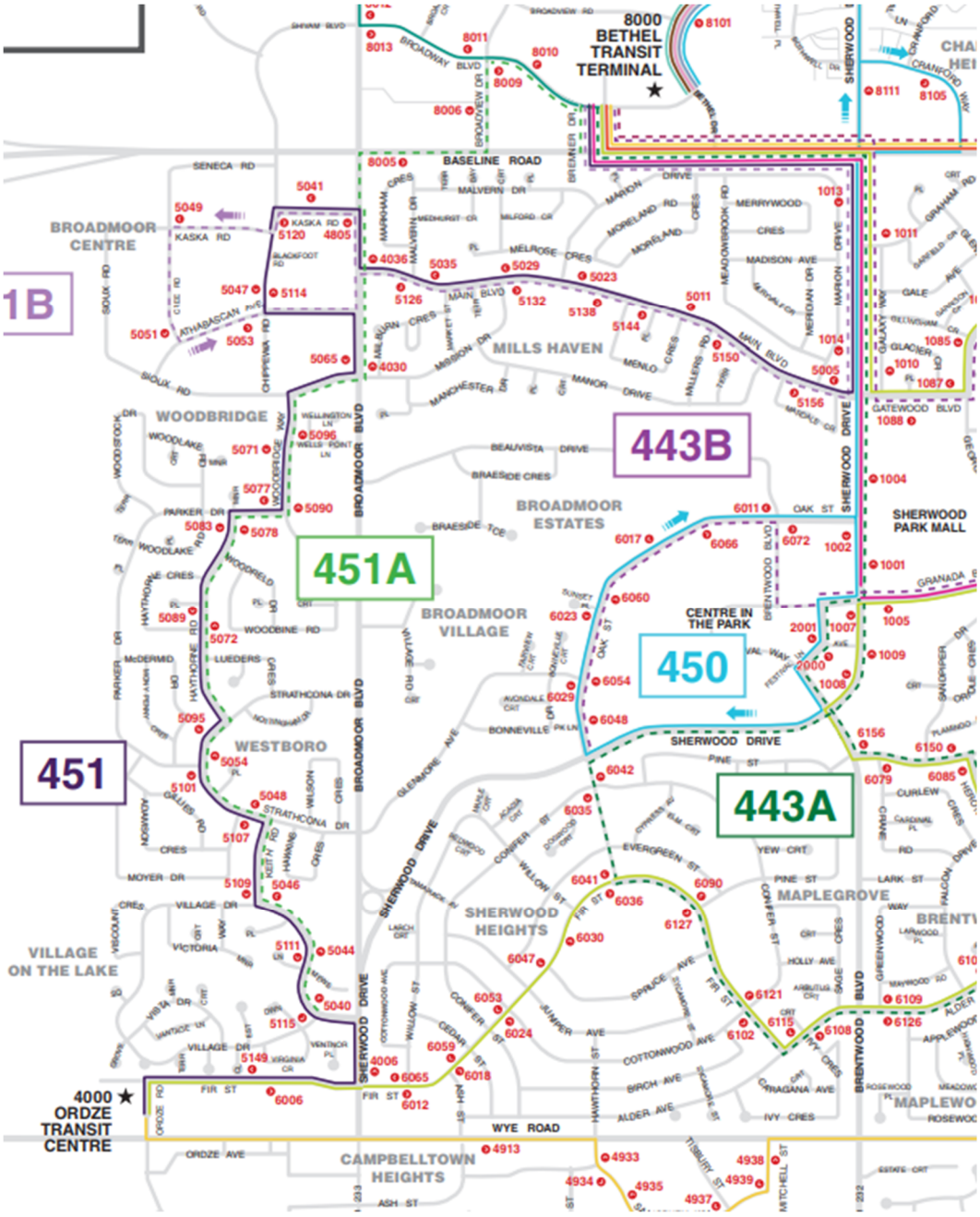
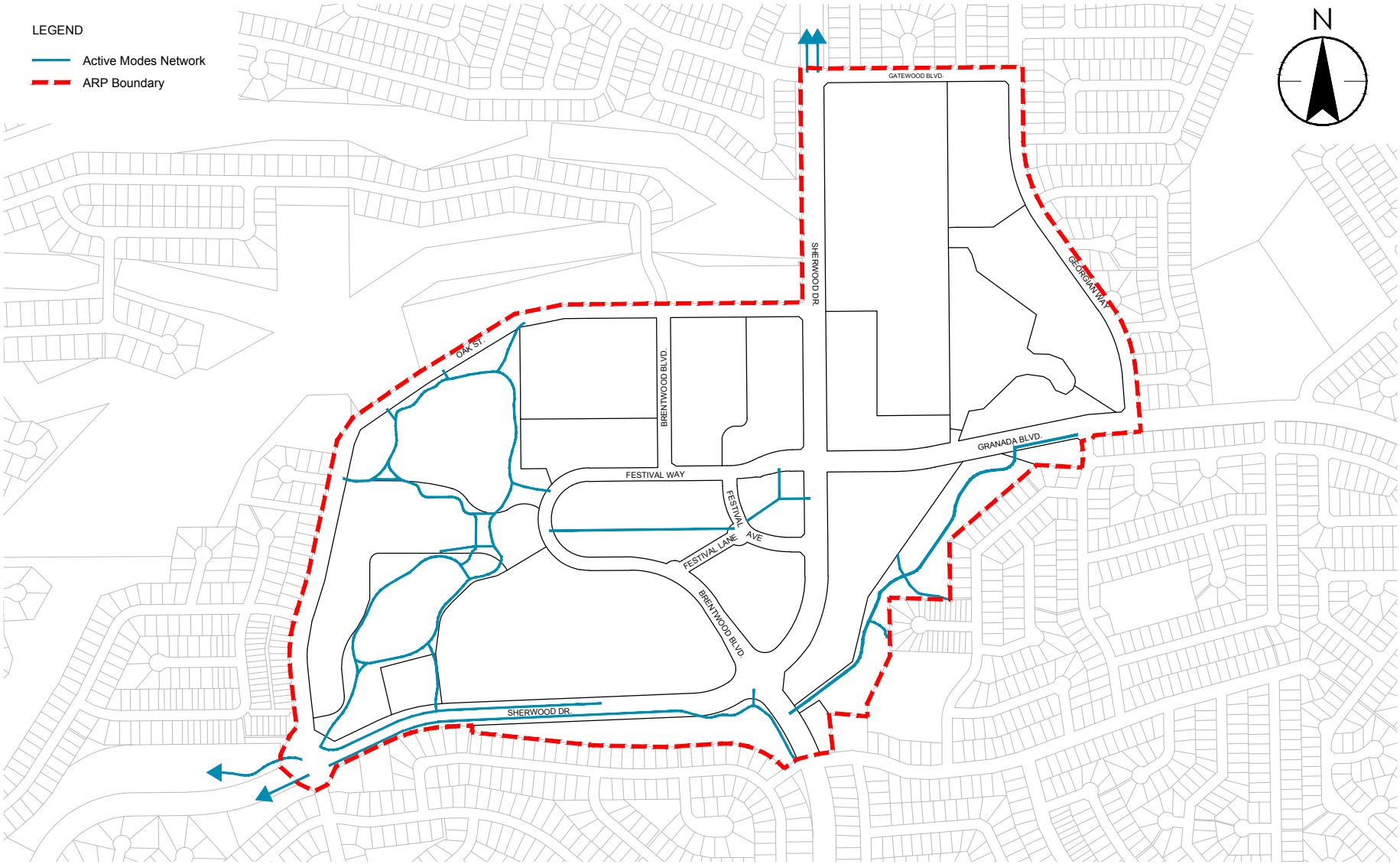


FIGURE 3: TRANSIT NETWORK

2.5 Active Transportation Network

All the streets in the study area include pedestrian facilities of varying types, usually in the form of a separated or mono-sidewalk. A network of multi-use trails exists within the current Centre in the Park recreational space and along Sherwood Drive. Some portions on the north side of Sherwood Drive adjacent to the fire hall and existing green spaces currently have both a separated walk and a multi-use trail. This trail network is summarized in **Figure 4**.

FIGURE 4 MULTI-USE TRAIL NETWORK



CENTRE IN THE PARK - TRANSPORTATION MASTER PLAN

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STRATHCONA COUNTY

Note: This map is conceptual in nature. The exact location and alignment of land uses, facilities, roadways and services will be determined by the future development subject to Strathcona County's approval.

3 TRANSPORTATION MASTER PLAN

3.1 Tools and Potential Treatment Options

Table 2 and **Table 3** summarize some industry best practice tools that could be applied at intersections and corridors within the Centre in the Park area in order to increase pedestrian and cyclist safety when crossing roadways, enhance the pedestrian and cyclist experience throughout the study area, and reduce vehicle speeds. Table 2 focuses on pedestrian/cyclist safety tools and Table 3 focuses on tools associated with reducing vehicle speeds. The tools identified were considered during the development of the proposed cross-sections and may apply to multiple street types within the proposed street network.

TABLE 2: POTENTIAL TREATMENT TOOLS – PEDESTRIAN/CYCLIST SAFETY & EXPERIENCE

Treatment	Intent	Photo Example
Median Refuge Island	Provides a refuge for pedestrians in the middle of the crossing movement, allowing for people crossing on foot and bike to cross one direction of travel at a time.	
Crosswalk Signage (Side-mounted or Overhead-mounted)	Increases driver awareness for pedestrians and cyclists crossing.	

Pedestrian Crossings	Rectangular rapid flash beacon (RRFB) or similar, to provide a warning communication to drivers when pedestrians or cyclists are crossing.	
Half Signals	Provides an indication to drivers to stop when pedestrians and cyclists are crossing.	
Curb Extensions & Removing Channelized Right-turns	Narrows crossing distances for pedestrians and cyclists crossing. Narrowing of the street also results in drivers travelling slower and provides increased visibility of pedestrians and cyclists intending to cross the street. The removal of channelized right-turns reduces crossing distances and reducing the speed of right turning vehicles.	
Tabletop Intersections or Raised Crosswalks	Vertical deflection to reinforce the desired operating speed of drivers travelling along the street. Transit and winter maintenance should be considered in application of this treatment.	

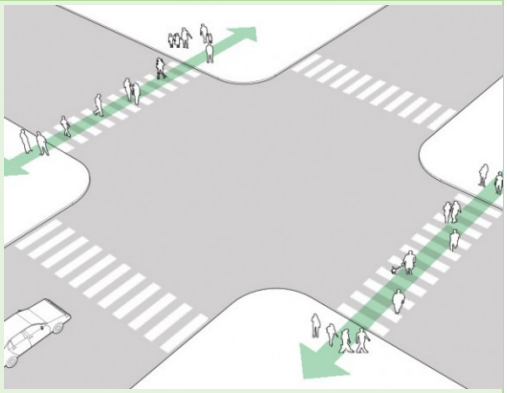
Pedestrian Scramble (after each motor vehicle phase)	For high pedestrian areas where crossing typically occur in multiple directions, reduces delay for pedestrians crossing.	
Cyclist Crossing Markings	Indicates the intended path of cyclists to both cyclists and vehicle drivers.	
Leading or Lagging Pedestrian Interval	Provides a short separation in time between people crossing the street on foot and drivers making left or right turns at signalized intersections to reduce conflicts.	

TABLE 3: POTENTIAL TREATMENT TOOLS – REDUCING VEHICLE SPEEDS

Treatment	Intent	Photo Example
Narrower Travel Lanes	Tends to make drivers travel slower though an area; however, can be less effective if there are multiple travel lanes or high volumes of heavy vehicles.	

Provide Median for narrowing effect	Creates a narrower feel to the roadway for drivers, which can encourage lower speeds.	
Introducing On-street Parking	Creates a narrower feel and friction to the roadway for drivers, which can encourage slower travel speeds.	
Edge/Separate Sidewalk treatment to make street feel less "open"	Creates a narrower feel to the roadway for drivers, which results in slower speeds by expanding the edge space along the travelled way. This could also include adding trees to the boulevard space or developing street-oriented active frontages along the roadway.	
Increase Friction On-Street so operating speed matches design speed (intersection treatments)	Collection of intersection controls along the street may have the effect of slowing vehicles since one consistent speed may not be possible.	

Vertical Deflection (e.g. speed hump)	Reinforces the desired operating speed of drivers travelling along the street.	
Curb Extensions & Removing Channelized Right-turns	Narrowing of the street results in drivers travelling slower and provides increased visibility of pedestrians and cyclists intending to cross the street. Curb extensions along the corridor at transit stops can increase transit level of service and enhance boarding and alighting for transit users. The removal of channelized right-turns reduces crossing distances and reducing the speed of right turning vehicles.	

3.2 Street Network

The Centre in the Park Street Network will be purposely designed to suit the desired outcomes identified in the Centre in the Park Area Redevelopment Plan. In addition to the general principles outlined in Section 1.2, the following general policies with respect to the street network identified in the ARP were considered when choosing street elements, element width, and desired connections:

- Require that streets are designed to accommodate all users to ensure opportunities for transportation choice;
- Encourage the creation of a safe, comfortable, accessible, vibrant, and attractive year-round public realm and pedestrian environment to encourage more trips by foot;
- Require a reduction to traffic speeds to between 30-50 km/h to ensure improved safety outcomes;
- Require streets to form part of the pedestrian network to ensure connection of residential areas, retail destinations, public amenities, and open spaces;
- Require pedestrian crossings across Sherwood Drive be enhanced to ensure the safety of all users;
- Require improved and increased crossings at intersections and high pedestrian locations to ensure barriers are minimized and pedestrian-vehicle conflict is reduced;
- Require the separation of people walking and cycling from higher speed, higher volume traffic to minimize conflicts;

- Encourage a gridded network to support improved permeability for people walking and cycling; and
- Require that vehicular access points are designed to minimize impacts to the pedestrian environment to create a positive pedestrian experience.

Context Sensitive Design

The Transportation Master Plan identifies the overall street types and facilities intended to support the transportation goals of the Area Redevelopment Plan. For existing streets within the study area, the revised street types retain the existing right-of-way. The space within that right-of-way has been reallocated to change the character of the street, compliment the proposed surrounding land uses, and prioritize the movements of people walking, cycling, and taking transit, to align with the goals and objectives of the ARP. The street types have been developed to consider all streets as a sum of zones, as illustrated below, but with flexibility in the width and details of each zone depending on the street context.

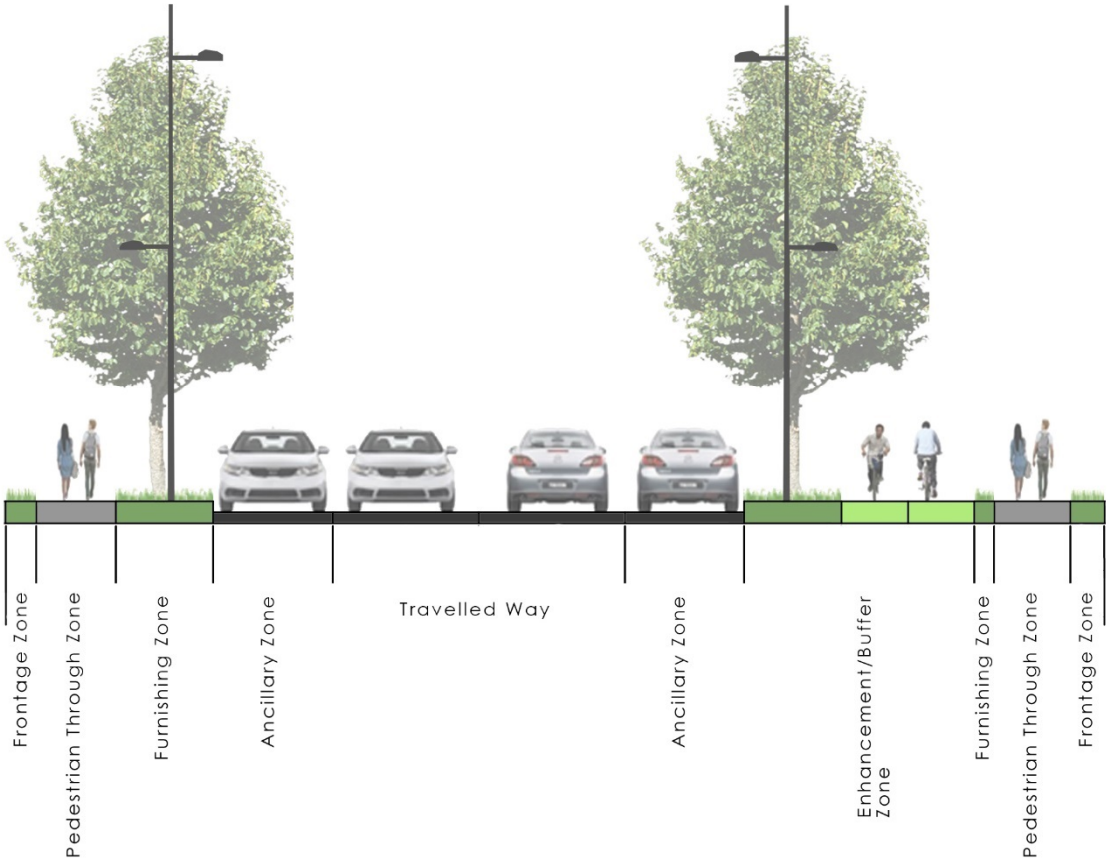


FIGURE 5: STREET ZONES

TABLE 4: STREET ZONE PURPOSE

Zone	Purpose
Travelled Way	The Travelled Way provides an area for traveling along a street or to access land uses along a street for people traveling by motor vehicle, bicycle, and transit, and for the delivery of goods. The space can include exclusive or shared lanes for bicycles, transit, motorized vehicles ,and goods. Medians or islands, concrete gutters, refuge areas for people walking or cycling, crosswalks and crossrides, and turning lanes are also located within the Travelled Way. In non-peak hours, some of the Travelled Way may be used as an area for motor vehicle parking or loading zones and, in some cases, can also be closed at time to motor vehicle traffic to host events and festivals. For Shared Streets, the Travelled Way is shared by people walking, cycling, driving, and delivering goods with the priority and right of way given to people walking. The Travelled Way is also the space for underground utilities including water, sanitary sewer, and storm sewer lines.
Ancillary Zone	Located between the Travelled Way and Furnishing Zone or Enhancement/Buffer zone, the Ancillary Zone provides a flexible space with the opportunity for various permanent and temporary street uses depending on the context and characteristics of the street. This area is typically considered “on-street”, but it is not designed for through traffic. The use of this flexible space can vary and can include motor vehicle parking, loading or delivery zones, parklets, bicycle parking, curb extensions, public art, and transit stops. This space also includes the concrete gutter along urban streets and can be used for snow storage. In cases where cycle tracks are provided (i.e., part of the Travelled Way), the Ancillary Zone may be located between two parts of the Travelled Way. Ancillary Zones are typically provided in street-oriented contexts including Main Street Arterials and Commercial Streets.
Furnishing Zone	Located adjacent to the Pedestrian Through Zone, the Furnishing Zone provides an area for signs, streetlight poles, street trees or landscaping, transit stops, benches, bicycle parking, public art, underground and surface utilities, low impact development (LID), snow storage, and concrete curb along urban streets Along Main Street Arterials and Shared Streets, a hardscaped Furnishing Zone shall be used due to their street oriented commercial context and the level of activity within the Ancillary Zone with people accessing and exiting parked vehicles and/or cycle tracks. Hardscaped Furnishing Zones can be in the form of acceptable concrete, paver stones, brick, or another hard surface. Using a different surface material from the Pedestrian Through Zone can assist with Universal Design and detectability under foot or with a long cane.
Enhancement/buffer zone	The enhancement/buffer zone is the space which accommodates the cycle track and adjacent buffer areas. This zone may consist of a variety of different elements.

Zone	Purpose
	These include curb extensions, parklets, stormwater management features, parking, bike racks, bike share stations, and curbside bike lanes or cycle tracks. It can, in some cases act as an extension of the ancillary zone with a through zone set aside for free movement of cyclists.
Pedestrian Through Zone	Located between the Frontage and Furnishing Zones, the Pedestrian Through Zone provides an area for active transportation mobility for people of all ages and abilities to access the land uses along the street and to interact with one another. This zone is typically used by people walking but, in the case of multi-use trails, can be shared by those cycling. To ensure that the design of the walking environment accommodates the greatest possible number and range of people, the following guidelines should be adhered to: • Allow a clear path of travel, free of obstructions; • Provide a firm, non-slip, and glare-free surface (typically concrete for sidewalks, asphalt for multi-use trails); • Ensure gradients along the path of travel are gradual to allow access by all and that landings are added if grades are greater than 6%; and • Limit motor vehicle driveways across the Pedestrian Through Zone to minimize disruption and improve safety.
Frontage Zone	Immediately adjacent to buildings or private property, the Frontage Zone in street-oriented contexts (e.g., Main Street Arterials) is a space used as a support and/or extension of the land uses along the street. Uses of the Frontage Zone can include ground floor retail displays, café seating, temporary signage, queuing areas, and other activities to support active use of the street by people and businesses. For neighbourhood streets and non-street-oriented contexts, the frontage zone is typically landscaped and a passive space that can include space between the Pedestrian Through Zone and the property line for underground utilities or noise attenuation devices such as a barrier wall.

The proposed overall ARP street network is shown in **Figure 6**. Four general street types have been identified:

- Main Street Arterial
- Arterial
- Neighbourhood Street
- Commercial Street

Each street type is described and illustrated in the following section. An overview of the streets their proposed locations, proposed speed limit, AADT threshold, and level of transit service is also summarized in **Table 5**. In addition to the four proposed street types listed above, the existing cross-sections along Festival Lane, Festival Ave, and the one-way portion of Festival Way are proposed to remain and are identified on Figure 5 and in Table 5 as Existing Commercial Streets.

TABLE 5: PROPOSED STREET TYPES

Street Type	Proposed ROW	Replacing which streets	Proposed Speed Limit	Proposed AADT	Level of Transit Service
Main Street Arterial	40 m	Sherwood Drive (between Gatewood Blvd and Brentwood Boulevard South)	50 km/h	25,000	Direct Routes to Transit Terminal
	36 m	Granada Boulevard	50 km/h		Direct Routes to Transit Terminal
Arterial Street	40 m	Brentwood Boulevard South	50 km/h*	35,000	-
		Sherwood Drive (west of Brentwood Boulevard South)	50 km/h		Direct Routes to Transit Terminal
Neighbourhood Street	24 m	Oak Street	30 km/h	8,000	Internal Circulation
		Georgian Way	40 km/h		
		Brentwood Boulevard North	30 km/h		
		Gatewood Boulevard	40 km/h		
Commercial Street	25 m	Festival Way North	30 km/h	5,000	Internal Circulation & Direct Route to Transit Terminal
		Festival Way South			Internal Circulation
Existing Commercial Street	25 – 30 m	Festival Way (one-way portion)	30 km/h	1,500	Internal Circulation
		Festival Lane		3,000	
		Festival Ave			

* However, the segment of Brentwood Boulevard South within the study area is short and the existing posted speed limit on the remainder of the corridor is 60 km/h.

FIGURE 6 STREET NETWORK

CENTRE IN THE PARK - TRANSPORTATION MASTER PLAN

0 100 300 500

STRATHCONA COUNTY

Note: This map is conceptual in nature. The exact location and alignment of land uses, facilities, roadways and services will be determined by the future development subject to Strathcona County's approval.

Main Street Arterials (40 m and 36 m)

Main Street Arterials are the highest volume traffic streets in the Centre in the Park but must also safely and comfortably accommodate people walking and cycling, as well as provide access for transit vehicles. The two existing streets that will be classified as Main Street Arterials are Sherwood Drive north from Brentwood Boulevard to the north end of the study area at Gatewood Boulevard and Granada Boulevard from Sherwood Drive to the eastern edge of the study area.

These streets have wide rights-of-way and, except for a short portion of Granada Boulevard, do not currently accommodate people on bikes on separated facilities. The redesign of these streets focuses on finding space within the right-of-way to accommodate people using all modes and lowering vehicle travel speeds. On-street parking has also been identified within the ancillary zone for Sherwood Drive. This flexible space could also be translated into a curbside transit lane, with some adjustments to the pedestrian through zone width, if higher order transit becomes a priority along the corridor. The speed limit along Main Street Arterials is proposed to be posted at 50 km/h.

Summary of Characteristics:

- Higher traffic volumes than other street types except for Arterials;
- Potential for higher order transit;
- On-street parking;
- High capacity cycling infrastructure (exclusive facilities separated from traffic, pedestrians);
- Wide sidewalks to accommodate pedestrian activity;
- Primarily street-oriented development; and
- Small frontage zone accommodates shy space from buildings and some signage.

Sherwood Drive from Gatewood Blvd to Oak Street (40 m)

The recommended cross-section for the 40 m ROW between Gatewood Blvd and Oak Street is illustrated in **Figure 7a**. Street-oriented development is only proposed along the east side of Sherwood Drive through this segment. On-street parking and the frontage zone has only been included on the east side of the street. The presence of a cycle track on the east side and a multi-use trail on the west side allow for connectivity for individuals travelling both to and through the area on a bicycle. The existing 40 m ROW presents a unique opportunity to enhance the pedestrian and cyclist experience by introducing a double row of trees along the east side of Sherwood Drive in addition to a treed median and a single row of trees on the west side.

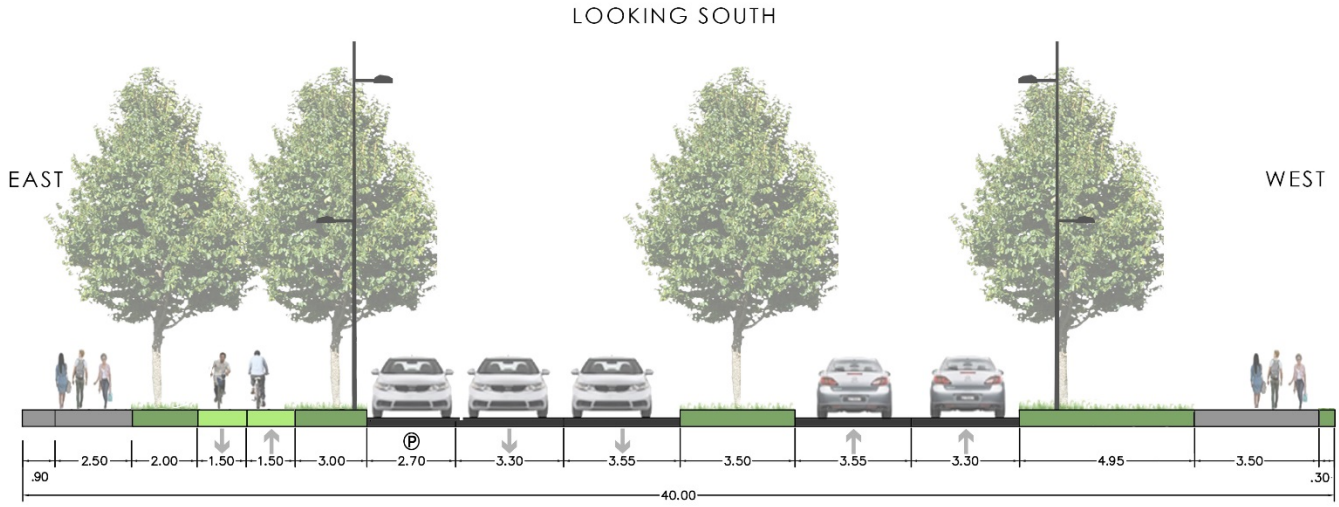


FIGURE 7A: SHERWOOD DRIVE FROM GATEWOOD BLVD TO OAK STREET (40 M)

Zone	Facilities/Widths
Travelled Way	• 3.3 m centre lane • 3.55 m curbside lanes • 3.5 m median • No exclusive turning lanes
Ancillary Zone	• East side: Parking – 2.7 m
Furnishing Zone	• East side: Boulevard trees/street furniture – 2.0 m • West side: Streetlights/boulevard trees/street furniture – 4.95 m
Enhancement/buffer zone	• East side: 2-way raised cycle track (3.0 m) • East side: 3.0 m buffer area
Pedestrian Through Zone	• East side: Sidewalk – 2.5 m • West side: Multi-use trail – 3.5 m
Frontage Zone	• East side: 0.9 m • West side: 0.3 m

Sherwood Drive from Oak Street to Brentwood Blvd South (40 m)

The recommended cross-section for the 40 m ROW between Oak Street and Brentwood Blvd South is illustrated in **Figure 7b**. Street-oriented development is proposed along both sides of Sherwood Drive through this segment. On-street parking and frontage zones have been implemented along both sides. The existing 40 m ROW presents a unique opportunity to enhance the pedestrian and cyclist experience by introducing a double row of trees along the east side of Sherwood Drive in addition to a treed median and a single row of trees on the west side.

It is noted that the proposed 2.7 m parking lane along the west side of Sherwood Drive through the road curvature between Festival Ave and Festival Way South may need to be widened to allow parked vehicles extra room to check for oncoming traffic when pulling out of parallel parking stalls. The exact parking width required for sightlines should be determined in the detailed design stage and the additional width could be removed from the furnishing zone or person through zone on the west side and/or existing wide travel lane width in the short term. As additional right of way is currently accommodating the existing service road, land may be available to accommodate needed alterations.

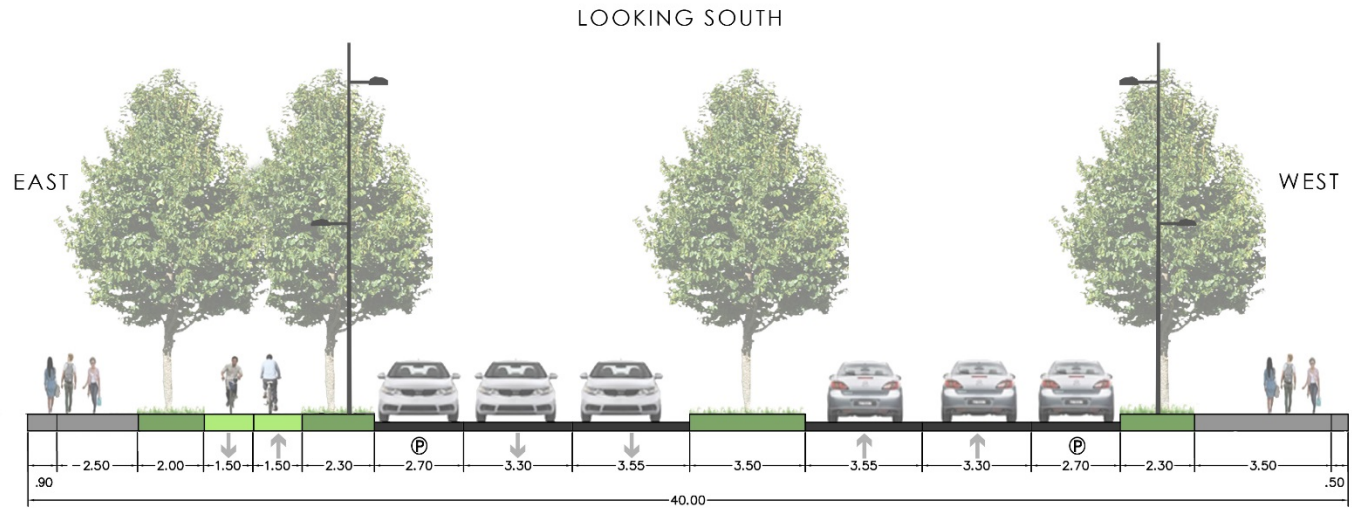


FIGURE 7B: SHERWOOD DRIVE FROM OAK STREET TO BRENTWOOD BLVD SOUTH (40 M)

Zone	Facilities/Widths
Travelled Way	• 3.3 m centre lane • 3.55 m curbside lanes • 3.5 m median • No exclusive turning lanes
Ancillary Zone	• Parking – 2.7 m*
Furnishing Zone	• East side: Boulevard trees/street furniture – 2.0 m • West side: Streetlights/boulevard trees/street furniture – 2.3 m
Enhancement/buffer zone	• East side: 2-way raised cycle track - 3.0 m • East side: 2.3 m buffer area
Pedestrian Through Zone	• East side: Separated Walk – 2.5 m

	• West side: Separated Walk – 3.5 m
Frontage Zone	• East side: 0.9 m • West side: 0.5 m

* Parking lane width should be increased along west side of Sherwood Drive through road curvature south between Festival Ave and Festival Way South.

Granada Blvd from Sherwood Drive to the east boundary of the Main Street Policy Area (36 m)

The recommended cross-section for the 36 m ROW between Sherwood Drive and the east boundary of the Main Street Policy Area is illustrated in **Figure 8a.** This 36 m Main Street will introduce on-street parking on both sides of Granada Blvd in the vicinity of the Main Street policy area where direct street frontage in anticipated. As such the Cross-section includes a frontage zone on each side.

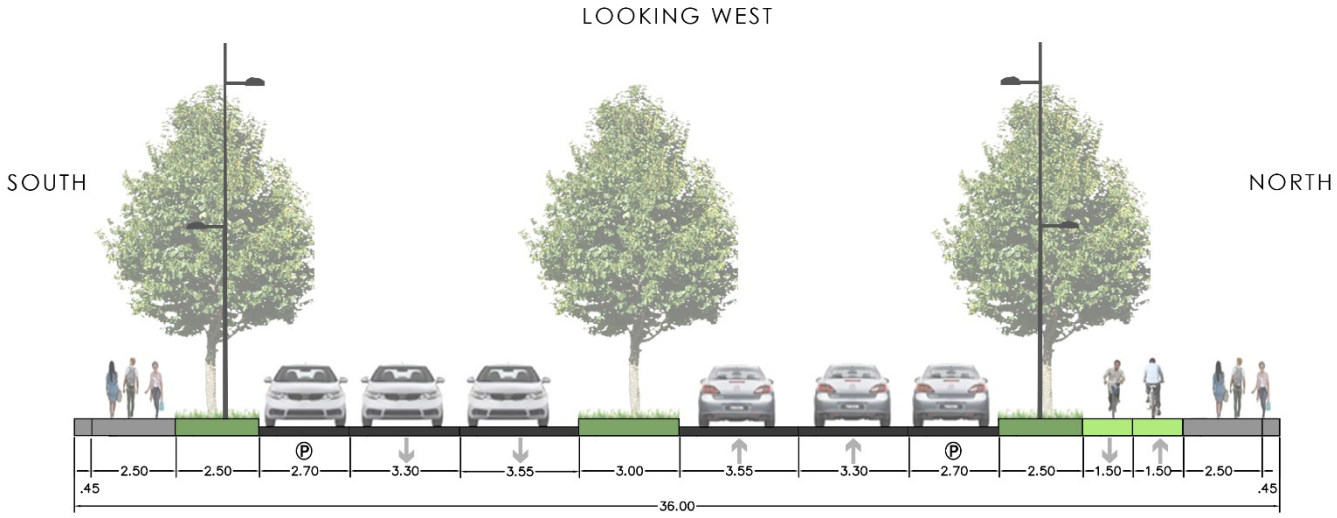


FIGURE 8A: GRANADA BLVD FROM SHERWOOD DRIVE TO THE EAST BOUNDARY OF THE MAIN STREET POLICY AREA (36 M)

Zone	Facilities/Widths
Travelled Way	• 3.3 m centre lane • 3.55 m curbside lanes • Median – 3.0 m • No exclusive turning lanes
Ancillary Zone	• Both sides: Parking – 2.7 m
Furnishing Zone	• South side: Streetlights/boulevard trees/street furniture – 2.5 m
Enhancement/buffer zone	• North side: 2-way raised cycle track (3.0 m) • North side: 2.5 m buffer area
Pedestrian Through Zone	• Both sides: Separated Walk – 2.5 m
Frontage Zone	• North side: 0.45 m • South side: 0.45 m

Granada Blvd from the east boundary of the Main Street Policy Area to Georgian Way (36 m)

Two Options are proposed for the 36 m ROW between the east boundary of the Main Street Policy Area and Georgian Way as illustrated in **Figure 8b** and **Figure 8c.** The option selection should be based on the ultimate land use configuration fronting the street. Where no active frontages are proposed on the north side Option A should be selected. Grade elevations and existing context will create difficulty in establishing active frontages along the south portion of the area. Where active frontages are proposed along the north section on-street parking and a frontage zone should be integrated as shown in Option B.

Option A

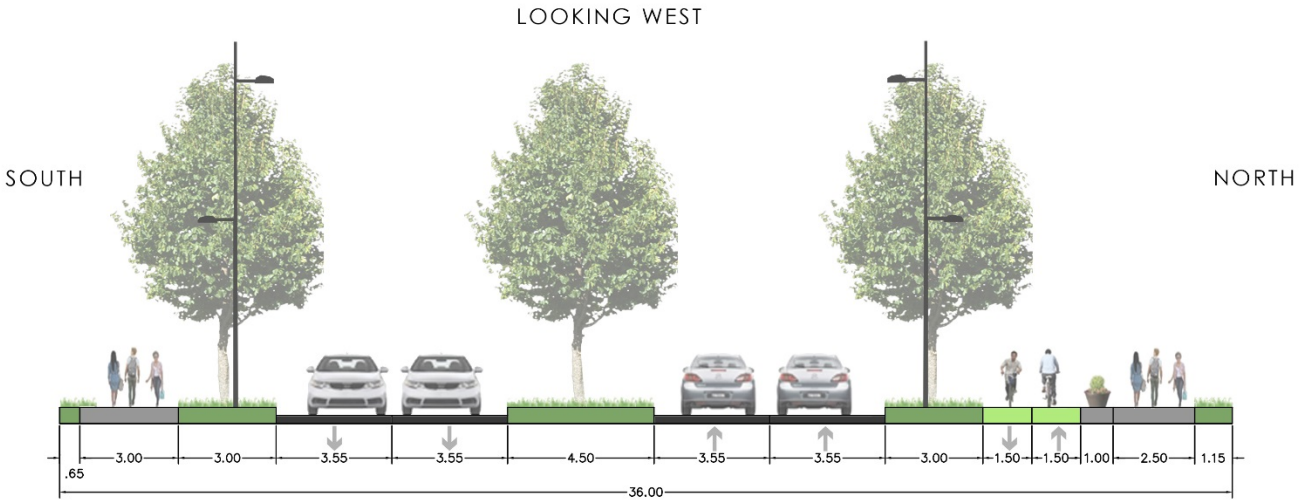


FIGURE 8B: OPTION A – GRANADA BLVD FROM THE EAST BOUNDARY OF THE MAIN STREET POLICY AREA AND GEORGIAN WAY

Zone	Facilities/Widths
Travelled Way	• 3.55 m curbside lanes • Median – 4.5 m • No exclusive turning lanes
Ancillary Zone	• N/A
Furnishing Zone	• North side: Street furniture – 1.0 m • South side: Streetlights/boulevard trees/street furniture – 3.0 m
Enhancement/buffer zone	• North side: 2-way raised cycle track (3.0 m) • North side: 3.0 m buffer area
Pedestrian Through Zone	• North side: Separated Walk – 2.5 m • South side: Multi-Use Trail – 3.0 m
Frontage Zone	• North side: 1.15 m • South side: 0.65 m

Option B

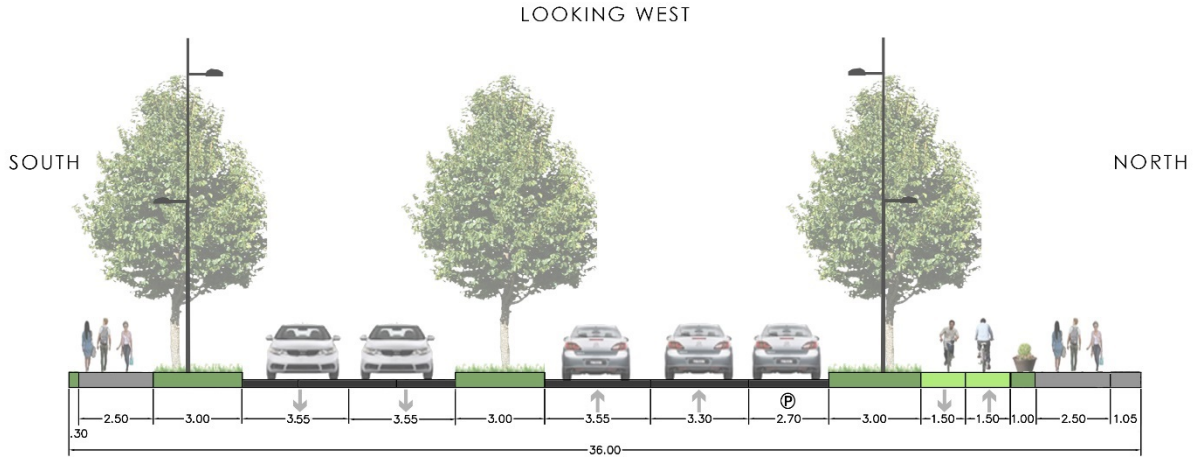


FIGURE 8C: OPTION B - GRANADA BOULEVARD FROM EAST BOUNDARY OF THE MAIN STREET POLICY AREA AND GEORGIAN WAY (36M)

FIGURE 8C: OPTION B - GRANADA BLVD FROM THE EAST BOUNDARY OF THE MAIN STREET POLICY AREA AND GEORGIAN WAY

Zone	Facilities/Widths
Travelled Way	• 3.55 m curbside lanes • Median – 3.0 m • No exclusive turning lanes
Ancillary Zone	• North side: Parking – 2.7 m
Furnishing Zone	• North side: street furniture – 0.5 m • South side: Streetlights/boulevard trees/street furniture – 2.2 m
Enhancement/buffer zone	• North side: 2-way raised cycle track (3.0 m) • North side: 2.5 m buffer area
Pedestrian Through Zone	• North side: Separated Walk – 2.5 m • South side: Multi-Use Trail – 2.5 m
Frontage Zone	• North side: 0.5 m South side: 0.3 m

Arterial (40 m)

The arterials within this study area have primarily open space frontage. With the implementation of the ACP, sections of this street will continue to have non street-facing land use development. The recommended street cross-section reflects this land use context. The posted speed limit proposed for Arterials is 50 km/h.

Summary of Characteristics:

- Higher traffic volumes;
- Lower pedestrian and cyclist volumes (use of shared facilities separate from traffic);
- Higher travel speed;
- Transit service; and
- Non-street-oriented development.

Sherwood Drive West of Brentwood Blvd South and Brentwood Blvd South to the ARP Boundary (40 m)

The remaining segment of Sherwood Drive west of Brentwood Boulevard South as well as Brentwood Boulevard South is illustrated in **Figure 9**. The recommended cross-section accommodates people cycling and people walking in a shared facility in the form of a multi-use trail.

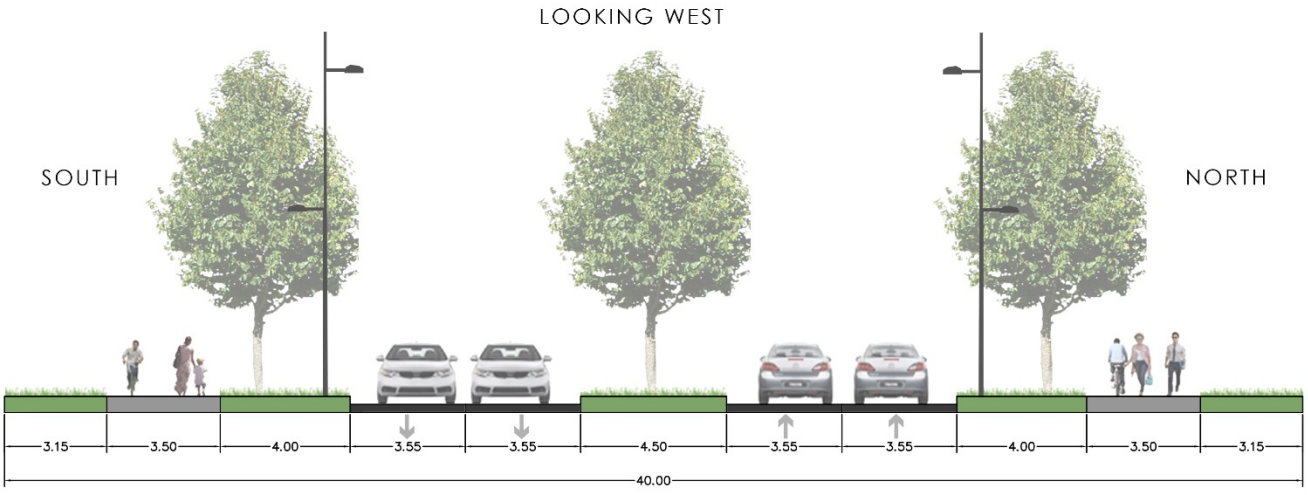


FIGURE 9: SHERWOOD DRIVE WEST OF BRENTWOOD BLVD SOUTH AND BRENTWOOD BLVD SOUTH TO THE ARP BOUNDARY (40 M)

Zone	Facilities/Widths
Travelled Way	• 3.55 m curbside lanes • Median – 4.5 m
Ancillary Zone	• N/A
Furnishing Zone	• Both sides: Streetlights/boulevard trees/street furniture – 4.0 m
Enhancement/buffer zone	• N/A
Pedestrian Through Zone	• Both sides: Multi-Use Trail – 3.5 m

Frontage Zone	• Both sides: 3.15 m

Neighbourhood Street (24 m)

Neighbourhood streets are lower speed residential streets. These streets provide access into and out of Centre in the Park. These street types can be implemented on the existing streets of Oak Street, Brentwood Boulevard North, Georgian Way, and Gatewood Boulevard. Lane widths have been chosen to accommodate transit. The proposed speed limit along Georgian Way and Gatewood Boulevard is 40 km/h. The speed limit along Brentwood Boulevard North is currently posted at 30 km/h; therefore, it is recommended that it remains 30km/h. The recommended speed limit along Oak Street is 30 km/h to discourage shortcutting.

Summary of Characteristics:

- Primarily local residential traffic;
- May have mixture of street oriented and non-street-oriented development;
- On-street parking;
- Separated cycling and walking infrastructure;
- Low speed traffic;
- Transit service; and
- A small easement may be needed to accommodating servicing outside of pedestrian through zone.

Oak Street, Brentwood Boulevard North and Gatewood Boulevard (24 m)

The cross-section for Oak Street, Brentwood Boulevard North and Gatewood Boulevard is illustrated within **Figure 10a**. Though the cross-section is the same as Georgian Way the cycling facility occur on the south and east portion of these roads.

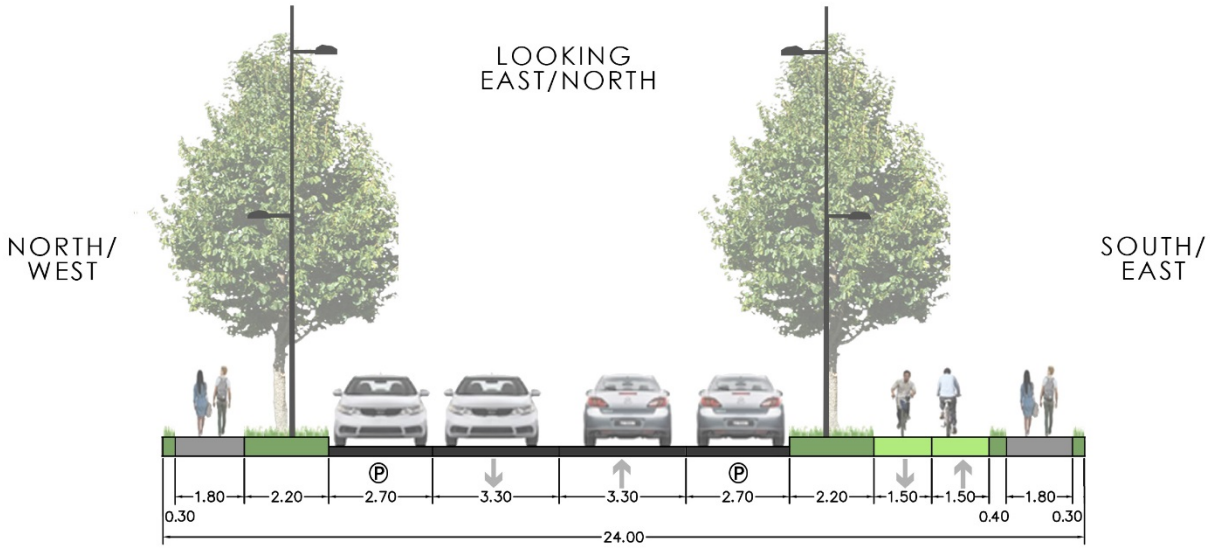


FIGURE 10A: OAK STREET, BRENTWOOD BOULEVARD NORTH AND GATEWOOD BOULEVARD (24 M)

Zone	Facilities/Widths
Travelled Way	• 3.3 m Travel lanes
Ancillary Zone	• Both sides: Parking – 2.7 m
Furnishing Zone	• South or East side: Streetlights/boulevard trees/street furniture – 0.4 m • North or West side: Streetlights/boulevard trees/street furniture – 2.2 m
Enhancement/buffer zone	• South or East side: 2-way raised cycle track (3.0 m) • South or East side: 2.2 m buffer area
Pedestrian Through Zone	• Both sides: Separated Walk – 1.8 m
Frontage Zone	• Both sides: 0.3m

Georgian Way (24 m)

The cross-section for Georgian Way is illustrated in **Figure 10b**. Though the cross-section is the same as Oak Street, Brentwood Boulevard North and Gatewood Boulevard, the cycling facility is found on the south and east portion of this road.

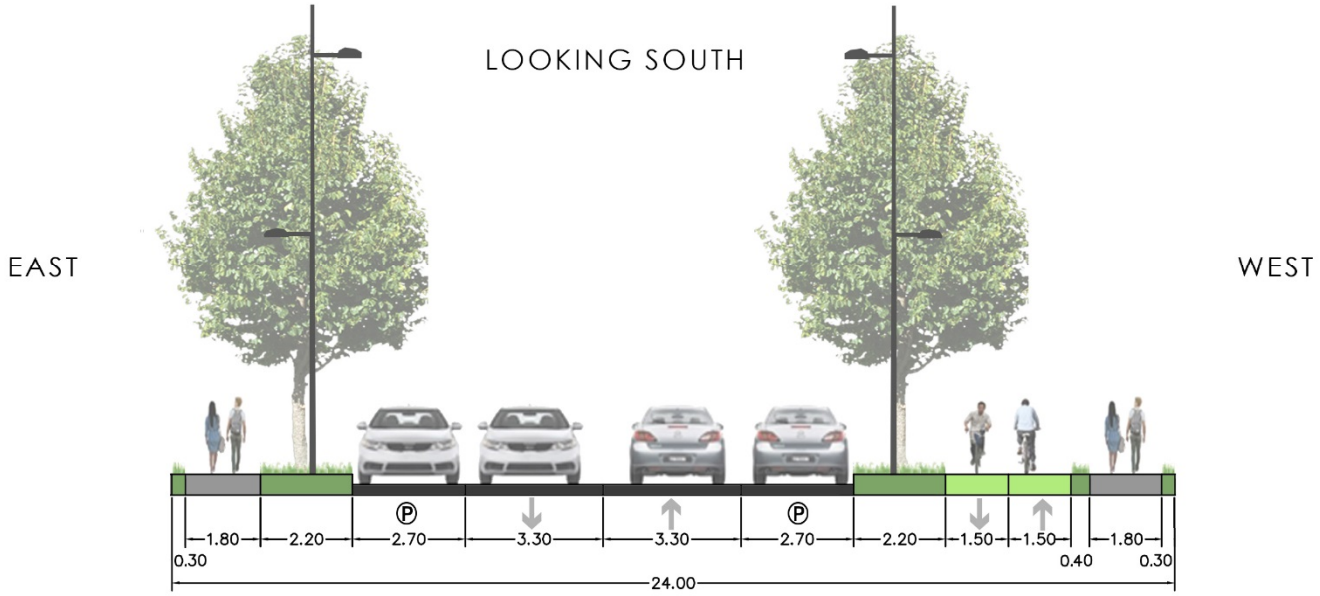


FIGURE 10B: GEORGIAN WAY (24 M)

Zone	Facilities/Widths
Travelled Way	• 3.3 m Travel lanes
Ancillary Zone	• Both sides: Parking – 2.7 m
Furnishing Zone	• West side: Streetlights/boulevard trees/street furniture – 0.4 m • East side: Streetlights/boulevard trees/street furniture – 2.2 m
Enhancement/buffer zone	• West side: 2-way raised cycle track (3.0 m) • West side:2.2 m buffer area
Pedestrian Through Zone	• Both sides: Separated Walk – 1.8 m
Frontage Zone	• Both sides: 0.3m

Commercial Street (25 m)

The Commercial Street is proposed along Festival Way North and South, the existing two-way travel portions of Festival Way. These segments of Festival Way generally carry lower traffic volumes with higher pedestrian activity, and both provide important connections throughout the site for people driving as well as walking and cycling.

Both streets represent shorter segments of Festival Way and accommodate transportation movements entering and exiting the central portion of Centre in the Park via Sherwood Drive. These segments currently accommodate one travel lane in each direction with additional vehicle capacity in left and right turn bay storage at Sherwood Drive and Brentwood Blvd North. It is noted that while a reduced cross-section is proposed for these streets, ultimate intersection capacity requirements at the Festival Way North/Sherwood Drive and Festival Way South/Sherwood Drive South intersections will require monitoring and analysis through future studies.

This plan maintains the two-way functionality of the existing streets. It is noted that the remainder of Festival Way is proposed to continue to accommodate one-way operations and no changes to the direction of travel are proposed along all segments of Festival Way. The recommended cross-section for a commercial street provides wide pedestrian through zones and on-street parking. It is recommended that the speed limit within the Commercial Streets and along the remainder of Festival Way remains 30 km/h.

Summary of Characteristics:

- Street-oriented development;
- On-street parking;
- Transit service;
- Separated walking and cycling facilities;
- May have transit service; and
- Minimal frontage zone to allow shy space from buildings.

Festival Way North and South (25 m)

The cross-section for Festival way North and south is illustrated on **Figure 11**. It is anticipated that parking along Festival Way North could be introduced along the north side of the street and consideration should be given to the removal of the westbound channelized right turn lane currently constructed at the Festival Way North/Brentwood Boulevard North intersection. The parking along Festival Way South could be introduced along the west side of the street adjacent to the school site.

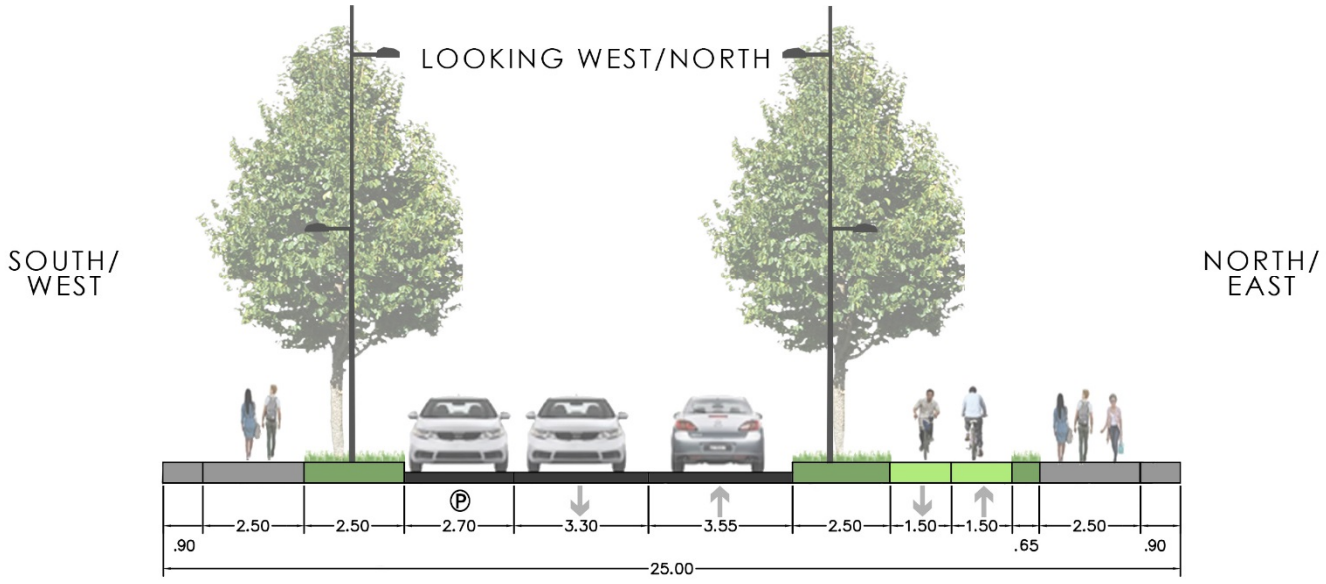


FIGURE 11: FESTIVAL WAY NORTH AND SOUTH (25 M)

Zone	Facilities/Widths
Travelled Way	• 3.3 m centre lane • 3.55 m curbside lanes
Ancillary Zone	• South and West side: Parking – 2.7 m
Furnishing Zone	• South and West side: Streetlights/boulevard trees/street furniture – 2.5 m • North and East side: Streetlights/boulevard trees/street furniture – 0.65 m
Enhancement/buffer zone	• North and East side: 2-way raised cycle track (3.0 m) • North and East side: 2.5 m buffer area
Pedestrian Through Zone	• Both sides: Separated Walk – 2.5 m
Frontage Zone	• Both sides: 0.9 m

Existing Commercial Streets

Festival Way

Based on discussions with Strathcona County, maintaining one-way operations along Festival Way was identified as the preferred option as one-way operations can be safer for all street users. Maintaining on-street parking supply along Festival Way was also identified as a priority for Strathcona County. Therefore, the existing Festival Way cross-section is recommended to remain as a one-way operational street including one travel lane, angled parking one side, parallel parking on the other side, and wide pedestrian mono-walks on both sides. The existing posted speed limit of 30 km/h hour is also recommended to be maintained. The existing bus lane along the outside of the loop could function as additional parking when the bus lane is not required.

Consideration could be given to designating the travel lane through the one-way portion of Festival Way as shared between cyclists and vehicle drivers. Appropriately placed pavement markings to direct cyclists to travel on the far side of the travel lane from the existing angled parking and signage to indicate the shared cyclist/vehicle function of the street is recommended.

Pedestrian and cyclists crossing treatments along Festival Way should be considered, particularly at major pedestrian/cyclist crossing points, for example at the Prairie Walk crossing.

Festival Avenue & Festival Lane

The existing Festival Avenue and Festival Lane cross-sections accommodate two-way operations, and each include two travel lanes, angled parking one side, parallel parking the other side, and wide pedestrian zones on both sides of the street. It is recommended that the existing cross-section along Festival Avenue and the existing posted speed limit of 30 km/h be maintained.

However, due to the low vehicle traffic volume and speeds on the street, it is recommended Festival Avenue and Festival Lane be designated as streets where travel lanes are shared amongst cyclists and vehicle drivers. Signage should be considered along Festival Avenue and Festival Lane to communicate this designation and will act as a wayfinding tool for cyclists and warn vehicle drivers to be aware of cyclists on Festival Avenue.

Additional Considerations

Existing Multi-use Trails

There are parks with existing multi-use trails within the study area that border streets already discussed. It is recommended that streets running parallel to existing multi-use trails within adjacent land uses should not duplicate the cycling infrastructure within the ROW and that a 1.8 m separate walk be constructed in place of the two-way raised cycle track proposed in the cross-sections above with the additional ROW being allocated to the frontage zone. It is important that the adjacent multi-use trail should run parallel and not deviate too far from the street to ensure proper cycling access and connectivity is maintained throughout the study area. The existing multi-use trail must tie into the two-way cycle track within the street ROW.

Sherwood Park Mall Redevelopment

The Sherwood Park Mall is currently developed as a typical suburban shopping centre with one large main building surrounded by large surface parking lots. The ARP defined the mall site as primarily being within the Urban Centre Policy Area and is proposed to potentially include a mix of high and medium density residential and commercial land uses in the future.

Although, the mall site may not redevelop within the short term, it is recommended when the site does redevelop that it includes a grid network of streets accommodating all modes of travel with priority given to pedestrians and cyclists and that strong active transportation connections are considered between the site and the future transit centre. While parking could be located along the grid network of streets, consideration should be given to constructing most of the parking underground in order to preserve pedestrian and cyclist safety.

Intersection Improvements

In general, pedestrian and cyclists crossing treatments outlined in Section 3.1 should be considered at intersections within the study area on a case by case basis, particularly on the Main Street Arterial and Arterial corridors, and at a minimum, all intersections should include the following treatments:

- Curb extensions shadowing parking lanes; and
- Removal of channelized right turns.

3.3 Active Transportation Network

Figure 12 illustrates the proposed Active Transportation network for the study area. The Active Transportation network was determined based on the Active Transportation elements within the proposed cross-sections for the streets within the study area and connections to the existing multi-use trail network. The following policies with respect to the Active Transportation network are identified in the ARP:

- Require pedestrian crossings at roadways to be clearly marked using appropriate signage and markings to ensure potential conflicts between vehicles, cyclists, and pedestrians are minimized;
- Require rest areas with benches and litter receptacles be installed at a minimum of every 0.5 km in accordance with Strathcona County's Design and Construction Standards;
- Require consistent and overall wayfinding to ensure connectivity and safety; and
- Require a network of paths and connections for pedestrian and cycling travel, which will utilize sidewalks, shared-use paths and separated bicycle paths to ensure key destinations and policy areas are well connected.

As shown in Figure 12, the proposed Active Transportation network provides strong and logical pedestrian and cyclist connections throughout the redevelopment area and with existing multi-use trails within and outside the study area boundary. In addition, the following considerations should be made:

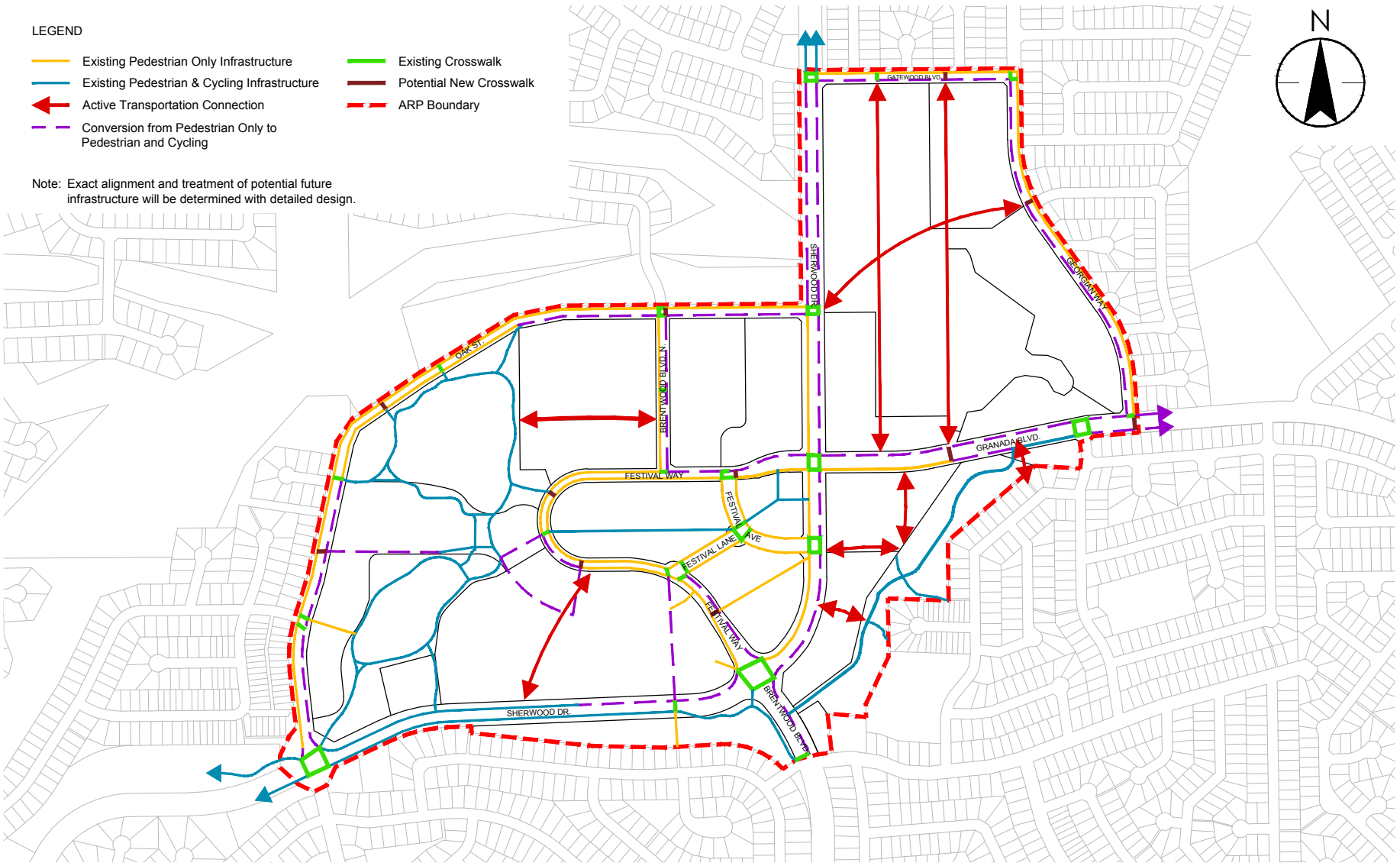
- As previously mentioned, two-way raised cycle tracks or multi-use trails are not proposed within street ROWs where existing multi-use trails are constructed;
- Pedestrian and cyclist crossing measures, as identified in Section 3.1, should be considered at every street crossing within the study area. For cycling crossings, intersection analysis should be undertaken to determine if separate bicycle signal indicators are warranted;
- Wayfinding signage will be an important consideration throughout the study area to communicate and ensure proper expectations of use of multi-use trails, two-way cycle tracks, and pedestrian zones;
- Secure bicycle parking within the study area, particularly near public amenities and within residential buildings for cyclists visiting the site or living on-site should be considered; and
- Signage or appropriately placed pavement markings along Festival Lane, Festival Ave, and Festival Way should be considered to communicate shared on-street cycling is permitted due to the low vehicle traffic volume and low speed nature of the street.

Potential Active Transportation connections through large redevelopment sites have been identified as conceptual on the Active Transportation network in Figure 12. The exact locations and facilities these connections accommodate will be determined through zoning and development permit stages of each redevelopment parcel. For example, future redevelopment of the Sherwood Park Mall should consider a grid network of streets accommodating all modes to enhance the north-south and east-west pedestrian and bicycle connectivity through the redevelopment site and the overall study area.

Figure 12 illustrates potential street crossings, including midblock and intersection crossings throughout the study area. The exact location and crosswalk treatments are not confirmed and will require future analysis to determine the appropriate locations and crossing treatments. However, the following should be considered regarding pedestrian and bicycle street crossings:

- Future pedestrian and bicycle crossings should consider the overall Active Transportation and street network as well as the adjacent land use;
- The introduction of pedestrian and bicycle crossings should consider access to future redevelopment parcels and the associated internal street networks in order to align future crossings with desired Active Transportation connections through redevelopment sites;
- Midblock crossings allow pedestrians and cyclists to cross streets without significantly deviating from their desired routes and in locations where the street network does not provide many opportunities to cross at intersections. Midblock crossings should be considered carefully and in locations where there is a significant pedestrian or cyclist desire line; and
- The latest version of Transportation Association of Canada's (TAC) Pedestrian Crossing Control Guide should be reviewed to determine the appropriate crossing controls at all future crossing locations.

FIGURE 12 ACTIVE MODES



CENTRE IN THE PARK - TRANSPORTATION MASTER PLAN

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STRATHCONA COUNTY

Note: This map is conceptual in nature. The exact location and alignment of land uses, facilities, roadways and services will be determined by the future development subject to Strathcona County's approval.

3.4 Transit Network

As previously mentioned, the Strathcona County Transit Master Plan, 2018, identified Centre in the Park as a candidate for transit-oriented development with the potential integration of a transit transfer facility (transit centre). Through the ARP, Centre in the Park will be an accessible neighbourhood, with walkable streets and a diversity of uses that will allow residents to access many of their needs on foot or using a bicycle. However, to support diverse population, there also needs to be convenient access out of the neighbourhood. The following policies with respect to transit were identified in the ARP:

- Encourage a pedestrian oriented on-street, at grade, transit transfer facility to be located with access via Sherwood Drive to promote the use of transit within the area.
- Consider the shared use of Strathcona County transit facilities with the area school boards to promote efficient use of land and infrastructure.

The transit concept for Centre in the Park is focused on providing an internal transit network that improves connections throughout the site, and the identification of a potential transit transfer facility within Centre in the Park with direct and convenient connections to existing transit terminals. This will allow residents and visitors to easily and quickly connect to Ordze Transit Centre and Bethel Transit Terminal, where transfers can connect them to the next leg of their journey.

Pedestrian Oriented On-Street, At-Grade, Transit Transfer Facility

A pedestrian oriented on-street, at grade, transit transfer facility has been identified within the vicinity of the Main Street Policy Area of the ARP. The on-street, at grade, transit transfer facility should be designed as a pedestrian oriented facility with safe and easy access for residents, employees, and visitors using transit to access the site. Secured bicycle parking at the transit centre should also be considered.

The proposed transit centre should be designed with the following goals to encourage transit ridership when people are moving to and from Centre in the Park:

- Create a people place: the transit centre should be safe and welcoming to people and a place people would visit regardless if they are transit riders or not.
- Create a place of activity: the transit centre should be designed to encourage vibrancy and high pedestrian activity to promote safety and security.
- Locate the transit transfer facility in a place where transfers make sense: it should be located in an area with a strong mix of supporting land uses such as high density residential, civic, institutional, office, and commercial land uses.
- Locate the transit transfer facility within a destination point.

The ultimate design of the proposed transit centre within the Main Street policy area requires consideration of the overall transit network within Strathcona County in order to properly integrate the new exchange. A separate study may be required in advance of design and implementation to consider the implications of providing a third transit centre within Sherwood Park and the reorganization of existing and new routes to create a cost effective and efficient

network within Strathcona County and the overall Edmonton metropolitan region.

Express Routes to Transit Terminals

To serve residents accessing major destinations around Strathcona County, two express routes from the proposed transit centre have been identified. These routes may be higher frequency with limited stops. The intent is to provide frequent, convenient access to Ordze Transit Centre and Bethel Transit Terminal, allowing those living and working in Centre in the Park to choose transit for their commutes.

Transit Stops

Transit stops throughout Centre in the Park should focus on safety, accessibility, and comfort. Based on a review of the National Association of City Transportation Officials (NACTO) Urban Design Guide, transit stops should include the following critical and recommended elements:

Critical

- Transit users must have safe access to transit stops through sidewalks and appropriate street crossings in the vicinity of the transit stop location.
- The amount of sidewalk space provided in the vicinity of a transit stop should reflect the demand and ridership levels of the transit routes.
- Wheelchair access and persons with mobility limitations should be considered when designing the interface between transit and the transit stops as well as the transit stop and the sidewalk.

Recommended

- Transit shelters should be provided at transit stops with high boarding demand.
- Bus bulbs should be constructed when dedicated bus lanes are present, transit merging back into traffic is difficult, or where transit users require additional waiting space.
- Transit stops should include transit information including transit or agency logos, stop name/number, transit routes and maps, and transit schedules.
- Lighting should be installed around transit stops to ensure transit user safety, security, and comfort.
- Providing real-time information at transit stops could also be considered for stops with many routes or high ridership demand.

Internal Circulation

There are increasing options for how internal access around a site like Centre in the Park can be facilitated through transit. A single bus looping through the internal network can provide a high-level access option for those with limited mobility, those without access to private vehicles, and during inclement weather. An alternative near-term option to consider if local transit service is not viable is dynamic transit (or on-demand) service.

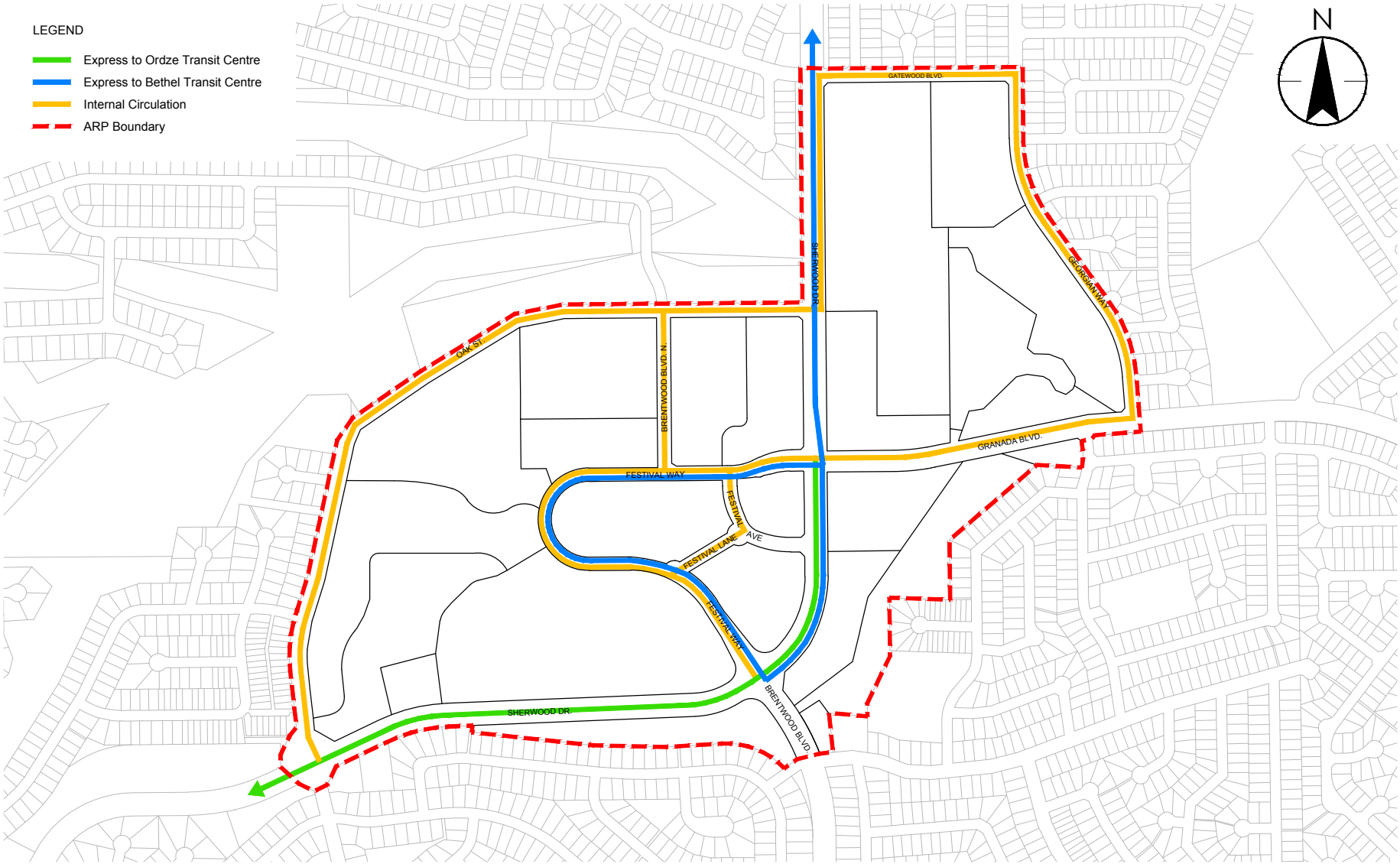
With emerging technology like Shared Autonomous Vehicles, an autonomous bus could be implemented for internal circulation in the future as a replacement to a typical transit bus. As the technology is refined and the price on the technology drops, this option may lower operating costs and could allow for increased transit frequency through Centre in the Park. Determination of the internal circulation frequency will be required when more information is available regarding potential ridership and cost of operations.

The proposed transit network is illustrated in **Figure 13.**

Cost Implications

There are both capital and operating cost implications for improved transit service to/from and around Center in the Park. Capital costs for a potential transit transfer facility and bus shelter upgrades are discussed in Section 3.9. Additional future operating costs will be directly related to additional routes and/or increased transit frequency.

FIGURE 13 TRANSIT NETWORK



CENTRE IN THE PARK - TRANSPORTATION MASTER PLAN

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STRATHCONA COUNTY

Note: This map is conceptual in nature. The exact location and alignment of land uses, facilities, roadways and services will be determined by the future development subject to Strathcona County's approval.

3.5 Parking

Parking is an important part of any municipality's infrastructure. A recommendation to complete a parking management plan including transportation demand management for Centre in the Park was previously identified in the March 2013 *Centre in the Park Parking Study and Traffic Review (March 2013 Report)*. The recommendations of the March 2013 Report include a framework for the integration of shared parking practices to maximize parking utilization and support sustainable transportation systems such as walking, cycling and transit. Based on these principles and the March 2013 Report's initial recommendations, several additional parking management strategies have been developed, and are outlined below into a series of short-term, long-term and on-going recommendations.

Short-Term Recommendations

Short-term recommendations focus on parking management strategies that can be implemented within a 1 to 5 year time frame. These recommendations range from minor infrastructure investment to policy decisions and initiations of future study. Short-term recommendations for CITP parking management include:

- Deployment of parking meters/kiosks to manage demand through paid parking;
- Invest in license plate recognition / handheld devices to improve enforcement methods;
- Incremental review and adjustment of parking rates to reflect market rates as occupancy increases;
- Daily parking passes for staff in lieu of monthly passes which can support occasional use of alternative modes of commuting;
- Identification of a commuter parking zone;
- Initiation of a separate curbside management study; and
- Identify the potential to accommodate electric vehicles through charging infrastructure.

Long-Term Recommendations

Consideration for the long-term impacts of the changing culture of driving, parking and technology should be considered, particularly prior to major investments in permanent parking infrastructure like covered structures. Future parking study can include:

- Identification and construction of additional structured parking if demand requires;
- Ongoing review of improved best practices in parking demand strategies including dynamic parking and carshare; and
- Evaluation of impact of shared autonomous and connected vehicles on parking demands;

Other Recommendations

Additional recommendations are identified as on-going and should continue from the short-term onwards or part of on-going internal discussions. These recommendations include:

- Separate parking revenue from general funds to use for demand management projects;
- Ongoing review of parking demand as CITP is implemented over time including monitoring of mode-split and impact of improved transit and cycling infrastructure to CITP;
- Continue to make real time parking information available; and
- Monitor curbside demand management.

3.6 Delivery of Goods and other Service Vehicles

Several design considerations need to be considered for the needs of commercial vehicles. In particular, the redesign of Strathcona Drive as a Main Street Arterial and the Commercial Streets through the heart of Centre in the Park must include flexibility to accommodate the heavier walking and cycling volumes while still accommodating commercial deliveries. Delivery of commercial goods is considered in the various street zones as follows:

- **Furnishing Zones** can be hard surfaced in delivery zones to accommodate the delivery of goods;
- **Ancillary Zones** allow for delivery zones located in front of commercial sites. In the case of Strathcona Drive, this space will need to be shared for commercial delivery, on-street parking, and transit zones. Time of day restrictions could be employed to ensure commercial delivery access is given priority during delivery times.

In addition, lane widths throughout CITP have been designed to accommodate larger turning vehicles where appropriate and all street types can accommodate emergency vehicles.

3.7 Capacity Assessment

Transportation modelling is used to support an anticipated future land use and transportation strategy, with the intention of identifying the recommend road network, sizing of facilities including number of lanes, locations and types of cycling facilities, width and location of sidewalks and transit routing. Detailed transportation analysis will be required with future redevelopment to identify intersection operational recommendations and access management planning, per the Bremner Area Project and Centre in the Park Transportation Impact Assessment Guidelines.

To undertake this modelling exercise, an update of Strathcona County's 2044 VISUM model was required. This update required:

- Revision to the street network input. For example, Sherwood Drive needed to be modelled as 2 travel lanes each direction (currently 3 lanes each direction) and Festival Way changed to one-way operation
- Reducing posted speeds: Sherwood Drive from 60 km/h to 50 km/h, Festival Way and Brentwood Blvd from 40 km/h to 30 km/h, and Oak Street from 50 km/h to 30 km/h
- Revision to the population and employment numbers by zone based on a finalized future (redeveloped) land use concept
- More detailed zoning to assess the travel demands around a potential future on-site transit centre
- Using travel survey information, to determine appropriate modal splits for the study area.

Prior to the undertaking the modelling exercise, a resizing of Sherwood Boulevard was initially thought to be feasible recognizing that:

- the 25,000vpd threshold for an Arterial Main Street is higher than the current daily traffic along Sherwood Drive
- traffic on Sherwood Drive appears to be operating well despite lane removal due to construction.

The modelling methodology, assumptions and results are summarized in a separate memo. This memo concluded during the PM peak hour traffic period, that the proposed 4-lane cross-section along Sherwood Drive within the CITP area can accommodate the projected traffic associated with the future land use intensification, with capacity to spare, assuming the 2044 target mode splits to transit and active transportation. It was also determined that the full build-out on Bremner is not anticipated to directly significantly influence the projected traffic volumes along Sherwood Drive within the study area. For more details on the modelling, please refer to the "CITP Transportation Master Plan VISUM Modelling" Memo.

Mode Split & Targets

The current mode split in the study area based on the 2018 census is: 88% passenger vehicle, 6% public transit, 6% walk/cycle. The 2044 mode split target assumptions for the model are: 70% passenger vehicle, 10% public transit, 20% walk/cycle.

To support these targets for Centre in the Park, other similar higher-density, transit-supportive, mixed-use redevelopments were examined. A summary of those future development area current and target mode splits is shown in **Table 6**.

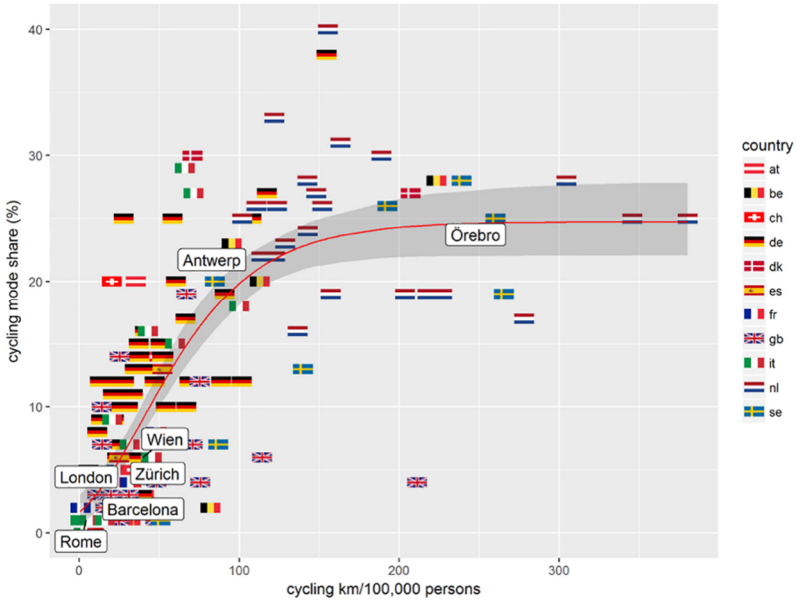
TABLE 6: TARGET MODE SHARE PROJECT COMPARISON

	Context	Current			Target		
		Transit	Walk	Bike	Transit	Walk	Bike
Bremner, Strathcona County AB	2080 – community hubs	-	-	-	10	10	3
Whyte Avenue, Edmonton AB	2047 – revitalized commercial corridor	19	13	1	25	16	1
Railway Avenue, Canmore AB	2030 – commercial arterial to urban boulevard	3	6	1	5	15	10
Rangeview (Non-TOD), Calgary AB	2039 – traditional land use	-	-	-	10	5	2
Rangeview (Commercial), Calgary AB	2039 – commercial land use only	-	-	-	15	15	8
Rangeview (TOD), Calgary AB	2039 – TOD land use	-	-	-	20	15	8
Centre in the Park					**10**	**15**	**5**

Some conclusions can be drawn from **Table 6**:

- Rangeview (Calgary) shows us that medium density mixed-used transit-oriented areas can expect to see 10-20% trips by transit, and over 20% trips by walk/cycle. CITP transit target is likely low, particularly if current split is 6%.
- Railway Avenue is a much lower density mixed used (mostly commercial) corridor than expected for CITP yet is targeting 25% active transportation. Given the short distances for trips in Canmore (via Railway Avenue), we can expect much more walking, and more cycling once safe facilities are implemented along and across the corridor.
- It can be concluded that CITP transit target (10%) is low. Active transportation target (20%) is achievable (and perhaps even slightly low), certainly by 2044 assuming the proposed land uses, and transit/active transportation infrastructure is implemented

There is a clear correlation between transit/active transportation investment and increased mode split world-wide. This relationship is clearly shown in the graph to the right. The cycling mode share increases proportionately as the kilometers of cycling infrastructure (per 100,000 population) increases.



Source: Health Impact Assessment of Cycling Network Expansions in European Cities, Preventative Medicine, Volume 109, April 2018 Pgs 62-70. https://www.sciencedirect.com/science/article/pii/S0091743517304978

Therefore, by reclassification/redesign of the existing road network (in particular Sherwood Drive) towards multi-modal, urbanized streets, a reduction of vehicular trips as users choose to take more walking, cycling, or transit trips can be achieved.

As streets are redesigned and land use intensifies, is it recommended that the neighbourhood street network traffic volumes and speeds be monitored, and, if necessary, employ mitigating traffic calming strategies (in addition to the 30km/hr posted speeds) should these streets not be functioning as proposed.

3.8 Short Term Improvements

Recommended short-term improvements (next 5 years) for Centre in the Park include:

Sherwood Drive

- Repurposing of outside curb lanes for parking and/or transit.
- Restriping of travel lanes and painting a buffer zone between the parking lane and narrower travel lanes.
- Introducing bump-outs or curb extensions to minimize corner radii; shorten pedestrian crossing distances; and protect parking.
- Enhancing crosswalks, monitoring signal timing/phasing at intersection locations identified through safety studies that have higher rates of collision.
- Reduced speed limit to 50 km/h.

Georgian Way

- The street was renewed in 2019 with no changes to the previous cross-section. As CITP is built out, this street should be reconstructed to the recommended neighbourhood street cross-section.

Festival Avenue & Festival Lane

- Festival Avenue and Festival Lane be designated as streets where travel lanes are shared amongst cyclists and vehicle drivers. Signage should be considered along Festival Avenue and Festival Lane to communicate this designation and will act as a wayfinding tool for cyclists and warn vehicle drivers to be aware of cyclists on Festival Avenue.

General

- Speed reduction to 40 km/h in 2019 on collector roadways with current speed limits of 50 km/h. Compliance is dependent on design/physical appearance and available travel way. For example, under-parked local streets may not see compliance with posted speed.
- Curb extensions should be constructed where possible if intersection corner reconstruction is already being undertaken.
- Strathcona County will continue to complete in service road safety reviews to inform and identify locations with highest safety concerns requiring mitigation.
- Upgrade of existing transit stops in study area with modern transit shelters

3.9 Cost Estimates

At the request of Strathcona County, a high-level cost estimating exercise to implement the short-term improvements identified in Section 3.8 and the long-term improvements for the Centre in the Park study area were undertaken.

Short Term

To establish a cost estimate for the short-term (5 year) improvements, the following assumptions were made:

- Modifications only on Sherwood Drive, Festival Avenue, and Festival Lane (Georgian Way is scheduled for renewal in 2019);
- Existing boulevard and median curbs maintained – except curb extensions at intersections with pedestrian crossings (including traffic signal, drainage relocation);
- Enhanced (ladder/zebra striping) crosswalks at pedestrian crossings;
- Potential conversion from pedestrian only to pedestrian and cycling infrastructure are not included. Until curbs are relocated, existing boulevard width is insufficient;
- For the 6-lane portion of Sherwood Drive, outside lanes repurposed for parking or transit;
- Existing lane lines along Sherwood Drive removed and re-painted (as dictated by reduced travel lane width);
- Added buffer (cross-hatching or similar) paint markings to separate parking lane from travel lane;
- Signage and pavement marking for parking zones, reduced posted speed, and shared bicycle roadways (i.e.. Festival Avenue, Festival Lane); and
- Upgrading of transit stops with existing or no shelters to modern transit shelters.

TABLE 7: SHORT-TERM COST ESTIMATES

Category	Description of Work	Estimate
Curb Extensions	Remove existing curb, islands, construct new curb, ramps, and concrete area	$600,000
Relocations	Traffic Signals & Catch Basins (related to Curb Extensions)	$900,000
Enhanced Crosswalks	Zebra/ladder pavement markings	$50,000
Pavement Markings	Relocation of travel lane lines, buffer between parking/travel lane, shared bicycle markings	$90,000
Signage	New signs for parking zones, reduced posted speed limits, shared bicycle streets	$30,000
Transit	Modernized Transit Shelters (19)	$380,000
Subtotal		**$2,050,000**
Contingency (20%)		$410,000
Engineering (10%)		$250,000
TOTAL		**$2,710,000**

Long-Term

To establish ultimate long-term costs for street reconstruction within Centre in the Park without the benefit of conceptual design to inform the exercise, the following assumptions were made:

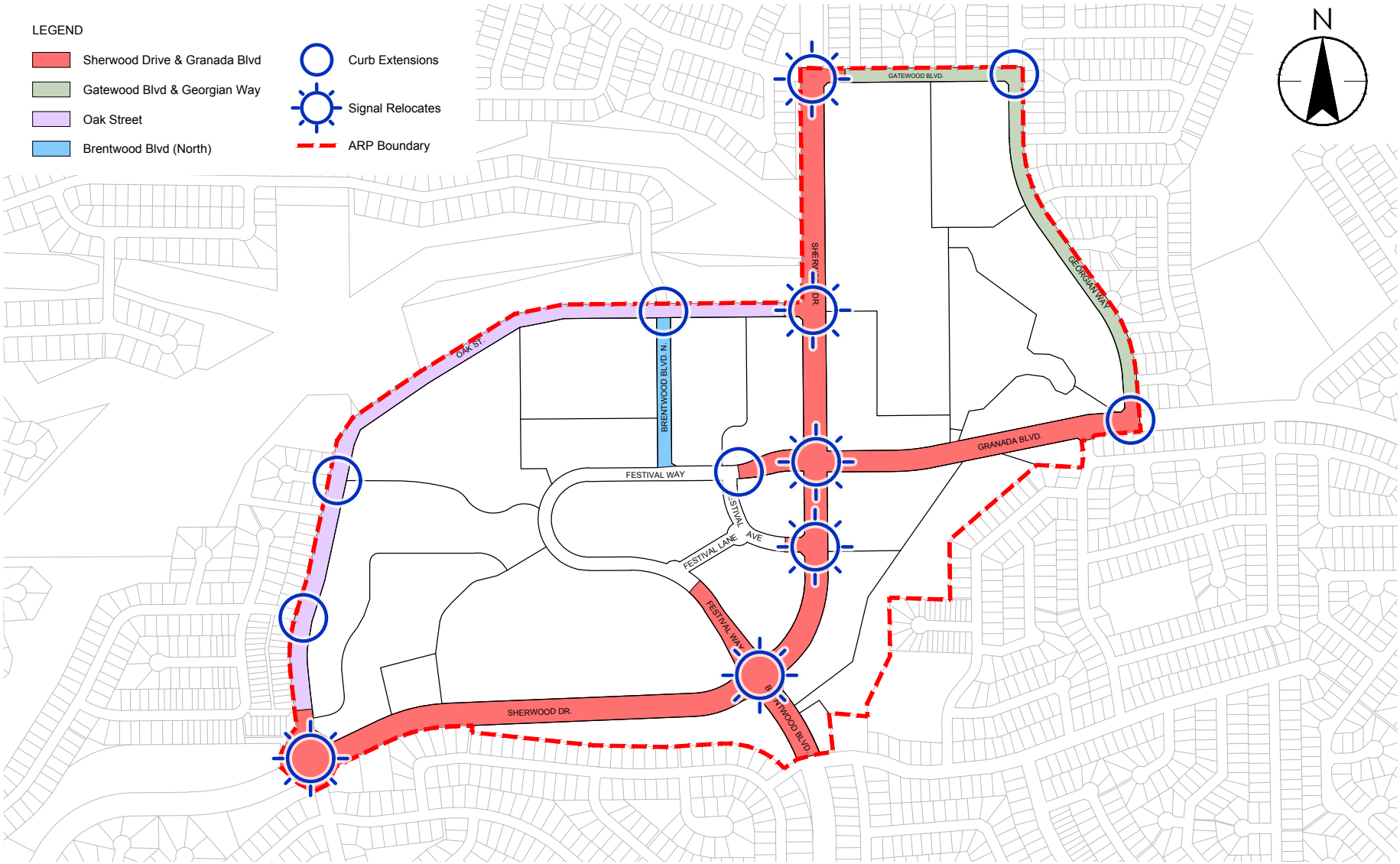
- Maintaining existing curb on one side of a given corridor provided that there is sufficient boulevard width to achieve the required pedestrian and bicycle infrastructure;
- Median and east curb relocation along Sherwood Drive;
- All reconstruction within existing street right-of-way. Therefore, no land acquisition costs included;
- Where necessary, modification to the typical cross-section boulevard treatment (e.g. not separating pedestrian and cycling facilities) if existing right of way doesn't permit;
- Potential relocation of the short-term intersection curb extensions to their ultimate location;
- New mid-block pedestrian crossing costs included;
- Traffic signal and street light relocation costs included;
- Landscaping (grass boulevard, trees) costs included; and
- Drainage relocation included

The cost estimate is broken down into four corridor areas as shown in Figure 14. Table 8 provides a breakdown by corridor area and includes contingency and engineering costs. Note that is a high level (Class 4-5) cost estimate. A completed conceptual design and refinement of these costs is strongly recommended.

TABLE 8: LONG-TERM COST ESTIMATES

Category	Description of Work	Estimate
Sherwood Drive & Granada Blvd Corridor + Festival Way (north and south) + Brentwood Blvd (south)	Reconstruction of Sherwood Blvd to Main Street Arterial 40m (Gatewood to Brentwood) and Arterial 40m (west of Brentwood). Full reconstruction of Granada to Main Street Arterial (36m). Reconstruction of Festival Way to Commercial Street (25m). Reconstruction of Brentwood Blvd (south) to Arterial Street (40m). New on-street, at-grade transit transfer facility.	$7.6M
Gatewood Blvd & Georgian Way Corridor	Reconstruction of Gatewood Blvd to Neighbourhood Street (24m)	$1.4M
Oak Street Corridor	Reconstruction of Oak Street to Neighbourhood Street (24m)	$1.9M
Brentwood Blvd (north)	Reconstruction of Brentwood Blvd (north) to Neighbourhood Street (24m)	$0.5M
Subtotal		**$11.4M**
Contingency (20%)		$2.3M
Engineering (10%)		$1.4M
TOTAL		**$15.1M**

FIGURE 14 COSTING



CENTRE IN THE PARK - TRANSPORTATION MASTER PLAN

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Note: This map is conceptual in nature. The exact location and alignment of land uses, facilities, roadways and services will be determined by the future development subject to Strathcona County's approval.

3.10 Next Steps

The recommended next steps for Strathcona County is to undertake a detailed traffic analysis of the corridor to inform a short-term and long-term conceptual design. The scope will include conducting peak hour traffic counts (including vehicles, buses, cyclists, pedestrians) at key intersections at a representative time of year (usually June or September) to establish an operational baseline. From there, future intersection turning volumes can be determined based on future land use trip generation and distribution. Analysis at both the existing and future horizons, coupled with the cross-sections already established will inform conceptual design. Once a preferred concept design is chosen, a revision of the traffic analysis may be required to confirm that the design operates at an acceptable level of service.

Engagement with existing landowners, developers, Strathcona County services, and the general public is necessary during the development of the preferred concept design so that the best design is put forward, and to give the project a higher level of support.

Once a preferred concept design is established/approved, the project can move into preliminary and detailed design before procurement and construction.

APPENDIX A: TRAFFIC MODEL

This appendix documents the model customized to reflect the proposed plans for the Center in the Park study area as well as modelling results/findings that focus on the reduced cross-section of Sherwood Drive.

Stantec

Final Memo

To:	Deanna Cambridge	From:	Jason Zhou, P.Eng. Joe Olson, P.Eng, PTOE
	Strathcona County		Stantec Consulting Ltd.
File:	CITP Transportation Master Plan - VISUM Modelling	Date:	August 23, 2019

Reference: CITP Transportation Master Plan VISUM Modelling - FINAL

1 INTRODUCTION

Stantec Consulting Ltd. (Stantec) is currently completing the Centre in the Park (CITP) Transportation Master Plan. Future travel demand forecasting was completed in order to assess, at a high-level, the proposed reduced cross-section on Sherwood Drive from six lanes to four lanes between Gatewood Boulevard and Brentwood Boulevard South within the study area given the proposed future CITP land uses and modal split assumptions. It is noted that the capacity analysis was undertaken at the link level, and that intersection traffic operations analysis is not part of the scope of this study, which will need to be undertaken through detailed traffic analysis.

Strathcona County's VISUM model was used as the basis - a starting point - for travel demand forecasting with updates to the future roadway network, land uses, and modal split targets. Details regarding Strathcona County's VISUM model are documented in the *Strathcona County Integrated Transportation Master Plan Working Paper – Travel Demand Modelling* (December 2012). It is noted that Strathcona County's VISUM model represents the PM peak hour only; therefore, the results summarized below are representative of the PM peak hour conditions.

This memo documents changes that have been made to the model to reflect the proposed plans for the CITP study area (see below) as well as modelling results/findings with a focus on the reduced cross-section on Sherwood Drive. **Figure 1** illustrates the CITP study area and proposed land use concept.

Reference: **CITP Transportation Master Plan VISUM Modelling - FINAL**

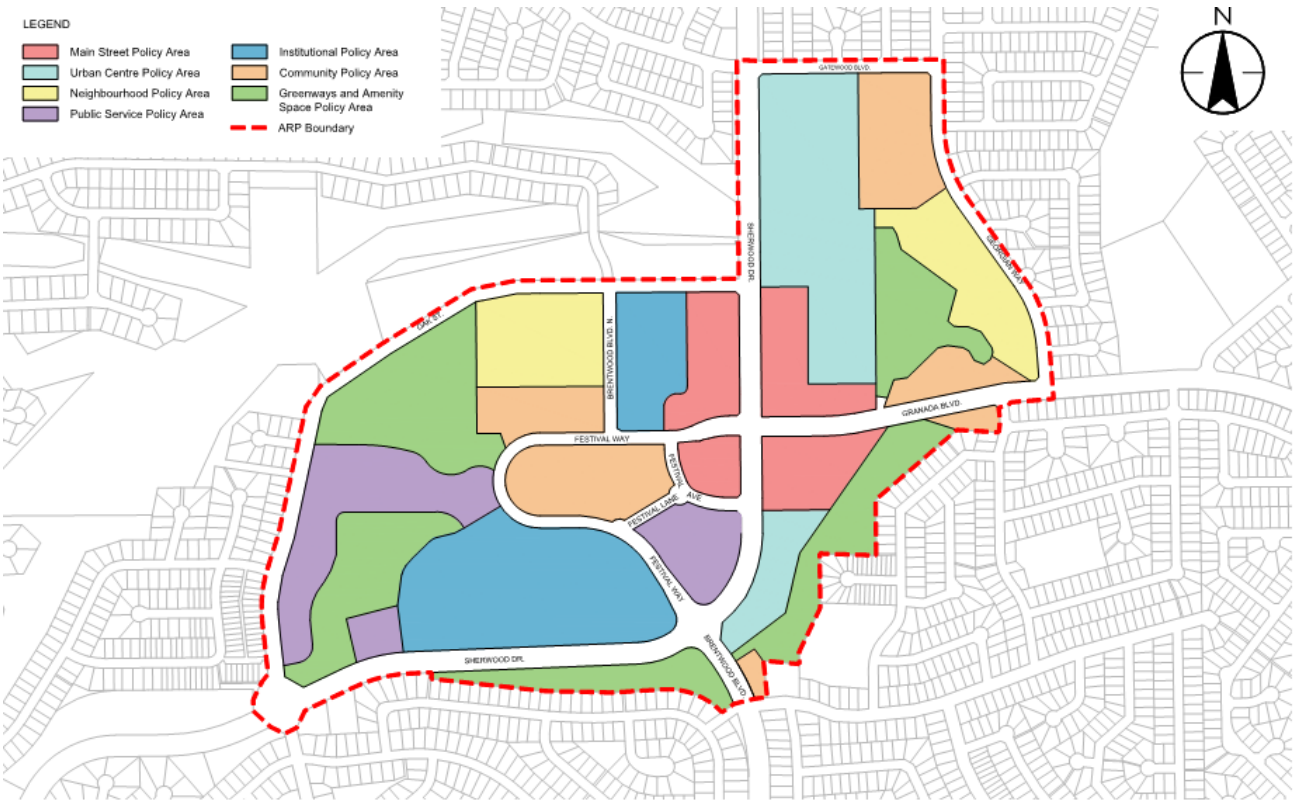


Figure 1: CITP Study Area and Proposed Land Use Concept

2 2021 BASE YEAR RUN

Strathcona County's VISUM model was recalibrated as part of the Strathcona County Integrated Transportation Plan (ITMP) in 2012 with a base year of 2009, a future interim horizon year of 2021, and a future horizon year of 2044. In order to validate the VISUM model, existing observed traffic volumes along the Sherwood Drive corridor were compared to the volumes projected by the model. The interim horizon year (2021) model was selected for the purpose of the model validation as it is closer to existing conditions than 2009.

2.1 ROAD NETWORK VERIFICATION

The 2021 model has two roadway network scenarios: Status Quo and Improved. The Status Quo road network included the base 2009 road network including improvements that were already determined and/or under construction in 2012. The Improved roadway network was built upon the Status Quo network with further improvements based on assessments completed in 2012. See **Attachment 1** for a map of the recommended improvements included in the 2021 Improved road network. The two roadway networks generated similar volumes on Sherwood Drive – less than 2% difference on the segment between Granada Boulevard and Brentwood Boulevard - as the recommended improvements are not in proximity to the study area. Nevertheless, the 2021 Improved roadway network was selected for the validation run as several recommended improvements have already been completed as of 2018. The recommended roadway improvements (near the study area) were verified against the 2018 roadway network. Any recommended improvements that were identified as not complete were removed from the 2021 model road network moving forward. Below is the list of the recommended improvements that were verified.

- S2: Sherwood Drive – Wye Road: implement jug handle, ban northbound left, westbound left and southbound left movements.
    - Not implemented as of 2018, therefore **NOT** included in the 2021 network.
- S3: Broadmoor Boulevard – Baseline Road: add a third lane for both northbound and southbound through movements or further investigate installation of a jug handle in the NW quadrant to reroute left turns.
    - Not implemented as of 2018, therefore **NOT** included in the 2021 network.
- S7: Sherwood Drive (Lakeland Drive to Highway 16): widen to four lanes.
    - Implemented as of 2018; included in the 2021 network.
- S8: Lakeland Drive (Clover Bar Road to Highway 21): widen to four lanes
    - Implemented as of 2018; included in the 2021 network.
- S9: Wye Road (Hawthorne Road to Brentwood Boulevard): widen to six lanes.
    - Implemented as of 2018; included in the 2021 network

The model validation run was completed using the 2021 Improved road network updated as outlined in the list above.

2.2 SHERWOOD DRIVE VOLUME COMPARISON

The latest counts available on Sherwood Drive for the PM peak hour were undertaken in 2017 at the Granada Boulevard/Sherwood Drive and Brentwood Boulevard South/Sherwood Drive intersections. Those volumes were estimated for the 2021 horizon year by applying a historical growth rate of 1% per year to the 2017 volumes along Sherwood Drive. The historical growth rate of 1% per year was calculated based on the daily volumes on Sherwood Drive south of Granada Boulevard measured between 2003 and 2018.

Table 1 summarizes the 2021 projected volumes grown from the measured 2017 volumes, the 2021 modelled volumes provided from the County's 2021 model and the percentage difference between the two volume sets. The GEH statistic is a statistic used to compare modelled traffic volumes and observed volume and is also included in Table 1. A GEH statistic less than 5.0 signifies the two volumes sets match well.

Table 1: PM Peak Hour Volume Comparison

Location	2021 Projected		2021 Modelled		% Diff.		GEH Statistic	
	NB	SB	NB	SB	NB	SB	NB	SB
North of Sherwood Dr/Granada Blvd	1,420	1,311	1,236	1,434	-13%	9%	5.06	3.32
South of Brentwood Blvd	838	718	880	677	5%	-6%	1.44	1.55

The 2021 model numbers are relatively close to the 2021 projected volumes with almost all differences less than 10% and GEHs under 5. The only exception is the northbound volume north of the Sherwood Drive/Granada Boulevard Drive intersection, which has a 13% difference and GEH of 5.06. These differences are acceptable given the strategic nature of this regional travel demand model as well as the variation in the existing counts. Based on the comparison above, Strathcona County's VISUM model is validated for the purpose of a high-level travel demand forecasting on Sherwood Drive.

3 2044 FUTURE SCENARIOS

The 2044 horizon year travel demand forecasting was based on the 2044 Strathcona County model with updates to the road network, land uses, and modal split within the study area. Additionally, due to the future Bremner development, a sensitivity test was undertaken to determine if the full build-out of Bremner has impacts on Sherwood Drive within the CITP study area.

3.1 ROAD NETWORK UPDATES

The 2044 road network was updated with the proposed street network and speed limits proposed in the CITP TMP and as shown in **Attachment 2**. Specifically, the following updates were made to the 2044 road network within the CITP study area:

- **Sherwood Drive**
  - Reduced number of lanes from 3 lanes per direction to 2 lanes per direction between Gatewood Boulevard and Brentwood Boulevard South;
  - Reduced posted speed from 60 km/h to 50 km/h in the study area;

- **Festival Way**
  - A segment of Festival Way was changed to one-way street;
  - Reduced posted speed from 40 km/h to 30 km/h;

- **Brentwood Blvd North**
  - Reduced posted speed from 40 km/h to 30 km/h;

- **Oak Street**
  - Reduced posted speed from 50 km/h to 30 km/h;

- **Festival Lane and Festival Avenue**
  - Added to the network;

- **Connectors**
  - Deleted connectors directly connected to Sherwood Drive; and,
  - Added connectors to Festival Lane.

3.2 LAND USE ASSUMPTIONS

The proposed CITP land uses assumed in the analysis are summarized by parcel in Attachment 3. The CITP study area is planned to serve a population of 6,020 and employment of 3,082 by 2044. The original Zone System was adjusted within the study area as follows:

- Zone 49 was subdivided into Zones 10033 and 10034 to represent the parcels divided by Festival Way;
- Zone 48 was expanded to include the existing townhouses at the southwest quadrant of the intersection of Oak Street and Brentwood Boulevard N previously part of Zone 46; and
- Zone 58 was expanded to include the existing residential development west of Georgian Way previously part of Zone 57.

The updated zone boundaries in the 2044 model are illustrated in **Figure 2**.

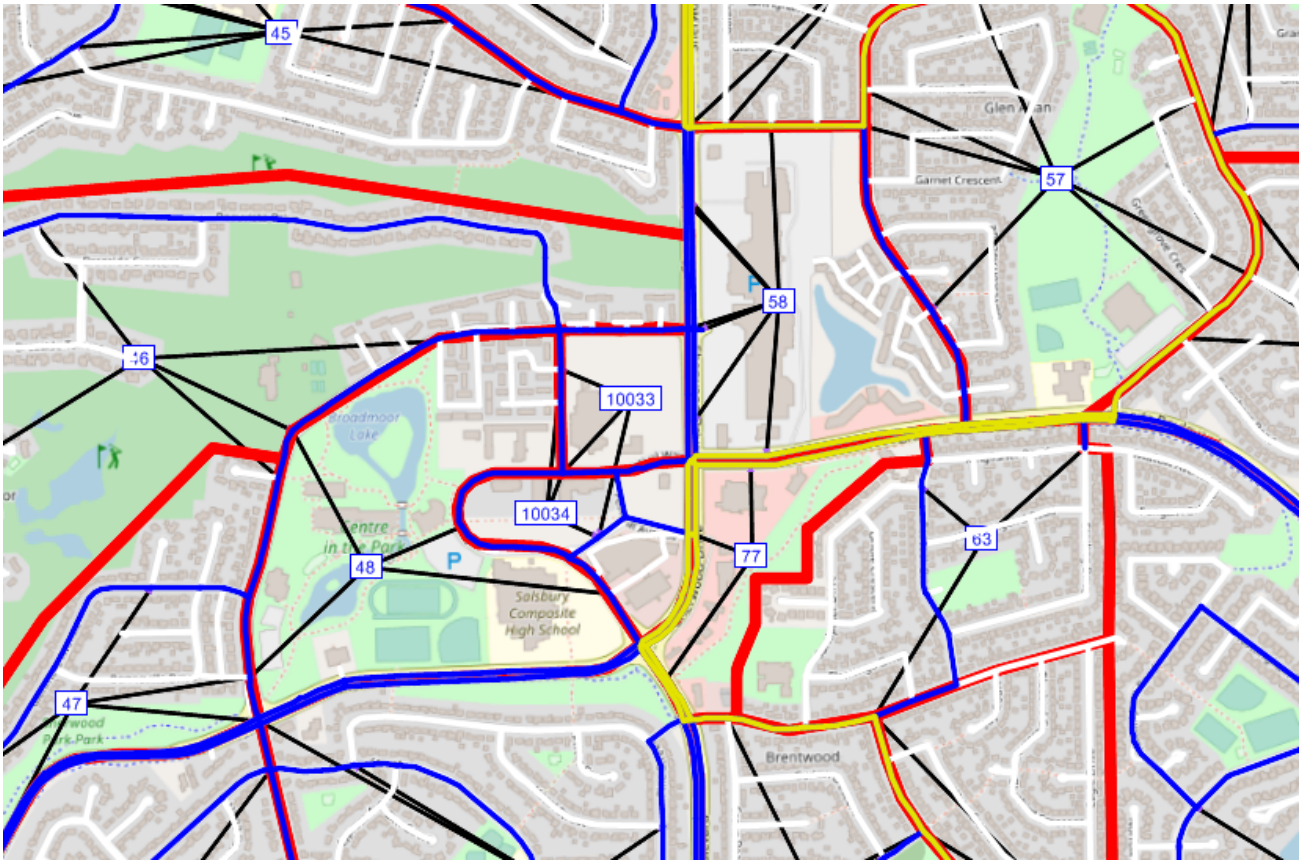


Figure 2: Updated 2044 Zone Boundaries

The population and employment allocated to each zone is summarized in **Table 2**. The totals shown in Table 2 are slightly higher than the proposed land use totals due to rounding. The zone totals were then further broken down to sub-categories by employment type and age, consistent with the original model assumptions.

Table 2: Population and Employment by Zone

Zone	Population	Employment	Student
48	866	357	1,900
58	3,245	1,040	-
77	1,310	430	-
10033	75	330	900
10034	778	864	-
Total	6,274	3,378	2,800

3.3 MODE SPLIT

Strathcona County's 2018 Census Results Report was reviewed to identify the existing mode split characteristics to transit and active modes within the Urban Service Area. For the purposes of this assessment, it was assumed that the responses included under "other" represent walking and cycling trips. The 2018 mode split is summarized below in **Table 3**. Estimates for the 2044 target mode split to transit and active modes (walking and cycling) to be included in the 2044 modelling exercise was determined based on discussions with Strathcona County and are also summarized in Table 3. A comparison of these target mode splits to similar projects is provided in the Section 3.7 of the Transportation Master Plan.

Table 3: Existing and Target Mode Split

	2018 Census	2044 Target	Adjustment Factor
Active Modes	6%	20%	n/a
Public Transit	6%	10%	1.67
Passenger Vehicle	88%	70%	0.80
Total	**100%**	**100%**	

While the VISUM model will assign passenger vehicle and transit trips to the roadway network, it is noted that the model will not assign walking and cycling trips to the network. In order to account for the 20% target in active modes trips, the passenger vehicle and transit trips generated for each zone within CITP by the model were adjusted to achieve a combined 80% modal split as per the 2044 target. Adjustment factors as shown in Table 3 were applied to the trips generated by the model for each zone to achieve 70% and 10% mode split to passenger vehicles and transit respectively. The adjustment factors were calculated based on the target mode split divided by the existing mode split.

Table 4 summarizes the 2044 updated passenger vehicle and transit trips generated for each zone. For comparison purposes, Table 4 also includes the passenger vehicle and transit trips generated by the proposed CITP development based on the previous 2044 model mode split assumptions. The transit share summarized in Table 4 represents the portion of transit trips assumed in the model for each zone between the passenger vehicle and transit trips only and is shown for comparison purposes between the original 2044 model and the updated 2044 model. It does not reflect the overall transit mode split between passenger vehicles, transit, and active modes.

Table 4: 2044 Passenger Vehicle and Transit Trips

CITP Zone	2044 Original Model			2044 Updated Model		
	Passenger Vehicle	Transit	Transit Share	Passenger Vehicle	Transit	Transit Share
48	1,079	70	6.1%	858	117	12.0%
58	3,257	158	4.6%	2,591	264	9.2%
77	1,700	101	5.6%	1,352	169	11.1%
10033	510	52	9.2%	405	86	17.6%
10034	1,040	64	5.8%	828	107	11.5%
Total	7,587	446	5.6%	6,035	743	11.0%
			Overall Mode Split	**71%**	**9%**	-

It is noted that while the 2044 target mode split to passenger vehicles and transit was 70% and 10% respectively, the model determines the exact splits for each zone and is dependent on proximity and opportunities to access transit. As shown in Table 4, the transit share for zones 10033 and 10034 were higher than the average due to the proximity to transit. After applying the adjustment factors towards the 2044 target mode splits, the passenger vehicles trips represent approximately 71% and the transit trips represent approximately 9% of the overall trips generated by CITP. While these do not exactly match the 2044 target mode splits, they are close (within 1%) and the application of the adjustment factors does not override the assumptions previously built into the model.

The original 2044 model included transit improvements in the study area as compared to the 2021 model; therefore, the transit routes and frequency in the 2044 model were maintained as the exact future transit information is not available at this time.

3.4 TRIP GENERATION

The trip generation characteristics of the different land use and trip types used for Center in the Park is summarized in the December 2012 Strathcona County Integrated Transportation Master Plan Working Paper – Travel Demand Modelling report. For the trip generation details from this report, refer to Attachment A5.

3.5 RESULTS AND FINDINGS

The resulting 2044 PM peak hour car (vehicle) and transit (person) volumes along Sherwood Drive are summarized in **Table 5** below. Additional PM peak hour volumes within the study area are shown in **Attachment 4**.

Table 5: Projected 2044 PM Peak Hour Volumes by Direction

Roadway Link	Northbound	Southbound	Eastbound	Westbound
North of Gatewood Blvd	1,377	1,568	-	-
North of Oak Street North	1,296	1,494	-	-
North of Granada Blvd	1,332	1,461	-	-
North of Brentwood Blvd South	1,365	1,107	-	-
East of Oak Street South	-	-	759	383

West of Oak Street South	-	-	750	365

As previously mentioned, Sherwood Drive was reduced to a 4-lane cross-section between Gatewood Boulevard and Brentwood Boulevard South; therefore, Sherwood Drive is assumed to have a capacity of 2,000 vehicles per hour per direction (1,000 vehicles per hour per lane). Volume-to-capacity (v/c) ratios for each roadway link within the study area were identified to assess the vehicle capacity of the roadway network. A v/c ratio less than 0.90 suggests there is sufficient link capacity on the network to accommodate the projected traffic volumes. A v/c ratio higher than 0.90 suggests the roadway link is approaching capacity and could experience congestion during peak travel periods. A v/c of 1.0 suggests the roadway link is at capacity. **Table 6** summarizes the v/c ratios and colour coding system used in the summary figures.

Table 6: Volume-to-Capacity Ranges

Volume-to-Capacity Ratio Range	Link Colour	Capacity
v/c less than 0.75	Green	Sufficient Capacity
v/c between 0.75 and 0.90	Blue	Sufficient Capacity
v/c between 0.90 and 1.00	Yellow	Approaching Capacity
v/c between 1.00 and 1.10	Orange	Over Capacity
v/c between 1.10 and 1.20	Red	Over Capacity

Figure 3 illustrates the v/c ratios for each roadway segment within the study area for the 2044 updated model including the adjustments to land use and assumptions stated above. As shown, all roadway links within the study area show a v/c ratio under 0.80. Sherwood Drive generally shows a v/c ratio under 0.75 with the exception of the southbound link north of Gatewood Boulevard, where the v/c is showing 0.80, still under capacity. The eastbound link on Gatewood Boulevard between Sherwood Drive and the mall site access is showing a v/c ratio of 0.80, still under capacity.

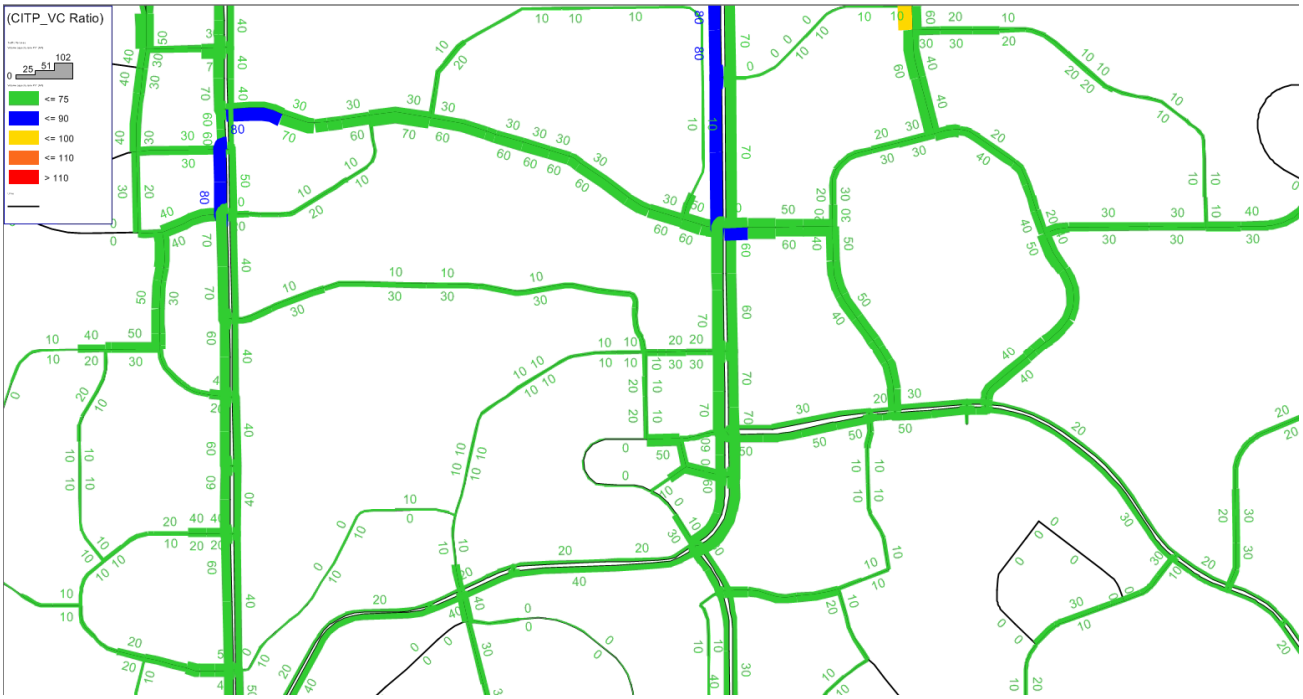


Figure 3: 2044 Updated Model Capacity Results

3.6 BREMNER FULL BUILD-OUT SENSITIVITY RUN

The 2044 original model assumes approximately 46% build-out of the Bremner area east of Highway 21 and north of Highway 16. The 46% build-out of Bremner was retained in the 2044 updated model assessment shown above; however, an additional 2044 model scenario was conducted to assess the potential impacts of the build-out of Bremner on Sherwood Drive within the study area. The model assumptions were retained with the exception of the additional population and employment statistics for the Bremner area. **Table 7** summarizes the Bremner area land use assumptions for each of the 2044 model runs.

Table 7: Bremner Land Use Assumptions

2044 Model Scenario	Population	Employment
46% of Full Build-out	36,467	9,057
100% of Full Build-out (Sensitivity Run)	79,228	19,625

The resulting 2044 Bremner full build-out PM peak hour car (vehicle) and transit (person) volumes along Sherwood Drive are summarized in **Table 8**.

Table 8: Projected 2044 PM Peak Hour Volumes by Direction (Bremner Full Build-out)

Roadway Link	Northbound	Southbound	Eastbound	Westbound
North of Gatewood Blvd	1,398	1,5672	-	-
North of Oak Street North	1,313	1,494	-	-
North of Granada Blvd	1,334	1,468	-	-
North of Brentwood Blvd South	1,345	1,121	-	-
East of Oak Street South	-	-	787	401
West of Oak Street South	-	-	777	380

Based on the 2044 Bremner full build-out model run, 30 or less additional PM peak hour vehicles were noted along Sherwood Drive in each direction; therefore, the impact on Sherwood Drive is anticipated to be minimal. **Figure 4** illustrates resulting v/c ratios within the CITP study area. It is anticipated that the trips generated to/from the Bremner area will likely use other major arterials within Sherwood Park and the surrounding area that offer more direct routing than Sherwood Drive within CITP.

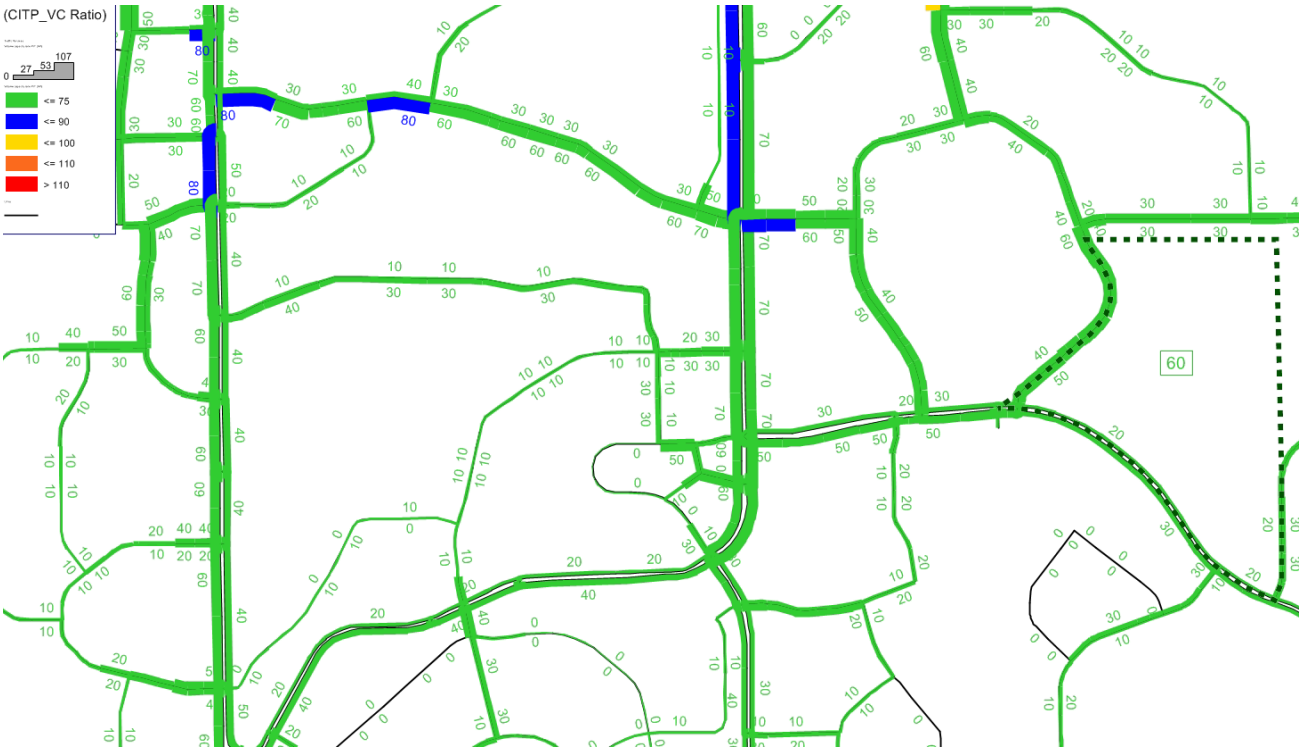


Figure 4: 2044 Bremner Full Build-out Model Run Results

4 CONCLUSION

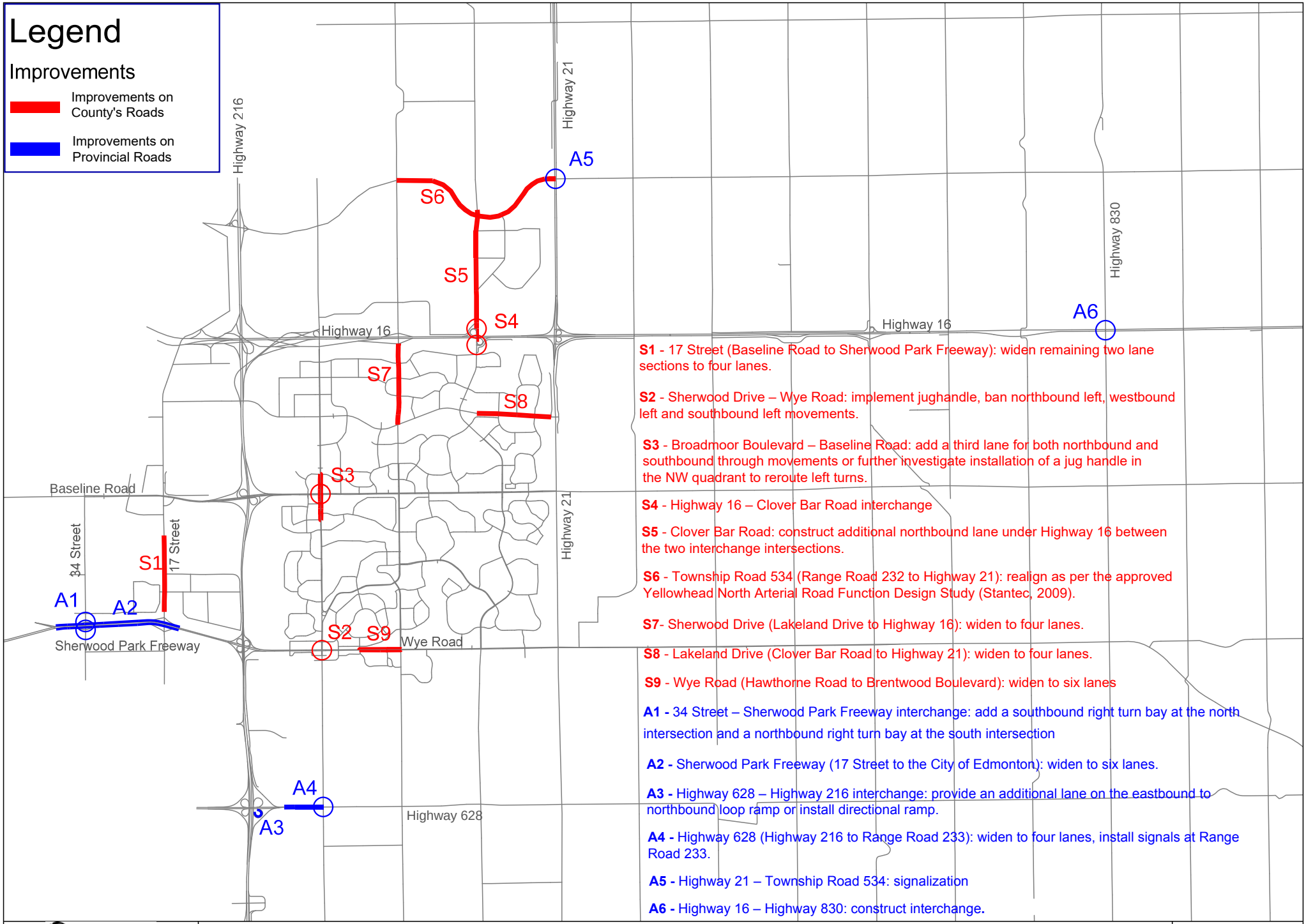
This memo summarizes the PM peak hour VISUM model runs that were designed to test the impacts of lane reduction on Sherwood Drive within the CITP area. The 2021 model run proved the model's validity to undertake the travel demand forecast for Sherwood Drive. Based on the 2044 updated model run, it is expected that the proposed 4-lane cross-section along Sherwood Drive within the CITP area can accommodate the projected traffic associated with the intensification of CITP, with capacity to spare, assuming 2044 target mode splits to transit and active modes are met. It was also determined that the full build-out on Bremner is anticipated to have very littles influence the projected traffic volumes along Sherwood Drive within the study area.

It is noted that the effects of dynamic transit and on-street parking was could not be modelled in the VISUM model runs. These represent inputs too detailed for the macro-scale VISUM modeling and further analysis at more detailed stages can assess these effects. At a high-level, it is anticipated that dynamic transit will provide an additional option for people residing and working within CITP and may reduce the reliance on personal vehicles, suggesting the overall passenger vehicle trips may reduce while transit trips may increase.

It is also noted that intersection design and analysis along Sherwood Drive was not included in this scope of work. Detailed intersection analysis will be required to confirm the future intersection geometry required.

Attachments:
A1 - Map of the Recommended Improvements on 2021 Road network
A2 - Proposed 2044 Road Network and Speed Limits
A3 - Proposed 2044 CITP Land Use by Parcel
A4 – 2044 Updated Model PM Peak Hour Volumes
A5 - Strathcona County Integrated Transportation Master Plan Working Paper – Travel Demand Modelling Section 3.1

Attachment 1: Recommended Improvements in the 2021 Improved Road Network



S1 - 17 Street (Baseline Road to Sherwood Park Freeway): widen remaining two lane sections to four lanes.

S2 - Sherwood Drive – Wye Road: implement jughandle, ban northbound left, westbound left and southbound left movements.

S3 - Broadmoor Boulevard – Baseline Road: add a third lane for both northbound and southbound through movements or further investigate installation of a jug handle in the NW quadrant to reroute left turns.

S4 - Highway 16 – Clover Bar Road interchange

S5 - Clover Bar Road: construct additional northbound lane under Highway 16 between the two interchange intersections.

S6 - Township Road 534 (Range Road 232 to Highway 21): realign as per the approved Yellowhead North Arterial Road Function Design Study (Stantec, 2009).

S7- Sherwood Drive (Lakeland Drive to Highway 16): widen to four lanes.

S8 - Lakeland Drive (Clover Bar Road to Highway 21): widen to four lanes.

S9 - Wye Road (Hawthorne Road to Brentwood Boulevard): widen to six lanes

A1 - 34 Street – Sherwood Park Freeway interchange: add a southbound right turn bay at the north intersection and a northbound right turn bay at the south intersection

A2 - Sherwood Park Freeway (17 Street to the City of Edmonton): widen to six lanes.

A3 - Highway 628 – Highway 216 interchange: provide an additional lane on the eastbound to northbound loop ramp or install directional ramp.

A4 - Highway 628 (Highway 216 to Range Road 233): widen to four lanes, install signals at Range Road 233.

A5 - Highway 21 – Township Road 534: signalization

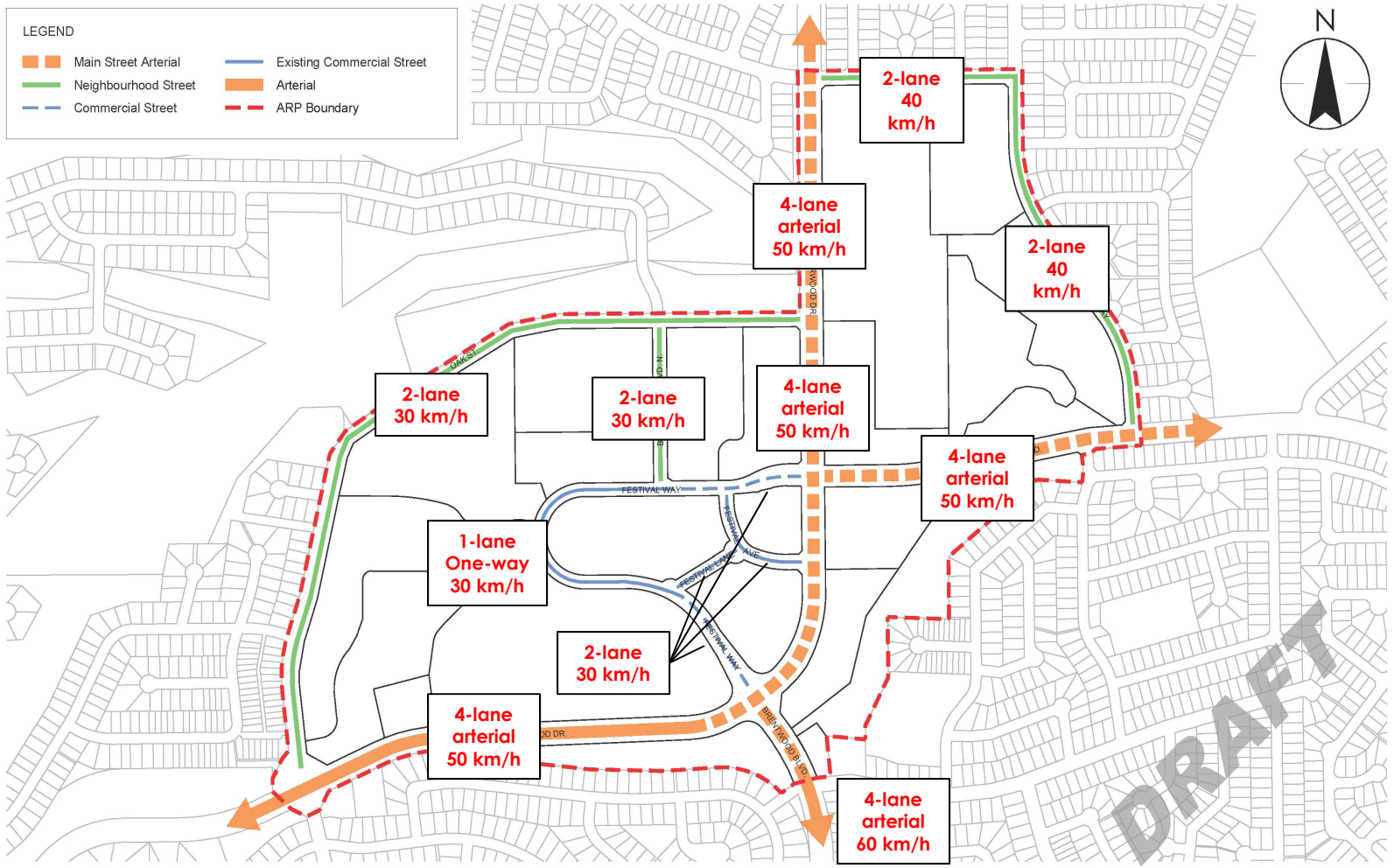
A6 - Highway 16 – Highway 830: construct interchange.

Stantec	Strathcona County - Integrated Transportation Master Plan	2012-08-23
Figure 6.11	2021 Recommended Improvements	1:100000

Attachment 2: Proposed Street Network and Speed Limits

FIGURE 4

STREET NETWORK



Note: This map is conceptual in nature. The exact location of land uses, facilities, roadways and services will be determined by the future development.

STRATHCONA COUNTY

CENTRE IN THE PARK

Attachment 3: Assumed Land Use Statistics by Parcel

	Approx. Parcel Area (ha)							
Policy Area	**A**	**B**	**C**	**D**	**E**	**F**	**Total**	
Main Street Policy Area	2.58	2.84	1.14	2.29			8.85	
Urban Centre Policy Area	10.63	2.31					12.94	
Neighbourhood Policy Area	4.05	4.07					8.12	
Community Policy Area	2.09	3.71	2.79	1.46	0.42	0.30	10.77	
Civic Policy Area	5.74	0.78	2.35				8.87	
Institutional Policy Area	3.07	10.24					13.31	
							62.86	TRUE

	Population							
Policy Area	**A**	**B**	**C**	**D**	**E**	**F**	**Total**	
Main Street Policy Area	75	204	82	507			868	TRUE
Urban Centre Policy Area	1866	699					2565	TRUE
Neighbourhood Policy Area	397	399					796	TRUE
Community Policy Area	427	678	510	265	60	43	1984	TRUE
Civic Policy Area	42		17				59	TRUE
Institutional Policy Area	900 **students**	1900 **students**						
							6272	TRUE

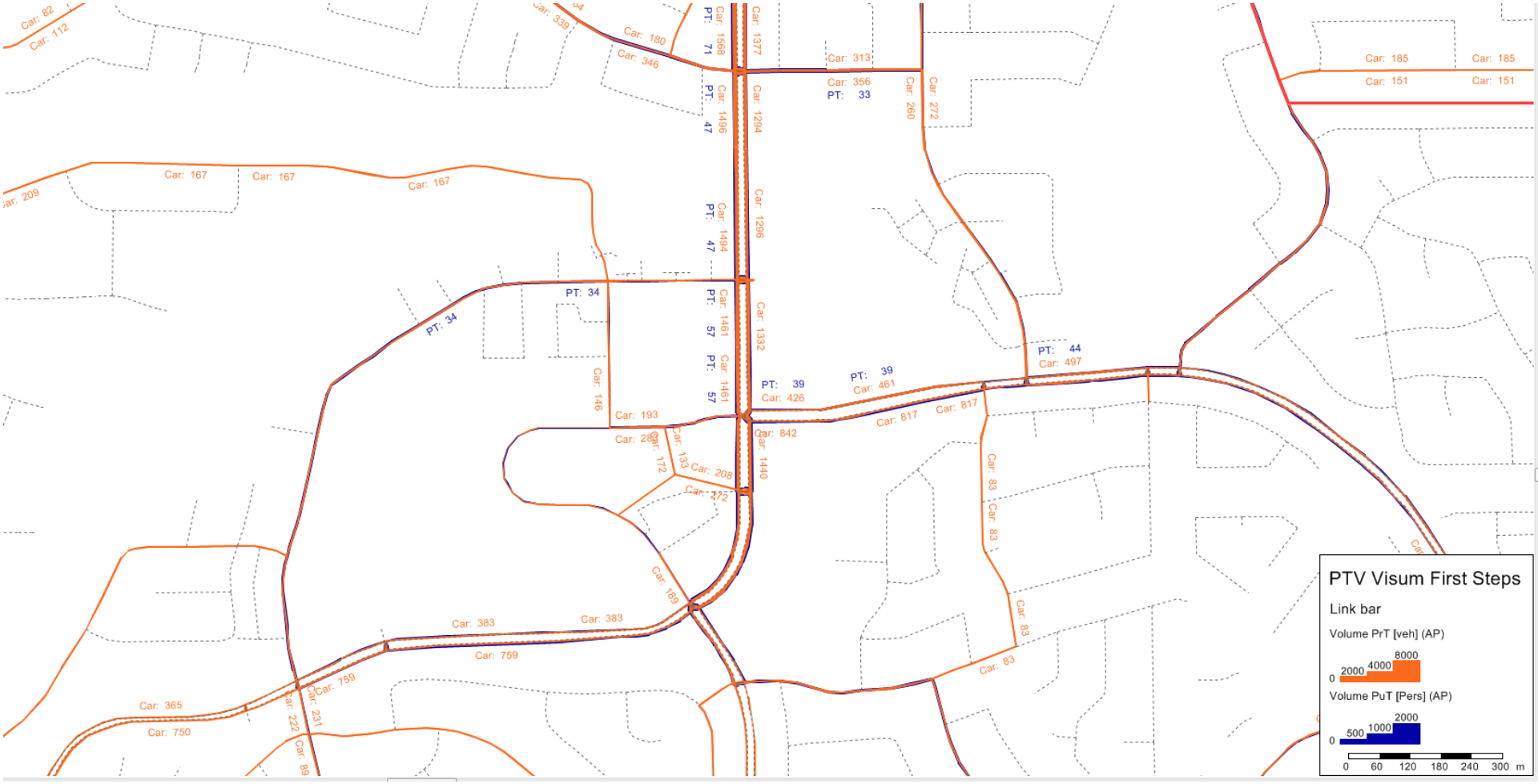
	Employment							
Policy Area	**A**	**B**	**C**	**D**	**E**	**F**	**Total**	
Main Street Policy Area	239	307	123	193			863	
Urban Centre Policy Area	643	152					795	
Neighbourhood Policy Area	0	0					0	
Community Policy Area	49	76	58	31	49	35	299	
Civic Policy Area	78	39	664				781	
Institutional Policy Area	90	190					280	
							3017	

FIGURE 3 LAND USE CONCEPT

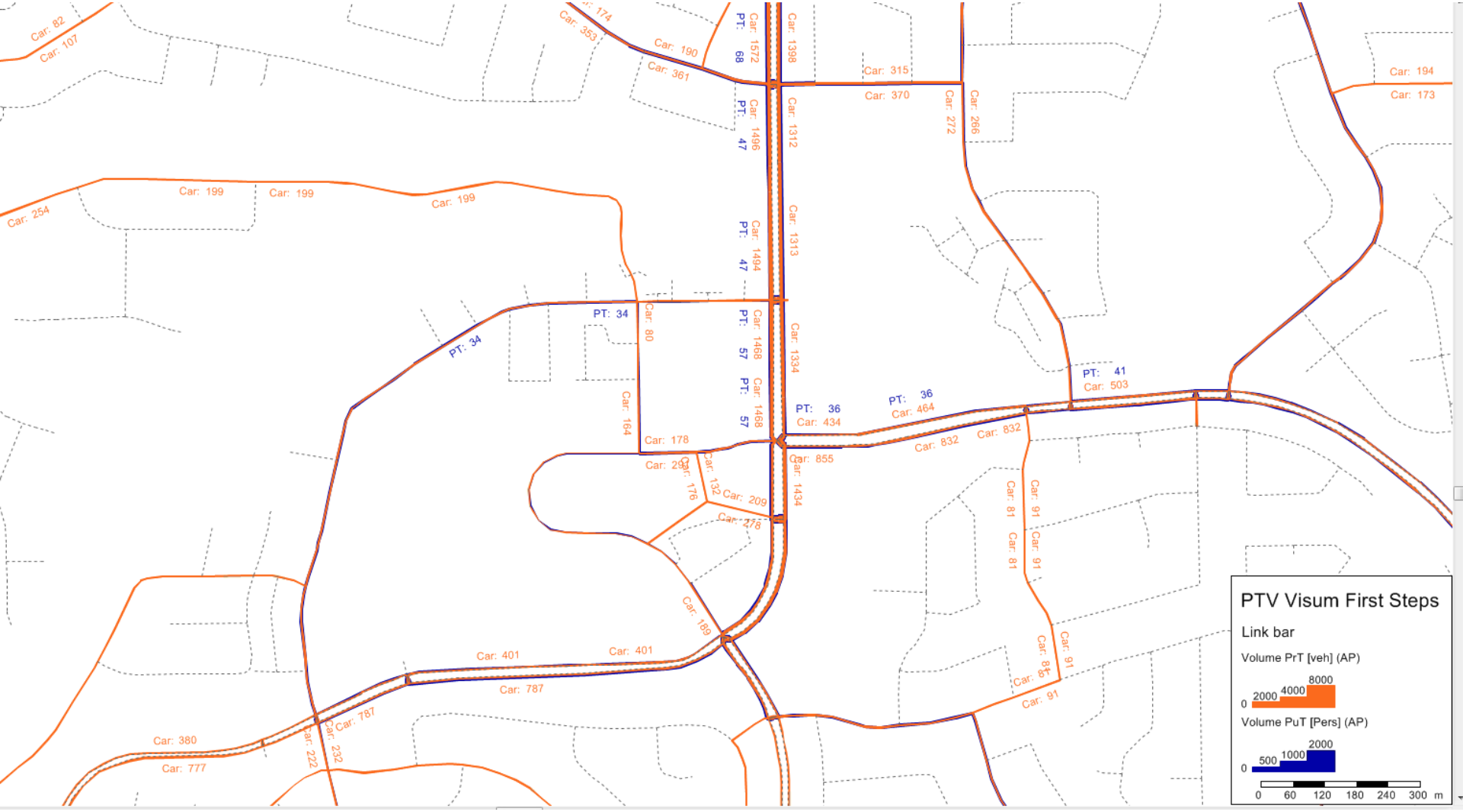
STRATHCONA COUNTY CENTRE IN THE PARK

CENTRE IN THE PARK - AREA REDEVELOPMENT PLAN

Attachment 4: 2044 Projected PM Peak Hour Volumes



Attachment 4: 2044 Projected PM Peak Hour Volumes –Sensitivity Run



Attachment 5

Strathcona County Integrated Transportation Master Plan Working Paper - Travel Demand Modeling

Prepared for:

Strathcona County

Prepared by:

Stantec Consulting Ltd.

Project: 1135 31049

Revised: December 13, 2012

factors estimated from base year traffic counts. Therefore, the base year model calibration discussed here focuses on personal trips only.

The four steps in the Transportation Planning Model have been implemented in VISUM as 64 operations (steps) as shown in Appendix B.

3.1 TRIP GENERATION

Trips taken during the PM peak hour can be divided into five basic trip types or demand strata:

- Home-Based Work (HBW)
- Home-Based University (HBU)
- Home-Based School (HBS, K-12)
- Home-Based Other (HBO)
- Non-Home Based (NHB)

Each of these trip types has different trip characteristics and therefore produces different travel patterns. The following outlines the approach used to model each trip type.

Home-Based Work

During the PM peak hour, these trips are primarily generated by the various employment areas and are attracted to the residential areas.

Home-Based University

During the PM peak hour, these trips are primarily generated by the universities or colleges in Edmonton City Centre, U of A, and NAIT, and attracted to the residential areas.

Home-Based School

During the PM peak hour, these trips are generated by various elementary, junior or senior high schools, and attracted to the residential areas.

Home-Based Other

During the PM peak hour, these trips are generally attracted to retail/service areas and generated by the residential areas.

Non-Home Based

During the PM peak hour, these trips are generally produced by the employment areas and attracted to other employment and retail areas.

The proportion of the generated trips assigned to each trip type depends on the land use and is summarized in Table 3.1. This allocation is based on typical travel demand modeling practices and experience in completing models for other similar urban areas.

Table 3.1 – PM Peak Hour Trip Type Split by Land Use

Land Use	Split		Trip Type Split				
	In	Out	HBW	HB Post Sec	HB School	HBO	NHB
Urban Residential							
People (< 15)	82%	18%	0%	0%	60%	40%	0%
People (15 - 24)	75%	25%	45%	10%	5%	40%	0%
People (25 - 44)	70%	30%	55%	3%	2%	40%	0%
People (45 - 64)	70%	30%	55%	0%	5%	40%	0%
People (>65)	75%	25%	30%	0%	10%	60%	0%
Rural Residential							
People (< 15)	82%	18%	0%	0%	60%	40%	0%
People (15 - 24)	75%	25%	55%	5%	5%	35%	0%
People (25 - 44)	70%	30%	65%	3%	2%	30%	0%
People (45 - 64)	70%	30%	60%	0%	5%	35%	0%
People (>65)	75%	25%	30%	0%	10%	60%	0%
Employment							
Retail (except NHB)	32%	68%	25%	0%	0%	30%	
Retail (NHB)	68%	32%					45%
Service	30%	70%	35%	0%	0%	35%	30%
Others	28%	72%	50%			20%	30%
Institutional							
School	20%	80%	0%	0%	90%	0%	10%
College/University	30%	70%	0%	80%	0%	0%	20%

Based on the location of trip generators (within or outside the project area), trips can be divided into two categories: internal zone generated trips and external zone generated trips.

3.1.1 Internal Zone Trip Generation

To generate the total trips within an internal zone, the trip generation rates need to be determined for each land use. Trip generation rates are factors that indicate the number of trips that occur in an area for every unit of associated land use. For the Strathcona County model the rates have been calculated in person trips for residential and employment land uses.

The residential and employment trip generation rates were established from the 2005 Edmonton Region Household Travel Survey, turning movement counts conducted by the County, ITE's *Trip Generation* (7th Edition), and data compiled for previous similar transportation planning studies. Table 3.2 summarizes the trip generation rates used for the Strathcona County Model.

Table 3.2 – PM Peak Hour Person Trip Generation Rates

Land Use	Unit	PM Peak Generation Rate	Trip Generation Rates									
			HBW		HB Post Sec		HB School		HBO		NHB	
			In	Out	In	Out	In	Out	In	Out	In	Out
Urban Residential												
People (< 15)	Person	0.244	0.000	0.000	0.000	0.000	0.120	0.026	0.080	0.018	0.000	0.000
People (15 - 24)	Person	0.336	0.113	0.038	0.025	0.008	0.013	0.004	0.101	0.034	0.000	0.000
People (25 - 44)	Person	0.457	0.176	0.075	0.010	0.004	0.006	0.003	0.128	0.055	0.000	0.000
People (45 - 64)	Person	0.471	0.181	0.078	0.000	0.000	0.016	0.007	0.132	0.057	0.000	0.000
People (>65)	Person	0.393	0.088	0.029	0.000	0.000	0.029	0.010	0.177	0.059	0.000	0.000
Rural Residential												
People (< 15)	Person	0.133	0.000	0.000	0.000	0.000	0.065	0.014	0.043	0.010	0.000	0.000
People (15 - 24)	Person	0.220	0.091	0.030	0.008	0.003	0.008	0.003	0.058	0.019	0.000	0.000
People (25 - 44)	Person	0.258	0.117	0.050	0.005	0.002	0.004	0.002	0.054	0.023	0.000	0.000
People (45 - 64)	Person	0.299	0.126	0.054	0.000	0.000	0.010	0.004	0.073	0.031	0.000	0.000
People (>65)	Person	0.260	0.058	0.019	0.000	0.000	0.019	0.006	0.117	0.039	0.000	0.000
Employment												
Retail (except NHB)	Employee	3.52	0.282	0.598	0.000	0.000	0.000	0.000	0.338	0.718		
Retail (NHB)											1.077	0.507
Service	Employee	1.37	0.144	0.335	0.000	0.000	0.000	0.000	0.144	0.335	0.123	0.287
Others	Employee	0.54	0.076	0.195					0.030	0.078	0.046	0.117
Institutional												
School	Student	0.245	0.000	0.000	0.000	0.000	0.044	0.176	0.000	0.000	0.005	0.020
College/University	Student	0.478	0.000	0.000	0.115	0.268	0.000	0.000	0.000	0.000	0.029	0.067

3.1.2 External Zone Trip Generation

External zones generate two types of trips associated with different destinations: external-external trips and external-internal trips.

- External-external trips are commonly called through trips. These trips originate in, and are destined to, external zones. They have neither an origin nor destination within the project area.
- External-internal trips have one trip end in an external zone and the other trip end in an internal zone.

For external zones other than those in central Edmonton (10001 to 10029), the external-external and external-internal trips were estimated based on traffic volumes at the external zones and a traversal matrix derived from RTM data. To prepare the external trips for use in the Strathcona County Base Year Transportation Model, the following steps were adopted:

1. Remove heavy trucks and buses from the traffic counts to yield auto trips (e.g. cars and/or single unit vehicles) at each external zone.

2. Multiply the auto trips at each external zone by the PM Peak traversal matrix percentages (based on traffic origins) to yield an initial external-external auto trip table.

3. Adjust the initial external-external auto trip table using reasonable destination traffic percentages to achieve a workable external-external auto trip table; this trip table is entered into VISUM as a demand matrix. The adjustment is necessary because the RTM traversal matrices are not balanced and must be balanced manually.

4. Subtract the total external-external auto trips from the auto vehicle counts to get the total external-internal auto trips at each external zone.

5. Multiply the total external-internal auto trips by an aggregated auto occupancy rate of 1.24 to yield person trips. The aggregated occupancy rate was estimated based on the assumption that 55% of the total external-internal auto trips belong to HBW, and 15% each belong to HBU, HBO and NHB. The auto occupancy rates discussed in Section 3.4.2 were referenced.

In order to estimate the total external-internal person trips between central Edmonton (zones 10030, 10031, and 10032) and Strathcona County using either Baseline Road or Sherwood Park Freeway, the following steps were adopted:

6. Establish the percentage of auto trips, using Baseline Road and Sherwood Park Freeway, for commuting between Strathcona County and central Edmonton. These trip distribution percentages were from the RTM using “EMME select link analysis” (similar to Flow Bundle technique in VISUM).

7. Multiply the total external-internal auto trips at Baseline Road and Sherwood Park Freeway by RTM trip distribution percentages.

8. Convert the auto trips to person trips (auto mode) for central Edmonton using the aggregated auto occupancy rate.

9. Add Strathcona County Transit passengers alighting/boarding in central Edmonton (estimated from the County 2010 Transit Survey) to yield the total person trips between central Edmonton and Strathcona County.

Finally, the person trips (auto mode only) estimated for the central Edmonton area were subtracted from the total external-internal person trips using Baseline Road and Sherwood Park Freeway to estimate person trips commuting between Strathcona County and all areas other than central Edmonton.