City of Saskatoon | GROWING forward! Shaping Saskatoon

GROWTH PLAN TECHNICAL REPORT

February 2016

Prepared for the City of Saskatoon by Urban Systems Ltd.

Growing Forward! Shaping Saskatoon
Growth Plan to Half a Million
Technical Report

PREPARED FOR:

City of Saskatoon
222 - 3rd Avenue North
Saskatoon, SK S7K 0J5

t. 306.975.2650
f. 306.975.2971

Attn: Lesley Anderson, MCIP, RPP
Project Manager, Growing Forward! Shaping Saskatoon

PREPARED BY:

Urban Systems
204 – 220 3rd Avenue South
Saskatoon, SK S7K1M1

t: 1-877-748-4498
e: jsteiner@urbansystems.ca

Contact: John Steiner, M.Eng., MCIP, RPP

In association with

PERKINS + WILL

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PART 1: INTRODUCTION TO THE GROWTH PLAN

1.1 The Imperative for the Growth Plan to Half a Million

Saskatoon has evolved from a prairie community that once experienced modest growth, to one where prosperity and opportunity has made the city among the most attractive and exciting places to live in Canada. According to the 2011 Census, the City of Saskatoon had a population of 222,190. In recent years, the city achieved annual growth rates of approximately 3 percent per year. The estimated December 2015 population is 262,900[1].

Moving forward, it is projected that there will be an average annual growth rate of approximately 2.5 percent. As a result, Saskatoon's population is expected to double to half a million people over the next thirty to forty years and change is inevitable. Growth provides many benefits, such as increased economic activity, employment, and business opportunities. However, with fast growth, there are also challenges associated with enhancing the quality of life and building and servicing a larger city.

This is a crucial time in Saskatoon's history, with significant choices to be made about how the city will continue to grow. Today's development and transportation infrastructure investments will last for decades if not centuries, and have a critical role in shaping land use patterns for generations to come. The City of Saskatoon has cast a vision for economic prosperity, quality of life, and environmental responsibility, and it is essential that today's land use and transportation choices set Saskatoon up to realize this vision.

The imperative is great and there are significant implications for the overall future livability of the city. Studies have found that Canadian cities are still continuing to sprawl, in spite of the revitalization of city cores. The average home is further from city centres than a decade ago. Commuting times and traffic congestion costs have increased. Growth patterns have resulted in higher servicing and infrastructure costs, less-effective public transit services, the displacement of large tracts of habitat and farmland, and compromised water and air quality. However, Saskatoon has already established a reputation for 'getting it right' and at this juncture there is an opportunity to define a future as a resilient city with a high quality of life.

By making the right choices now, Saskatoon will:

- better utilize its land and infrastructure assets;
- provide opportunities for the public to use an efficient, convenient transit system;
- have a scale of development, density of development, and mixture of land uses that support walking and cycling;
- provide a range of housing types to meet the needs of all people;
- provide jobs close to homes;
- provide the social infrastructure required to support families and other community needs;
- protect the natural environment; and,
- be ultimately more affordable to run in the long-term.

1 *Although the City provides annual population estimates, the analysis in this Technical Report generally uses data from the 2011 Census and other information sources (e.g. City of Saskatoon traffic data) available in 2013 when the Growth Plan process was initiated.*

1.2 Overview of the Growth Plan

The Growth Plan to Half a Million (Growth Plan) is about making choices to proactively manage the changes associated with growth, and to create a city that is vibrant and attractive to future generations. A vibrant Saskatoon is a city with a diverse mixture of housing, commercial, social, cultural, and recreational opportunities that are universally accessible by all modes of transportation including walking, cycling, transit, and driving. Creating a healthy and sustainable Saskatoon is also essential to support and attract people from other parts of Canada and the world. This migration is necessary to sustain current and anticipated levels of economic growth and to increase diversity, which benefits the region, the province, and Canada as a whole.

This vision was first articulated by residents as part of the Saskatoon Speaks process, which occurred a few years ago. This City-led initiative engaged a large portion of the community in a discussion about the city's future. Residents were asked to share what they value and articulate their aspirations for Saskatoon. Eight interrelated themes and visions were identified. These themes contributed significantly to Council's Strategic Plan 2013-2023 (Strategic Plan).

In an integrated fashion, the Growth Plan advances the Strategic Plan goals around *Sustainable Growth and Moving Around*. These goals are about building places to bring people together and providing more transportation choices so Saskatoon will be a healthier, more sustainable, accessible and attractive place to live as described in **Figure 1.01**.

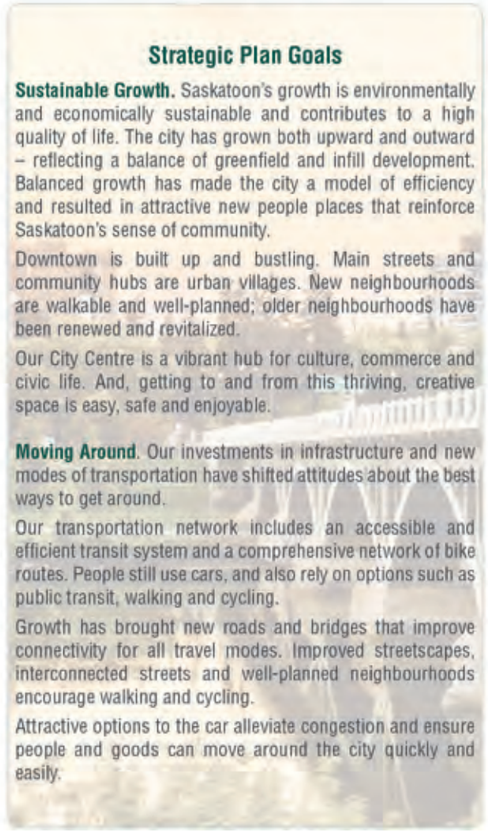


Figure 1.01 - City of Saskatoon Strategic Plan Goals - Sustainable Growth and Moving Around

The Growth Plan is made up of several parts that when pieced together form a new growth model for Saskatoon. Corridor Growth, Transit, and Core Bridges make up the core initiatives within the Growth Plan. In addition there are four supporting initiatives that will also help meet the needs of our growing city. These supporting initiatives include Employment Areas, Active Transportation, Water & Sewer, and Financing Growth.

Corridor Growth

This aspect of the Growth Plan explores ways to encourage growth and redevelopment near Saskatoon's major corridors in order to reduce outward growth pressures, provide more housing options close to employment areas, and enhance transportation choices throughout the city. Residents have expressed a desire for sustainable growth options and a balancing of outward growth with upward growth. Corridor Growth will complement key planned infill growth areas, including Strategic Infill (i.e. Downtown, North Downtown and University of Saskatchewan lands) and Neighbourhood Infill (i.e. smaller scale residential infill in core area neighbourhoods). Corridor Growth is essential to transform low-density, auto-centric land uses into vibrant, complete communities that support attractive transit and the long-term success of the city as a whole.

Transit

Public transit is a major focus of the Growth Plan, given the important role that transit service plays in supporting and shaping the growth of any city. Residents have expressed a desire for Saskatoon to have an accessible and efficient transit system with an attractive customer experience. While people will still use cars, an efficient transit system with rapid transit priority lanes will provide options to alleviate and even bypass congestion, ensuring that people can move around the city quickly and easily. Attractive transit will also reinforce opportunities for sustainable growth along major transit corridors.

Core Bridges

As Saskatoon's population grows, so too will demands for travel across the river. This aspect of the Growth Plan explores options to improve access to and from the core area of Saskatoon over the next 30 to 40 years. The emphasis is a review of the city's core area bridges and analysis of opportunities to balance the movement of more people across the core area bridges. The focus is on making the most of existing infrastructure while also reviewing the potential need for an additional river crossing in the long-term.

Supporting Initiatives

As indicated, the Growth Plan includes four key supporting initiatives:

- **Employment Areas** is about ensuring that the city has the right amount of employment in the right areas;
- **Active Transportation** is about providing more choices for how people move around the city, particularly with respect to walking and cycling;
- **Water & Sewer** is about ensuring that the critical infrastructure required to support growth is in place; and,
- **Financing Growth** is about assessing growth patterns and ensuring cost effective growth.

While these supporting initiatives are being addressed by the City as a key part of the Growth Plan, this Technical Report focuses on Corridor Growth, Transit, and Core Bridges.

1.3 The Current Planning Framework

The City has already undertaken a number of land use planning and road network planning initiatives as a precursor to the Growth Plan. These initiatives provide the foundation for the work on the Growth Plan, and they are highlighted briefly below.

1.3.1 Land Use Planning Initiatives

The City has already prepared several strategic plans to support a doubling of Saskatoon's population over the next thirty years. **Figure 1.02** illustrates sustainable land use plans developed for New Suburban Areas, Neighbouhood Infill Areas, and Strategic Infill Areas. Additionally, road network improvements for expanding areas of the city have also been planned to serve the movement of people, goods and services.

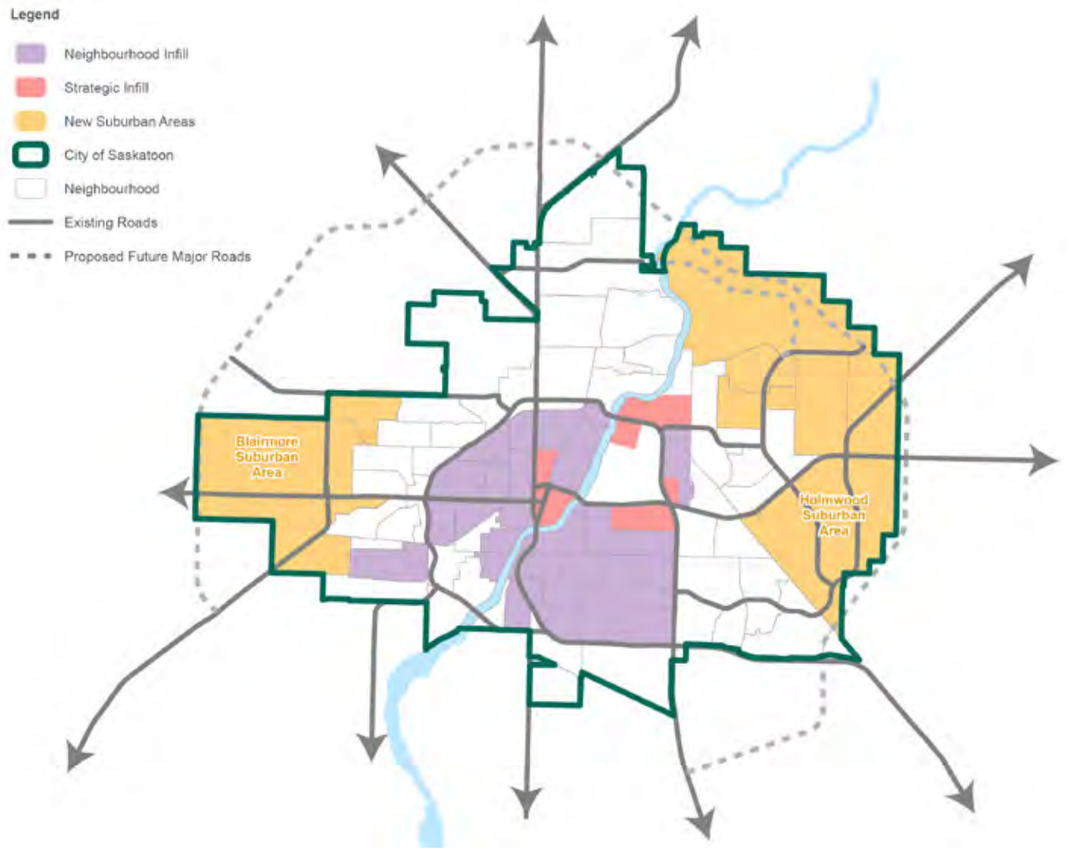


Figure 1.02 - The Current Growth Model

These planned land uses and transportation system improvements provide the basis for further work on the Growth Plan.

New Suburban Neighbourhoods

The City has recently developed detailed plans for new growth areas including Blairmore, University Heights and Holmwood. Through these area plans, the traditional models of suburban growth are being re-imagined so that new neighbourhoods include mixed-use buildings, apartments and townhouses that are focused around higher density cores and include public gathering spaces. These neighbourhoods could support approximately 65% of the long-term population growth in the city.

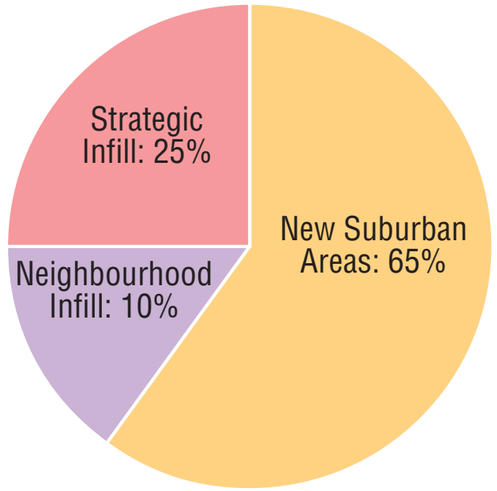


Figure 1.03 - Planned Future Growth (Current Model)

Strategic Infill

Saskatoon's Downtown, North Downtown and areas around the University of Saskatchewan have the potential to accommodate significant growth. As major employment and activity hubs, these areas support opportunities to work, live, shop and socialize in the same neighbourhood. These areas are focal points for Saskatoon, and their success as complete communities is critical to the economic success of the city, region, and province. Once completed, these areas could accommodate approximately 25% of the city's growth to half a million people.

Neighbourhood Infill Areas

The City has also identified an existing trend towards increasing density in established residential neighbourhoods that can accommodate smaller-scale growth (e.g. duplexes, townhouses, secondary suites). Known as Neighbourhood Infill, growth in these areas will provide additional housing options for current and future residents. Neighbourhood Infill could accommodate approximately 10% of the city's long-term population growth.

Roadways

The City has been working with residents, as well as the Province of Saskatchewan, on the provision of new and improved roadways that will serve New Suburban Neighbourhoods and support the movement of people, goods and services (see **Figure 1.04**). Investments in major municipal roads and the Saskatoon Freeway are necessary to serve new areas of the city, including employment growth planned for the North Industrial area. Other network improvements within the core area of the city and new crossings such as the Traffic Bridge will make best use of existing infrastructure, and serve other modes such as transit, walking and cycling.

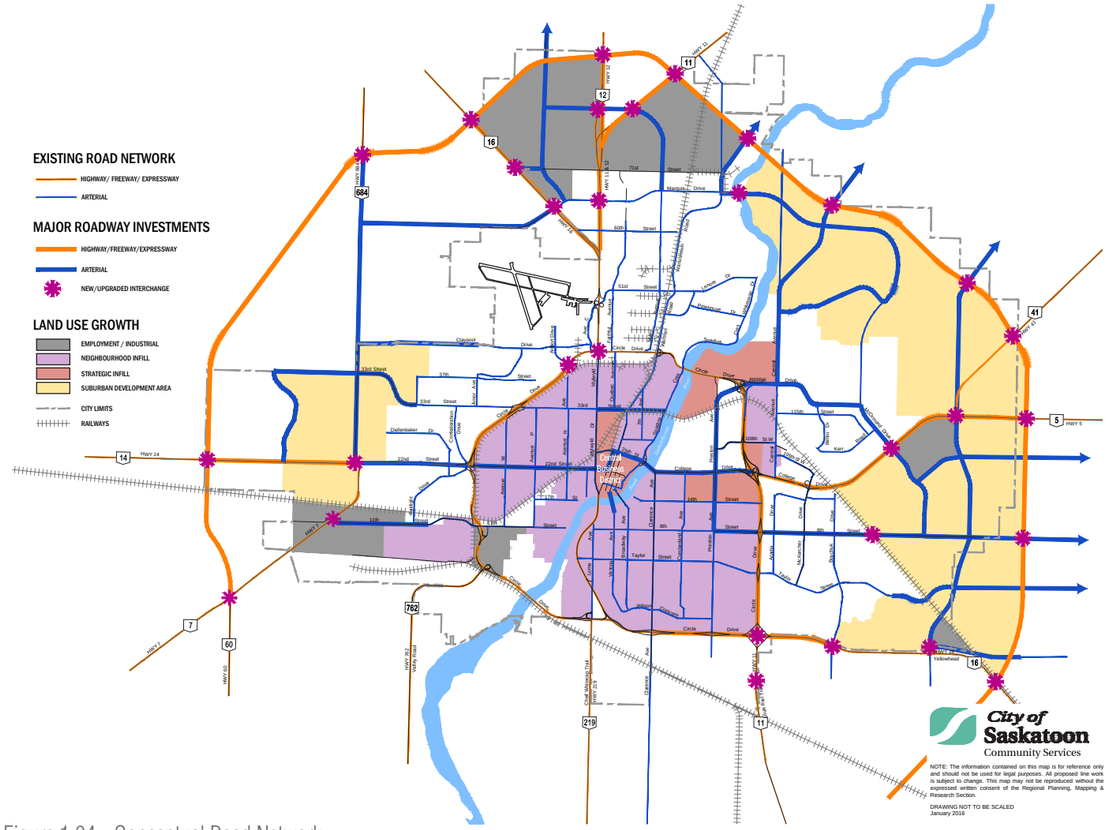


Figure 1.04 - Conceptual Road Network

1.4 The Growth Plan Development Process

The Growth Plan was developed through a five phase public engagement process called Growing Forward! Shaping Saskatoon. The timing and outcomes of each phase are described below and illustrated in **Figure 1.05**.

- **Phase 1: Setting the Stage (October to December 2013)** provided a review of past planning initiatives, presented current plans, and summarized existing conditions and baseline growth patterns in order to highlight what's at stake for Saskatoon.

- **Phase 2: Focusing Our Shared Vision (January to March 2014)** utilized input from Saskatoon residents to create the goals and objectives that will shape the long-term directions for Corridor Growth, Transit, and Core Bridges. Public Event #1 examined what's at stake for the city, in order to solicit input on challenges and opportunities to be addressed by the Growth Plan.

- **Phase 3: What are the Possibilities? (April to December 2014)** included the development and evaluation of optional strategies for Corridor Growth, Transit, and Core Bridges. Preliminary ideas were presented at Public Event #2 and further evaluated based on community input and feedback.

- **Phase 4: What is the Preferred Plan? (January to June 2015)** formed the long-term directions of the Growth Plan. Public Event #3 examined preliminary long-term directions with the community and the feedback was used to shape the preferred plan.

- **Phase 5: How do We Make this Happen? (July 2015 to March 2016)** outlines the steps to start implementing the Growth Plan. The preferred plan and implementation priorities were presented to the community during Public Event #4.

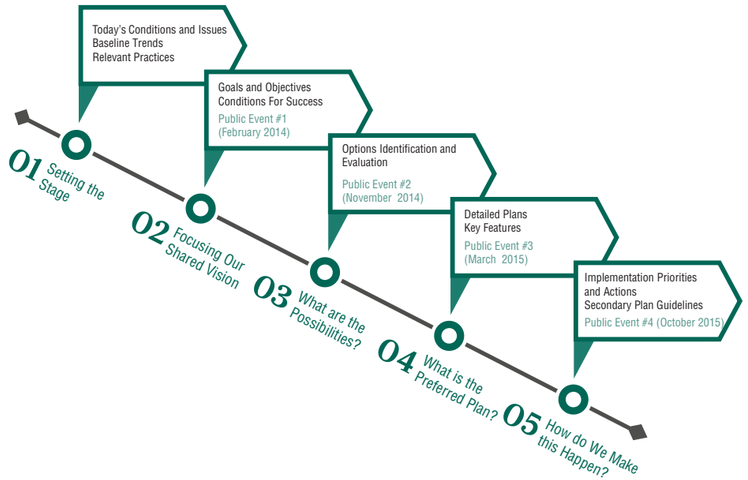
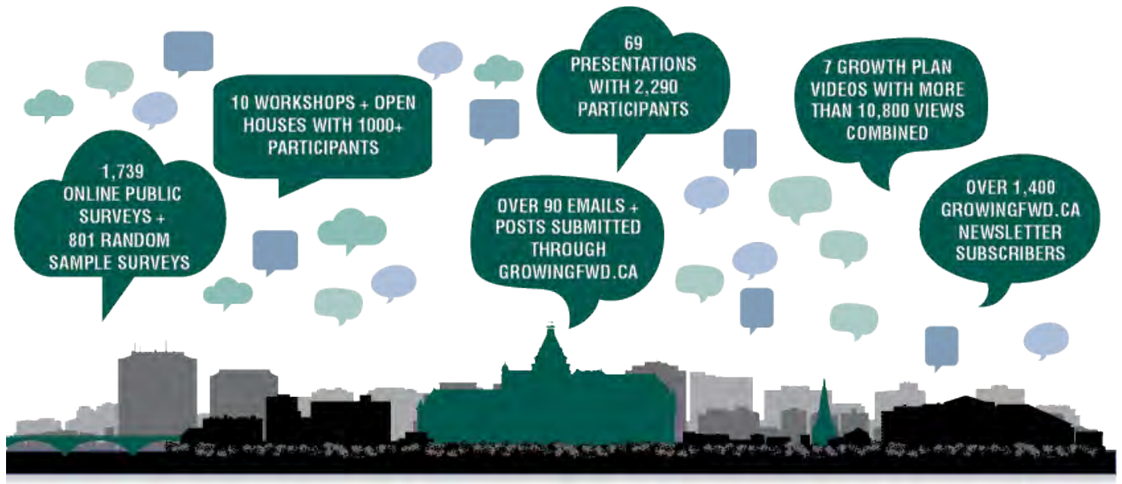


Figure 1.05 - Growing Forward! Shaping Saskatoon Public Engagement Process



The Growth Plan development process included ongoing engagement with residents of Saskatoon to discuss current and future challenges and to assist in identifying potential long-term changes to the city. This process was consistent with International Association for Public Participation (IAP2) guidelines.

While much of the community involvement took place during key project milestones as illustrated in **Figure 1.05**, several forms of outreach and engagement have also been available throughout the process as outlined below.

- **Public events:** included presentations, open houses and workshops with residents and community stakeholders at four key milestones during the project.
- **Website:** the project website, www.growingfwd.ca, was used to allow interested individuals the opportunity to learn more about the Growth Plan, share opinions though surveys, find out about upcoming events, and sign up to receive project updates.
- **Community outreach:** targeted towards groups that were under-represented at public events and to promote greater opportunity for discussion among key stakeholders.
- **Council meetings:** preliminary directions and public feedback have been shared with City Council throughout the process.

1.5 Technical Report Organization

This Growth Plan Technical Report provides the long-term directions and implementation priorities for each of the Growth Plan's core initiatives – Corridor Growth, Transit, and Core Bridges. The Growth Plan builds from the foundation and aspirations articulated in the 2010-2011 Saskatoon Speaks process and Council's Strategic Plan 2013-2023 (Strategic Plan).

The Growth Plan Technical Report is separated into four chapters as follows:

- **Chapter 1** – Introduction and Overview of the Plan provides the context for preparing a Growth Plan for Saskatoon and describes the progressive steps toward creating a long-term plan.
- **Chapter 2** – Corridor Growth provides an overview of Saskatoon's land use patterns and demographic characteristics as well as the context for growth based on historical and more recent plans developed by the City. The chapter articulates a vision, goals, and objectives for Corridor Growth to increase sustainable land use patterns and choices for residents. It also includes an identification and evaluation of those corridors with the greatest long-term potential for infill and redevelopment in order to create vibrant places for people.
- **Chapter 3** – Transit includes an overview of existing transit services and facilities, and explores future pressures associated with a 'business-as-usual' approach to managing and investing in transit. The report outlines the vision, goals, and objectives for transit, and describes long-term possibilities, which were developed based on extensive input and discussion with the community in order to develop the long-term plan and implementation priorities.
- **Chapter 4** – Core Bridges provides an integrated look at the city's core area crossings of the South Saskatchewan River, as well as planned changes to major roadways. Needs are assessed based on both today's conditions and a long-term horizon for growth to half a million people. The vision, goals, and objectives presented for core area bridges reflect the community's desire for an integrated solution that encourages transit, walking and cycling and supports growth planned inside Circle Drive. Packages of candidate crossing strategies are described and evaluated to develop a long-term direction that is designed to increase transportation choice and support infill growth in Saskatoon's core neighbourhoods.

PART 2: CORRIDOR GROWTH

For the last 50 years, growth in Saskatoon has extended outside Circle Drive to the Suburban Development Areas. These communities have taken on various forms of auto-oriented, low-density residential, commercial, or industrial development which is typically focused around internal, curvilinear road networks. Large, arterial roads provide access, and they generally separate neighbourhoods from each other. Most arterial roads in Saskatoon either do not have fronting development, or fronting development is low-density and auto-oriented in nature, with large surface parking lots between the street and buildings. This urban structure is unconducive to attractive transit, walking, and cycling, and the private automobile is the primary mode of transportation for most people living, working, and shopping in these areas.

Over the next 30 years, Saskatoon will continue to grow 'outward' as part of growing to half a million people. New suburban neighbourhoods will be a significant part of the community choice for living, working, and shopping in the future. Community discussions during Saskatoon Speaks and the directions developed as part of the City's Strategic Plan (2013 – 2023) have emphasized the need for more sustainable growth patterns as the city experiences unprecedented increases in population and employment. Thus, in recent years, the City has committed to reimagining new suburban neighbourhoods by placing more emphasis on a greater mixture of land use types and housing as well as transportation choices – particularly transit, walking, and cycling.

In recent years, the City's commitment toward sustainable growth has extended to planning inside the Circle Drive area. Growing 'upwards' is essential to creating more vibrant areas in the city that will make Saskatoon attractive to existing and future residents. To this extent, the City has established plans to redevelop the core areas of the city with greater housing choices, employment hubs, and retail activities, as well as social and recreational space. Greater infill and development within these areas will also support and promote needed investments in the transportation system, particularly the provision of attractive pedestrian and bicycle facilities as well as transit services. To plan for sustainable growth inside Circle Drive, key planned growth areas include:

- Strategic Infill Areas – These areas include the Downtown, North Downtown, and University of Saskatchewan lands, all of which will see larger scale development or redevelopment. This development will change the shape of these central areas and create opportunities for more vibrant communities.
- Neighbourhood Infill – This type of growth is intended to complement the existing character of core area neighbourhoods, providing additional housing or commercial options to current and future residents. Residential infill is to be primarily of a smaller scale, including secondary suites, duplexes, and townhouses.

Beyond these significant areas of growth planned for the city, the Growth Plan assessed redevelopment opportunities along major corridors in order to bolster the commitment toward a more compact urban area, and to provide the foundation for introducing attractive transit services as well as quality facilities for walking and cycling. Along select corridors in the urban areas of the city, a greater scale of development, density of development, and mixture of uses will enhance the potential to introduce rapid transit services and ultimately reduce the need for building larger streets. Similar principles can also be applied in new neighbourhoods to ensure transit-conductive forms of development.

2.1 Saskatoon Past, Present and Future

Land use patterns influence how much people travel, why they travel, where they travel, and when they travel. Land uses patterns can also influence the travel modes that people choose. Travel mode decisions are also influenced by street design and the availability of space for attractive are walking, cycling and transit facilities and services.

This section of the **Technical Report** highlights Saskatoon's historic and current land use structure, which shapes current travel patterns as well as opportunities to significantly improve transit services. This section also explores the key land use features required to facilitate vibrant communities that may be supported by an attractive transit service.

2.1.1 Historical Context

In 1906, the communities of Riversdale, Nutana, and the Village of Saskatoon combined to form the City of Saskatoon. Known as the 'City of Bridges' for the six bridges that crisscross the South Saskatchewan River, the City of Saskatoon has seen a number of major periods of growth. These periods include: the Settlement Period (1901-1931); the Baby Boom (1946-1966); and, Rural-to-Urban Migration (1976-1986). The City is currently in a fourth period of sustained population expansion, which began in approximately 2006. During this period of sustained population expansion, it is anticipated that the population growth rate will average approximately 2.5 percent per year. A key driver behind the Growth Plan is the need to accommodate this sustained growth over the next thirty years.

Throughout its history, Saskatoon's growth and urban form have been closely linked to transportation. At the turn of the century, proximity to the CN Rail yard and its economic activity was a key catalyst for the location of the Downtown. The establishment of the University of Saskatchewan across the river, just to the northeast of the rail yard and Downtown core, provided an anchor 'node' that would help to link both areas and support growth on the city's east side. Subsequently, the construction of streetcar lines (post 1906) and numerous bridges helped drive commercial and residential growth along key corridors on both the east and west sides of the river during the first half of the twentieth century. Key lines of the Saskatoon Municipal Railway included the Mayfair/University and Princess Avenue/Pleasant Hill lines, which connected the east and west sides of the river, in addition to the west side Avenue H/Pleasant Hill line. Despite expanding the city's growth outward, each of these lines passed through the Downtown core, helping to reinforce the central role of this key area moving forward.

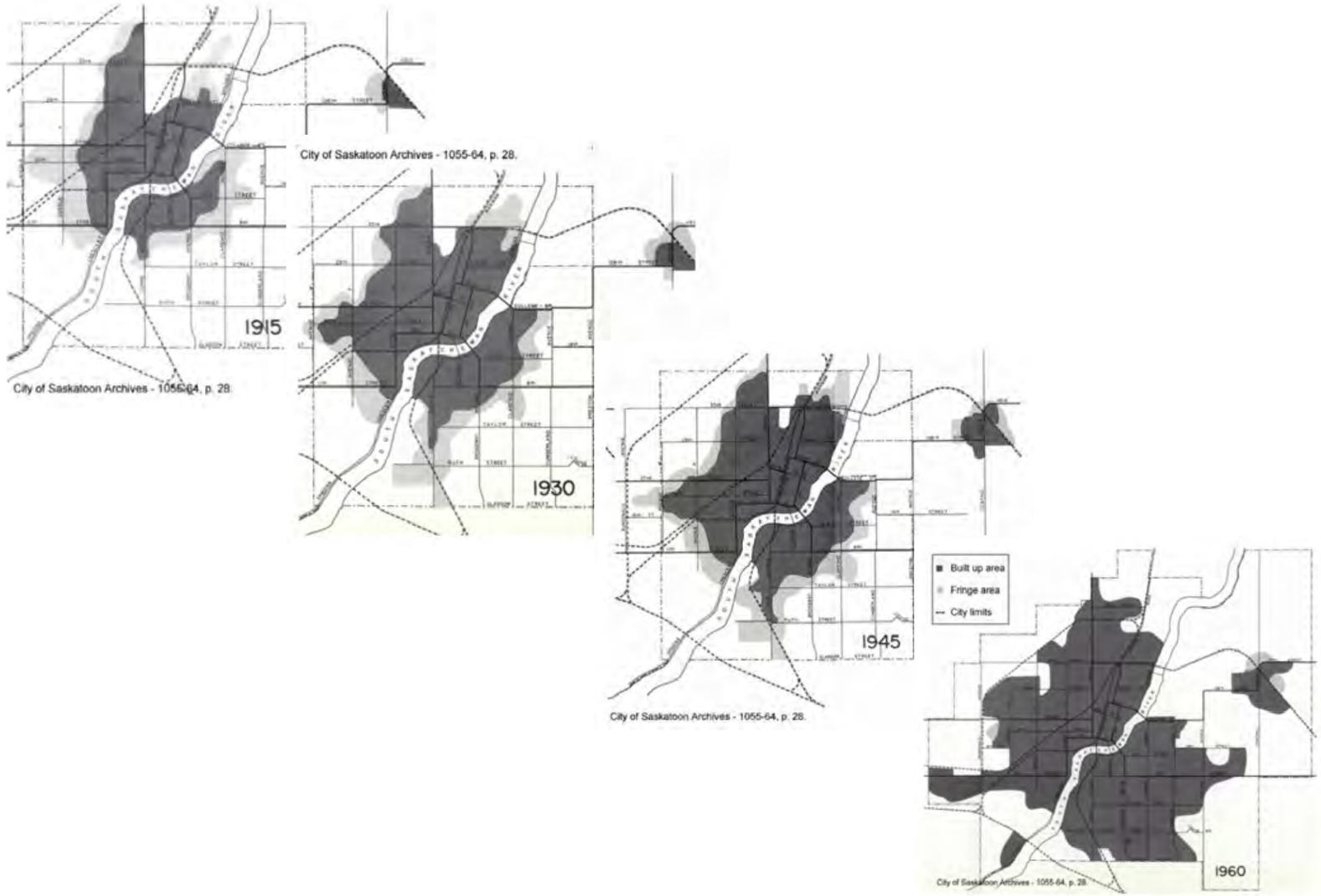


Figure 2.01 - City of Saskatoon Historic Growth Patterns (1915-1960)

- **Early 1900s**. From the beginning, the City recognized the need for careful planning to accommodate growth. Its 1913 Plan of Greater Saskatoon (**Figure 2.02)** outlined major land uses, key amenities, neighbourhoods, institutions, and major transportation corridors. Of note, the Plan established the area north of the city's Downtown as the industrial hub. The 1929 Plan (**Figure 2.03**) illustrates the City's early focus on the relationship between transit corridors, walkability, and population distribution. Such analysis remains an integral component of today's **Growth Plan**.

Figure 2.02 - 1913 Plan for Greater Saskatoon

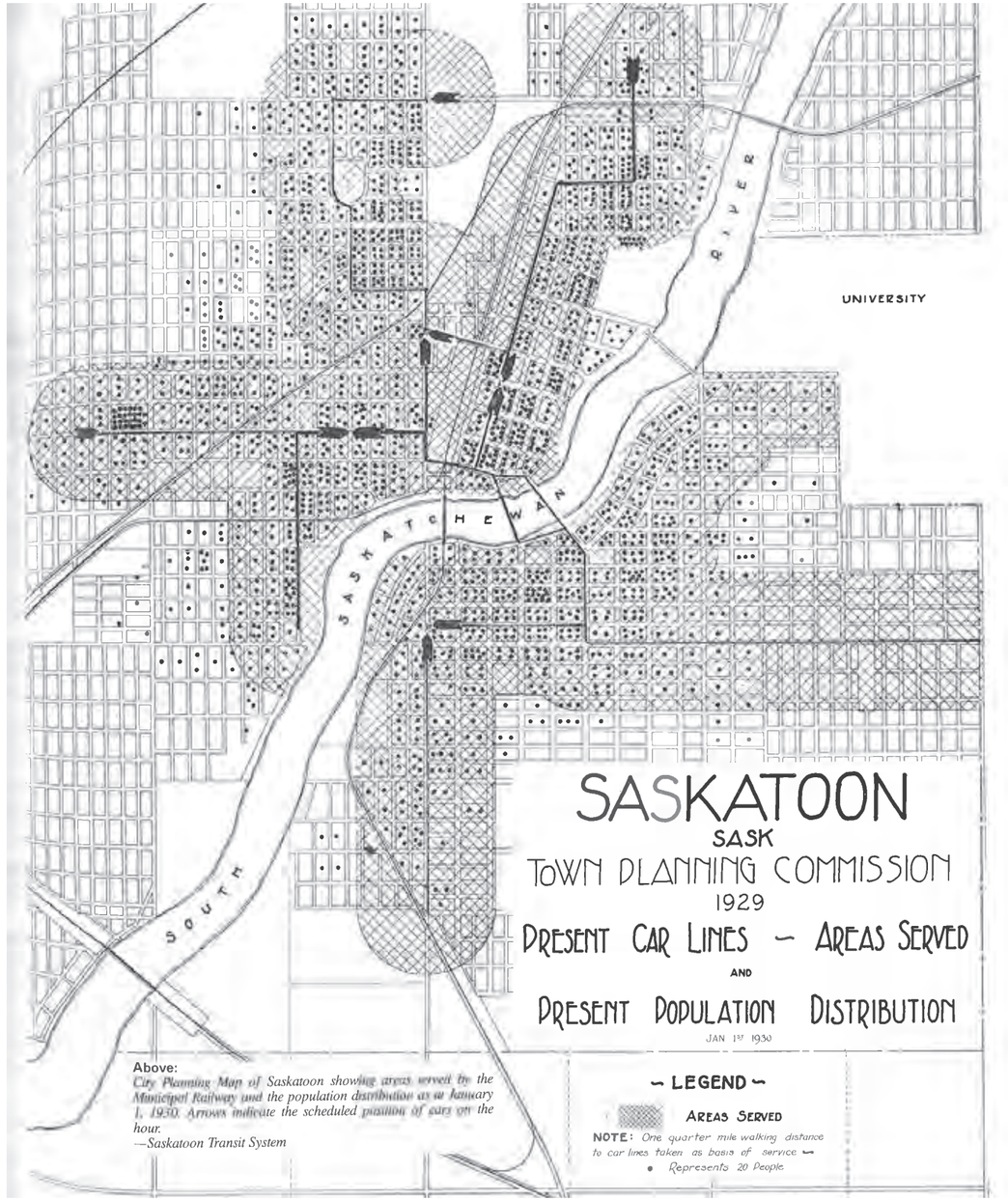


Figure 2.03 - Streetcar Lines & Population Distribution (1929)

- **Pre-war era**. The City of Saskatoon has historically played a key role in the physical development of the city, acting as one of the largest developers. This role traces its roots to the more austere periods in the city's history – prior to World War I and during the Great Depression of the 1930's – during which the City amassed significant landholdings from delinquent property owners, which were subsequently sold, land banked, or developed. In addition to shaping the form of Saskatoon, development by the City has been a significant source of revenue.
- **Post-war era**. The combination of the 'Baby Boom' and rise of the automobile led to the rapid expansion of the city's built up area, typically in the form of single family, car-oriented, 'suburban-style' development. The 'suburbanization' of the city would be the dominant form of growth for much of the second half of the twentieth century. Saskatoon's First comprehensive 'Community Planning Scheme' was adopted by City Council in 1966. It prepared the city for growth of suburban development areas, auto-oriented corridor growth, separation of land uses, and a strong downtown core. Many of these principles are still in effect today. In addition to residential growth, during this period, much of the city's employment growth occurred in peripheral areas located to the north of the Downtown. Similar to the suburban areas, this typically light industrial growth was often in the form of lower density, car oriented development.
- **Recent evolution of suburban areas**. The City is shifting away from the 'business as usual' suburban growth model in its newest, peripheral areas such as Blairmore, Holmwood, and University Heights. This new approach focuses on intensifying these developing areas to accommodate an increased mix of uses and density of development, and a greater number of residents and jobs. In particular, intensification will be directed in-and-around Suburban Centres, with transit playing a key role. In addition to its newer, peripheral areas, the City is also re-examining older, established neighbourhoods located in the city's core. Growth in these areas will be in the form of infill redevelopment, taking advantage of these areas' close proximity to major city amenities and key transit corridors.

2.1.2 Existing Urban Structure

Urban structure refers to the general arrangement of open space, streets, blocks, and buildings that make up an urban area. Every community has a unique structure with a unique set of elements that, when combined, make a place. Saskatoon is no different. A few highlights that define Saskatoon's urban structure are briefly described below and illustrated in **Figure 2.04**.

- **The South Saskatchewan River**. The meandering South Saskatchewan River has, and continues to be, a defining structural element in the city of Saskatoon. Not only is it a dramatic linear blue and green corridor that attracts residents and tourists alike, but its visual and physical quality adds amenity value to adjacent neighbourhoods and, as a result, functions as a catalyst for reinvestment and intensification.
- **The grid road pattern**. Downtown is characterized by its "tilted" grid street pattern that provides visual and physical access to the river valley. Downtown Saskatoon, another structural element within the city, is centrally located on the scenic west bank of the South Saskatchewan River and functions as the social, cultural, economic and physical heart of the city. The grid pattern road network extends beyond the downtown to adjacent pre-war neighbourhoods including Riversdale, City Park, Nutana, Mayfair, Pleasant Hill, and Varsity View. The grid pattern road network also facilitates relatively consistent development blocks with strong active edges, rear lane access in residential areas, and route choice, which in turn supports walkability and pedestrian comfort. In many of these neighbourhoods, the grid pattern road network ensures connectivity to main streets that function as the commercial and social centre for the neighbourhood.
- **Growth beyond Circle Drive**. New neighbourhoods were developed, largely beyond Circle Drive, based on a hierarchical road pattern that tended to prioritize the movement of automobiles and, unintentionally, reduced the walkability and accessibility for pedestrians. Following the Second World War, there was a move away from the grid street network. This trend, which was common in cities across North America, has resulted in a fundamental shift in the urban structure of the city of Saskatoon. Within Circle Drive, there are compact, walkable, transit-supportive, rectilinear development blocks that are intuitive to navigate and offer redevelopment flexibility. However, outside Circle Drive, this structure has been replaced with dispersed, curvilinear and organic development blocks that promote automobile use and are difficult to service with transit.
- **An east-west orientation**. The city of Saskatoon's residential population growth has largely taken place east and west of the downtown. New Suburban Development Areas including Blairmore and Holmwood are examples of this east-west orientation, with University Heights pushing neighbourhood development into the city's north-east sector. The five bridge crossings of the South Saskatchewan River help facilitate this east-west movement of people across the city.
- **Concentrated employment areas**. Current employment is largely located within the Downtown, the University of Saskatchewan, and the industrial areas within the city. With the exception of smaller industrial areas (eg. Sutherland Industrial and South West Industrial), the predominant industrial employment base is in the north end of the city. With the residential population largely east and west of the river and employment Downtown and in the north end, traffic congestion has been a growing concern in Saskatoon. This congestion is particularly evident during the PM peak as north industrial area workers are required to travel south to access one of the bridge crossings in order to travel east towards home.

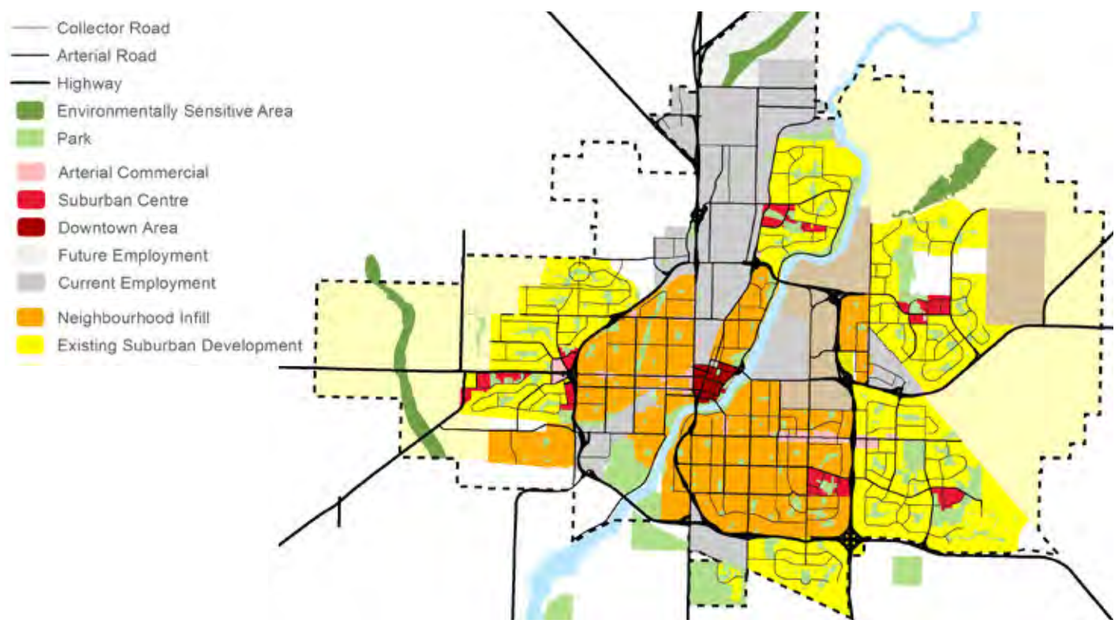


Figure 2.04 - Saskatoon's Urban Character

2.1.3 Existing Population and Employment

This section describes some of the foundational population and employment patterns that shape urban form and influence travel patterns throughout the city.

- **Population Distribution**. According to the 2011 Census, the City of Saskatoon had a population of 222,190 in 2011. As illustrated in **Figure 2.05,** the city's population is relatively balanced east-west with approximately 52% of people living on the east side of the river and 48% living on the west side of the river. In addition, approximately 58% of the city's population lives outside Circle Drive in the newly developing areas in the far west, north-east and south-east, leaving the balance of the population (42%) living in the established neighbourhoods inside Circle Drive, predominantly within the Core Neighbourhood Area, Nutana and parts of Confederation Suburban Development Areas (SDA).

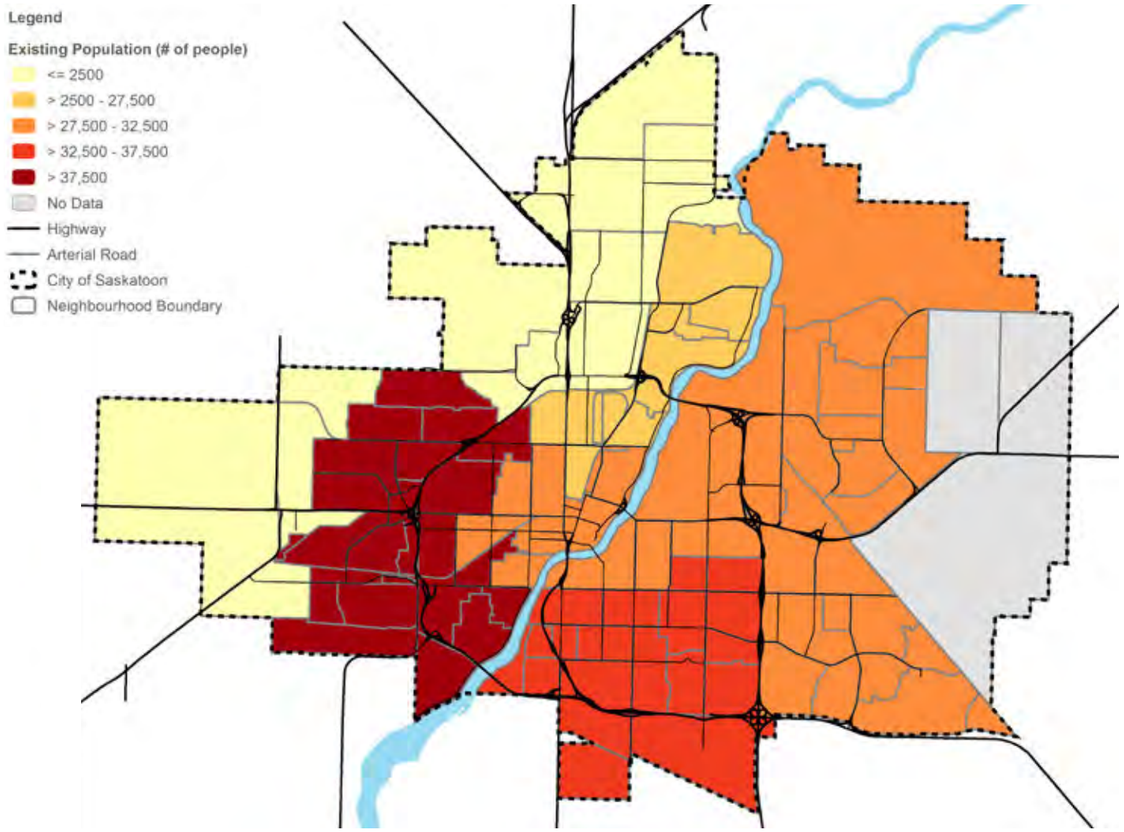


Figure 2.05 - Existing Population Distribution by Suburban Development Area

- **Residential Density**. As illustrated in **Figure 2.06,** the highest residential densities are predominantly located in Downtown and adjacent older neighbourhoods including City Park, Pleasant Hill, and Nutana, reaching neighbourhood-wide densities of over 18 units per hectare. Nutana Suburban Centre is the only other neighbourhood with equivalent densities. It is located outside the core area, but still within Circle Drive. While the built form and scale of these areas vary, each neighbourhood contains common features – a more compact, walkable urban form; a concentration of higher density housing types along major corridors within each neighbourhood; and, for the most part, a core 'main street' style commercial corridor(s) that contains a diverse mix of uses, destinations, and users. In Nutana, the Broadway Avenue corridor serves this 'main street' function, while in Pleasant Hill, 20th Street acts as a 'main street' style corridor. These areas contain not only a broad range of residential opportunities but they also contain commercial, institutional, and recreational uses, allowing residents the opportunity to 'live, work, and play' in the same area and to move between activities conveniently on-foot, bicycle, or transit.

  Slightly lower densities can be found in more recently developed areas including Dundonald and Hampton Village in the west, Lakeview and Wildwood in the south-east, Lawson Heights Suburban Centre in the north, and Willowgrove and Forest Grove in the east. These areas also accommodate a range of residential choices with higher density uses adjacent to major corridors, central commercial nodes, as well as various informal and formal recreational areas.

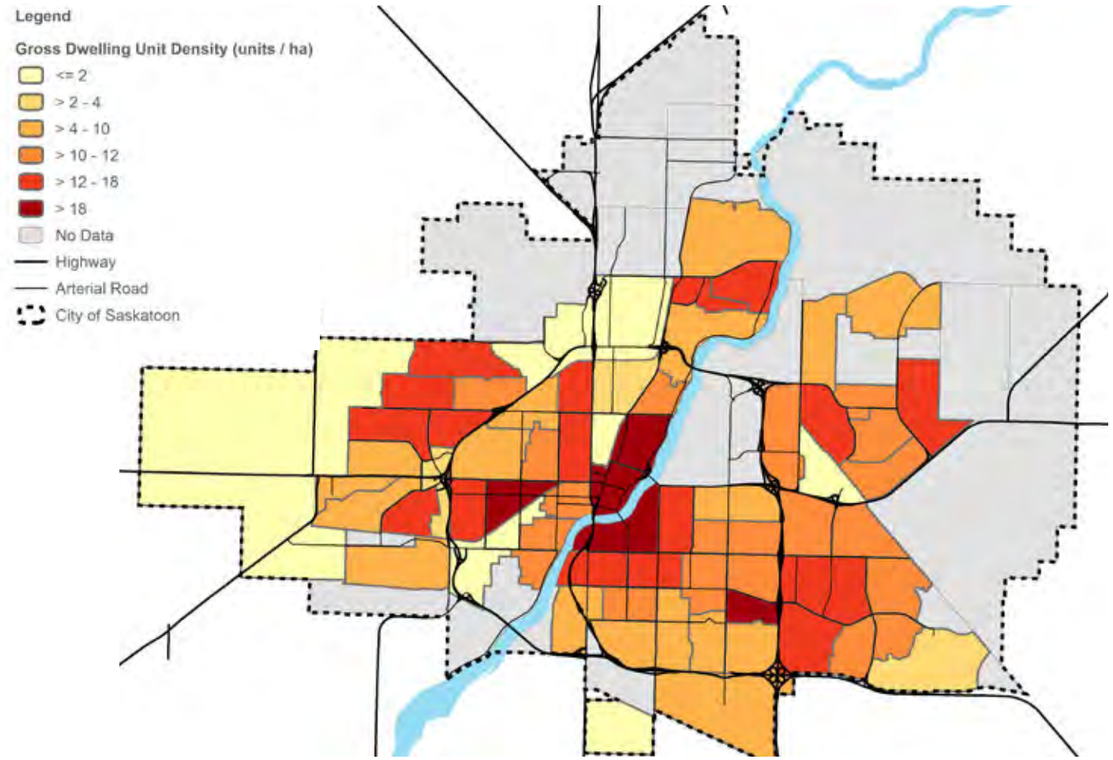


Figure 2.06 - Existing Dwelling Unit Density

- **Current Employment**. As illustrated in **Figures 2.07** and **2.08**, Saskatoon's strongest employment areas are located in the Core Neighbourhood Area, the University of Saskatchewan, and the North Industrial Area, which accommodates approximately 65% of the jobs. In contrast to the east/west population distribution, employment growth and density in Saskatoon has followed a primarily north/south trajectory. This trend has its origins in some of the City's earliest planning efforts (as well as the location of the railroad), which prioritized the area north of downtown for industrial development. Beyond the Core Neighbourhood Area, University of Saskatchewan lands and the North Industrial Area, significant employment densities can also be found in the Nutana Suburban Centre.

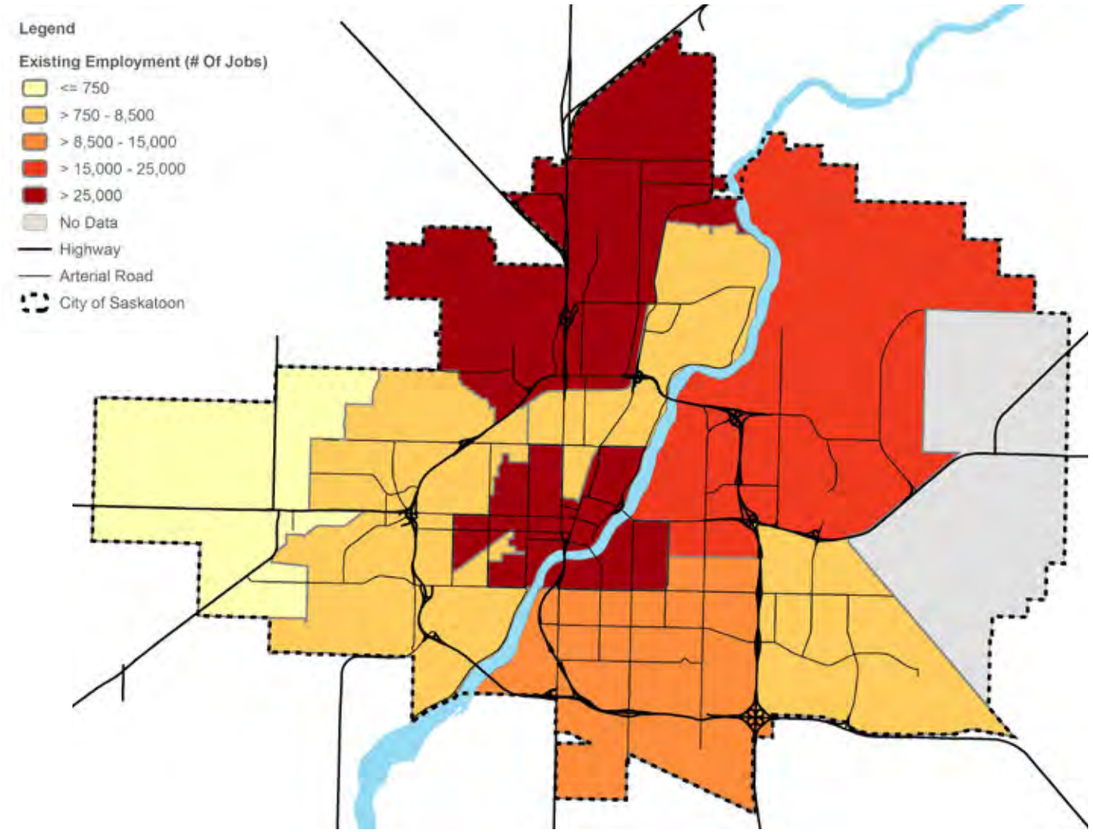


Figure 2.07 - Existing Employment Distribution

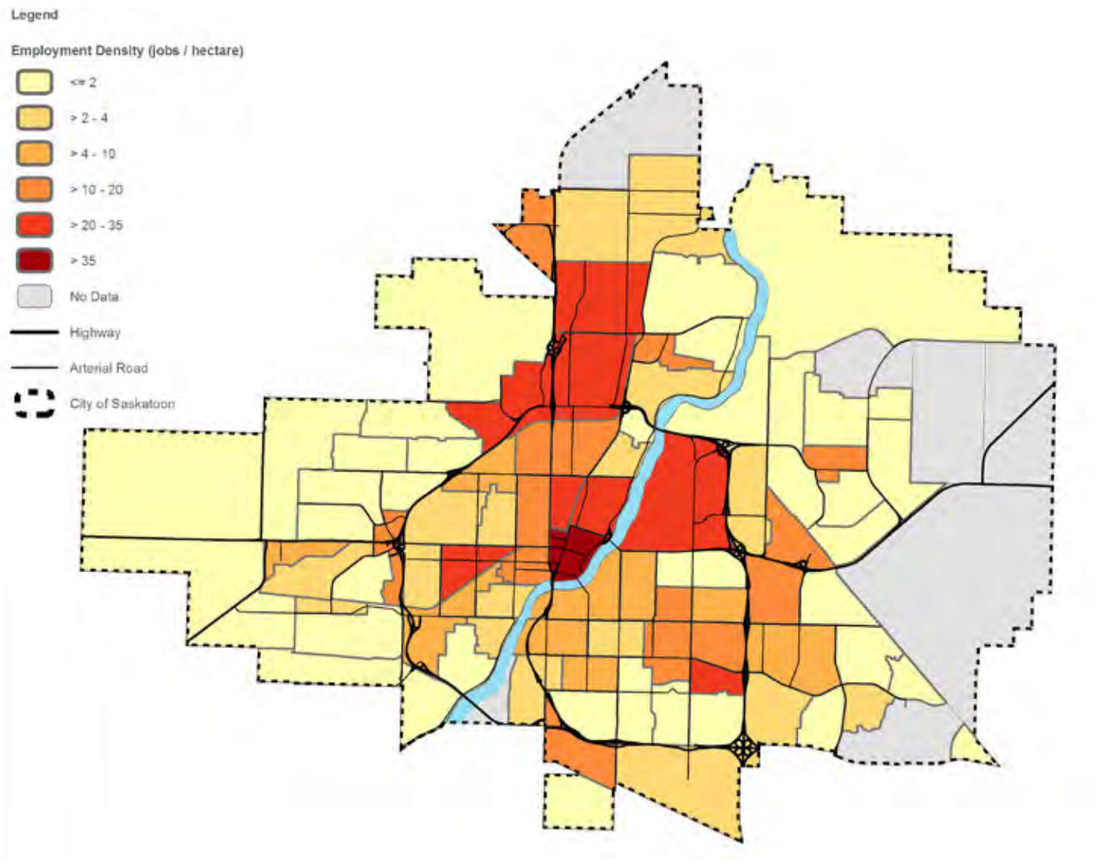


Figure 2.08 - Existing Employment Density

The three primary employment areas vary significantly in their character.

- The Core Neighbourhood Area currently accommodates more than 32,000 jobs, with the majority of those jobs (+/- 27,000) in the Central Business District, City Park and Pleasant Hill. The Core Neighbourhood Area is characterized by a strong retail, office, entertainment, and institutional environment with supporting residential development in a variety of building forms.

- Located across the river from the Central Business District, the University of Saskatchewan forms another major employment centre within Circle Drive. With over 20,000 students and more than 15,000 jobs, the University has been a historically stable source of employment for the city. The form of development in the built areas is typically that of a higher density institutional form.

- The North Industrial Area is the third key employment area within the city, currently providing more than 26,000 jobs. Located on the city's northern edge, the North Industrial Area is the largest employment centre in terms of land area. The area is home to the Saskatoon International Airport, both light and heavy industry, as well as commercial and professional services. The predominant form of development is a mix of low rise warehouses and 'suburban style' office buildings.

- **Mixed Use Areas**. Combined residential population and employment densities help to indicate key neighbourhoods and corridors where people choose to live and work. As illustrated in **Figure 2.09**, the areas with the greatest combined population and employment densities are centrally located and include the Central Business District, City Park, Nutana, and Pleasant Hill. In neighbourhoods such as these ones, there are often opportunities to offer a mix of land uses. Key corridors within these neighbourhoods that successfully offer mixed-use opportunities include 2nd Avenue in City Park, 20th Street West in Pleasant Hill and Broadway Avenue in Nutana. The Nutana Suburban Centre functions more as a node rather than a corridor.

  Additional opportunities to accommodate mixed-use development can be found within many of the established neighbourhoods within Circle Drive, and also along corridors such as 8th Street, 22nd Street West, and Idylwyld Drive. Although these corridors provide both live and work opportunities, the quality of the pedestrian environment is often bleak at best. Further attention is required to ensure these mixed-use corridors function as attractive, vibrant and safe people places.

  Finally, suburban centres and their adjacent neighbourhoods also provide significant potential to facilitate appropriate residential development to support adjacent employment opportunities. Examples include the Lawson Heights, University Heights and Lakewood Suburban Centres. Once again, additional effort is required to ensure that these environments facilitate increased walkability and transit ridership, with a supportive scale of development, density of development, and mix of uses.

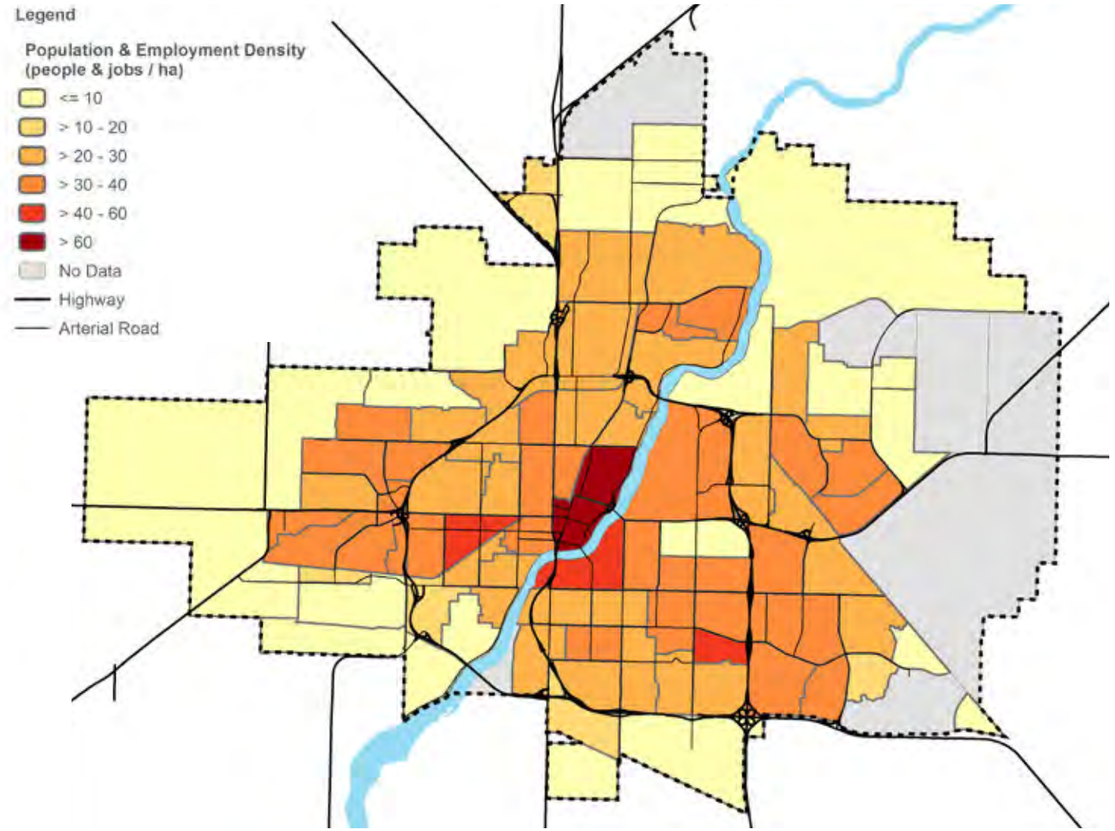


Figure 2.09 - Population and Employment Density

2.1.4 Growth Targets

In order to accommodate the unprecedented levels of projected growth within the existing municipal boundaries, the city must be able to balance the need to grow both upward and outward. A new form of outward growth has already begun to take form through several recent plans and changes to the housing, retail and employment markets. Upward growth has occurred through several strategic initiatives and plans that will strive to create more vibrant communities within Saskatoon.

Context for Growth

Without question, Saskatoon's growth over the last decade has not only been significant, but has become a new normal as one of Canada's fastest growing communities. This section highlights some of the historical trends that contribute toward growth projections for the city as well as the future patterns for demographic change.

- **Over the past decade, the city of Saskatoon has experienced significant population growth**. As illustrated in **Figure 2.10**, through the 1990s and into the early 2000s, the city experienced modest population increases with a typical annual growth rate of approximately one percent. However, in recent years leading up to the 2011 Census, the city achieved annual growth rates of approximately 3 percent per year.

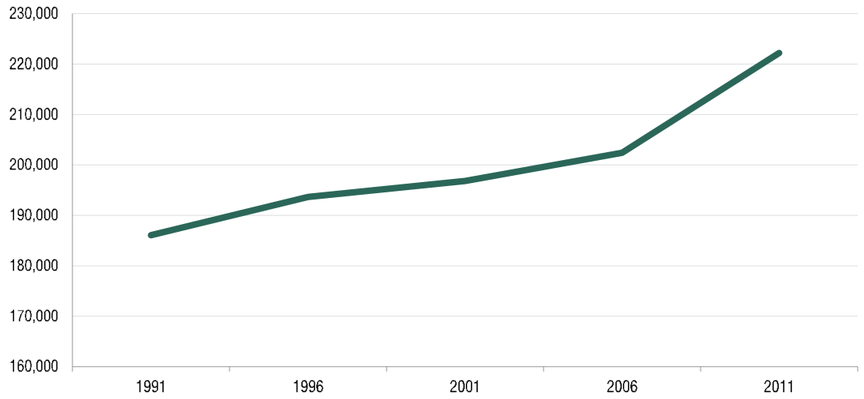


Figure 2.10 - City of Saskatoon Historic Population Growth

- **Compared to other communities of similar size and slightly larger, the city of Saskatoon is the fastest growing city in Canada**. The city experienced overall population growth of almost 10% between the 2006 Census and the 2011 Census. As illustrated in **Figure 2.11**, this rate of growth exceeded the rate of growth for comparable sized communities in Canada.

- **The population in Saskatoon is projected to increase to half a million people in 30 years**. In March 2013, the City explored population projections through to 2032 based on a range of potential future demographic and economic conditions. These population projections provided low (2 percent), medium (2.5 percent) and high (3 percent) annual growth projections, using the Halley Population Projection Model framework, which is based on a cohort survival methodology that considers fertility, mortality, and migration on an age specific basis.

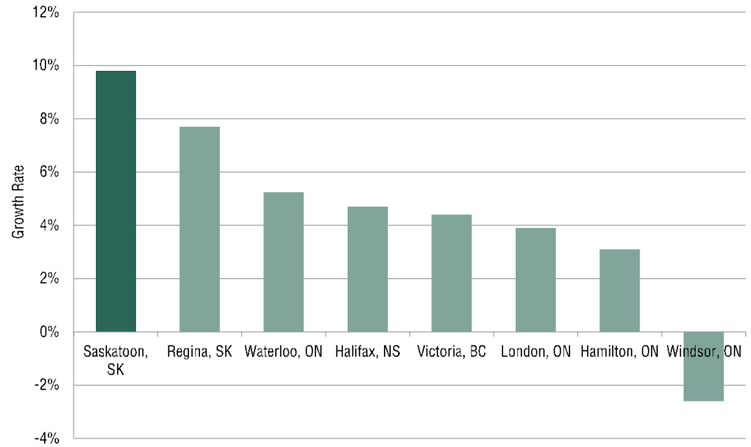


Figure 2.11 - Population Change in Peer Communities

- **Through this work, a mid-range 2.5 percent annual growth rate was identified as the most likely scenario for growth in the city.** It is anticipated that the city could reach of a population of 500,000 by the year 2043. Achieving this level of growth obviously relies on a significant net migration from other parts of Canada and beyond.

- **Saskatoon will continue to move towards a balance of 50 percent multi-family units and 50 percent single detached units and a total of 125,000 housing starts over the next 30 years**. In 2011, the city of Saskatoon had an average household size of approximately 2.4 persons per household. If this average household size were to be sustained, there would be a requirement for approximately 116,000 new dwelling units between the year 2011 and the 500,000 population horizon. However, in the coming years, there are expected to be significant changes to the age composition of the city's population, with resulting impacts on household size and future dwelling unit requirements.

    - The proportion of people over 65 years old is projected to grow faster than any other age groups. This above-average rate of growth for the older age groups would largely be the result of the aging of today's baby boomers (between the ages of 47 and 66 in 2012).

    - Relatively slow growth is projected for the 45 to 64 age groups, given that the baby boomers currently occupy this age range. However, while an aging population is a theme common to many regions, it is also anticipated that Saskatoon will see its prime working-age population (i.e. the 35 to 44 age group) experience significant growth, driven by net migration.

Given these changes to the city's age composition, combined with a trend towards smaller household sizes, it is anticipated that upwards of 125,000 new dwelling units may be required to accommodate a city population of 500,000. It is expected that Saskatoon will continue to move towards a balance of 50 percent multi-family units and 50 percent single detached units in terms of total housing starts. However, it is noted that a shift of this magnitude would be more likely to occur with quality urban areas and the advent of rapid transit, which could change development patterns by creating greater demand for multi-family housing units within the vicinity of proposed station areas.

2.2 Future Planned Growth Areas

The City has advanced a multi-faceted strategy to plan for growth to a population of 500,000 within the existing municipal boundaries. In addition to the plans for New Suburban Neighbourhoods, the City has advanced significant initiatives to plan for sustainable growth within the existing urban area. The City has identified Strategic Infill Areas including the Downtown, North Downtown, and University of Saskatchewan, where more compact, mixed-use growth is planned. The City has also advanced a Neighbourhood Infill strategy to accommodate growth within established residential neighbourhoods. The strategic context for sustainable growth already planned within the City is described below in further detail.

2.2.1 New Suburban Neighbourhoods

Over the last half-century, suburban development has been the primary type of growth in the city, with much of this growth occurring outside of Circle Drive. Suburban growth has commonly been in the form of low-density residential, commercial, or industrial development. This development has occurred on greenfield sites – undeveloped land (commonly farmland) that has limited existing services and infrastructure at the time of development. Briarwood, Silverspring, and Willowgrove are all examples of recent suburban growth areas. Since the city is surrounded by a vast, undeveloped land area, historically there have been few constraints to this outward growth.

The vast majority of the city's new suburban growth is expected to occur in the Suburban Development Areas of Blairmore, Holmwood, and University Heights, identified in **Figure 2.12**.

Together, these areas are projected to accommodate almost 175,000 additional residents. As indicated previously, the City of Saskatoon has recently made a concerted effort to reimagine its suburban developments. New neighbourhoods, such as Evergreen, now include mixed-use buildings, apartments, and townhouses, all focused around a higher density core that also include public gathering spaces. As the City moves into new suburban growth areas, there are continued efforts to reimagine development in these areas, using a nuanced approach that combines the following key strategies:

- Development along "Main Streets" and support for Transit Oriented Development;
- Provision of significant employment opportunities in a suburban context;
- The establishment of Suburban Centres as the "focal point" of suburban growth areas; and,
- The redefinition of suburban neighbourhoods as places that are easier to get around, and that are well connected to the rest of the city.

The planned land use patterns for the three New Suburban development areas are briefly described below:

A) Blairmore Sector

Blairmore is Saskatoon's west growth area for future urban expansion. In anticipation of growth in this area, the City developed the Blairmore Sector Plan, which was approved by City Council in 2011.

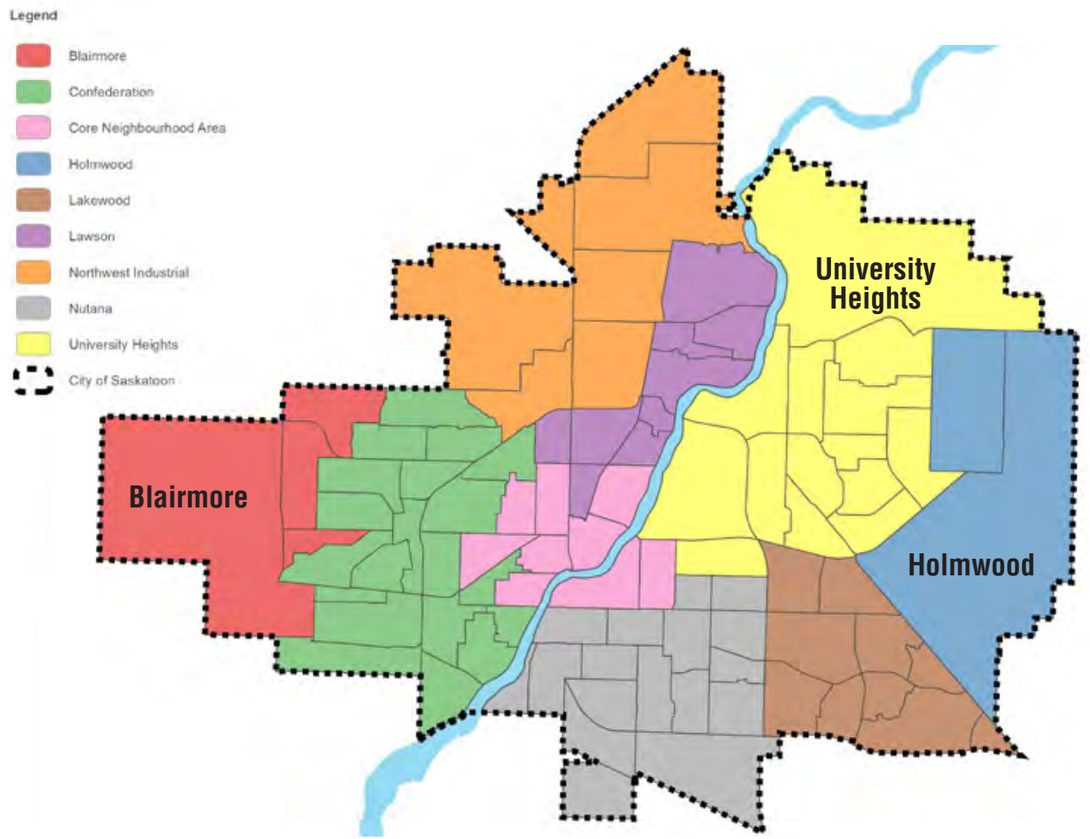


Figure 2.12 - New Suburban Development Areas

The City has outlined a four phase development plan for the area, with earlier phases focused on the Blairmore Suburban Centre and the Kensington neighbourhood. Overall, the Sector Plan calls for primarily residential development, with the Blairmore Suburban Centre serving as the commercial hub for the area. To augment the Suburban Centre, a limited amount of neighbourhood commercial and institutional uses are included elsewhere in the Sector.

It is noted that lands to the west of the West Swale are identified as Urban Holding Areas, due to mining interests in this general area. While future development may be possible on these lands, for the foreseeable future, the City is focusing on developing the lands to the east of the swale.

Most residential neighbourhoods in Blairmore are projected to have gross residential densities of approximately 17 units per ha (7 units per acre). At full build-out, the total estimated number of units could be over 32,000 and the total estimated population could be approximately 75,000, including the Urban Holding Areas to the west of the West Swale.

B) University Heights Sector

University Heights is located in the northeast corner of the City. The Sector Plan for University Heights was initially approved in 1993 and it has been amended twice since then. A key feature of the amended Plan is a direct reference to the City's Strategic Plan and its goals for Sustainable Growth, Moving Around, and Environmental Leadership.

Building off the land uses within the existing University Heights Suburban Development Area, the 2013 University Heights Sector Plan proposes the following major land use shifts within the undeveloped study area:

- Two future neighbourhoods (Aspen Ridge and Neighbourhood UH3);
- Two District Village Commercial areas;
- Mixed-Use Core centered on a walkable "main street";
- Business Park;
- Light Industrial Park;
- "Complete streets" that connect adjacent development areas and offer transportation options; and,
- New and enhanced natural features.

Within the Mixed Use Core, the Sector Plan projects average gross densities of 30 units per ha (12 units per acre). In residential neighbourhoods, average gross density is expected to be 18.5 units per ha (7.5 units per acre). The proposed new development areas could accommodate approximately 28,000 additional residents at full build-out, resulting in a total population of over 75,000 within the broader University Heights Suburban Development Area.

C) Holmwood Sector

Holmwood is located at the eastern edge of the City. The Holmwood Sector Plan was adopted by Council in 2012, and it provides a visionary plan for growth that is focused around a new, transit-supportive suburban centre. Unlike other recent developments, the vision for the Holmwood Suburban Centre includes thriving multi-modal arterials with mixed land uses and medium density development fronting the street. The Sector Plan also includes a significant new business park, two identified locations for regional retail, and five major residential development areas.

According to the Sector Plan, Holmwood's residential neighbourhoods are projected to have gross densities of approximately 18.5 units per ha (7.5 units per acre). Within the Suburban Centre, densities of approximately 30 units per ha (12 units per acre) are projected. Overall, the Sector Plan identifies potential for approximately 33,000 new units and a population of approximately 74,000.

2.2.2 Strategic Infill Areas

These areas represent foundational commitments for the City to not only encourage sustainable growth, but to create strong, vibrant areas of the City. Planned Strategic Infill will involve larger scale development or redevelopment of the Downtown, North Downtown, and University of Saskatchewan lands, significantly changing the shape of these central areas that are fundamental to the success of the city. As major employment and activity centres that also have the capability to accommodate significant residential populations, these areas are major focal points for the city, and their success as neighbourhoods is critical to the economic success of the Saskatoon, the region, and the Province.

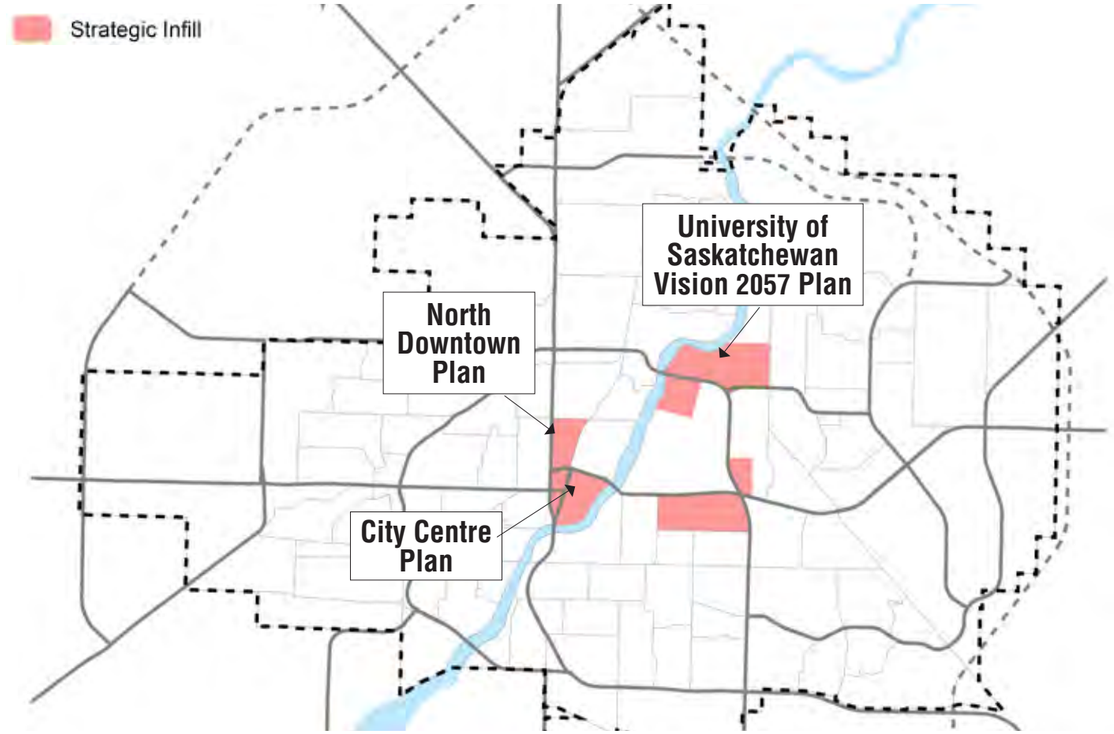


Figure 2.13 - Strategic Infill Areas

The city's Strategic Infill areas have the potential to accommodate a total of approximately 37,000 additional units housing 74,000 new residents. As well, significant employment growth is expected in these areas. Within the City Centre alone, preliminary employment projections anticipate a requirement for the addition of over 3.6 million square feet to the retail and office space inventory.

To plan for substantial new development in Strategic Infill areas, the City has developed two key plans – the City Centre Plan and the North Downtown Plan. In addition, the University of Saskatchewan has developed its own planning documents – Vision 2057 and the College Quarter Concept Plan.

A) City Centre Plan

The **City Centre Plan** is a recently completed project to develop a new comprehensive plan for the Downtown core and important corridors leading into the area. The City has completed multiple rounds of community engagement to ensure the Plan meets the needs of residents. The Plan proposes a wide range of strategies to enhance the vibrancy of the City Centre. To this end, the Plan prioritizes expanding land uses such as residential, office, commercial, cultural, and institutional uses. More importantly, the Plan calls for mixing these uses in amongst the City Centre to encourage a complete and active core. How the uses are mixed in will be dependent on the character of smaller, identified districts located within the City Centre.

The Plan outlines twelve strategies for achieving its vision. Regarding land use, key strategies include:

- ⇨ Making the City Centre a regional retail destination;
- ⇨ Developing a new West Downtown;
- ⇨ Increasing public/arts and cultural amenities, and associated land uses; and,
- ⇨ Strengthening existing residential areas.

Of particular note, the Plan calls for focusing the residential strategy in this area on two key demographics – seniors and 'Generations X and Y.'

Within the Downtown area, the City Centre Plan anticipates accommodating an additional 15,000 residents. The City Centre Plan also identifies potential for another 10,000 new residents along key corridors leading into the Downtown; however, as part of the Growth Plan, these areas will be reviewed in more detail for their potential to accommodate corridor growth.

B) North Downtown Plan

The **North Downtown Plan** includes the area located immediately north of the Central Business District (CBD). The North Downtown Plan includes high and medium density residential uses, office/institutional uses, commercial uses, (limited) industrial uses, mixed uses, community uses, and green spaces. The Plan aims to create a well-connected neighbourhood with a mix of uses that supports a vibrant community. Rather than a one-size-fits-all approach, the Plan looks at the unique character of various districts within the study area – districts such as the Warehouse District, the Saskatchewan Polytechnic District, or Cross-Rail District. Overall, it is expected that the North Downtown could accommodate a residential population of approximately 7,000 to 10,000.

C) University of Saskatchewan

The **University of Saskatchewan** is a major landholder in Saskatoon, and the development of University lands will have a substantial impact on the City. In 2009, the University completed the study entitled, Vision 2057: University Land Use Planning. In addition to laying out plans for the core campus area, the Vision 2057 report also outlines a range of potential uses for the University Endowment Lands. These lands may be used for University purposes or a variety of for-profit developments including:

- ⇨ Mixed-Use Neighbourhoods;
- ⇨ Research Park;
- ⇨ Business Park;
- ⇨ Institutional Uses;
- ⇨ Commercial Uses; and,
- ⇨ Recreational, Open Space.

Of the total University inner-city land holdings of 755 hectares (1865 acres), 401 hectares (991 acres) of land are recommended to be designated as Endowment Lands. Development of even a portion of these areas will have a significant impact on the city. The lands most suited for development are known as the U of S Management Areas. Within these areas, it is expected that an additional 23,000 residential units could be developed, representing an additional 49,000 people. As well, there is identified potential for approximately 12 million square feet of non-residential development.

2.2.3 Neighbourhood Infill

Neighbourhood Infill development potential has been identified within established areas of the city to accommodate context-sensitive growth within the areas identified in **Figure 2.14**. Neighbourhood Infill growth is intended to complement the existing character of the neighbourhood, providing additional housing options to current and future residents. Residential infill is to be primarily of a smaller scale, including secondary suites, duplexes, and townhouses.

The City has recently developed Neighbourhood Infill Guidelines to ensure that the design and implementation of the new development is consistent with the form and character of the existing areas (e.g. Pre-War versus Post-War neighbourhoods), and to ensure that new development enhances the vibrancy of the neighbourhoods. Overall, these areas are projected to accommodate an additional 15,000 units (at the 500,000 population scenario). Furthermore, the smaller scale of development and distinct character of these established areas will help to further broaden the range of housing and lifestyle options to new residents - options that may not be met by the New Suburban Development or Strategic Infill Areas.

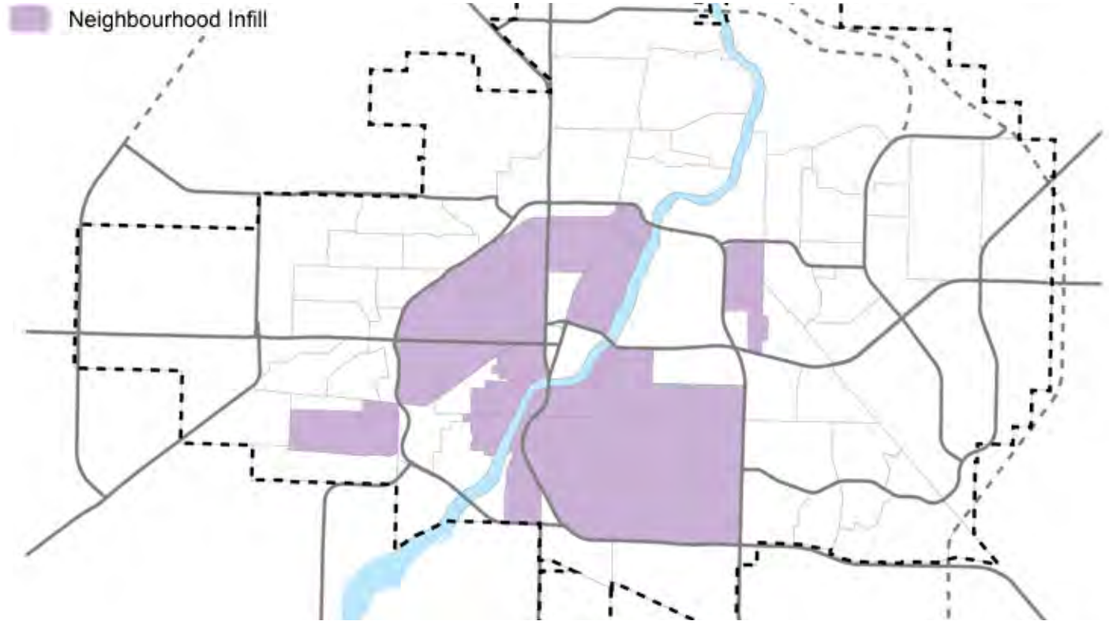


Figure 2.14 - Neighbourhood Infill Areas

2.3 Problem Definition

2.3.1 Balancing Outward Growth with Upward Growth

At the present time, outward growth is the dominant form of development in Saskatoon. To achieve smart, sustainable growth, the City has identified a need to balance greenfield development with infill development in order to make the city a model of efficiency and create attractive new people places that reinforce Saskatoon's sense of community. To this extent, the city has recently established plans for:

- Intensification of the Downtown, North Downtown and University of Saskatchewan as focal points for Strategic Growth within the core area of the city; and,
- Smaller scale residential Neighbourhood Infill growth within older residential neighbourhoods, primarily located within Circle Drive.

The plans for Strategic Growth address key central areas in the city. And, the plans for Neighbourhood Infill Growth provide a means by which established residential areas can evolve over time with the addition of small-scale developments such as garden suites, duplexes, and townhouses. However, until this point, there has not been a plan for Corridor Growth within the existing urban area.

2.3.2 The Need to Address Saskatoon's Major Corridors

Outside of Strategic Growth Areas, there is a critical need to address the condition of Saskatoon's main streets and community hubs in order to ensure that they can become thriving urban villages in the future. Residents have expressed a strong desire for quality main street environments in the city. Yet, at this time, most major corridors have low density, auto-centric land uses. In contrast, thriving urban villages would have a greater scale of development, density of development, mixture of land uses, and a positive environment for walking, cycling, and transit uses. In short, these types of developments are people places. The creation of these types of places is essential to attract people to Saskatoon from other places in Canada and the world, recognizing that the city's growth plan relies on continued in-migration.

Without Corridor Growth, there would be many negative implications for the city. These implications include the following:

- **Limited opportunities for complete communities with choice for existing and future residents.** In comparison with suburban land use patterns of recent decades, New Suburban Neighbourhoods in Saskatoon have been planned to support a greater mixture of land uses and choices of residential development. Strategic Growth Areas in the heart of the city, such as the North Downtown and City Centre, will also offer diverse choices to live, work, socialize, and recreate. These Strategic Growth Areas will provide opportunities for people who wish to have a more urban experience, in a higher density area. However, in between New Suburban Neighbourhoods and Strategic Growth Areas, there are few opportunities for medium-density housing within close proximity to walkable mixed use commercial areas. Although major corridors are ideally suited to the development of vibrant neighbourhoods around transit, to date, low density, auto-oriented uses predominate along most of the city's major corridors.
- **Limited access to employment and amenities.** The Downtown and the industrial area to the north remain Saskatoon's primary nodes for employment. In fact, the vast majority of the city's employment is located in these areas. The City's employment areas study is considering opportunities to diversify the location and types of employment opportunity within Saskatoon. Currently, unique employment areas are beginning to take shape in new locations such as the River Landing development to the south of Downtown. This area offers mixed land uses, transportation choices, and attractive amenities such as a riverfront pathway, parks, restaurants, farmers' market, and more. In contrast, major corridors such as 22nd Street and 8th Street are generally attracting commercial uses with low density, service-oriented employment opportunities. Transformations of major corridors into mixed use, higher density activity areas and nodes could provide a variety of new employment nodes within the city, focused around attractive transit and other community amenities.
- **Transportation choices for people destined to areas along major roadways are generally centred on driving.** Along Saskatoon's major roadways, most developments are low density, single use buildings that are oriented towards automobile use. Developments typically have large surface parking lots adjacent to the street, and pedestrian/cyclist conditions are poor. These characteristics mean that for people destined to areas along major corridors, the vehicle is the primary available transportation choice. The low density of development, the significant distance between developments, the unfriendly road conditions, and the poor quality of the public realm will make it increasingly difficult to support pedestrian and cyclist activity should this form of development persist.
- **Land uses on major corridors do not support attractive transit services.** Because of the low density character of development along major corridors, attractive, high frequency transit services are not viable at this time. Generally, medium density forms (e.g. 4 to 6 storey development) or higher density destinations (e.g. redeveloped Suburban Centres) are required to reinforce the provision of attractive transit services. Without redevelopment along key major corridors, it would be very difficult to implement a long term plan for rapid transit.
- **Major roadways are becoming barriers to communities that surround them.** Within the city, major roadways such as 22nd Street and 8th Street currently function as barriers to the communities that surround them. Roadways such as these ones often have six lanes of fast-moving traffic, and poor conditions for pedestrians and cyclists. In many cases, to cross the street from one development to another, the norm is to travel by vehicle rather than walking. These conditions result in the road acting as a barrier between communities. In contrast, Corridor Growth can help to connect neighbourhoods. By developing multi-storey buildings closer to the street and improving the quality, character and scale of the public realm, there are opportunities to bring people together in a main street environment and to facilitate connectivity across major corridors.
- **Growing outward rather than upward can contribute toward inefficient use of City services and infrastructure.** With a continued focus primarily on outward growth, there are significant future financial risks to the City. Outward growth requires new fire stations, schools and recreation facilities to serve an expanding population. It also means creating new road, water, sanitary sewer, and stormwater infrastructure, often in a low density land use context. In contrast, in many cases, appropriate upward growth offers opportunities to take advantage of existing city services and infrastructure, making the most efficient use of resources that already exist. Cities with a smaller overall footprint have less linear infrastructure per capita, with significant long-term savings for operations, maintenance, and replacement.

Corridor Growth offers an opportunity for the City to maximize its investment in existing city services and infrastructure and minimize its long-term liability associated with the service and infrastructure expansion required for outward growth.

- **Limited choices for growing upward can continue to place pressures on the city's sustainable growth patterns.** Saskatoon has experienced tremendous growth over the last decade, placing pressures on the market to ensure housing and other community services are attractive and readily available. Like many other cities, planned suburban communities can often be the natural choice for housing and they are easy to support with infrastructure and services that are planned as part of a comprehensive greenfield development. However, without attractive alternatives to planned suburban communities, it will be a challenge to shift growth patterns to more sustainable options. To address this challenge, many cities such as Saskatoon have taken other steps such as creating growth boundaries in order to contain suburban growth and encourage new infill development.

- **Higher Density Land Uses in Challenging Locations.** Outside of Strategic Growth Areas, the natural locations for higher density land uses are along major corridors, stitching together future rapid transit routes (e.g. beads of density along a corridor). Without planned choices for higher density, mixed use areas within the existing urban area and in key suburban areas (e.g. Suburban Centres with attractive transit service), these higher density land uses will arise more randomly away from major corridors. In these locations, it is difficult to support this density with attractive transit services and other amenities that are needed.

Without Corridor Area Planning, major corridors in the city will remain unchanged and the spin-off challenges will continue. Without Corridor Growth, it will be difficult for the city to achieve its vision for sustainable growth and moving around. In fact, the low density patterns along the city's major corridors mean that attractive transit use is likely not possible along these corridors until such time that redevelopment occurs. And, without attractive transit, there would be few opportunities outside of Strategic Infill Areas to create the thriving main streets and community hubs that are desired by both residents and newcomers. Corridor Growth is a critical ingredient to the long term success of the city as a whole.

2.3.3 Opportunities for Corridor Growth

Opportunities for Corridor Growth primarily exist in locations along arterial roads that provide good access to major activity centres such as the Downtown and the University of Saskatchewan. By creating a series of urban villages throughout the existing urban area, there will be exciting new choices for people to live in complete communities with a range of housing, shopping, employment, and community amenities. These urban villages will be well connected with high frequency transit, providing easy access to the Downtown, University, and other major activity centres within the city.

There is also a need to ensure that the city continues the shift to sustainable growth that it has started in New Suburban Neighbourhoods. As indicated, the City's plans call for a greater mix of uses and higher densities of development in New Suburban Neighbourhoods. Recent new neighbourhoods such as Willowgrove and Evergreen have been successful in establishing a core area with higher density residential and commercial uses focused around a central public park. Yet, these neighbourhoods still have an inward focus, and are bordered by auto-oriented arterial roads with no fronting development.

The City's most recent planning initiatives call for the development of quality street environments along new arterial roads, with fronting higher density land uses that would support the provision of attractive transit service. In key locations such as the new Holmwood Suburban Centre, there is a significant opportunity to reimagine new suburban development around the provision of high frequency transit. In a greenfield development context, such transit oriented development would provide an exciting new form of mixed use development and provide a new choice for Saskatonians to live in a very well-connected suburban environment.

With respect to transportation, Corridor Growth is also critical to provide choices and enable possibilities for public transit, walking, and cycling. At the present time, Saskatoon provides few options for residents to live or work in locations that are integrated with efficient transit service. Further, land use patterns and street environments often do not lend themselves to walking or cycling. Corridor Growth presents an opportunity to develop a more integrated transportation network and enhance connectivity for all modes.

In order to ensure that high-frequency, attractive transit services are possible, there is a need for large concentrations of population within close proximity of major corridors. One of the key ways to attract development within close proximity of major corridors is to provide high-frequency, attractive transit services. Transit and Corridor Growth reinforce each other, and successful implementation of the Growth Plan requires an emphasis on both Transit and Corridor Growth.

2.4 Vision & Possibilities for Corridor Growth

Through discussions with the community and recent plans, the City is positioned to accommodate half a million people over the next 30 years or so. Although this growth equates to more than a doubling of the population in Saskatoon, residents have clearly said that the footprint of the city cannot and should not double. In other words, Saskatoon needs to change the way growth patterns of the last couple decades have occurred, and provide a range of transportation solutions to meet the demands of growth.

Great strides have already been taken towards planning sustainable growth patterns through the design of New Suburban Development Areas, plans for redevelopment in Strategic Infill Areas, and new policies for small-scale Neighbourhood Infill. To shape Saskatoon's plans for sustainable land use patterns, the next step is to identify major corridors that have the potential to support redevelopment.

This section of the report outlines the long-term vision and possibilities for growth along the city's major corridors. This section includes a review of candidate corridors to: a) identify a shortlist of preferred road types that could potentially accommodate Corridor Growth; and, b) screen the candidate corridors with the greatest potential to accommodate growth. In turn, this analysis informs the long-term plan for corridor growth identified in **Section 2.5**.

Corridor Growth is critical to the achievement of the city's aspirations for Sustainable Growth, as identified in the Saskatoon Speaks process. Through this process, residents highlighted a desire for balanced growth that creates quality street environments and supports the possibilities for transit, walking, and cycling. This vision was further articulated in the City's Strategic Plan, as noted below. Through the Growth Plan process, residents of Saskatoon provided input and feedback to refined goals and objectives for Corridor Growth.

Saskatoon's Vision for Sustainable Growth (from the 2013-2023 Strategic Plan)

Saskatoon's growth is environmentally and economically sustainable and contributes to a high quality of life. The city has grown both upward and outward – reflecting a balance of greenfield and infill development. Balanced growth has made the city a model of efficiency and resulted in attractive new people places that reinforce Saskatoon's sense of community.

Downtown is built up and bustling. Main streets and community hubs are urban villages. New neighbourhoods are walkable and well-planned; older neighbourhoods have been renewed and revitalized. Our City Centre is a vibrant hub for culture, commerce and civic life. And, getting to and from this thriving, creative space is easy, safe and enjoyable.

Corridor Growth Goals (developed for the Growth Plan)

The City will explore opportunities for complete, vibrant communities along major corridors with attractive transit services. The design of these communities will facilitate more people friendly environments and easy-to-access priority modes such as walking, cycling and transit that will contribute toward these vibrant areas of the city.

Corridor Growth Objectives

- To create and enhance complete communities with a variety of housing choices, a high quality public realm, and overall vibrancy.
- To create and improve access to employment and amenities.
- To improve mobility options for people along major corridors and on a City-wide basis.
- To enhance connectivity between and within neighbourhoods by enhancing communities' edges.
- To support the efficient provision of infrastructure and associated services.

2.4.1 Key Possibilities

Although many of Saskatoon's corridors could technically support further growth and infill on properties that surround them, only a select few have the characteristics and potential to accommodate significant growth. The **Growth Plan** process included a comprehensive review of all candidate major corridors in the city in order to identify those corridors that have the greatest potential to ultimately become the hubs for vibrant communities, with a mixture of land uses for people to live, work, shop, play, and enjoy leisure activities.

This section of the report describes the process used to evaluate all of Saskatoon's major corridors for significant growth potential, and identify specific characteristics of those with the greatest potential. The first step was to identify the corridor typologies that suit increased scale of development, density of development, and mixture of land uses. Although all shortlisted corridors could potentially support redevelopment and growth, the second step involved a preliminary evaluation of relative potential for accommodating growth. Those corridors with the greatest potential for accommodating growth and transformation were identified as the priorities for the **Growth Plan**.

Step 1 – Shortlist Preferred Road Types

As is the case in most cities, the City of Saskatoon's roadway classification system includes freeways and expressways, arterials, collectors, local streets, and lanes. These classifications are based on characteristics such as traffic capacity, user destination, mix of vehicles, speed, width, and access. Of the five roadway classifications, arterials – both major and minor arterials – feature characteristics that make them best suited to support additional growth and development. In particular, arterial roads:

- have the greatest potential to accommodate transit services with higher ridership;
- have adjacent development sites that are conducive to higher densities; and,
- provide proximity and access to major community destinations, amenities, and employment areas.

Within Saskatoon, there are approximately 165 kilometers of major and minor arterial roads. Each of these roadways are different in terms of their form, function, and character. While some arterial roads have only two travel lanes, many arterial roads support four or six travel lanes within rights-of-ways of generally greater than 25 meters. Many arterial roads also have facilities for pedestrians, transit and/or cyclists. Some arterials have vibrant, street-fronting land uses, while other arterials do not have street-fronting uses, and primarily facilitate longer distance travel between neighbourhoods in the city. In many cases, the land use character that surrounds these corridors varies in terms of scale of development, density of development, and mixture of land uses. Even along the same corridor, there can be areas with low density, vehicle-oriented land uses, as well as areas where there is street-oriented commercial, mixed use, or residential development and a strong pedestrian character.

To assist in evaluating the potential for each arterial road to accommodate larger scale growth, arterial roads were classified into eight unique typologies, based on their form, function, and character. These arterial road typologies are summarized below along with local examples.

- **Community Arterials** include some of the largest, most heavily-used corridors in the city. Community Arterials are primarily commercial in character and often feature major community destinations (e.g. malls). They commonly have large right-of-ways and offer relatively high frequency transit service. Most existing Community Arterials are found within Circle Drive.

  Examples: *8th Street E, 22nd Street W*

- **Urban Boulevards** serve as key gateways to the City. These arterials have a high potential for rapid or frequent transit due to their wide rights-of-way and strong linkages to major institutions such as the University of Saskatchewan (U of S) and Saskatchewan Polytechnic. Urban Boulevards typically feature treed centre medians that, when combined with wide rights-of way, give the arterials their 'boulevard' feel. Existing Urban Boulevards are found within Circle Drive.

  Examples: *College Drive, Idylwyld Drive*

- **Main Streets** are retail shopping streets that feature street-fronting development, on-street parking, and a strong pedestrian environment. Main Streets tend to have an intimate scale due to small or medium-sized rights-of-way and moderate building heights (2 – 3 stories). Saskatoon's Main Streets are often considered among the most 'vibrant' arterials in the city. Most existing Main Streets are found within Circle Drive.

  Examples: *Broadway Avenue, 20th Street W, 33rd Street W, Central Avenue*

- **Suburban Centre Arterials** are found in-and-around the city's Suburban Centres. Due to their concentrated location, these arterials function more as contained nodes than as extended corridors. These arterials typically feature controlled vehicle access, a weak pedestrian environment, and primarily large format retail/mall uses.

  Examples: *Confederation Drive, Attridge Drive*

- **Residential Arterial 1** corridors are the most common road typology in Saskatoon. The corridors are characterized by street-facing, residential development – in the form of single-detached houses or low-rise apartments – that are accessed via driveways or rear lanes. Residential Arterial 1 roads are generally found in older, established neighbourhoods.

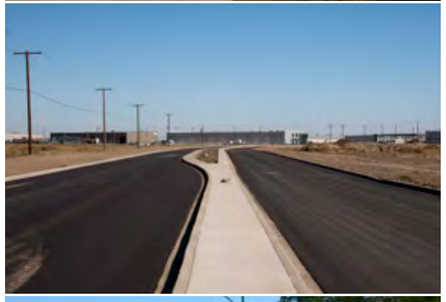
  Examples: *Preston Avenue S, Clarence Avenue, Avenue H S, 33rd Street*

- **Residential Arterial 2** corridors are fast-moving, controlled access roads that are commonly found adjacent to newer residential development. In contrast with the street-fronting residential development of Residential Arterial 1's, Residential Arterial 2's typically feature development that 'backs' onto the road. These corridors are often characterized by a weak pedestrian environment and feature physical barriers – such as sound attenuation walls or fences – between the road and adjacent development.

  Examples: *Warman Road, Boychuck Drive, 8th Street E (east of McKercher Drive)*

- **Industrial Arterials** provide access to the city's low density industrial areas. These arterials typically feature low-frequency transit service and a weak pedestrian environment**.**

  Examples: *Marquis Drive, Airport Drive*



- **Parkways** are established 'green' corridors that serve multiple purposes, including moving vehicles, providing greenspace, and providing access to recreational opportunities, such as bike paths or trails. These corridors typically – and intentionally– feature limited-to-no development. Parkways are generally found along the South Saskatchewan River and through the University of Saskatchewan area. Major changes in the character of Saskatoon's Parkways are not anticipated in the foreseeable future.

  Examples: *Spadina Crescent*

Figure 2.15 illustrates the locations of these arterial road typologies throughout the city. As shown, neighbourhoods inside Circle Drive have the heaviest concentrations of Community Arterials, Urban Boulevards, and Main Streets. Suburban Centre Arterials are found in locations like Confederation Suburban Centre, Lawson Heights Suburban Centre, and University Heights Suburban Centre. Residential Arterial 1 roads are generally found in older, established neighbourhoods. Most Residential Arterial 2 roads are in newer areas, where street-facing development is not always encouraged along arterial roads. Industrial Arterials are primarily located in the city's north and southwest employment areas. And, Parkways are generally found along the South Saskatchewan River and through the University of Saskatchewan area.

Of the eight unique arterial road typologies, five typologies demonstrate the key ingredients required to support growth near major corridors – Community Arterials, Urban Boulevards, Main Streets, Suburban Centre Arterials and Residential Arterial 1. These corridors:

- support frequent transit or are located in close proximity to a corridor that supports frequent transit;
- are conducive to urban vibrancy and higher residential densities; and,
- connect major community destinations such as Downtown, the University of Saskatchewan, hospitals, community centres, and commercial centres.

The other arterial road typologies include Residential Arterial 2 roads, Industrial Arterials, and Parkways. In their current form, these corridors do not contain the ingredients necessary to foster or support growth near transit within the context of the **Growth Plan**. As a result, these typologies are not considered further as candidates for growth near major corridors.

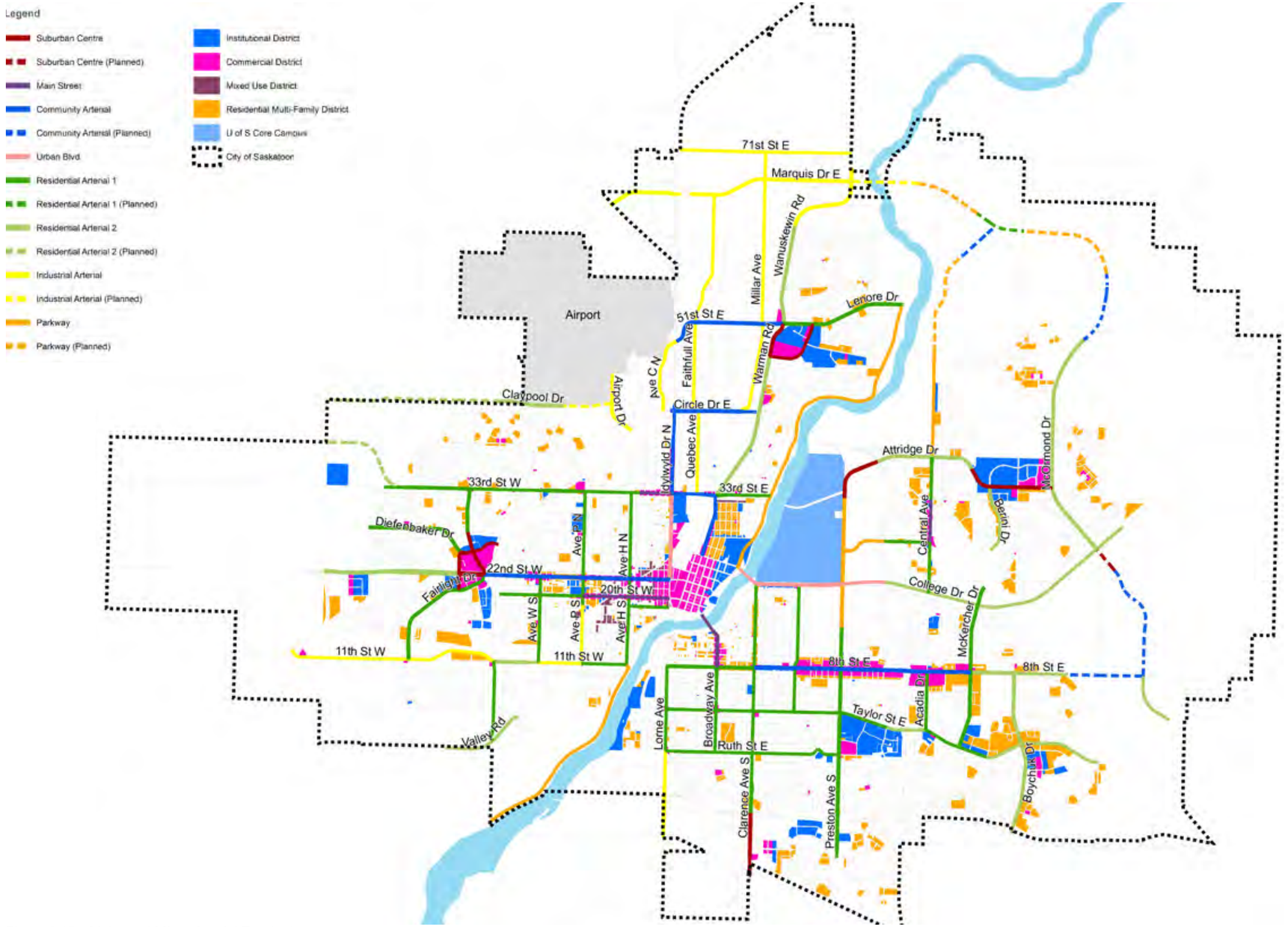


Figure 2.15 - Major and Minor Arterial Typologies

Note: Road typologies are a representation of known conditions and planned roads may vary from identified typologies.

Step 2 – Evaluate Candidate Corridors

In order to identify those corridors with the greatest potential, each of the candidate corridors illustrated in **Figure 2.15** was evaluated further and a shortlist of priority corridors with the greatest potential for growth and transformation were identified.

Each candidate corridor was assessed based on four key criteria to determine their ultimate suitability for redevelopment and to accommodate growth near transit. The criteria were as follows:

1. **Proximity to transit**. Are there higher frequency transit services along the corridor? Is there the potential for higher frequency transit services along the corridor?
2. **Opportunity for investment**. Is there an opportunity for investment/are there currently underutilized lands that could be redeveloped?
3. **Urban block structure.** Is there a grid road network with compact blocks and street-facing development that can facilitate appropriate and efficient redevelopment?
4. **Continuity of destinations.** Does the corridor connect key community destinations?

This assessment framework was used to screen the candidate corridors and identify high, medium and low priority corridors for growth, based on their relative suitability to accommodate significant development. **Table 2.01** reviews Community Arterials, Urban Boulevards, and Main Streets, many of which offer significant growth potential. **Table 2.02** reviews Suburban Centre locations. In contrast to the other typologies, each Suburban Centre is reviewed as a whole, because opportunities for intensification tend to be confined to a more concentrated area, focused on the node as opposed to the corridor. **Table 2.03** reviews Residential Arterial 1 corridors.

In these corridor assessments, the scoring against the assessment criteria was used as the primary basis for identifying high, medium, and low priority corridors for redevelopment. However, it is noted that in some cases, corridors may meet many of the assessment criteria but not be identified as a high priority corridor. For example, Broadway Avenue (north of 8th Street) scores high for its proximity to transit, grid urban block structure, and connectivity to key community destinations. In short, it displays many of the qualities typically conducive to Corridor Growth. However, because in this instance the corridor is well-developed with limited opportunities for future identification, it is identified as a low priority corridor for future growth.

Based on the corridor evaluations, high, medium and low priority corridors (and Suburban Centre nodes) are identified in **Figure 2.16.**

The high priority corridors are assessed in further detail as part of the **Growth Plan**. The medium and low priorities represent a second tier that can be considered in the future when conditions are conducive to redevelopment. It is noted that in general, the Community Arterials, Urban Boulevards, Main Streets, and Suburban Centres provide the most significant opportunities to accommodate growth.

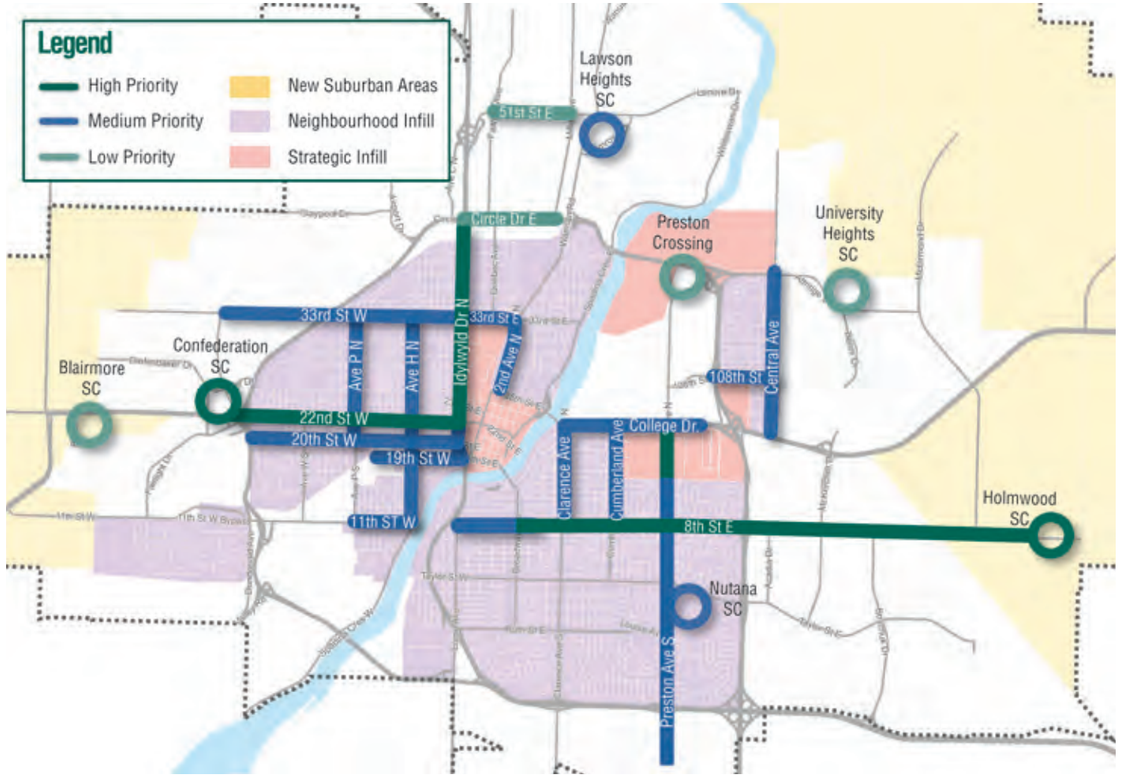


Figure 2.16 - Priorities for Corridor Growth Potential

Residential Arterial 1 roads also offer potential for modest intensification (e.g. townhouses), and future growth along these corridors should be considered as the city grows and other corridors begin to develop. Note that **Figure 2.16** illustrates only the high and medium priority Residential Arterial 1 roads, given that many of the low priority Residential Arterial 1 roads offer little immediate redevelopment potential. In the hierarchy of priorities, the low priority Community Arterials (e.g. Circle Drive East, 51st Street East), Main Streets (e.g. Broadway Avenue), and Suburban Centres (e.g. Blairmore Suburban Centre, Preston Crossing Suburban Centre, and University Heights Suburban Centre) should generally be considered for redevelopment prior to considering redevelopment along low priority Residential Arterial 1 roads.

Community Arterials, Urban Boulevards and Main Streets	Corridor Type	Proximity to Transit	Opportunity for Investment	Urban/Block Structure	Continuity of Destinations	Comments	Recommendation
8th Street E	Community Arterial	●	●	◖	●	Key east-west connection from Downtown to community commercial hubs and new Holmwood Suburban Centre to east	High Priority Corridor
22nd Street W (E of Confederation)	Community Arterial	●	●	●	●	Key connection between Blairmore and Confederation Suburban Centre to Downtown with significant redevelopment potential	High Priority Corridor
College Drive (W of Preston Avenue)	Urban Boulevard	●	●	◖	●	Along major east-west rapid transit connection between Downtown and University	High Priority Corridor (note that growth will primarily be Strategic Infill)
Idylwyld Drive N	Urban Boulevard	●	●	◖	●	Could support some redevelopment to complement planned North Downtown Plan growth; however, redevelopment is constrained by some cul-de-sac configurations and proximity of industrial areas	High Priority Corridor
2nd Avenue N / 3rd Avenue N	Main Street	◖	●	◖	●	In proximity of proposed rapid transit and North Downtown but limited redevelopment sites	Medium Priority Corridor
20th Street W (E of Avenue P S)	Main Street	◖	●	●	●	Key east-west connection with commercial uses, but not directly on primary rapid transit corridor	Medium Priority Corridor to be considered in relation to 22nd Street
33rd Street E (Idylwyld to Warman)	Community Arterial	●	◖	◖	◖	Potential to complement planned North Downtown Plan Growth	Medium Priority Corridor
33rd Street W (Avenue G N to Idylwyld)	Main Street	●	◖	●	◖	Located close to Idylwyld but limited number of large sites for redevelopment	Medium Priority Corridor
Central Avenue	Main Street	◖	◖	●	◖	Not as well connected to surrounding neighbourhoods and distance from core is a limiting factor	Medium Priority Corridor
Broadway Avenue (N of 8th Street E)	Main Street	●	◖	●	●	Important corridor connecting downtown to 8th Street E, but already well-developed with limited opportunities for further intensification	Low Priority Corridor for future growth due to existing well-developed character
51st Street E	Community Arterial	◖	◖	◖	◖	Longer term potential but outside Circle Drive and away from higher intensity uses	Low Priority Corridor
Circle Drive E (Idylwyld to Warman)	Community Arterial	○	◖	○	○	Vehicle oriented commercial at southern edge of Northern Industrial area	Low Priority Corridor

● High ◖ Medium ○ Low

Table 2.01 - Assessment of Community Arterials, Urban Boulevards and Main Streets

Suburban Centres	Corridor Type	Proximity to Transit	Opportunity for Investment	Urban/Block Structure	Continuity of Destinations	Comments	Recommendation
Confederation Suburban Centre	Suburban Centre	●	◖	○	●	Significant node on primary east-west corridor and multiple redevelopment sites	High Priority Suburban Centre
Holmwood Suburban Centre	Suburban Centre	●	●	TBD	●	Most significant opportunity for greenfield TOD	High Priority Suburban Centre (new)
Lawson Heights Suburban Centre	Suburban Centre	●	◖	○	●	Within the Suburban Centre, the redevelopment opportunity is the most significant on the single mall site	Medium Priority Suburban Centre
Nutana Suburban Centre	Suburban Centre	◖	◖	◖	●	Market Mall site offers the most significant redevelopment opportunity	Medium Priority Suburban Centre
Blairmore Suburban Centre	Suburban Centre	●	○	○	●	More recently developed	Low Priority Suburban Centre
Preston Crossing	Suburban Centre	●	○	○	●	More recently developed with vehicle-oriented commercial	Low Priority Suburban Centre
University Heights Suburban Centre	Suburban Centre	◖	○	○	●	More recently developed with vehicle oriented commercial	Low Priority Suburban Centre

● High ◖ Medium ○ Low

Table 2.02 - Assessment of Suburban Centres

Residential Arterial 1 Corridors	Corridor Type	Proximity to Transit	Opportunity for Investment	Urban/Block Structure	Continuity of Destinations	Comments	Recommendation
8th Street E (Broadway to Clarence)	Residential Arterial 1	●	●	●	●	Key east-west connection from Downtown to community commercial hubs	High Priority Corridor
8th Street E (Lorne to Broadway)	Residential Arterial 1	◖	◖	●	◖	Longer term intensification potential	Medium Priority Corridor
11th Street W (Avenue P S to Avenue H S)	Residential Arterial 1	◖	◖	●	◖	Longer term intensification potential	Medium Priority Corridor
19th Street W	Residential Arterial 1	◖	◖	◖	◖	Provides connection to downtown but not along primary transit route	Medium Priority Corridor
20th Street W (W of Avenue P)	Residential Arterial 1	●	◖	●	◖	Already has mix of multi-family and single detached residential uses	Medium Priority Corridor
33rd Street W (Confederation to Avenue G N)	Residential Arterial 1	●	●	◖	●	Longer term intensification potential but distant from future rapid transit	Medium Priority Corridor
108th Street (Circle Drive to Central Avenue)	Residential Arterial 1	◖	◖	●	◖	Precedent for redevelopment has been established with some apartment buildings along primarily single detached corridor	Medium Priority Corridor
Avenue H N	Residential Arterial 1	●	◖	●	●	Longer term intensification potential but distant from future rapid transit	Medium Priority Corridor
Avenue H S	Residential Arterial 1	◖	◖	◖	◖	Longer term intensification potential but distant from future rapid transit	Medium Priority Corridor
Avenue P N	Residential Arterial 1	◖	◖	●	◖	May have longer term potential across from park or at key intersections	Medium Priority Corridor
Avenue P S (19th Street to 22nd Street)	Residential Arterial 1	●	●	◖	●	Adjacent to hospital with mix of multiple family and single detached residential	Medium Priority Corridor
Broadway (S of 8th Street)	Residential Arterial 1	◖	●	◖	●	Longer term intensification potential	Medium Priority Corridor
Clarence Avenue N	Residential Arterial 1	○	◖	○	○	Longer term intensification potential between 8th Street and College Drive	Medium Priority Corridor
Cumberland Avenue N/S	Residential Arterial 1	◖	◖	●	◖	Longer term intensification potential outside of College Quarter (Strategic Infill component), between 8th Street and College Drive	Medium Priority Corridor
Preston Avenue N (8th Street to 14th Street)	Residential Arterial 1	●	●	◖	●	Key connection between 8th Street and University of Saskatchewan, and part of proposed east-west rapid transit corridor. May have redevelopment potential adjacent to station areas, although street currently has a stable single detached character	Medium Priority Corridor
Preston Avenue S (8th Street to Stonebridge)	Residential Arterial 1	◖	●	●	●	Longer term intensification potential	Medium Priority Corridor

● High ◖ Medium ○ Low

Table 2.03 - Assessment of Residential Arterial 1 Corridors

Residential Arterial 1 Corridors	Corridor Type	Proximity to Transit	Opportunity for Investment	Urban/Block Structure	Continuity of Destinations	Comments	Recommendation
33rd Street E (Warman to Spadina)	Residential Arterial 1	◖	◖	◖	◖	Will have greater potential if new bridge is endorsed along 33rd Street alignment	Low Priority Corridor
33rd Street W (W of Confederation)	Residential Arterial 1	◖	◖	◖	◖	Stable single detached character but provides connection to future developments to the west.	Low Priority Corridor
Acadia Drive	Residential Arterial 1	◖	○	○	◖	Stable single detached character	Low Priority Corridor
Avenue W S (22nd Street to 11th Street)	Residential Arterial 1	◖	◖	◖	◖	Limited existing multi-family development; longer-term intensification potential	Low Priority Corridor
Clarence Ave S	Residential Arterial 1	◖	○	●	◖	Stable single detached character	Low Priority Corridor
Confederation Drive (33rd Street W to Milton Street)	Residential Arterial 1	●	◖	○	◖	Longer term intensification potential – 4 lane arterial plus on-street parking (6 lanes total)	Low Priority Corridor
Diefenbaker Drive (E/NE of Confederation SC)	Residential Arterial 1	◖	◖	●	◖	Longer term intensification potential – 4 lane arterial	Low Priority Corridor
Dundonald Avenue	Residential Arterial 1	○	○	◖	○	Single detached character at edge of urban development	Low Priority Corridor
Fairlight Drive	Residential Arterial 1	●	◖	○	◖	Longer term intensification potential – 4 lane arterial	Low Priority Corridor
Lenore Drive	Residential Arterial 1	◖	◖	◖	◖	Longer term intensification potential – 4 lane arterial	Low Priority Corridor
Lorne Avenue	Residential Arterial 1	◖	○	●	○	Stable single detached character	Low Priority Corridor
McKercher Drive	Residential Arterial 1	◖	◖	○	◖	Longer term intensification potential	Low Priority Corridor
Ruth Street	Residential Arterial 1	◖	○	●	◖	Stable single detached character	Low Priority Corridor
Taylor Street	Residential Arterial 1	◖	○	●	◖	Stable single detached character	Low Priority Corridor

● High ◖ Medium ○ Low

Table 2.03 - Assessment of Residential Arterial 1 Corridors - Continued

As indicated in the corridor evaluations, the highest priorities for growth include:

- **22nd Street West** - A high traffic volume, auto-oriented corridor with the potential for new transit-oriented development on currently under-utilized parcels adjacent to future rapid transit.
- **8th Street East** - A high traffic volume boulevard with a large amount of car-oriented commercial development sites that could accommodate urban infill.
- **College Drive** (and an adjacent portion of Preston Avenue) - A high traffic volume boulevard adjacent to the University with several large greenfield sites that may be appropriate for urban infill. These (and all other University of Saskatchewan) lands have already been identified as Strategic Infill.
- **Idylwyld Drive North** - A moderate-high traffic volume, auto-oriented corridor linking the airport to Downtown and having moderate potential for new urban infill development on larger sites. The North Downtown Master Plan identifies higher redevelopment potential to the east of Idylwyld Drive, south of 33rd Street.
- **Confederation Suburban Centre** – A large, suburban hub with the long-term potential to redevelop into a mixed use, transit-oriented node with future rapid transit on 22nd Street.
- **Holmwood Suburban Centre** – A planned new Suburban Centre that has the potential for transit oriented development, centered around the extension of frequent transit along the 8th Street corridor.

These corridors are illustrated in **Figure 2.17** and assessed in further detail in Section 2.5.1 of this report.

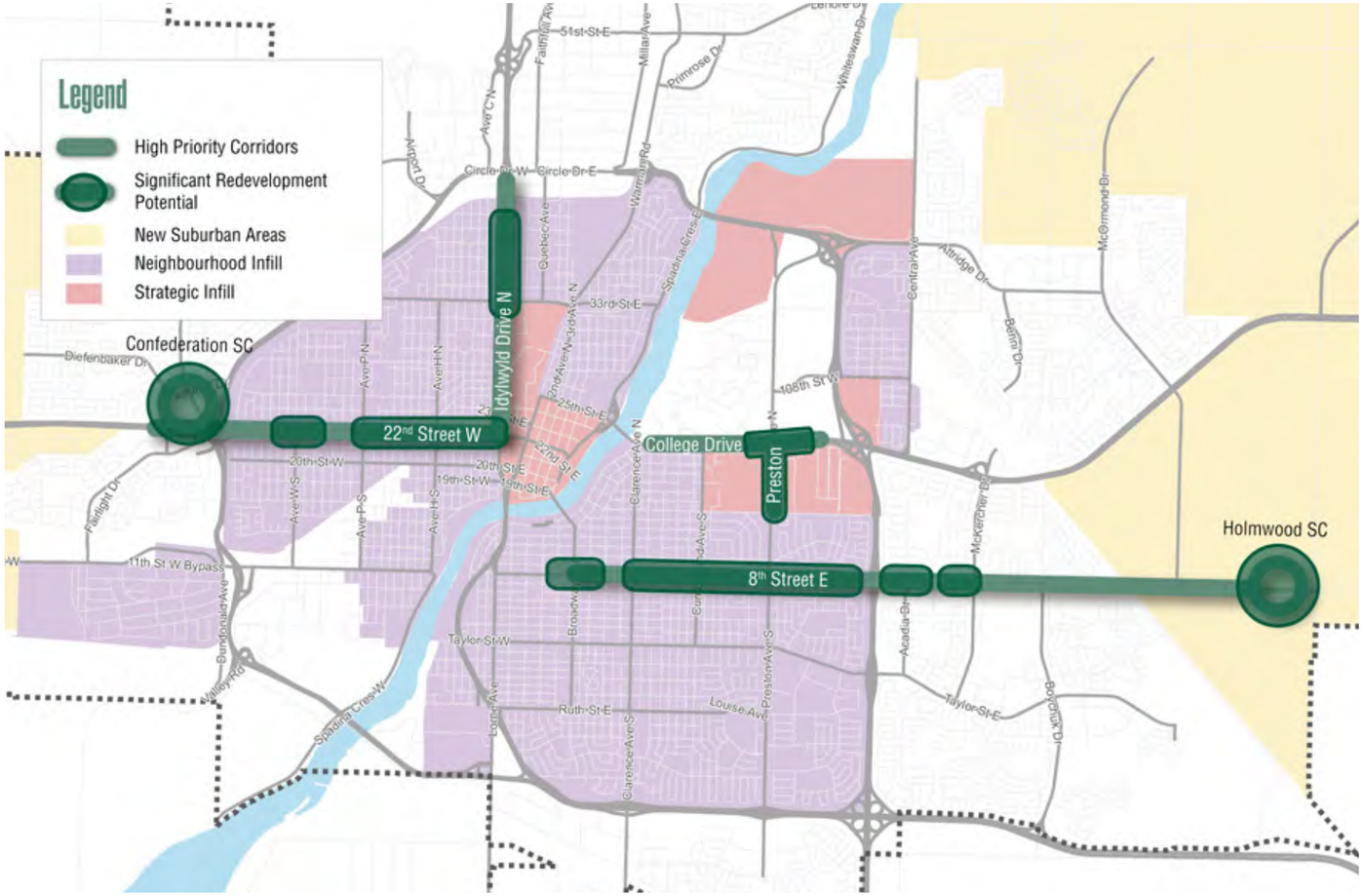


Figure 2.17 - Summary of Priority Corridors for Growth

2.5 Long-Term Plan for Corridor Growth

This section of the report describes the long-term plan for Corridor Growth. It describes potential growth opportunities for high priority corridors, it highlights the overall growth potential to augment current city plans, and it describes the key ingredients for successful redevelopment of these priority corridors.

2.5.1 Corridor Assessments

At this stage, the long-term plan includes a summary of development potential along each of the priority corridors in order to inform overall growth potential for Corridor Growth and to inform Corridor Area Plans. For each corridor and node, detailed assessments were undertaken with regard to both infill suitability and infill development as highlighted below:

- **Infill Suitability** refers to the existing site conditions and the suitability of each corridor or node to accommodate new infill development. The focus for growth near major corridors will typically be large properties with vacant space such as shopping centres, car dealerships and other land intensive, under-developed sites. In addition, development tends to be focused along major streets with easy access to transit, services and other key destinations. To evaluate infill suitability, the urban assessments review key factors such as mobility, development feasibility, livability, and ecology, as described below:
  - **Mobility:** Does the existing and planned mobility network support transit-oriented development? Are there opportunities to improve it? Key considerations include: extent of local movement networks (e.g. pedestrian, cycling, transit); traffic volumes; and, streetscape design.
  - **Development Feasibility:** Does infill and intensification make economic sense? Can the City improve the viability of infill development? Key considerations include: land intensity (e.g. presence of under developed or vacant sites); parcel size; and, physical and planning context.
  - **Livability:** Is this someplace people will want to live? Can infill development support a more vibrant community and unique sense of place? Key considerations include: connectivity to existing compact communities; proximity to amenities and services; and, access to green space and recreational opportunities;
  - **Ecology:** Would new development negatively impact local ecology? Are there ways to improve ecological function through redevelopment? Key considerations include: presence of previously developed sites; opportunity for low impact development; and, impact on habitat.
- **Infill Potential** refers to the ultimate development yields that could be accommodated along each corridor or node. Estimated future development yields take into account the unique context and conditions of each corridor and node. For each corridor and node, potential infill development typologies were developed to provide a very high level estimate of what the city could expect to see in terms of future residential and commercial development. This assessment is intended to set the stage for future corrridor planning work, which would result in adopted secondary plans for high priority corridors.

  In general, the maximum average Floor Area Ratio (FAR - refers to the ratio of the total area of a building to the area of the property that it is built on) outside of the Downtown for any North American city is in the vicinity of 1.5. Specific properties can easily reach 3.0 FAR; however, the average is lowered by older buildings, vacant sites and smaller properties. In Saskatoon, the relatively low land costs and high construction costs make concrete construction with underground parking (generally anything over 2.0 FAR) less feasible.

Urban land prices can be improved (making infill development more viable) through public investments in transit, services, amenities, and infrastucture (like water and sewer) to allow for infill development. An attractive neighbourhood with a unique sense of place will be more likely to support new transit-oriented development.

Given these built form considerations, the following principles were developed to help guide and support new infill development within the priority nodes and corridors:

1. **Made for Saskatoon Solutions**. Develop typologies that incorporate mid-rise, wood-frame construction with innovative parking solutions that minimize the need for more expensive multi-level underground parking.
2. **Transit-oriented Development.** Provide a mix and density of housing, services and employment within a 5 minute walk of priority transit nodes and corridors.
3. **Connect Communities.** Reinforce an interconnected, walkable street and trail network with a high quality pedestrian realm to link residential areas to key transit, commercial and recreation destinations.
4. **An interconnected Green Network.** Provide an interconnected network of parks, trails and open spaces that support natural stormwater management, biodiversity and recreation opportunities.
5. **Corridors that Bring People Together.** Develop human-scaled streets that bring people together and enhance the unique character and vibrancy of the neighbourhood.

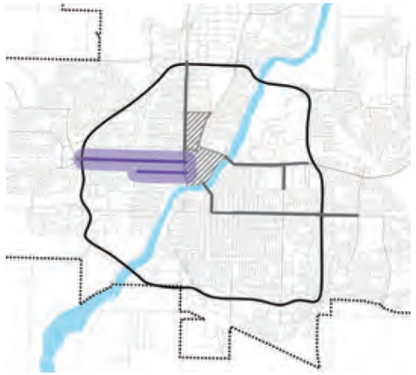


Figure 2.18 - 22nd Street Context Map

22nd STREET

Infill Suitability

- **CONNECTOR:** 22nd Street links two major regional destinations: the Central Business District (CBD) and Confederation Suburban Centre
- **AUTO-ORIENTED:** 22nd Street is auto-oriented but adjacent residential neighbourhoods are characterized by more walkable, pedestrian-oriented development
- **OPPORTUNITY:** currently under-utilized parcels adjacent to planned rapid transit offer excellent opportunities for future transit-oriented infill development

Figure 2.19 - 22nd Street at Street Level

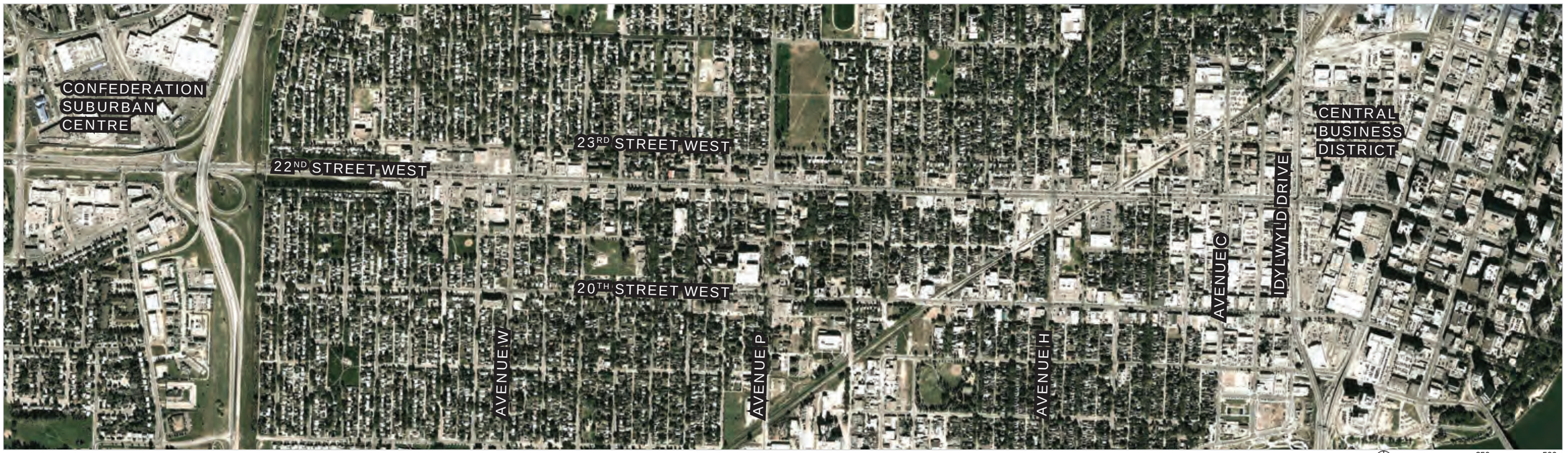


Figure 2.20 - 22nd Street Corridor

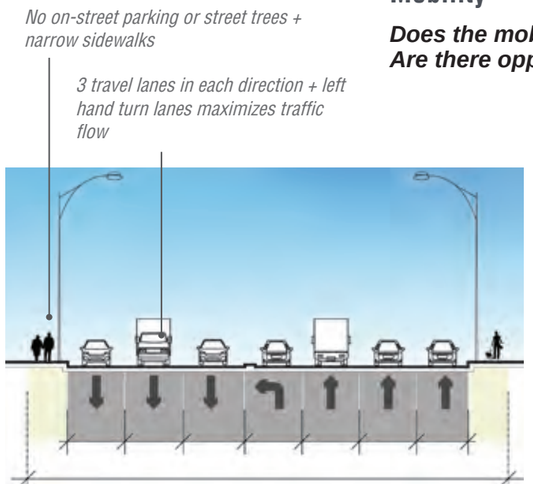


Figure 2.21 - Existing Street Design of 22nd Street

Mobility

Does the mobility network support transit-oriented development? Are there opportunities to improve it?

- **Car-oriented:** The existing auto-orientated design of 22nd Street and Idylwyld Drive does not support transit oriented development
- **Pedestrian opportunities:** Nearby pedestrian-friendly streets (including 20th Street) and potential trails (ie. CPR ROW) could support TOD along 22nd Street
- **Transit:** Rapid transit planned along 22nd Street will support transit oriented infill opportunities
- **Cycling:** The existing cycling network on 23rd Street provides reasonable connectivity that helps to support transit oriented development

Development Feasibility

Does infill and intensification make economic sense? Can the City improve the viability of infill development?

- **Under-utilized parcels:** Vacant or under-utilized parcels represent significant opportunities for infill along 22nd Street
- **Large parcels:** Large parcels along 22nd Street reduce the need to consolidate properties and make larger-scale infill more feasible
- **Proximity to Downtown:** Large, under-utilized parcels are clustered towards the eastern extent of 22nd Street where proximity to Downtown may improve infill opportunities
- **Zoning:** Reducing parking requirements will open parcels up for new development.

OPPORTUNITIES

- Strengthen pedestrian/ cyclist connections to and between key parks and open spaces
- Capitalize on CPR ROW 'shoulders' as greenway opportunities
- Develop a more comfortable pedestrian scale for 22nd Street to support new transit-oriented development
- Enhance active transportation facilities at crossings and intersections to mitigate the barrier effect of 22nd Street and Idylwyld Drive and create a more pedestrian friendly environment

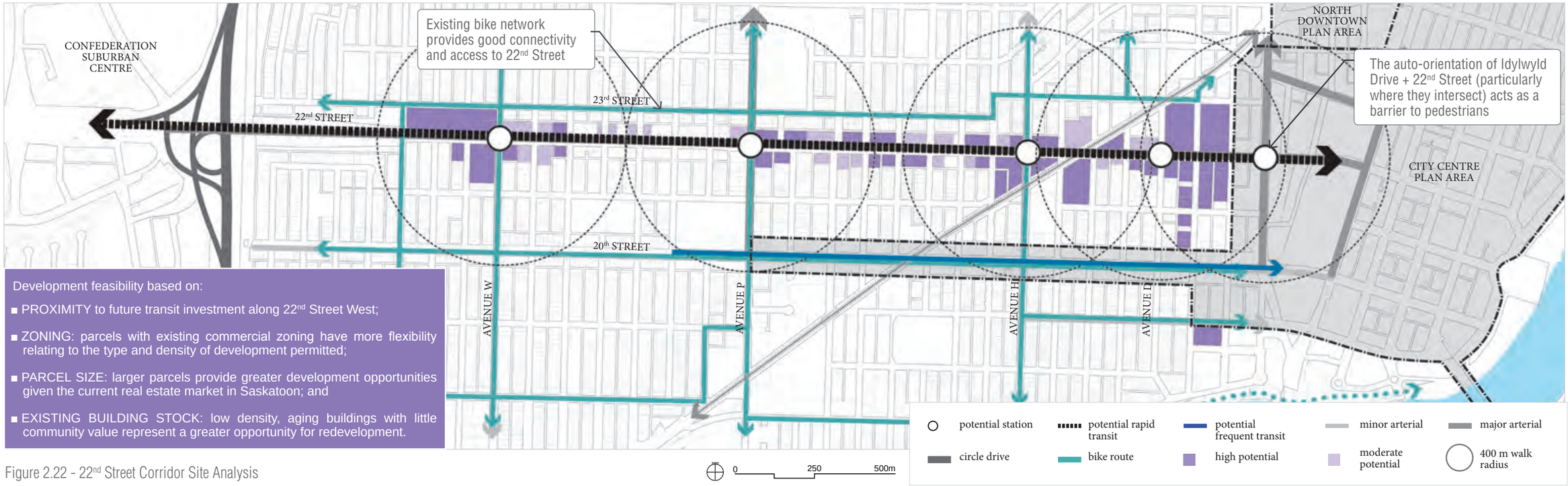


Figure 2.22 - 22nd Street Corridor Site Analysis

OPPORTUNITIES

- Introduce higher density transit oriented development along 22nd Street and Avenue C to support more diverse retail opportunities, and services/amenities
- Reinforce Avenue C as an important pedestrian connection between 22nd Street, 20th Street, Isinger Park and Victoria Park

Livability

Is this someplace people want to live? Can infill support a more vibrant, unique community?

- **Compact communities:** Compact residential neighbourhoods adjacent to 22nd Street could support and benefit from new transit-oriented development
- **Commercial corridors:** 22nd Street is primarily car-oriented, strip commercial; however 20th Street is a pedestrian-oriented shopping street providing an attractive amenity for future residents
- **Green space:** West of Avenue H has good access to green space but there is a lack of green space east of Avenue H
- **Cultural amenities:** Theatres, community centres and local retail are clustered along 20th Street and east of Idylwyld Drive (Midtown Plaza, TCU Place, etc.)

Ecology

Would new development negatively impact local ecology? Are there ways to improve ecological function?

- **Greyfield development:** Infill parcels are primarily greyfield and brownfield sites (i.e. underutilized urban lands or lands that may be contaminated from previous uses) that currently have little ecological value
- **Urban forest:** A healthy urban forest in adjacent residential areas should be protected and extended to include 22th Street, Idylwyld Drive and the commercial district east of Avenue C
- **Opportunity:** Pocket parks can be incorporated into larger scale development along 22th Street and Avenue C and green streets (i.e. streets that prioritize to pedestrian circulation and open space) created to link parks and open space

OPPORTUNITIES

- Develop parcel typologies (i.e. templates for redevelopment):
  - Street-fronting mixed use development on medium sized lots interfacing with single-family homes;
  - Mixed use development incorporating large format retail uses; and
  - Higher density mixed use development on large parcels.

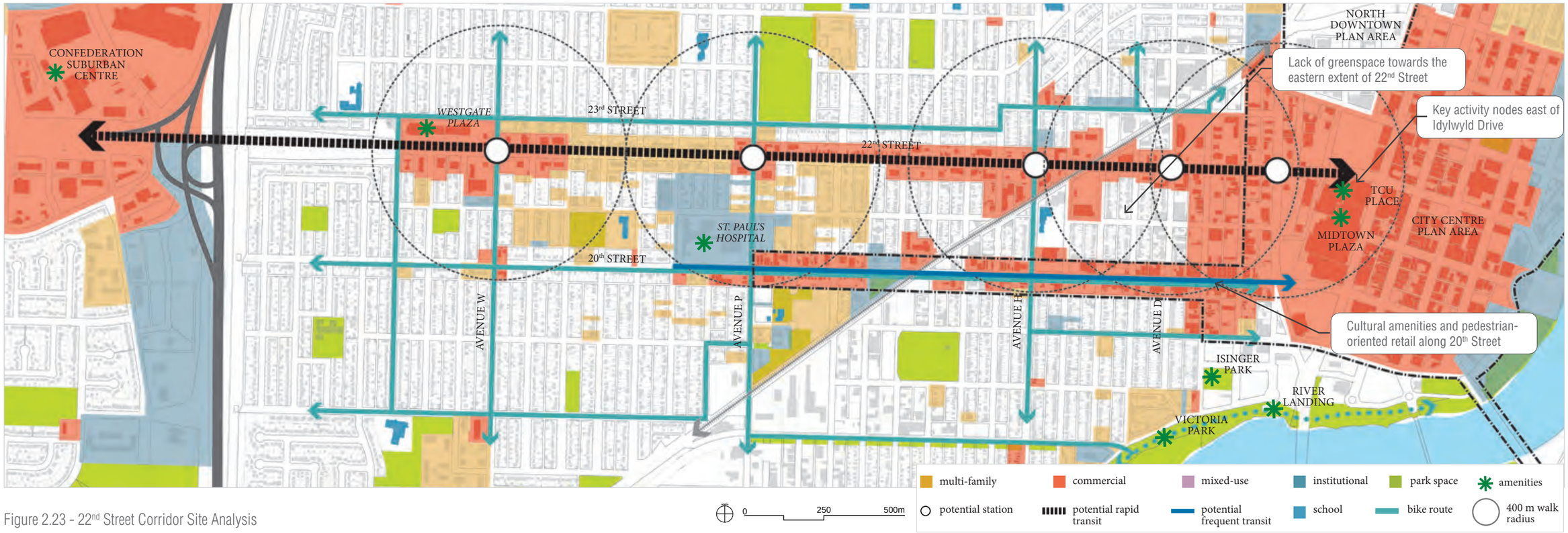


Figure 2.23 - 22nd Street Corridor Site Analysis

Infill Potential

The greatest infill potential can be found within the existing commercial districts on 22nd Street (zoned B3, B4, B5):

Build-out to existing zoned capacity is unlikely given the extremely high densities that would need to be accommodated within the B5 districts as shown in Typology A

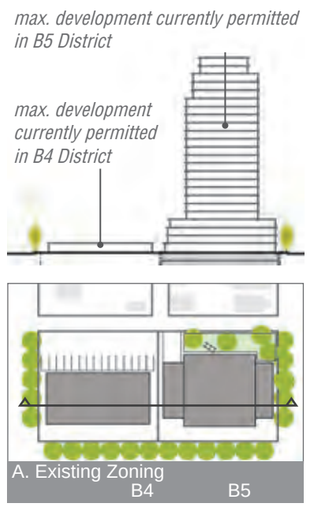
- Existing Zoned Capacity could accommodate up to:
  - 2,700 dwelling units, and
  - 100,780 m² of commercial space
- With slight modifications to the zoning requirements, these districts could more realistically accommodate an estimated:
  - 1,640 - 3,475 dwelling units, and
  - 43,840 - 52,610 m2 of commercial space.

(Recognizing a future focus on residential with some supporting commercial at station areas)

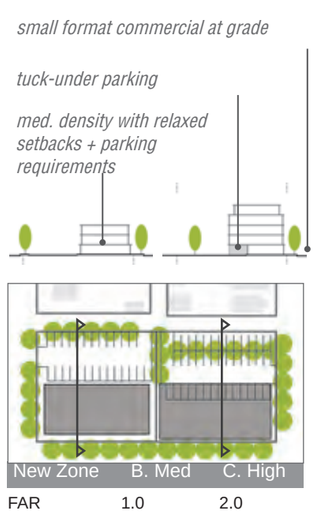
	Infill Area (m²)	Existing (Built)			A. Max (Existing Zoning)			B. Medium (New Zoning)			C. High (New Zoning)		
		FAR	Com. m²	DU	FAR	Com. m²	DU	FAR	Com. m²	DU	FAR	Com. m²	DU
B3	52,370	0.28	14,860		0.75	39,280		1.0	13,090	490	2.0	15,710	1,115
B4	94,000	0.26	24,000		0.50	47,000		1.0	23,500	880	2.0	28,200	2,000
B5	9,000	0.96		110	10.0	4,500	1,070	1.0	2,250	80	2.0	2,700	110
B5C	20,000	0.20	4,000		7.0	10,000	1,630	1.0	5,000	190	2.0	6,000	250
TOTAL	191,000	0.29	42,860	110	1.72	100,780	2,700	1.0	43,840	1,640	2.0	52,610	3,475

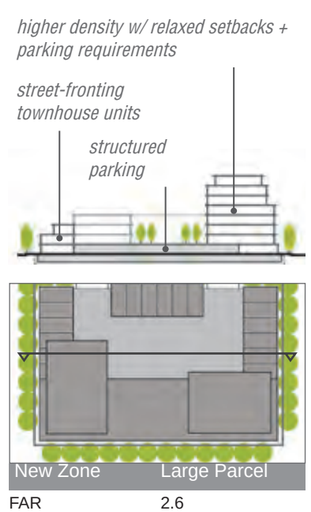
Table 2.04 - 22nd Street Infill Potential

Development Permitted Under Existing Zoning



Potential New Development Typologies (FAR 1.0 to 2.6)





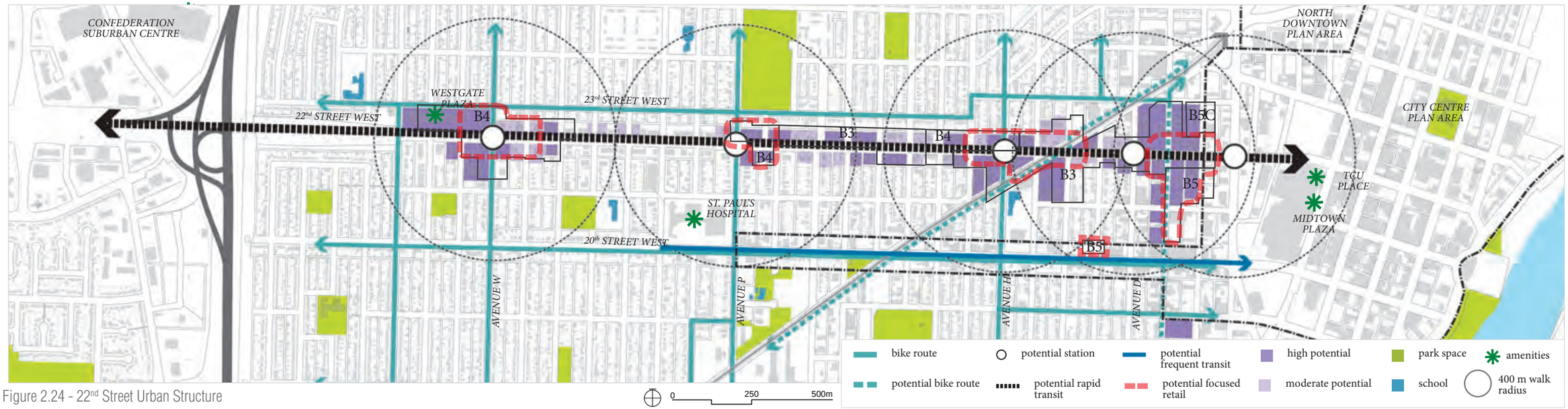


Figure 2.24 - 22nd Street Urban Structure

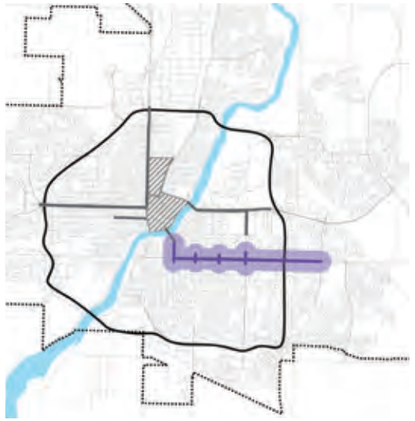


Figure 2.25 - 8th Street Context Map

8th STREET

Infill Suitability

8th Street is defined by it's function, character and context:

- **MOVEMENT:** 8th Street is an important east-west mobility corridor providing access to the Downtown
- **AUTO-ORIENTED:** The corridor itself is auto-oriented but adjacent residential neighbourhoods are characterized by more walkable, pedestrian-oriented development
- **OPPORTUNITY:** Large parcels adjacent to planned rapid transit offer excellent opportunities for future transit-oriented infill development

Figure 2.26 - 8th Street Existing Condition

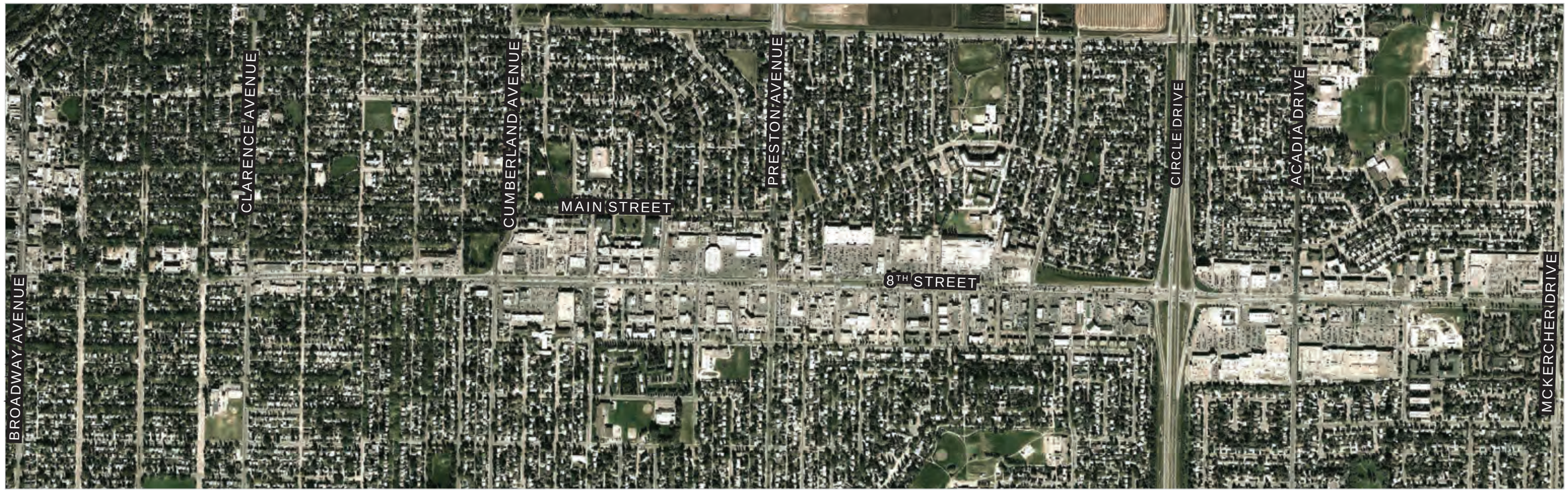
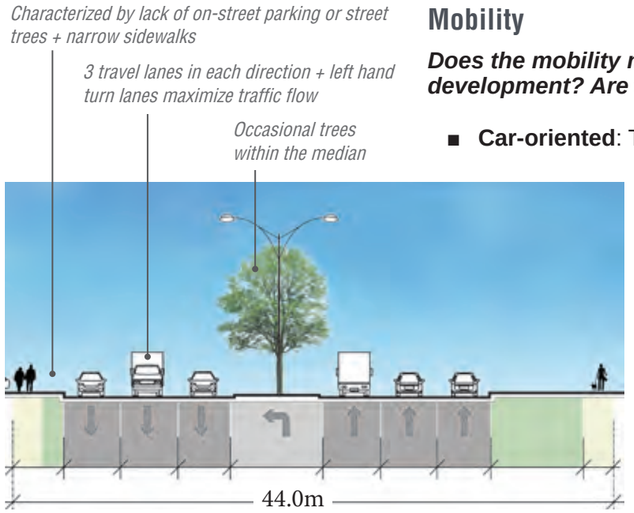


Figure 2.27 - 8th Street Corridor



Mobility

Does the mobility network support transit-oriented development? Are there opportunities to improve it?

- **Car-oriented**: The auto-oriented nature of 8th Street doesn't currently support TOD
- **Pedestrian opportunities**: Adjacent pedestrian-friendly streets could be extended to include 8th Street
- **Transit:** Rapid transit planned along 8th Street will support TOD
- **Cycling**: The disconnected bike network doesn't provide adequate access

Development Feasibility

Does infill and intensification make economic sense? Can the City improve the viability of infill development?

- **Strip commercial:** In many instances commercial along 8th Street is thriving; however, there is potential to intensify development following public investments in transit infrastructure
- **Large parcels:** Many of the parcels along 8th Street are large, reducing the need to consolidate properties
- **Proximity to attractive neighbourhoods:** Adjacent neighbourhoods, particularly close to Broadway Avenue can help to increase development feasibility on 8th Street
- **Zoning:** Reducing parking requirements will open parcels up for new development.

OPPORTUNITIES

- Extend existing grid pattern street network through large parcels fronting 8th Street
- Develop a more comfortable, pedestrian-scale for 8th Street to support new transit-oriented development
- Enhance active transportation facilities at crossings to mitigate the barrier effect of 8th Street
- Extend the existing bike network particularly additional east-west 'off-8th Street' routes that provide access to major retail areas

Figure 2.28 - Existing Street Design of 8th Street (Cumberland Avenue to McKercher Drive)

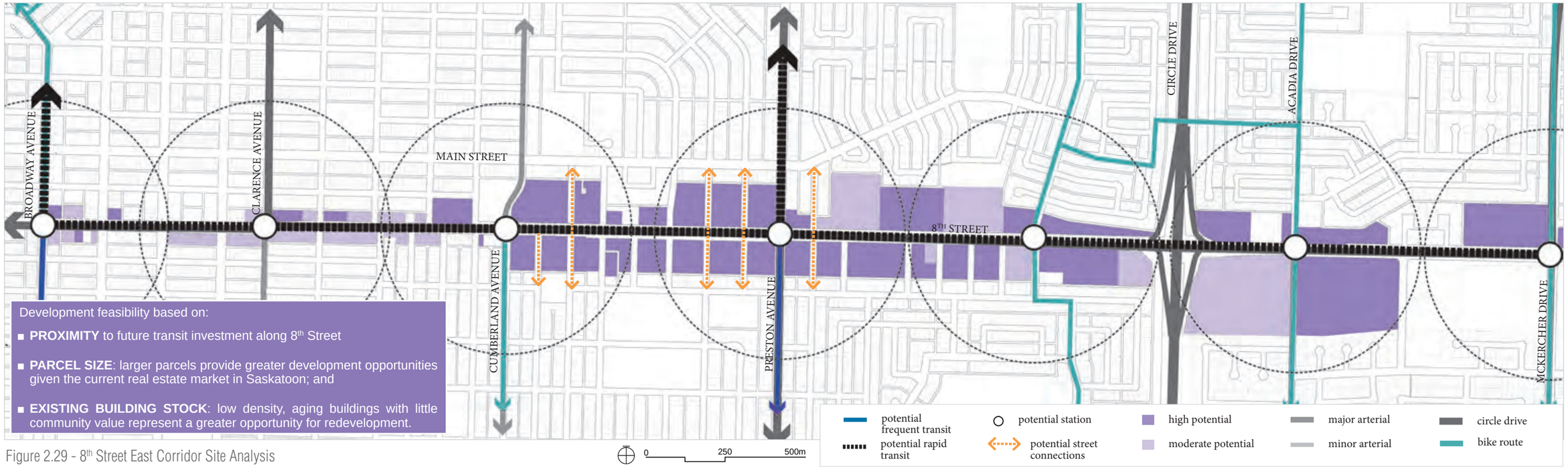


Figure 2.29 - 8th Street East Corridor Site Analysis

OPPORTUNITIES

- Focus higher density transit oriented development next to planned rapid transit
- Provide opportunities for smaller-scale pedestrian-oriented retail development along 8th Street
- Maintain small-scale institutional uses along 8th Street to support employment diversity
- Redevelopment is required to undertake frontage improvements (i.e. filling in missing sections of sidewalks) that can serve to enhance pedestrian connectivity, safety and character.

Livability

Is this someplace people want to live? Can infill support a more vibrant, unique community?

- **Compact communities:** Compact residential neighbourhoods adjacent to 8th Street could support and benefit from new transit-oriented development
- **Commercial corridors:** 8th Street is primarily car-oriented, strip commercial; however, Broadway Avenue is more pedestrian-oriented and the extension of this character along 8th Street could help provide amenities for new residents
- **Access to green space:** The area has numerous parks and open spaces for new and existing residents
- **Cultural amenities:** Theatres, community services and local retail are clustered along Broadway Avenue

Ecology

Would new development negatively impact local ecology? Are there ways to improve ecological function?

- **Greyfield development:** Infill parcels are primarily greyfield sites that currently have little ecological value
- **Urban forest:** A healthy urban forest in single family residential areas can be linked to local parks by green streets (i.e. streets that prioritize pedestrian circulation and open space) that provide natural stormwater infiltration
- **Opportunities to improve ecology:** There are opportunities to incorporate pocket parks into larger scale development along 8th Street

OPPORTUNITIES

- Incorporate additional cultural amenities (e.g. public art) into new development along 8th Street corridor
- Design bike routes as 'green streets', with ample street trees and pocket parks, that reinforce an interconnected parks and open space network
- Incorporate pocket parks into new larger scale developments

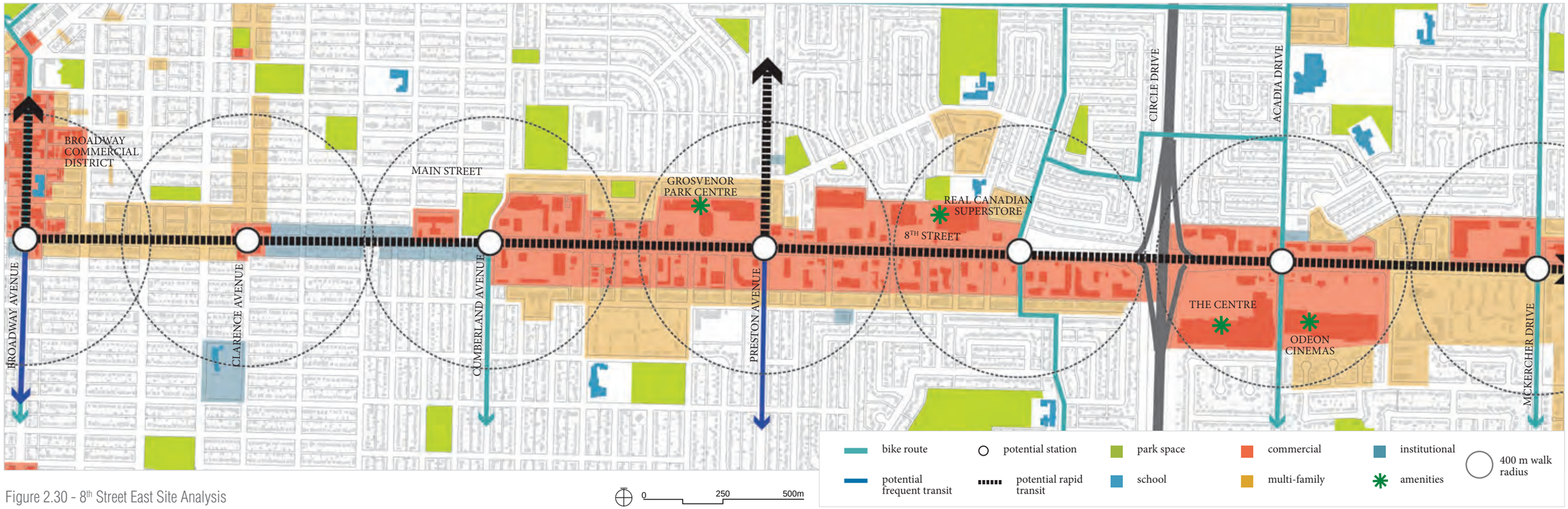


Figure 2.30 - 8th Street East Site Analysis

Infill Potential

The greatest infill potential can be found within the existing commercial districts on 8th Street (zoned B4 and B5B):

- Existing Zoned Capacity could accommodate up to:
  - 380 dwelling units, and
  - 337,030 m² of commercial space
- With slight modifications to the zoning requirements, these districts could more realistically accommodate an estimated:
  - 5,350 - 11,900 dwelling units, and
  - 224,320 - 316,830 m² of commercial space.

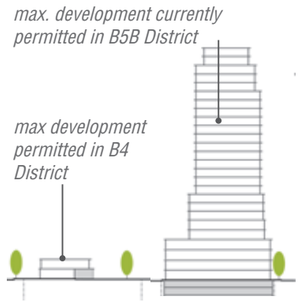
	Infill Area (m²)	Existing (Built)			A. Max (Existing Zoning)			B. Medium (New Zoning)			C. High (New Zoning)		
		FAR	Com. m²	DU	FAR	Com. m²	DU	FAR	Com. m²	DU	FAR	Com. m²	DU
M1	28,300	0.32	9,100		1.0	28,300		1.0	28,300		1.0	28,300	
RM3	5,000	0.55		35	1.5		90	1.5		90	1.5		90
B4	613,100	0.32	195,050		0.5	306,550		1.0	195,050	5,230	2.0	287,020	11,740
B5B	3,630	0.27	970		7.0	2,180	290	1.0	970	33	2.0	1,515	70
TOTAL	191,000	0.32	205,120	35	0.6	337,030	380	1.0	224,320	5,350	2.0	316,830	11,900

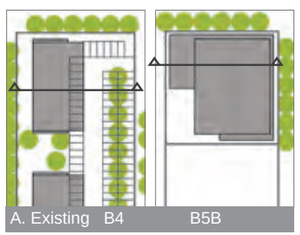
Table 2.05 - 8th Street Infill Potential

Development Permitted Under Existing Zoning

max. development currently permitted in B5B District

max development permitted in B4 District



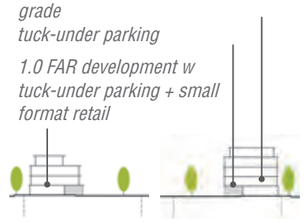


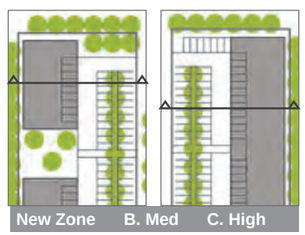
FAR	**0.45**	**7.0**
Parking	1/24m²	none
Commercial	1,980m²	1,200m²
Dwellings	0	330

Potential New Development Typologies (FAR 1.0 to 2.5)

2.0 FAR mixed use development with small format commercial at grade tuck-under parking

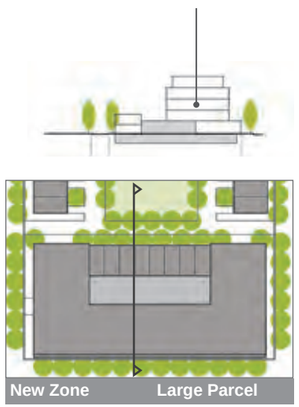
1.0 FAR development w tuck-under parking + small format retail





FAR	**1.0**	**2.0**	
Parking	1/100m²	none	
Commercial	900m²	1,000m²	
Dwellings	40 units	75	

2.5 FAR mixed use development with small format commercial at grade + mix of apt and townhouse units



FAR	**2.5**	
Parking	none	
Commercial	1,245m²	
Dwellings	100	

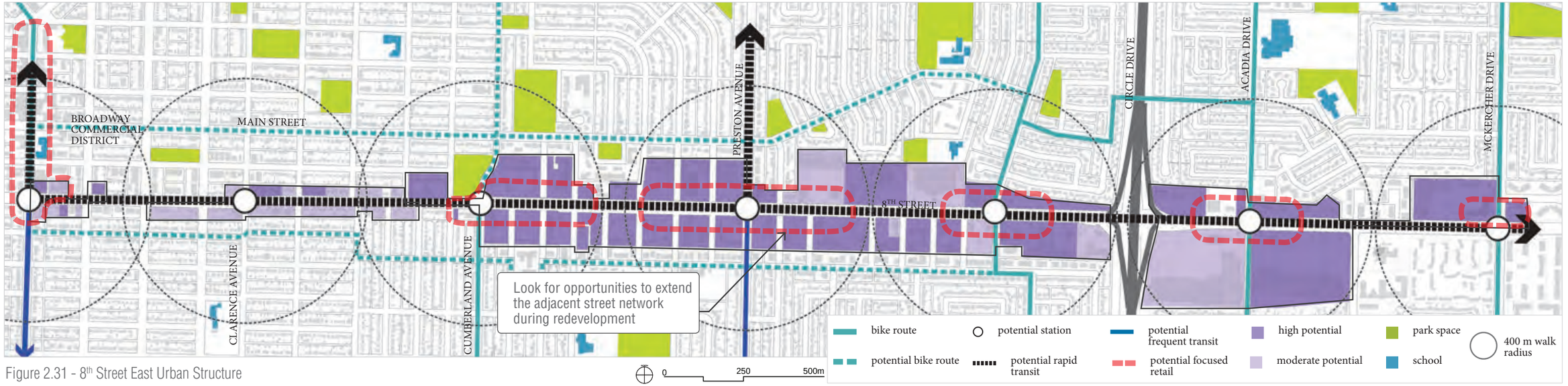


Figure 2.31 - 8th Street East Urban Structure

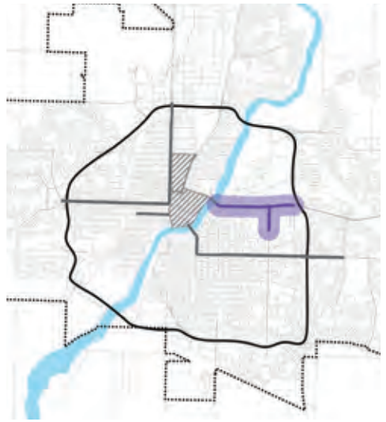


Figure 2.32 - College Drive Context Map

College Drive

Infill Suitability

College Drive is defined by it's function, character and context:

- **MOVEMENT**: College Drive is an important east-west mobility corridor providing access to the University and Downtown
- **AUTO-ORIENTED**: The corridor itself is auto-oriented but adjacent residential neighbourhoods and the U of S campus are characterized by more walkable, pedestrian-oriented development
- **OPPORTUNITY**: College Drive's context includes compact residential neighbourhoods, a major university campus and large greenfield parcels appropriate for strategic urban infill

Figure 2.33 - College Drive (looking west towards Downtown)

Figure 2.34 - College Drive

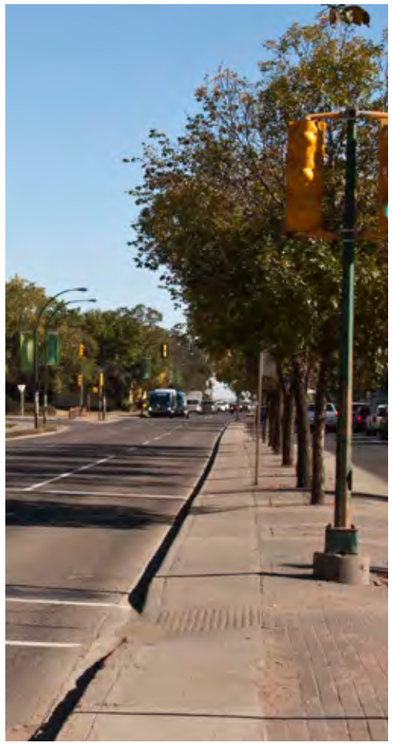


Figure 2.35 - College Drive (at street level)

Mobility

Does the mobility network support transit-oriented development? Are there opportunities to improve it?

- **Car-oriented**: College Drive is primarily car-oriented with no provision for pedestrians or cyclists east of Cumberland
- **Pedestrian opportunities**: Adjacent local streets are friendly to pedestrians/cyclists and the sidewalks/street trees on College Drive west of Cumberland could be extended east
- **Transit:** Rapid transit planned along College Drive will support transit-oriented development
- **Cycling**: The cycling network is poorly connected and should provide better access to the University

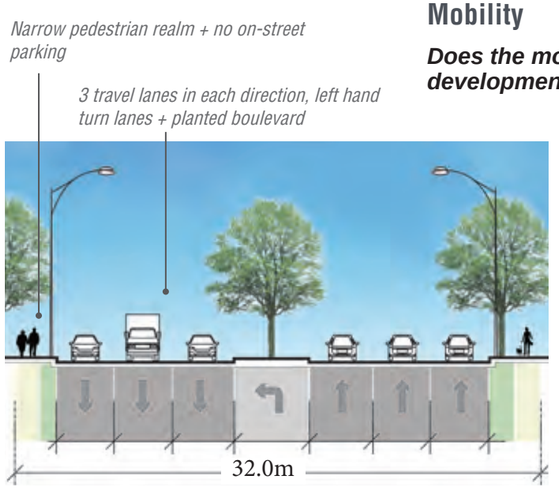


Figure 2.36 - West of Cumberland Streetscape

College Drive, west of Cumberland, has sidewalks and street trees that improve the pedestrian environment

Development Feasibility

Does infill and intensification make economic sense? Can the City improve the viability of infill development?

- **Campus lands:** The University owns the large parcels to the south of College Drive and has completed the College Quarter Concept Plan to guide redevelopment of the area between Preston Avenue and Cumberland Avenue
- **Agricultural lands:** The university owns several large parcels to the north and south of College Drive. The parcel to the north is identified for continued agricultural use at this time. However, if the University's intentions change in the future, this parcel would provide an excellent opportunity for redevelopment and connectivity to rapid transit
- **Corridor infill:** There are very few opportunities for infill development along the built up portion of College Drive west of Cumberland Avenue

OPPORTUNITIES

- Improve pedestrian and cyclist connections to the University, College Drive and existing and future housing
- Enhance pedestrian/cyclist crossing treatments to mitigate the barrier effect of College Drive, particularly as the College Quarter continues to redevelop
- Develop innovative parking solutions (e.g. reduced parking standards) that allow for affordable, higher density development while minimizing large surface parking lots

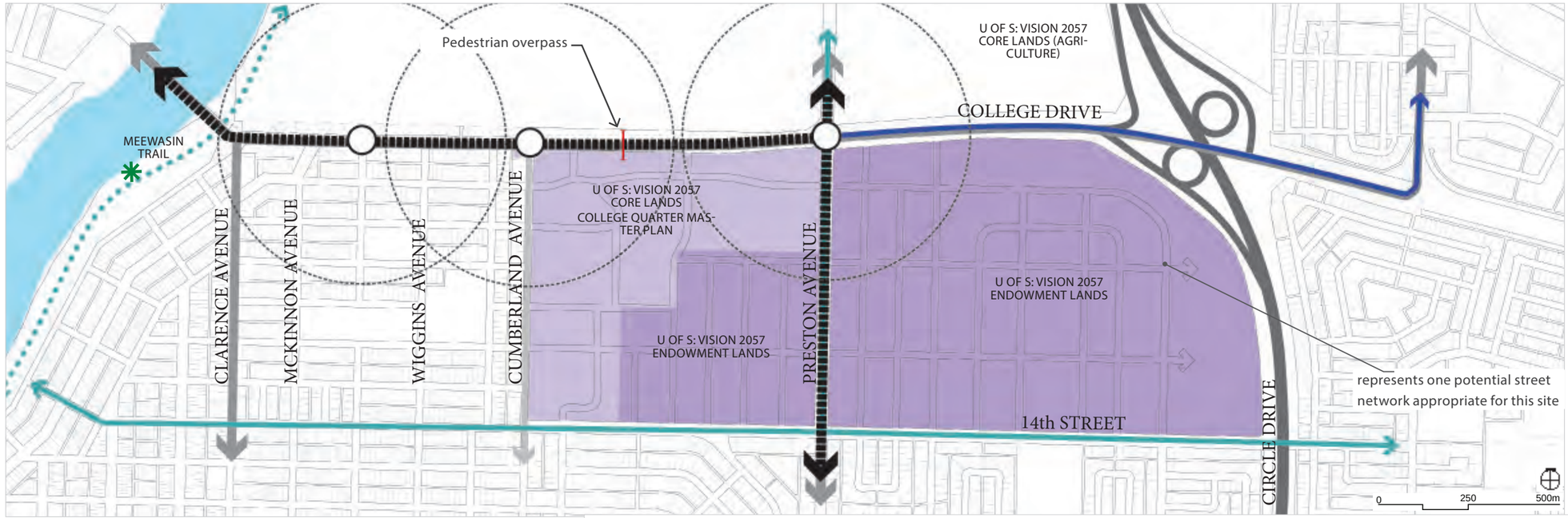


Figure 2.37 - College Drive Site Analysis

Development feasibility based on:

- PROXIMITY to future transit investment along College Drive;
- PARCEL SIZE: larger parcels provide greater development opportunities given the current real estate market in Saskatoon;
- EXISTING BUILDING STOCK: greenfield sites represent a greater opportunity for redevelopment; and
- FUTURE PLANNING: the University of Saskatchewan has identified endowment lands south of College Drive as long term mixed use communities

OPPORTUNITIES

- Incorporate cultural amenities, local serving retail and basic services into new development on or off the University campus

Livability

Is this someplace people want to live? Can infill support a more vibrant, unique community?

- **Compact communities:** Compact, residential Varsity View neighbourhood south of College Drive could support and benefit from new transit-oriented development
- **Institutional anchor:** The university is an important activity generator that can help to support local amenities, services and transit
- **Access to green space:** This area has a large community park and numerous green spaces associated with the university in addition to trails and open space along the river
- **Cultural amenities:** Facilities associated with the university can also serve the adjacent community

Ecology

Would new development negatively impact local ecology? Are there ways to improve ecological function?

- **Greenfield development:** Potential infill parcels are primarily on agricultural lands that have moderate to significant ecological value
- **Urban forest:** A healthy urban forest in single family residential areas should be protected and linked to local parks by green streets (i.e. streets that prioritize pedestrian circulation and open space) to provide habitat connectivity and natural stormwater management
- **Opportunity to improve ecology:** Community parks, garden plots and integrated stormwater management can form the backbone of any larger scale development south of College Drive

OPPORTUNITIES

- Emphasize parks, open space, urban agriculture and natural stormwater management as the backbone of any new greenfield development

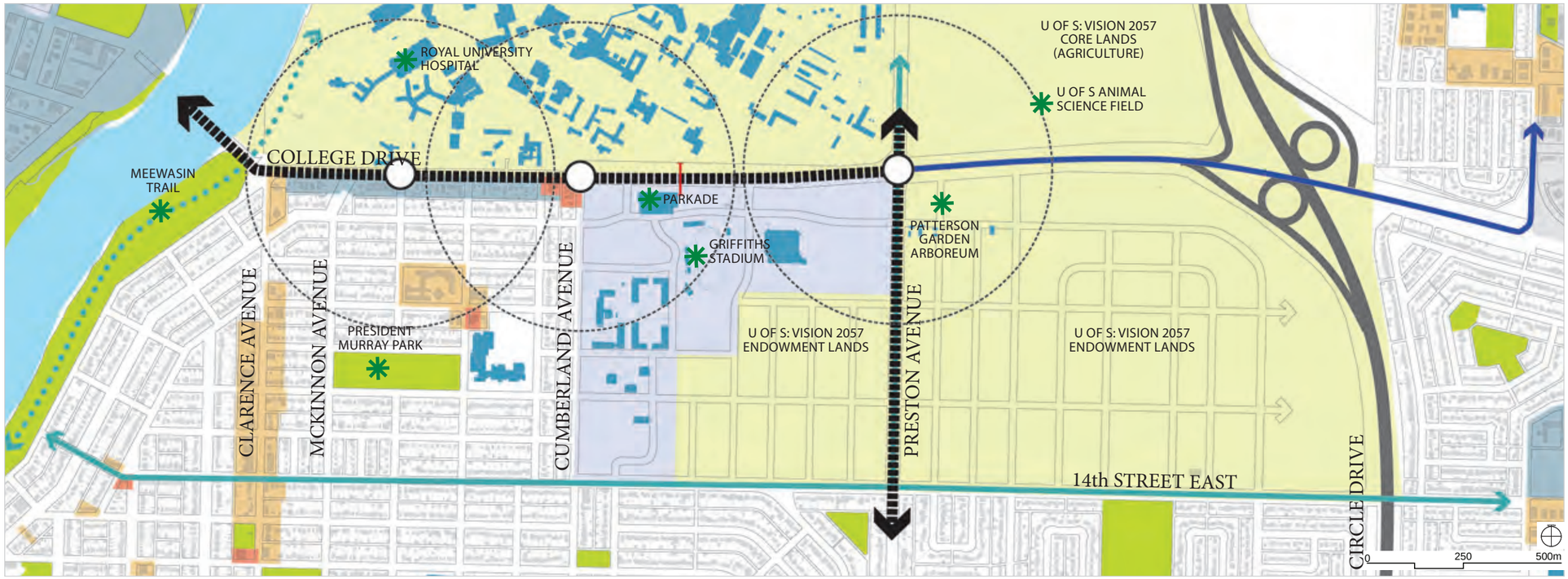


Figure 2.38 - College Drive Site Analysis

Figure 2.39 - Local Restaurant at the Corner of Cumberland and College Drive

Figure 2.40 - Existing Parkade adjacent to College Drive

Infill Potential

The greatest infill potential can be found within the University of Saskatchewan lands south of College Drive:

- Existing Zoned Capacity could accommodate up to:
  - 2,335 dwelling units, and
  - 468,880 m² of retail/office/academic/hotel space
- By updating the endowment land zoning to allow for mixed use development, these districts could accommodate:
  - 9,220 - 13,110 dwelling units, and
  - 261,340 - 295,930 m² of office/academic/hotel space

The growth identified in this section is part of the University Strategic Infill Area and will be included in the Strategic Infill Area population estimates rather than the Corridor Growth estimates. The following numbers are provided for information only. →

	Infill Area (m²)	Existing (Built)*			A. Max (Existing Zoning)*			B. Medium (New Zoning)*			C. High (New Zoning)*		
		FAR	Other m²	DU	FAR	Other m²	DU	FAR	Other m²	DU	FAR	Other m²	DU
AG	691,810	0.0	-	-	0.5	345,900	35	1.0	138,360	6,920	1.5	172,950	10,810
DCD7	242,870	0.23	22,250	625	0.88	122,980	2,300	0.88	122,980	2,300	0.88	122,980	2,300
TOTAL	934,680	0.02	22,250	625	0.60	468,880	2,335	1.0	261,340	9,220	1.34	295,930	13,110

** Other = office, academic, facilities, hotels etc.*
DCD7 estimates based on Option 1 of the College Quarter Master Plan

Table 2.06 - College Drive Infill Potential

Principles for Developing Greenfield Sites within the Existing Urban Area

Developing large greenfield sites within the existing urban area can help to alleviate development pressure at the urban fringe. Where appropriate, these sites should be developed according to the following principles to ensure they support transit use, walkability and vibrant communities.

1. **CONNECT COMMUNITIES**
   Provide a fine-grained, interconnected, and pedestrian-oriented street network that creates strong connections between new and existing neighbourhoods
2. **TRANSIT-ORIENTED DEVELOPMENT**
   Ensure a mix and density of housing, services and employment within a 5 minute walk of priority transit nodes and corridors
3. **MADE FOR SASKATOON SOLUTIONS**
   Achieve transit-supportive densities through medium density development that requires less expensive parking solutions recognizing that current land economics in Saskatoon make underground parking difficult
4. **INTERCONNECTED GREEN NETWORK**
   Ensure that an interconnected network of parks, trails and open spaces forms the backbone of new development and supports natural stormwater management, biodiversity and recreation opportunities
5. **FRIENDLY FACES TO THE STREET**
   Ensure new development presents a friendly face to the street by providing access, parking and servicing off of a rear lane

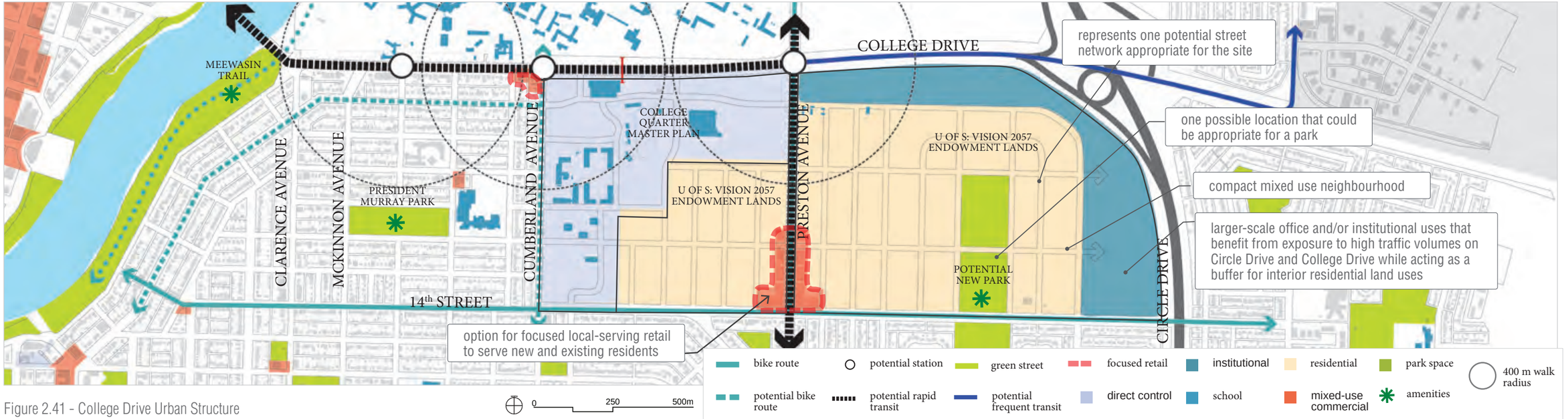


Figure 2.41 - College Drive Urban Structure

Idylwyld Drive

Infill Suitability

- **CONNECTOR**: Idylwyld Drive links the Downtown core to the main industrial district and airport
- **AUTO-ORIENTED**: Idylwyld Drive currently prioritizes automobile travel
- **OPPORTUNITY**: Redevelopment in North Downtown will spur a transformation of Idylwyld Drive and support new development along the corridor

Figure 2.42 - Idylwyld Drive Context Map

Figure 2.43 - Idylwyld Drive at 30th Street (looking north)

Figure 2.44 - Idylwyld Drive at 33rd Street (looking north)

Figure 2.45 - Idylwyld Drive Corridor

OPPORTUNITIES

- Strengthen pedestrian/ cyclist connections to and between potential rapid transit stations, the Downtown and key parks and open spaces
- Capitalize on new connections created by North Downtown Master Plan
- Enhance the streetscape of Idylwyld Drive to encourage pedestrian use
- Increase pedestrian crossings along Idylwyld Drive

Mobility

Does the mobility network support transit-oriented development? Are there opportunities to improve it?

- **Car-oriented**: Relatively high traffic volumes and insufficient pedestrian or cyclist facilities prioritizes automobiles
- **Pedestrian opportunities**: The pedestrian environment weakens along Idylwyld Drive as it nears Downtown
- **Transit:** Providing rapid transit along Idylwyld Drive would help to support future transit oriented development
- **Cycling**: The existing cycling network is fairly dense adjacent to Idylwyld Drive but new east-west connections through the North Downtown would strengthen the network

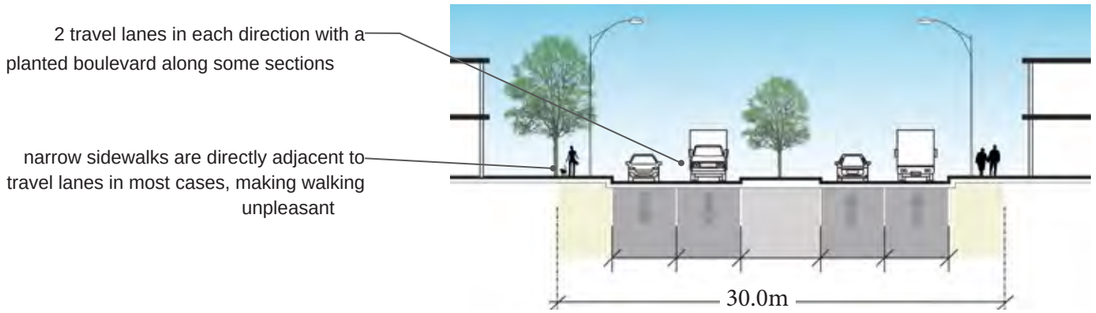


Figure 2.46 - Existing Street Design of Idylwyld Drive (North of 25th Street)

Development Feasibility

Does infill and intensification make economic sense? Can the City improve the viability of infill development?

- **Under-utilized parcels**: A number of under-utilized parcels in the North Downtown could support new development
- **Large parcels**: Large parcels along Idylwyld Drive reduce the need to consolidate properties making infill more feasible
- **Proximity to Downtown and North Downtown**: Under-utilized parcels located along Idylwyld Drive have close proximity to Downtown as well as the proposed North Downtown Plan area

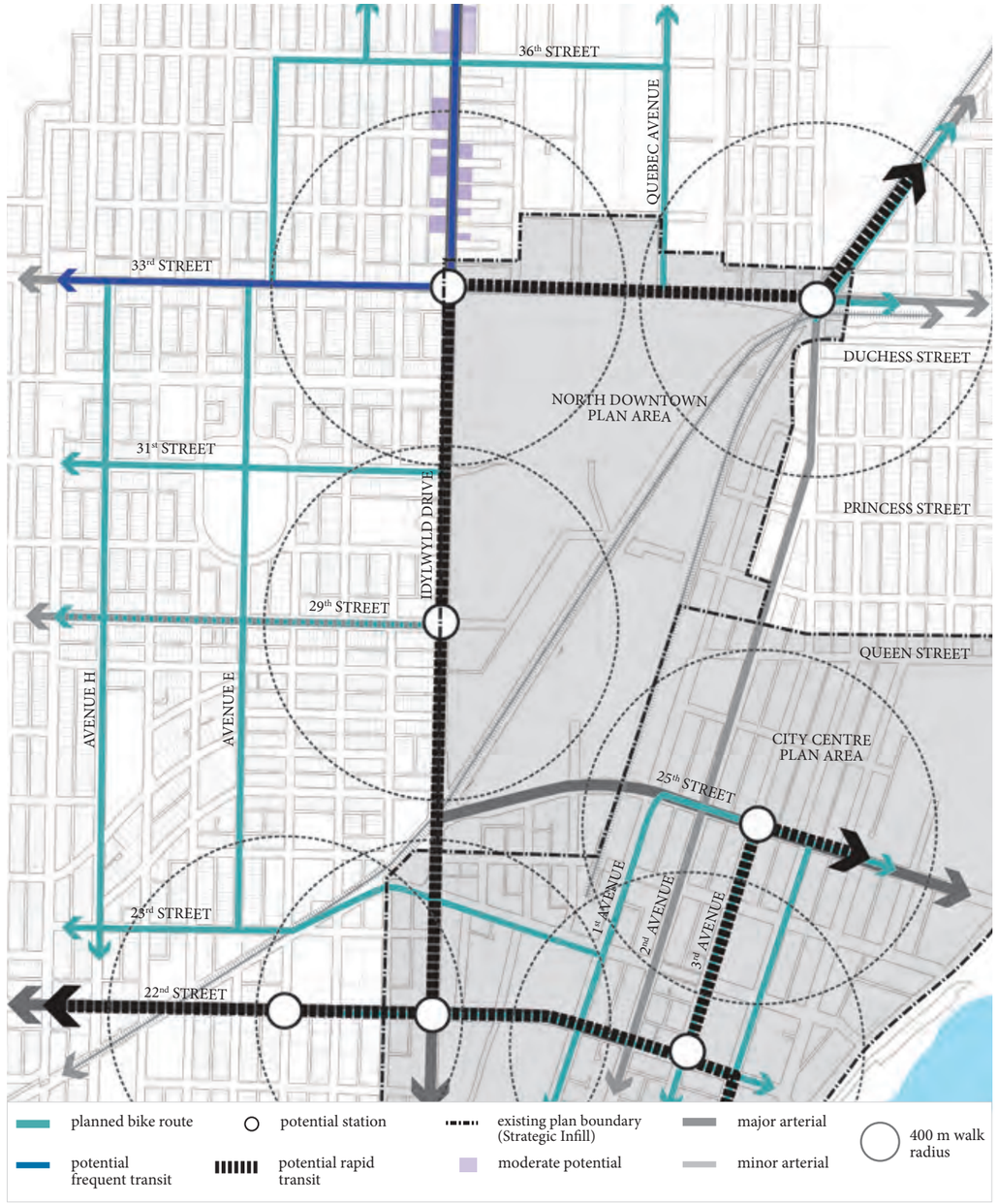


Figure 2.47 - Idylwyld Drive Site Analysis

OPPORTUNITIES

- Enhance the streetscape of Idylwyld Drive to be more attractive for pedestrians
- Capitalize on mixed-use infill opportunities to tie in with proposed North Downtown Master Plan to create a dynamic neighbourhood

Livability

Is this someplace people want to live? Can infill support a more vibrant, unique community?

- **Adjacent residential communities:** Established residential neighbourhoods to the west of Idylwyld are desirable places to live and new development in the North Downtown could provide additional amenities to support new development
- **Access to green space:** Few parks currently exist within a 5 minute walk of Idylwyld Drive but new green space will be part of future development in the North Downtown
- **Adjacent to Downtown**: The proximity of Idylwyld Drive to the North Downtown and the Central Business District make it a convenient location for new development

OPPORTUNITIES

- Ensure a consistent tree canopy along Idylwyld Drive

Ecology

Would new development negatively impact local ecology? Are there ways to improve ecological function?

- **Greyfield development**: Infill parcels are primarily greyfield sites that currently have little ecological value
- **A healthy urban forest**: Residential neighbourhoods to the west have a healthy urban forest that should be extended to incorporate Idylwyld Drive
- **Opportunity:** Pocket parks could be incorporated into larger scale development along Idylwyld Drive. As well, green streets (i.e. streets that prioritize pedestrian circulation and open space) could be provided to link parks and open space into North Downtown plan and adjacent residential neighbourhoods to the west

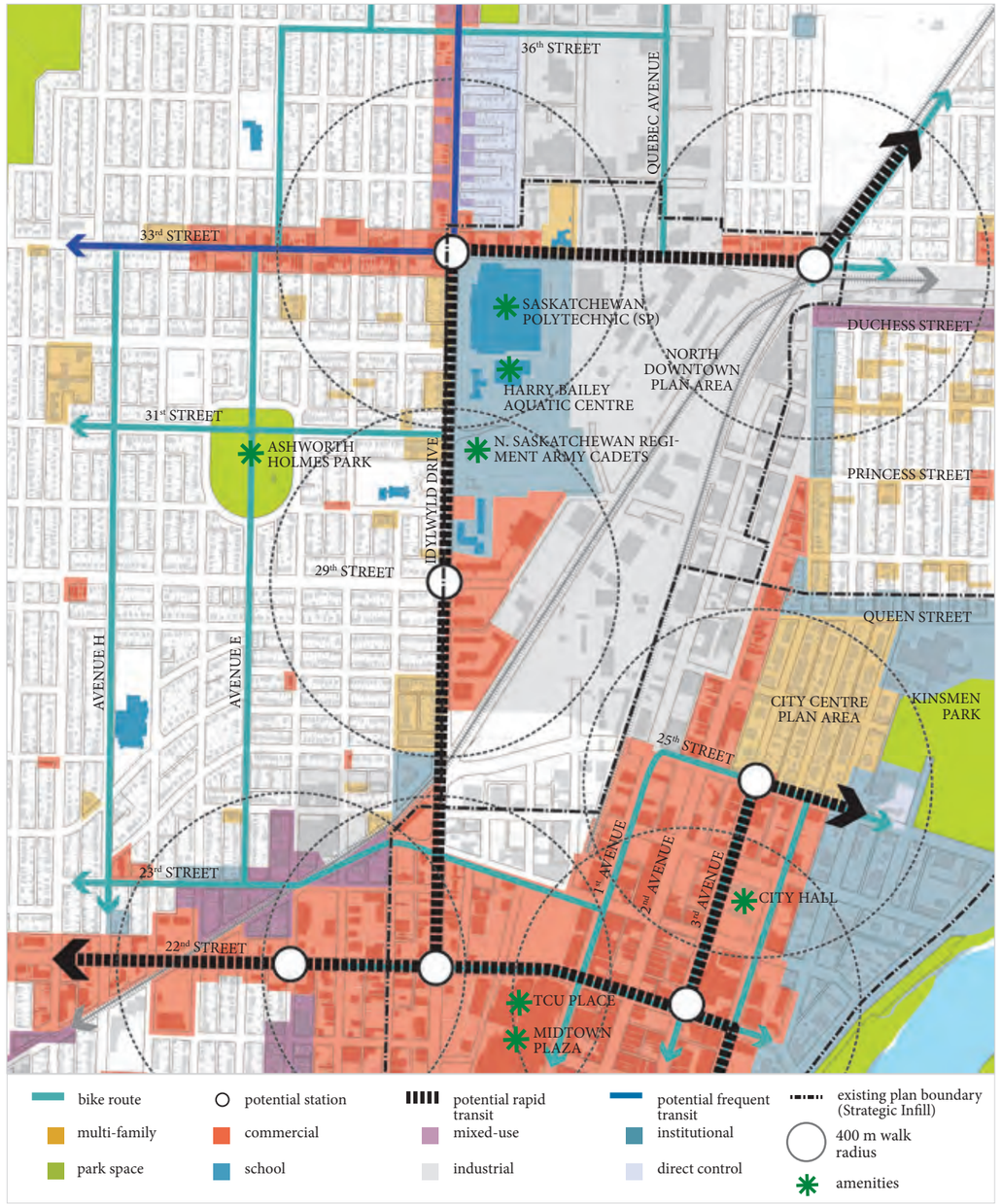


Figure 2.48 - Idylwyld Drive Site Analysis

OPPORTUNITIES

- Reduce commercial parking requirements in the B3 zone to allow for more compact development typologies
- Saskatchewan Polytechnic long term plan calls for more facilities and potential student housing adjacent to Idylwyld Drive
- Zoning may change as a result of Mayfair - Kelsey Woodlawn Local Area Plan

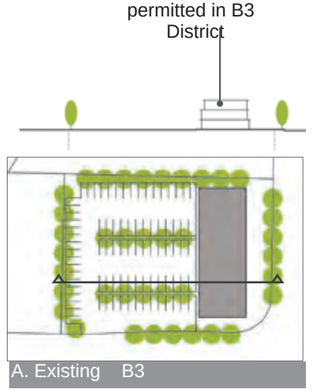
Infill Potential

The greatest infill potential can be found within the DCD2 and B3 Districts along Idylwyld Drive:

- Existing Zoned Capacity could accommodate up to:
  - 745 dwelling units, and
  - 11,750 m2 of commercial space
- With modifications to the existing zoning, these areas could accommodate an estimated:
  - 570 - 1,215 dwelling units, and
  - 7,250 - 7,750 m2 of commercial space.

Development Permitted Under Existing Zoning

max development permitted in B3 District

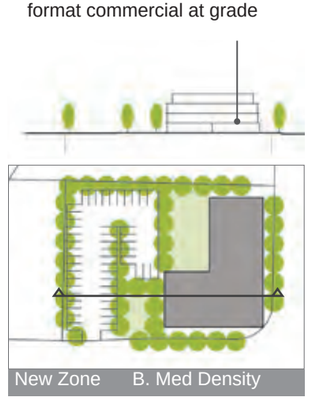


A. Existing B3

FAR 0.5
Parking 1/24m²
Commercial 2,100m²
Dwellings 0

Potential New Development Typologies (FAR 1.0 to 2.0)

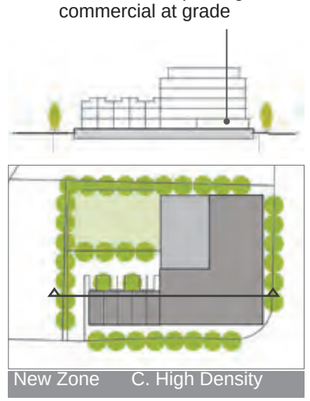
1.0 FAR mixed use development with surface parking + small format commercial at grade



New Zone B. Med Density

FAR 1.0
Parking 1/100m²
Commercial 840m²
Dwellings 14

2.0 FAR mixed use development with surface parking + commercial at grade



New Zone C. High Density

FAR 2.0
Parking none
Commercial 1,140m²
Dwellings 75

	Infill Area (m²)	Existing (Built)			A. Max (Existing Zoning)			B. Medium (New Zoning)			C. High (New Zoning)		
		FAR	Com. m²	DU	FAR	Com. m²	DU	FAR	Com. m²	DU	FAR	Com. m²	DU
DCD2	42,510	0.24	-	80	1.5	4,250	745	1.0	4,250	480	2.0	4,250	1,010
B3	7,540	0.15	1,120	-	0.75	7,500	-	1.0	3,000	90	2.0	3,500	206
TOTAL	50,050	0.24	1,120	80	2.1	11,750	745	1.0	7,250	570	2.0	7,750	1,215

Table 2.07 - Idylwyld Drive Infill Potential

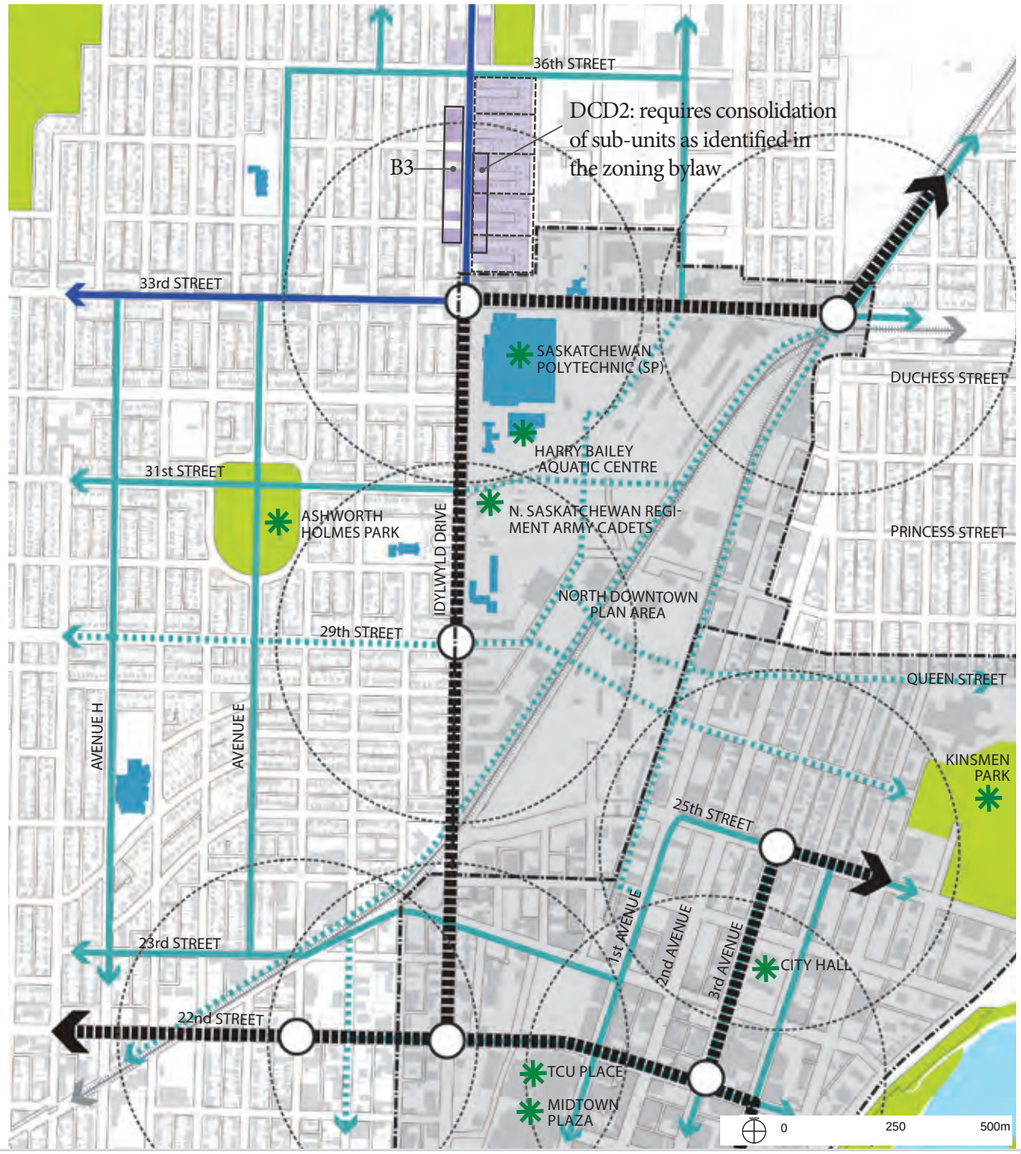


Figure 2.49 - Idylwyld Drive Urban Structure

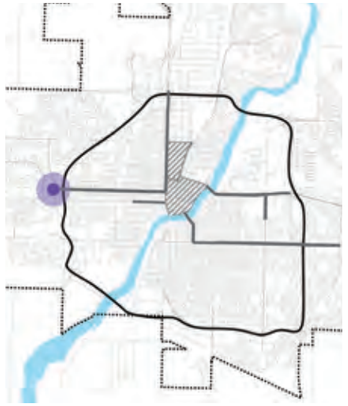


Figure 2.50 - Confederation Suburban Centre Context Map

Confederation Suburban Centre

Infill Suitability

- **NODE:** Confederation Suburban Centre is an important retail node in Saskatoon that serves local and regional traffic
- **AUTO-ORIENTED:** Confederation Suburban Centre is primarily auto-oriented with large surface parking lots, wide streets and few pedestrian connections
- **OPPORTUNITY:** The location of Confederation Suburban Centre supports larger-scale retail that can become a catalyst for new mixed-use transit-oriented development. There is a high opportunity for investment based on the aging infrastructure and building stock

Figure 2.51 - Aerial View of Confederation Suburban Centre (and surrounding context)

Figure 2.52 - Confederation Drive at Confederation Suburban Centre (looking south)

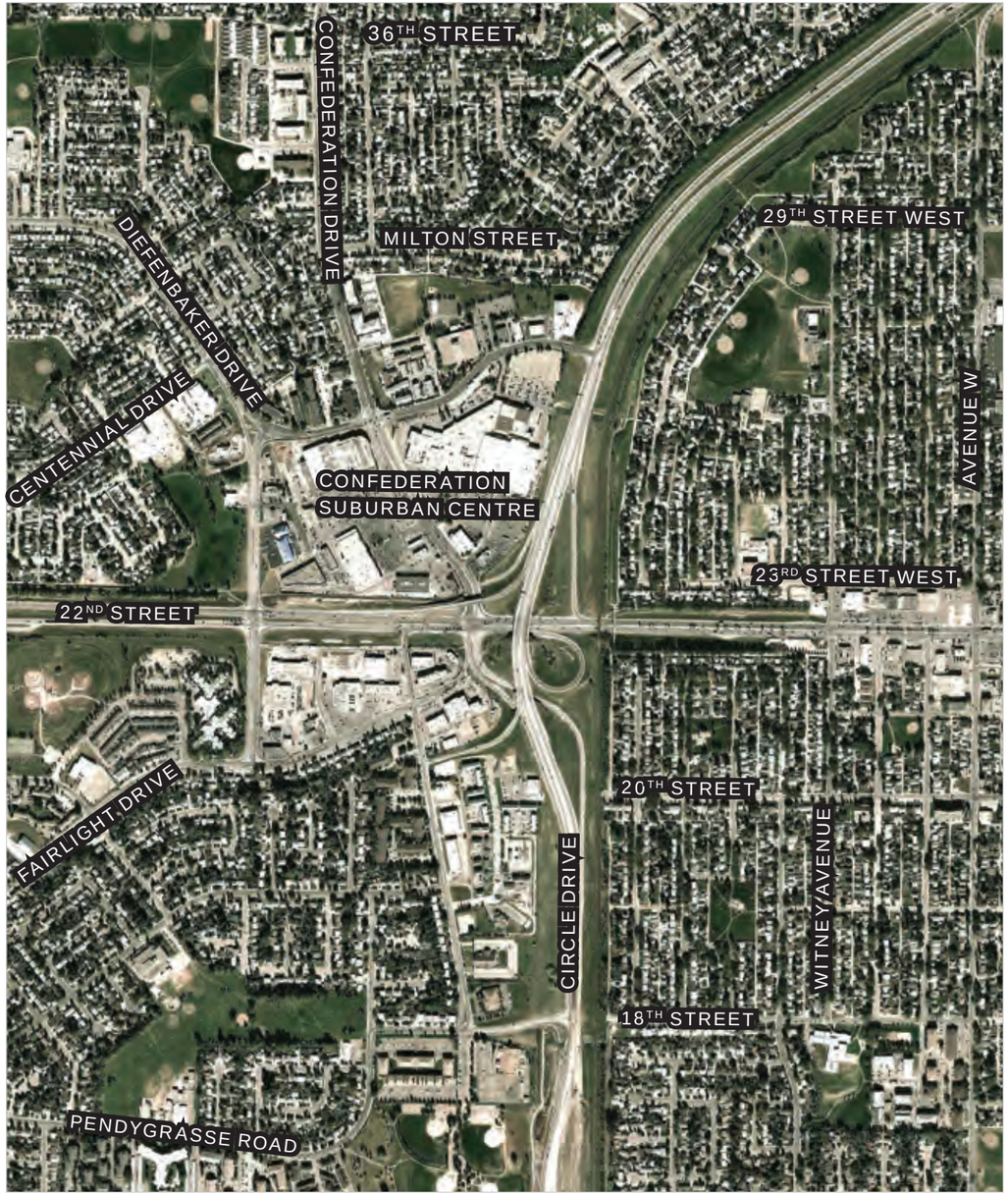


Figure 2.53 - Confederation Suburban Centre Node

OPPORTUNITIES

- Extend pedestrian/ cyclist routes through the mall site and provide connections to future transit
- Humanize streets by minimizing lane widths, turning radii and spacing between intersections/pedestrian crossings
- Locate a future rapid transit stop to maximize access to existing and future development
- Reduce commercial parking requirements to promote a more compact form of development

Mobility

Does the mobility network support transit-oriented development? Are there opportunities to improve it?

- **Car-oriented:** streets within and adjacent to Confederation Suburban Centre are car-oriented with wide lanes and turning radii to maximize travel speeds
- **Lack of pedestrian connectivity:** streets that are designed primarily for cars and large surface parking lots act as barriers to pedestrian movement
- **Transit:** Rapid transit planned along 22nd Street could support transit oriented infill opportunities
- **Cycling:** cycling routes stop short of actually providing access to the Confederation Suburban Centre site

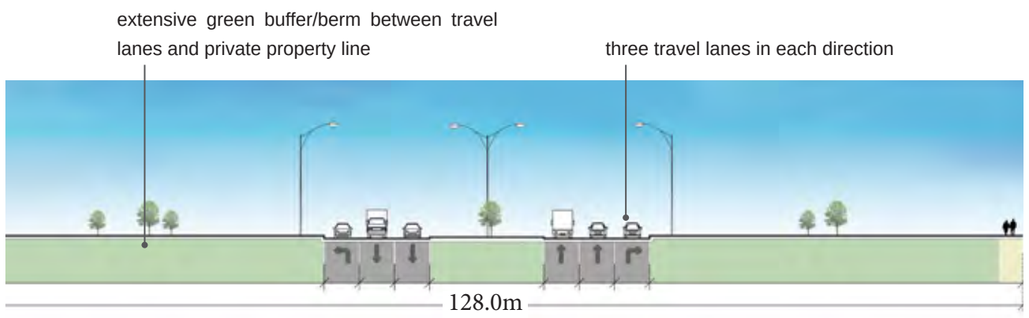


Figure 2.54 - Existing Street Design of 22nd Street Adjacent to Confederation Suburban Centre

Development Feasibility

Does infill and intensification make economic sense? Can the City improve the viability of infill development?

- **Retail viability:** while the existing retail appears to be thriving, there is potential to intensify development following public investments in transit infrastructure
- **Surface parking + under-utilized parcels:** an abundance of surface parking provides opportunities for incremental infill, particularly along Confederation Drive
- **Large parcels:** large parcels reduce the need to consolidate properties making infill more feasible
- **Regional connectivity:** the site is a hub between western neighbourhoods and Downtown

Figure 2.55 - Confederation Suburban Centre Site Analysis

OPPORTUNITIES

- Provide direct and attractive pedestrian/cyclist connections to green space, amenities and planned rapid transit
- Incorporate parks and open space amenities into new development

Livability

Is this someplace people want to live? Can infill support a more vibrant, unique community?

- **Adjacent density:** A number of mid-rise apartment buildings adjacent to the mall could benefit from infill development on the mall site and the improved transit service that could be expected with an increase in residential density
- **Retail access:** Existing retail serves adjacent and potential new residents. With redevelopment there could be opportunities to improve currently weak pedestrian connections between adjacent neighbourhoods and local retail services.
- **Access to green space:** There are a number of parks in the vicinity of the mall including Atlantic Park which is directly across the street. Improving pedestrian/cyclist connections to these parks can improve overall character and function
- **Amenities:** Existing retail, office, industrial and institutional uses form a good base which can be enhanced/expanded with new development

OPPORTUNITIES

- Incorporate best practices in stormwater management into the design and construction of new buildings and landscapes
- Develop priority green streets to connect key parks and open space
- Incorporate street trees into all new streetscape designs

Ecology

Would new development negatively impact local ecology? Are there ways to improve ecological function?

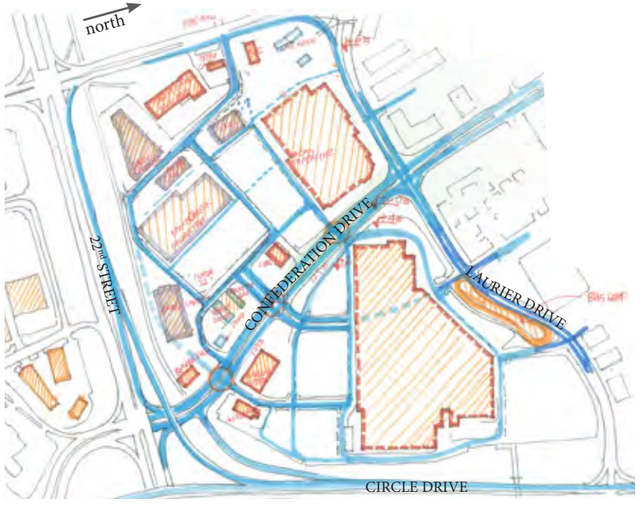
- **Greyfield development:** Infill parcels are primarily greyfield sites that currently have little ecological value
- **Urban forest:** Street trees are lacking along most streets within and adjacent to the mall site
- **Flooding:** During high rainfall/snow melt events flooding can be an issue on the mall site and adjacent streets. This will need to be mitigated through design and stormwater management initiatives
- **Opportunity:** Strengthen connection between the mall and adjacent parks with green streets (i.e. streets that prioritize pedestrian circulation and open space) and trails and explore opportunities for pocket parks to be incorporated into larger scale development within the mall site

Figure 2.56 - Confederation Suburban Centre Site Analysis

Infill Potential

EXISTING BUILDING STOCK ASSESSMENT

A number of newer buildings on the mall site will likely remain for the foreseeable future but some could be expected to redevelop over the short to medium term.



Newer building: likely retained
Older building: opportunity to redevelop
Relocate
Subject to assessment: reconstruction
Flood line

INCREMENTAL REDEVELOPMENT

There are opportunities to intensify uses along Confederation Drive and therefore create a more compact, attractive 'retail high street'

Existing building
New building

Mall sites across North America are redevelopingas the existing buildings age and property values increase. Over the longer term it is possible that development pressure will make infill on the Confederation Suburban Centre site more feasible. This could result in an estimated 3,280 - 5,580 dwelling units and up to 120,400 m² of commercial space.

Existing building
New building

	FAR	Com. m²	DU
Existing (Built)	0.32	92,000	-
Max (Existing Zoning)	0.5	141,800	-
Medium (New Zoning)	1.25	92,000	3,280
High (New Zoning)	2.0	120,400	5,580

Table 2.08 - Confederation Suburban Centre Infill Potential

Principles for Redevelopment of Existing Mall Sites

The following principles should guide the retrofit of existing mall sites to ensure they support transit use, walkability and vibrant communities.

1. STRENGTHEN / ENHANCE RETAIL

Look for opportunities to create a high quality shopping experience by creating a unique sense of place that is attractive to pedestrians

2. CREATE STRONG CONNECTIONS

Create strong multi-modal connections within the mall site as well as to surrounding residential areas and planned transit. Look for opportunities to locate retail on or close to these routes

3. REDUCE SURFACE PARKING

Reduce parking demand and look for opportunities to implement parking solutions that minimize the negative impact of large surface parking areas

4. FRIENDLY FACES TO THE STREET

Ensure new development presents a friendly face to the street by providing parking and servicing to the rear and by orienting main entrances towards main pedestrian circulation routes

5. EFFICIENT LAND USE

Ensure that roadways are designed to maximize developable parcels (e.g. establish new grid network through Suburban Centre) and balance space dedicated to cars, bicycles, pedestrians and transit

Holmwood Suburban Centre

While the corridor assessments mainly focus on major infill opportunities along existing major corridors, the Holmwood Suburban Centre stands out at as an opportunity to reimagine a future suburban centre that will take shape in a greenfield context. Within Holmwood, there is a significant opportunity in the short to medium term to facilitate the development of Transit Oriented Development in a greenfield context – this approach would mean orienting brand new development meaningfully around future rapid transit.

In this case, since the opportunity exists within a greenfield context, a site assessment was not completed in a similar fashion to the other corridor assessments. However, the following guidelines provide a high level framework for the future development of the Holmwood Suburban Centre. These guidelines could also be applied to other future greenfield transit oriented developments within the city.

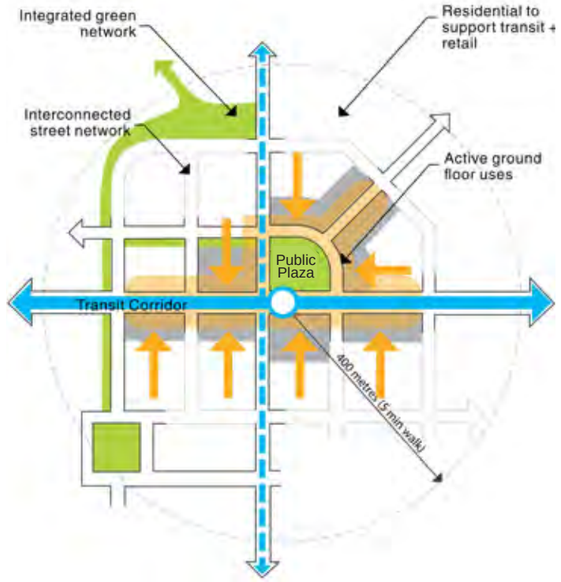


Figure 2.57 - Suburban Centres

- **Make Transit the Heart of the Community:** Focus pedestrian-oriented commercial and employment uses supported by mid- to high-density residential along the transit corridor
- **Create a Highly Permeable Street Network**: Provide an interconnected network of streets and pathways to ensure easy access to transit. Avoid block lengths longer than 160 metres.
- **Design Streets for All Users:** Minimize curb to curb widths, reduce turning radii at intersections, and extend the pedestrian realm (minimum of 4 metres including street tree boulevard).
- **Present a Friendly Face to the Street, Even Arterials!**: Minimize building setbacks to no more than 4 metres and ensure main entrances are oriented towards the street rather than parking areas.

2.5.2 Summary of Corridor Growth Potential

Based on the detailed corridor assessment, **Figure 2.58** highlights those areas identified as being the most suitable for infill growth near major corridors. These areas were determined as having the highest suitability for infill development based on the assessment criteria (i.e. mobility, development feasibility, livability, and ecology). The identified areas have the greatest immediate potential for infill redevelopment that will both be supported by the provision of rapid and frequent transit, and reinforce the viability of a high frequency transit service.

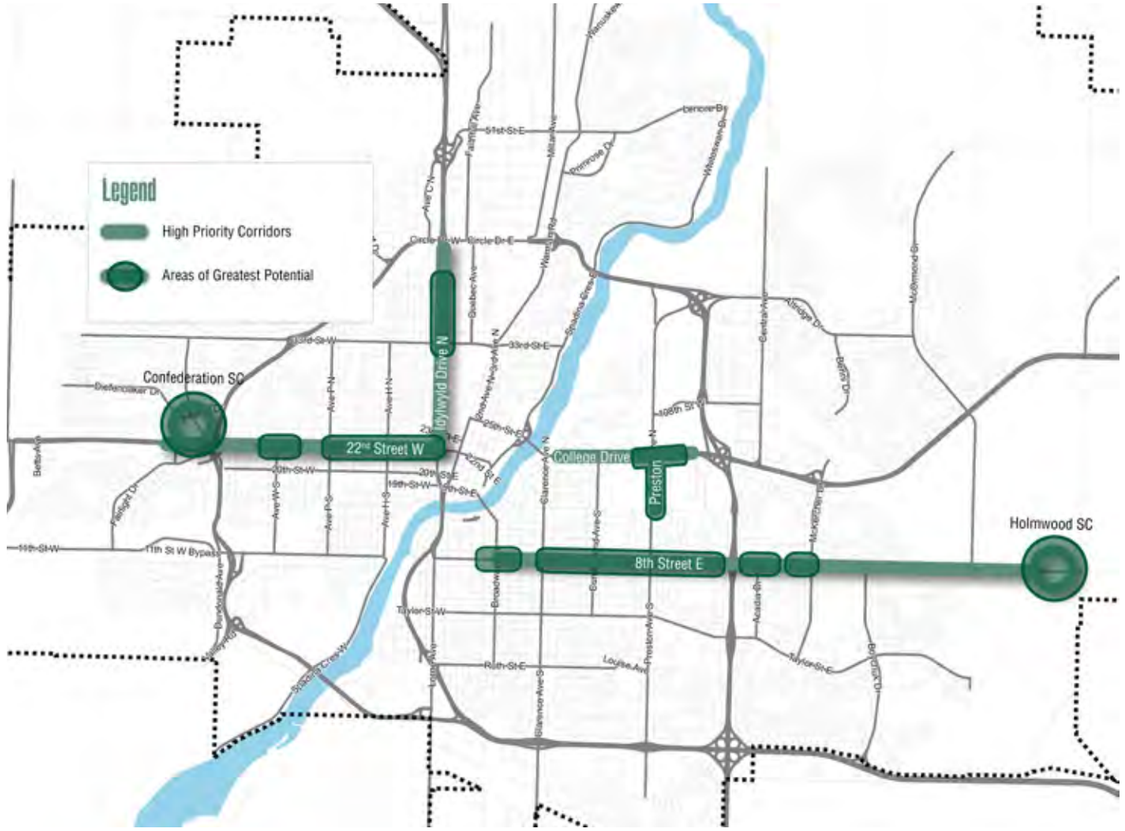


Figure 2.58 - Areas Most Suitable for Redevelopment on High Priority Corridors

Although Corridor Area Plans will be needed to work with land owners and area stakeholders to determine the most appropriate redevelopment potential, **Table 2.09** below summarizes the scale of potential growth described for each of the high priority corridors. As indicated, Corridor Growth has the potential to accommodate approximately 11,000 dwelling units (about 20,000 people) in a medium density scenario, or approximately 22,000 dwelling units (about 40,000 people) in a high density scenario. Along with this population growth there will also be new opportunities for retail, office, and institutional development, particularly near transit stations. As indicated, the additional non-residential development on all corridors may range anywhere from approximately 367,500 square metres in the medium density scenario to almost 498,000 square metres in the high density scenario.

These growth projections are for the high priority infill corridors within the existing urban area only, and they do not include projected growth in Holmwood Suburban Centre, which offers the potential for a suburban transit oriented development. These projections also do not include potential additional Corridor Growth on the medium and low priority corridors reviewed in Section 2.4.2 of this Technical Report. While some infill growth may occur on these corridors, as indicated above, it is anticipated that the majority of Corridor Growth will follow transit and occur on the high priority infill corridors that were reviewed in the detailed assessments.

	EXISTING INFILL		MEDIUM DENSITY INFILL		HIGHER DENSITY INFILL	
	COM. (m^2)	DU	COM. (m^2)	DU	COM. (m^2)	DU
1. 22nd Street	42,860	110	43,840	1,640	52,610	3,475
2. 8th Street	205,120	35	224,320	5,350	316,830	11,910
3. College Drive	0*	0*	0*	0*	0*	0*
4. Idylwyld Drive	1,120	80	7,250	570	7,750	1,215
5. Confederation	92,000	-	92,000	3,280	120,400	5,580
TOTAL	341,100	225	367,410	10,840	497,590	22,180

* Infill along College Drive is included in the Strategic Infill Area calculations

Table 2.09 - Potential Development Yields for Corridor Growth

2.5.3 Key Considerations and Recommendations

Servicing Feasibility

To complement the long-term plan for Corridor Growth, the City of Saskatoon has undertaken preliminary servicing feasibility assessments for some of the high priority corridors that could see redevelopment in conjunction with the east-west rapid transit corridor. Preliminary servicing feasibility assessments were undertaken for:

- 22nd Street;
- 8th Street;
- College Drive; and,
- Confederation Suburban Centre.

These servicing feasibility assessments reviewed the water distribution network, the sanitary sewer network, and the stormwater management system. In general, various infrastructure replacement and capacity upgrades would be required to accommodate the extent of development potential identified in the detailed corridor assessments. Nevertheless, with further planning, these infrastructure upgrades are not expected to be a significant constraint to redevelopment. More detailed infrastructure plans will need to be developed in conjunction with specific Corridor Area Plans in the future.

Economic Feasibility

The detailed corridor assessments were informed by a high-level economic analysis to provide input into the possibilities for redevelopment along major corridors. The analysis acknowledged that in markets such as Saskatoon with relatively low land costs and high construction costs, it can be challenging to create favourable conditions for redevelopment in mature areas. Therefore, the focus for infill development is typically large properties which have vacant space, such as shopping centres (e.g. Confederation Suburban Centre), University of Saskatchewan lands close to College Drive, and other underdeveloped sites along major corridors, such as retail shopping plazas and car dealerships.

The economic analysis was used to provide input into the redevelopment potential (i.e. target floor space ratios) provided for each of the areas included in the detailed corridor assessments. In general, the analysis suggests targeting floor space ratios of 1.5 to 3.0 on large sites immediately adjacent to future transit stations, and lower average floor space ratios of about 0.75 to 1.25 on sites further away from transit stations. Corridor specific conditions are illustrated in the detailed corridor assessments. More detailed market analysis will be required in conjunction with individual corridor area plans, in order to confirm the floor space ratios that are proposed in this report.

Within the short term, redevelopment within the existing urban area can be expected primarily in the most desirable areas, which combine proximity to employment, retail uses, transit, the University of Saskatchewan, the river, and other amenities. While the city's Strategic Infill areas stand out as the most attractive initial opportunities for significant redevelopment activity, investment in rapid transit will assist in creating the market conditions for redevelopment along the city's major corridors. For each of the infill corridors assessed in detail in section 2.5.1, a brief general commentary on the market conditions is provided below.

- **22nd Street** – The corridor has numerous vacant and underutilized parcels that represent significant opportunities for infill. Redevelopment activity can be expected at station areas and closer to the Downtown. This corridor offers the potential to be a major focus of redevelopment due to the presence of two anchors (i.e. Confederation Suburban Centre to the west and Downtown to the east) and the availability of larger sites.

- **8th Street** – Along this corridor, thriving commercial developments may be more difficult to redevelop in the short term. However, the many large parcels reduce the need for consolidation. Infill development will be possible on underutilized parcels with a focus on major intersections and future transit stations.

- **College Drive** – Along this corridor, large vacant sites provide a significant short-term opportunity for new masterplanned, mixed-use communities. Proximity to the University, the Downtown, and future rapid transit provide significant opportunities for higher density developments within a 400 to 500 metre radius of rapid transit stations.

- **Idylwyld Drive North** – This corridor offers proximity to the Downtown and Saskatchewan Polytechnic, but portions of the corridor with smaller parcels have more limited immediate redevelopment potential due to the need for property consolidation. Where there are larger parcels and underutilized sites, redevelopment potential will be longer term.

- **Confederation Suburban Centre** – This Suburban Centre has significant redevelopment potential as sites are currently underutilized. Nevertheless, significant redevelopment of a site such as this one typically only occurs after rapid transit has been implemented. Following rapid transit implementation, Confederation Suburban Centre could potentially support the highest densities outside of Downtown Saskatoon.

To attract Corridor Growth, the importance of attractive rapid transit cannot be understated. In general, initial redevelopment opportunities will typically be focused within one block of transit station areas. Exceptions are large-scale sites such as those sites along College Drive and at Confederation Suburban Centre.

In most cases, residential uses are the greatest beneficiary of rapid transit services. As a result, it is expected that the vast majority of Corridor Growth will be residential. Retail development is possible in close proximity to station areas and at prominent corners, and likely limited to grade level.

It is important to note that for redevelopment to occur, land values need to be high enough to justify the cost of site assembly and demolition compared to development on new lands. If relatively inexpensive, new land at the outskirts continues to come available at a rapid pace, it may be difficult to realize the market conditions for redevelopment activity. Nevertheless, in the longer term, as the city invests in rapid transit, developers will follow transit. An attractive, efficient transit system has the ability to shape and focus density on the city's main corridors. In the long term, transit investment is critical for Corridor Growth. The areas that will increase in value the most are expected to be:

- station areas at key intersections in close proximity to the Downtown; and,
- large future development sites which are themselves destinations, such as the Confederation Suburban Centre.

As such, the long-term potential for Corridor Growth is inextricably linked with the City's future investment in rapid transit.

Linkage to Rapid Transit Investment

As outlined further in Section 3 of this Technical Report, the Transit Plan calls for the establishment of an east-west Bus Rapid Transit corridor extending from a future Holmwood Suburban Centre in the east to Blairmore Suburban Centre in the west. Routing will include segments along 8th Street, Preston Avenue, College Drive, segments through Downtown Saskatoon, and a segment along 22nd Street. In addition, Bus Rapid Transit will be provided to the University Heights Suburban Centre. This routing is illustrated in **Figure 2.59**.

Figure 2.59 - Saskatoon's Proposed Red Line BRT

As indicated, Bus Rapid Transit will be implemented in phases, with initial phases linking the University of Saskatchewan to Downtown, with a subsequent phase focused on the 22nd Street corridor prior to completing the corridor. Given the ability of rapid transit investment to reinforce the urban structure and act as a catalyst for Corridor Growth, plans for Corridor Growth will generally coincide with the planned investment in rapid transit.

Recommended High Priority Focus Areas

Consistent with the Transit Plan, Corridor Growth will occur in a phased manner to generally coincide with the establishment of the city's rapid transit network. As shown in **Figure 2.60 (following page)** , the short term priorities for Corridor Growth include:

- 22nd Street West;
- University of Saskatchewan; and,
- Holmwood Suburban Centre

Although Holmwood Suburban Centre is identified in the Transit Plan as being included in longer term phases of bus rapid transit investment, it is noted as a short term priority for detailed planning as there is an immediate opportunity to establish plans for a suburban transit oriented development in this context.

In the medium to longer term, as transit investment occurs, Corridor Growth will become a priority in additional areas, including:

- Confederation Suburban Centre;
- 8th Street; and,
- Idylwyld Drive.

The recommended approach to planning for this Corridor Growth is identified in further detail in Section 2.6 – Implementing the Plan.

2.5.4 Long Term Impact on City Growth Framework

As indicated in the detailed corridor assessments, there is long term Corridor Growth potential for approximately 11,000 dwelling units in the medium density infill scenario and approximately 22,000 dwelling units in the high density infill scenario. While Corridor Growth will be primarily residential, there will also be supporting retail, office, and institutional development, particularly near station areas. It is anticipated that the city's Corridor Growth will complement planned growth in Strategic Infill and Neighbourhood Infill areas, providing for infill development that will be critical in shaping sustainable growth in Saskatoon. This Corridor Growth is vital to establish new choices for living and carrying out day-to-day activities in well-connected urban villages, and to reinforce the establishment of an efficient, frequent transit system for Saskatoon. In short, Corridor Growth is vital to support the City's other plans for Strategic Growth and Neighbourhood Infill growth and to balance outward growth in New Suburban Areas with upward growth within the existing urban area.

The medium density scenario (with potential for approximately 11,000 dwelling units) is most aligned with current market conditions, as it is expected that significant investment in transit will need to occur as a precondition to higher density Corridor Growth. As well, it is expected that much of the city's near-term infill growth will occur in Strategic Infill areas prior to there being increased demand for residential development along major corridors outside of the city's core areas. Therefore, the high density scenario (with potential for approximately 22,000 dwelling units) reflects a more ambitious long term target.

Within the city's 500,000 population horizon, achievement of the high density scenario for Corridor Growth will require significant interventions. Examples of such interventions include

- the provision of attractive, high-frequency transit along the identified major corridors;
- establishment of a fixed urban growth boundary and phasing of greenfield development to ensure that multiple development fronts are not competing with planned infill development; and,
- incentives for redevelopment (e.g. revitalization property tax exemptions, lower off-site levies for urban infill).

As the city's rapid transit system evolves and as Strategic Infill areas develop, long-term demand for Corridor Growth will increase, and development at the levels outlined in the high density scenario will become more possible. As indicated previously, the importance of attractive transit cannot be understated as a precondition to the attraction of Corridor Growth. Therefore, in the short to medium term, the corridors expected to realize transit investment should be prioritized for Corridor Growth. In the longer term, additional corridors (including medium and low priority corridors identified in Section 2.4.2 of this Technical Report) can also be considered for infill growth, particularly as demand builds and redevelopment becomes possible.

Based on the City's current growth plans (i.e. New Suburban Neighbourhoods, Strategic Infill and Neighbourhood Infill, but no Corridor Growth), it is expected that approximately 65 percent of new growth to a 500,000 population horizon will be in New Suburban Neighbourhoods. Because of the plans for Strategic Infill and Neighbourhood Infill, this percentage of new suburban growth already represents a shift in direction. In recent years, approximately 80 percent of growth has been in a greenfield development context and 20 percent of growth has been in an infill context[1].

With the addition of Corridor Growth, there is an opportunity to continue balancing outward growth with upward growth, and to achieve a greater share of infill development throughout the city. In the medium density scenario for Corridor Growth (approximately 11,000 new dwelling units), it is projected that Corridor Growth could represent 8 percent of total growth in the city, with the proportion of growth in New Suburban Areas reducing from 65 percent to 57 percent. In the high density scenario for Corridor Growth, it is projected that Corridor Growth could represent 15 percent of total growth in the city, with the proportion of growth in New Suburban Areas further reducing to approximately 50 percent. This high density scenario represents the aspirational target for the 500,000 population horizon, and it is based on significant investment in transit in relationship to the projected Corridor Growth.

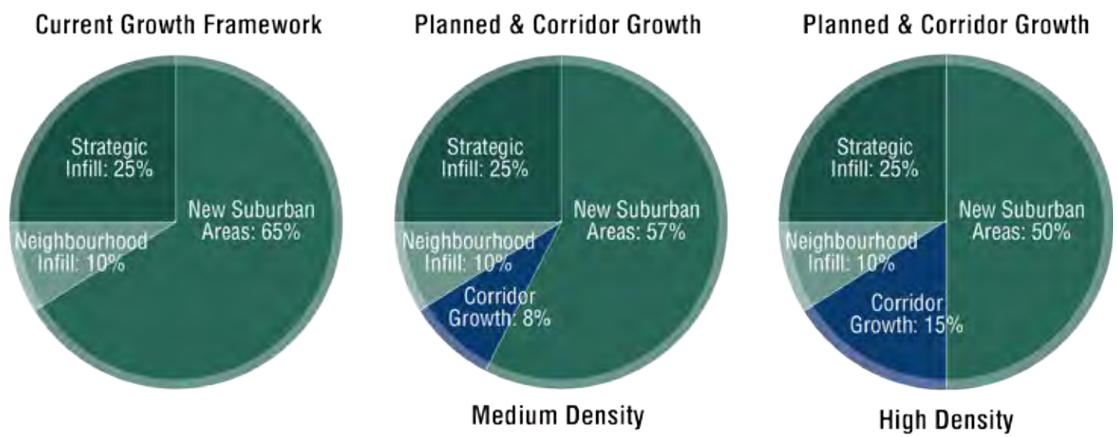


Figure 2.60 - Current Growth Framework vs Priority Growth Corridors

1 *Notwithstanding, the percentage of infill vs. greenfield development activity has fluctuated in recent years, with infill development reaching as high as 30 percent of new dwelling unit growth in the peak years for infill growth.*

2.6 Implementing the Plan

The long term plan for Corridor Growth is about creating thriving major streets with a greater scale of development, density of development, mixture of land uses, and a positive environment for walking, cycling, and transit uses. Plans for Corridor Growth are inextricably linked with the provision of attractive, frequent transit, and the phasing of plans for Corridor Growth will generally follow the phasing of investment in rapid transit, as identified in Section 3 of this Technical Report. To implement plans for Corridor Growth, a variety of tools will be used, as described below.

- **Corridor Area Plans** will need to be prepared to further define future land use plans along major corridors. A key goal of Corridor Area Plans is to provide for redevelopment that reinforces the provision of attractive, frequent transit along the city's major corridors. The Corridor Area Planning process is laid out in detail in the Corridor Area Planning Process Guide.
- **Transit Oriented Development (TOD) Design Guidelines** have been prepared to establish the framework for development in proximity to future rapid transit stations. These guidelines provide a range of development typologies for different conditions. The guidelines will be utilized and refined through the Corridor Area Planning process.
- A **Complete Streets Policy and Design Guide** will be prepared to provide direction to accommodate all anticipated users of public right of way. It will also direct planners and engineers to work with the community and developers to ensure that land uses are integrated and contribute toward a people-oriented street environment.
- **Policy and Regulatory Changes**, such as changes to the City's Official Community Plan and Zoning Bylaw, will be required to implement the directions contained in this Growth Plan.

2.6.1 Corridor Area Planning

While the **Growth Plan** provides the overall framework for Corridor Growth, corridor area will be prepared to further define future land use plans along major corridors. The corridor area planning process provides the city, property owners, residents, businesses and other stakeholders (e.g. community groups) with an opportunity to consider and facilitate changes along major corridors, while also ensuring that any changes are sensitive to the overall community character. It is anticipated that initial corridor area plans will focus on areas experiencing investment in rapid transit and demonstrating characteristics conducive to significant redevelopment. Subsequent corridor area plans will also include other key corridors, such as those corridors with frequent (as opposed to rapid) transit, and those corridors that also demonstrate potential for redevelopment. For those corridors assessed in Section 2.5.1, corridor areas plans should incorporate the key opportunities identified in this Technical Report.

As part of the **Growth Plan,** the **Corridor Area Planning Process Guide** was prepared to provide City of Saskatoon staff and Council with a road map for the completion of plans to accommodate Corridor Growth. The Guide outlines priority areas for corridor area plans, and clarifies the goals for corridor area plans. The Guide also details services required to complete corridor area plans the potential scope of work, and a typical planning process. The intent is that the contents of the Corridor Area Process Guide can be adapted by the city to establish the terms of reference for the completion of individual corridor area plans.

Key Corridor Areas

Based on the guiding principles and the analysis undertaken as part of the Growth Plan, key plan areas were identified, as illustrated in **Figure 2.61 (following page)**. As shown, corridor area plans are organized into short term, medium term, and long term plan areas. Areas of focus or areas with the greatest redevelopment potential in the short term, have been identified within each study area based on preliminary development analysis. These areas are flexible in nature and serve as a starting point from which to consider the timing and extent of appropriate redevelopment.

Short-term, medium-term, and long-term plan areas are summarized in the following table.

SHORT-TERM CORRIDOR AREA PLANS	EXTENT
22nd Street West	22nd Street West from Idylwyld Drive to Circle Drive
University of Saskatchewan*	College Drive from Clarence Avenue to Circle Drive, and Preston Avenue North from College Drive to 14th Street East
Holmwood Suburban Centre	Holmwood Suburban Centre (study area to be determined)
3rd Avenue**	22nd Street to 25th Street

* Note: Secondary plan to be completed as collaboration between City and University of Saskatchewan

** Note: Streetscape enhancements along 3rd Avenue will implement City Centre Plan direction and will take place in conjunction with rapid transit improvements.

MEDIUM-TERM CORRIDOR AREA PLANS	EXTENT
Confederation Suburban Centre	Confederation Suburban Centre
8th Street East	Preston Avenue to McKercher Drive

LONG-TERM CORRIDOR AREA PLANS	EXTENT
Idylwyld Drive North*	22nd Street West to Circle Drive
8th Street West	Broadway Avenue to Preston Avenue

* Note: Secondary plan to build off of North Downtown Plan, which articulates plan for east side of Idylwyld Drive N from 33rd Street E to 23rd Street E.

Table 2.10 - Short, Medium and Long-term Corridor Area Plans

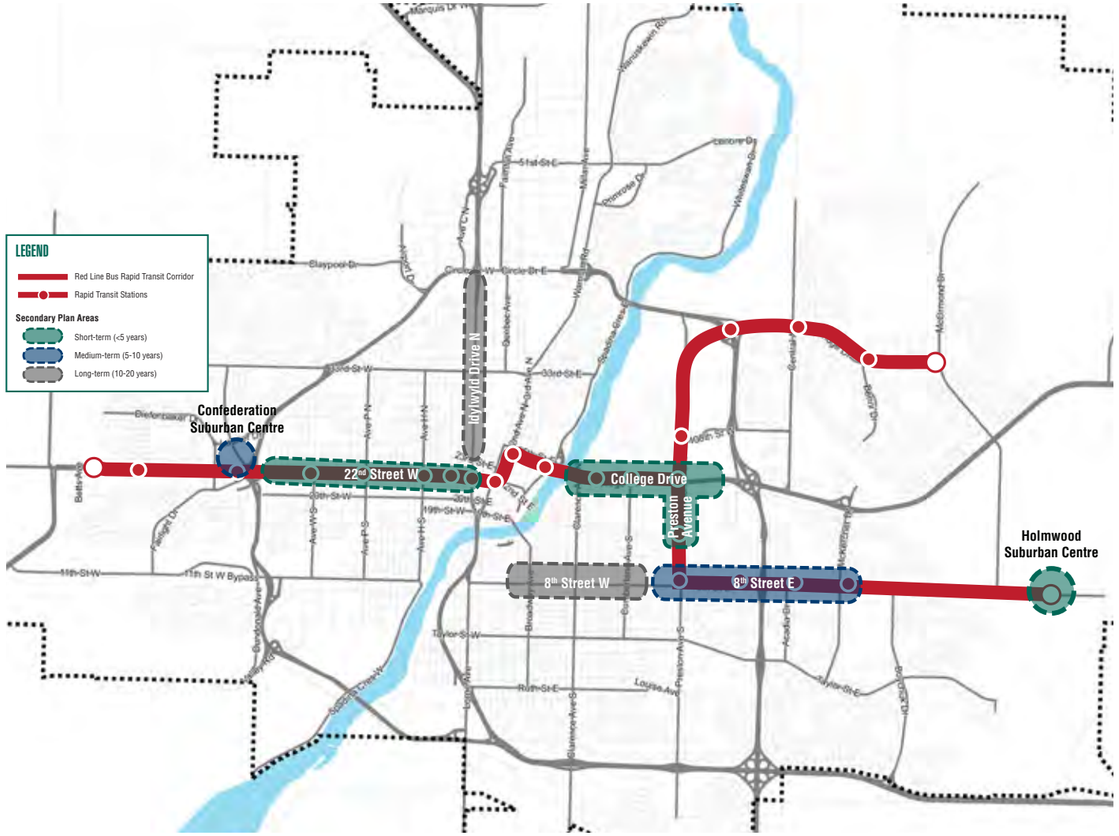


Figure 2.61 - Short, Medium and Long-term Corridor Plan Areas

The Planning Process

Within Corridor Area Plans, a five step process will be used to examine redevelopment possibilities and develop feasible land use plans for each of the priority areas. This process is illustrated in **Figure 2.62** and described in further detail in the **Corridor Area Planning Process Guide**.

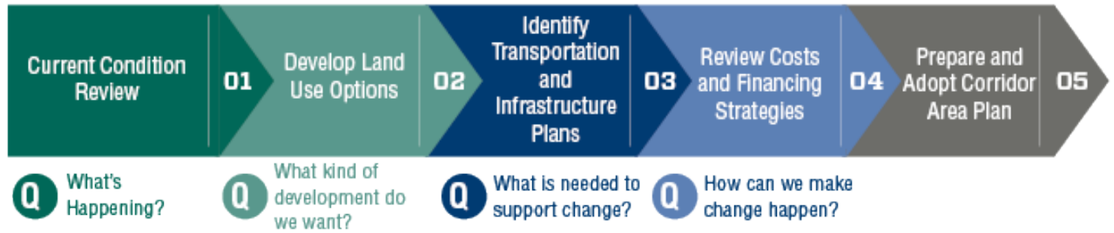


Figure 2.62 - Corridor Area Plan Process

Public Engagement Session, Source: Urban Systems Ltd.

Community Engagement

Local residents, community associations, businesses, property owners, and other neighbourhood groups will be consulted with at every step of the planning process. Engagement can assist in confirming plan area characteristics, identifying opportunities and constraints, crafting a vision for future land use, developing land use concepts, and confirming a preferred land use plan. Ongoing communications are required to provide updates on the planning process and to keep the public informed about engagement opportunities. Engagement may include a variety of tools, such as design charrettes, workshops, open houses, online surveys, project websites, use of social media, and informal engagement.

2.6.2 Transit Oriented Development Design Guidelines

Beyond accommodating more sustainable growth patterns, the principle goal for Corridor Growth is to transform several major corridors in the city and encourage land use patterns that create vibrant places and attract people. This approach means transforming the street environment as well as the scale of development, density of development, and mixture of land uses. This approach also means carefully designing new developments to create quality environments that are conducive to transit, walkers and cycling.

Transit-oriented land use patterns will serve as the foundation to achieve the goals and objectives for Corridor Growth. As part of the **Growth Plan**, **Transit Oriented Development (TOD) Design Guidelines** were developed to shape land use change and corridor treatments along priority corridors. These guidelines will be confirmed and refined as part of each Corridor Plan. As outlined in the Guide, the fundamental ingredients shaping the success of Corridor Growth include:

- **Street Design for All Users**. Streets should be designed for users of a variety of modes of transportation, as well as provide a universally accessible and friendly environment for pedestrians. Transit stations will be well-connected, visible and accessible, and designed to have minimal impact on traffic flow.

Photo: City of Saskatoon

- **Compact Mixed Use**. Encouraging compact, mixed-use development around rapid transit is key for establishing a robust and well-used transportation system. A mixture of commercial, residential, office and civic uses along rapid-transit corridors will create vibrant and well connected communities. Providing amenities, employment and activities around transit stops will create liveable centres and ensure use throughout the day.

Photo: Perkins+Will

- **Fine Grained Neighbourhood Structure**. A key to having a walkable neighbourhood is ensuring a fine grained block structure. Activating laneways and encouraging mid-block connections for blocks with larger lengths are some ways to achieve this fine grained structure. By allowing people more ways to reach their destination, a richer urban fabric is created with more opportunities for development to tie in to the transit network. It also provides route choice for users and an easy to understand and intuitive street network.

Photo: City of Saskatoon

- **Pedestrian Friendly Buildings**. New development should never turn its back on the street. Buildings that engage with pedestrians and enhance the streetscape are an important element of successful transit-oriented development. Active ground floor uses are critical in creating a vibrant street environment. Establishing guidelines for setbacks, weather protection, glazing ratios and openings will help to create an attractive and welcoming environment for pedestrians, cyclists and drivers alike.

Photo: SitePhocus

- **Enhanced Public Realm**. Transit-Oriented Development sites provide a perfect opportunity for enhancing the public realm, which supports higher densities and private development. Small measures, such as well-designed landscaping, lighting and street furniture can dramatically enhance the public realm. Taking advantage of under-utilized spaces to create small plazas, pocket parks or gathering areas will increase the attractiveness of the streetscape. Successful public realm design will facilitate access to transit and also takes transit stops and shelters into consideration.

Photo: City of Saskatoon

- **Balanced Approach to Parking**. Ensuring parking demand and supply are balanced in a reasonable manner is another crucial aspect to successful transit oriented development. Whenever possible, surface parking will be avoided in favour of tuck-under, structured or below grade parking. Parking should also be shielded from the street and pedestrian areas. This shielding can be accomplished through planting, architectural screening or other methods.

Photo: Unknown

Building on these ingredients for success, the **TOD Design Guidelines** include guidance on general building parameters for transit oriented development, addressing the following topics:

- Connectivity;
- Street Definition;
- Height and Massing;
- Active Frontages;
- Sustainability;
- Public Realm;
- Safety and Security;
- Parking and Access; and,
- Design for Suburban Centres.

Further, the **TOD Design Guidelines** provide a range of Transit Oriented Development typologies for a range of conditions applicable along the city's major corridors. These conditions include:

- High Density Employment areas;
- High Density Mixed Use areas;
- High Density Residential areas;
- Medium Density Residential areas; and,
- Commercial Retrofit areas.

Development typologies for these conditions can be applied as part of the Corridor Area Planning process along key areas being considered for Corridor Growth.

2.6.3 Complete Streets

Traditionally, and still today, roadways in most North American communities are conservatively designed for the largest users of the road – the car and truck – and for higher than posted speeds. This practice of conservative designs has inadvertently created an urban street environment that favours cars over other users of the road such as pedestrians, cyclists, and transit users. The practice has also made for less people-oriented street design as the environments are not comfortable places for people and it is difficult for adjacent development to be close to the street.

Saskatoon has a range of experiences with urban streets. In some areas, there is a grid system and the design supports mobility for all modes and abilities of people in the community. At the same time, in other areas, there is less redundancy in the network and/or streets have been designed to minimize delays for large volumes of traffic travelling at high speeds. As such, streets are designed for vehicles and are less inviting and accommodating for pedestrians, cyclists, and transit.

As part of the Growth Plan, the City developed an early vision and principles for complete streets in Saskatoon. Building on these principles, a Complete Streets Policy and Design Guide will be developed to provide a blueprint for designing, building (retrofitting), operating, and maintaining complete streets.

What is a Complete Street?

Complete Streets are streets for everyone. They are designed to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street. In conjunction with land use, they help build strong, livable and vibrant communities.

Complete streets are also unique, and so are the guides for each community. Saskatoon is no exception, and has its own challenges and opportunities. For Saskatoon, complete streets should be designed to:

- **Enhance safety for all modes.** Appropriate facilities designed as separated or shared space enhance the safety and comfort of everyone. For vulnerable users such as pedestrians and cyclists, addressing perceived and real safety will serve to not only reduce serious collisions, but will ultimately increase mode share for these sustainable modes

Photo: Nelson Nygaard

- **Expands transportation choice.** Visibility of attractive and comfortable pedestrian, cycling and transit facilities will serve to create greater awareness of transportation choices that are available in Saskatoon. In turn, increased use of these facilities will also motivate people to consider options that can contribute toward personal and community goals

Photo: Unknown

- **Support universal accessibility.** Everyone is a pedestrian during part or all of their journey. As such, the design of sidewalks, crossings and connections with private properties can create barriers for people with physical and/or cognitive disabilities. Universal accessibility is essential to support not only people with mobility challenges, but will make public space comfortable for everyone.

Photo: Nelson Nygaard

- **Enhance economic development prospects.** Complete streets are complementary to the surrounding land uses. They serve not only to provide space for people to move around within and between communities, they also serve to provide access for people to live, work, shop and play. They can also support the development and creation of a vibrant public realm. The provision of complete streets can compliment land uses and support the economic activity by providing an extension of businesses into the street space with patios, parklets or simply with better access. In most communities, commercial property values can be higher in communities where streets are complete.

Photo: NACTO Urban Street Design Guide

- **Develop a sense of place.** Ultimately, many streets in the community should be comfortable and desirable places for people. Rather than simply moving people, complete streets should be designed as comfortable and desirable place to linger, socialize and recreate

Photo: Unknown

What does a Complete Street NOT do?

- **Is not focused solely on the automobile.** While there are some streets where the primary function is to move large volumes of traffic – such as for on-ramps to highways – there are often other or even secondary functions that must be considered in the design and configuration of the street system. In particular, where vulnerable users such as pedestrians and cyclists are present, the street design should provide for safe and comfortable facilities to enhance safety for all road users

Photo: City of Saskatoon

- **Is not focused on one street to solve everything and accommodate all modes.** In all communities, the public right-of-way for streets is often limited and even constrained. In other words, it is unlikely that the needs of all modes can be accommodated in exclusive space on one street. Although modes can be designed to share space in many instances, a network of redundant streets is often required to comfortably accommodate the needs of all modes. A grid system of streets promotes a network approach where some streets may serve cars, transit and pedestrians effectively where parallel streets may prioritize pedestrians and cyclists and serve lower volumes of traffic.

- **Are not necessarily a prescriptive design.** In most built areas of Saskatoon, the available space and uses for the existing street network are already established. Rather than look for an off-the-shelf solution or design standard, complete streets are typically created by understanding the constraints and opportunities to yield unique solutions that suit the context based on guidelines or a tool-kit of best practices.

- **Does not require an immediate retrofit to the ultimate solution**. Building new and retrofitting existing streets can be expensive. Beyond the obvious surface works, underground and above-ground utilities and property can dramatically increase the cost for even the smallest road projects. Rather than commit to the full implementation on retrofit projects, a phased approach toward implementing a complete street will allow some of the more critical matters to be dealt with in the short-term and other features to be added over time as resources are available. In this regard, complete streets may be achieved in steps particularly when transforming existing roadways to make it manageable financially. It is important that the community understand that a phased implementation is possible or even likely depending on the project. Phasing a project can also help develop community support early on, letting users experience the change as a low cost trial before full investment into the ultimate solution.

Photo: Unknown

Photo: NACTO Urban Street Design Guide

Vision for Complete Streets in Saskatoon

The City has developed the following early vision for complete streets that will continue to be refined as plans evolve.

> "Saskatoon will plan, design, operate and maintain existing and new streets to effectively support movement for people of all ages and levels of mobility by: providing appropriate facilities that support pedestrians, cyclists, transit vehicles as well as motor vehicles; and, integrating the street environment with existing and future land uses."

2.6.4 Policy and Regulatory Changes

To implement the plans for Corridor Growth, various policy and regulatory changes will be required. These changes include:

- **Amendments to the Official Community Plan**

  A comprehensive review of the Official Community Plan, the long-term policy plan guiding and directing growth, will be required to ensure consistent policy support for Corridor Growth initiatives and implementation of the Growth Plan. For instance:

  - Section 3.0 (City Form, Structure and Development Phasing) should be amended to acknowledge Corridor Growth and the Corridor Area Planning process that will be used to implement Corridor Growth. The City may also wish to review its development phasing system to ensure that there are suitable short-term urban growth boundaries that will assist in ensuring that outward growth is balanced with upward growth.
  - Section 4.0 to 8.0 (Land Use Designations) should be reviewed to ensure that land use designations along major corridors are appropriate to facilitate the vision articulated in this Growth Plan. For example: a) Suburban Centre designations should encourage the development of vibrant, mixed-use transit-oriented developments; and, b) the arterial commercial designation should be revisited for areas under consideration for Corridor Growth, as the designation is not conducive to the scale of development, density of development, and mix of uses envisioned for these areas. The City may wish to develop a new land use designation for areas being considered for future Corridor Growth, in order to emphasize the vastly different form of development than currently seen along many of Saskatoon's arterial roads.
  - In Section 14 (Urban Design and Design Review) and elsewhere, the Official Community Plan should reference the new **TOD Design Guidelines**.
  - Either within Section 18.0 (Implementation) or afterwards, a new section should articulate policies for the Corridor Area Planning process.

- **Amendments to the Zoning Bylaw**

  A comprehensive review of the Zoning Bylaw should be completed to ensure that bylaw supports Corridor Growth as opposed to constraining Corridor Growth. In most areas, Zoning Bylaw amendments will be required to support Corridor Growth. Zoning Bylaw amendments can be confirmed through the Corridor Area Planning Process or even at time of development. In some cases, Direct Control districts will be required for unique developments along the city's major corridors. However, in advance of the Corridor Area Planning and development processes, the City may wish to start developing new zones that support the development typologies established in the detailed corridor assessments and the **TOD Design Guidelines**. As well, the City should review its parking regulations and consider the possibility of reduced parking standards (including potential maximum requirements) for areas adjacent to rapid transit stations.

- **Amendments to Design Standards for Streets**

  To support the plans for Corridor Growth, the City will need to review its design standards for streets, including both new streets and existing streets that are being redesigned to accommodate Corridor Growth and frequent transit and rapid transit. In addition, the City will need to further develop and confirm the vision and principles of Complete Streets through public engagement, as well as implement new methods to facilitate the development of complete streets.

2.7 Financing Corridor Growth

Growing cities require more municipal services, like attainable housing, libraries and community programs, as well as more infrastructure, like water, transit, active transportation, and parks. Encouraging more sustainable land use patterns and choices for moving around Saskatoon will maximize our financial resources.

Beyond managing demands on the roadway network, growth in the urban area will make use of existing services and infrastructure. As infrastructure in this area is aging, it should be recognized that growth would largely fund expansion of the infrastructure and a small portion of the replacement costs.

Several Corridor Area Plans will be developed with the community over the next 10 years to guide growth along major corridors. Expanded infrastructure and servicing requirements will be identified along with anticipated costs and funding tools associated with corridor redevelopment.

	Planning and Design	Infrastructure and Facilities	Municipal Services
EXISTING SOURCES OF REVENUE			
Development Levies and Local Area Costs		✓	
Property Taxes and Utility Rates	✓	✓	✓
Federal/Provincial Programs	✓	✓	
EXPANDED POTENTIAL REVENUE SOURCES			
Land Value Capture		✓	✓
Land Transfer Taxes		✓	✓

Table 2.11 - Potential Funding Sources Expanded

In 2014, the City of Saskatoon commissioned a **Financing Growth Study** as part of the **Growth Plan** to better understand the general impacts of growth, new options for funding growth, and the degree to which growth affects property taxes. Today, Development Levies, funded by developers, account for approximately 90% of growth-related infrastructure costs in new suburban areas. However, this funding does not cover all costs associated with growth, such as attainable housing, new libraries, police and fire services as well as transit.

Within the established areas of the city, Development Levies and other sources have been used to expand infrastructure. However, the long-term replacement costs of infrastructure within these areas are funded through property taxes as well as through partnerships with other levels of government.

Growing cities require access to additional funding sources mainly from higher levels of government. With more than 80% of Canadians living in cities, support from provincial and federal governments is important to our success.

Saskatoon must work with the provincial and federal governments to secure new sources of revenue, including cost sharing programs with senior levels of government as well as legislation to access alternative revenue sources that have been used in other jurisdictions.

The City will explore funding strategies using existing sources of revenue and consider alternatives, where possible. A funding strategy that considers alternative sources will not only serve to recover new costs, but will incentivize desirable forms of sustainable development that will transform major roadways and create great places for people.

TRANSPORTATION FEES	e.g. Parking surcharges, cash-in-lieu of parking, vehicle registration and tolls.
LAND VALUE CAPTURE	Capture portions of the increased land values adjacent to rapid transit.
LAND REVENUE TAXES	Based on the sale of properties which are also linked to increasing value across the city.
TRANSIT REVENUE PROGRAMS	e.g. Expanded EcoPass for employers, residents & special events.

Table 2.12 - Potential Funding Sources

PART 3: TRANSIT

Public transit is a major focus of the Growth Plan, given the important role that transit service plays in supporting and shaping the growth of any city. Residents have expressed a desire for Saskatoon to have an accessible and efficient transit system with an attractive customer experience. While people will still use cars, an efficient transit system with rapid transit priority lanes will provide options to alleviate and even bypass congestion ensuring that people can move around the city quickly and easily.

There is also a community desire to link transit with the development of major corridors. In this respect, frequent transit services and attractive transit facilities will act as a catalyst for growth and support investments in rapid transit along select major corridors. New transit-oriented community development would also support various strategic goals such as access to housing options and the development of attractive, mixed-use neighbourhoods where people can work, shop and play.

The Growth Plan includes the development of a long-term transit plan which examines the feasibility of rapid transit to better serve the residents of Saskatoon.

3.1 Existing Conditions

This section of the report examines the travel characteristics and needs of transit customers in Saskatoon, in addition to examining features and performance of the transit system itself with comparisons to other communities. Data used for this technical review includes transit ridership information as well as performance reviews and comparisons collected and provided by the City as well as through other industry sources such as the Canadian Urban Transit Association. Although much of this data was gathered and analyzed prior to and at the outset of the Growth Plan (2012 and 2013), the patterns are still considered relevant for this discussion.

3.1.1 The Transit Customer

The city's transit system continues to support a growing customer base that is made up of mostly people without other means of getting around, as well as those who may have access to an automobile but choose to use transit. Before deciding where to expand Saskatoon's transit system, it is important to understand both today's customer market and potential future customer markets that transit could serve. Considerations include the composition of the customer base, the frequency of their transit use, and the locations where they are traveling. The following discussion highlights some of the known attributes of the customer base currently using the transit system today.

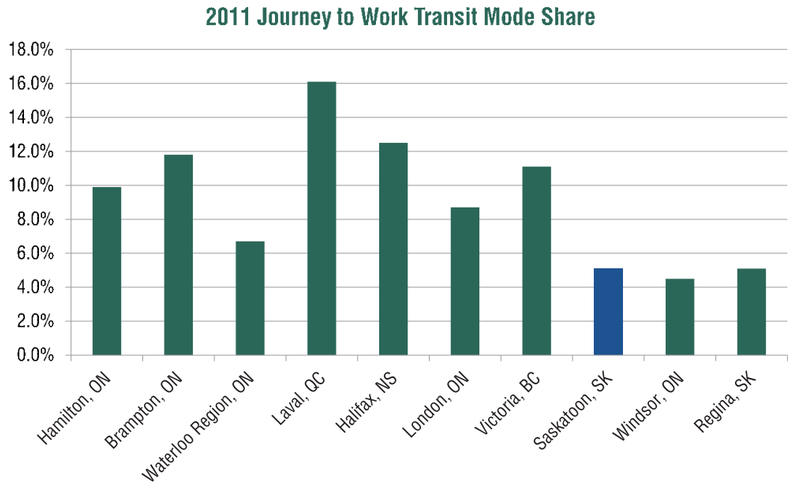


Figure 3.01 - 2011 Journey to Work Transit Mode Share

Source: 2011 Journey to Work Mode Share (National Household Survey, 2011)

- **Transit accommodates approximately 4.5% of all daily work trips.** In comparison to other Canadian communities with populations between 200,000 and 500,000 people, the proportion of people using transit in Saskatoon is relatively low, as illustrated in **Figure 3.01**. There are various factors that may contribute toward lower transit ridership. These factors include the transit customer experience, land use patterns, and other transportation system characteristics.

- **Transit serves over 9 million passengers a year**. **Figure 3.02** illustrates the growth in system ridership over a five year period. Between 2008 and 2012, transit ridership grew from slightly more than 8 million to over 9 million passengers – an increase of 15%, or about 4% per year. This increase in ridership exceeds growth in annual service hours during the same period (approximately 2% per year).

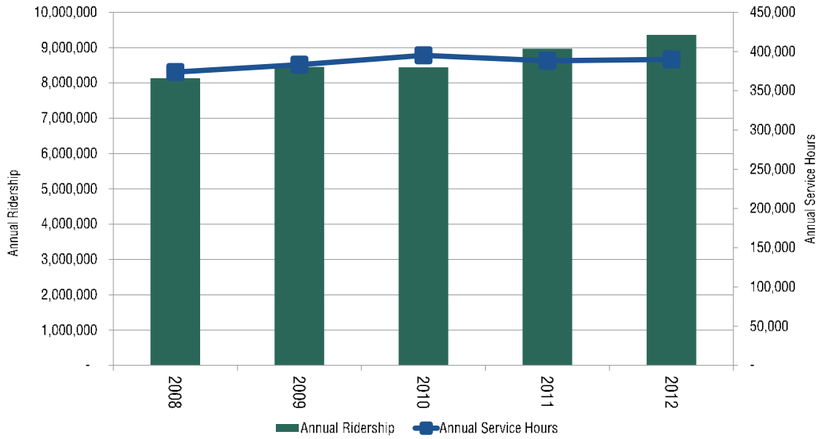


Figure 3.02 - Annual Ridership and Service Hours

Source: 2012 Saskatoon Transit Annual Service Report

- **The transit system serves approximately 25,000 customers every weekday. Figure 3.03** below illustrates daily boardings on transit for each day of the week. Transit ridership on Fridays is slightly lower than the Monday through Thursday periods. Additionally, weekend transit ridership levels are approximately 25% to 30% of typical weekday ridership levels. These daily patterns are typical of other cities in Canada.

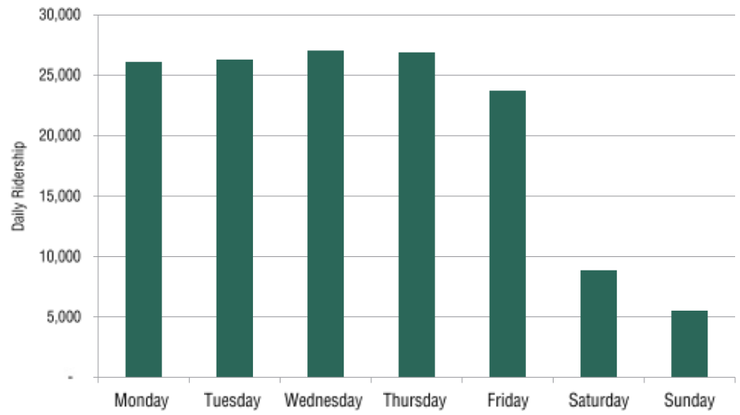


Figure 3.03 - 2012 Daily Transit Ridership

Source: Farebox Data (March 20 - 31, 2012)

- **On weekdays, over 55% of all transit trips occur during the morning and afternoon peak periods. Figure 3.04** illustrates the daily profile of customer boardings per hour across the entire system. On a typical weekday, over 14,000 customers board the transit system during the morning and afternoon peak periods (i.e. 7am to 9am and 3pm to 5pm). In the peak hour (3pm to 4pm), approximately 4,000 customers board the transit system. The peak periods generally capture daily travel to work and school, and typically influence the scale of fleet and number of operations in the system. As experienced in most communities, midday hourly ridership is much lower than the peak periods of a weekday. It is also noted that evening weekday transit ridership after 7pm is very low even though services operate until after midnight in some areas.

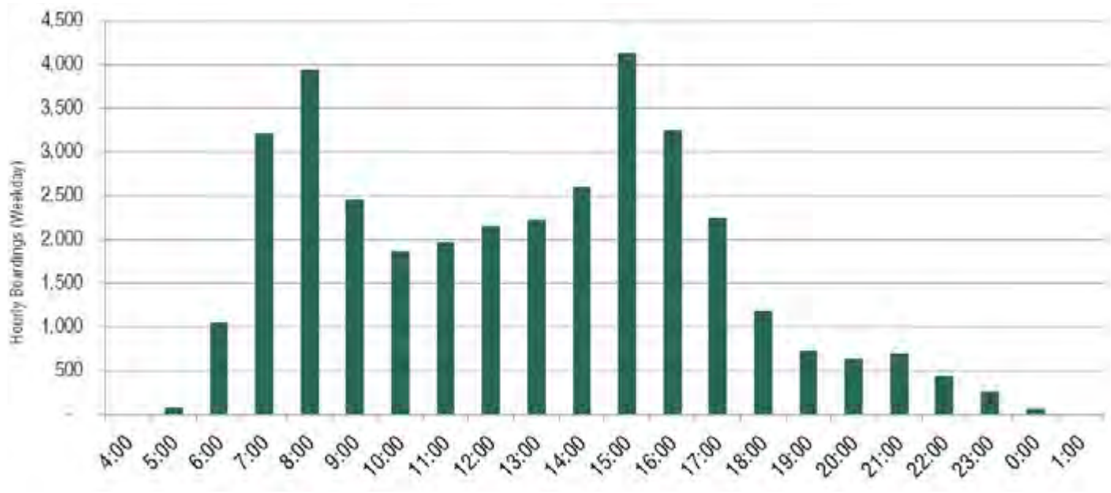


Figure 3.04 - Weekday Transit Boardings per Hour

Source: Farebox Data (March 20-31, 2012)

- **Weekend ridership generally increases throughout the day toward the afternoon peak between 3pm and 4pm.** As illustrated below in **Figure 3.05**, transit ridership gradually increases to a peak of approximately 1,200 boardings per hour on a typical Saturday. Although the weekend peak transit ridership is approximately 30% of the weekday peak hours, evening transit ridership levels for a Saturday are generally consistent with weekday patterns. These ridership patterns suggest that peak weekend service levels and resources need only to be 30% of weekday services.

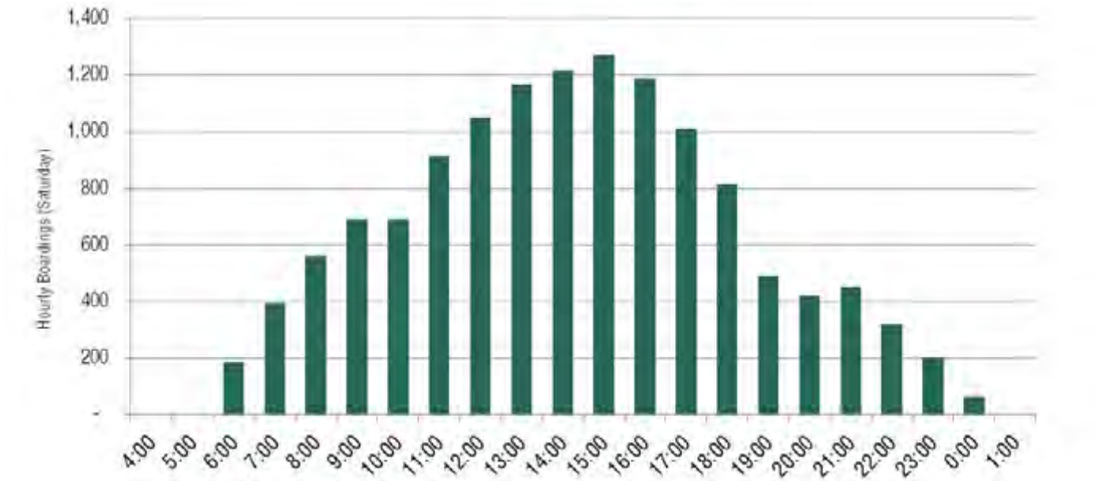


Figure 3.05 - Saturday Transit Boardings per Hour

Source: Farebox Data (March 20-31, 2012)

- **Almost 80% of all passengers are regular / daily transit customers.** Month/Day Pass, post secondary-UPass, and discounted pass holders make up the majority of the rider base. Seniors, cash and ticket fares make up less than 20% of all customers making use of transit today. As is the case in most communities, regular pass holders often use transit from a fixed origin to a fixed destination, five days a week.

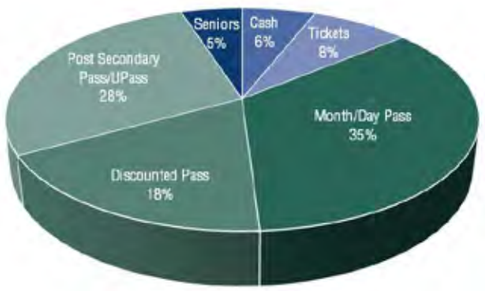


Figure 3.06 - Transit Ridership by Fare Type

Source: 2012 Saskatoon Transit Annual Report

- **Almost 30% of all transit customers are Post-Secondary Student Pass/UPass holders.** A large majority of these trips are to and from the University of Saskatchewan where the UPass has been available to all full and part time students since 2009. The UPass provides unlimited access to Saskatoon Transit buses at a deeply discounted rate.

- **Over 65% of all work trips (for all modes) begin in the suburban areas of Lakewood, Lawson Heights and Blairmore.** The remaining 35% of work based trips begin in the established communities largely inside the Circle Drive area. The distribution of work trip origins is generally consistent for both car and transit travel. In addition to post-secondary students, work based trips can be one of the strongest potential markets for transit customers, requiring highly attractive levels of service outside Circle Drive to connect passengers from suburban neighbourhoods to employment areas.

- **Over 85% of work trips by transit are destined to the Downtown and University areas**. In comparison, almost 60% of work trips by all modes are destined to the downtown, university and industrial areas. As of 2011, the Saskatoon region has over 110,000 jobs within the City boundaries, a majority of which are located in the Downtown, North Industrial and University of Saskatchewan areas. Despite the balance in the distribution of jobs, the core areas of the city are the primary transit customer markets. As experienced in other North American cities, suburb-to-suburb travel, even for work trips, can be more difficult to serve with transit, rendering these trips unattractive for people that have the option of driving.

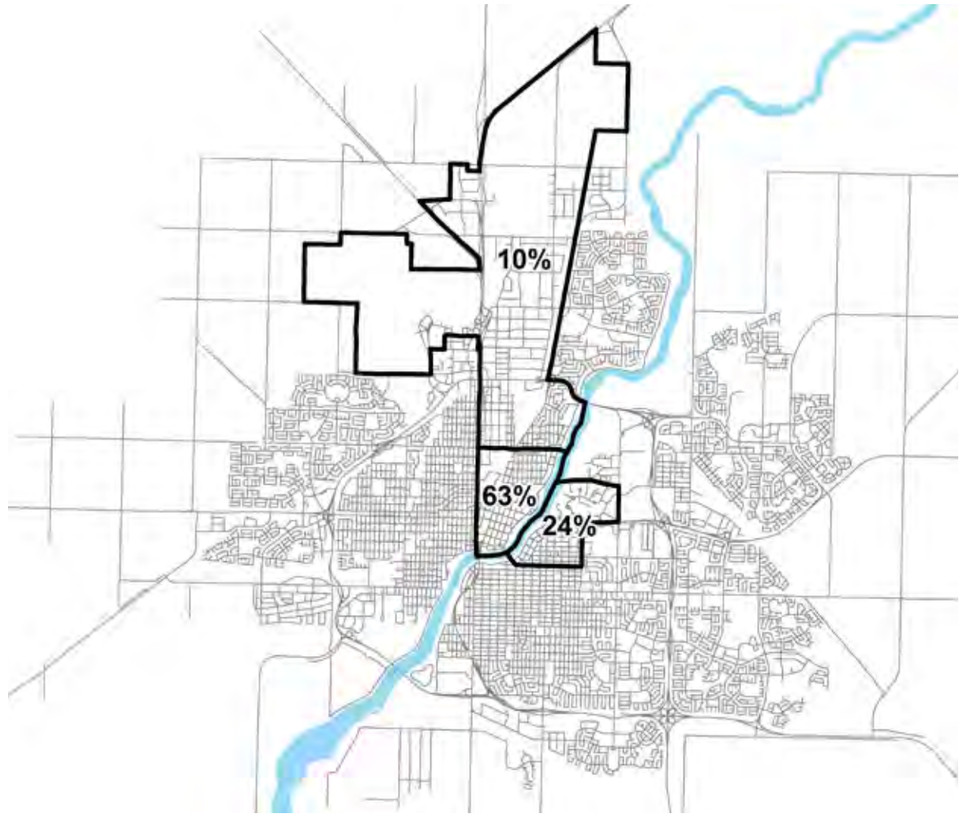


Figure 3.07 - Primary Work Trip Destinations by Transit

Source: Transportation Model

- **A majority of all weekday peak period transit trips start along a select number of key corridors and community terminals throughout the City.** As previously noted, a majority of the boardings on transit occur during the morning and afternoon peak periods. **Figures 3.08 and 3.09** below illustrate new boardings (excludes transfer trips) for the most active bus stop locations in the city, which account for approximately 45% and 75% of the total boardings in the morning and afternoon peak periods, respectively. These patterns suggest that a majority of transit customers start their trips in many of the primary land use terminals in the city such as the Downtown and the University, as well as several suburban centres such as in Lawson Heights, Confederation and University Heights. Additionally, several key corridors such as 22nd Street, 20th Street, Broadway Avenue, and 8th Street generate significant transit ridership during both the morning and afternoon peak periods. Concentrations of mixed-use areas represent the strongest two-way transit markets in the city today.

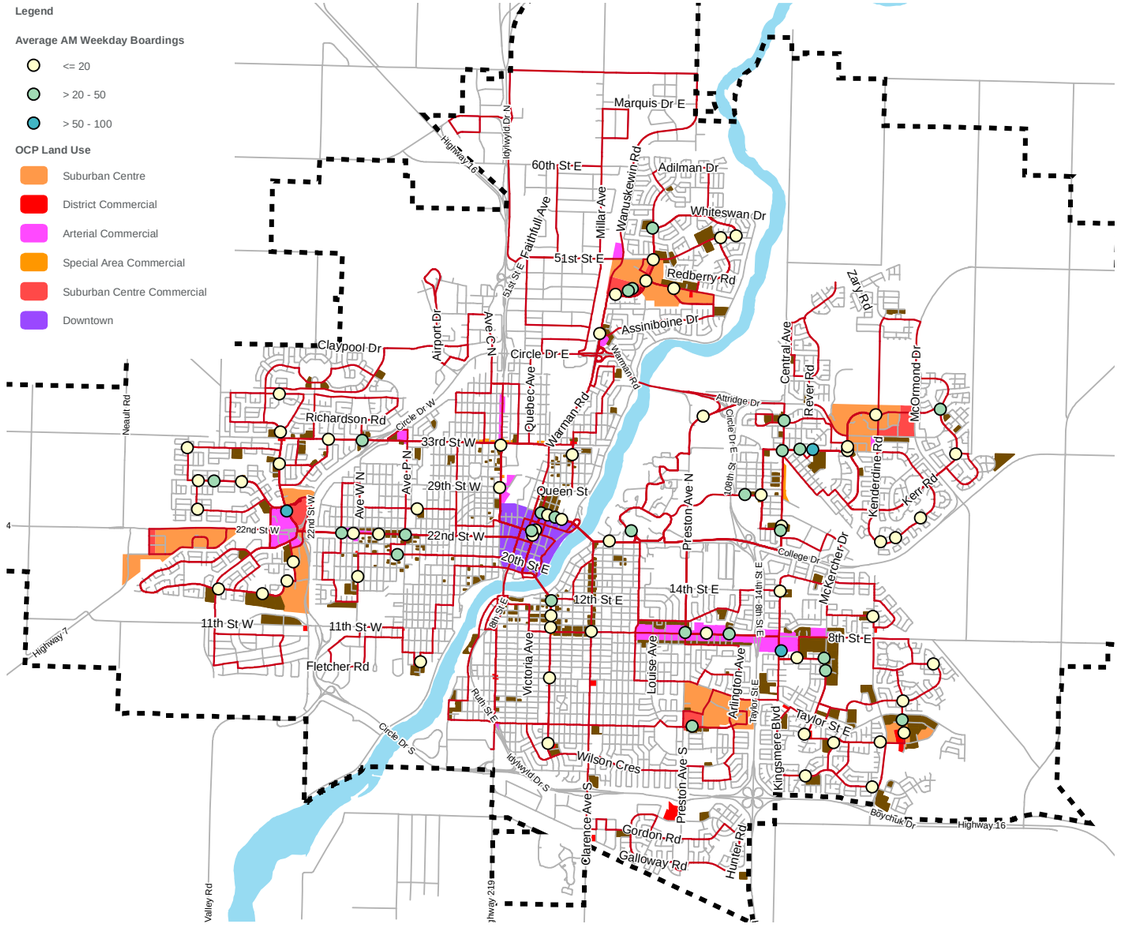


Figure 3.08 - Average AM Weekday Boarding Activity with Land Use

Source: Farebox (October 2013)

- **It is also noted that a portion of the busiest morning boarding activity occurs at stops outside key corridors and nodes.** Many transit trips begin in suburban residential areas in the morning. These boarding patterns highlight the importance of the suburban sections of the DART routes that extend beyond the primary corridors and mixed-use nodes of the city to serve residential areas.

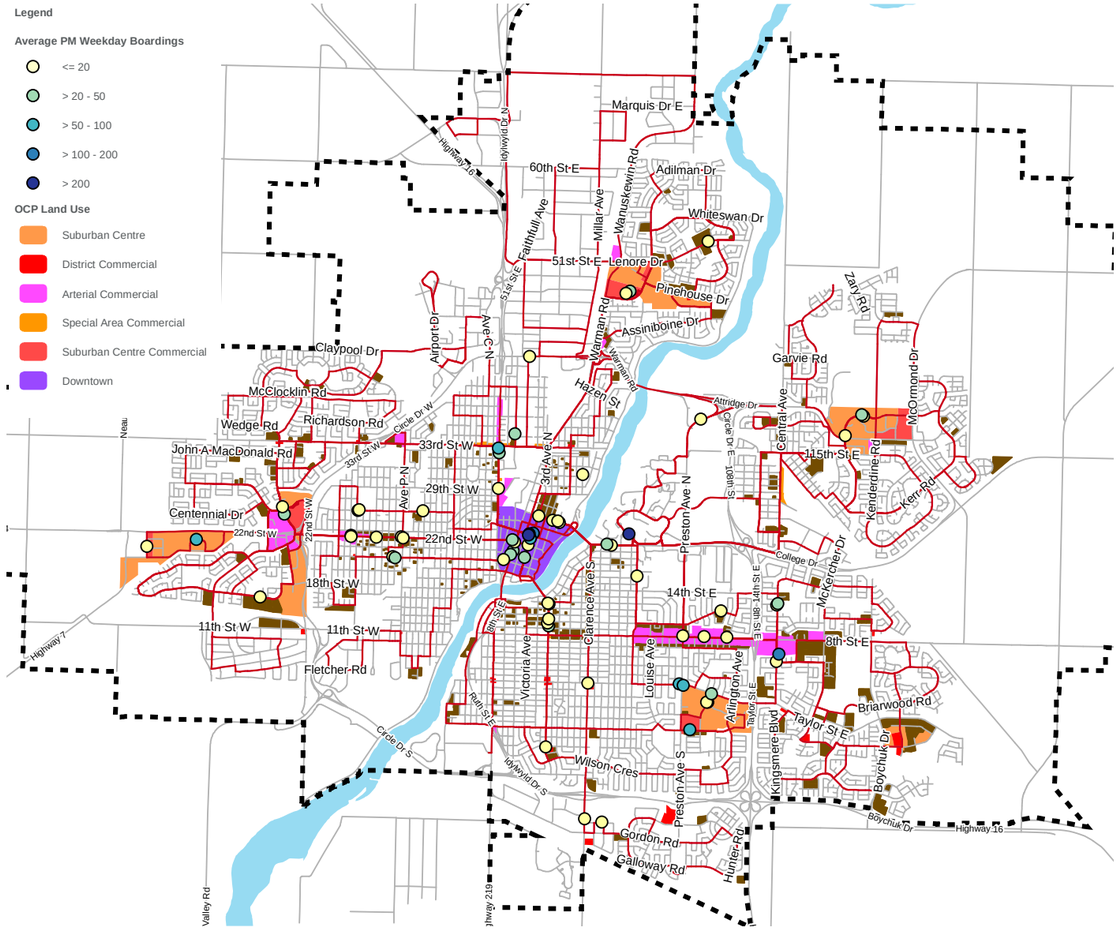


Figure 3.09 - Average PM Weekday Boarding Activity with Land Use

Source: Farebox (October 2013)

- **East-west transit ridership is generally higher than north-south ridership, and east-west ridership is significantly higher in the eastern areas of the city. Figure 3.10** below illustrates the transit ridership on all routes crossing major east-west and north-south screenlines in the city during the morning and afternoon peak hours. In general, the peak directional demands crossing each of the major screenlines range anywhere from 300 to over 1,100 passengers per hour during the morning and afternoon periods. Consistent with the boarding patterns previously described, east-west transit ridership is higher than north-south ridership. In particular, morning and afternoon transit ridership on east-west routes is highest on the east side of the river, with over 1,100 passengers entering and leaving the core area in the AM and PM peak directions respectively. Transit ridership across the river is generally balanced between both directions of travel in both the morning and afternoon peak periods.

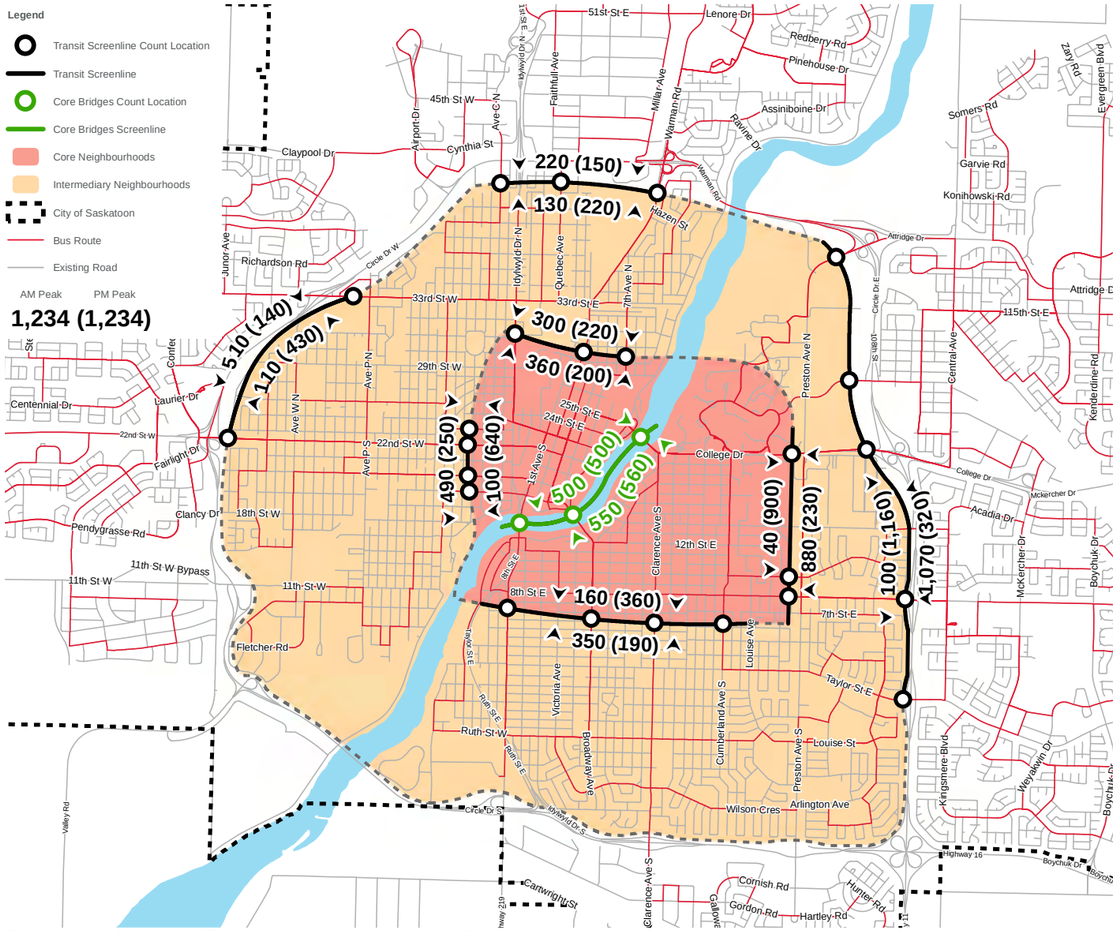


Figure 3.10 - Peak Hour Transit Screenline Counts (AM (PM) passengers per direction)
Source: City of Saskatoon (September 2013)

- **Approximately 7 to 10% of all the trips across the three core area bridges during the morning and afternoon peak hours are on transit. Figure 3.10** indicates that transit supports over 500 passengers in both directions across the South Saskatchewan River during the peak hours. For comparison purposes (prior to the opening of the Circle Drive South bridge), approximately 9,000 and 12,000 vehicles crossed these core area bridges in the morning and afternoon peak hours respectively. In general, the 7 to 10% transit mode share over the South Saskatchewan River in the core area is notably higher than the 4.5% city-wide travel to-work mode share noted in the 2011 National Household Survey. These patterns reinforce the importance of the downtown and university areas as the primary markets for transit today.

3.1.2 Existing Transit Services and Facilities

The parts of the transit system that most influence the customer experience include the amount, type and form of the services, as well as the facilities that accommodate passengers such as transit stops and terminals. This section of the Technical Report highlights the existing transit system within the city and provides comparisons with other communities of less than half a million people in Canada.

- **Saskatoon Transit provides approximately 395,000 hours of service to the community annually, of which 80% is delivered during the week and 20% on weekends**. This service level equates to slightly more than 1.6 service hours per capita, as illustrated in **Figure 3.11**. Communities of between 300,000 and 500,000 people appear to have service levels that range anywhere from 1.2 hours of service per capita to approximately 2.2 hours of service per capita. As the city grows, the number of service hours per capita will need to increase in order to make transit attractive and to increase transit mode share.

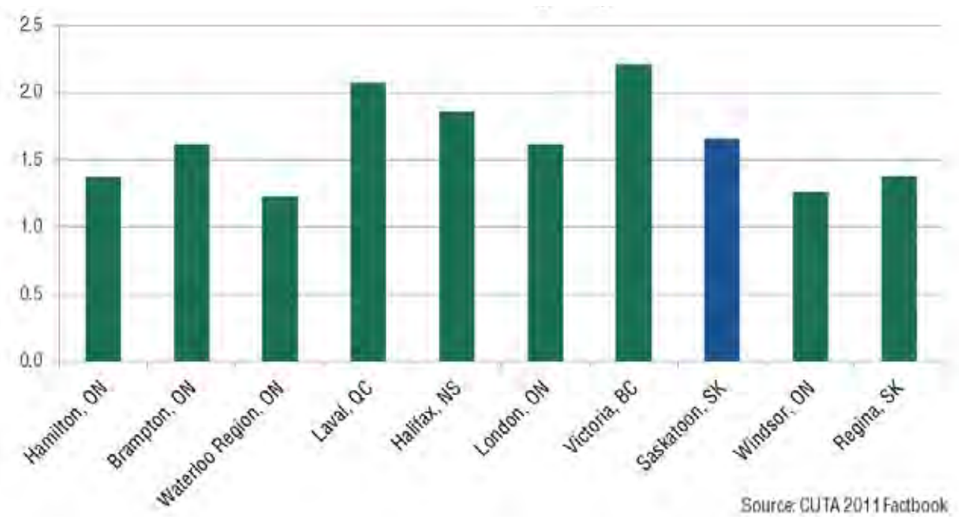


Figure 3.11 - Annual Service Hours per Capita

- **Saskatoon's transit system is designed as a hub-and-spoke service that is centered on the downtown and university areas of the city, as illustrated below in Figure 3.12.** Consistent with most cities, Saskatoon's transit system is designed to serve the major, two-way travel patterns that occur during peak periods. In this case, the system is designed to connect the suburban development areas with the Downtown and University. The 23rd Street Downtown terminal is the system's primary terminal, and is a transfer point in the system where most routes connect every 15 or 30 minutes.

Figure 3.12 - Existing Transit System Structure (Hub-and-Spoke)

- **The system largely consists of conventional fixed-route, fixed-schedule transit serving urban and suburban areas of the city with 30 to 60 minute frequencies.** DART routes provide 30 minute service between suburban areas of the city through to the Downtown, while most other routes connect people to the Downtown at 30 minute peak, and 30 or 60 minute off-peak frequencies.

- **Most residents are within reasonable walking distance to transit (<400m)**. **Figure 3.13** illustrates the 'coverage' of transit service in Saskatoon (<400 metre walking distance). Saskatoon's Official Community Plan (2013) states that wherever possible, transit routes should be provided within 450 metres of one-unit dwellings and townhouses, 250 metres of medium and high density multiple-unit dwellings, and 150 metres of special needs housing. Although there are some 'gaps' where transit is beyond a reasonable waking distance, transit service covers approximately 95% of the established areas of the City.

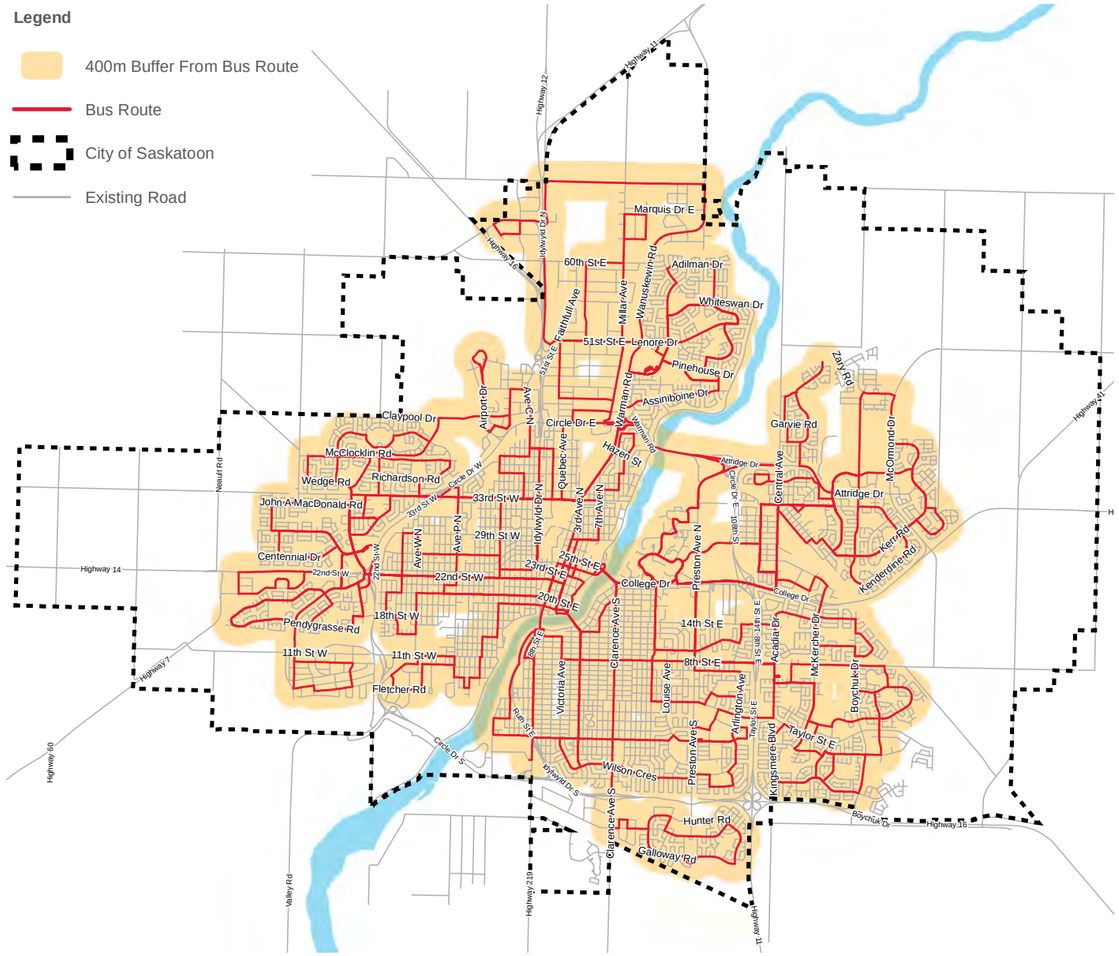


Figure 3.13 - Transit Coverage (400m Buffer)

- **Although transit service coverage is excellent, the road network layout of most suburban areas creates circuitous and indirect transit travel for many customers.** As experienced throughout North America over the past three decades, many suburban areas have shifted away from a grid roadway system such as the system that exists inside Circle Drive, and moved towards a curvilinear street system. This shift has created several transportation challenges that have extended to the transit system. Outside Circle Drive, the curvilinear road network results in indirect and circuitous transit routes that increase travel times for many customers. Although these areas represent the outer edges of the service area today, the effect of these areas will become more pronounced in the future as growth to the urban boundaries continues.

- **The most frequent transit services are focused on the core areas of the city and key roadways, such as College Drive, Preston Avenue, 22nd Street, Idylwyld Drive, Broadway Avenue, and Warman Road.** Transit services within the city generally operate at 30 minute frequencies during the peak periods, and every 30 to 60 minutes during the off-peak. **Figure 3.14** illustrates the cumulative morning and afternoon peak transit frequencies of all services operating along each corridor in the city. Despite the fact that many corridors, such as College Drive and 22nd Street, are served by 6 to 12 buses per hour, the maximum peak frequency on any corridor is limited to 15 minutes due to the hub-and-spoke nature of the system and the timed transfer downtown. In this regard, many core area corridors experience platoons or "bunching" of buses operating down the street at the same time.

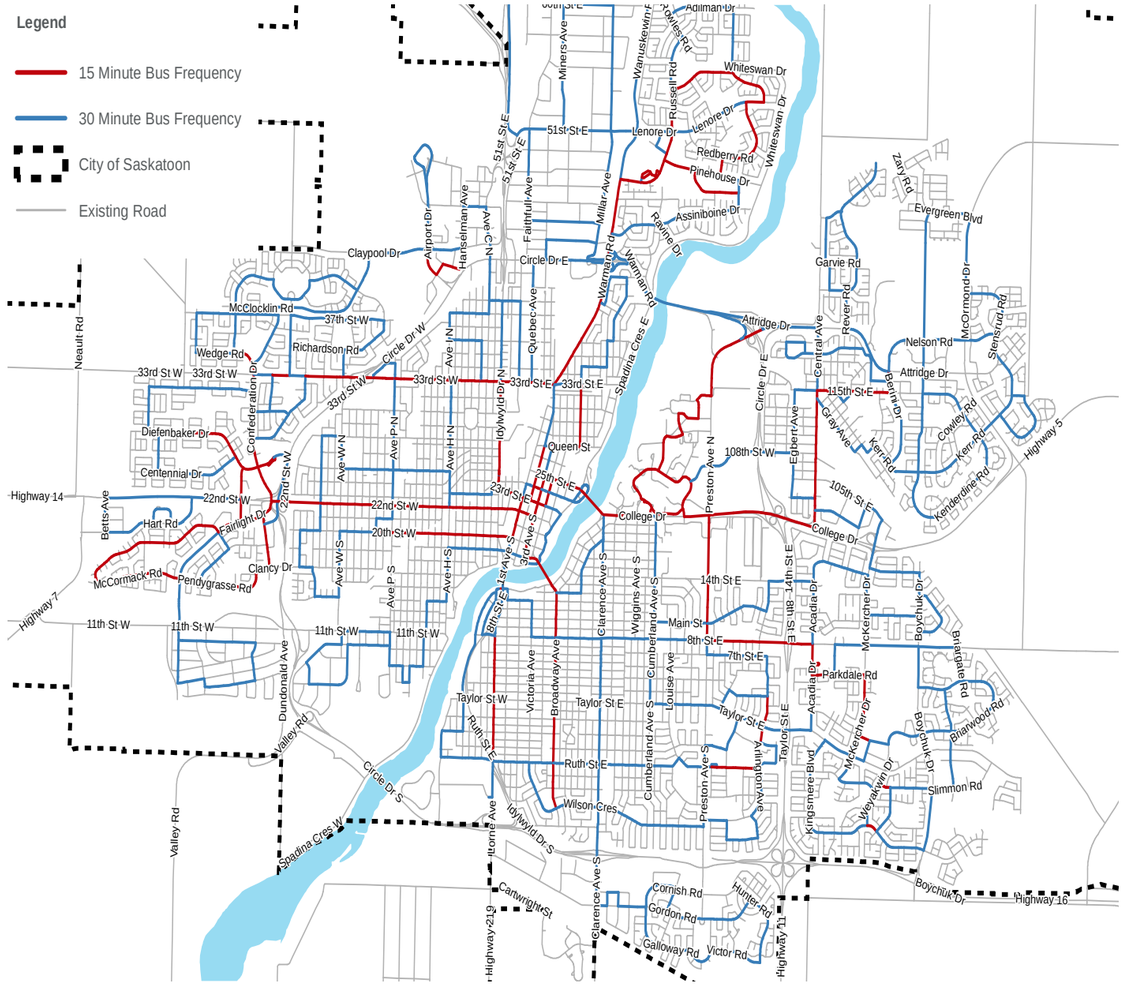


Figure 3.14 - Transit Frequencies (2013)

- **Transit travel times are most competitive to the car between the Downtown and suburban centres.** Transit travel between the Downtown and many of the key trip generators in the city is quite competitive with auto travel time. For example, a trip from Confederation Mall to Downtown takes approximately 11 minutes by car and 15 minutes by transit as illustrated below in **Figure 3.15**. For most transit customers, this small travel time differential would make transit a very attractive alternative. Conversely, suburb-to-suburb travel takes significantly longer on transit. Trips that take three or four times longer on the bus in comparison to driving are very unattractive, especially to choice riders that have access to a car. These markets are much more difficult to serve by transit and are typically higher proportions of vehicle travel than other areas of the city.

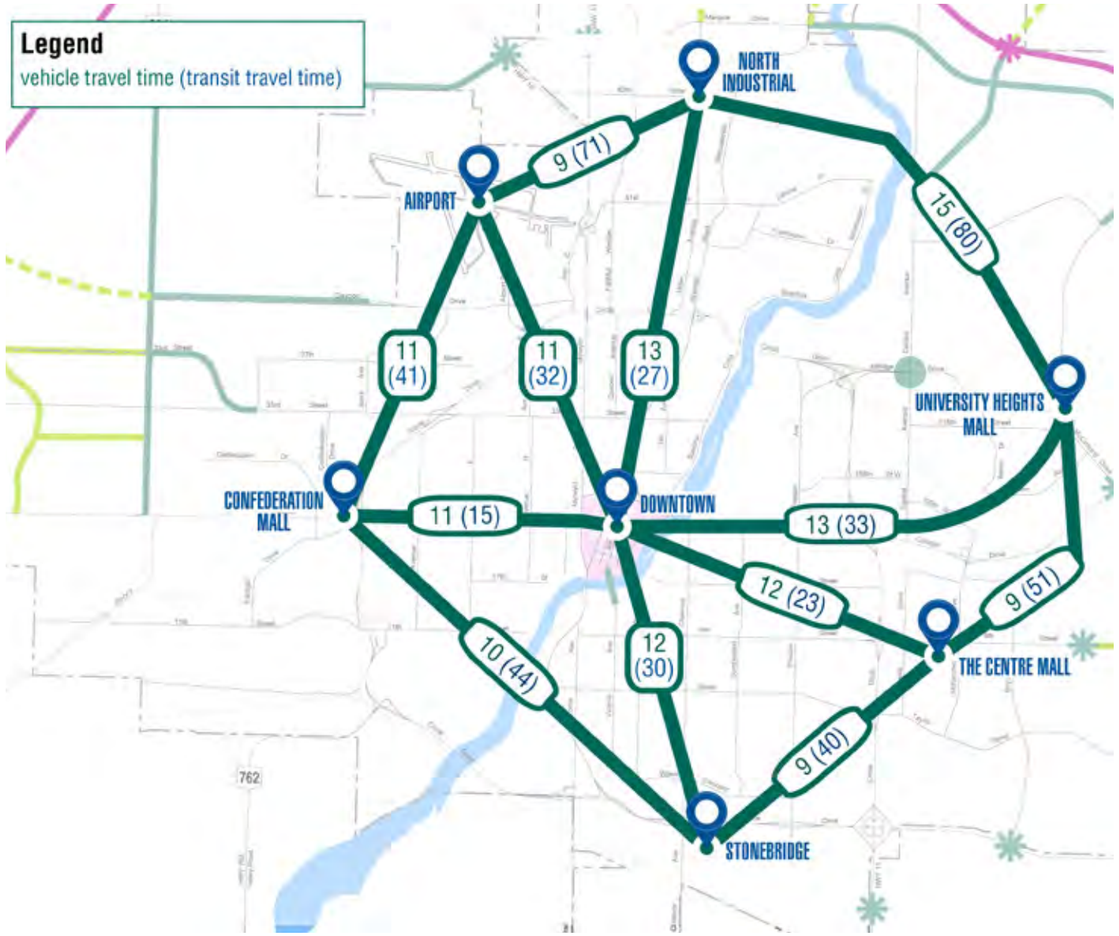


Figure 3.15 - Existing Car & Transit Travel Time Comparisons
Source: Google Travel Times

Monthly Pass		Fee
Transit Pass		$50 (child) $83 (adult)
University Parking		$30.38* (students) $60 (faculty)
Downtown Parking	Parkade 1 Av/20 St Impark - YMCA Impark 2 Av/24 St	$145.00 $120.00 $175.00
North West Industrial Area Parking		$0

**$234/Fall and Winter Semester (8 months)*

Table 3.01 - Monthly Transit Fares & Sample Parking Rates
Source: Saskatoon Transit, USask Parking Services, Parkopedia, 2016

- **Monthly parking is generally free outside the core area of the city and a very low cost at the University (see Table 3.01).** Abundant supplies of free or low cost parking encourage people to drive their car for frequent and routine trips, such as those to work and school. Within the core area of the city, monthly parking rates tend to be more expensive than a transit pass at approximately $150/month, while staff/faculty parking rates at the University are below the price of a monthly transit pass at $60/month. When parking rates are lower or comparable to transit fares, many people will choose to drive rather than take transit.

- **Over 70% of stops do not have a shelter and a greater percentage do not have seating. Just 33% of stops are considered to be well lit**. Saskatoon has over 1,688 transit stops throughout the city, including those located in transit terminals. As is the case in many cities, a large majority of transit facilities consist of a transit sign identifying the transit stop and the bus route number(s). In many areas of the city, transit stops do not provide adequate facilities in terms of seating and lighting to make the customer experience comfortable.

- **Fleet comfort and accessibility can impact the customer experience.** Providing an accessible fleet and facilities surrounding the stops means more people can ride conventional services and reduce demands on custom transit. Provision of an accessible fleet is often quite costly. **Table 3.02** compares Saskatoon's fleet size, age and accessibility with that of other communities. Although the City has wisely managed financial resources by purchasing buses from other transit agencies, this approach has reduced accessibility and comfort for passengers. As of 2015, the average age of buses within Saskatoon was 11.9 years (with an age ranging from 1990 to 2015). In 2015, a fleet replacement strategy was adopted that will see ten (10) new buses annually, with the goal to have an accessible fleet by 2018.

City	# Buses	Average Age	Percent Accessible
Saskatoon, SK	161	13	59%
Regina, SK	109	9.4	77%
Victoria, BC	280	7.5	100%
Waterloo Region, ON	235	8.2	92%
Winnipeg, MB	545	8.9	84%

Table 3.02 - Summary of Transit Fleet Age & Accessibility
Source: CUTA 2011 Factbook

3.1.3 Transit Fares and Funding

This section examines current fares for operating transit in Saskatoon and highlights the funding sources for operating and capital improvements relative to other communities in Canada.

- **Saskatoon's transit fares are generally in line with other similarly-sized municipalities. Table 3.03** below compares 2014 fares for the City of Saskatoon with other larger cities in Canada. Saskatoon's fare-pricing structure is targeted towards resident university students and seniors. Saskatoon, like Regina, offers significant discounts to seniors purchasing monthly passes to support mobility for an aging population. Similar to Victoria and Waterloo Region, a deeply discounted UPass is compulsory for full time students at the University of Saskatchewan.

		Saskatoon	Regina	Victoria	Waterloo Region	Winnipeg
CASH	Adult	$3.00	$2.50	$2.50	$3.00	$2.55
	Senior	$3.00	$2.50	$2.50	$3.00	$2.05
	Post Secondary	$3.00	$2.50	$2.50	$3.00	-
	High School	$2.50	$2.00	$2.50	$3.00	$2.05
	Youth	$2.00	$2.00	$2.50	$3.00	$2.00
MONTHLY	Adult	$78.00	$62.00	$85.00	$72.00	$84.70
	Senior	$26.00	$16.83	$45.00	$60.00	$42.35
	Post Secondary	$78.00	$53.00	$77.00	$60.00	-
	High School	$56.00	$47.00	$35.00	$60.00	$58.90
	Child	$47.00	$47.00	$35.00	$60.00	$58.90
UPass (Semester)		$76.00	None	$81.00	$72.23	None
Farebox Cost Recovery (%)		38%	33%	47%	39%	60%

Source: Saskatoon Transit, Regina Transit, BC Transit, Grand River Transit, Winnipeg Transit, University of Saskatchewan, University of Regina, University of Victoria, University of Waterloo, University of Manitoba websites (retrieved January, 2014); CUTA Factbook (2011)

Table 3.03 - Summary of Transit Fares & Cost Recovery

Unlike investments in roads and other municipal infrastructure, cost recovery from the farebox has become a measure of effectiveness for most transit systems. Although there should be no expectation that the farebox revenues recover the costs for the service, a farebox recovery percentage provides a means of assessing how effective the service is relative to other systems in the country. As indicated in **Table 3.03**, a 38% farebox recovery in Saskatoon is generally consistent with most other similar sized and slightly larger systems.

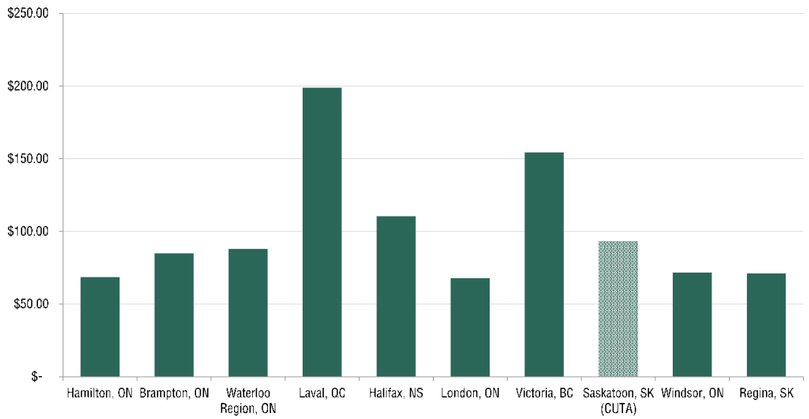


Figure 3.16 - Municipal Operating Contributions per Person

- **On average, Saskatoon taxpayers invest about $93 per capita per year to operate the City's transit system.** As shown in **Figure 3.16**, this places Saskatoon near the average level of municipal investment per person for the cities shown.

3.2 Future 'Business-as-Usual' Transit

Projected population growth to half a million people will increase demands on the transit system. This section explores the 'base' level investments to expand the transit system and identifies the projected increases in travel demand in order to examine potential improvements to be considered in the Plan.

3.2.1 Base Service Increases

Since 2007, annual transit service hours have grown at a compound rate of approximately 1.8% per year despite higher rates of population growth during that time. Over the next 30 years, it is assumed that the City will continue to invest in transit services and facilities at a higher level than the past in order to provide more attractive travel choices and to increase overall ridership. As a starting point however, a 'base' level of investment to increase transit services by 1.8% is assumed for the purpose of serving planned growth areas of the city as previously described. The Transit Plan and rapid transit review will determine whether additional investments would be worthwhile to capture key transit markets and foster growth along major corridors.

The following discussion highlights the 'base' level investments and service changes anticipated for the transit system over the next 30 years.

- **Although the population is expected to more than double over the next 30 years, current rates of transit investment mean that service levels in the system would only increase by 70%.** As previously described, the population is projected to grow at approximately 2.5% per year, resulting in a more than doubling of the city's population over the next 30 years. If current rates of transit investment, i.e. 1.8% annually, were maintained over this time frame, service hours would increase from slightly less than 400,000 hours annually to approximately 675,000 hours. Despite this increase in total service hours, it would actually result in a decline in service hours per capita, going from slightly more than 1.6 to less than 1.4. **Figure 3.17** illustrates and compares the base level investments in transit service hours over the next 30 years with the population growth rates projected.

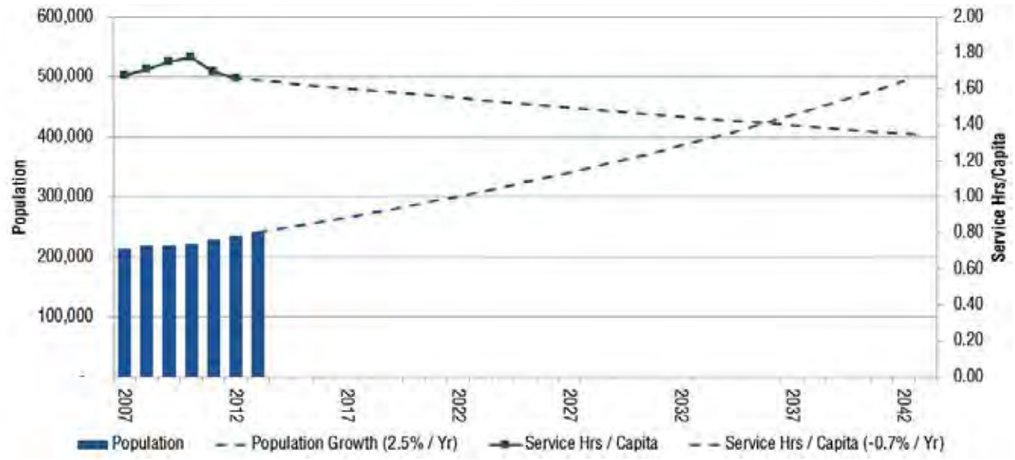


Figure 3.17 - Projected Population and Base Transit Service Hour Growth to 2043

- **This 'base' level of investment will make it impossible to increase transit mode share and provide reasonable transportation choice.** Service hours are a measure of how much service is on the street serving customers, which in turn influences ridership and mode share. **Figure 3.18** illustrates the relationship between today's service hours and mode share in systems across the country. In very broad terms, communities with more than 2.0 annual service hours per capita experience transit mode shares of 11 to 16%. Communities with 1.0 to 2.0 annual service hours per capita experience transit mode shares of 4% to 15%. And, communities with less than 1.0 service hours per capita experience transit mode shares of less than 3%. In this regard, transit service hours need to be increased beyond current rates of growth in order to realistically increase transit mode share. For Saskatoon, service levels per capita must be above 2.0 in order to increase ridership and manage congestion.

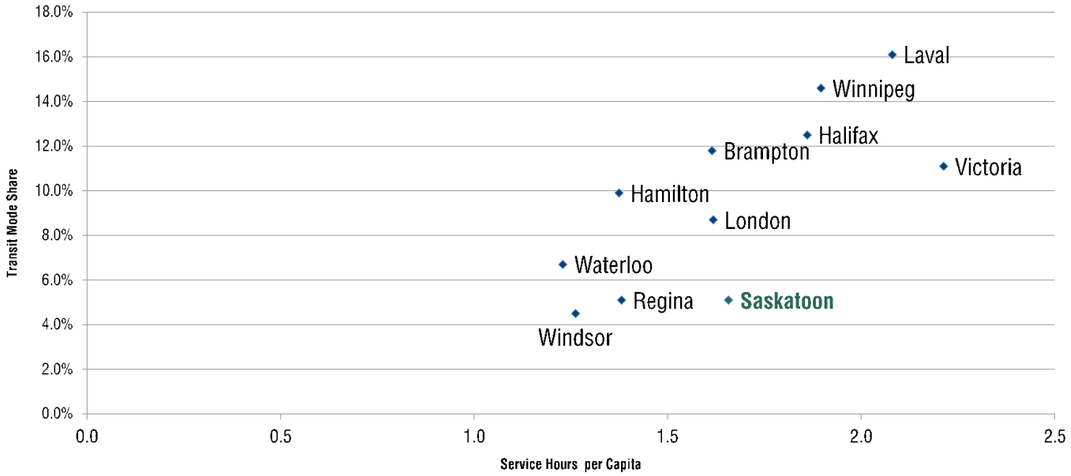


Figure 3.18 - Annual Service Hours per Capita and Transit Mode Share

Source: 2011 CUTA Factbook

- **Along some key corridors, a 'business-as-usual' investment could be designed to improve the frequencies of buses to 10 minutes or less.** The increase in annual service hours would be allocated across the system to serve the suburban development areas and to improve frequencies on the most productive routes as a base level of investment in expanding service hours. The specific allocation of service hours are assumed to be distributed as follows:

    - 30 minute service levels to the three suburban development areas that include the introduction of three new routes to Blairmore, three new routes to Holmwood, and two new routes to University Heights. Consistent with the current services, these routes are designed to connect local areas to the core areas and transit markets of the city.

    - Increases in bus frequencies on the most successful routes including changes to DART routes 50, 60, 70, and 80 from 30 to 20 minutes headways (for a combined DART corridor frequency of 10 minutes); Route 2 headways from 30 to 10 minutes; and, Route 4 headways from 30 to 15 minutes.

Figure 3.19 illustrates the future base peak period corridor frequencies. Several key corridors develop as primary transit spines with peak frequencies of 10 minutes or better. Corridor frequencies of 10 minutes or better provide greater flexibility to customers boarding transit on these corridors as they will not need to consult a schedule and will never have a significant wait time.

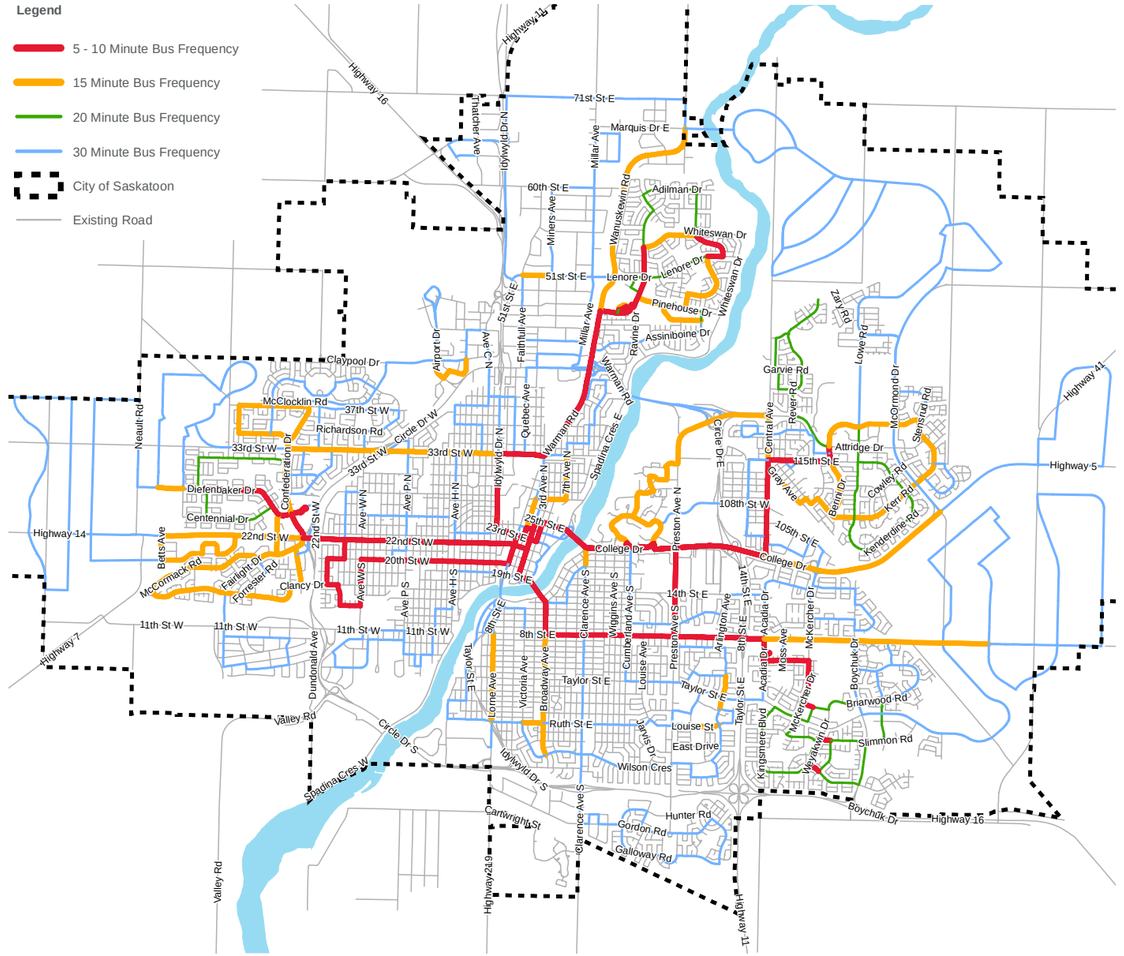


Figure 3.19 - Future Transit Frequencies (Base)

3.2.2 Forecast Ridership Changes

The 2011 transportation model was used to assign forecast PM peak hour trips to the 'base' transit network to confirm overall shifts in ridership and the volume of transit passengers projected along each corridor in 30 years. The following discussion highlights the overall patterns and transit passenger volumes along key corridors in the core areas of the city.

- **Consistent with today's patterns, east-west transit ridership across the city is higher than the ridership on north-south services.** Over the next 30 years, College Drive, University Bridge, 8th Street and 22nd Street through to the downtown are projected to accommodate the highest transit ridership in the PM peak hour as illustrated in **Figure 3.20.** Much of the ridership is generated by existing nodes and planned growth along these corridors inside Circle Drive as well as from suburban services outside Circle Drive. Consistent with today's transit travel patterns, these areas are projected to continue to be the strongest markets for transit in the long-term.

Figure 3.20 - Forecast PM Peak Hour Transit ridership (Business-as-Usual)

Source: Traffic Model

- **The secondary markets for transit travel include other east-west corridors such as 33rd Street, 20th Street, and parts of 8th Street.** North-south corridors such as Idylwyld Drive, Warman Road, Preston Avenue, and Broadway Avenue are also projected to accommodate moderate passenger loads during the PM peak hour.

- **Over the next 30 years, PM peak hour east-west transit passenger loads are projected to increase to as much as 1,100 passengers in the peak direction along College Drive near the University, and to approximately 650 passengers on 22nd Street west of downtown.** Additionally, the PM peak directional ridership southbound across the Broadway Bridge and on services to the north of the Downtown (on Idylwyld Drive and 2nd Avenue) are generally in the range of approximately 400 passengers. These patterns are illustrated below in **Figure 3.21.**

Figure 3.21 - Forecast PM Peak Hour Screenline Ridership (Business-as-Usual)

Source: Traffic Model

3.3 Problem Definition

The transit system in Saskatoon is typical of many small to mid-size communities across Canada in terms of the level of investment, amount and design of services (as well as facilities) and the subsequent ridership or transit mode share (currently at 5% of all daily travel). Beyond the transit system itself, land use patterns and other transportation systems have a tremendous impact on the success of transit regardless of the service quality. This section highlights some of these and other challenges facing transit today, and what this means for the future of Saskatoon with half a million people as previously described.

Today, Saskatoon's transit system provides service levels that are comparable to other mid-size cities with approximately 400,000 hours of service per year (or approximately 1.6 hours per capita). The overall quality of the current transit system is affected by the following factors:

- Transit is designed as a hub-and-spoke system that is centred on the downtown to support 85% of all transit passengers today. For those going to other areas of the city however, passengers must travel to the downtown transit terminal before transferring to another bus before getting to their destination. This reduces the directness of travel and adds significant travel time for trips other than to the downtown and University areas.
- Most residents are within a 400 m walking distance of transit across the city, and as a result services can be indirect for many customers (i.e. the system uses a coverage model).
- Land use patterns within many suburban neighbourhoods in the city are single-use, low density areas with circuitous street patterns that are difficult to support with attractive and cost effective transit service. However, the city is challenged with the expectations and trade-offs of providing a basic level of transit service to new suburban areas that are generally low transit generators rather than providing more attractive services to larger transit market areas and corridors.
- The frequency of transit services along many corridors in the city are modest with services generally operating every 15 to 30 minutes or more during the peak periods of the day.
- Transit is 'one-size fits all' type of service with conventional routes trying to serve multiple travel needs – local trip making, travel between neighbourhoods and cross-city trip making.
- The transit system is not very accessible compared to other cities in Canada. On one hand, the aging fleet has limited accessibility for boarding and leaving the bus for people with mobility challenges. Beyond the vehicle itself, many transit stops and pedestrian facilities are also not accessible, especially during winter months.
- The overall customer needs are variable and the experience with transit for some has become a barrier to making regular use of transit. Barriers have been identified at every step of the journey, from planning a trip on transit through to leaving the bus to an individual's destination.
- As the primary alternative to transit, drivers generally experience modest levels of congestion and abundant supplies of free or low cost parking in most areas of the city. Investments in the roadway network to address congestion and the provision of excessive parking through development will continue to make driving more attractive for most trips.

The City of Saskatoon is expected to double in population and support approximately half a million people and nearly 250,000 jobs by 2045. Current plans with see growth accomomdated in New Suburban Areas (e.g. Blairmore, Holmwood, University Heights), Neighbourhood Infill Areas (e.g. existing residential neighbourhoods primarily within Circle Drive), and Strategic Infill Areas (e.g. Downtown, North Downtown, University of Saskatchewan). Overall, 50% of the growth is planned for the core area inside Circle Drive, and the remaining 50% in New Suburban Areas.

With planned growth to half a million people, the limited choices that exist today within the transportation system will impact mobility of residents. Over the next thirty years, the city roadway network could be expected to support 100,000 additional vehicle trips during the peak hours alone. With planned land use patterns and the network improvements, average trip distances will increase from 6 km to 10 km with travel times growing by 300%. In short, the planned roadway network with modest changes inside Circle Drive means that more roadways in the city's core area will be at capacity. Since most roadways in the established areas of Saskatoon cannot and should not be widened, the City must look for ways of increasing the people-carrying capacity for existing road space through transit.

Recognizing the changes in travel demands and patterns across the city, the challenges ahead for transit are being exacerbated by the modest increases in transit investments as well as mounting pressures for roadway space and congestion. With a 'business-as-usual' approach to transit, there are several critical challenges ahead for mobility throughout a city with half a million people as briefly highlighted below.

- Continuing the trend of smaller increases in transit services over the next 30 years will result in 70% more transit service levels with a 100% increase in population. On a per person basis, this means that service levels with half a million people would be worse than the experience of many customers today.
- The challenges of serving expanding areas of the city with modest levels of transit service at the expense of stronger transit markets in the urbanized areas of the city will become even greater in the long-term.
- The capacity of the transit system will undoubtedly be exceeded during peak periods of the day on some of the most attractive corridors without significant increases to service levels. In other words, the number of buses with full passenger loads, will increase dramatically.

- Even with significant increases in vehicle travel times, transit would be stuck in the same congested street system as traffic without any advantage for the customer. At the same time, the people-carrying capacity of the street system would remain unchanged with a 'business-as-usual' approach.
- Without enhanced transit customer support, service and facilities, the city will be unable to respond to the needs of an aging population and variation in mobility levels of a growing city. As experienced elsewhere, this typically means that more people will rely on specialized transit services that are more costly rather than the conventional system.
- The city-wide transit mode share will likely decline without corresponding increases to transit service levels that exceed population growth.

In the end, a 'business-as-usual' approach affects more than the transportation system. Transit is at the centre of enabling and supporting sustainable growth patterns across the city. Without attractive transit services and facilities, the city's plan to support 50% of all growth within the core area inside Circle Drive will be compromised. Further, Corridor Growth patterns envisioned within the Growth Plan rely on transforming the street environment with attractive transportation alternatives such as rapid transit in addition to walking and cycling facilities. At best, these areas may remain auto-oriented without significant investments in transit. At worst, the city may be unable to grow upward in a sustainable manner and will face continued pressure for outward growth.

3.4 Vision and Possibilities for Transit

This section describes the long-term vision for transit in Saskatoon, and describes the possible improvements that were explored as part of the Growth Plan to enhance the transit system. The transit vision mirrors the Saskatoon Speaks and Strategic Plan directions for Moving Around, and it is supported by transit specific goals and objectives that guide the long-term plan needed to achieve the long-term vision.

3.4.1 Vision and Goals for Transit

Through the Saskatoon Speaks process, City residents acknowledged the need for viable alternatives to the car, recognizing that more and more people are seeking other ways to get around. During the process, residents recognized that traveling by car or truck through the city should be easy, but also expressed a desire to make public transit more efficient and attractive. This vision was further articulated in the City's Strategic Plan, as noted below.

Saskatoon's Vision for Moving Around (from the 2013-2023 Strategic Plan)

Our investments in infrastructure and new modes of transportation have shifted attitudes about the best ways to get around. Our transportation network includes an accessible and efficient transit system and a comprehensive network of bike routes. People still use cars, and also rely on options such as public transit, walking and cycling.

Growth has brought new roads and bridges that improve connectivity for all travel modes. Improved streetscapes, interconnected streets and well-planned neighbourhoods encourage walking and cycling. Attractive options to the car alleviate congestion and ensure people and goods can move around the city quickly and easily.

Goal for Transit (developed for the Growth Plan)

The transit system in Saskatoon will strive toward providing exceptional experience for customers and be attractive. The long-term Transit Plan will include a broader range of service to support a variety of trips. Rapid transit will complement the overall transit system, and serve as the spine to the transit network. Rapid transit corridors and stations will be planned to support and connect higher density, mixed-use areas of the City in order to enhance mobility for residents and visitors.

Transit Objectives

- To support and shape opportunities for growth and development beyond current plans.
- To provide frequent, direct and reliable transit services for the most significant travel markets.
- To provide neighbourhood services that support local area travel and connections to primary corridors.
- To provide transit supportive facilities that enhance safety and comfort for customers.

3.4.2 Possibilities for Transit

This section describes the possibilities that were considered and incorporated in the Growth Plan to alter the 'business-as-usual' approach to delivering transit services. These possibilities focus on improving the customer experience, increasing the amount and range of services, providing transit priority treatments, and providing transit supportive infrastructure and programs.

A) Improving the Customer Experience

The customer experience is central to the success of transit in Saskatoon. The community has clearly stated the experience on transit is essential as a foundation of the transit business and improvements to the customer experience should be implemented NOW! Whether it's planning a trip or getting to the destination, there are many things that can be done to improve the experience for customers of all ages and abilities. Some of the potential improvements considered and developed in the Growth Plan are designed for each step of the travel journey as illustrated in **Figure 3.22**.

Figure 3.22 - Improving the Customer Experience

B) Improving Service Levels and Quality

In order to increase the attractiveness of transit in Saskatoon, the amount, type and quality of services must be dramatically improved. The following possibilities will allow the City to achieve its overall vision and goals for moving around and supporting sustainable growth.

- **Grow the amount of services available in Saskatoon faster than population growth in order to truly enhance weekday and weekend service levels.** The long-term Transit Plan is framed around thirty-year service levels ultimately being anywhere from 900,000 to 1,000,000 service hours per year, or between 1.8 and 2.0 service hours per capita. To accomplish this level of growth, annual service hours would need to increase by as much as 2.5 to 3.0% per year over the next thirty years. This investment would not only maintain, but increase the levels of service per capita from today in order to make transit attractive for a city of half a million people. This level of service is in line with other peer Canadian cities at or nearing the half million population horizon such as Victoria, Winnipeg and Halifax where transit mode shares are higher than Saskatoon.

Figure 3.23 - Comparison of Annual Service Hours
Source: CUTA 2013 Factbook

- **Increase the range of services to better suit varying needs.** An attractive transit system in Saskatoon begins with the concept of a broader range of services—designed to support different travel and customer needs. Some services must be direct and fast in order to meet customer needs—particularly longer distance trips. Other services are needed to provide frequent and reliable transit service along major corridors in the city and to connect to key areas. Some services are needed to support everyday and infrequent travel such as shopping and appointments, while other services are needed to support longer distance travel between communities in the city.

  For these differing customer needs, a broader range of services are required, as described in **Table 3.04**. Recognizing the relationship between travel and land use, the more frequent and direct services typically require a higher scale and density of development, as well as a greater mixture of land uses to make them economically possible.

SERVICE OR CORRIDOR TYPE	WHAT DOES IT DO?	VEHICLE TYPE	FREQUENT	DIRECT	FAST	RELIABLE	COVERAGE
Rapid Transit Corridors	Dedicated Bus Lanes & Stations. Supports Frequent & Conventional Transit Services		✔	✔	✔	✔	
Frequent Transit	Connects higher demand areas.		✔	✔	✔	✔	✔
Conventional Transit	Connects neighbourhoods.					✔	✔
Community Shuttle	Connects low demand outer areas to main corridors.					✔	✔
Commuter Service	Connects with surrounding communities.			✔		✔	✔

Table 3.04 - Broader Range of Transit Serving Different Customer Needs

- **Shift the structure of the transit system from a hub-and-spoke system designed to only serve University and Downtown travel to a grid system where other destinations can also be made convenient by transit.** Consistent with most cities, Saskatoon's transit system is designed to connect the suburban development areas with the Downtown and University. The 23rd Street Downtown terminal is the system's primary terminal, and is a transfer point in the system where most routes connect every 15 or 30 minutes. The existing structure of service will evolve toward a grid system of services along streets where more areas are served with attractive transit and services can be more direct for the majority of passengers.

- **Direct most services to the largest transit markets.** Providing higher quality service for larger potential transit markets, and managing the amount of service in lower demand areas is essential for transit to be successful. Instead of providing equal transit service everywhere, it is recommended that steps be taken now to adjust service frequency, directness and hours of operation during both weekdays and weekends so more resources can be invested where they have more impact. This will result in some areas of the city seeing more attractive service while other areas with limited ridership may see less service (see **Figure 3.24** below).

Figure 3.24 - Service Coverage vs Service Quality Design

C) Transit Priority Treatments

Improved speed and reliability can make transit travel more competitive with automobile travel and attract more passengers. Through the implementation of transit priority treatments (See **Figure 3.25**, below), passengers are likely to move faster than cars during periods of congestion. Additionally, buses will arrive and depart at scheduled times. This means that passengers will arrive at their destinations on time. For the operator, transit priority measures to bypass areas of congestion can improve operating speeds and increase reliability, thus reducing 'bunching' of buses and imbalanced headways. As a result, fewer buses are required to provide the same frequency of service on a given route. Alternatively, the same number of buses could be used to provide more frequent service along major corridors.

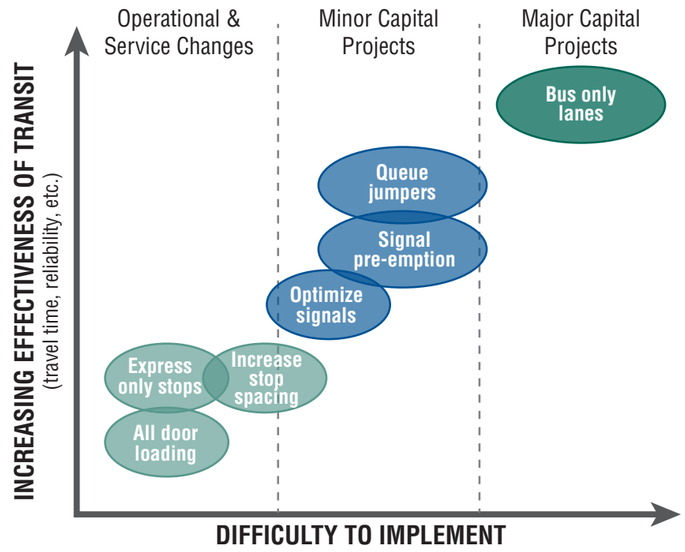


Figure 3.25 - Example Transit Priority Measures

The benefits of reallocating or providing additional space for buses must be weighed against the impacts and with community engagement to build awareness of the trade-offs to keep transit moving.

Through service planning and design, ongoing improvements to the customer experience and efficiency of the system can be made through operational changes such as by simply increasing stop distance and managing boarding and alighting activities. In some cases where sufficient ridership and services are provided, more active measures that include a wide range of traffic signal based measures can be used (e.g. transit biased signal progression, provision of transit specific signal phases, and traffic signal phase modification based on transit needs (TSP)). In other corridors, where service and ridership is significant and rapid transit services are envisioned, passive measures may be considered, such as: enhancements targeted at all modes and that also result in transit improvements (e.g. widening of roadways); provision of intersection queue jumpers; and, regulatory exemptions (e.g. exemption from turn restrictions or other prohibitions). Work to review such opportunities should be undertaken in partnership with transportation, public works, and roadways groups at the City.

D) Transit Supportive Infrastructure and Programs

A number of critical transit supportive features are required to achieve Saskatoon's goals for Moving Around. These features include park-and-ride lots, transit stations, conversion of bus terminals for rapid transit, bus fleet replacement, improvements to transit stop accessibility and comfort, and community outreach along with staff/customer training.

3.5 Transit Plan

This section of the report describes the primary features of the long-term Transit Plan that includes an enhanced customer experience, improved transit services and facilities as well as the provision of Bus Rapid Transit.

3.5.1 Improving the Customer Experience

Community input and feedback on the directions for the Growth Plan highlight the need for a holistic approach to improving the transit customer experience – from the point that customers are considering and planning a trip to the time they arrive at their destination, and also including any follow-up that may be required. Consistent with other service-based industries, transit must be a more customer focused service where the experience at each stage of the journey progresses with relative ease and comfort for people of all ages and levels of mobility. When considering or planning a trip, customers not familiar with the transit system must be able to easily access information on which bus to take, and the scheduled departure and arrival times. During the journey, customers should be able to comfortably walk, bike or drive to accessible bus stops and terminals that offer attractive and safe facilities at the busiest locations. Once the bus arrives, customers of all mobility levels must be able to easily board the bus and the vehicle should be clean, comfortable and safe. In all cases, information should be available on-board for customers, and drivers should be trained to deal with the many needs of passengers.

A) Real Time Bus Arrivals

Saskatoon Transit has recently equipped their fleet with internet-enabled GPS units, which enhance the rider experience by allowing transit users to monitor the location of buses in real-time. As shown in **Figure 3.26,** customers now have the information to monitor the precise location of their bus, which empowers them to choose when best to venture to the bus stop. Minimizing uncertainty and wait-times at stops can be particularly helpful during the winter. In addition, GPS units power the updated web-based trip planning application, ensuring customers are routed in the most efficient manner possible.

Real-time scheduling and bus arrivals are now also available on Google Maps, which provides a multi-modal, globally standardized platform for trip directions at the stroke of a mouse or swipe of a finger.

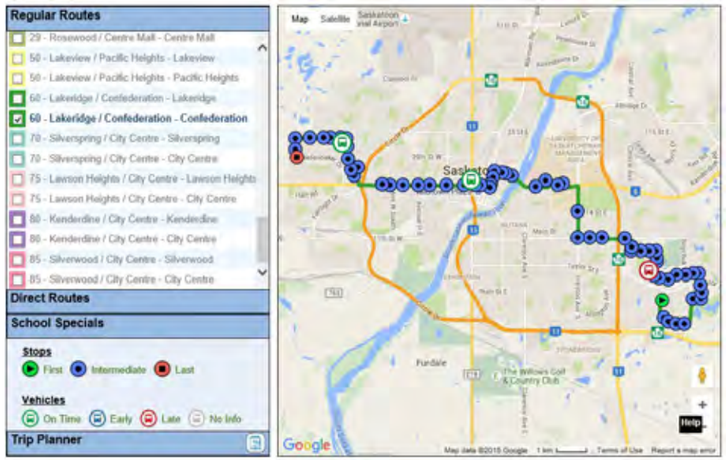


Figure 3.26 - Saskatoon Transit's New Real Time Bus Map

Recommended Actions:

- **To best leverage the efficiency of real time bus arrivals for customers, new fleet should be outfitted with GPS units.**
- **Additionally, it is recommended that all future rapid transit stations and other busy stops in the system be equipped with digital displays notifying customers of real-time arrivals for the next bus.**

These customer enhancements will require ongoing maintenance and upgrades once installed throughout the system.

B) Mobile App

Mobile apps complement the City's Real Time Bus Arrivals by providing much of the same information in an easy to interpret format suitable for Smart Phones. While an official Saskatoon Transit mobile app has not yet been created, several free third party mobile apps are available for download that provide real time scheduling and bus location information on the go for customers. Third party mobile apps use routing and real-time GPS information provided by Saskatoon Transit to map the precise location of vehicles on a route-by-route basis. This information is valuable for trip making decisions such as routing choices, when to leave the house, and how long one can expect to wait at a stop.

Recommended Action:

- **That the City continue to provide routing, stop, and GPS location data to third party developers on a go-forward basis.**

C) Ongoing Website Upgrades

The City's website has increasingly become the primary method by which existing and potential customers obtain most of their information. As the City's population grows, so too will the number of people with mobility and cognitive challenges that make use of the transit system. As such, Saskatoon Transit's website will need to adapt to be accessible to all customers.

Recommended Actions:

- **Pursue ongoing website development and expansion using Web Accessibility Guidelines based on internationally accepted practices to support people with a range of disabilities.**
- **Consider other opportunities to enhance accessibility of the website for all transit customers include further enhancements to the trip planner, additional accessibility information, video clips of key transit nodes (such as at planned BRT stations and terminals), and the provision of new functions such as the use of speech-enabled web content software.**
- **As the city grows and more languages are needed, an on-line translator as well as specific instructions to call Customer Information for those needing further assistance in other languages may be required.**

As much as possible, these and other changes to the website should be done with the input and feedback of customers through various forms of market research.

D) Universally Accessible Bus Stops

In recent years, the accessibility of Saskatoon's transit system has been vastly improved through the provision of low-floor accessible buses and specialized transit service. However, while some bus stops are designed to accommodate passengers using mobility aids, such as wheelchairs and scooters, the current system is not truly universally accessible, as transit users with other disabilities are not fully accommodated. Universal accessibility implies that services are designed to accommodate persons with various degrees of mobility, visual, hearing, and cognitive impairments. This includes passengers who, though not using any mobility aids, may not be able to walk long distances or stand for long periods of time without difficulty.

In the future, there will be increasing demand for universally accessible bus stops. Our population is aging and, because the disability rate increases with age (over 40% of Canadians 65 and over have some form of disability), it is anticipated that the proportion of our population with disabilities will grow over time. Ultimately, universally accessible transit facilities will accommodate the needs of all customers better.

Recommended Action:

- **That the City of Saskatoon engage in a process of updating its bus stop standards to promote universal accessibility. These standards would be intended for use by engineers and other professionals and parties involved in the design and building of bus stops and other accessible infrastructure throughout Saskatoon.**

E) Access to Transit

Access to and from transit was noted by the public as one of the most significant areas that requires more attention moving forward. In winter conditions, access to transit becomes even more difficult. Snow and ice obstruct bus stops and sidewalks, making them at times impassable for all but the most able.

Due to the nature of Saskatoon's climate, choppy ice and compact snow can remain on city sidewalks through the winter, making many sidewalks impassable for those with mobility impairments and generally difficult for all customers for several months a year. This situation is exacerbated by a policy that requires landowners and tenants to clear snow and ice from sidewalks adjacent to their properties, resulting in an inconsistent quality of sidewalk clearance. Saskatoon's winter conditions also increase the discomfort of waiting for buses on dark and cold days.

Recommended Action:

- **Ensure all frequent transit corridors have wide accessible sidewalks on both sides of the street within 400 metres of a future rapid transit bus stop. Sidewalks along main corridors should be well-lit. Where possible, separated sidewalks may be preferred along high volume/fast moving arterial corridors to improve pedestrian comfort (safer spacing and reduced incidence of splashing from vehicles during rains / snow melts).**
- **Ensure all sidewalks along frequent transit corridors have curb cuts that can facilitate wheelchair access.**
- **Ensure safe and frequent road crossing opportunities across major transit corridors.**

- **Shift the responsibility for snow and ice clearing from private landowners and tenants to the City, specifically within the Urban Core and University District and along Rapid Transit and frequent transit corridors. This will allow for a consistent level of snow and ice clearance along all City sidewalks in heavy-use transit areas, putting sidewalk snow clearance on-par with roadway snow clearance.**
- **Work towards universal accessibility at all bus stops (as per above) with a focus on Rapid Transit and Frequent Transit Corridors as well as stops within the Downtown core.**
- **Implement heated and well-lit shelters at all stations along Rapid Transit corridors; consider installing heated shelters at primary bus stops along frequent transit routes.**
- **Ensure new commercial and higher density residential developments are oriented to rapid transit stops (not parking lots), making transit the most convenient mode to access these new developments.**
- **Ensure easy penetration into neighbourhoods from transit stops, with preference for grid or modified grid street networks in newly developing areas.**
- **Build a parallel cycling network that connects neighbourhoods and rapid transit stops to each other; ensure the provision of bike racks or other cycling facilities at rapid transit stations to facilitate intermodal travel.**

F) Community Outreach

The needs of existing and potential customers vary from simply getting the right information through to assistance boarding and leaving the transit vehicle. For many people, limited assistance or even poor customer service can be a barrier to using transit. This is particularly true for people with cognitive or physical disabilities and it can place added pressures on specialized service (i.e. Access Transit).

Training for customers and staff that work with people of varying needs are essential to increase comfort and accessibility of transit for everyone. Community outreach programs will serve to increase awareness of system accessibility and the customer support that is available, and will be used to address individual circumstances. This form of customer outreach and support is considered a “high touch” approach and requires trained staff resources. As such, outreach programs may be targeted toward specific groups that work with youth, seniors as well as people with disabilities.

Recommended Action:

- **In most cases, the City will want to provide hands-on training (i.e. train-the-trainer) so that community leaders can assist potential customers on a routine basis—school programs, seniors groups and organizations that work with people with disabilities. To be effective, most customer training and community outreach initiatives should be piloted, evaluated and modified as necessary to increase accessibility of the conventional transit system.**

G) Customer Service Staff & Training

To increase accessibility of the transit system, the volume and complexity of customer needs must be accommodated and supported by staff through enhanced customer service. Beyond having full time staff to provide customer services, planning for and working with customers with disabilities requires individuals with special training and guidance.

Recommended Actions:

- **Provide basic level training for all staff. This training could emphasize that individuals with disabilities are a diverse group of customers using the transit system. Training could address how fears and prejudices can result in misinformed assumptions, and may alter attitudes and perceptions that shape behaviours.**
- **Provide expanded opportunities for passenger assistance training and refresher courses for those working with disabled customers on a day-to-day basis. This form of training could essentially involve more details about various disabilities and how to provide direct assistance.**

H) Customer Satisfaction Surveys

Customers riding the bus today are perhaps the most informed about the transit experience and can become detractors for others to use transit when their experience is poor. Customer satisfaction surveys should be done for the entire system or on a route-by-route basis in order to get a broad understanding of all people using the system.

Recommended Action:

- **Implement customer satisfaction surveys to generally monitor and maintain a positive experience for existing transit customers and to make changes where customer satisfaction is below reasonable levels**

Based on experience of other transit systems, there are various sample customer experience metrics that may be monitored, including:

- Safety & Security (safety at stops, stations and on board vehicles);
- Reliability & Frequency (ability to meet departure times, frequency of services and reliability of card readers);
- Comfort (cleanliness, availability of seats, temperature on board, and facilities at stops and stations);
- Ease of Use (using and understanding ticketing including transferring between routes, ease of finding stops);
- Proximity (convenience of available routes, distances from stops and stations);
- Efficiency (door-to-door travel time, connections with other services and avoidance of congestion).
- Information (ability to understand on board and at-station information, timetables, maps and journey planning information);
- Accessibility (ease of getting on and off the platform, and on and off the vehicles);Staff (knowledge, conduct, presentation and helpfulness of staff);
- Affordability (cost of tickets and benefits of not having to pay for parking); and,
- Service Reliability / Adherence.

3.5.2 Service Plan

A) Increase Service Hours

If Saskatoon maintains the current rates of investment, transit service will not keep pace with the City's rapid population growth. Today, almost 400,000 transit service hours are provided in Saskatoon, resulting in about 1.6 service hours per capita. But with lagging investment in transit, overall service hours per capita will decline over the next thirty years to 1.4 service hours per capita. Although the overall travel demand is expected to grow, the proportion of people using transit will decline without a corresponding increase in service levels.

The Transit Plan requires additional service hours beyond the recent annual increases of 1.8% per year. The Transit Plan is framed around thirty-year service levels ultimately being anywhere from 900,000 to 1,000,000 service hours per year, or between 1.8 and 2.0 service hours per capita. This investment would not only maintain, but also increase the levels of service per capita from today in order to make transit attractive for a city of half a million people. This level of service is in line with other peer Canadian cities at or nearing the half million population horizon (e.g. Victoria, Winnipeg and Halifax), where transit mode shares are higher than Saskatoon.

Recommended Action:

- **To accomplish this level of growth, annual service hours would need to increase by as much as 2.5 to 3.0% per year over the next thirty years, up from today's 1.8% per year rate of growth, which does not keep pace with Saskatoon's population growth rate of 2.5% as illustrated below in Figure 3.27.**

Figure 3.27 - Plan for Annual Service Hours Changes and Comparisons

The increase in transit services must be directed toward the largest customer markets today and for the future travel patterns in Saskatoon. Considering the planned growth within the city and projected ridership patterns, the strongest markets for attractive transit services are illustrated in **Figure 3.28.**

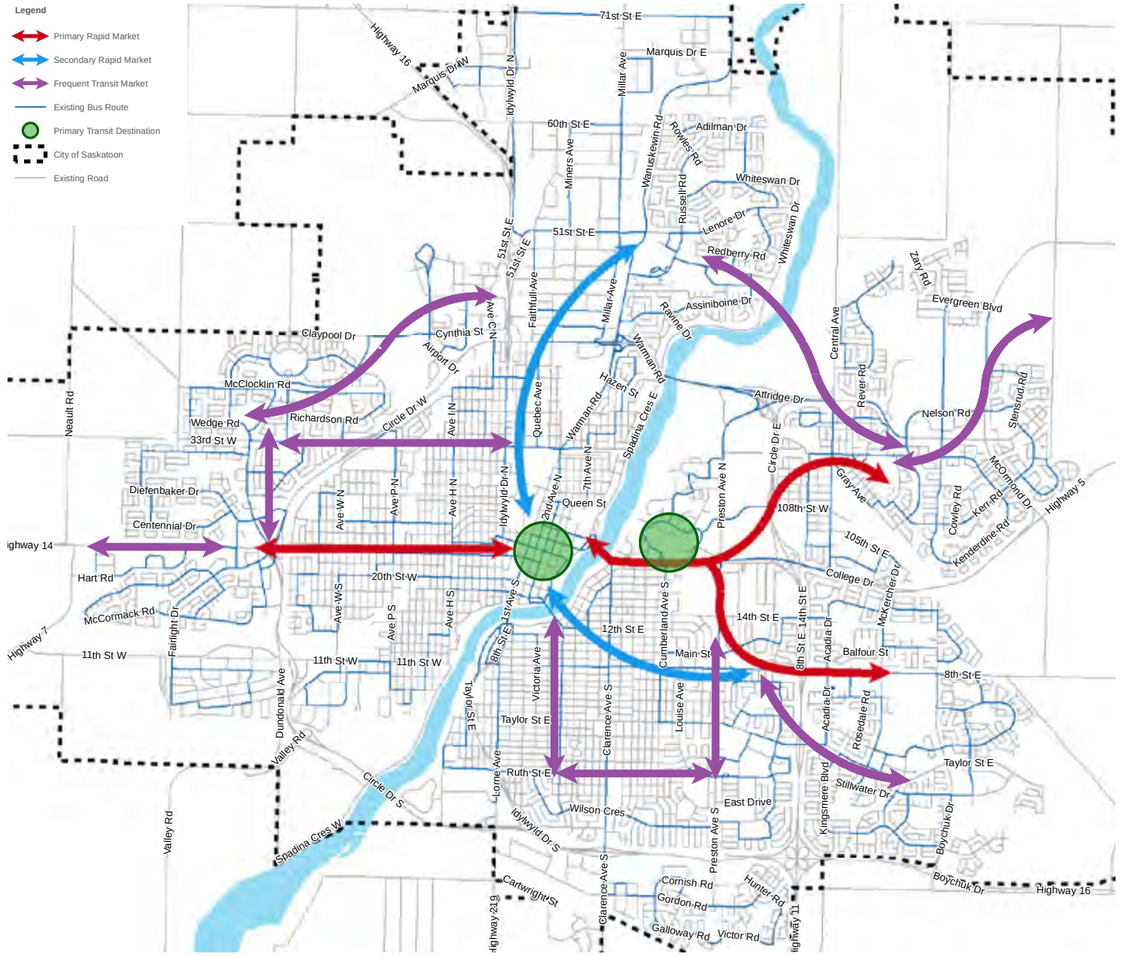


Figure 3.28 - Potential Transit Markets

B) Rapid Transit Corridors

Ultimately, rapid transit is intended to shape and support growth in addition to providing an attractive transportation choice. Rapid transit stations and corridors are more than a 'transportation utility.' They should be designed with the intent to create vibrant urban environments that are attractive and comfortable for people. Rapid transit systems are also unique from the rest of the transit system in that they are identifiable corridors with mostly or entirely separate travel lanes, enhanced transit stations for the comfort of passengers and real time information. These integrated investments will enhance the customer experience and system operation.

With half a million people, the projected east-west and north-south ridership for the rapid transit corridors can be accommodated using buses in dedicated lanes. Although higher capacity systems such as Light Rail Transit (LRT) may be required to support transit ridership beyond 30 or 40 years, a Bus Rapid Transit (BRT) system allows the city to significantly expand transit services and the system as ridership grows.

Similar to the BRT system in operation in Ottawa as well as what's being planned for Winnipeg, the rapid transit service will be made up of the combined services from different areas of the city that are directed to specific corridors with dedicated bus lanes or priority treatments for buses at intersections. For Saskatoon, this means increasing the frequency and directness of the DART services and introducing additional east-west and north-south express bus services across the city. With the cumulative frequencies of these interconnected routes, customers could expect a bus at least every 5 to 10 minutes along the BRT corridors during peak periods.

In the long-term, BRT corridors will form the 'spine' of the transit system for Saskatoon as illustrated in **Figure 3.29.** Ultimately, the east-west corridors (Red BRT Line) will include approximately 22 kilometres of dedicated bus lanes with 25 stations between Blairmore, University Heights and Holmwood. The Red BRT Line will eventually operate along established corridors where existing and forecast transit customer markets are significant such as along 22nd Street, 3rd Avenue, 25th Street, College Drive, Preston Avenue, and 8th Street. As dedicated lanes are implemented, nearby transit terminals such as the Downtown, University and Confederation terminals will be replaced with on-street stations. In fact, most routes will operate through the downtown area, providing customers with a transferless trip across the city and no wait times in the middle of their journey.

The north-south corridors (Blue BRT Line) will include approximately 12 kilometres between Nutana Suburban Centre and Lawson Heights. The projected ridership and service levels would support transit priority treatments in order to bypass areas of recurring congestion such as signalized intersections as described later in the Plan. The Blue BRT Line includes corridors such as 8th Street, Broadway Avenue, 3rd Avenue, 25th Street, Idylwyld Drive, 33rd Street, and Warman Road.

Recommended Actions:

- **Increase the frequency and directness of the DART services and as demand grows, introduce additional east-west and north-south express bus services across the city**
- **Add service incrementally to establish cumulative frequencies on these interconnected routes, where customers could expect a bus at least every 5 to 10 minutes along the corridors during peak periods.**

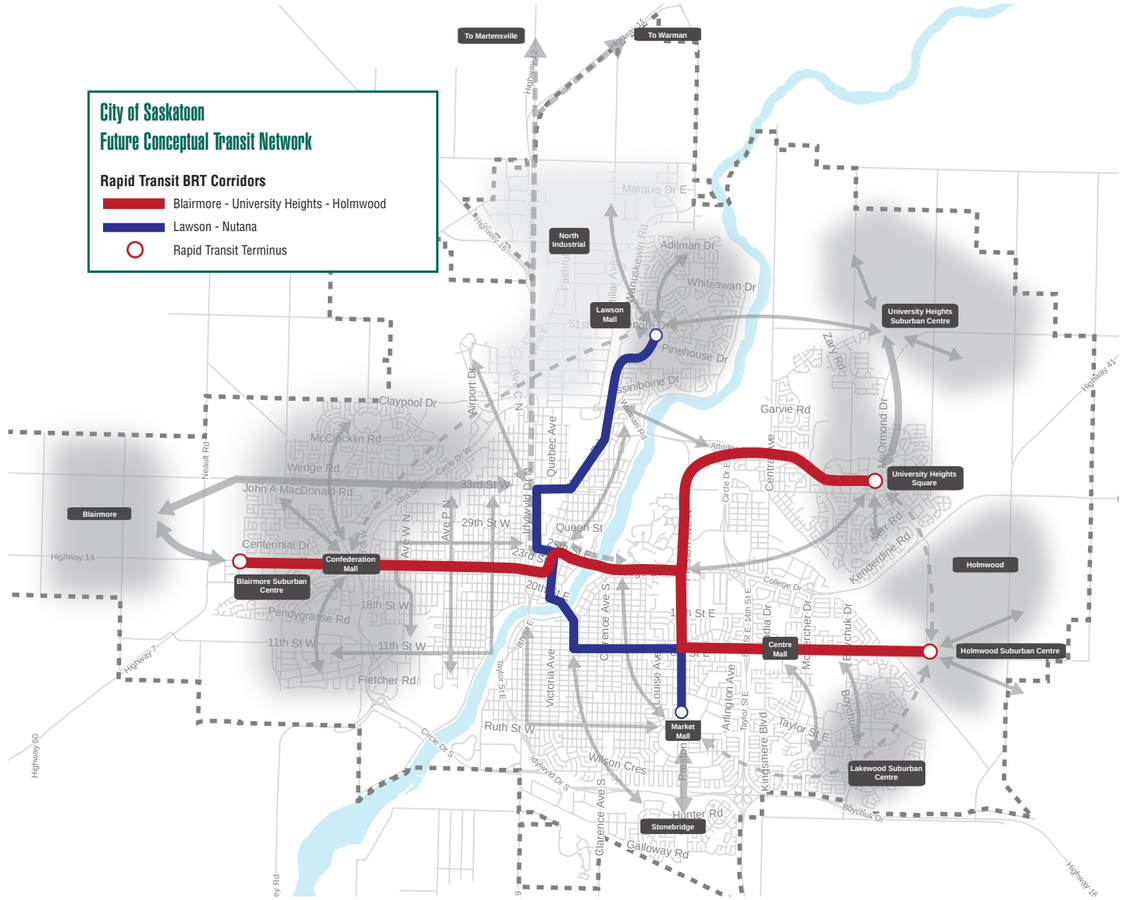


Figure 3.29 - Recommended Red & Blue BRT Lines

C) Frequent Transit Corridors

Beyond the BRT corridors, Frequent Transit Corridors (FTC) will also serve as identifiable parts of the city's transit system. **Figure 3.30** conceptually illustrates the FTCs planned for the city in the long-term. Ultimately, buses will operate at least every 15 minutes along FTCs, for 15 hours per day, 7 days a week. With greater awareness of the system and corridors, customers boarding transit along the FTCs can rely on an attractive bus service. With growing north-south travel from Stonebridge and planned growth in Blairmore, University Heights and Holmwood, FTCs can be created along corridors such as 22nd Street, 33rd Street, Preston Avenue and McOrmond Drive. Similar to BRT corridors, transit services will be directed to FTCs in order to create the minimum desired frequencies and to shape land use patterns along the corridors. FTCs should be equipped with comfortable stops with shelters and passenger information where transit ridership and boardings are highest.

Recommended Actions:

- **Build service along corridors to create minimum desired frequencies. Ultimately, buses will operate at least every 15 minutes along FTCs, for 15 hours per day, 7 days a week.**
- **Equip FTCs with passenger amenities where transit ridership and boardings are highest.**

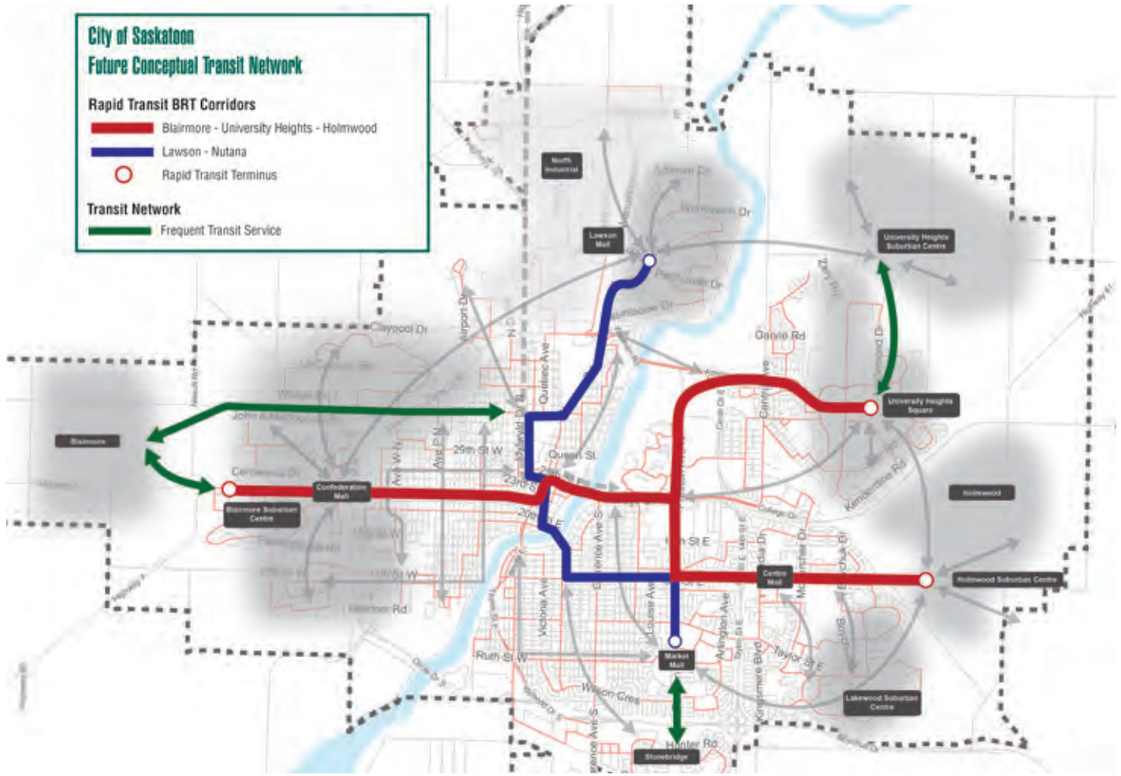


Figure 3.30 - Recommended Frequent Transit Corridor Structure

D) Conventional Transit Services (including Suburban Centre Services)

Conventional transit services will form the largest part of the transit network in the city. Within the core areas of the city, the 'grid structure' of conventional services along several major roadways will enhance access to BRT Lines and FTCs where customers can transfer at stations and comfortable stops. Conventional services will also be designed to support local trip making with more direct and frequent access to other areas of the city not well served by transit today, as well as providing direct connections between suburban centres and the North Industrial Area. With these new transit connections inside the core and between suburban areas, transit travel times will become much more reasonable and attractive to enhance the customer experience. In order to be attractive, peak and off-peak services should be at least every 15 minutes and 30 minutes respectively. **Figure 3.31** illustrates the conceptual network of conventional transit services proposed for Saskatoon.

Recommended Action:

- **Transition to a 'grid-like structure' of conventional services along frequent transit corridor along several major roadways within the core area of the city, to enhance access to BRT Lines and FTCs where customers can transfer at stations and comfortable stops.**
- **In order to be attractive, peak and off- peak services should be at least every 15 minutes and 30 minutes respectively.**

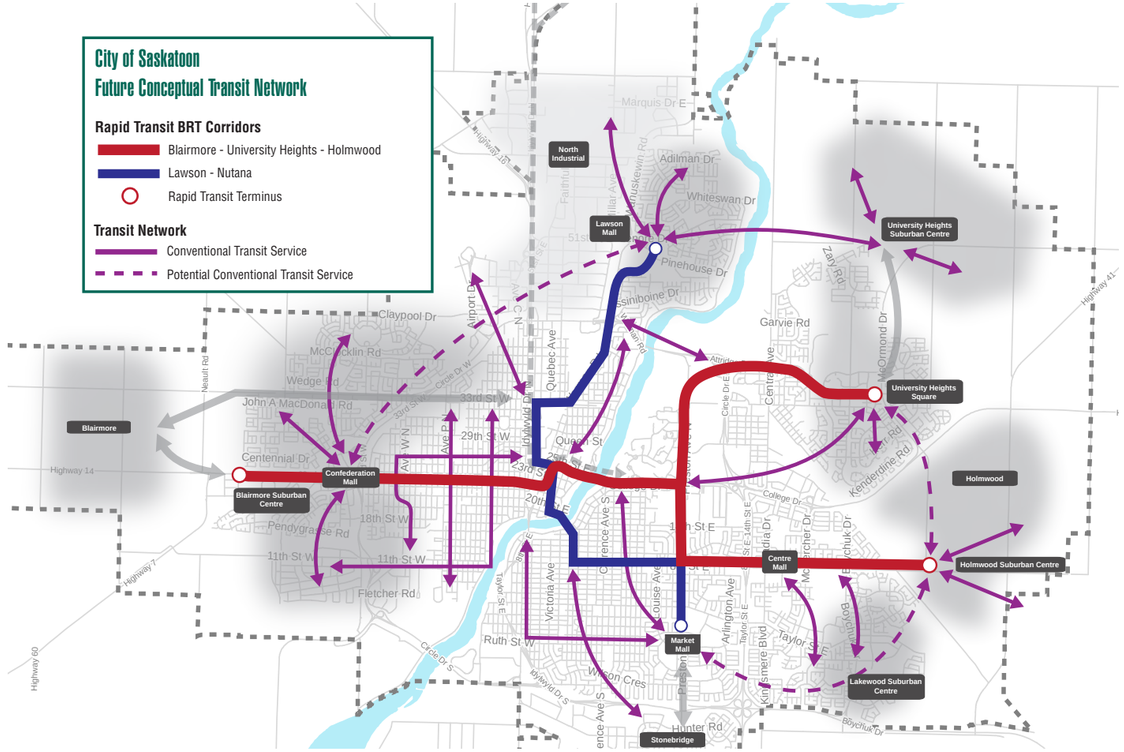


Figure 3.31 - Recommended Conventional Transit Service Structure

E) Community Shuttle / Flexible Service Areas

Travel to, from, and within expanding areas such as Holmwood, University Heights and even the North Industrial Area is expected to grow significantly in the long-term. Rapid transit, FTCs and conventional services will be designed to provide more direct and frequent services between the established and growing areas of the city. Within the lower density suburban areas of the city, however, it can be difficult to make transit attractive to serve local trip making.

In order to maintain reasonable coverage and access to transit, community shuttle or flexible transit services may provide access for local area travel and to other parts of the transit system. Smaller buses can operate on neighbourhood streets to provide greater coverage and easier access to transit, with minimal impact on the community. In some areas—such as the North Industrial Area—flexible community shuttle services may be required to provide easy connections to the Lawson Heights BRT station during much of the day. **Figure 3.32** illustrates the community shuttle service areas where rapid transit, FTCs and conventional services may not provide sufficient coverage and where customers may benefit from additional transit coverage.

Recommended Action:

- **Identify form of community shuttle and flexible service solutions to better serve lower density areas with lower travel demand, while providing local access and access to more frequent services.**

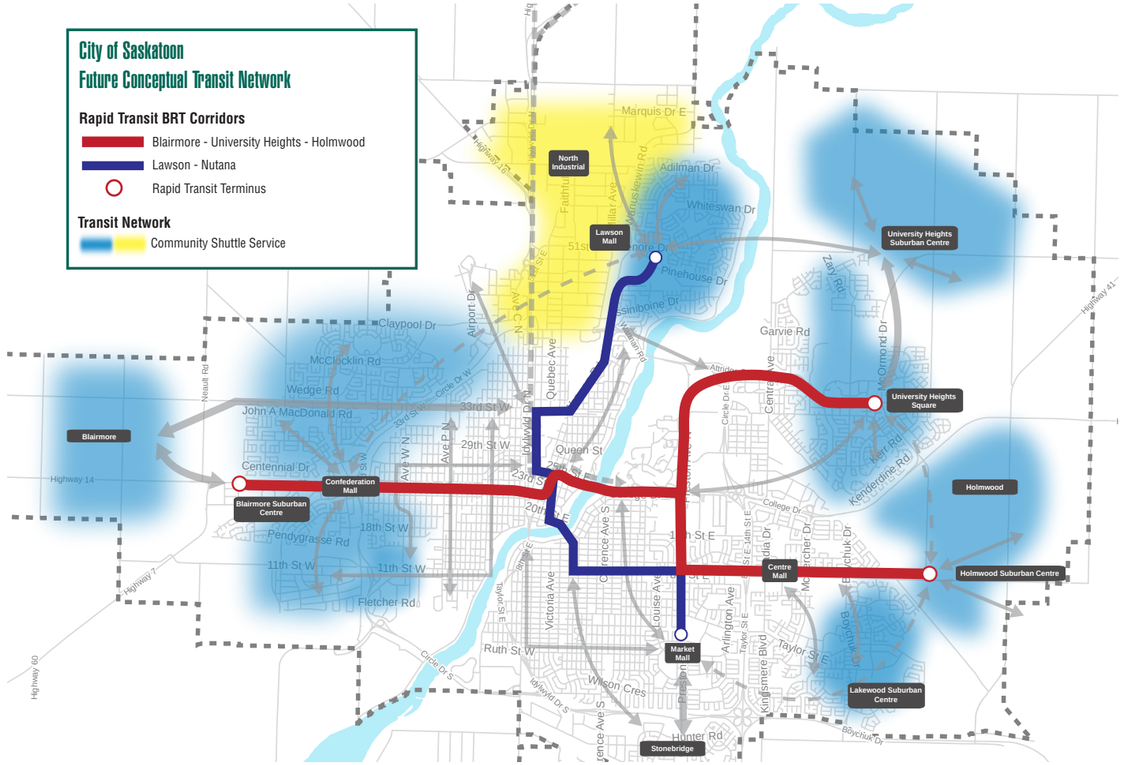


Figure 3.32 - Recommended Community Shuttle Areas

F) Commuter Services

As the city and surrounding communities continue to grow, so too will regional travel. Commuter Services in Saskatoon can provide connections between surrounding areas such as Warman / Martensville and primary destinations in the city such as the North Industrial area, Downtown and the University. Although Commuter Services are included in the long-term Transit Plan, they would be financially supported by surrounding municipalities and possibly contracted to Saskatoon Transit or alternatively a private operator. These services should be supported with strategically located park-and-ride facilities inside the outlying communities in order to intercept driving trips closer to where they begin. **Figure 3.33** illustrates the conceptual connections for commuter services entering the city from Martensville and Warman.

There is no recommendation at this time.

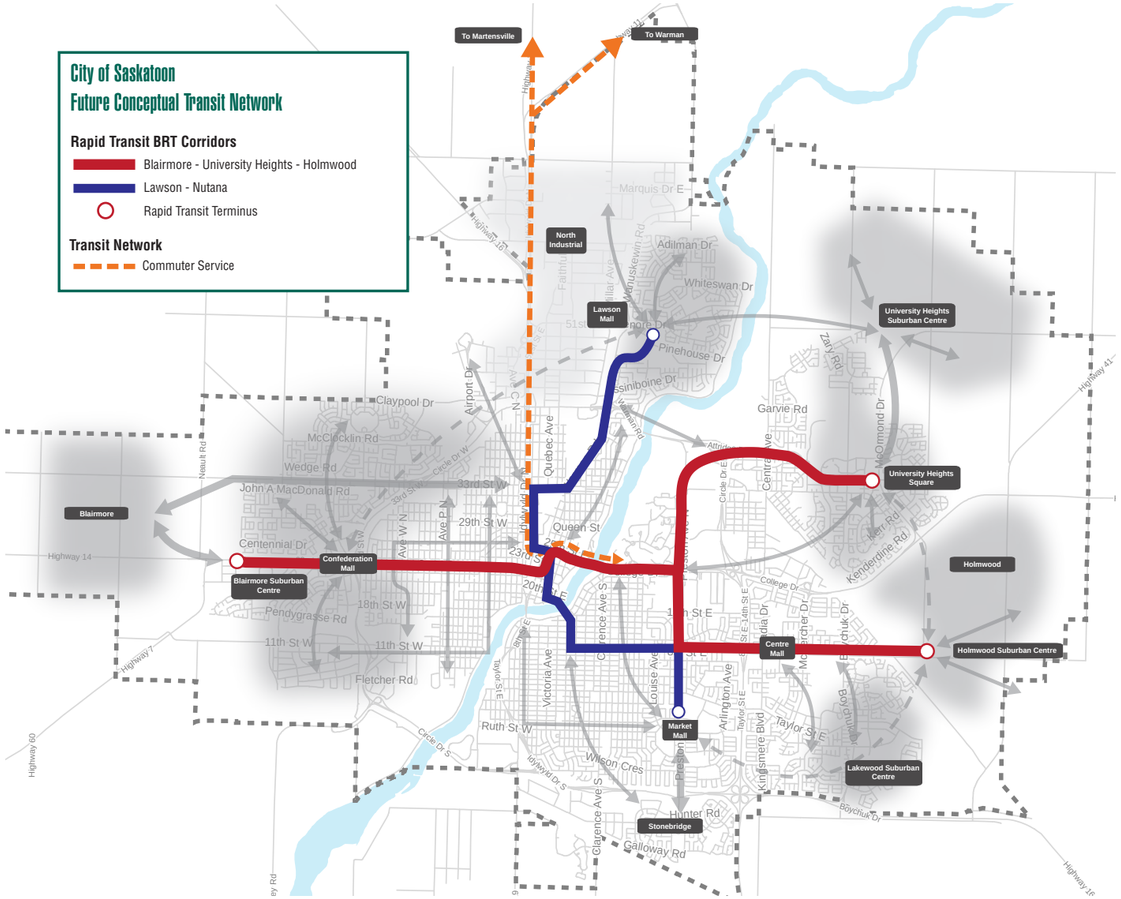


Figure 3.33 - Recommended Commuter Services (Martensville & Warman)

The long-term Transit Plan for Saskatoon is illustrated in **Figure 3.34.**

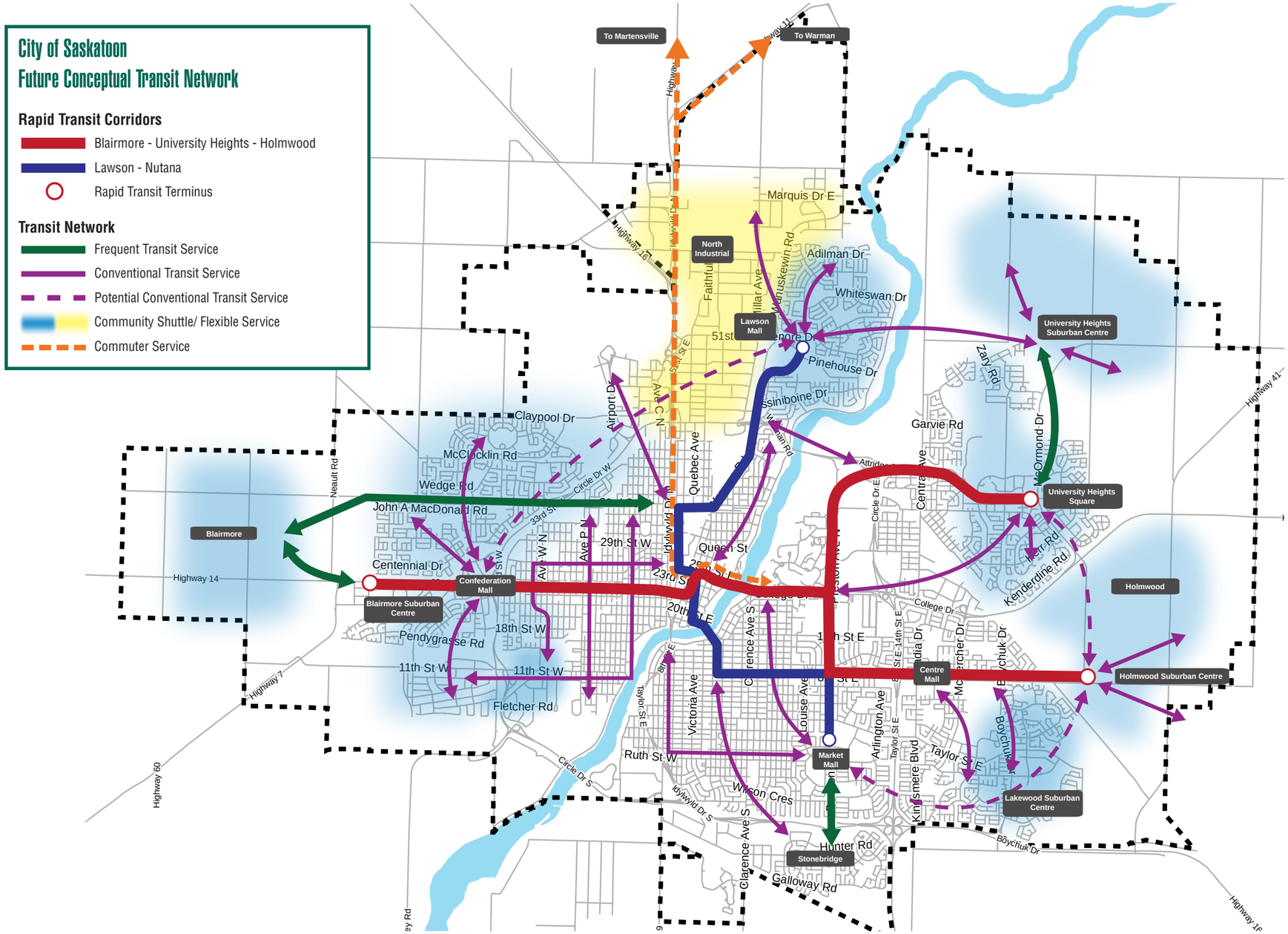


Figure 3.34 - Conceptual Long-term Transit Plan

3.5.3 Support Facilities

A) Bus Fleet Replacement

Over the past number of years, the City has purchased used buses from other transit agencies. This has allowed the City to put more buses into the system at reduced capital costs. This has also resulted in Saskatoon having a comparatively much older fleet than other peer communities in the country. Comfortable and fully accessible vehicles are essential to improving the attractiveness of transit going forward. A Fleet Renewal Strategy was adopted by the City in 2015.

Recommended Action:

- **Continue to implement the Fleet Renewal Strategy to maintain a safe and reliable fleet, with an average fleet age meeting the industry average.**

B) Bus Fleet Expansion

The ten year implementation plan requires approximately 126,000 additional service hours beyond current levels. If the current fleet usage ratio is maintained, 52 additional buses will be required to support the ten year service expansion, or about five new buses each year. The City should pursue partnerships with senior levels of government to achieve this goal. It should be noted that these costs are estimates only and should not be used for budgeting purposes. Additionally, these costs do not account for additional operating and maintenance costs.

Implementation Timing and Cost

Actions:	Purchase 5 additional buses every year ($600,000 per bus assumed)	Annual Cost $3.0 M
Timing:	Annual fleet purchases	
Estimated Cost:	**$30 M ($ 2015)** in capital costs over 10 years	

Table 3.05 - Bus Fleet Expansion Implementation Timing & Cost

Recommended Action:

- **Pursue a fleet expansion strategy to meet the needs of growth and provide additional service hours.**

C) Transit Priority Treatments

Through service planning and design, ongoing improvements to the customer experience and efficiency of the system can be made through operational changes such as by simply increasing stop distance and managing boarding and alighting activities. In some cases where sufficient ridership and services are provided, more active measures that include a wide range of traffic signal based measures can be used (e.g. transit biased signal progression, provision of transit specific signal phases, and traffic signal phase modification based on transit needs (TSP)). In other corridors, where service and ridership is significant and rapid transit services are envisioned, passive measures may be considered, such as: enhancements targeted at all modes and that also result in transit improvements (e.g. widening of roadways); provision of intersection queue jumpers; and, regulatory exemptions (e.g. exemption from turn restrictions or other prohibitions).

Recommended Action:

- **Identify and implement locations for the installation of passive and active transit priority treatments, as required, in order to improve the efficiency of the system and improve the customer experience.**
- **Work to review such opportunities should be undertaken in partnership with transportation, public works, and roadways groups at the City.**

D) Transition from Transit Terminals to BRT Stations

Bus terminals (or Transit Terminals) provide an important interface between the transit customer and the system. The terminals themselves typically accommodate the highest number of buses converging on a specific area and represent the primary starting or transfer points for most transit customers. There are currently six designated transit terminals in Saskatoon: City Centre (23rd Street), University of Saskatchewan (Place Riel), Confederation, Lawson Heights, Market Mall, and Wildwood Centre. Of these six, the City Centre and University (Place Riel) are the most prominent in terms of passenger activity.

While all transit terminals should be accessible and comfortable for passengers transferring from other services, walking or cycling to the terminal, or getting dropped-off, those terminals with the highest boarding activity require the greatest attention in the short-term. The Downtown and Place Riel terminals not only accommodate the largest number of passengers and services, but are also core parts of the Bus Rapid Transit corridor. The following discussion highlights the anticipated needs for the BRT stations that will ultimately replace the City Centre and Place Riel transit terminals.

- **City Centre Transit Terminal to 3rd Avenue Stations**. Today, nearly all transit routes terminate at the central transit terminal on 23rd Street. The terminal is the nexus for all transit services and is designed around a timed-transfer model. Bus routes are designed to arrive and depart the terminal at the same time, to maximize transfer opportunities for system users. While this method has significant advantages, it requires ample space to accommodate buses stopping and laying-over concurrently. 23rd Street between 2nd and 3rd Avenues is the exclusive domain of the transit terminal with no through traffic permitted. Additionally, the transit terminal extends onto 23rd Street west of 2nd Avenue and 3rd Avenue both north and south of 23rd Street.

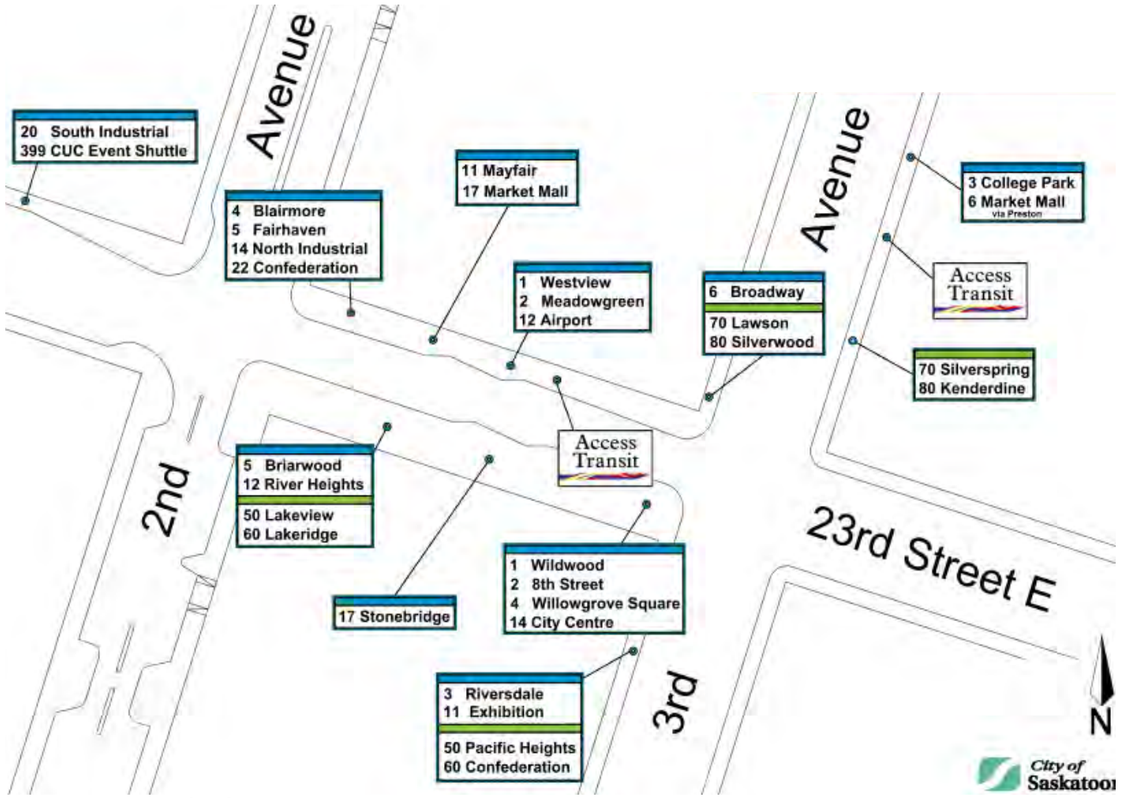


Figure 3.35 - Existing City Centre Transit Terminal

The 3rd Avenue corridor will ultimately host two BRT stations (near 22nd Street and 25th Street) serving both north-south and east-west services across the city. **Figure 3.36** conceptually illustrates three optional configurations for a curb, centre or side running BRT service along the 3rd Avenue corridor. Each station will include amenities such as heated shelters, large platforms for pick-up and drop-off, as well as other critical passenger information. Transit services will be redesigned to allow 3rd Avenue to accommodate all east-west and north-south services directed through the Downtown area. Interlining routes through the Downtown reduces the need for layover curb space for buses. For transit customers, a continuous service without stopover or transfer within the downtown will also increase convenience and travel time.

Recommended Action:

- **Once the timed-transfer model has been transitioned to a headway based model, implement two 3rd Avenue stations to replace the City Centre Transit Terminal on 23rd Street.**

Following this conversion, 23rd Street may potentially be converted to use for general purpose traffic, bicycle facilities and on-street parking.

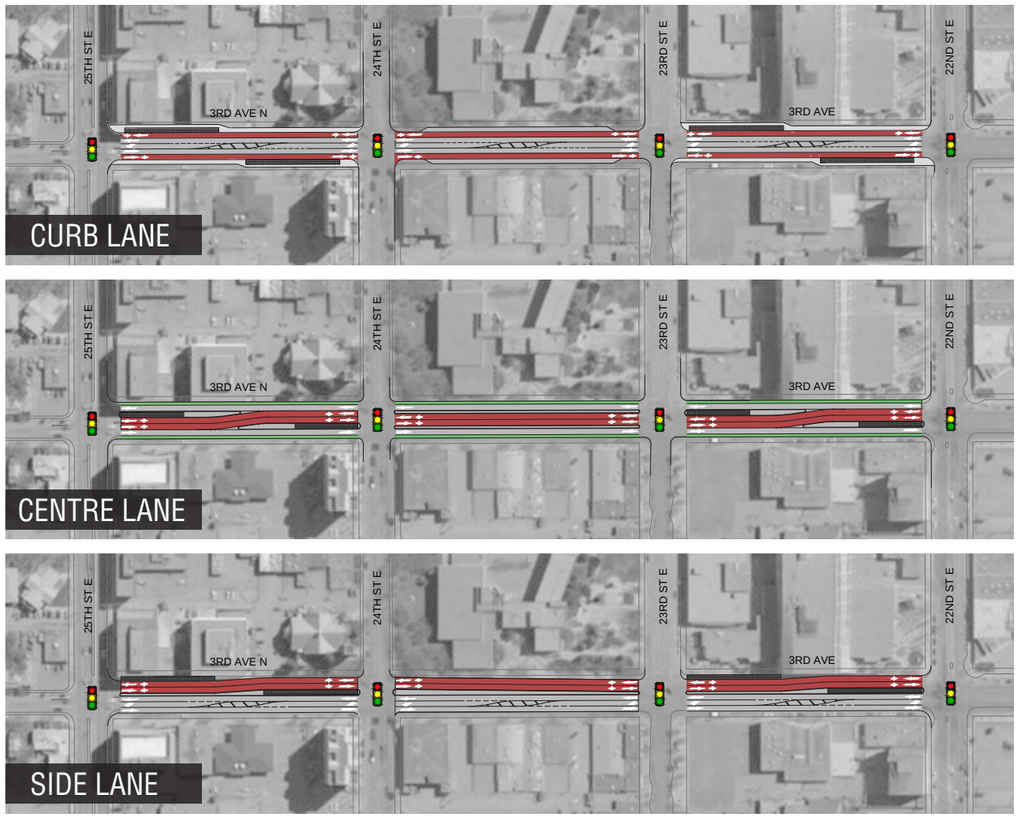


Figure 3.36 - Alternative BRT Configurations for 3rd Avenue

➢ **Place Riel Transit Terminal to College Drive Stations**. Today, on the eastern side of the city, most transit services leaving or destined to the Downtown are directed through the University. The Place Riel terminal is located off-line and requires a short detour through campus, resulting in indirect routing for through passengers and approximately five minutes of additional travel time. When aggregated for all routes serving the terminal and annualized, this represents a significant expenditure of service hours and system resources.

With the provision of BRT lanes and stations along College Drive, three new stations are planned—Hospital Station, Central Campus Station and East Campus Station. Assuming the provision of safe and attractive pedestrian facilities along-side and crossing College Drive as well as large accessible station areas, transit services may remain on College Drive rather than entering the Place Riel terminal. Two optional BRT lane and station configurations may be considered, as displayed in **Figure 3.37.** A curbside option has designated bus lanes and stops on both the east and west side of College Drive, requiring University bound passengers to cross College Drive to access westbound transit stops. A side running option has bus lanes integrated onto Campus on the north side of College Drive, eliminating the need for transit users to cross the street.

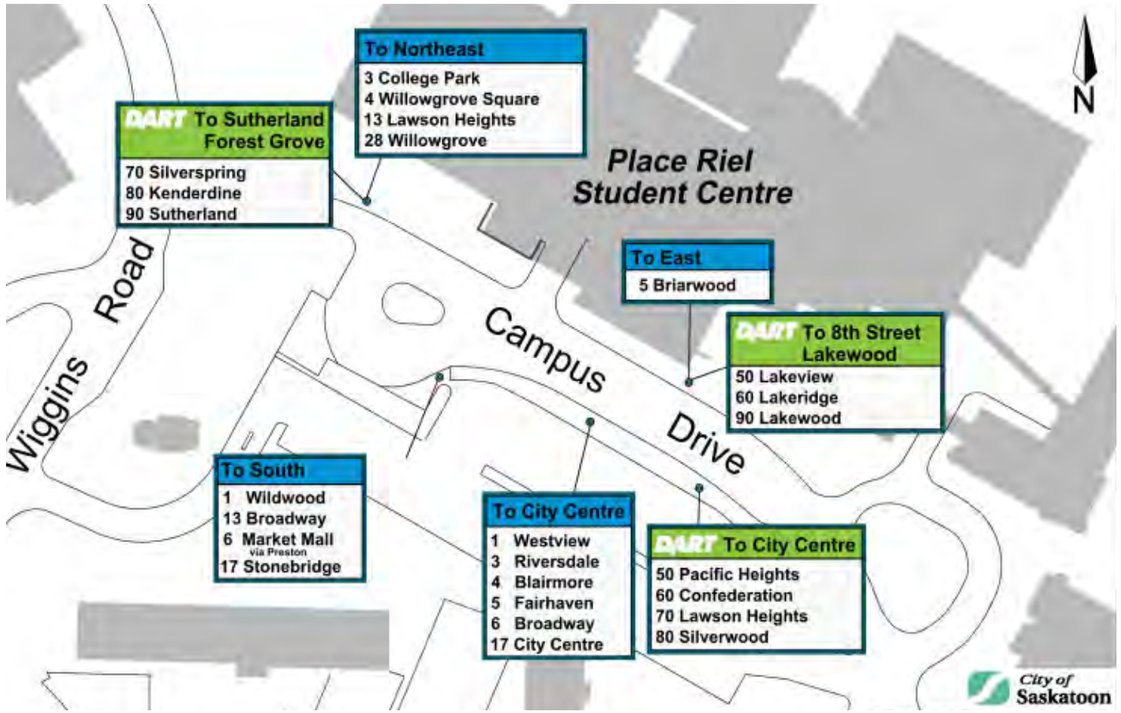


Figure 3.37 - Existing Place Riel Transit Terminal

Recommended Actions:

- **As part of the functional planning for BRT facilities and stations along College Drive, long-term station requirements should be confirmed. For planning purposes, 60 metre station areas have been conceptually identified to accommodate two or three stop areas in each direction.**
- **Develop BRT facilities along College Drive to include safe and attractive pedestrian facilities along-side and crossing College Drive as well as large accessible station areas, which will allow transit services to remain on College Drive rather than entering the Place Riel terminal.**

It should be noted that stops for local services that serve and turnaround within the University will still need to be accommodated on campus.

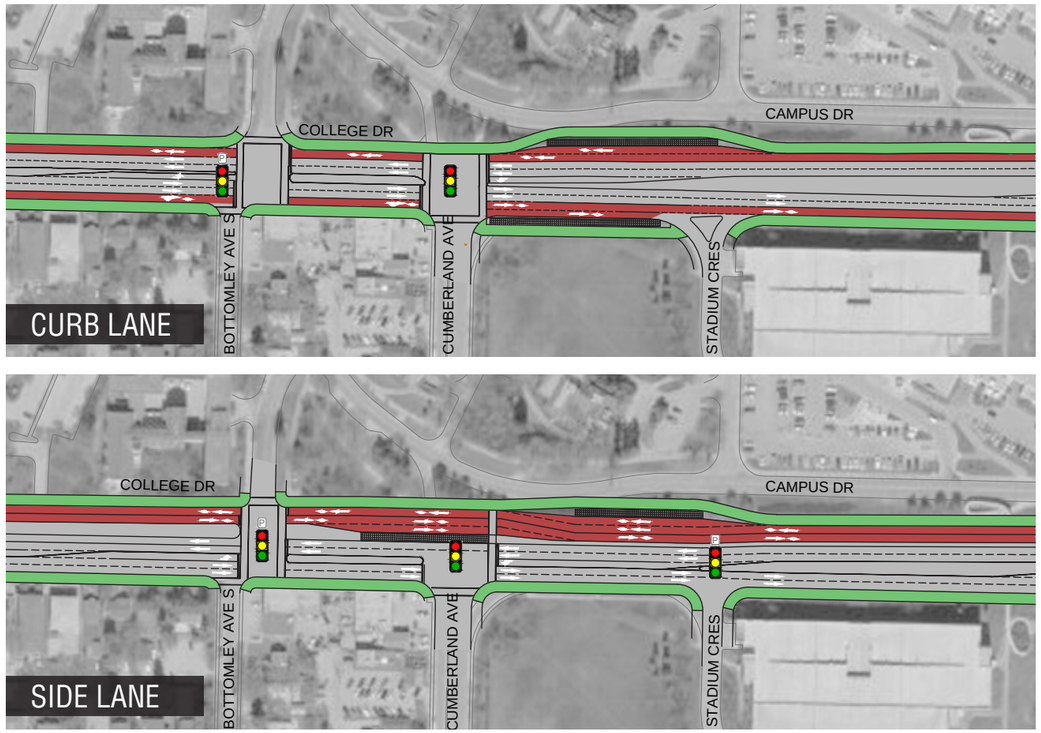


Figure 3.38 - Alternative BRT Configurations for College Drive (Central Campus Station)

E) Park-and-Ride Lots

Park-and-ride lots provide a means of accessing frequent transit services in lower-density areas where the walking distances to transit are lengthy and local services are not frequent. Studies in other communities have shown that park-and-ride lots must be located close to the start of the trip (within a distance of less than 20% of the total trip). If the distance to the park-and-ride lot is greater, most motorists will simply continue driving to their destination. As is the case in other winter cities, park-and-ride lots must be fully serviced with car plug-ins as well as other treatments to make it comfortable and safe to encourage passengers to transfer to transit.

Figure 3.39 illustrates the locations where park-and-ride lots could be considered. These locations include Blairmore Shopping Centre, Confederation Mall, Centre Mall, and University Heights Shopping Centre near the Red Line and Lawson Heights Mall near the Blue Line. They may begin as temporary small sites of 50 to 100 parking spaces with potential to expand to as many as 300 stalls at each location in the longer-term.

Recommended Actions:

- **Undertake siting and feasibility studies for these park-and-ride locations in support of functional planning and design for rapid transit stations.**
- **Implement park-and-ride lots as required to serve growing demand.**

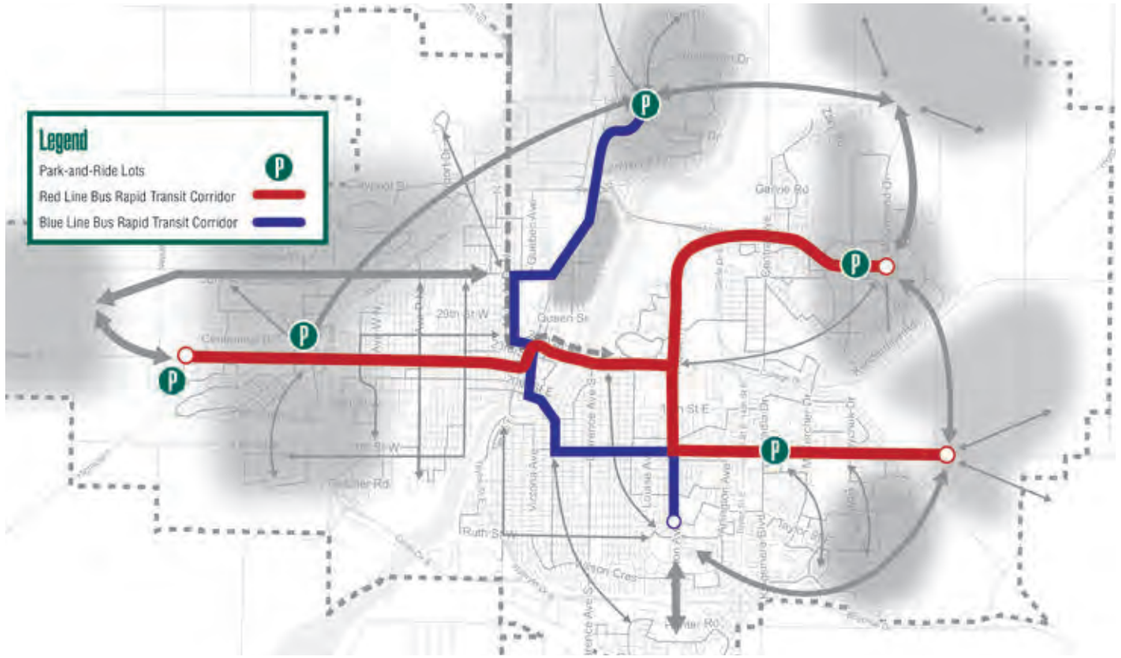


Figure 3.39 - Areas for Candidate Park-and-Ride Lots

3.5.4 Red Line BRT Corridor

The Service Plan highlights the most pronounced markets today and with the long-term growth planned for Saskatoon. Today, over 90% of all transit trips are destined to the downtown and University areas. Additionally, a large majority of the ridership is traveling east-west along corridors such as 22nd Street, College Drive and 8th Street, serving outlying communities as well as mixed-use development that surrounds these corridors. In the long-term, planned growth in New Suburban Areas such as Blairmore, University Heights and Holmwood as well as along these major corridors in the core areas mean that existing east-west travel demands across the city will only intensify.

The Service Plan described in Section 3.5.2 outlines the structure of the transit system planned for the next 30 years. Appendix A describes the identification and evaluation of alternative rapid transit technologies and routing across the city to serve the largest long-term transit markets. In order to attract and support east-west travel demands, a Red Line Bus Rapid Transit (BRT) service was identified. Consistent with cities such as Ottawa and what's planned for Winnipeg, the transit service along the Red Line BRT corridor will be made up of the combined services from different areas of the city in order to deliver a bus every 5 minutes or less and to take advantage of the BRT facilities (such as bus-only lanes, dedicated stations, and other customer amenities). In this regard, the BRT services and treatments along the corridor are designed to support the largest transit markets across Saskatoon and to also support transit-oriented land use patterns planned for some of the city's major corridors such as 22nd Street, College Drive and 8th Street (as described in Section 2.0).

This section of the report describes the Red Line BRT corridor treatments and facilities based on design guidelines developed as part of the overall Growth Plan. The rapid transit technology, route and BRT configuration options examined as part of the process are highlighted and inserted into Appendix A for further reference. This information may be used in discussion with senior levels of government for cost-sharing on the implementation of rapid transit in Saskatoon.

In the long-term, the preferred Red Line BRT corridor consists of approximately 22km of bus-only lanes with 25 stations between Blairmore, University Heights and Holmwood with direct connections to the Downtown and University areas of the city as illustrated in **Figure 3.40**.

Figure 3.40 - Proposed Red Line BRT

As a long-term technology, a BRT system in Saskatoon will ultimately combine the quality of rail transit with the flexibility of buses. A BRT system in the city could eventually incorporate frequent and rapid transit services, limited stops, unique vehicles and stations, real time customer information and exclusive running ways. It will provide a unique experience within the City's transit system and will form the spine of the network for moving around the city as well as become the focus of growth and development.

Within Saskatoon, the candidate BRT corridors must both serve to shape land use scale, density, mixture and form with a design that is people-oriented as much as it is transit-oriented. Street treatments should ultimately be designed and built to attract and accommodate people. In other words, BRT must be considered an integral part of the urban area along the candidate corridors rather than a separate utility to simply serve travel demands. Across North America, BRT systems operate in a variety of environments – mostly surface, with some elevated and/or underground sections – that are separated from general purpose traffic for much of the corridor where ridership is significant. Some of the general features that contribute toward the uniqueness of BRT include:

- Reduced travel times over and above regular bus operations;
- Frequent service during all periods of operation, seven days per week;
- Buses serve stations rather than regular stops, and stations are spaced further apart;
- Stations have unique and identifiable designs for passenger comfort and quality of experience;
- Buses operate with transit priority treatments or in exclusive space to ensure reliable and attractive travel times and to bypass areas of recurring congestion;
- Buses are generally larger and can carry more passengers; and,
- Passenger comfort is prioritized and alternative loading opportunities are often used to expedite boardings and alightings.

BRT design guidelines serve as the "vision" for service planning and facility design. They are based on best practices and experience with other systems planned and implemented in other North American cities. Although the design guidelines for Saskatoon describe an ultimate or ideal state for BRT, these services and facilities can be implemented in stages as ridership increases, recurring delays on city streets grow, resources become available, and community support for transit investments increases (See **Figure 3.41**).

Service design changes over time can evolve from conventional and express bus services that exist today along Saskatoon's recommended BRT corridors, to more frequent, two way services with increased stop spacing. In low ridership segments of the rapid transit corridors, transit services may operate in mixed travel lanes with general purpose traffic for many years. As investments are made in the transit system to increase service levels and transit priority facilities, services to and from suburban development areas will be interlined with the BRT corridors to connect passengers to the highest demand areas of the city, and to make use of transit priority treatments. Over time, as transit-oriented development and transit ridership grow along BRT corridors, service levels can continue to increase and dedicated lanes can be added or converted to accommodate travel demands and to bypass areas of recurring congestion.

Once the BRT corridors generate a larger portion of the ridership, dedicated BRT vehicles as well as services may be implemented to further enhance the brand identity of BRT in Saskatoon. At that time, the City may consider longer term plans and ridership potential for other tranist technologies such as LRT.

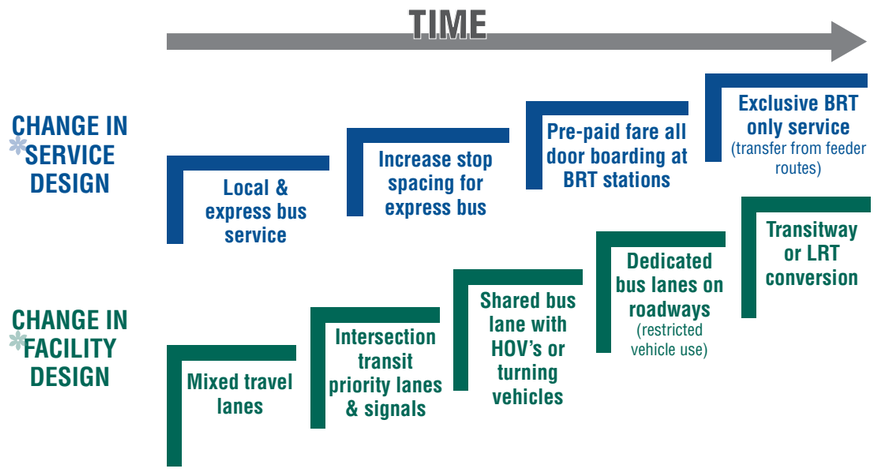


Figure 3.41 - Evolving Transit Service and Facilities

This section of the Transit Plan highlights the specific features of the recommended Red Line BRT corridor in terms of design guidelines, potential configurations as well as overall projected benefits and costs.

A. BRT Design Guidelines

The following discussion highlights the general guidelines for planning and designing BRT corridors in Saskatoon.

Operating Features

Service frequency and direct connections are of little value to customers if BRT services are not seen to be fast and reliable as compared with conventional bus services – or even with automobile travel. The operating features of BRT services – such as schedule reliability, number of stops, dwell times and traffic delays – will influence the real and perceived travel time advantages for transit customers. The following section highlights the operating procedures and system infrastructure that are important in attracting and growing BRT ridership.

Frequency and periods of operation are important to the identity of BRT systems. Similar to most rapid transit systems, BRT services should be in operation during all time periods when transit service is provided. This means that BRT services in Saskatoon would operate 7 days a week between 6 AM and 12:30 AM (or 18.5 hours per day). Additionally and as previously described, the rapid transit corridors should offer attractive frequencies in order to minimize wait times for customers. Typical minimum frequencies in North America are every 5 to 10 minutes during peak periods and every 10 to 15 minutes during off-peak periods. Busier sections of the BRT corridor (i.e. in the core area of Saskatoon) may experience frequencies as low as 2 minutes.

- **Advanced transit management technologies** such as global position systems (GPS) and automatic vehicle location (AVL) technology are used to identify the location of a bus on the road network, providing real-time monitoring of bus movements. Transit management technologies permit monitoring and management of bus headways, transit signal priority, and response to operating issues.
- **Headway based operation** ensures that buses will arrive at fixed intervals such as every 5 or 7 minutes along a BRT corridor rather than bunching and arriving two at a time every 10 minutes. Advanced transit management technologies effectively monitor headways between vehicles, which can result in shorter overall travel times for customers.
- **Station spacing** serves to minimize travel times for customers where stations are well spaced –approximately 400 metres apart in urbanized areas and 1,000 metres apart or more in suburban areas. Customers are typically willing to walk further to access transit services that provide attractive travel times. Increased station spacing will also serve to reduce delays.
- **All door boarding** can significantly reduce dwell times at busy stations, particularly in combination with advanced fare payment technologies such as smart cards. On-board fare enforcement will be required periodically to minimize fare evasion. Studies in the U.S. indicate that boarding times with prepaid fares average 2.5 seconds per passenger, compared with boarding times of 4.2 seconds per passenger for dip passes and tickets. The boarding process can be reduced up to 30 seconds for every 18 passengers with a proof of payment system and corresponding fare technology.
- **Transit priority** is designed to provide travel time advantages for buses as a result of traffic congestion, signals and other non-recurring delays such as collisions. The use of transit priority can range from transit signal priority at intersections that alter green phases when buses are approaching an intersection, to transit only bus lanes or intersection queue jumpers that further reduce the impacts of recurring traffic congestion. Enforcement of transit priority lanes is perhaps the most significant challenge in most communities, particularly when shared with other traffic including high-occupant and right-turn vehicles.
- **Real time passenger information** is an important feature for BRT to enhance the customer perception and experience of reliable, fast service. Real-time information helps to eliminate uncertainty on the part of passengers by providing accurate information regarding the arrival times of vehicles. Most agencies have found that the customer benefits of real-time passenger information far outweigh the relative costs of providing the technology.

Running Ways

In the long-term, vehicle travel speeds along the Red Line BRT corridors are projected to decline significantly with average travel speeds declining by as much as 5km/hr to 15km/hr as illustrated in **Figure 3.42**. Although average speeds along most urban streets may be generally between 25km/hr to 30km/hr the Red Line BRT corridor vehicle speeds are expected to decline significantly along corridors such as 22nd Street, College Drive and 8th Street in the long-term. In fact, without dedicated bus-only lanes, a non-stop trip between Blairmore and University Heights along the preferred BRT corridor will take 85 minutes in the PM peak hour and 90 minutes to Holmwood.

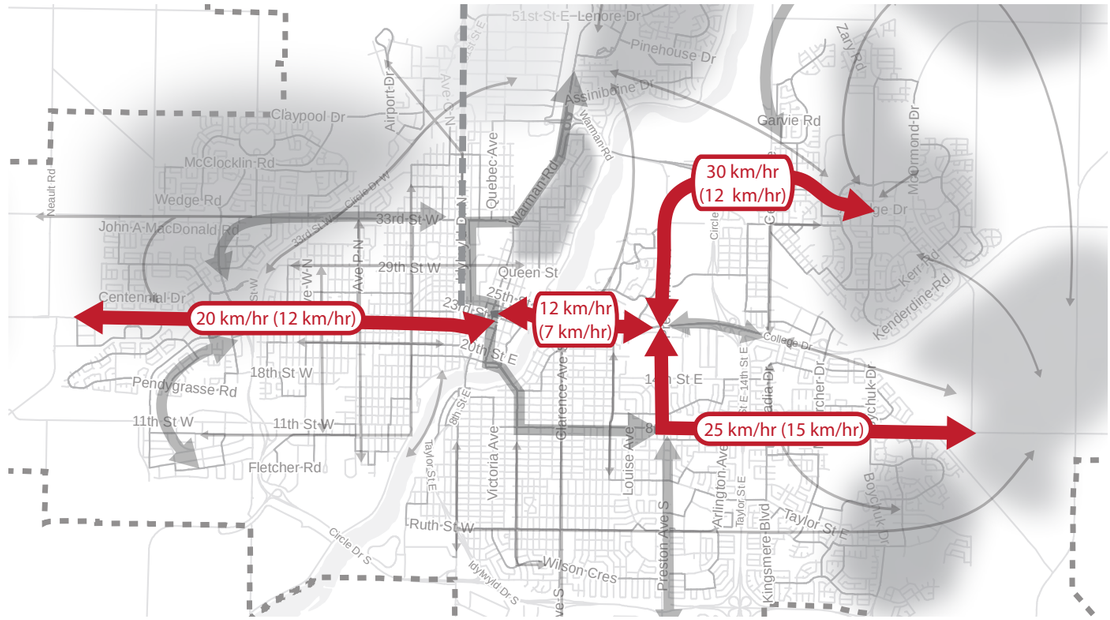


Figure 3.42 - Existing (Forecast) Average Peak Period Vehicle Speeds

Where there are significant passenger volumes and recurring areas of traffic congestion, consideration should be given toward providing segregated running ways for buses. In general, three types of urban roadway bus lanes have been used in communities throughout North America, as summarized below and illustrated in **Figures 3.43 to 3.46**. These types of urban roadway bus lanes are used to guide the identification and evaluation of options for Saskatoon.


Figure 3.43 - Curb Bus Lane (Ottawa)

- **Curb bus lanes** operate on an outer lane on the right side of the roadway in both directions. Curb bus lanes can generally evolve from peak period, peak direction operations to full day bus lane operations in both directions. Right turning vehicles are often mixed with curb bus lanes and in some cases, these right side lanes may also be shared with high-occupant vehicles where bus volumes are modest.

  This approach often reduces the public perception of the 'empty lane' syndrome that can reduce community support for bus only lanes. Although parking can be permitted in curb bus lanes in the off-peak period, the bus lane could utilize this space during peak periods or for the entire day if right-of-way is limited. During peak periods, right-turn restrictions may be implemented at minor intersections to reduce delays for transit. BRT stations would be located along sidewalks, adjacent to and integrated with surrounding land uses where possible.

- **Centre running bus lanes** are similar to side running bus lanes in that they are dedicated for bus use only. In this regard, conflicts with general purpose traffic are limited to signalized intersections where buses would be prioritized and left turns for general purpose traffic could be permitted and accommodated with turn lanes. Centre running bus lanes would eliminate mid-block left-turn movements to access property. Right-turn access to properties along with minor intersections could be maintained along with on-street parking where adequate rights of way exist.

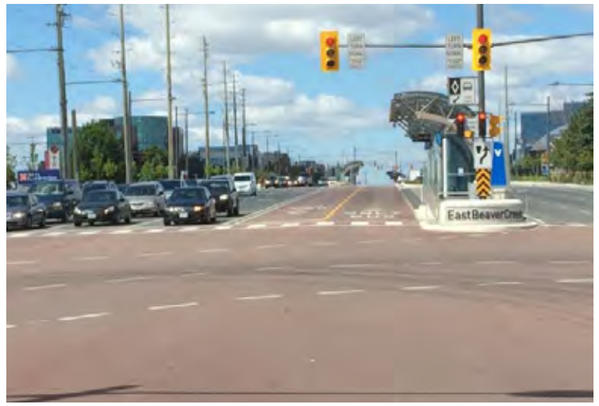


Figure 3.44 - Centre Bus Lane (Toronto Area)

- **Side running bus lanes** are dedicated areas of the road for bus only operation. The side running lanes can be located on either side of the road with protected space to physically separate buses from general purpose traffic. Reduced conflicts with general purpose traffic and transit signal priority would further reduce transit travel times relative to curb bus lanes. Because of the configuration, however, side running bus lanes could never be opened for general purpose traffic or parking at any time and would eliminate access to adjacent property driveways and minor intersections.


Figure 3.45 - Side Bus Lane (Barcelona)

- **Rural shoulder bus lanes** are similar to urban curb bus lanes in that transit lanes occur on the right side along roads without curb, gutter and sidewalks. Use of the shoulder for buses only can be a cost-effective strategy for prioritizing transit on highways or rural roadways where bus frequency may not be as high as in urban areas, but where transit passenger travel times are still impacted by areas of recurring congestion.

Figure 3.46 - Rural Shoulder Bus Lanes (Vancouver)

Recommended Action:

- **Although the City will want to ultimately plan for centre or side running dedicated bus lanes along the entire Red Line BRT corridor, curb lanes are recommended for most of the priority corridors over the next 10 years (alternative configurations should be further explored for curb and side BRT lanes and stations for College Drive). In general, incrementally investing in and implementing BRT facilities over time as service levels and ridership grows will improve the public's perception of transit expenditures and dedicated facilities. Conversely, investing in BRT facilities well ahead of the basic needs of the city's transit system and converting general purpose traffic lanes for buses will potentially result in more negative public reaction to transit in Saskatoon.**

Some of the reasons for implementing curb bus lanes along most corridors in the first 10 years of the Plan are briefly highlighted below. It should be recognized that these facilities may be altered to centre or side running BRT lanes in the longer-term as service levels and ridership grow.

- **The City needs to increase investments in many other areas of transit that are essential for the Plan's success.** Much like other cities in Canada, Saskatoon is struggling to maintain existing service levels as the population grows and needs to invest in many foundation services and facilities to improve the customer experience. The Transit Plan includes significant investments to increase service levels, provide customer-oriented programs and facilities and to build rapid transit. Even with assistance from senior levels of government on capital funding for BRT, the City must spend significantly more on the transit system in order to increase ridership.
- **Saskatoon does not yet have a 'transit' culture. There are two critical aspects to a transit culture in any community.** The first and most important of which is the customers themselves. As described earlier in the Plan, the resources allocated to transit today permit a coverage model where most residents are within a reasonable walking distance to transit. As resources grow, more and more residents (although not everyone) will have access to more frequent and direct transit services. This will change the customer experience and ultimately increase ridership.
- **With low ridership and cost recovery, all residents are concerned about the amount of investment and resources that are directed toward the transit system.** In particular, advancing significant investment in capital—centre or side bus lanes—that may not address the basic challenges facing transit will be difficult to support over the first 10 years of the Plan. Although most survey responses supported the preliminary directions of the Transit Plan (and the proposed Red Line BRT route in particular), many are concerned about the extent of the expenditure relative to where the system is at today.
- **Although the frequency of services along the Red Line BRT corridors will increase during the first 10 years of Plan, the 'empty lane syndrome' will affect public perception of the benefits of dedicated bus lanes.** Over the first 10 years of the Plan, the number of buses operating along BRT corridors such as 22nd street will increase from approximately 4 to 6 buses per hour—or from every 15 minutes to every 10 minutes. Along College Drive, the number of buses will increase from approximately 12 to 20 per hour—or from about every 5 minutes to every 3 minutes. Consistent with the intent of rapid transit, service frequencies will only be slightly lower during off-peak weekday and weekend periods.
- **With the exception of College Drive and 3rd Avenue, long-term peak period ridership on most BRT corridors will generally result in frequencies of 5 to 10 minutes.** Although dedicated lanes will be required to move through congested areas of the city, most drivers will see empty lanes much of the time if centre or side bus lanes are implemented within the next 10 years or so.
- **Curb bus lanes provide flexibility to grow the facilities along with the ridership over time, whereas centre or side bus lanes must operate 24 hours a day, 7 days a week from the outset.** Curb bus lanes can be implemented in stages and for increasingly longer periods of the day. In fact, many communities will begin implementing curb bus only lanes during peak periods and in the peak direction where traffic congestion is most significant and ridership is highest. During the first 10 years of implementation for example, dedicated curb lanes may be implemented along 22nd Street in the peak directions to and from downtown in the morning and afternoon periods respectively. During off-peak periods, these lanes may remain for general purpose traffic or may be used for parking in some instances until full-time bus only lanes are required.

Stations

Beyond the important connection with the land uses that surround them, BRT stations are the interface between passengers and services. Stations that are conveniently located, comfortable, safe and accessible for all transit users will enhance the passenger experience with transit in Saskatoon. Stations will also serve to create and reinforce the identity for BRT related services.

BRT stations include features that are more often associated with rail transit. As is the case in cities where both LRT and BRT exist (such as Paris and Rouen, France), the same basic elements and design are used for both facilities.

Figure 4.01 - Concept BRT Station

- **Unique, identifiable design** of stations not only serve to provide a consistent experience for passengers throughout the system, but also create awareness and a sense of permanence for BRT in the same way that rail transit infrastructure does. Everything from the design of platform areas through to the shelters and signage within stations needs a consistent standard that creates a unique identity and help to attract new customers.
- **Platform width and length** is large enough to accommodate 2 or 3 buses arriving at once (up to 45m), along with additional length to accommodate passenger flows to and from the station. Stations must also be wide enough to accommodate passengers and station equipment (3.5 – 4m). Since all services operate through the station (without layover), most stations utilize standard curbs rather than saw-tooth design in order to minimize station dwell times. In busier stations, bus bypass lanes may be required to minimize delays and queuing of buses.
- **Customer information** includes displays of real-time information such as next bus arrival as well as static information about hours and frequencies of services. Dynamic information signage at the station increases passenger comfort and awareness of wait times and any other delays that may affect a trip on BRT.

Figure 4.02 - Completed BRT Station

- **Permanent weather protection** is required for all BRT stations and can extend for the length of the station platform so that all doors are protected while passengers board transit. Shelters provide protection from sun, rain, and snow. In cold climates such as Saskatoon, parts of the station shelter can be enclosed and incorporate radiant heating for passenger comfort.

- **Safety and security** are important elements in the design of transit stations. Perhaps the most important element is visibility. Stations and activities in the station must be visible from the street to allow for passive monitoring of the station. Additionally, more active video monitoring equipment and surveillance as well as access to emergency assistance for passengers must also be available to increase passenger comfort and safety while waiting at BRT stations.
- **Off-board fare payment** at stations allows for all-door boarding and reduces overall dwell times for transit passengers. The result is a significant savings in travel times for customers (up to 30 to 60 seconds per stop) as well as for vehicle requirements and system operating costs. Fare paid zones are typically incorporated with centre bus lanes as they are easier to monitor and enforce than curb side lanes. Although many rapid transit systems have turnstiles to limit entry to only those that have paid, 'proof of payment' zones can be used where passengers would purchase fares before entering the area and boarding a bus.
- **For people of all ages and mobility levels**, universal design, such as low floor or kneeling buses, tactile warning strips, on-board stop displays and announcements, and an intuitive design can go a long way towards making conventional transit a more attractive option. These techniques also make transit more accessible for passengers with physical or cognitive disabilities, thus reducing the demand for more expensive Access Transit para-transit services.

Vehicles

Vehicles are an integral part of the transit experience for customers, and BRT services are no exception. As system ridership grows over the next 10 to 20 years, dedicated vehicles may be required to operate along BRT corridors in order to increase the carrying capacity of the system and to reinforce the rapid transit identity. Generally, vehicles can provide more of a rapid transit experience not only in the look and appearance, but also in the physical design of the vehicle. The following discussion highlights some of the ultimate features for BRT dedicated vehicles that may be considered for Saskatoon in the long-term as well as some of the short-term features that may be considered in all fleet operating on the BRT corridors.

- **High capacity articulated vehicles** are essential for BRT corridors in order to support higher volume travel demands. The principle way of accommodating higher passenger capacity is through the use of larger, articulated buses that can be as long as 20 metres or bi-articulated vehicles that can reach 25 metres.
- **Low floor, accessible vehicles** are important throughout the transit system in Saskatoon. On BRT corridors, low floor vehicles are often configured similar to rail rapid transit vehicles with fewer seats and more open configuration to reflect the higher passenger loads. An open interior is particularly beneficial when all-door boarding is permitted and passenger turnover is high due to short-distance travel.
- **On-board information and announcements** for customers are generally growing throughout many systems in North America. In particular, many BRT systems provide interior customer information displays and provide real time visual and audible notice of upcoming stations and connecting lines, as well as static information about the transit system.
- **Advanced vehicle technology** allows for the tracking of buses on the BRT corridors and it is essential to enhance reliability and operating speeds for transit. As previously noted, technologies include on-board GPS (global position systems) and AVL (automatic vehicle location) on all buses that utilize BRT corridors. The addition of Automatic Passenger Counting (APC) technologies should also be installed on all BRT buses at a minimum to monitor ridership and to utilize dynamic systems for deploying additional fleet where necessary to support high passenger loads in the system.

As ridership along the BRT corridors continue to grow in the long-term, dedicated, distinct vehicles should be considered. Distinct vehicle designs, with multiple doors and open interior space with enhanced features such as air conditioning may be considered as part of the rapid transit experience. A unique design and dedicated fleet will also serve to enhance the identity of rapid transit in Saskatoon.

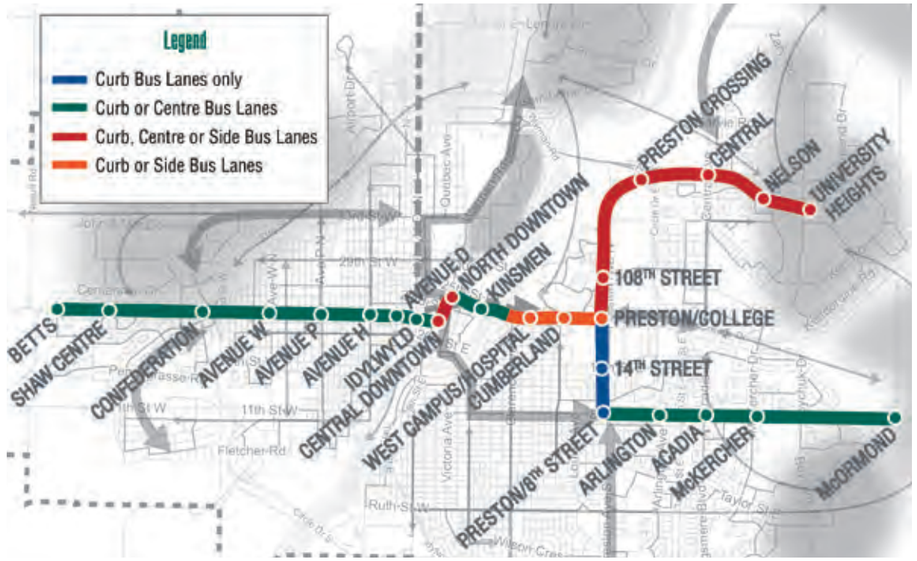


Figure 3.47 - Optional Red Line BRT Corridor Configurations

B. Potential Configurations

As indicated, there are three types of bus lane configurations available for consideration in Saskatoon: curb, centre and side running configurations. These options are illustrated on a six lane road for illustrative purposes in **Figure 3.48**.

A high level evaluation framework was used to compare alternative configurations along each corridor segment and to identify feasible configurations for the City to consider once the Growth Plan is approved. The details of this evaluation are provided in Appendix A. In much the same way that the overall BRT system may evolve with ridership, so too could the implementation of dedicated bus-only lanes. In this regard, curb bus lanes may be the first step toward centre or side running bus lanes. It should be noted however that the planned rights-of-way along all corridors should be designed for either centre or side running facilities to ease the longer-term potential for Light Rapid Transit (LRT). **Figure 3.47** illustrates the feasible configurations for the Red Line BRT corridor.

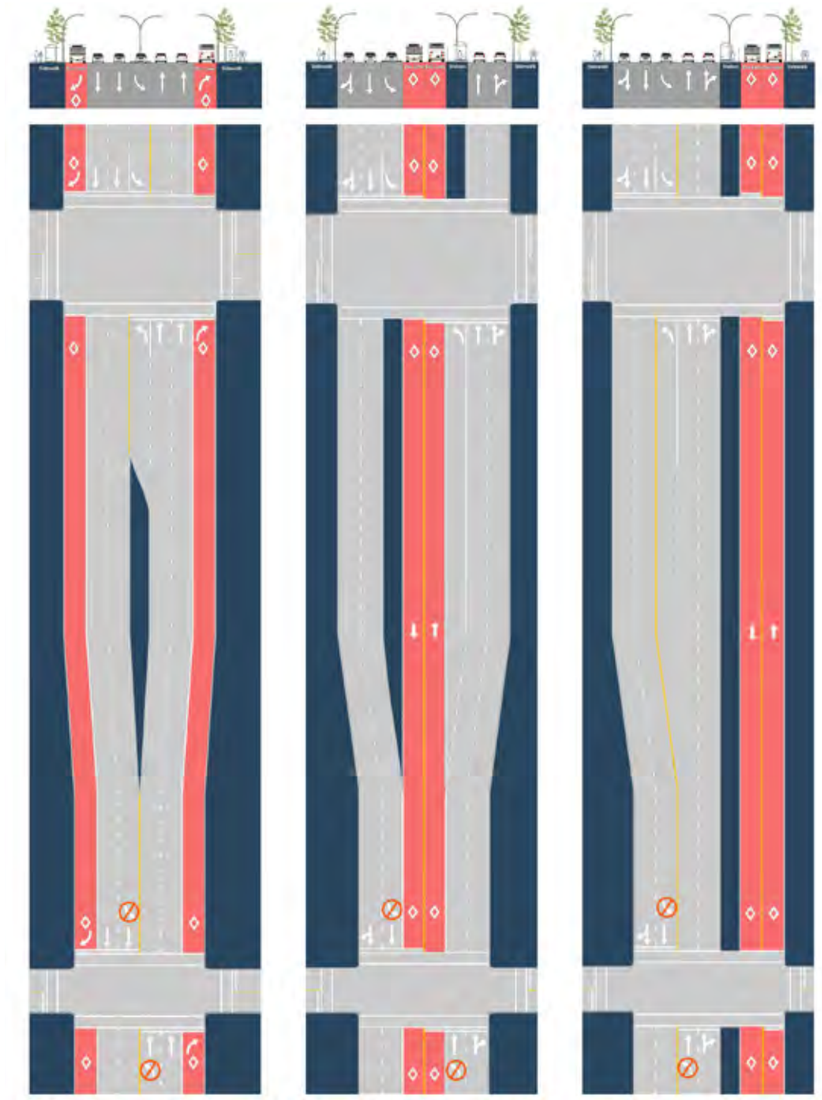


Figure 3.48 - Alternative BRT Laning Configurations (6 Lane Road)

The following discussion highlights the optional configurations identified through the assessment for each segment. The details of this assessment are provided in Appendix A.

A. **22nd Street (Blairmore to 3rd Avenue).** Between Betts Station and Central Downtown along 22nd Street, curb or centre bus lanes are potential short-term and/or long-term optional configurations. Side running lanes are not feasible as they would restrict driveway access along one side of the corridor. Outside Circle Drive, BRT lanes could be added to the existing roadway as either centre or curb facilities. Inside Circle Drive, general purpose traffic lanes would need to be converted to bus-only lanes. Curb lane operations permit time based evolution of bus-only lanes during the peak periods of the day while centre lane facilities would support full-time bus-only use. It should be noted that centre lanes and stations would require additional rights-of-way inside Circle Drive that may only be available through redevelopment. It should be noted that a grade-separated overpass of the rail corridor would be required and has been assumed as part of the overall concept for BRT on 22nd Street.

B. **3rd Avenue (22nd Street to 25th Street).** This section would ultimately support the Red and Blue Line rapid transit services through the downtown core with two stations at the south and north ends of the segment. All configurations are possible along this segment and can be accommodated within the existing right-of-way. All configurations would impact one travel lane and on-street parking to varying degrees.

C. **25th Street / University Bridge / College Drive (3rd Avenue to Preston Avenue).** This segment would accommodate four stations at Kinsmen, West Campus / Hospital, Cumberland and Preston. The 25th Street corridor and University Bridge could support either curb or centre running bus-only lanes. Side running facilities would require widening of the bridge which was a show-stopper based on advice from the City's structural engineering staff. East of the bridge, curb running bus-only lanes could continue along College Drive, or transition to the north side to provide a side running configuration. A general purpose travel lane in each direction would be converted to bus-only lanes either during peak periods only for curb side facilities or permanently with centre or side running lanes. It should be noted that general purpose travel lanes on the University Bridge could remain for several years with transit priority and operational changes on either side of the bridge.

D. **Preston Avenue.** Attridge Drive (College Drive to McOrmond Drive). This segment of the Red Line BRT corridor would support five stations extending to University Heights in either curb, centre or side running bus-only lanes. In general, most of this section could support additional lanes to accommodate BRT with some lane conversions near Preston Crossing and across Circle Drive. All concepts would benefit from grade-separation at the rail line north of 108th Street and side running facilities would require a new overpass of Circle Drive with changes to the interchange.

E. **Preston Avenue (College Drive to 8th Street).** This segment of the Red Line BRT corridor would support two stations south of College Drive. Widening of this corridor is constrained by a transmission corridor on the east side, but curb or centre facilities are feasible for this segment. Side running facilities could not be accommodated with access requirements with current land use patterns.

F. **8th Street (Preston Avenue to McOrmond Drive).** There are five stations planned along 8th Street. While both curb and centre running lanes are feasible, side running facilities would restrict driveway access to adjacent properties. As such, side running lanes are not feasible without alternative access arrangements for most properties. Although the right-of-way could accommodate widening to support bus-only lanes, consideration should be given toward converting existing general purpose travel lanes in order to manage the scale of the roadway and to support transit-oriented land use patterns and street character.

C. Projected Benefits and Costs

Not only are investments in dedicated bus lanes along the Red Line BRT corridors essential to support the projected demands, they will also allow transit to bypass areas of recurring congestion and provide significant travel time savings to customers and the system. Depending on the configuration, transit customers could experience up to a 30 minute (curb lane) to 50 minute (centre or side lane) travel time savings in the long-term between Blairmore and University Heights. Reduced delays and increased system reliability on top of improved bus frequencies will dramatically improve the transit customer experience. Additionally, the travel time savings will also benefit the transit system operation with reduced delays and platooning of buses caught in congested areas.

The overall economic evaluation of curb, centre or side running facilities is summarized in **Table 3.06**. As indicated, both curb and centre/side BRT configurations will generate a positive net present value and a benefit-cost ratio of greater than 1.0 – meaning all configurations are attractive investments for funding partnerships with local, provincial and federal governments. Curbside lanes are estimated to cost approximately $44 to $66 million, while centre or side bus lane configurations could cost as much as $390 to $410 million.

Criteria	Curbside Bus Lanes	Centre or Side Bus Lanes
COST RANGES CLASS D		
CAPITAL COST	$44.2 M - $66.3 M	$387.3 M - $412.3 M
CAPITAL COST (PV)	$33 M - $49.5 M	$289.4 M - $308 M
MAINTENANCE COST	$3.5 M	$3.5 M - $3.6 M
SALVAGE VALUE (20%)	$(6.6 M) - $(9.9 M)	$(57.9 M) - $(61.6 M)
TOTAL COST	$30 M - $43.2 M	$235.1 M - $250 M
SAVINGS		
TRANSIT TRAVEL TIME SAVINGS	$173 M	$297.1 M
TRANSIT OPERATING	$19.7 M	$35.8 M
TOTAL BENEFITS	$192.8 M	$332.9 M
ECONOMIC		
NET PRESENT VALUE	$149.6 M - $162.8 M	$82.9 M - $97.8 M
BENEFIT-COST RATIO	4.5 - 6.4	1.3 - 1.4

Table 3.06 - Summary Costs & Benefits of Alternative BRT Configurations

With an investment period of 25 years, curbside lanes result in a net present value ranging between $150 and $163 million and a benefit-cost ratio ranging from 4.5 to 6.4. Alternatively, centre or side-running lanes have a total lifecycle cost ranging between $235 and $250 million and result in $333 million of travel time and operations benefits over 25 years. The implementation of centre or side lanes (wherever possible) results in a net present value of $83 to $98 million and a benefit-cost ratio ranging from 1.3 to 1.4 over a 25 year term.

3.5.5 Blue Line BRT Corridors

The Blue Line BRT corridor extends approximately 12 km supporting transit services between Nutana and Lawson Heights as illustrated in Figure 3.49 below. Although the projected long-term ridership would not necessarily support dedicated bus-only lanes throughout the corridor, aspects of the BRT design guidelines presented for the Red Line BRT corridor could be utilized (such as the operational, station and vehicle features).

Much like the Red Line BRT corridor, many services would extend beyond the corridor into neighbourhoods at their outer limits and provide direct service to connect with the Blue Line BRT corridor. Rather than consider bus-only lanes throughout however, transit priority treatments described in Section 3.5.3 may be used to enhance service quality and reliability. This will ensure that transit customers will move faster than cars through areas of recurring congestion with the use of queue intersection jumpers and signal preemption. Additionally, buses will be more likely to arrive and depart stops at the scheduled times, and in turn passengers can arrive at their destinations on time.

Through service planning and design, ongoing improvements to the customer experience and efficiency of the system can be made through operational changes such as by simply increasing stop distance and managing boarding and alighting activities. In some cases where sufficient ridership and services are provided on the Blue Line BRT corridors, more active measures that include a wide range of traffic signal based measures can be used (e.g. transit biased signal progression, provision of transit specific signal phases, and traffic signal phase modification based on transit needs (TSP)). Work to review such opportunities should be undertaken in partnership with transportation, public works, and roadways groups at the City.

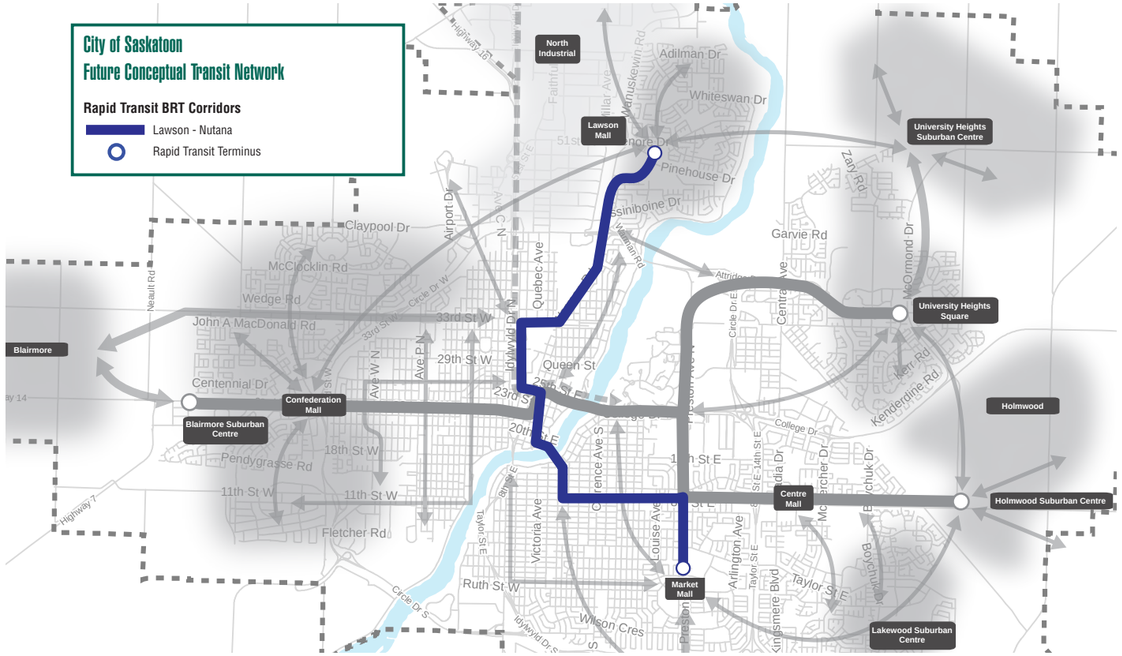


Figure 3.49 - Proposed Blue Line BRT

3.6 Implementing the Plan

The long-term Transit Plan is about more than simply increasing service frequencies and extending more of the same services to growing areas of the city. Simply put, the Transit Plan is transforming the city's transit system with significantly more resources. The Transit Plan uses a multi-faceted approach to improve and expand services, to implement new and more comfortable facilities, and to provide support programs and services that will enhance the customer experience.

3.6.1 5 Year Priorities

For the most important improvements, the City can begin implementation in the next few years as additional resources become available. In other cases, the city will want to stage the expansion of services, facilities and programs to support growth and further increase transit ridership. This section highlights the 5 year implementation priorities and provides the annual or total cost allocations. It should be noted that the cost allocations are estimates only and are intended to provide guidance on the order-of-magnitude investment that may be required. These figures should not be used for budgeting purposes. It should be noted that these costs do not include increases to operating and maintenance costs.

A. Improving the Customer Experience

The improvements designed to enhance the customer experience at all stages of the journey – from planning a trip to exiting transit – largely consist of initiatives that are ongoing and build from customer feedback and suggestions. As noted in **Table 3.07**, most of the initiatives involve enhanced customer service, while some of the initiatives lead to physical changes to the website or transit facilities to make them universally accessible. While the former initiatives can begin with target groups within the first 5 years of implementation, facility upgrades to improve accessibility and comfort for all transit customers will require planning time and will require many years to implement.

Plan Item	Implementation Activities	Order of Magnitude Cost
Real Time Bus Arrivals	Implement GPS technology within all new buses and upgraded stop facilities. Implement digital displays at BRT stations	$50,000/yr
Mobile App	Provide routing, stop and GPS location data to third party developers.	$25,000/yr
Ongoing Website Upgrades	Review and develop best practices for website design features. Implement ongoing upgrades to enhance trip planning.	$20,000/yr
Universal Accessibility	Prepare universal accessible bus stop design guidelines. Implement accessibility improvements at select number of stop locations. Work with other City departments to explore accessibility treatments surrounding transit.	$52,000/yr
Community Outreach	Engage and share information with special interest groups on the transit system, particularly with groups such as seniors, youth and people with disabilities.	$180,000/yr
Customer Service Staff Training	Provide basic customer service level training for all staff. Provide expanded training for working with disabled customers.	$180,000/yr
Customer Satisfaction Surveys	Implement annual customer satisfactions surveys by route.	$40,000/yr

Table 3.07 - 5 Year Customer Service and Facility Improvements

B. Service Plan

Providing higher quality service for larger potential transit markets and managing the amount of service in lower demand areas are essential for transit to be successful. The 5 year priorities for expanding transit are starting the shift from providing equal transit services everywhere, to a system where some areas will see more attractive services while other areas with limited ridership potential see less services. Steps can be taken now to adjust service frequency, directness and hours of operation during weekday and weekend periods so more resources can be invested where they have more impact. In this regard, existing services can be modified and new service hours can be allocated to the largest and growing transit markets in the city. The following discussion highlights the 5 year priorities for modifying and expanding service levels.

- **Optimize Existing Transit Services.** As part of ongoing annual reviews and 3 to 5 year planning, the City may consider strategies that address routes with low ridership and disproportionately higher levels of service. These may be area or route specific issues that should be continually examined to improve efficiency as well as effectiveness of resources. Strategies to address these may include altering routes to provide more direct service, reducing service frequencies, or modifying service periods. Ridership, boarding and other data should be used to consider any routing changes along with customer input and feedback as part of local area planning or annual routing changes.

  Although any routing changes require direct input and feedback from existing customers, **Figure 3.50** below illustrates the relative rides per service hour and total annual service hours provided to each route in the system based on 2013 data. While many routes (including Route 2 and 50/60 DART services) are performing adequately, several routes such as Routes 1, 3, 11, 14, 28, and DART 70/80 are under performing. Many of these routes, including Routes 1, 3 and DART 70/80, represent significant allocations of service resources.

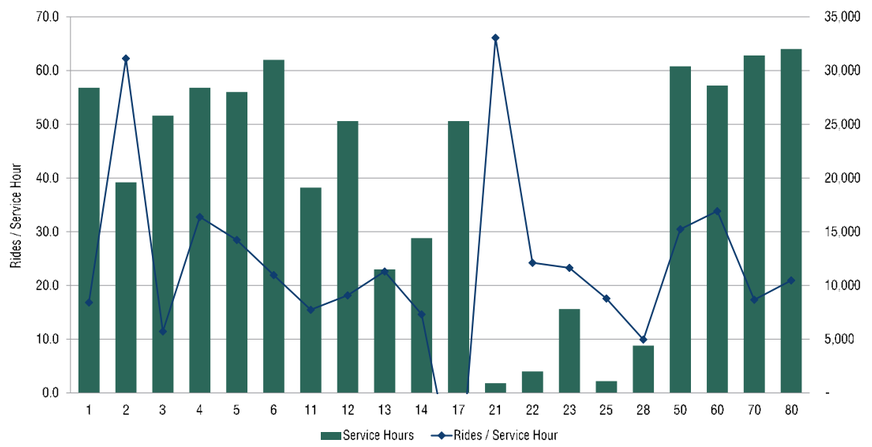


Figure 3.50 - 2013 Route Performance

Source: Ridership Data: March 24 - March 30, 2012; Service Hour Data: July 2012 Schedules

- **Enhance Existing Services.** In many areas of the City, existing services and corridors may be increased to support ridership throughout the City and where transit markets are strongest. In particular, increasing services along the rapid transit corridors are considered a high priority and will grow long-term transit ridership across the City as growth occurs in Blairmore, Holmwood and University Heights. Additionally, conventional services may be modified to retain coverage in growing areas and where rapid transit services are streamlined.

- **Introduce New Services.** In the first 5 years, new and modified services will be designed to increase frequencies and directness of services along planned Red and Blue Line BRT corridors, enhance neighbourhood services in higher demand neighbourhoods and to examine the potential of community shuttle services to low density areas that may be implemented in the 5 to 10 year horizons.

The 5 year implementation priorities are centred on increasing overall annual service hours at 2.5% per year. Service increases are primarily directed towards improving weekday peak and midday services. . Over the first 5 years of the implementation, service levels would increase from approximately 410,000 to 463,000 annual service hours. A conceptual level 5 year service plan is thematically illustrated in **Figure 3.51**. All service changes should be examined with annual performance data as well as through the engagement of transit customers and other stakeholders.

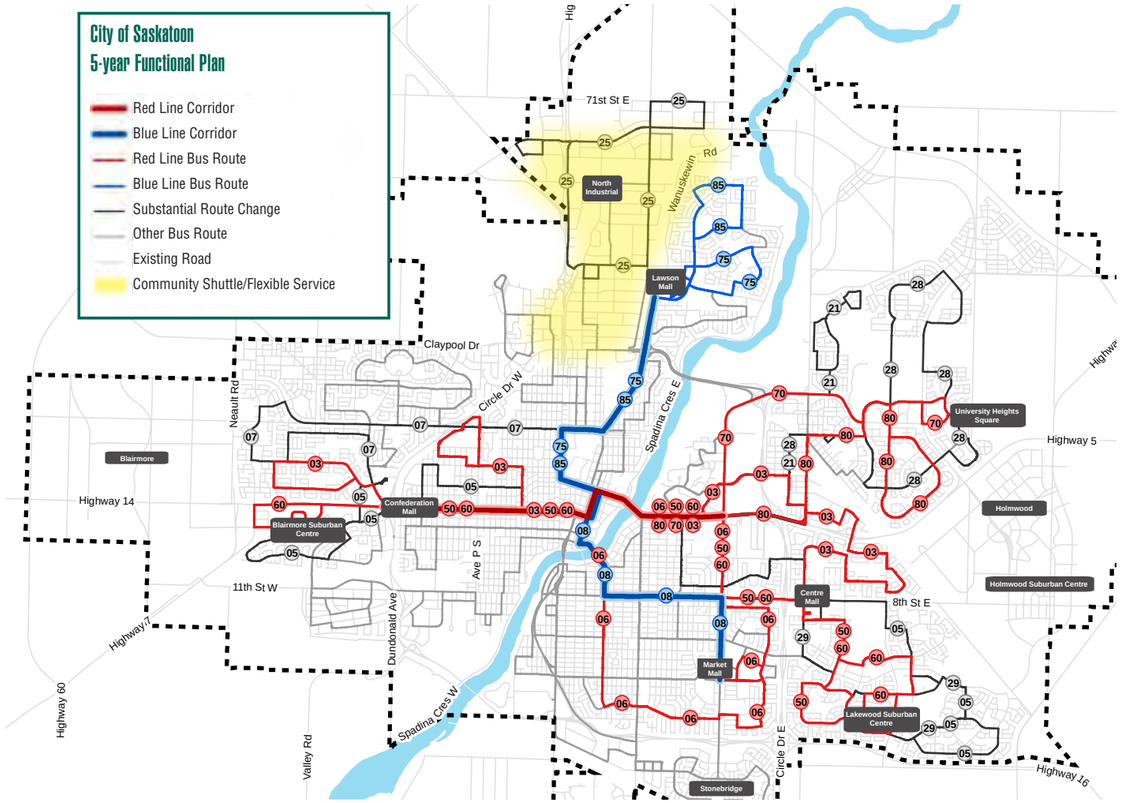


Figure 3.51 - 5 Year Transit Plan Implementation Process

C. Support Facilities

All of the support facilities for the Transit Plan are essential for the success of the long-term Transit Plan and are needed in the next 5 years to support planned service improvements and enhancements to customer service. **Table 3.08** summarizes the implementation priorities and order of magnitude cost estimates.

Plan Item	Implementation Activities	Order of Magnitude Cost
Bus Fleet Replacement	Replace 10 buses every year.	$5.0M per year
Bus Fleet Expansion	Purchase 5 additional buses every year.	$2.7M per year
Park-and-ride Lots	Complete siting studies for 5 park-and-ride lots with priority for implementation being given toward Red Line BRT station areas as noted on the plan.	$50,000 per year
Transition from Transit Terminals to BRT Stations	With the implementation of BRT corridors and stations along 3rd Avenue and College Drive, as well as alterations to the time transfer service design downtown, the existing downtown and University bus terminals may be decommissioned.	$5.0M

Table 3.08 - 5 Year Priorities for Transit Supportive Facilities

D. Red Line BRT Lanes and Stations

The 22 km and 25 stations along the Red Line BRT may be implemented in stages over the next 20 years as illustrated in **Figure 3.52**.

Figure 3.52 - Proposed Phasing for Red Line Dedicated Lanes and Stations

Within the short-term, dedicated BRT lanes and stations could be implemented in the core areas of the city where transit service and ridership are highest, and congestion already impacts travel time and reliability for transit passengers. During the first 5 years of the Plan, dedicated lanes and stations along segments of 3rd Avenue and College Drive could be planned, designed and implemented.

Although the City will want to ultimately plan for centre or side running dedicated bus lanes along the entire Red Line BRT corridor, curb lanes are recommended for most of the priority corridors over the next 10 years. For College Drive, alternative configurations should be further explored for curb and side BRT lanes and stations. In general, the public's perception of transit expenditures and dedicated facilities will improve through incremental investment and implementation of BRT facilities over time as service levels and ridership grow. Conversely, a more negative public reaction could occur if there is investment in BRT facilities and conversion of general purpose traffic lanes for buses well ahead of the basic needs of the city's transit system.

Table 3.09 summarizes the implementation actions and costs associated with BRT facilities for the first 5 years. It should be noted that these costs are unit rates and should not be used for budgeting purposes. Rather, functional designs of the BRT streets and station areas will provide more reliable concepts and estimates of the changes required.

Implementation Activities and Cost

Activity:	Order of Madnitude Cost:
^ 3rd Avenue design and implementation	$1.2 – 1.8 M
^ College Drive design and implementation	$3.2 – 4.8 M

Table 3.09 - 5 Year Red Line BRT Implementation Priorities

E. Blue Line BRT Transit Priority

Over the next 5 years, the Blue Line BRT corridor will begin to see an increase in transit service and ridership. At the same time, corridors such as Broadway Avenue, 8th Street, Idylwyld Drive, and Warman Road will continue to experience growing levels of congestion during the peak periods of the day. In order to enhance travel time and reliability of transit service as well as the comfort of more and more passengers, transit priority treatments and facilities have been identified in the long-term plan. For all Blue Line BRT corridors, enhanced bus stop facilities with shelters, seating, lighting and other amenities will be implemented. **Table 3.10** summarizes the Blue Line BRT corridors that are planned to see transit priority treatments and facilities within the first 5 years of the Transit Plan.

	8th Street	Broadway Avenue	3rd Avenue
TRANSIT OPERATIONS			
Express Bus Service	✓	✓	✓
Increase Stop Spacing	✓		
All Door Boarding	✓	✓	✓
TRANSIT FACILITIES			
Optimize Signals	✓	✓	✓
Signal Pre-emption	✓	✓	✓
Intersection Queue Jumpers	✓	✓	
All Door Boarding	✓	✓	✓

Table 3.10 - 5 Year Blue Line Transit Priority Treatments

Table 3.11 summarizes the 5 year implementation priority actions and costs associated with implementation of Blue Line BRT treatments. It should be noted that these costs are unit rates and should not be used for budgeting purposes.

Implementation Activities and Cost

Activity:	Order of Madnitude Cost:
^ 8th Street (Broadway - Preston)	$2.5 M
^ Broadway Avenue (8th – Bridge)	$2.0 M
^ 3rd Avenue (Bridge – 22nd Street)	$2.0 M

Table 3.11 - 5 Year Blue Line BRT Implementation Priorities

3.6.2 10 Year Priorities

This stage of implementation will involve monitoring progress on the first 5 years of the Plan and to gauge the impacts of the changes as they are being implemented. In all likelihood, adjustments will be required to address issues and to raise public confidence in the City's commitment toward strengthening transit in Saskatoon.

This stage of implementation will also build many of the initiatives that began during the first 5 years and begin new initiatives where needs are anticipated and being realized. The following discussion highlights the 5 to 10 year priorities for implementing the Transit Plan. Once again, it should be noted that the cost allocations are estimates only and intended to provide guidance on the order-of-magnitude investment that may be required. These figures should not be used for budgeting purposes.

A. Improving the Customer Experience

Once again, the City will want to monitor progress on the first 5 year initiatives around improving the customer experience and confirm that these investments are making a difference. Through customer surveys, the City will also be able to assess customer feedback that may be used to guide not only the customer service improvements, but all aspects of current day services and possible improvements.

For the next 5 years of the implementation, the City will want to continue with many of the customer service initiatives, in addition to implementing key facility improvements such as required with universally accessible transit stops and stations. **Table 3.12** highlight the priorities for implementing customer service and facility improvements for the 5 to 10 year period.

Plan Item	Implementation Activities	Order of Magnitude Cost
Real Time Bus Arrivals	Implement GPS technology within all new buses and upgraded stop facilities. Implement digital displays at BRT stations	$50,000/yr
Mobile App	Provide routing, stop and GPS location data to third party developers.	$25,000/yr
Ongoing Website Upgrades	Review and develop best practices for website design features. Implement ongoing upgrades to enhance trip planning.	$20,000/yr
Universal Accessibility	Prepare universal accessible bus stop design guidelines. Implement accessibility improvements at select number of stop locations. Work with other City departments to explore accessibility treatments surrounding transit.	$52,000/yr
Community Outreach	Engage and share information with special interest groups on the transit system, particularly with groups such as seniors, youth and people with disabilities.	$180,000/yr
Customer Service Staff Training	Provide basic customer service level training for all staff. Provide expanded training for working with disabled customers.	$180,000/yr
Customer Satisfaction Surveys	Implement annual customer satisfactions surveys by route.	$40,000/yr

Table 3.12 - 5 to 10 Year Customer Service and Facility Improvements

B. Service Plan

Once again, the City will want to monitor performance of all routes in the system and compare with customer feedback and suggestions. The intent of the 5 to 10 year implementation plan is to continue the shift of providing the most attractive services to the largest transit markets, while providing a basic level of coverage in low density, single use areas where ridership is likely to remain well below the system performance averages and acceptable levels based on common measures such as cost per ride. The following discussion highlights the 5 to 10 year priorities for modifying and expanding service levels.

- **Optimize Existing Transit Services.** The City should continue annual reviews and reporting of performance of existing services and identify opportunities for optimizing resources through service cuts, routing or modifying periods of operation.
- **Enhance Services on Key Corridors.** In some cases, current day service hours may be modified or shifted to other routes in the system where ridership is high and potential is greatest. The City will want to explore the trade-offs of shifting services toward routes and corridors that increase frequencies on the Red and/or Blue Line BRT corridors.
- **Introduce New Services.** During the 5 to 10 year periods of implementation, the City will want to not only concentrate more services on the rapid and frequent transit corridors presented in the Transit Plan, but to begin implementing community shuttle or flexible neighbourhood services as a replacement for fixed route service in low density residential and employment areas.
- Once again, the 5 to 10 year implementation priorities are centred on increasing overall annual service hours at 2.5% per year. Service increases are primarily directed towards improving weekday peak and midday services as well as some weekend service improvements. Over the next five years of the implementation, service levels would increase from 463,000 to 524,000 annual service hours. A conceptual level 10 year service plan is thematically illustrated along with the 5 year changes in **Figure 3.53**. All service changes should be examined with annual performance data as well as through the engagement of transit customers and other stakeholders.

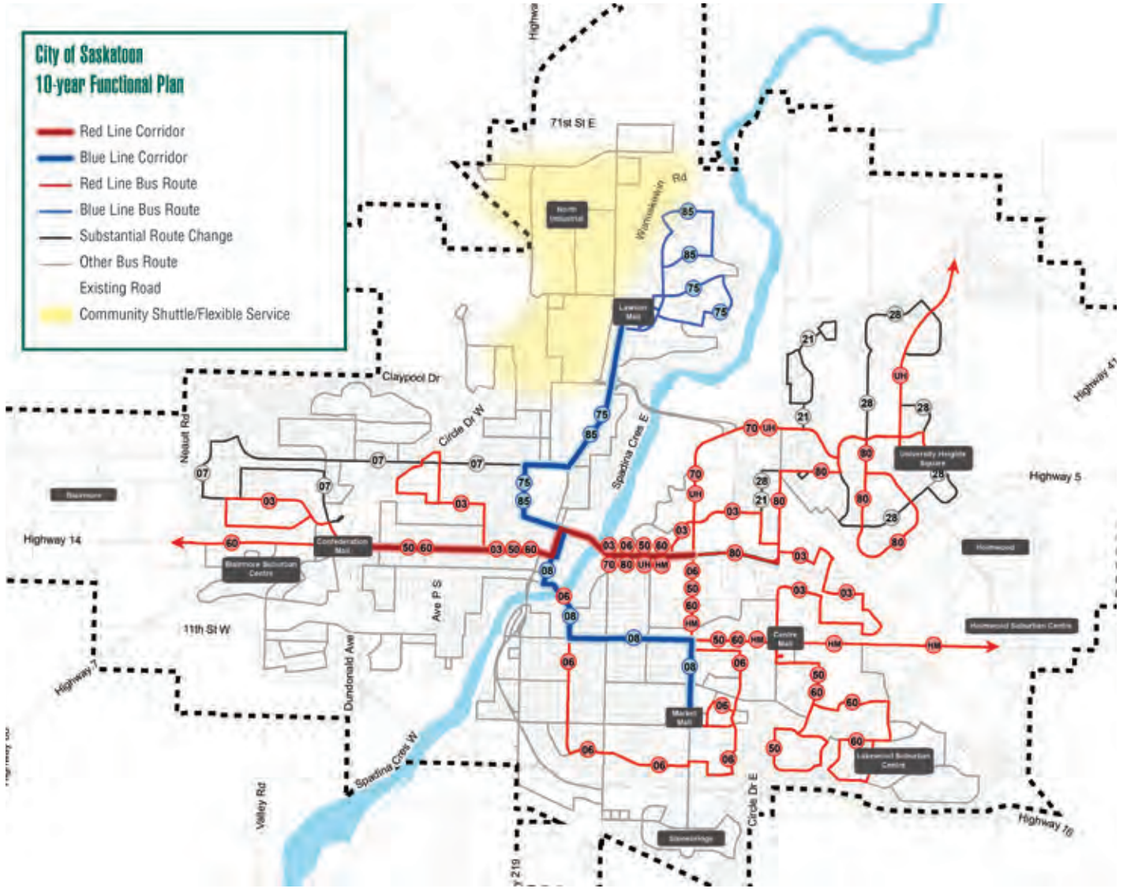


Figure 3.53 - 10 Year Transit Plan Implementation Process

C. Support Facilities

Support facilities required for the 5 to 10 year implementation period are essentially building from the service plan commitments as previously described along with other support facilities. **Table 3.13** summarizes the implementation priorities and order-of-magnitude cost estimates.

Plan Item	Implementation Activities	Order of Magnitude Cost
Bus Fleet Replacement	Replace 10 buses every year.	$5.0M per year
Bus Fleet Expansion	Purchase 5 additional buses every year. Annual Maintenance.	$2.7M per year $40,000 per year
Park-and-ride Lots	Implement 3 park-and-ride lots near Confederation, Wildwood and University Heights	$13.0M

Table 3.13 - 5 to 10 Year Priorities for Transit Supportive Facilities

D. Red Line BRT Lanes and Stations

After the first 5 years of implementation, the City will want to monitor progress and results with the implementation of high priority facilities already implemented. In some cases, improvements may be required while other locations may require expanding periods of operation or even operational improvements at signalized intersections. As with any of the monitoring initiative, changes should be transparent to all decision-makers and the public in order to assure the community that resources are be invested and results are being achieved.

The second stage of priorities for implementing BRT lanes and stations should continue in the core ares of the city where transit service and ridership are growing, and congestions levels continue to impact travel times for transit customers and the system. Between years 5 and 10, bus lanes and stations should be implemented along 22nd Street between 3rd Avenue and Circle Drive, as well as along 25th Street between 3rd Avenue and the University bridge. It should be noted that grade separation of the 22nd Street railway crossing would support investments in BRT but would not be a precondition for implementing curb bus-only lanes along the Red Line BRT corridor. Additional planning and design could also commence for BRT corridors and stations to be implemented beyond the 10 year time-frame.

Table 3.14 summarizes the implementation actions and costs associated with BRT facilities for the 5 to 10 year implementation period. It should be noted that these costs are unit rates and should not be used for budgeting purposes. Rather, functional designs of the BRT streets and station areas will provide more reliable concepts and estimates of the changes required.

Implementation Activities and Cost

Activity:	Order of Madnitude Cost:
^ 22nd Street design and implementation	$8.2 M – 14.1 M
^ 25th Street design and implementation	$2.2 – 3.3 M
^ Preston-University Heights design	$11.4 – 17.1 M
^ 22nd Street-Blairmore design	$5.0 – 7.5 M
^ Preston – 8th Street Holmwood design	$13.0 – 19.5 M

Table 3.14 - 5 to 10 Year Red Line BRT Implementation Priorities

E. Blue Line BRT Priority Treatments

Over the next 5 years, segments of the Blue Line BRT corridor will continue to see increased transit service and ridership as well as growing congestion and delays during peak periods. Transit priority treatments may be expanded to further enhance the transit service reliability and speed through treatments and facilities identified in the Plan.

Implementation Activities and Cost

Activity:	Order of Madnitude Cost:
^ Idylwyld Drive (25th Street – 33rd Street)	$2.5 M
^ 33rd Street (Idylwyld Drive – Warman Road)	$2.0 M
^ Warman Road (33rd Street – Primrose Drive)	$2.0 M

Table 3.15 - 5 to 10 Year Blue Line Transit Priority Treatments

For all Blue Line BRT corridors, enhanced bus stop facilities with shelters, seating, lighting and other amenities will be implemented. **Table 3.15** summarizes the Blue Line BRT corridors that are planned to see transit priority treatments and facilities within the 5 to 10 year periods of the Transit Plan. It should be noted that these costs are unit rates and should not be used for budgeting purposes.

3.6.2 Longer Term (Beyond 10 Years)

Throughout the first 10 years of implementation, the City will monitor progress in terms of both investments and outcomes of the transit system along with land use patterns. Beyond the 10 year priorities, the City will:

- Continue annual reviews to optimize service delivery and ensure Transit Plan implementation is on track.
- Implement additional customer service improvements (outreach, website upgrades, customer satisfaction surveys)
- Continue fleet renewal and expansion.
- Continue increasing service hours and frequencies to high ridership areas.
- Expand planning, designing and constructing remaining Red Line BRT.
- Plan, design and implement park-n-ride lots for Lawson Heights and Market Mall.

3.7 Financing Transit

Transit in Saskatoon is governed by City Council and managed through the City's Transportation and Utilities Department. In this regard, City Council is responsible for all decisions regarding service plans, fares and local taxes associated with transit investments. The operation of conventional and specialized transit services is the responsibility of Saskatoon Transit, which operates all fixed route bus and Access Transit services. This responsibility also includes the delivery of services, maintenance, marketing, customer service, and fare collection.

Unlike many jurisdictions in Canada, transit decisions in Saskatoon are very much in the purview of those making decisions on other matters that can dramatically influence the success of transit as illustrated in **Figure 3.54**. In particular, land use and transportation decisions can affect everything from access to transit through to the ability of transit to serve larger customer markets associated with higher scale of development, density of development, and mixture of land uses. Consistent with the Growth Plan, 50% of new growth in Saskatoon is expected to occur within the core areas of the city inside Circle Drive. This growth will ensure that frequent, direct and fast services can be provided to the largest customer markets. As a result, more people will have access to the most attractive transit services in the city. Council's commitment to promote plans for Strategic Growth Areas, Neighbourhood Infill and Corridor Growth will ultimately influence the success of transit.

Beyond planned land use changes, directions for other modes can also impact the success of transit. For example, building roadway capacity to address congestion in the core area of the city, and providing abundant supplies of low cost long-term parking in the Downtown and other growth areas can undermine the success of transit and other sustainable modes of transportation.

Figure 3.54 - Key Factors to the Success of Transit

The funding for transit operations in Saskatoon is primarily the City's responsibility, with some Federal assistance for capital improvements through grant programs. Unlike many other provinces however, there has historically been no provincial funding provided directly to transit operations and capital expansion. Further, transit operations are principally funded through the farebox and property taxes, with limited ability to access other funding sources. Although many factors contribute toward the success of transit as previously noted, the efficiency of the system is important to ensure that resources are used wisely.

Over the next 30 or more years, investments in transit services and facilities must increase significantly in order to improve not only the experience for transit customers, but also to ultimately increase ridership. Annually, additional service hours and new fleet are required to gradually change and increase service levels in key areas of the city as summarized in **Table 3.16**. Improved facilities ranging from accessible stops and station areas with customer amenities through to BRT lanes and transit priority treatments on select streets will require significantly more financial resources to implement and support.

	Total Population	Cost per Service Hour (2015 $)	% Farebox Recovery
Saskatoon Today	248,700	$87	35%*
Saskatoon Tansit Plan (long-term)	500,000	$87	49%
Other Communities			
Regina	210,600	$77	37%
Victoria	359,800	$108	43%
Waterloo Region	509,400	$108	41%
Winnipeg	699,300	$86	61%

Source: Saskatoon: % Farebox Recovery derived from 2012 farebox ridership and passenger revenues; other categories and all other cities: CUTA Factbook (2013).

Table 3.16 - Measures of Efficiency

Even with changing land use patterns and strategic improvements in other parts of the transportation system, investments in additional service hours as well as transit programs and facilities must be targeted. In this regard, the largest potential customer markets should see the most attractive service levels and facilities, while other lower density areas of the city may continue to see modest levels of service. With this strategic approach, a more than doubling of service hours is projected to yield a threefold increase in ridership by the time that Saskatoon's population reaches half a million people. Despite an improved farebox recovery with increased ridership, Saskatoon will still rely on property taxes to cover approximately 50% of the operating cost for transit without other funding sources.

Figure 3.55 - Increased Transit Capital, Operating and Maintenance Responsibilities

As Saskatoon grows, the City will continue to see more diverse needs and expectations beyond transit and transportation that rely on property tax for funding. Much like other cities, Saskatoon's growth to half a million people will continue to place increasing pressures on social, recreational and community safety services and facilities. With growing reliance on property taxes to fund many other municipal priorities, Saskatoon must seriously consider additional funding sources for transit services, facilities and programs. Some of those potential funding sources are already permitted within current practices and others will require legislative changes as well as new agreements with the Province.

The City recently completed a study on funding growth related infrastructure (Financing Growth Study), a portion of which may apply to transit facilities such as BRT lanes and stations. Development levies for example, allow Saskatoon to charge for local and off-site services required to support new development. The fees are administered under the annual prepaid services rates (Direct and Offsite) adopted by Council. Levies may generally be applied to growth related infrastructure such as roads (including bridges), parks, and recreational facilities as well as water, wastewater and stormwater infrastructure. Although transit is technically not included as a defined service supported by development levies, road improvements supporting BRT related facilities may be included if serving growth in the city. For example, BRT lanes and related street improvements are essential to support long-term growth of the city. Without growth, in fact, there would be very little need to alter streets and invest in BRT related facilities. The City should explore the extent of the capital investments in BRT facilities that may be supported through development levies in addition to other funding from the province and federal governments.

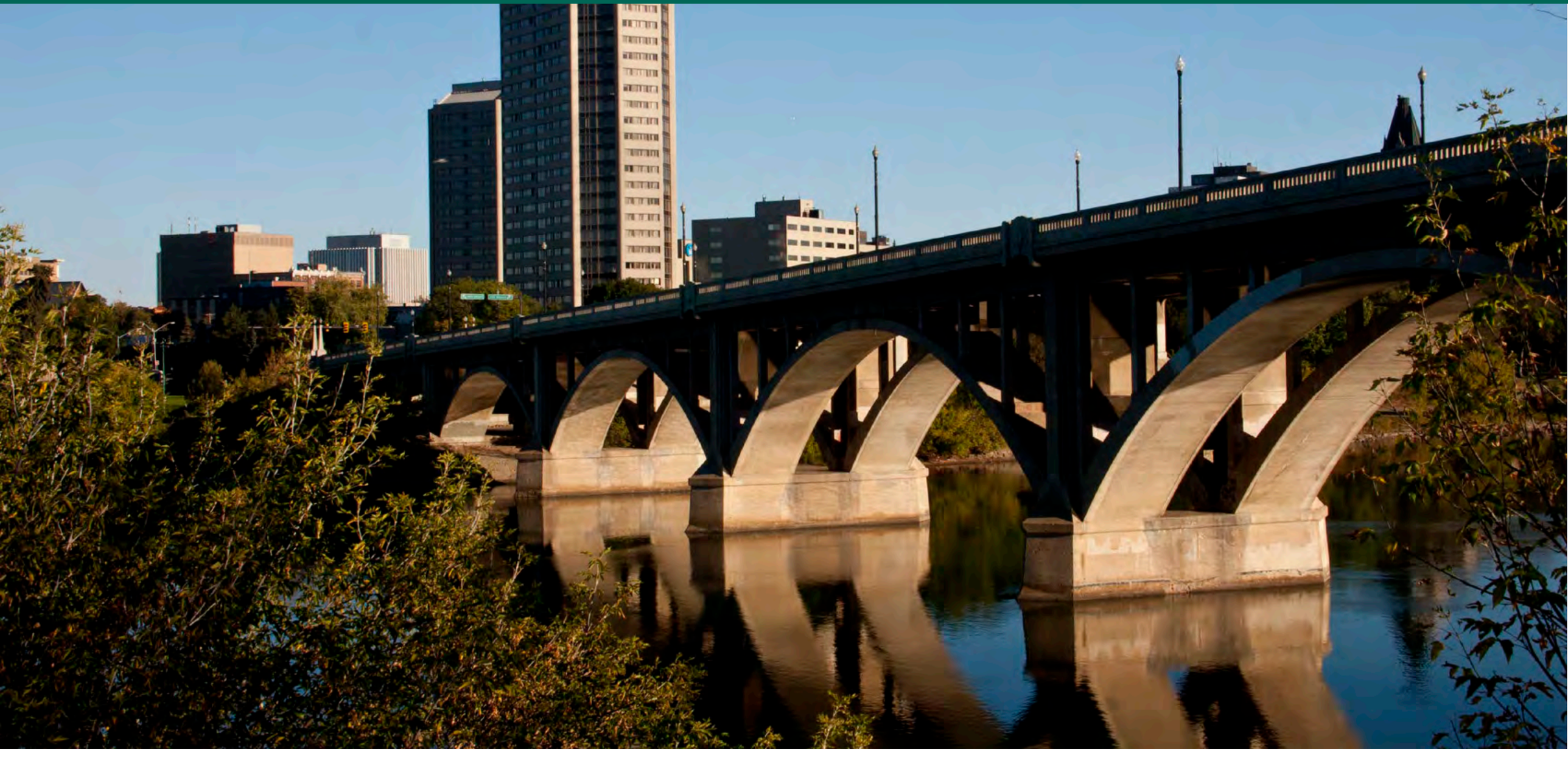
As a starting point for the discussion with Council and senior levels of government, **Table 3.17** summarizes additional revenue sources that should be considered to implement planned transit services and facilities identified in the Growth Plan. The City will want to examine these alternatives and carefully consider the experience of other jurisdictions.

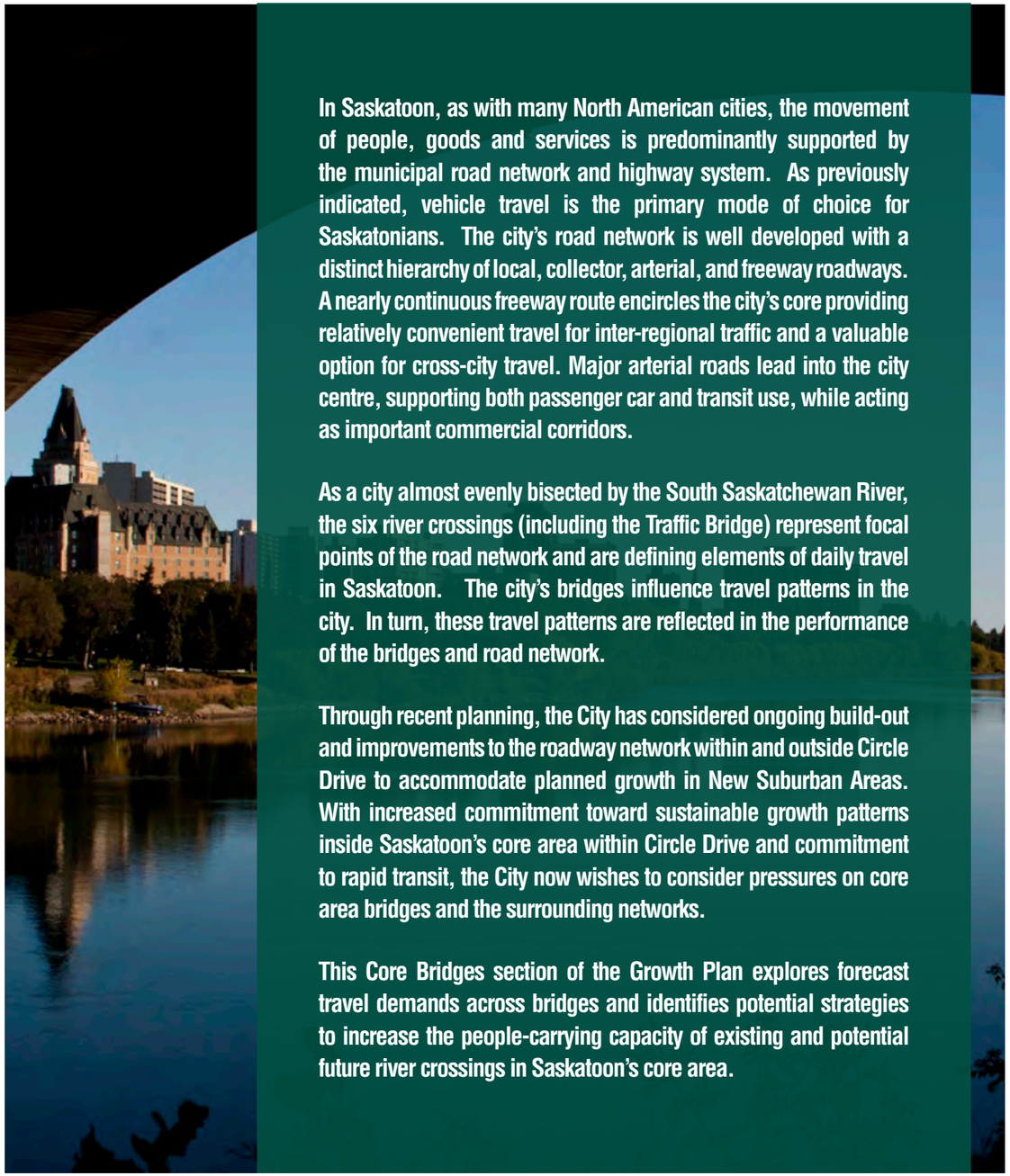
Potential Funding Sources

Operating Revenues:	^ Transit Fares, Program Revenues, Charters & Special ^ Event Fees ^ Advertising	
Local Property Tax		
Park-and-ride Facility Charges		
Surcharges	^ Parking Surcharge ^ Sales Surcharge ^ Vehicle Registration Levy	^ Motor Vehicle Fuel Surcharge
Private Sector Partnerships	^ Partnership with Major Employers ^ Land Value Capture & Leases	
Senior Government	^ Capital Grant Programs ^ Regional Partnerships Initiative	^ Building Canada Fund ^ Provincial Grants and Funding to be explored

Table 3.17 - Potential Funding Sources

PART 4: CORE BRIDGES





In Saskatoon, as with many North American cities, the movement of people, goods and services is predominantly supported by the municipal road network and highway system. As previously indicated, vehicle travel is the primary mode of choice for Saskatonians. The city's road network is well developed with a distinct hierarchy of local, collector, arterial, and freeway roadways. A nearly continuous freeway route encircles the city's core providing relatively convenient travel for inter-regional traffic and a valuable option for cross-city travel. Major arterial roads lead into the city centre, supporting both passenger car and transit use, while acting as important commercial corridors.

As a city almost evenly bisected by the South Saskatchewan River, the six river crossings (including the Traffic Bridge) represent focal points of the road network and are defining elements of daily travel in Saskatoon. The city's bridges influence travel patterns in the city. In turn, these travel patterns are reflected in the performance of the bridges and road network.

Through recent planning, the City has considered ongoing build-out and improvements to the roadway network within and outside Circle Drive to accommodate planned growth in New Suburban Areas. With increased commitment toward sustainable growth patterns inside Saskatoon's core area within Circle Drive and commitment to rapid transit, the City now wishes to consider pressures on core area bridges and the surrounding networks.

This Core Bridges section of the Growth Plan explores forecast travel demands across bridges and identifies potential strategies to increase the people-carrying capacity of existing and potential future river crossings in Saskatoon's core area.

4.1 Existing Network Characteristics & Conditions

This section of the report highlights city-wide networks and travel patterns as well as the characteristics and conditions of the roadway network inside Circle Drive and across the South Saskatchewan River. It should be noted that the timing of the analysis occurred using traffic data prior to the opening of the Circle Drive South Bridge (from 2011 – 2012). The assessment contained in this report is augmented with a review of city-wide roadway network conditions after the bridge was complete and transportation model forecasts with all planned growth and roadway network improvements including the Traffic Bridge, Commuter Bridge and Perimeter Highway. Although the opening of the Circle Drive South Bridge was not explicitly examined as part of the existing conditions review, this and other planned roadway network improvements are accounted for in the future base case analysis as well as for optional river crossing improvement strategies.

4.1.1 City-wide Network and Travel Patterns

This section highlights the existing road network layout and travel patterns between key areas of the city.

- **Saskatoon's road network consists of major roadways and neighbourhood streets that serve distinct needs.** Both types of roadways provide access to a variety of destinations and fulfill travel needs for all trip purposes. **Figure 4.01** illustrates the roadway classes throughout the city, including freeway, arterial, collector, and local roads.

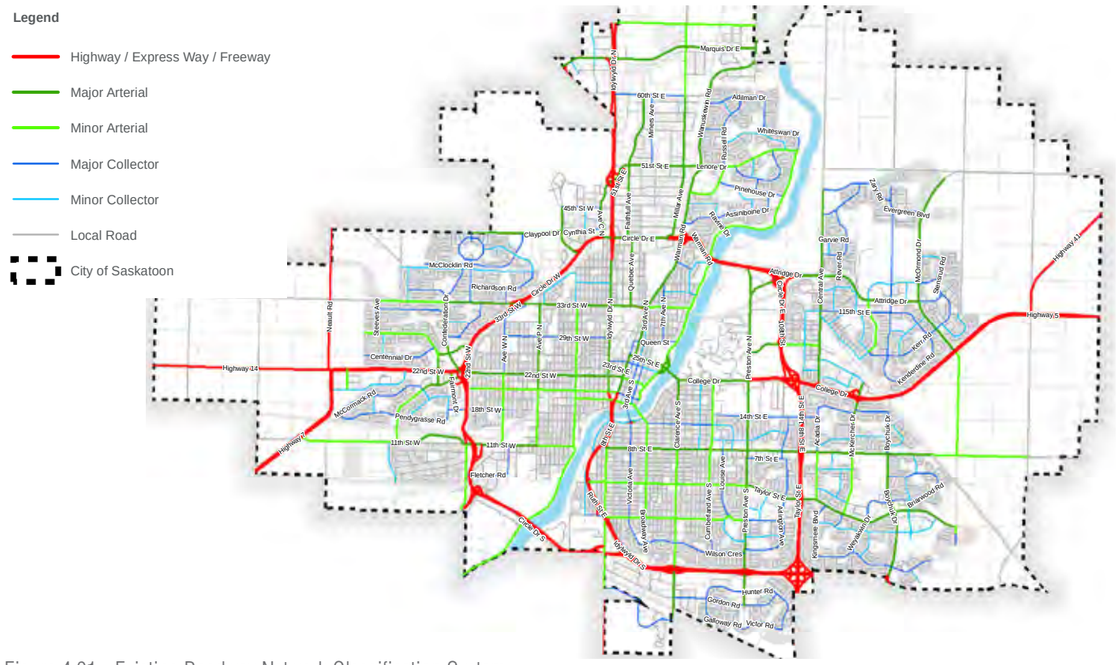


Figure 4.01 - Existing Roadway Network Classification System

- **The city's network structure inside Circle Drive is distinctly different than outside Circle Drive.** In the older, more established areas of the city inside Circle Drive, there is a grid network of urban arterials, collectors, and local roads that provide alternative and continuous east-west and north-south routes. Outside Circle Drive, the street system is more curvilinear, with fewer direct corridors and alternative routes to serve travel between areas of the City.

- **Weekday afternoon peak hour traffic is approximately 30% more than morning peak periods on roadways in many areas of the city. Figure 4.02** illustrates average weekday hourly traffic volumes crossing core screenlines around the city. These patterns indicate that the morning peak period for daily traffic across most screenlines occurs between 6am to 8am, and the afternoon peak occurs between 4pm and 6pm. The afternoon peak period is consistently higher than the morning peak across all screenlines by as much as 30%. These demand patterns are slightly different than transit ridership where morning and afternoon weekday peak period travel is generally consistent.

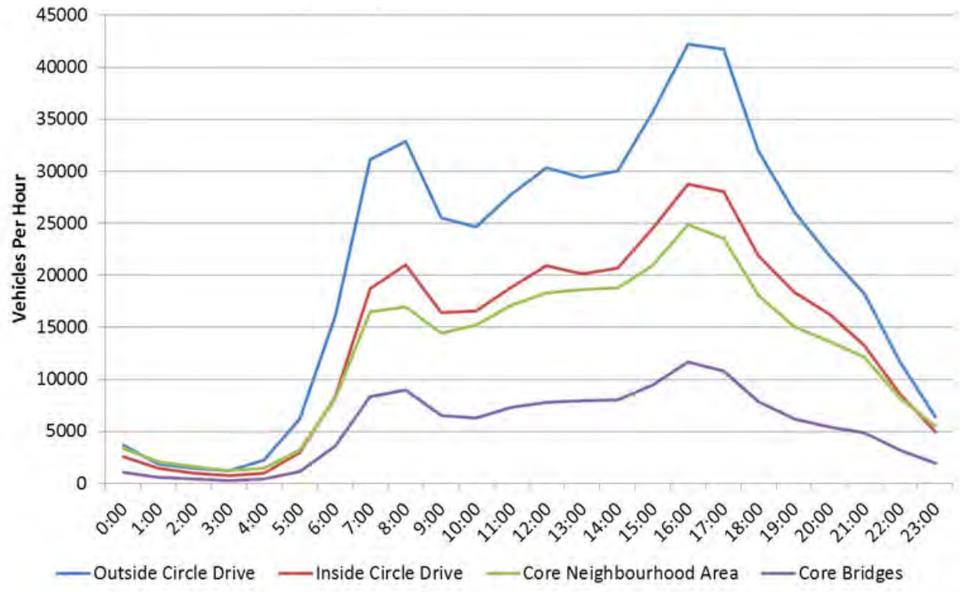


Figure 4.02 - 2011 Weekday Hourly Traffic Volumes Across Screenlines (Arterial Roads)

Note: This data represents conditions prior to the Circle Drive South bridge opening.

- **Prior to the opening of Circle Drive South Bridge, morning and afternoon peak hour traffic volumes are much higher around Circle Drive than volumes entering and leaving the core areas of the city.** Average AM and PM peak hour traffic volumes crossing core screenlines around the city are illustrated in **Figure 4.03**. The PM peak hour volumes are generally higher than the AM peak hour volumes at all screenline locations and in all directions. Traffic volumes around the Circle Drive screenlines are generally higher than the core area screenlines. This pattern highlights the important role of the Circle Drive corridor in providing an alternative route around the city rather than directing city-wide, regional and provincial traffic through the core area. It is anticipated that implementation of the Circle Drive South Bridge has further enhanced this route as an alternative to driving through the core areas of the city.

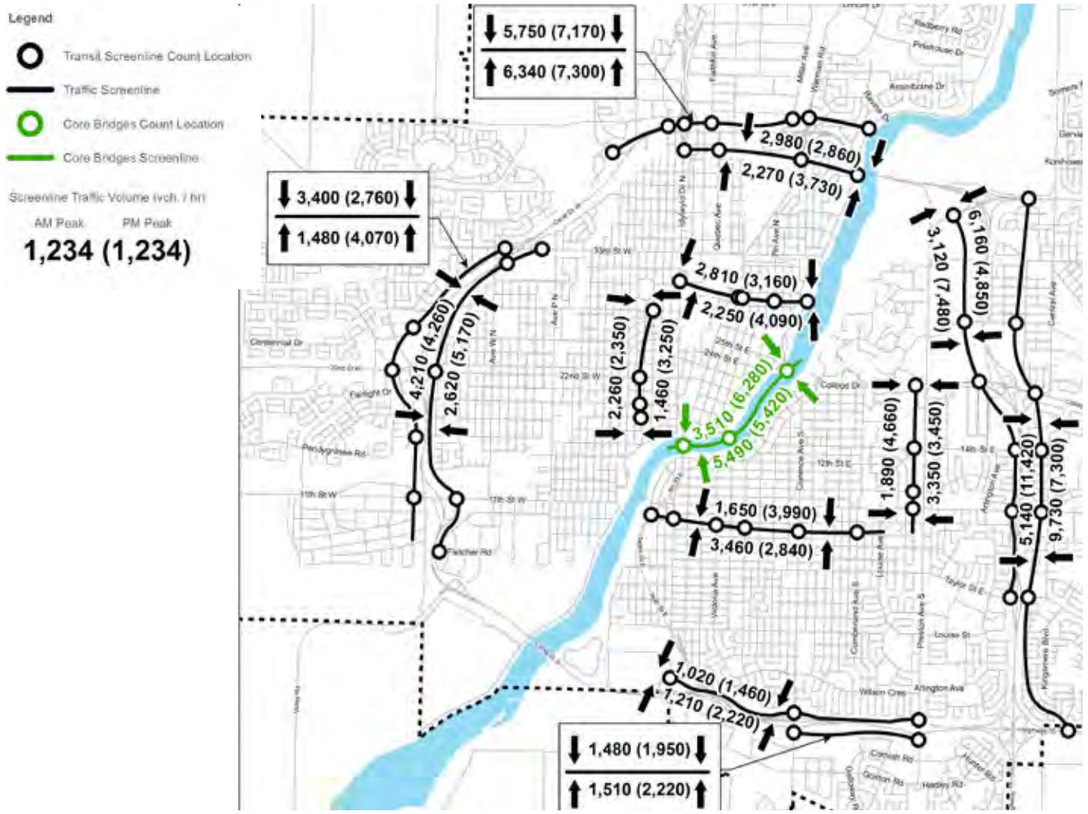


Figure 4.03 - 2013 Peak Hour Traffic Volumes Across the City (AM/PM vehicles per direction)

Note: This data represents conditions prior to the Circle Drive South Bridge opening.

Within the core area, peak directional volumes across the South Saskatchewan River suggest a higher demand toward the downtown in the morning and a balanced flow in both directions during the afternoon peak hour. Once again, these patterns are generally consistent with transit ridership where the passenger volumes are balanced in both directions across the core area bridges.

4.1.2 Core Area Networks and Bridges

Within the core area bordered by Circle Drive, the road network system may be best characterized as a traditional grid system. Additionally, the three core area bridges (i.e. Senator Sid Buckwold, Broadway, and University) significantly influence local travel patterns on either side of the river. The following discussion describes the core area bridge and network characteristics and conditions. Although the Traffic Bridge is approved for design and implementation for 2018, the existing conditions assessment does not incorporate this future connection.

- **Core Area Network and Arterial Roads.** Idylwyld Drive provides a direct highway to arterial connection to the Downtown approaching from the north and south. Other major arterial routes entering and leaving the core area of the city include 22nd Street and College Drive. These major arterials transition from six lanes to four lanes as one approaches the Downtown. Other major four lane arterials leading into the Downtown include 20th Street and 33rd Street from the west and Broadway Avenue from the south. Two lane collector roads support the arterial network and provide connections for the regular local grid system. The road networks, including number of lanes in the core area, is illustrated in **Figure 4.04**. Although there is a strong grid of major roads within the core area, river crossings and Circle Drive are "pinch points" in the network.

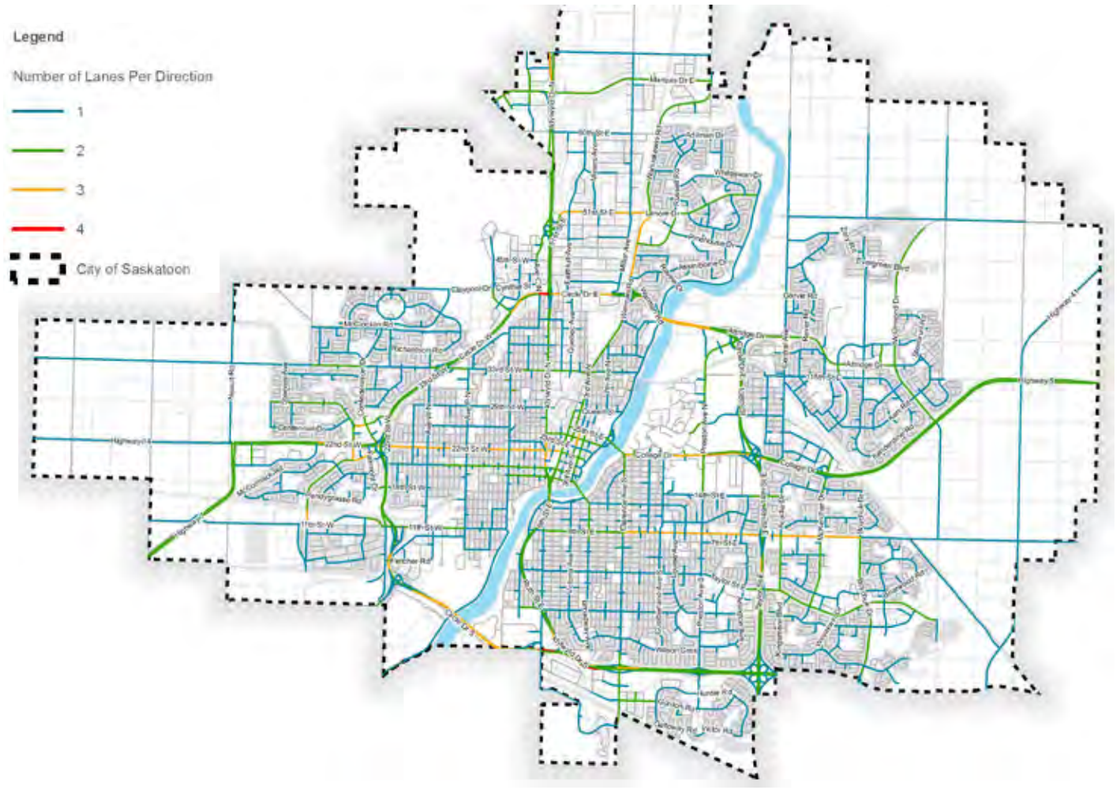


Figure 4.04 - Laning of Collector & Arterial Roads

- **The core area of Saskatoon is served by three bridges: Senator Sid Buckwold (Idylwyld Drive); Broadway; and University.** Although these bridges provide connections across the city, they increasingly serve local travel to, from, and within the core area. The University and Broadway Bridges are classified as major and minor arterials, respectively, by virtue of the roads they connect. Both bridges support two travel lanes in each direction and have separated pedestrian walkways on each side that are also shared with cyclists. The Senator Sid Buckwold Bridge is classified as a freeway from the south side of the Saskatchewan River through to the Downtown where the corridor transitions to the arterial roadways of Idylwyld Drive and 1st Avenue. This river crossing supports three traffic lanes per direction and a separated area for pedestrians and cyclists on the east side.

  The City has indicated that the structural characteristics of both the Broadway and University bridges could not support further widening for additional travel lanes or pathway facilities.

- **Prior to the opening of the Circle Drive South Bridge, core area bridges could generally support the existing peak hour traffic demands.** The Senator Sid Buckwold (Idylwyld Drive), Broadway and University Bridges connect the east and west sides of the city and the Downtown area. These three bridges provide a total of seven travel lanes in each direction and can serve up to approximately 8,900 vehicles. The assigned directional capacity per lane ranges from 1,000 vehicles per hour on crossings with signalized intersections on either end (such as the Broadway Bridge) to 1,500 vehicles per hour for bridges with grade-separated connections on either side (such as the Senator Sid Buckwold Bridge). **Table 4.01** below summarizes the existing traffic volumes and conditions in terms of volume-to-capacity ratio, as well as a level of service in the morning and afternoon peak direction. The level of service (LOS) is a measure of vehicle delay where LOS A suggests that there is no delay and LOS F indicates that there is significant delay. A minimum LOS D or better is generally used as a guideline for planning purposes.

Bridge	NUMBER OF LANES	2012 PEAK DIRECTIONAL VOLUME		DIRECTIONAL CAPACITY	PEAK DIRECTIONAL V/C		PEAK DIRECTIONAL LEVELS OF SERVICE	
		AM	PM		AM	PM	AM	PM
Sid Buckwold Bridge	3	2,390	2,890	4,500	0.53	0.64	C	C
Broadway Bridge	2	1,170	1,410	2,000	0.58	0.70	B	B
University Bridge	2	1,950	1,980	2,400	0.81	0.82	C	C
ALL CROSSINGS	7	5,510	6,280	8,900			-	-

Table 4.01 - Core Area Bridge 2012 Traffic Conditions

Note: This data represents conditions prior to the opening of Circle Drive South Bridge , and the levels of service do not reflect impacts of nearby signalized intersections.

- **Core area roads connecting to the bridges generally experience moderate delays with some isolated areas of congestion during the afternoon peak periods.** The performance of the network is generally measured in terms of delay which typically occurs at signalized intersections in urban areas. For the purposes of this review, however, the overall performance of the core area network is described using two sources of information as briefly highlighted below.

  - **Model volume-to-capacity (V/C) ratios.** The updated city-wide 2011 PM peak hour travel demand model provides V/C relationship for all corridors in the city based on a theoretical capacity of each roadway (depending on number of lanes, signals, etc.). As V/C ratios exceed 0.85 and approach 1.0, drivers will experience moderate to significant delays. Where V/C ratios exceed 1.0, traffic flow is considered to be in an unstable state and unable to serve the demand. This typically results in a breakdown of traffic flow until the peak demand subsides.

    Figure 4.05 below illustrates the modelled V/C ratios for the core area roadways prior to opening Circle Drive South Bridge. As illustrated, few areas of the network were operating beyond the capacity of the roadway with V/C ratios greater than 1.0. The model indicates that 'outbound' vehicle travel demands across the core area bridges are approaching their capacity and resulting in moderate to significant delays during the peak.

Figure 4.05 - 2011 Model PM Peak Hour Volume-to-Capacity Ratios

- **Network travel speeds with Circle Drive South Bridge**. Recognizing that the timing for opening Circle Drive South Bridge occurred during the study, Google Maps was used to provide a streamlined approach to summarizing conditions with this significant network improvement. Although relatively new technology, Google Maps provides another perspective on typical peak period traffic conditions in Saskatoon. Google Maps provides real time traffic conditions as well as typical conditions during different periods of the day using Android cell phone data in cities throughout North America. By taking frequent samples of individual travelers, a picture of actual traffic flow conditions can be interpreted. An example of typical weekday afternoon conditions is illustrated in **Figure 4.06**. This data was taken over several days in September 2013. By comparing the Google Traffic Data to the city's existing conditions travel demand model, the resulting speed is estimated for each colour gradient.

These results indicate that the City's network is generally operating at more than 50% of the posted speed during the PM peaks – or greater than 25km/hr on most urban roadways and higher on Circle Drive. This suggests that most corridors in the city are operating at LOS C or above and is typical for most urban areas where there is modest levels of congestion. Within the core area, the University Bridge and the south side of the Broadway Bridge are operating below 50% of the posted speed. As illustrated and experienced by many commuters, the University Bridge experiences vehicle queues extending west across the bridge from the first signalized intersection on the east side – Clarence Avenue. Similarly, the Broadway Bridge also experiences slight delay and queuing at the first signalized intersection on the south side – 12th Street – with shorter vehicle queues. Aside from these two locations, these overall patterns would suggest that most of the roadway network within the core area of the city was operating with relatively modest delay in 2013 – after the opening of the Circle Drive South Bridge.

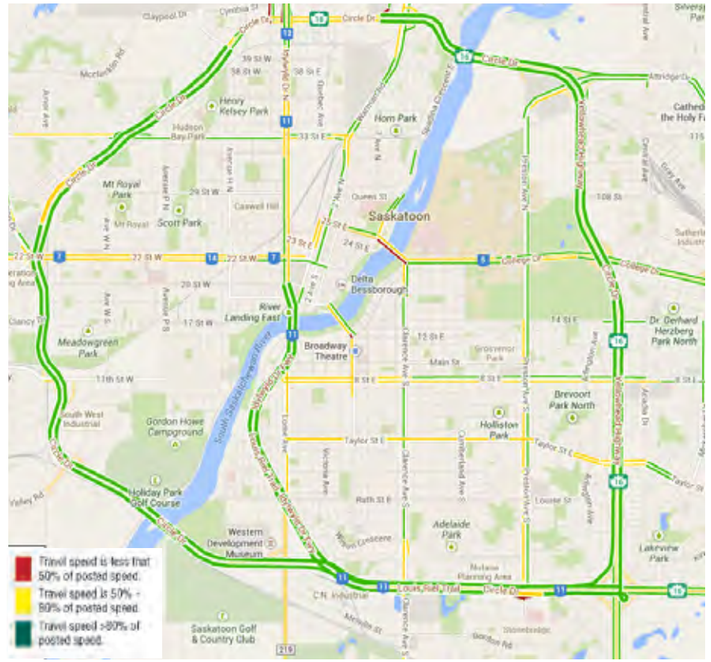


Figure 4.06 - Observed 2013 Network Performance (Google Traffic Data) - Weekday PM Peak
Source: Google Maps, 2013

4.2 Future 'Business-as-Usual' Network and Travel

Taking into consideration the planned population and land use changes (without Corridor Growth described in Section 2.0), in addition to the incorporation of planned road network improvements, a 30-year future 'base' travel projection has been developed using an updated version of the City's transportation demand model. Using this tool, forecasted changes to travel patterns, traffic volumes, and road network/bridge performance can be projected. It should be noted that the 'Business-as-Usual' model scenario assumes no changes to mode choice for transit, walking and cycling.

This section of the Technical Report examines how growth is expected to influence travel patterns and the demands on the city's road network and core area bridges. As previously indicated, the PM peak hour traffic conditions are generally 30% higher than the AM peak. Therefore, PM peak forecasts are used for the purpose of forecasting travel demands, identifying areas of congestion, and exploring possible improvements across core area bridges. It should be noted that the future 'Business-as-Usual' scenario includes planned growth to half a million people as described in Section 2.0 of the Technical Report. However, this assessment does not include the shift toward increased Corridor Growth as recommended in the Growth Plan. Although this form of sustainable growth is important to the transportation system, the core area bridge review would not be substantively different with Corridor Growth.

4.2.1 Planned Network Improvements

The City of Saskatoon and the Saskatchewan Ministry of Highways and Infrastructure have identified medium- and long-term network improvement projects to accommodate growth in the city and for regional and provincial travel in and around Saskatoon. This section outlines some of the more significant projects that are assumed to be part of the base condition and implemented in the long-term.

Key city and provincial road and highway improvement initiatives are illustrated in **Figure 4.07**. Selected projects most relevant to future city and regional travel patterns are briefly described below.

- **Traffic Bridge** – A few years ago, City Council approved the plan to replace the Traffic Bridge with a two lane steel truss bridge including 3 metre multi-use pathways on both sides to accommodate pedestrians and cyclists. This replacement bridge is now under construction and expected to be completed in 2018.

- **North Commuter Parkway Bridge and corridor** – The North Commuter Parkway Functional Planning Study identified the alignment and functions for a new bridge across the South Saskatchewan River. This new link is needed to connect east side neighbourhoods such as University Heights with the Marquis Industrial Area. The alignment extends Marquis Drive from the west side of the river to a McOrmond Drive extension at Fedoruk Drive. It is anticipated that truck traffic will continue to utilize the Circle Drive bridges and the future Saskatoon Freeway, noted below. The North Commuter Parkway will be constructed as a six lane roadway and bridge. Support roadway connections such as Central Avenue and others will be designed with features consistent with a town centre area as outlined in the University Heights Sector Plan. A grade-separated connection is planned for Idylwyld Drive and Marquis Drive. Construction of this new crossing of the South Saskatchewan River is also expected to be complete by the end of 2018.

- **Saskatoon Freeway and North Bridge** – This project is being planned by the Ministry of Highways and Infrastructure in partnership with the City of Saskatoon. Although the timing and phasing for implementation is unknown at this time, the Perimeter Highway will start from Highway 11 South (at Grasswood Road) and extend north to connect with Highways 5, 41, 11, 12 and 16 before ending at Highway 14 and 22nd Street West.

- **Other transportation network improvement projects** have also been identified as part of the Holmwood Sector Plan, University Heights Sector Plan, and Blairmore Sector Plan areas on the east and west sides of the city. These roadway improvement projects provide access to and from the major road system in Saskatoon and are included in all modeling and assessment of future travel demands and road network conditions. **Appendix B** lists all planned future roadway network improvements contained in the 'Business-as-Usual' model scenario and analysis.

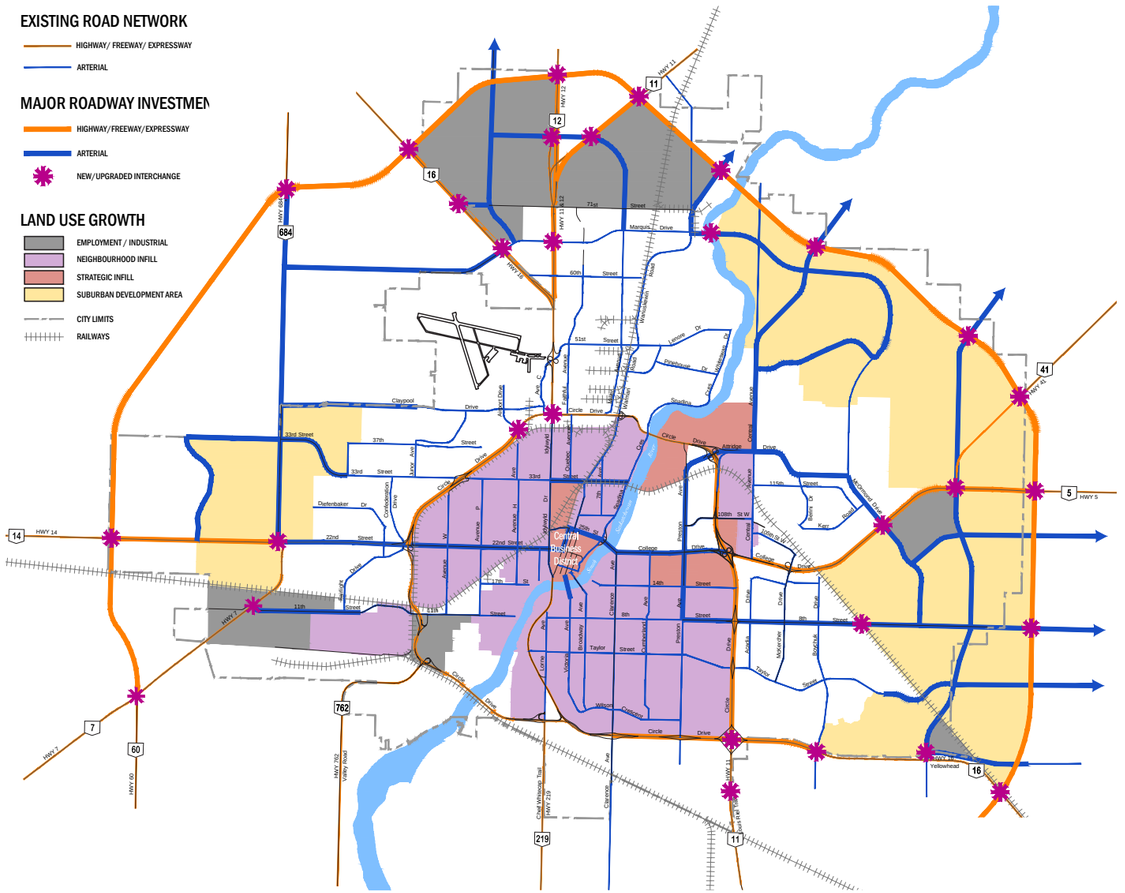


Figure 4.07 - Planned City & Provincial Long-term Network Improvement Projects

Source: City of Saskatoon

4.2.2 Forecast Travel Demands and Roadway Conditions

Growth in population, employment as well as commercial activity throughout the city will continue to increase travel demands to the areas of most significant change and place increasing pressures on the city's road network. This section of the Technical Report highlights the forecast traffic demand patterns and areas of greatest change with the planned growth and base network improvements identified by the City's and Province's current plans.

- **Over the next 30 years, the city roadway network will support 100,000 additional vehicle trips during the afternoon peak hour with planned growth and the 'base' improvements to the transportation system. Figure 4.08** illustrates the total vehicle trips generated by land uses within the city today during the afternoon peak hour as well as what is expected with half a million people. As illustrated, it is estimated that the city's roadway network accommodates approximately 86,000 vehicle trips in the afternoon peak hour today based on the transportation model. Over the next 30 years, the planned growth for half a million people is projected to result in a 220% increase to the total number of vehicle trips on the city's street system. This assumes that the mode share or the percentage of people using transit, walking and cycling remain relatively unchanged.

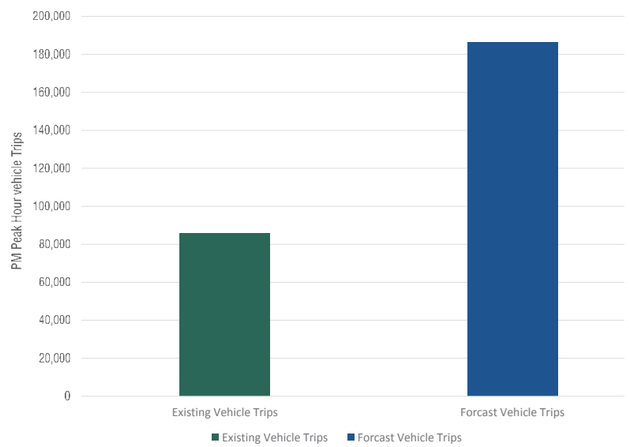


Figure 4.08 - Projected Change in PM Peak Hour Vehicle Trips
Source: City of Saskatoon Updated Model

- **Although all areas of the city will generate more vehicle travel, the North Industrial area, Downtown, University and new suburban areas will experience the largest increase in PM peak hour trip origins (see Figures 4.09 & 4.10).** These patterns indicate that while the urban areas of the city will continue to generate a significant amount of traffic, the suburban area growth will place more pressure on the street system outside Circle Drive.

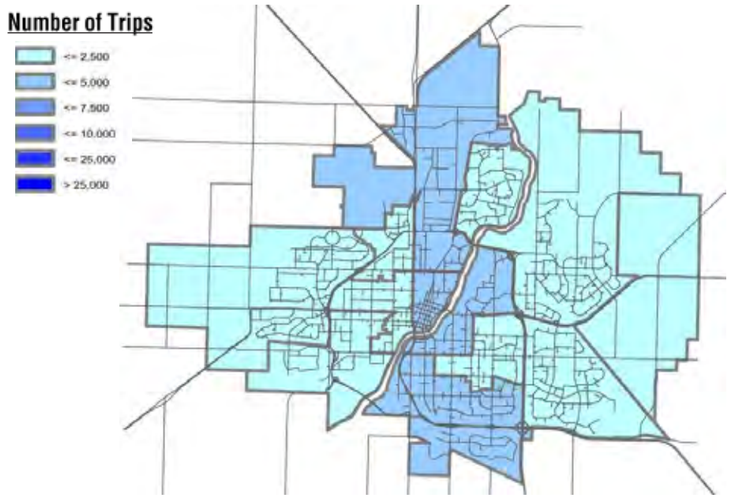


Figure 4.09 - Existing PM Peak Hour Vehicle Trip Origins

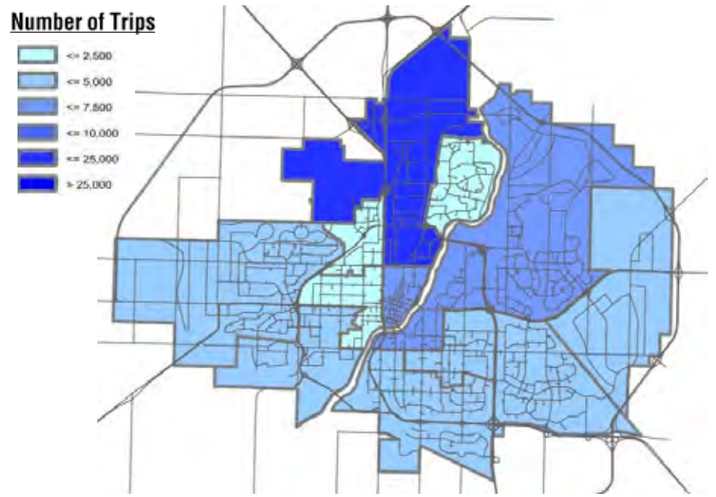


Figure 4.10 - Forcast PM Peak Hour Vehicle Trip Origins (30 year)

- **Similarly, suburban areas will experience the greatest increase in vehicle travel in the future as the highest PM peak hour destinations in the city, as illustrated in Figures 4.11 and 4.12.** Although all areas of the city are projected to grow as destinations for vehicle travel, the University Heights and Blairmore areas are projected to generate the most vehicle trips during the PM peak hour in the long-term.

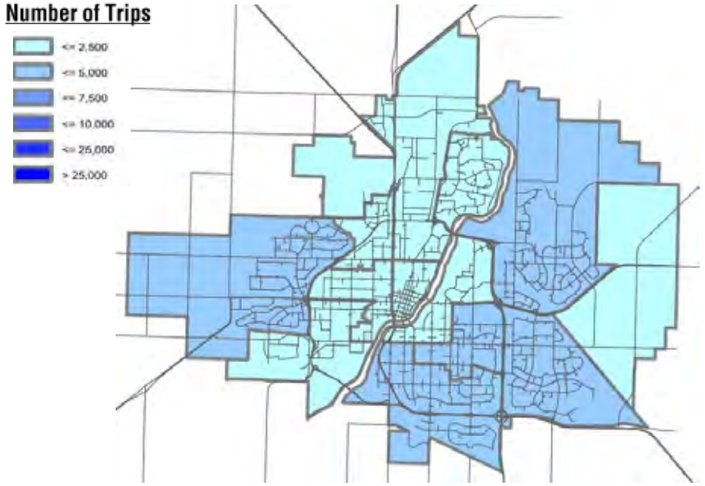


Figure 4.11 - Existing PM Peak Hour Vehicle Trip Destinations

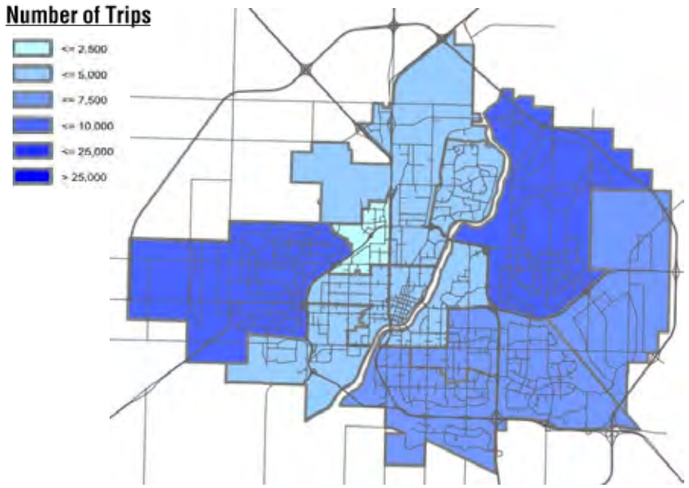


Figure 4.12 - Forecast PM Peak Hour Vehicle Trip Destinations (30 year)

- **As expected, the largest increases in PM peak hour vehicle travel are along select major roadways within and peripheral roadways outside and including Circle Drive. Figure 4.13** illustrates the projected long-term vehicle travel per direction on existing and planned roadways throughout the city over the next 30 years. These patterns suggest that some of the greatest and most significant change will be on roadways such as Circle Drive and adjacent networks connecting to this corridor as well as the planned Saskatoon Freeway. Leading to and from the core areas of the city, Idylwyld Drive, 22nd Street, Broadway Avenue, College Drive and Warman Road will see the largest increases in arterial road traffic.

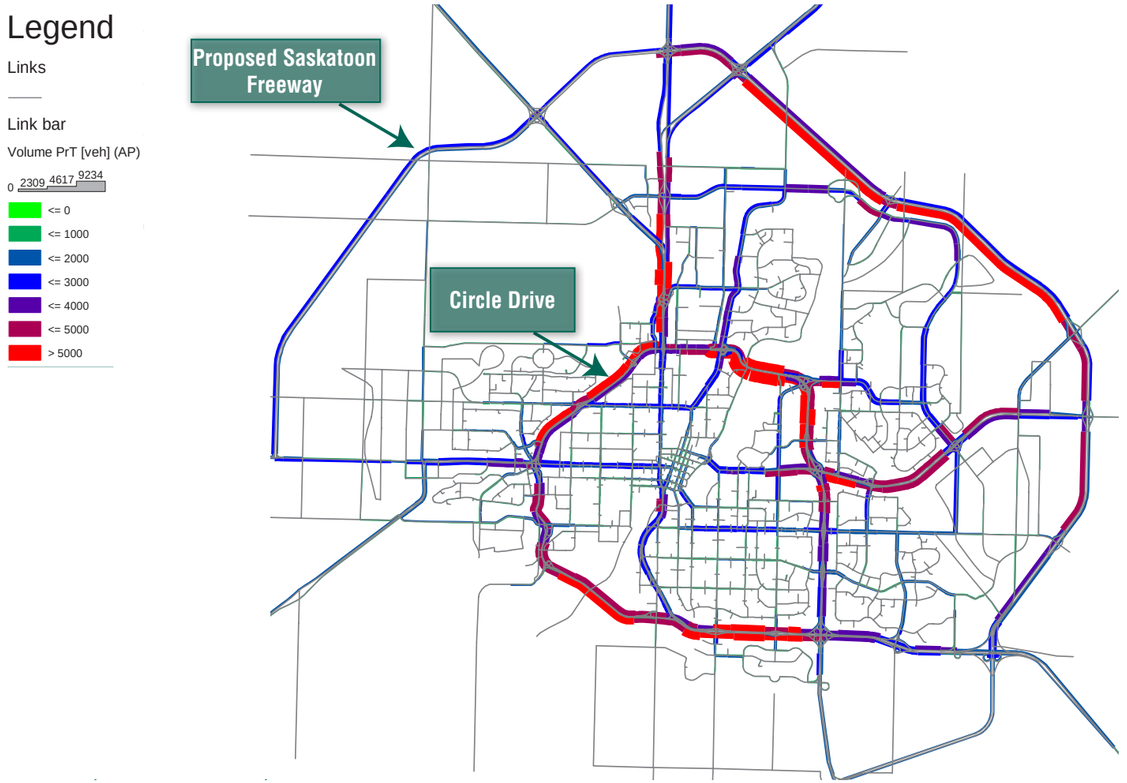


Figure 4.13 - Projected PM Peak Hour Model Directional Volume with Half a Million People

- **Although traffic on core area bridges and streets does not increase as much as in the outer areas, vehicle travel demands across the river are projected to increase by as much as 3,700 vehicles in the peak directions and 2,500 vehicles in the off-peak directions. Figure 4.14** illustrates the projected increase in PM peak hour directional traffic on all major screenlines in the downtown area. It should be noted that the transportation model includes the City's plan for half a million people as well as the planned roadway networks illustrated in **Figure 4.07**. While most individual corridors accommodate over an additional 1,000 vehicles per direction, traffic on the core area bridges is projected to increase to 5,500 and 6,300 in the morning and afternoon peak directions, respectively (a 60% to 75% increase).

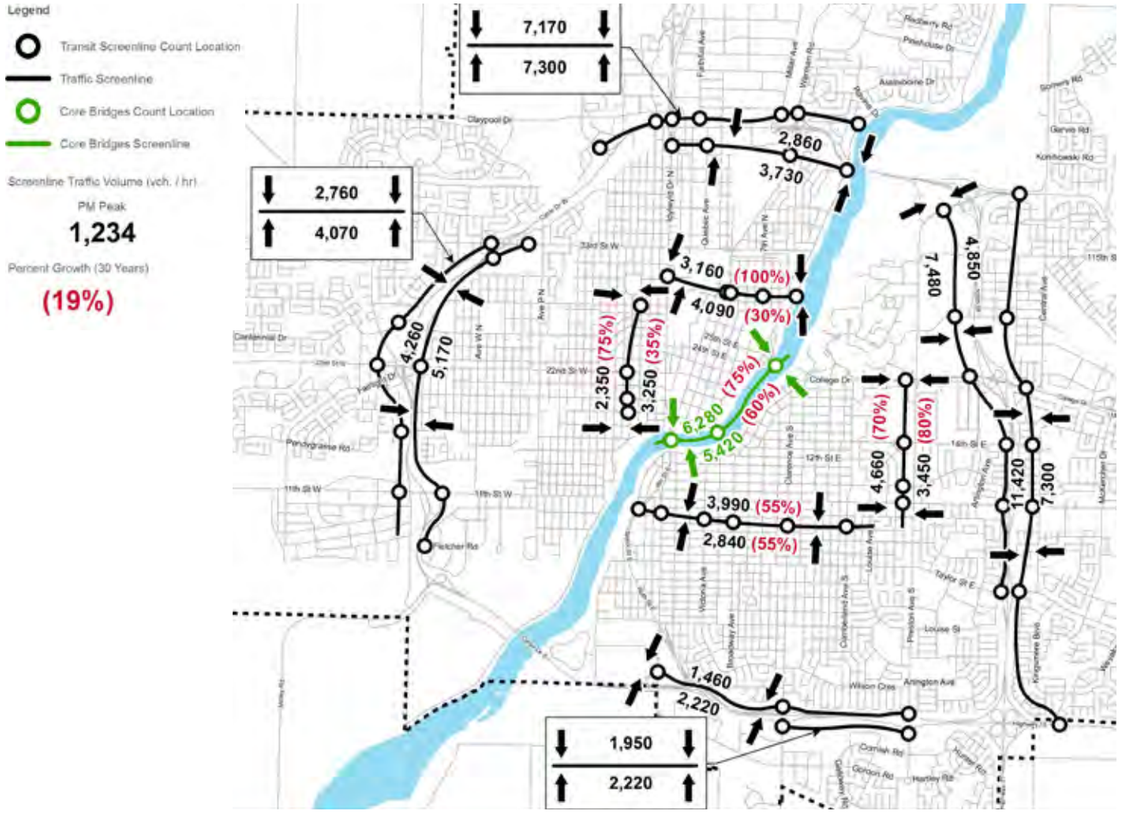


Figure 4.14 - Projected PM Peak Hour Directional Volume Growth (PM % Traffic Growth (30 Years))

- **Most core area bridges are projected to continue serving localized traffic as opposed to through traffic without an origin and/or destination in the core of the city.** Using the transportation model, **Figure 4.15** illustrates the forecast PM peak hour trip origins for vehicle trips across each of the core area bridges (otherwise referred to as the east / south flow bundles in the transportation model). As illustrated, a majority of the vehicle trips travelling east and south across the Senator Sid Buckwold, Traffic, Broadway and University Bridges begin inside the core areas of the city inside Circle Drive. In fact, a majority of the forecast vehicle trips originate from the downtown core area of the city during the PM peak hour. Although the Senator Sid Buckwold Bridge is forecast to principally serve core area travel in the long-term, PM peak origins extend to areas outside Circle Drive.

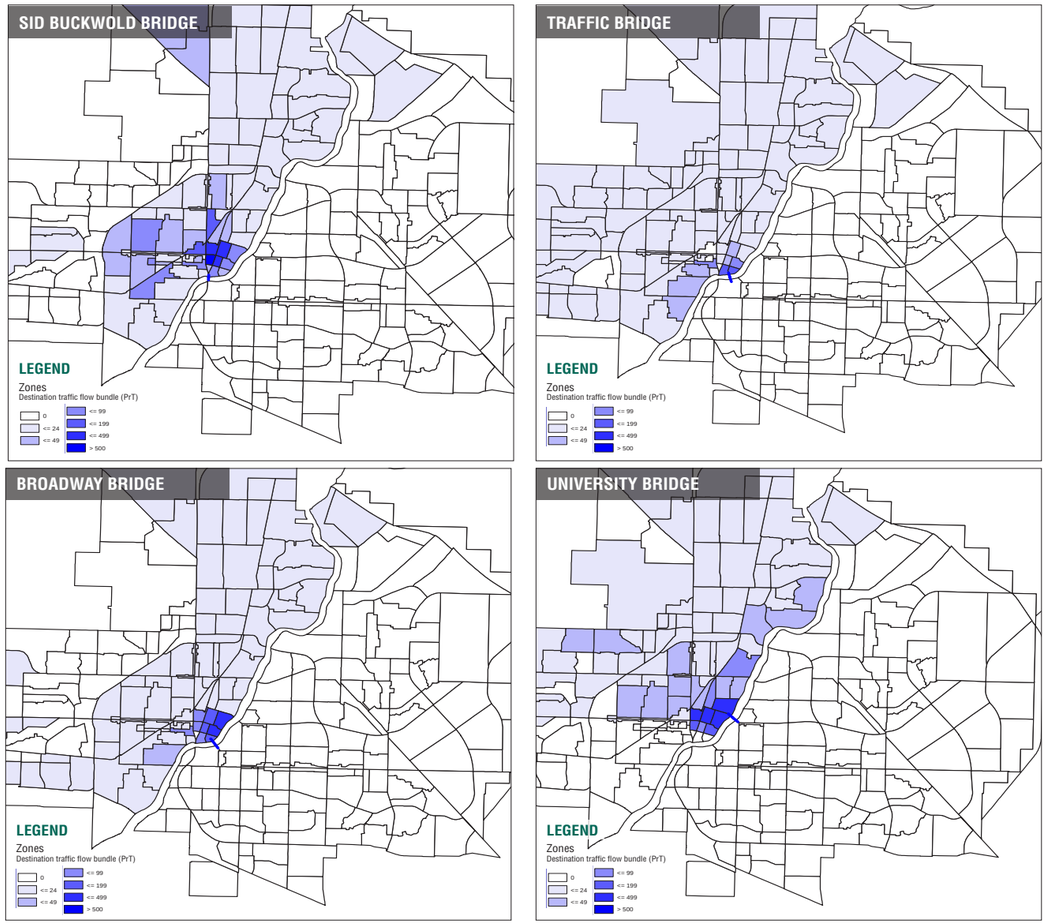


Figure 4.15 - Forecast PM Peak Hour Model Trip Origin Patterns for Core Area Bridges

- **Increased traffic demands on core area roadways are projected to significantly increase delays as the PM peak hour traffic volumes exceed the available capacity on several streets and each river crossing.** Projected 30 year PM peak hour volume-to-capacity (V/C) ratios are illustrated for the core area roads and bridges in **Figure 4.16**. Where v/c ratios exceed 0.85 and approach 1.0, traffic conditions and performance can be expected to begin to degrade resulting in increased congestion, slower speeds, and increased delays. Where v/c ratios exceed 1.0, traffic flow is considered to be in an unstable state and unable to serve the demand, typically resulting in a breakdown of traffic flow until the peak demand subsides.

Figure 4.16 - Core Area Projected 30 Year PM Peak Hour Volume-to-Capacity Ratios

As illustrated in **Table 4.02**, the projected 30 year peak directional traffic demands will exceed the capacity of the core area bridges by over 1,000 vehicles during the PM peak hour (or as much as 2 lanes of traffic).

Bridge	NUMBER OF LANES	PEAK PM DIRECTIONAL VOLUME	DIRECTIONAL CAPACITY	PEAK DIRECTIONAL V/C
Sid Buckwold Bridge	3	4,410	4,500	0.98
Traffic Bridge	1	1,165	1,000	1.15
Broadway Bridge	2	2,100	2,000	1.05
University Bridge	2	3,350	2,400	1.40
ALL CROSSINGS	8	11,025	9,900	-

Table 4.02 - Projected PM Peak Hour Core Area Bridge Demands & Capacity (Eastbound or Southbound)

4.3 Problem Definition

The future 'Business-as-Usual' approach to accommodating the transportation needs of half a million people as previously described includes expansion of the roadway network to support New Suburban Areas, and modest investment in transit, cycling and walking facilities. In fact, the 'Business-as-Usual' approach assumes expanding the transit system in the city at levels below historical growth rates – 1.8% per year increase in service with 2.5% increase in the projected population. This actually means that the annual service levels would decrease on a per capita basis from 1.7 to 1.35 hours of service per person and the forecast conditions on the roadway network could get worse than estimated in the 'Business-as-Usual' scenario.

With a 'Business-as-Usual' approach toward investing in transit, cycling and walking over the next 30 years, peak hour vehicle trips in Saskatoon would increase by almost 220% across the city. As the city expands outwards, average vehicle trip distances during the peak period are projected to increase from approximately 6.3 km today to 9.8 km when the city's population reaches half a million people. With the increase in travel distance and delays throughout the network, travel times are projected to increase significantly, particularly to and from the core areas of the city as illustrated below in **Figure 4.17.**

Figure 4.17 - Existing & Projected 30 Year PM Peak Hour Vehicle Travel Times (minutes)

Overall, the average vehicle trip time of approximately 15 minutes during the peak period today will more than double to over 40 minutes per trip in the long-term 'Business-as-Usual' scenario based on the city-wide transportation model. Although the travel times for suburban-to-suburban area trips are projected to generally increase by less than 70% in the western areas of the city, travel times from the Downtown area during the peak hours are projected to increase by 200% or more. Similarly, vehicle trips on the east side of the city from Downtown are projected to increase by more than 40 minutes or 300% of current day travel times. This increase in travel times will also significantly impact transit travel times and reliability.

Even with the Traffic and North Commuter Parkway Bridges as well as the overall network expansion to serve suburban growth areas of the city and region, overall delays and congestion are projected to increase significantly across the city. In fact, even with planned network improvements, several major roadways are expected to experience significant delays with half a million people as indicated by the projected PM peak hour roadway volume-to-capacity ratios illustrated in **Figure 4.18** (below).

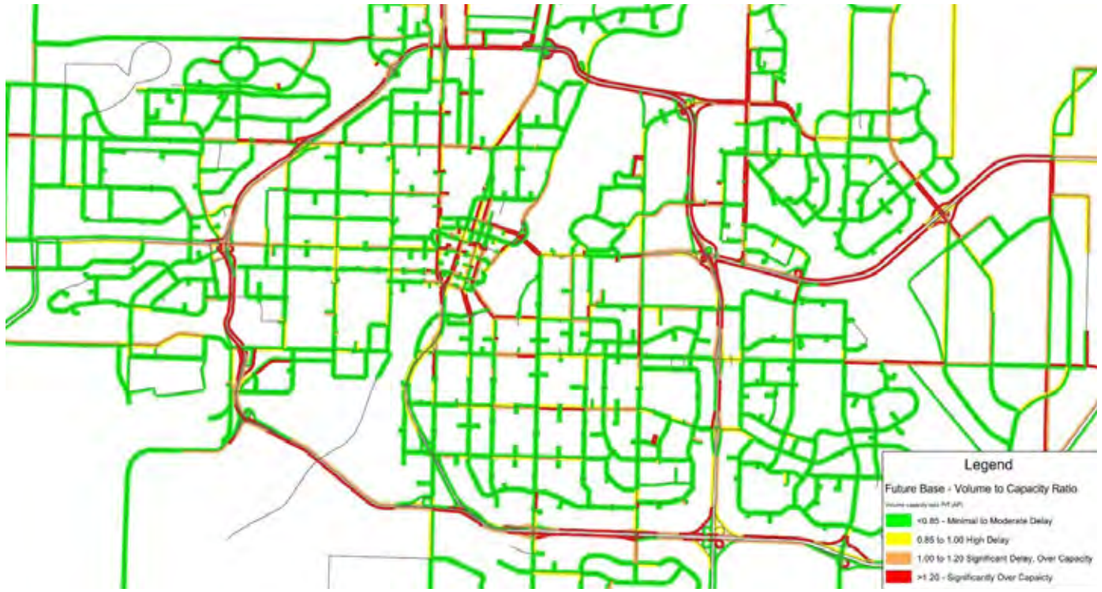


Figure 4.18 - Forecast PM Peak Hour Roadway Volume-to-Capacity Ratios

Within the core area of the city, all bridges and several major roadways such as Idylwyld Drive, 22nd Street, 33rd Street, College Drive and Warman Road are all projected to operate beyond their physical capacity. With almost half of the growth in the city planned for the core areas such as the City Centre, North Downtown, University as well as major corridors as described in Section 2.0, travel demands are understandably expected to increase within the core area and across the South Saskatchewan River. Even with the additional crossing capacity provided by new crossings such as the Traffic Bridge and the North Commuter Parkway Bridge, core area crossing demands are expected to exceed the capacity during the peak periods where severe congestion and delay will be experienced. **Figure 4.19** illustrates the forecast change in demands and levels of congestion expected relative to the four core area crossings. For most core area bridges and major roadways approaching them, average travel speeds are expected to decline to approximately 10km/hr or less during peak periods with the forecast levels of congestion. Even with increases to transit service levels, it should be noted once again that these delays and levels of congestion will also impact the attractiveness and cost effectiveness of transit service.

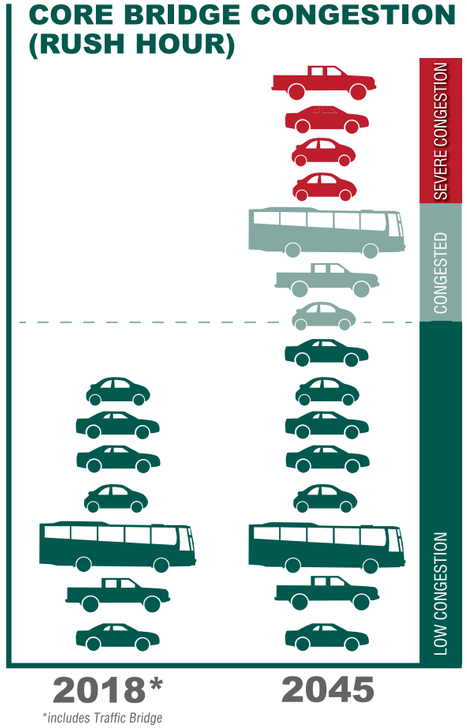


Figure 4.19 - Forecast Change in Congestion for Core Area Bridges

Within the core areas of the city, the Growth Plan explores the need for investments in additional crossings of the South Saskatchewan River and adjacent networks. In addition to considering vehicle demands, the analysis also considers the potential for rapid transit corridors to serve existing and projected transit markets, and to reduce pressures on the established urban area street system.

4.4 Vision and Possibilities for Core Bridges

This section of the report outlines the long-term vision and possibilities for accommodating core area growth in travel across the South Saskatchewan River, including additional people-carrying capacity to serve vehicles, transit, and other modes of travel. Optional concepts are identified and evaluated in comparison to a 'Business-as-Usual' scenario that includes planned improvements already identified by the City through recent land use and transportation planning initiatives as previously referenced in Section 4.2.

Through the Saskatoon Speaks process, city residents highlighted a desire for investment in roads and bridges to improve connectivity for all travel modes. This vision was further articulated in the City's Strategic Plan, as noted below. Through the Growth Plan process residents of Saskatoon provided input and feedback to these goals and objectives for core bridge crossings.

Saskatoon's Vision for Moving Around (from the 2013-2023 Strategic Plan)

Our investments in infrastructure and new modes of transportation have shifted attitudes about the best ways to get around. Our transportation network includes an accessible and efficient transit system and a comprehensive network of bike routes. People still use cars, and also rely on options such as public transit, walking and cycling.

Growth has brought new roads and bridges that improve connectivity for all travel modes. Improved streetscapes, interconnected streets and well-planned neighbourhoods encourage walking and cycling. Attractive options to the car alleviate congestion and ensure people and goods can move around the city quickly and easily.

Goal for Core Bridges (developed for the Growth Plan)

The core area bridges will continue to be the primary routes to and from the established areas of the city while planned peripheral roadways and bridges support vehicle travel between the suburban growth areas. As the City Centre, North Downtown and University area plans are implemented, the road network and bridges serving these areas should support these vibrant communities with priority treatments for transit and attractive pedestrian and cycling facilities.

Core Bridge Objectives

- To connect arterial roads that serve travel between core area communities in Saskatoon;
- To primarily serve core area travel rather than vehicle travel that starts and ends outside Circle Drive;
- To connect pedestrians, cyclists, transit, and vehicles to promote sustainable modes of travel within the core areas;
- To continue the grid street pattern that exists within the core area to not only promote use of alternative modes, but to minimize impacts of increasing traffic on neighbourhoods;
- To create an urban street character on both sides of any new or existing crossing within the core area.

4.4.1 Description of Possibilities

In order to support growth to half a million people, four core area river crossing scenarios were considered, as illustrated in **Figure 4.20**.

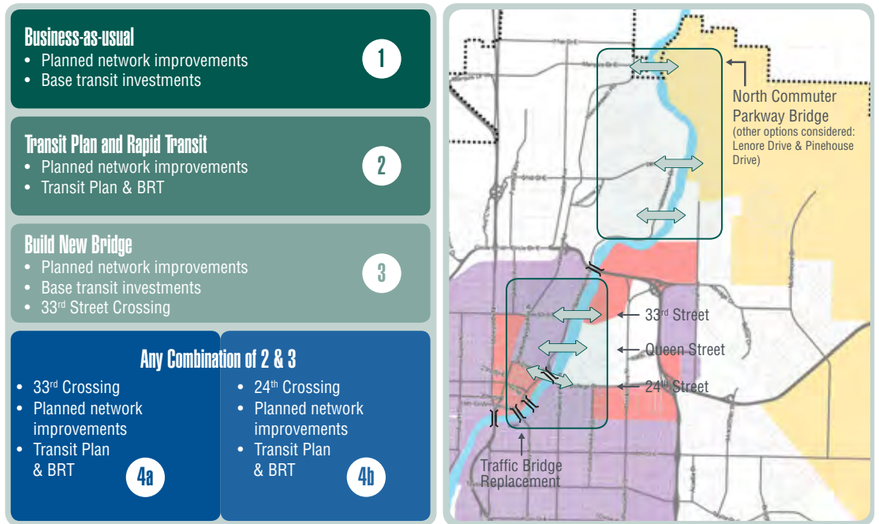


Figure 4.20 - Core Area River Crossing Scenarios

The capacity of bridges in Saskatoon are largely influenced by the urban street system and intersections that they connect to. In fact, one lane of a bridge that connects with a highway can typically support 75% to 100% more traffic per lane than one that connects with a signalized intersection. Although intersection improvements on either side of the Broadway, University and future Traffic Bridges may be considered to maximize the investments, they would not address long-term challenges and needs for core area river crossings by themselves. None-the-less, the City should consider operational strategies to improve and maximize the vehicle carrying capacity of existing river crossings as part of all other possibilities being considered. This strategy may include, but not be limited to: signal timing and prioritization for major roadways that connect to bridges; signal coordination along connecting roadways; additional lanes or modifications; and/or turn restrictions.

1. 'Business-as-Usual' (Base Case)

The first scenario considered is the 'Business-as-Usual' approach previously described which essentially includes building planned roadways for peripheral area growth with limited change to roadways inside Circle Drive other than the provision of the Traffic Bridge. As indicated, this approach includes modest increases to transit service levels as well as bicycle and pedestrian facilities and policies in order to theoretically maintain the existing mode share. Additionally, minor operational improvements to the intersections on either sides to existing core area bridges should be considered as part of this and all other crossing strategies. These should include either additional turn lanes at signalized intersections or turn restrictions and lane changes that would prioritize bridge traffic.

It should be noted that reversible lane concepts which prioritize peak directional traffic were considered in the Growth Plan process in order to optimize the use of Saskatoon's core area bridges; however, reverse lane concepts were eliminated for two principle reasons:

- The off-peak directional traffic volumes are 85% of the peak direction today and in the long-term.
- The projected off-peak directional traffic volumes are projected to be utilizing 90% of existing capacity and therefore well beyond the capacity of reduced lanes on any core area bridge.

2. Transit Plan & Rapid Transit (plus 'Business-as-Usual')

The second scenario includes significant increases in transit service hours (anywhere from 2.8% to 3.9% per year) in order to increase the people-carrying capacity of existing major roadways as well as core area bridges. This Transit Plan scenario also includes the provision of the Red and Blue Line rapid transit corridors as described in Section 3.0 of the Growth Plan. The Bus Rapid Transit (BRT) service would provide direct, reliable and frequent connections between the Downtown / University areas and the Blairmore, University Heights, and Holmwood Suburban Centres as illustrated in **Figure 4.21** below.

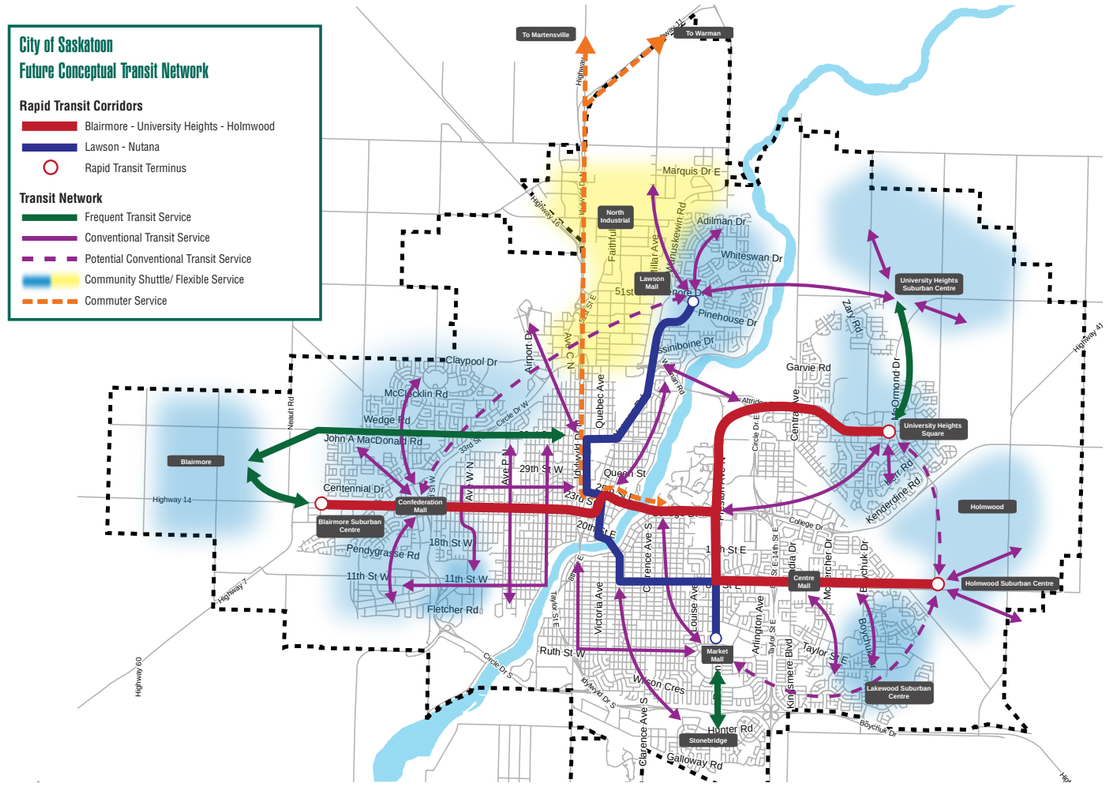


Figure 4.21 - Long-term Transit Plan

As part of this scenario, dedicated BRT lanes would be implemented across the University Bridge and connecting roadways on the east (eg. College Drive, Preston Avenue and Attridge Drive) and west sides (25th Street, 3rd Avenue and 22nd Street). Within the core area of the city where right-of-way is limited, traffic lanes would be converted to bus-only lanes as a method of increasing people-moving capacity. In particular, two travel lanes across the University Bridge would be converted to bus only lanes in order to carry up to 1,600 passengers per hour in each direction during the afternoon peak – equivalent to 1,400 vehicles that would otherwise require an additional two travel lanes in each direction. Outside the core area, the number of general purpose travel lanes may be retained in most cases with widenings to accommodate bus-only lanes.

This approach also includes the 'Business-as-Usual' investments in planned roadway networks to support growth to half a million people, in addition to operational improvements on either sides of existing core area bridges.

3. Build a New Bridge

The third scenario for the core area includes building a new bridge to serve planned growth that includes an approximately 125,000 additional people in Strategic Growth Areas, Neighbourhood Infill and Corridor Growth areas described in Section 2.0 of the Growth Plan. This crossing strategy would also include the 'Business-as-Usual' improvements with planned networks and transit investments.

As part of the process, two alternative crossings that would support the forecast growth in east-west travel across the city were identified: 33rd Street and Queen Street.

Ultimately, the 33rd Street crossing would connect the arterial road system on the east and west sides of the river with a four lane roadway, and provide a continuous east-west corridor across the core area of the city. On the west side of the river, 33rd Street is a minor arterial with two to four travel lanes west of Idylwyld Drive and a minor arterial east to Spadina Crescent with two travel lanes and on-street parking. The road and right-of-way width east of Warman Road is approximately 20 metres or more, with sidewalks on the north side of the street and a multi-use path on the south side. On the east side of the river, 33rd Street would extend northeast to connect with Attridge Drive at Preston Avenue. Both connecting roadways along with Old Preston Avenue to the north are classified as major arterials with four travel lanes. The right-of-way for the east side connection to Attridge Drive has not been identified, but the alignment would need to support University plans for growth and development of the endowment lands as envisioned in the University of Saskatchewan's **Vision 2057: University Land Use Plan**.

With forecast travel demands of more than 2,500 vehicle trips per direction during the PM peak hour as described later in the report, the 33rd Street Bridge would connect the west side communities to the University Lands with a multi-modal connection that includes up to four travel lanes, separated bicycle facilities as well as sidewalks on both side of the bridge. **Figure 4.22** illustrates the candidate crossing concept and connections on either side of the river.

An alternative Queen Street crossing was also considered during the process in response to community feedback. Queen Street is a collector roadway on the west side of the river extending between 1st Avenue to Spadina Crescent. A crossing at this location would traverse through the central area of the University of Saskatchewan Campus on the east side of the river before connecting with Preston Avenue.

The objectives outlined at the outset of this section and other considerations were used to compare as assess these two crossing alternatives, as briefly described on the right:

Figure 4.22 - 33rd Street and Preston Avenue /Attridge Drive Crossing Concept

- **Connect arterial roads where their function is already designed to serve travel between neighbourhoods and areas of the City**. A University to Queen Street river crossing would connect Preston Avenue to Queen Street at Spadina Crescent. Queen Street is classified as a two lane collector with space for parking on both the north and south sides of the street. Consistent with most collector roads in the city, Queen Street is designed to support neighbourhood traffic which includes travel to and from the hospital. Within the University lands, a new crossing and connection to Preston Avenue could potentially be classified as an arterial roadway with four travel lanes. In comparison to a Queen Street crossing alternative, the 33rd Street crossing would connect to the arterial network on both sides of the river. Consistent with the City's classification system, these roadways are expected to carry traffic between neighbourhoods locally and across the city.

- **Add to the grid pattern of streets within the core area of the city inside Circle Drive to properly disperse traffic and manage the scale of any particular major corridor to four traffic lanes**. A Queen Street crossing would be located approximately 1.5 kilometres south of Circle Drive and 400 metres north of the University Bridge. In many urban areas, the typical spacing of arterial roadways ranges anywhere from a minimum of 400 metres to 800 metres with a grid system of collector and local roads between them. As a comparison, the 33rd Street crossing would be located approximately 800 metres away from both the University and Circle Drive Bridges. This spacing is more consistent with other urban areas of the city and other communities. Ultimately, a grid street system will serve to disperse traffic and manage the scale of all major roadways in the city as well as the impact of through traffic on neighbourhoods.

- **Have the ability to handle projected traffic volumes with reasonable improvements to the roadway network on either side without significant impacts on and requirements for property**. A four lane river crossing at Queen Street would attract approximately 1,800 to 2,000 vehicles in both directions during the morning and afternoon peak periods. Although a two lane Queen Street may be maintained between Spadina Crescent and Idylwyld Drive, traffic volumes would be notably

higher than today (slightly higher than expected for a typical collector roadway). Additionally, forecast turning movements at the Queen Street and Spadina Crescent intersection would also impact the intersection and likely the bridge configuration with a double westbound left turn lane. Although traffic volumes forecast on 33rd Street between Idylwyld Drive and Spadina Crescent would increase substantially with the 33rd Street crossing, volumes west of Idylwyld Drive to Circle Drive would be only moderately higher than 'Business-as-Usual'.

- **Serve core area travel demands today and what's projected for the long-term with an increase in population and employment in Strategic Growth Areas, Neighbourhood Infill Areas, as well as Corridor Growth**. In this regard, a majority of the trips using core area bridges should serve core area needs with an origin and/or destination within Circle Drive. It is anticipated that a Queen Street Bridge and 33rd Street Bridge would primarily serve core area travel with more than 80% of all peak travel starting or ending their trip inside the Circle Drive area.
- **Benefit walking, cycling and transit** by adding to the network and providing more opportunities to enhance facilities and increase use of sustainable modes within the core area of the city. An alternative crossing at Queen Street would provide an attractive crossing for pedestrians and cyclists, but would not likely serve transit. Conversely, a 33rd Street crossing could potentially serve transit, cycling and walking.
- **The impacts associated with a new arterial roadway through the centre of the University lands are significant.** Sections of the corridor would cross lands that are designated for crop science research that are to remain part of the campus uses as outlined in the University's Vision 2057. A proposed arterial corridor would also dissect the campus in areas intended for future university expansion. In fact, a Queen Street crossing would not serve planned development north of the railway corridor which would otherwise be served by the 33rd Street crossing and connection through to Preston Avenue/Attridge Drive.

Based on this preliminary scan, it would appear that there are some 'show stoppers' and limitations to a Queen Street river crossing. Although the forecast traffic volumes and patterns would be comparable to a 33rd Street river crossing, the networks on either side of the river could not be modified to support east-west travel demands. In particular, the collector roadway function of Queen Street would serve as a constraint to this new east-west connection. On the east side of the river, a new arterial roadway connection through the University lands would likely impact existing buildings and would not be consistent with Vision 2057.

4. Combined Bridge and Transit Strategy

The fourth and final scenarios include combinations of planned network improvements, the Transit Plan as well as a new crossing at either 33rd Street or 24th Street. These two possible river crossings concepts are briefly described below.

A) 33RD STREET CROSSING & TRANSIT PLAN (INCLUDING RAPID TRANSIT)

Consistent with Scenario 3, the first option combines a new crossing at 33rd Street with increased investments in transit services as described in Option 2 (Transit Plan). The potential four lane crossing (with a widening of 33rd on the west side of the river) would support forecast growth planned for the University lands, as well as other Strategic Growth Areas, Neighbourhood Infill and Corridor Growth. Investments in significantly expanding the transit system and BRT would generate 1,600 or more transit passengers in each direction across the South Saskatchewan River in the PM peak hour as projected in the long-term Transit Plan.

B) 24TH STREET CROSSING & UNIVERSITY BRIDGE BRT LANES

A second combined option includes the planned roadway networks, the Transit Plan and BRT along with a 24th Street crossing to connect with College Drive on the east side. Combined with the University Bridge / 25th Street corridor in the Downtown area, this crossing would serve as part of a one-way couplet between Downtown and the University area as illustrated in **Figure 4.23**.

Depending on the preferred configuration for accommodating BRT on College Drive – centre or curb lane – the 24th Street Bridge would support two general purpose travel lanes in the eastbound direction as well as a multi-use pathway for cyclists and pedestrians. A centre bus lane configuration along College Drive would include BRT services operating on the University Bridge, while a curb side BRT configuration with the one-way couplet system would place westbound services on the University Bridge / 25th Street and eastbound services on 24th Street within downtown and across the river to connect with College Drive. This configuration would require a three lane 24th Street crossing to support a bus only lane and two general purpose lanes. The University Bridge may remain four lanes with a bus only lane and three general purpose traffic lanes. Alternatively, consideration may be given to enhanced cycling and pedestrian facilities by providing only two general purpose traffic lanes.

Figure 4.23 - 24th Street Bridge Concept with BRT on University Bridge

Although this option supports additional people-carrying capacity with the provision of bus only lanes, there is virtually no increase in vehicle capacity to the existing University Bridge crossing of two travel lanes in each direction. It should also be noted that the 24th Street Bridge couplet would only be considered if BRT services and dedicated lanes were to be introduced to the College Drive corridor.

4.4.2 Options Analysis

For the growth to half a million population, core area river crossing possibilities are compared with the 'Business-as-Usual' Scenario in terms of overall traffic patterns and transit ridership. The highlights that will be of interest to the broader community and underscore the technical benefits and impacts of each possibility are described in terms of:

- **What's changed** in terms of forecast traffic patterns relative to the 'Business-as-Usual' scenario using the city-wide transportation model?
- **What are the potential benefits** in terms of reduced congestion (as measured by bridge volume-to-capacity travel, travel speeds, etc.), reduced vehicle travel demands and/or increased transit ridership and travel times?
- **Where are the potential impacts** of traffic diversion caused by the network changes beyond what is projected in the 'Business-as-Usual' scenario?

Scenario 2 – Convert Existing Lanes for Bus Rapid Transit (BRT)

The following discussion highlights the long-term traffic and transit ridership patterns relative to a 'Business-as-Usual' scenario.

A) What's changed?

- **Transit ridership across the core area bridges is expected to increase significantly with expanded and redesigned transit services and implementation of BRT**. As described in Section 3.0, the transit mode share across the city is projected to increase from 5% in the 'Business-as-Usual' scenario to 8% with the Transit Plan and BRT investments. Within the established areas of the city, transit ridership across the core area bridges is expected to increase from approximately 1,200 passengers in the peak hour direction with the 'Business-as-Usual' Scenario to 1,800 passengers, as illustrated in **Figure 4.24**.

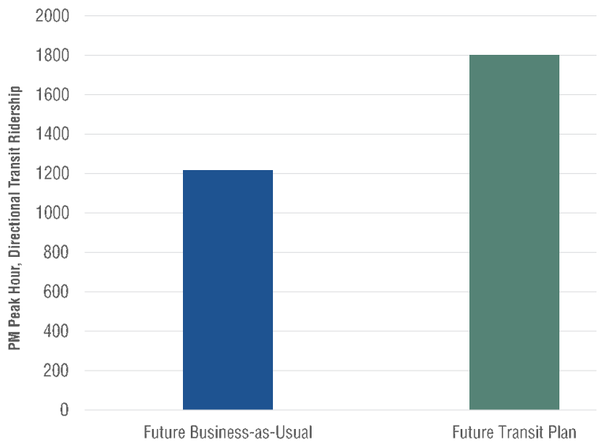


Figure 4.24 - 2045 PM Peak Hour Directional Transit Ridership Across Core Area Bridges

- **Increased transit ridership will reduce core area bridge traffic volumes by approximately 1,000 and 1,500 vehicles from the 'Business-as-Usual'** (see **Figure 4.25**). The decline in vehicle travel across core area bridges relative to the 'Business-as-Usual' Scenario may be partially attributed to increased transit ridership. At the same time, the reduction in vehicle crossing capacity on the University Bridge from the 'Business-as-Usual' scenario will force traffic to use other crossings.

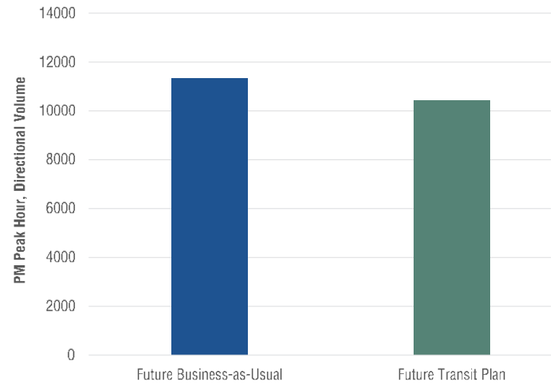


Figure 4.25 - 2045 PM Peak Hour Directional Traffic Volumes Crossing Core Area Bridges

- **University Bridge is projected to support approximately 2,000 vehicles per direction during the PM peak hour in the 30 year time frame**. **Figure 4.26** below illustrates the projected 2045 PM peak hour corridor volumes in the core area of the city. Although the projected demands crossing the University Bridge are generally well beyond the capacity of a two lane bridge, the laning and available movements of signalized intersections on either side may be altered to accommodate a portion of the increased traffic volumes.

Figure 4.26 - Forecast 2045 PM Peak Hour Corridor Volumes (Scenario 2 : Transit Plan)

- **More than 90% of all traffic using the University Bridge originate from or are destined to areas inside the core of the city. Figure 4.27** illustrates the distribution of westbound vehicle trips projected for the University Bridge. A two-lane University Bridge is largely serving traffic to and from the Downtown and University areas. In this regard, the major arterial service function does not change with the reduced travel lanes.

Figure 4.27 - Forecast 2045 PM Peak Hour Westbound Traffic Flow Bundle for University Bridge (Scenario 2: Transit Plan)

- **Forecast PM peak hour traffic volumes on nearby core area river crossings and major roadways inside the core area will not substantially change from the 'Business-as-Usual' traffic volumes with reduced travel lanes on the University Bridge and other rapid transit corridors**. **Figure 4.28** illustrates the forecast traffic volume changes with the reduced travel lanes along the Red Line BRT corridor relative to the forecast 'Business-as-Usual' scenario. The overall increase in transit ridership throughout the city and across the river reduces total vehicle travel across core area bridges. Additionally, the potential lane reductions and vehicle carrying capacity on core area roadways such as 22nd Street, 3rd Avenue, 25th Street, and College Drive do not adversely impact other roadways in the city. In other words, the projected volumes and amount of congestion for other core area streets will not be dramatically different than the 'Business-as-Usual' scenario in the long-term with the implementation of the Transit Plan and the provision of BRT services and facilities.

Figure 4.28 - Forecast 2045 PM Peak Hour Traffic Volume Differences (Scenario 2: Future Transit Plan vs. Scenario 1: 'Business-as-Usual')

- **The significant investment in transit and BRT will result in increased transit ridership across the University Bridge and other major roadways in the city. Figure 4.29** illustrates the forecast PM peak hour transit ridership along all major corridors in the Downtown area. In addition to the University Bridge, rapid transit corridors such as College Drive on the east side to the University, 3rd Avenue, and 22nd Street carry anywhere from 1,400 to 2,300 passengers per hour in the PM peak direction. These travel demands would be equivalent to 1,250 to 2,100 cars on the road that would otherwise require two travel lanes in each direction.

Figure 4.29 - Forecast 2045 PM Peak Hour Transit Passenger Volumes (Scenario 2: Transit Plan)

B) What are the potential benefits?

- **The total vehicle-kilometers travelled across the city during the PM peak hour are projected to decrease by approximately 5% from the 'Business-as-Usual' scenario with increased transit usage.** With investments in rapid transit and the overall transit system, there is a projected decrease in the vehicle-hours and vehicle-km travelled. These forecasts indicate that the increase in ridership and the relative changes for vehicle travel will contribute toward reducing the personal costs for travel as well as vehicle emissions.

- Improves people-carrying capacity of the University Bridge and other BRT corridors. The forecast PM peak hour transit ridership increases significantly along the proposed Red Line BRT corridor and moderately along the Blue Line BRT corridor. This will in turn make better use of existing capacity of the city's roadway network.

- Results in limited traffic diversion to other major corridors in the city with the provision of dedicated bus-only lanes along the Red Line BRT corridors. With the increased investment in transit and dedicated bus-only lanes, the increase in overall ridership and reduction in vehicle travel relative to 'Business-as-Usual' results in minimal diversion to other east-west roadways.

C) What are the potential impacts?

- **Consistent with the 'Business-as-Usual' scenario, the forecast PM peak hour volumes will be 20% over the capacity of the core area bridges with the lane reductions and changes in vehicle travel** (see **Figure 4.30**). In the long-term, the crossing capacity of the core bridges is exceeded by approximately 15% for the 'Business-as-Usual' scenario and further to 20% above capacity with the lane conversion across the University Bridge. As previously noted, all core area bridges will operate beyond capacity with these forecast travel demands and lane reductions to the University Bridge.

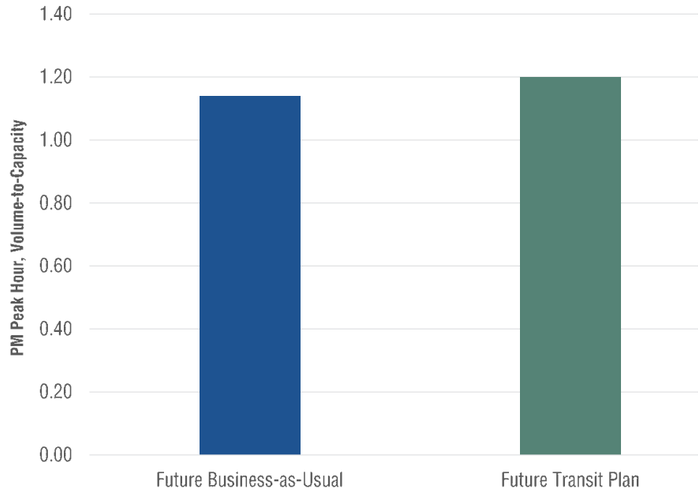


Figure 4.30 - 2045 PM Peak Hour Traffic Volumes Crossing Core Area Bridges (Scenario 2: Transit Plan)

- **Average travel speeds across most core area bridges do not change dramatically from the 'Business-as-Usual' scenario, with the exception of the University Bridge**. **Figure 4.31** compares link travel speeds across core area roadways and bridges for the 'Business-as-Usual' and Transit Plan scenarios. With the increase in transit ridership (and corresponding reduction in vehicle travel) as well as the reduced lanes to accommodate the east-west BRT on roadways such as 22nd Street, 25th Street, University Bridge and College Drive, vehicle travel speeds do not change on most major roadways. As illustrated however, the average vehicle speeds crossing the University Bridge during the afternoon peak hour are projected to be approximately 3km/hr and 5km/hr in the peak and off-peak directions respectively.

Figure 4.31 - Forecast 2045 PM Peak Average Vehicle Speeds (km/hr)

Scenario 3 – Build New Bridge (33rd Street Crossing)

The following discussion highlights the long-term traffic and transit ridership patterns with a 33rd Street crossing in relation to a 'Business-as-Usual' scenario.

A) What's changed?

- All core area bridges combined will accommodate approximately 13,000 vehicles in the peak direction and 1,200 passengers on transit. With the addition of the 33rd Street Bridge, core area bridges will potentially support an additional 1,500 vehicles per hour in the PM peak direction across the South Saskatchewan River. **(see Figure 4.32).**

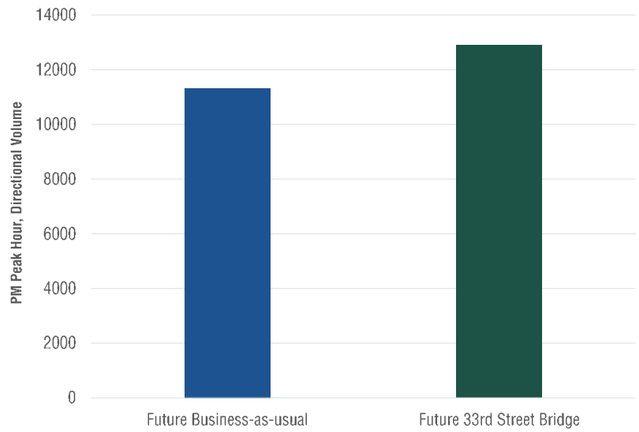


Figure 4.32 - Core Bridge 2045 Peak Hour Directional Volumes

- **33rd Street Bridge is projected to support anywhere from 2,500 to 2,700 vehicles in the peak hour per direction in the 30 year time frame** (see **Figure 4.33**). These peak hour directional volumes are slightly below what's forecast for the University Bridge in the long-term 'Business-as-Usual' scenario, but generally exceed the capacity of a four lane bridge connecting with signalized intersections on either side.

- **Forecast PM peak hour volumes across the 33rd Street Bridge are generally balanced in both directions.** Similar to today's patterns and forecasts for the long-term across existing core area bridges, the westbound volumes are more than 90% of the peak eastbound direction traffic forecasts during the afternoon peak hour, as illustrated in **Figure 4.33**.

- **Forecast PM peak hour traffic will decrease for all bridges in the core areas as well as the north Circle Drive North Bridge relative to a 'Business-as-Usual' scenario**. As illustrated in **Figure 4.33**, approximately 80% of the traffic (or 2,150 vehicles) using the 33rd Street crossing will shift from using other core area bridges. The most notable shift is from the Circle Drive North Bridge, which is projected to experience significant delays in the 'Business-as-Usual' Scenario.

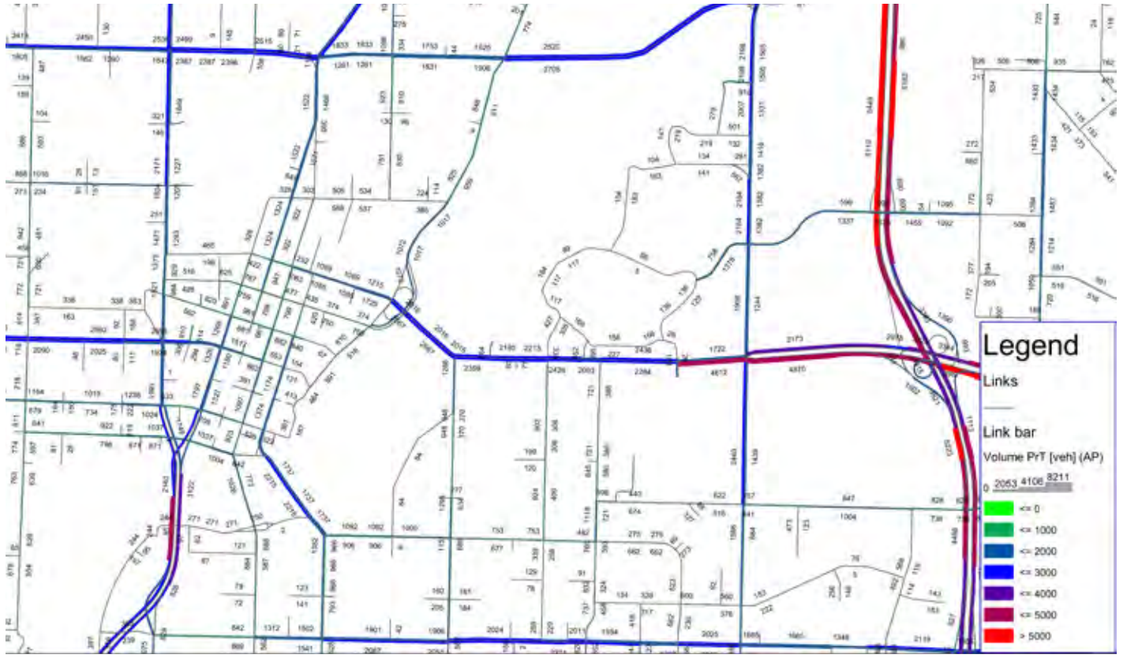


Figure 4.33 - Forecast 2045 PM Peak Hour Corridor Volumes (Scenario 3: 33rd Street Bridge)

- **On the west side of the river, 33rd Street between Spadina Crescent and Warman Road / 3rd Avenue will serve approximately 1,800 vehicles per direction during the PM peak hour in the long-term.** This peak directional traffic demand will require additional travel lanes on 33rd Street between Spadina Crescent to Warman Road from two to four lanes. The City should consider whether this is a peak only operation and on-street parking may be permitted during off-peak periods.

- **Approximately 75% or more of the traffic using the 33rd Street Bridge originates from or is destined to areas inside Circle Drive**. **Figure 4.34** illustrates the distribution of modeled eastbound vehicle trips crossing the river in terms of where they are projected to flow to and from during the afternoon peak hour. As illustrated by these flow diagrams, a majority of these vehicle trips begin or end inside the Circle Drive area. For the 2,700 eastbound vehicle trips projected on the 33rd Street Bridge, most trips are coming from the downtown using Spadina Crescent, 7th Avenue and Idylwyld Drive in addition to 33rd Street to the west. These patterns are generally consistent with the westbound bridge traffic where 75% of all trips also originate from or are destined to the core areas of the city.

Figure 4.34 - Forecast 2045 PM Peak Hour Traffic Flow Bundle for a 33rd Street Bridge (Scenario 3: 33rd Street Bridge)

- **Other than the increase in forecast traffic on 33rd Street between Spadina Crescent and Warman Road, forecast corridor traffic volumes on many core area roadways do not change dramatically**. **Figure 4.35** illustrates the change in traffic from the 'Business-as-Usual' Scenario with a 33rd Street Bridge. As previously noted, the forecast volumes along 33rd Street east of Warman Road are projected to increase significantly. Additionally, traffic volumes on Warman Road (north) and Spadina Crescent are also expected to decrease. Beyond these corridors, traffic volumes are not projected to change dramatically on roadways connecting to the bridge or other crossings where traffic is projected to decline. Although the model suggests traffic would increase slightly on 7th Avenue North, intersection improvements at 33rd Street and Warman Road could potentially limit this diversion to this and other corridors. These patterns would suggest that the 33rd Street Bridge is serving forecast local area traffic that will be on the network regardless, as opposed to generating additional vehicle trips to the core area of the city.

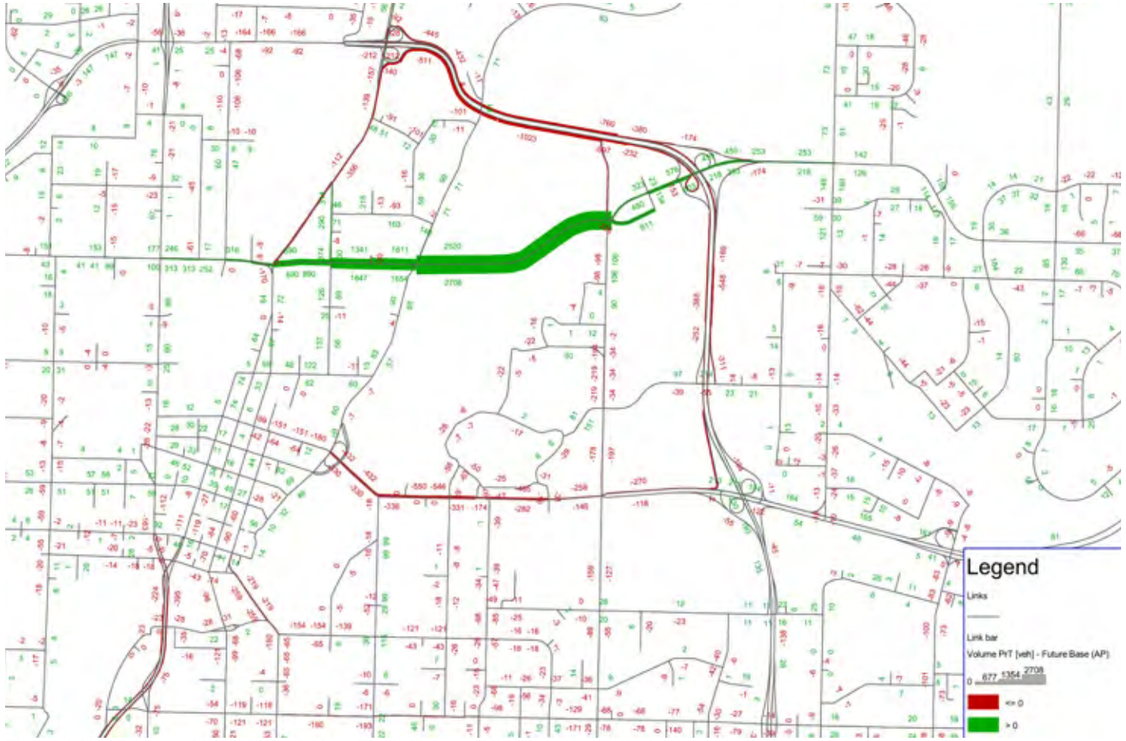


Figure 4.35 - Forecast 2045 PM Peak Hour Traffic Volume Difference (Scenario 3: 33rd Street vs. Scenario 1 'Business-as-Usual')

- **Forecast transit ridership with the 33rd Street Bridge and network connections would remain relatively unchanged from the 'Business-as-Usual' scenario**. The forecast transit ridership across the core area bridges is projected to remain relatively unchanged from the base transit investment scenario. Although not confirmed at this stage of planning, a 33rd Street crossing may potentially offer another east-west route to serve transit customers through the northern areas of University of Saskatchewan Campus and the University Heights Suburban Centre.

B) What are the potential benefits?

- **The forecast PM peak hour bridge crossing volumes will decline slightly, but remain approximately 5% over the capacity of the core area bridges**. The projected peak directional volumes, illustrated in **Figure 4.36** are forecast to be 15% above the crossing capacity in the 'Business-as-Usual' scenario and 5% for the 33rd Street crossing scenario, resulting in slightly less congestion.

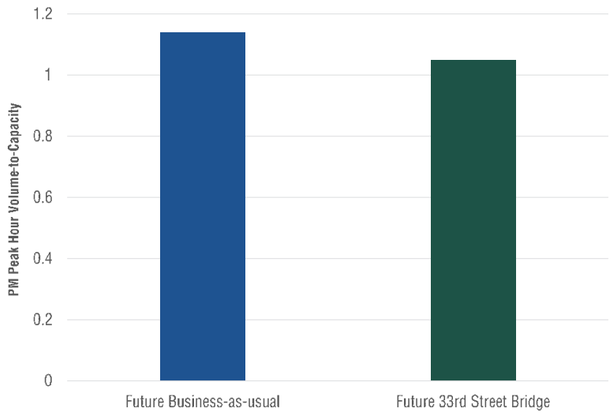


Figure 4.36 - 2045 PM Peak Average Crossing V/C Ratios

- **The average vehicle trip length in the city is projected to decline slightly with the 33rd Street crossing**. Today, the average trip length by car is estimated to be approximately 6.3 kilometres based on transportation modelling. The average trip length is projected to increase to 9.8 kilometres with planned development and expansion of the network as defined in the 'Business-as-Usual' scenario. The provision of the 33rd Street crossing will serve to slightly reduce the average trip length (1% for the city-wide average) and in particular provide more direct connections for travel to, from and within the core areas of the city.

- **The 33rd Street crossing will enhance the grid system of streets within the core area of the city, providing an alternative east west corridor to serve increasing travel by car, transit, walking and cycling**. As traffic demand grows along with delays on the major roadways in Saskatoon, so will short-cutting and other impacts on neighbourhood traffic inside the core areas of the city. The 33rd Street crossing will continue to reinforce the grid system of streets in the established area. Although the grid system will provide additional east-west capacity, the network structure will serve to manage neighbourhood traffic spillover and manage the scale of major roads to ensure livability along the corridor.

- **Average travel speeds across core area bridges will increase slightly with the 33rd Street crossing. Figure 4.37** (on the following page) compares link travel speeds across core area bridges for the 'Business-as-Usual' and 33rd Street Bridge crossing scenarios. As illustrated, the shift in traffic demands across all core area bridges will result in increased average vehicle speeds – or reduced delays. For example, average vehicle travel speeds across the University Bridge will increase from 8km/hr to 12km/hr in the PM peak direction and from 14km/hr to 22km/hr in the off-peak direction. The increase in average vehicle travel speeds will also support transit across the core area bridges.

- **Support access to the University's Strategic Growth Area**. The Growth Plan outlines the importance of sustainable growth patterns in the city not only to increase housing and other choices, but to create and strengthen neighbourhoods inside the core areas of Saskatoon. Consistent with that goal, the University's Vision 2057 outlines plans for development of the endowment lands. A 33rd Street crossing and corridor connecting with Preston Avenue/Attridge Drive would connect the established and growing areas on the east and west sides of the river, providing access for walking, cycling, transit and car. In fact, the development of this area should support the urbanized character of the east-west corridor and potential crossing.

C) What are the potential impacts?

- **Residents on the 33rd Street corridor east of Idylwyld Drive will experience a significant increase in traffic volumes.** Today, the 33rd Street corridor is a minor arterial between Spadina Crescent and Warman Road with two travel lanes, on-street parking, and driveway access to adjacent residential properties. The 33rd Street crossing and additional travel lanes along 33rd Street west of Spadina Crescent will impact residents that currently own properties along that section of the corridor.

- **Potential for spillover traffic on neighbourhood streets.** East of Idylwyld Drive, the increased traffic volumes using 33rd Street means that more traffic is headed to this corridor in order to cross the river. A 33rd Street Bridge means that there is potential for neighbourhood short-cutting on roadways such as 7th Avenue, Spadina Crescent as well as other connections. As overall traffic increases on 33rd Street with or without a new crossing, the City will need to monitor and address the potential of neighbourhood spillover traffic during peak and off-peak timeframes.

- **Potential removal of on-street parking along 33rd Street during peak periods to support four travel lanes.** With or without the 33rd Street Bridge, traffic volumes along 33rd Street west of Idylwyld Drive during the morning and afternoon peak periods will require four travel lanes. With the implementation of a 33rd Street Bridge, this section of 33rd Street will experience significant change and still require four travel lanes. The City should consider whether this is a peak only operation and on-street parking may be permitted during off-peak periods.

Figure 4.37 - 2045 PM Peak Average Vehicle Travel Speeds (km/hr)

Scenario 4 - Combined Bridge and Transit

The following discussion highlights the long-term traffic and transit ridership for the 33rd Street or 24th Street river crossing combined with the Transit Plan investments.

A) What's changed?

- **Transit ridership across the core area bridges is expected to increase significantly with additional transit services and the implementation of BRT compared to the 'Business-as-Usual' scenario** as shown in **Figure 4.38.** As described in Section 3.0, the transit mode share across the city is projected to increase from 5% for the 'Business-as-Usual' and 33rd Street Bridge scenarios to 8% with the city-wide Transit Plan and other combined scenarios with a new crossing. Within the established areas of the city, transit ridership across the core area bridges is expected to increase from approximately 500 passengers in the peak hour direction today to 1,800 passengers in either the 24th Street or 33rd Street bridge crossing scenarios.

Figure 4.38 - Core Bridge Forecast PM Peak Hour Directional Transit Ridership

- **Core area bridge traffic volumes crossing the river will be moderately lower than the 'Business-as-Usual' scenario with the 24th Street Bridge, and slightly more with the 33rd Street Bridge**. In fact, the provision of the 24th Street Bridge and increased investments in transit will result in approximately 10,600 vehicles per hour crossing the river in the PM peak direction as illustrated in **Figure 4.39**, and almost 12,100 vehicles per hour crossing the river in the PM peak direction with the 33rd Street crossing scenario (in comparison to 11,300 in the 'Business-as-Usual' scenario).

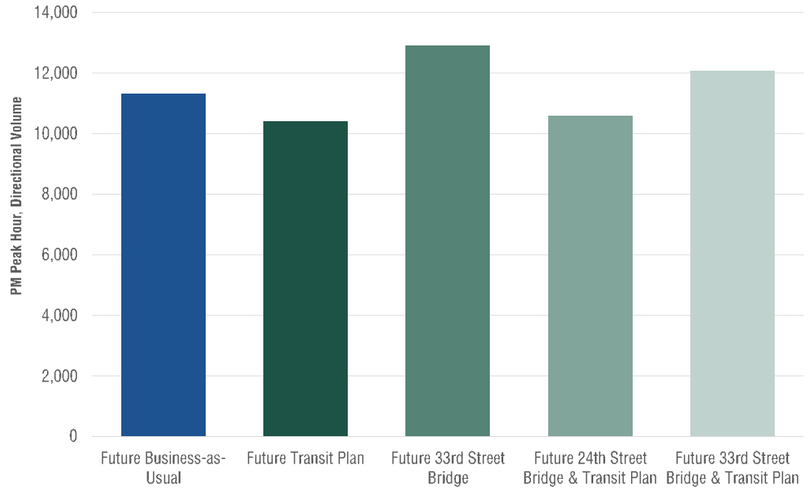


Figure 4.39 - Core Bridge Forecast PM Peak Hour Directional Traffic Volumes

- **Both the 33rd Street and 24th Street crossings will reduce pressures on other bridges in the core area of the city.** A greater network benefit is realized with the 33rd Street Bridge and corresponding investments in transit. **Figure 4.40** (on the following page) illustrates the projected 2045 PM peak hour volume differences between the two network scenarios and the traffic volumes for Scenario 2 – Transit Plan. The vehicle trips assigned to the road network are comparable for each of these scenarios and highlight the actual impacts of each crossing assuming that the Transit Plan is implemented. It should be noted that the increase in PM peak hour westbound traffic volumes crossing the University Bridge for the 24th Street Bridge scenario is principally due to retaining the two travel lanes (relative to the reduced travel lanes in Scenario 2).

  The 33rd Street Bridge scenario draws slightly more traffic from other core area crossings (as well as the Circle Drive North Bridge) than the 24th Street Bridge scenario. In the PM peak hour, the 33rd Street Bridge draws approximately 800 to 1,000 vehicles per direction away from other core area bridges, while the 24th Street Bridge crossing diverts approximately 500 vehicles per hour per direction. The extent of the diversion with the 33rd Street Bridge suggests that this scenario would reduce network delays more than the 24th Street Bridge scenario.

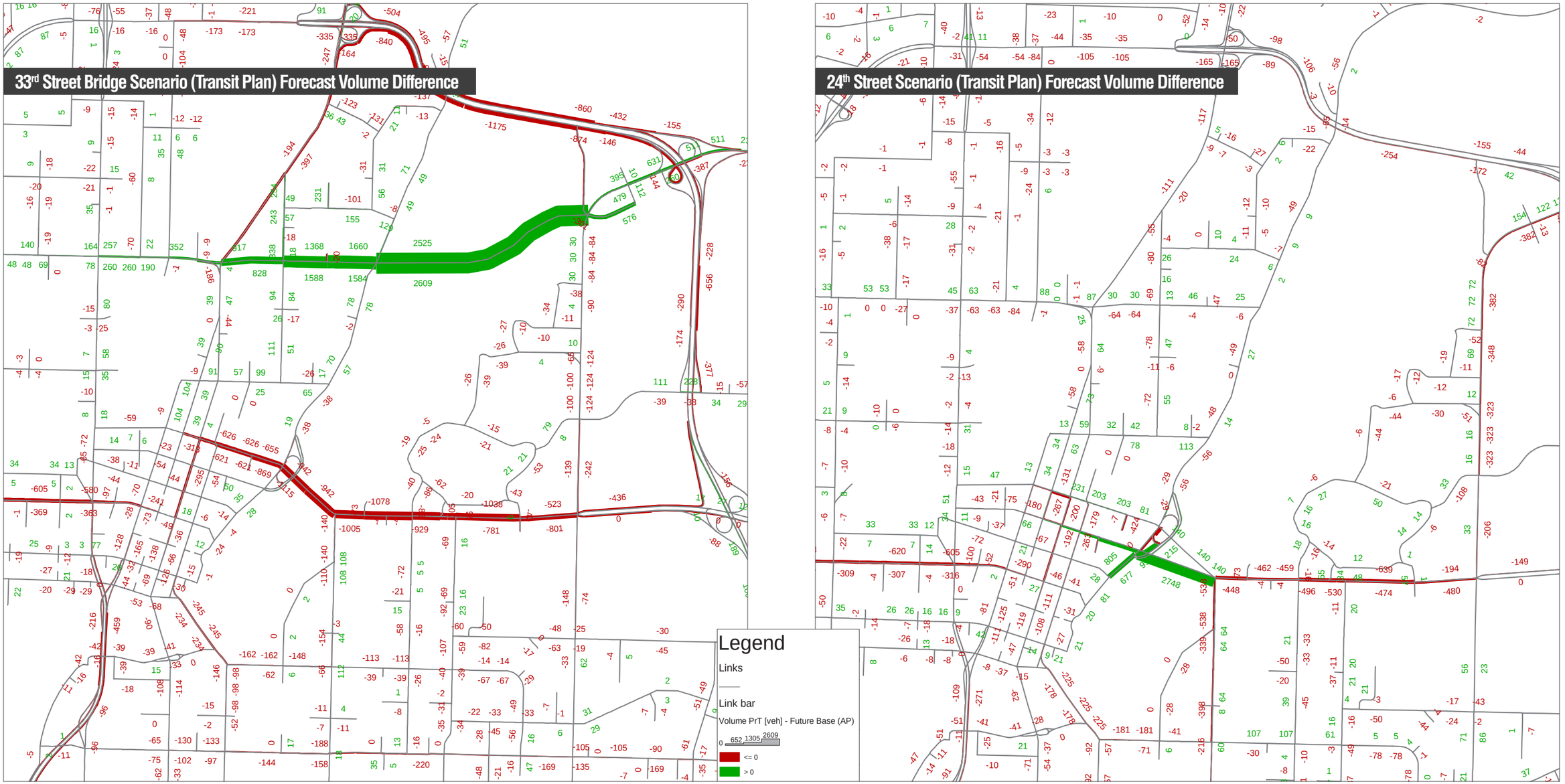


Figure 4.40 - Forecast 2045 PM Peak Hour Traffic Change (Scenario 4A and 4B vs. Scenario 2: Transit Plan)

- **Similar to the University Bridge today, the 24th Street Bridge would serve more traffic between the Downtown and University areas while the 33rd Street Bridge would serve more traffic to and from the core area and beyond the University area**. **Figure 4.41** illustrates the dispersion of forecast PM peak hour eastbound traffic across the 33rd Street and 24th Street bridges for the respective scenarios. As described for the 33rd Street Bridge scenario (without the Transit Plan investments), almost 75% of the traffic using the 33rd Street Bridge originates from and/or is destined to areas inside Circle Drive. In other words, the 33rd Street Bridge would serve as an important connection for supporting growth projections inside the core areas of the city. Whether traffic is diverted from other bridges (relative to a 'Business-as-Usual' scenario) or the Circle Drive North Bridge, the 33rd Street Bridge would provide a more direct connection inside the core area of Saskatoon.

The patterns illustrated in the traffic flow diagrams below suggest that the 24th Street Bridge would serve a similar core area function. In fact, in the PM peak hour, approximately 90% of the forecast 2,750 eastbound vehicles crossing the 24th Street Bridge will be generated from and/or destined to areas of the city inside Circle Drive.

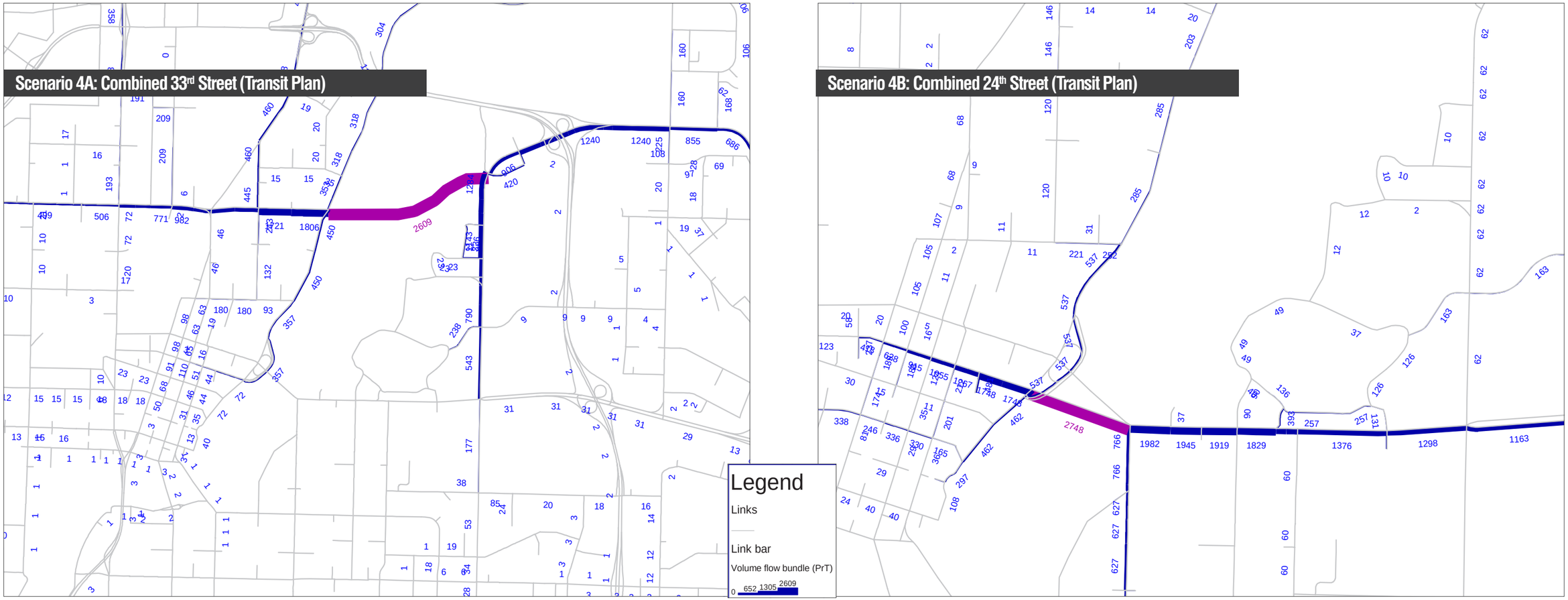


Figure 4.41 - Forecast 2045 PM Peak Hour Eastbound Traffic Flow Bundle for 33rd Street and 24th Street Bridges

- **With similar investments in the Transit Plan, both network scenarios are projected to experience a significant increase in transit ridership, with the largest growth along the proposed BRT corridors across the city**. **Figure 4.42** illustrates the forecast PM peak hour transit ridership along all major corridors in the Downtown area. This ridership is largely unchanged from Scenario 3 – Transit Plan. Although not assumed in this network scenario analysis, the 33rd Street Bridge may also serve as an alternative east-west transit connection across the city, serving similar travel patterns within the core area to the traffic patterns previously noted.

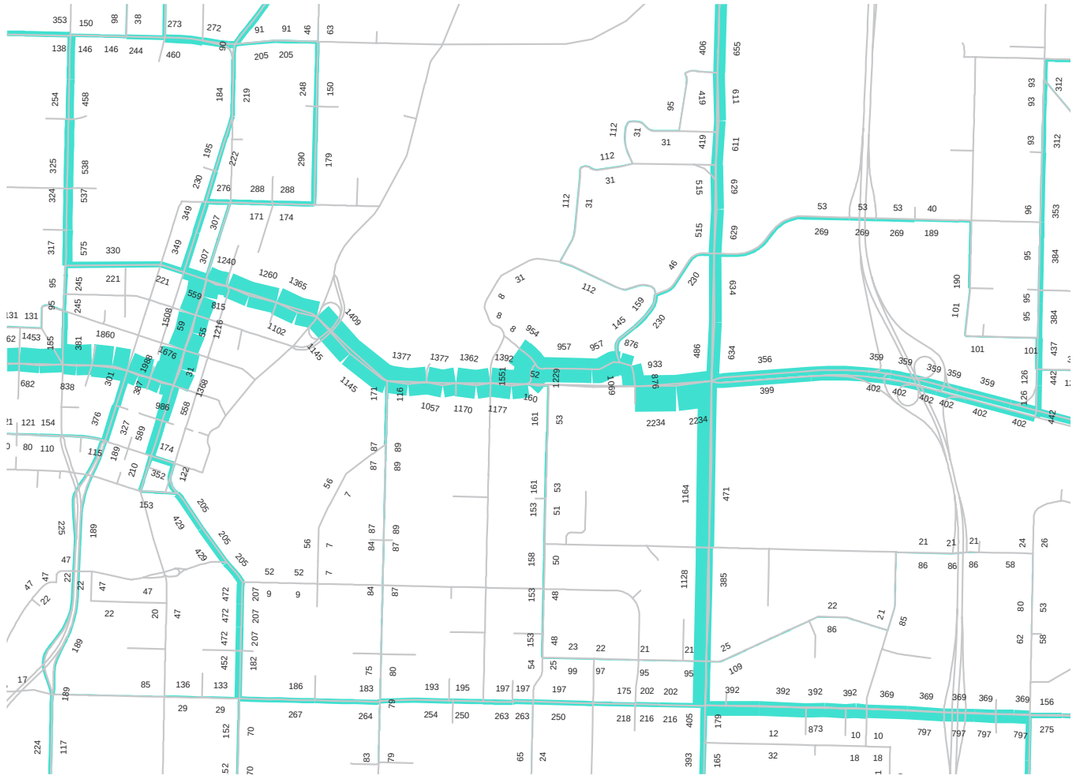


Figure 4.42 - Forecast 2045 PM Peak Hour Transit Passenger Volumes (Scenario 4A and 4B)

B) What are the potential benefits?

- **The bridge volume-to-capacity ratios or delays crossing the core area bridges are projected to be lower for both the 33rd Street and 24th Street Bridge crossing scenarios in comparison to a 'Business-as-Usual' Scenario**. **Figure 4.43** compares the v/c ratios for the core area bridge crossings for all network scenarios. As illustrated, the 'Business-as-Usual' scenario and Future Transit Plan scenarios will experience the highest delays crossing the core area bridges with projected PM peak directional volumes of 15% to 20% more than the capacity of the crossings. Forecast traffic crossing the core area bridges in the 24th Street and 33rd Street Bridge scenarios will exceed the capacity of the crossings by slightly more than 5%.

- **Although the system-wide vehicle-kilometers travelled in the city during the PM peak hour are slightly lower with either crossing, the system-wide vehicle hours travelled are significantly lower for the 33rd Street Bridge scenario**. The system-wide modeling work indicates that the total vehicle distance travelled (measured by vehicle-km) is slightly lower with the 33rd Street Bridge scenario than the 24th Street Bridge scenario (a difference of less than 1% for both options). The 33rd Street Bridge scenario provides significantly greater benefits in terms of reduced vehicle hours travelled by approximately 4% relative to the 'Business-as-Usual' scenario (as compared to reduced vehicle hours of 0.4% for the 24th Street Bridge scenario).

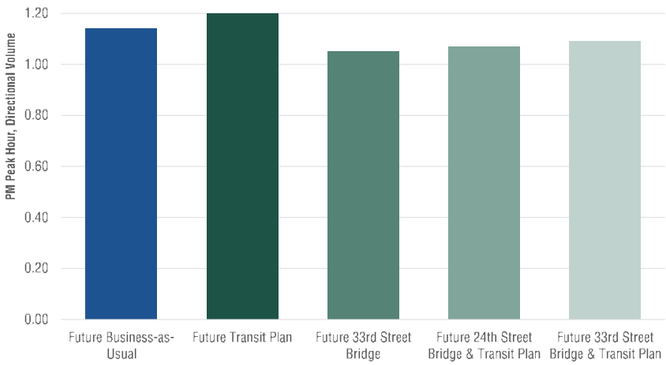


Figure 4.43 - Core Bridge Forecast PM Peak Hour Crossing V/C Ratios

- **Improves people-carrying capacity of the University Bridge and other BRT corridors.** The forecast PM peak hour transit ridership increases significantly along the proposed Red Line BRT corridor and moderately along the Blue Line BRT corridor. This will in turn make better use of existing capacity of the city's roadway network.

- **Results in limited traffic diversion to other major corridors in the city with the provision of dedicated bus-only lanes along the Red Line BRT corridors.** With the increased investment in transit and dedicated bus-only lanes, the increase in overall ridership and reduction in vehicle travel relative to 'Business-as-Usual' results in minimal diversion to other east-west roadways.

C) What are the potential impacts?

- **Residents on the 33rd Street east of Idylwyld Drive will experience a significant increase in traffic volumes.** Today, the 33rd Street corridor is a minor arterial between Spadina Crescent and Warman Road with two travel lanes, on-street parking and driveway access to adjacent residential properties. As illustrated by the volume differences relative to the 'Business-as-Usual' scenario (**Figure 4.43**), the 33rd Street crossing and additional travel lanes west of Spadina Crescent will increase traffic volumes by approximately 1,500 vehicles per direction and impact residents that currently own properties along that section of the corridor. Traffic volumes along other connecting roadways such as Spadina Crescent and 7th Avenue are also expected to increase moderately during peak and off-peak periods. Additional steps may be taken to manage undesirable spillover traffic impacts.

- **Traffic access and circulation within the downtown area would be impacted with a one-way couplet system between 25th Street and 24th Street.** Although the impact would be relatively modest, local residents and business access would be altered as a result of implementing a one-way couplet system between 24th and 25th Streets.

4.4.3 Options Evaluation

The comparative evaluation between candidate core area bridge and/or transit scenarios is intended to highlight the primary differences as well as the overall benefits and impacts as previously summarized. The evaluation criteria provide a multiple account assessment of key factors that will interest the community and decision makers in terms of the transportation system, community, environmental and financial accounts. The accounts and relative measures evaluated for each integrated network scenario are compared to the 'Business-as-Usual' scenario using the criteria summarized in **Table 4.03** below.

The following discussion highlights the comparative review of each core area bridge and network scenario for each of the accounts.

Criteria	Relative measure compared to the 'Business-as-Usual" scenario
TRANSPORTATION	
Vehicle Mobility Savings	Change in travel time per vehicle
Transit Mobility Savings	Change in travel times per person
Traffic Diversion	Traffic diversion from other river crossings
Transit Ridership Change	Change in PM peak hour transit ridership
Walking & Cycling	Potential for increased walking and cycling
COMMUNITY	
Neighbourhood Impacts	Degree of community severance (barriers that limit mobility)
Property Requirements	Change in property requirements
Community Connectivity	Change to community connectivity
ENVIRONMENT	
Impact on GHG Emissions	Relative vehicle emissions
Impact on Sensitive Areas	Potential impact on sensitive areas (ESAs)
FINANCIAL	
Annual Transit Operating Cost Increase	Increase in annual operating cost
River Crossing	Conceptual Capital Cost
Transit Travel Time Savings	% reduction in passenger transit travel time
Vehicle Travel Time Savings	% reduction in vehicle travel time

Table 4.03 - Core Area Bridge & Network Evaluation Criteria

Transportation

The relative changes from the future 'Business-as-Usual' scenario are summarized for the transportation account below in **Table 4.04**. The relative assessments highlight the transportation benefits of investing in the Transit Plan in order to increase the people-carrying capacity of the city's roadway network in comparison to a new 33rd Street Bridge or combinations of transit and bridge crossing improvements.

Criteria	SCENARIO 1 (Business-as-Usual)	SCENARIO 2 (Transit Plan)	SCENARIO 3 (Build New 33rd Street Crossing)	SCENARIO 4A (33rd Street Crossing & Transit Plan)	SCENARIO 4B (24th Street Crossing & Transit Plan)
TRANSPORTATION SYSTEM					
Vehicle Mobility Savings: Change in travel time per vehicle	-	◐	◐	●	◐
Transit Mobility Savings: Change in travel times per person	-	●	○	●	●
Traffic Diversion: Traffic diversion from other river crossings	-	○	●	●	◐
Transit Ridership Change: Change in PM peak hour transit ridership	-	●	○	●	●
Walking & Cycling: Potential for increased walking and cycling	-	○	◐	◐	○

○ LOW ◐ MODERATE ● HIGH

Table 4.04 - Transportation Account Evaluation Summary

- **Vehicle Mobility Savings**. Scenarios 2 and 4A/B generally include approximately 3% fewer vehicles on the network than both the 'Business-as-Usual' scenario and Scenario 3, as the transit mode share increases from 5% to 8% city-wide. None-the-less, the average vehicle speeds improve even with the reduction in vehicle capacity along major corridors such as 22nd Street, 25th Street and College Drive in order to accommodate bus-only lanes. As such, the average travel time per vehicle declines moderately for Scenarios 2, 3 and 4B, and more significantly for Scenario 4A.

- **Transit Mobility Savings**. The average trip time by transit is improved with the investments in BRT facilities and the overall Transit Plan, which provides more direct service on dedicated road space in Scenarios 2 4A and 4B.

- **Traffic Diversion**. The significance of the diversion from other crossings for Scenario 3 and Scenario 4A is much greater than Scenario 4B. The 33rd Street Bridge supports travel to and/or from the core areas of the city and moderately reduces demands across other core area bridges as well as the Circle Drive North Bridge.

- **Transit Ridership Change**. Transit ridership is projected to increase by about 5,000 trips during the PM peak hour with the implementation of the Transit Plan services and facilities in Scenarios 2, 4A and 4B relative to the 'Business-as-Usual' scenario. The introduction of a broader range of services across the city along with BRT will provide an enhanced customer experience and increase long-term mode share from 5% to 8% city-wide.

- **Support Walking and Cycling**. Scenarios 3 and 4A (with the 33rd Street Bridge Crossing) have a moderate benefit to walking and cycling across the River with a new northern connection to serve growth and development of the University Endowment Lands and the northern parts of the city's core area.

Community

The relative changes from the future 'Business-as-Usual' scenario are summarized for the community account below in **Table 4.05.**

Criteria	SCENARIO 1 (Business-as-Usual)	SCENARIO 2 (Transit Plan)	SCENARIO 3 (Build New 33rd Street Crossing)	SCENARIO 4A (33rd Street Crossing & Transit Plan)	SCENARIO 4B (24th Street Crossing & Transit Plan)
COMMUNITY					
Neighbourhood Impacts: Degree of community severance	-	○	○	○	◐
Property Requirements: Impacts on property	-	●	○	○	○
Community Connectivity: Impacts on community connectuvity	-	◐	◐	●	◐

○ NEGATIVE ◐ NEUTRAL ● POSITIVE

Table 4.05 - Community Account Evaluation Summary

- **Neighbourhood impacts**. Scenarios 3 and 4A (with the 33rd Street Bridge Crossing) have the greatest potential community impacts for those residents currently living along the minor arterial connector west of the river. Additionally, existing high density residential development would be impacted by a 24th Street crossing. Scenario 2 would not impact existing neighbourhoods.

- **Property Requirements**. The 33rd Street Bridge Crossing Scenarios will require new rights-of-way within the University Endowment Lands through to Attridge Drive at Preston Avenue. Additionally, development of the University lands will require road connections to serve the surrounding area. West of the river, some additional right-of-way may be required around major intersections depending on the configuration. This should be determined through corridor functional planning. A 24th Street crossing would require additional right-of way on the west side of the river.

- **Community Connectivity**. Scenarios 2, 4A and 4B, increase travel choice and connectivity across Saskatoon with transit investments. In Scenario 4A, the 33rd Street Bridge provides the added benefit of a new connection in the northern areas of the city's core, where the University and Circle Drive North Bridges are approximately 2.7km apart. The 33rd Street Bridge provides an intermediate crossing that will serve to enhance long-term connectivity for the growing areas of the city.

Environmental

The relative changes from the future 'Business-as-Usual' scenario are summarized for the Environmental Account below in **Table 4.06**.

Criteria	SCENARIO 1 (Business-as-Usual)	SCENARIO 2 (Transit Plan)	SCENARIO 3 (Build New 33rd Street Crossing)	SCENARIO 4A (33rd Street Crossing & Transit Plan)	SCENARIO 4B (24th Street Crossing & Transit Plan)
ENVIRONMENT					
GHG Emissions: Vehicle emission reductions	-	◐	◐	●	◐
Sensitive Areas: Potential impact on sensitive areas	-	○	◐	◐	◐

○ LOW ◐ MODERATE ● HIGH

Table 4.06 - Environmental Account Evaluation Summary

- **Greenhouse Gas Emissions (GHG).** Although all scenarios reduce total vehicle hours travelled (a surrogate for GHGs), the investments in the Transit Plan and BRT in Scenario 4A (with the 33rd Street Bridge Crossing) contributes to slightly larger reductions.

- **Impacts on Environmentally Sensitive Areas.** Although any new crossing can impact watercourses as well as embankments on either side of the South Saskatchewan River, these impacts are rated neutral as they can generally be mitigated through design and other treatments.

Financial

The financial account summarized in **Table 4.07** below is typically expressed in monetary benefits and costs relative to the future 'Business-as-Usual' scenario. It should be noted that the relative travel time savings for transit and vehicle travel are summarized for each scenario rather than the actual monetized value. The significance of the delay for the future 'Business-as-Usual' scenario appears to exaggerate the extent of the travel time savings for a major improvement and its corresponding value for the following reasons:

- The 'Business-as-Usual' network is a preliminary network strategy for the City based on current plans and known projects. The Growth Plan work and recommended directions on core area bridges, transit and BRT as well as overall corridor growth will complete the foundational strategies in which to undertake further long-term network planning across the city.
- The 'Business-as-Usual' model scenario with half a million people projects no significant delays. Therefore, the modeled travel time benefits in congested networks can be exaggerated because of the exponential effects of congestion on travel time. As such, the relative travel time savings are summarized as a percentage change across the city relative to the 'Business-as-Usual' scenario.

Criteria		SCENARIO 1 (Business-as-Usual)	SCENARIO 2 (Transit Plan)	SCENARIO 3 (Build New 33rd Street Crossing)	SCENARIO 4A (33rd Street Crossing & Transit Plan)	SCENARIO 4B (24th Street Crossing & Transit Plan)
FINANCIAL						
Costs (2014 $)	**Annual Transit Operating Cost Increase:** Estimated increase in annual operating cost		$22-32M	$0	$22-32M	$22-32M
	River Crossing: Estimated Capital Cost		N/A	$100M	$100M	$70M
Benefits	**Transit Travel Time Savings:** % reduction in passenger transit travel time	-	(5.0%)	(0.1%)	(5.0%)	(5.0%)
	Vehicle Travel Time Savings: % reduction in vehicle travel time	-	(3.4%)	(2.9%)	(5.2%)	(3.5%)

Table 4.07 - Financial Account Evaluation Summary

- **Annual Transit Operating Cost Increase.** The annual operating costs for Scenarios 3 and 4A/B are expected to increase from the 'Business-as-Usual' scenario where the annual service levels grow from approximately 675,000 service hours per year to approximately 900,000 to 1,000,000 service hours per year. Based on 2014 dollars, this change is estimated to cost an additional $22 to $32 million per year in system operating costs (not including the investments in BRT facilities).
- **River Crossing Costs.** Conceptual, order-of-magnitude cost estimates are provided for the 33rd Street and 24th Street river crossings using unit costing for bridge structures and roadways. These estimates are referred to as Class D costs and are typically only used to understand relative differences between concepts and should not be used to prepare project budgets. The 33rd Street crossing is expected to cost as much as $100 million, and the 24th Street crossing is estimated to cost as much as $70 million.
- **Annual Transit Travel Time Savings.** The system wide delays and transit travel times are projected to increase significantly in the long-term 'Business-as-Usual' scenario. Scenario 3 (33rd Street Crossing) is expected to reduce system transit travel times marginally by less than 0.1% with some traffic diversion to the 33rd Street Bridge. In Scenarios 2 and 4A/B, the increase in ridership and overall system travel time by passengers is off-set by the provision of dedicated BRT facilities. Dedicated lanes across the Red Line BRT corridors would contribute toward a significant transit system travel time savings of approximately 5.0% system-wide.
- **Annual Vehicle Travel Time Savings.** All core area bridge scenarios result in some network level vehicle travel time savings. Scenario 2 (Transit Plan) includes the provision of BRT facilities and services as well as the implementation of significant transit services that reduce overall vehicle travel relative to a 'Business-as-Usual' scenario. The reduction in vehicle travel as well as the vehicle lanes produces a vehicle travel time savings of approximately 3.4% across the city. Scenario 4B (24th Street Bridge Crossing) results in a marginally higher system-wide vehicle travel time savings, while Scenario 4A is projected to experience the most significant vehicle travel time savings of 5.2% compared to the 'Business-as-Usual' scenario.

4.4.4 Evaluation Summary

The multiple account evaluation for each of the four integrated core area bridge and network scenarios are summarized in **Table 4.08**. Scenario 4A (33rd Street Crossing & Transit Plan) receives the highest ranking based on the technical evaluation of transportation, community, environmental and financial criteria. Scenario 4A includes the 33rd Street crossing as well as the implementation of the Transit Plan as previously described. This scenario also includes dedicated bus-only lanes across the city and University Bridge between Blairmore, University Heights and Holmwood. The 33rd Street crossing would connect arterial roadways on both sides of the river that are generally intended to connect neighbourhoods across the city. In fact, the spacing of the 33rd Street crossing (approximately 1.5 kilometres north of the University Bridge and south of the Circle Drive Bridge) would enhance the grid system of arterial roadways typically needed to support attractive transit services as well as walking and cycling facilities, and minimize travel on neighbourhood streets. Much like the other crossings options, the 33rd Street crossing would principally serve local area travel to and from the core areas of the city. With growth planned on both the east and west sides of the river in the North Downtown and University areas, a 33rd Street crossing would also provide improved walking and cycling connections and allow for the provision of frequent transit services to these communities.

Recognizing the importance of encouraging alternative modes throughout the city, the 33rd Street crossing may be deferred for the very long-term through accelerated investments in transit services and facilities, maintaining general purpose travel lanes across the University Bridge, and other land use and transportation demand management strategies.

Criteria		SCENARIO 1 (Business-as-Usual)	SCENARIO 2 (Transit Plan)	SCENARIO 3 (Build New 33rd Street Crossing)	SCENARIO 4A (33rd Street Crossing & Transit Plan)	SCENARIO 4B (24th Street Crossing & Transit Plan)
TRANSPORTATION						
Vehicle Mobility Savings: Change in travel time per vehicle		-	◐	◐	●	◐
Transit Mobility Savings: Change in travel times per person		-	●	○	●	●
Traffic Diversion: Traffic diversion from other river crossings		-	○	●	●	◐
Transit Ridership Change: Change in PM peak hour transit ridership		-	●	○	●	●
Walking & Cycling: Potential for increased walking and cycling		-	○	◐	◐	○
COMMUNITY						
Neighbourhood Impacts: Degree of community severance		-	○	○	○	◐
Property Requirements: Impacts on property		-	●	○	○	○
Community Connectivity: impacts on community connectivity		-	◐	◐	●	◐
ENVIRONMENT						
GHG Emissions: Vehicle emission reductions		-	◐	◐	●	◐
Sensitive Areas: Potential impact on sensitive areas		-	○	◐	◐	◐
FINANCIAL						
Costs (2014 $)	**Annual Transit Operating Cost Increase:** Estimated increase in annual operating cost		$22-32M	$0	$22-32M	$22-32M
	River Crossing: Estimated Capital Cost		N/A	$100M	$100M	$70M
Benefits	**Transit Travel Time Savings:** % reduction in passenger transit travel time	-	(5.0%)	(0.1%)	(5.0%)	(5.0%)
	Vehicle Travel Time Savings: % reduction in vehicle travel time	-	(3.4%)	(2.9%)	(5.2%)	(3.5%)
Technical Ranking		5	3	4	1	2

○ LOW / NEGATIVE ◐ MODERATE / NEUTRAL ● HIGH / POSITIVE

Table 4.08 - Overall Evaluation Summary for Core Bridge Scenarios

4.5 Long-term Plan for Core Bridges

Core areas inside Circle Drive are expected to accommodate 50% of the city's growth, with 125,000 new residents concentrated in the city's Strategic Growth Areas (University, North Downtown and City Centre), as well as along major corridors and through Neighbourhood Infill. With this growth, more people will need to move to, from, and within the core area of the city inside Circle Drive.

The overarching vision guiding the review and evaluation of alternative core area river crossing strategies is centred on creating a transportation system that supports vibrant communities in the core area of the city and prioritizes mobility for transit, walking and cycling. In doing so, any core area bridge strategy must connect arterial roads, primarily serve core area travel needs, increase sustainable modes of travel, continue the grid system of streets that are characteristic of Saskatoon's core area and contribute toward enhancing the urban character of major roadways within the city.

After an extensive process of considering all possibilities to address long-term challenges and evaluating alternative strategies, the plan for core area river crossings has three distinct features that are essential to supporting the overall growth of Saskatoon to half a million people. The features of the plan include:

A) Maximize Capacity of Existing River Crossings

The capacity of bridges in Saskatoon are largely influenced by the urban street system and intersections that they connect to. As previously described, one lane of a bridge that connects with a highway can typically support 100% more traffic per lane than one that connects with signalized intersections. Although intersection improvements on either side of the Broadway, University and future Traffic Bridges may be considered to maximize the investments, they would not address long-term challenges and needs for core area river crossings by themselves. None-the-less, the City should consider operational strategies to improve and maximize the vehicle carrying capacity of existing river crossings.

Recommended Actions:

- **As part of an ongoing strategy, the city should consider improvements to urban street intersections on both sides of core area bridges in order to maximize the actual capacity of the river crossings and to defer other major roadway and bridge investments.**
- **Operational improvement strategies may include, but not be limited to: signal timing and prioritization for major roadways that connect to bridges; signal coordination along connecting roadways; additional lanes or modifications; and/or turn restrictions.**

B) Transit Plan

The long-term Transit Plan described in Section 3.5 of the Technical Report outlines the critical elements of a successful transit system for Saskatoon that will not only provide transportation choice, but will also support planned growth across the city over the next 30 years. The core bridge review also found that the Transit Plan is essential to reducing pressures on the city's roadway network and in particular the core area river crossings.

The Long-term Transit Plan includes: customer service improvements; plan for enhanced and increased services; support facilities; Red Line BRT corridor; and Blue Line BRT corridor. As indicated in the assessment of core area bridges, the Transit Plan significantly increases the transit mode share in the city from 5% to 8%, and in turn decreases vehicle travel relative to a 'Business-as-Usual' approach to investing in transit. In this regard, the people-carrying capacity of the city's street system will also grow with more attractive transit services. In particular, investments in dedicated bus-only lanes along the Red Line BRT corridor will ensure that the University Bridge is designed to carry the projected 1,600 passengers per hour in the peak direction (and even more beyond the 30 year time-frame of the Growth Plan).

Recommended Actions:

- **Implement the Transit Plan as described in Section 3.0 of the Technical Report in order to defer the need for an additional crossing.**
- **Prioritize transit investments wherever possible to potentially defer investments in roadway network improvements planned for other areas of the city.**

C) 33rd Street Bridge

Beyond and well after the city accelerates investments in attractive transit services and BRT facilities, a 33rd Street Bridge is also recommended to address core area travel based on the technical review. With planned growth of more than 40,000 people across the University of Saskatchewan lands on the east side of the river and other growth projected for Strategic Growth Areas as well as along major corridors, an east-west crossing will support travel for all modes and connect these growing communities. In comparison to the 'Business-as-Usual' approach, a 33rd Street Bridge will provide direct connections between growing urban areas of the city, and reduce overall travel distances and time for core area trip making.

Consistent with the vision for alternative core area crossings, a 33rd Street Bridge will:

- Connect arterial roads that serve travel between core area communities in Saskatoon;
- Primarily serve core area travel rather than vehicle travel that starts and ends outside Circle Drive;
- Connect pedestrians, cyclists, transit, and vehicles to promote sustainable modes of travel within the core areas;
- Continue the grid street pattern that exists within the core area to not only promote use of alternative modes, but to minimize impacts of increasing traffic on neighbourhoods; and
- Create an urban street character on both sides of the bridge.

With forecast travel demands of more than 2,500 vehicle trips per direction during the PM peak hour, the 33rd Street Bridge would connect the west side communities to the University Lands with a multi-modal connection that may include up to four travel lanes, separated bicycle facilities as well as sidewalks on both side of the bridge as conceptually illustrated in **Figure 4.44** below. Functional planning in the future will determine the required capacity and number of lanes for the bridge.

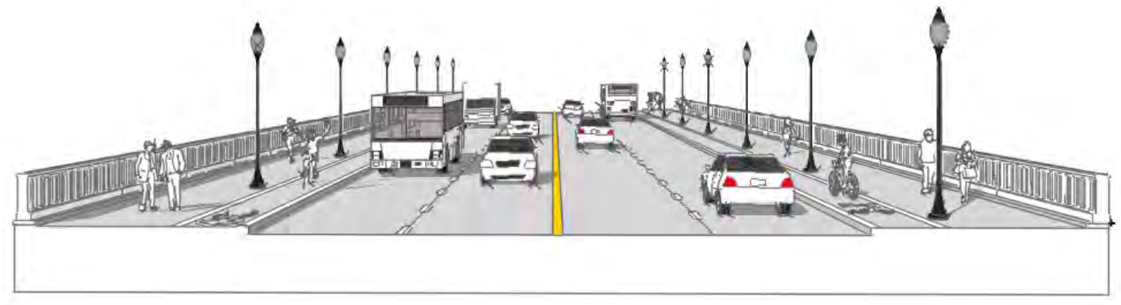


Figure 4.44 - Potential Configuration of a 33rd Street River Crossing

Recommended Actions:

- **Utilize other strategies to optimize operation of existing river crossings and investments in transit facilities and services to defer the need to plan for and invest in the 33rd Street Bridge.**
- **Plan, design and implement the 33rd Street river crossing as a long-term improvement required to support planned growth on the University of Saskatchewan lands in addition to the city's other Strategic Growth Areas – City Centre and North Downtown.**

4.6 Implementing the Plan

The long-term plan for core area bridges requires a multi-faceted approach to increasing transportation choices by investing in transit and maximizing the use of existing river crossings before investing in a new crossing. The following discussion highlights the implementation priorities needed to achieve the vision for core area bridges and to support the overall Growth Plan.

4.6.1 5 Year Priorities

Within the first five years, the City will want to explore operational improvements of the urban street system connecting core area river crossings in order to maximize existing capacity and investment. As described in the Plan, these strategies are largely centred on the nearby intersections and include: signal timing and prioritization for prioritize major roadways; additional lanes or modifications; and turn restrictions.

During this initial stage of implementation, the City will also be improving existing transit services to maximize these resources and investing in new services and facilities to attract the largest transit markets. In particular, the City will begin implementation of the Red Line BRT corridor with the potential of dedicated bus-only lanes and stations along College Drive and 3rd Avenue.

The investments in transit services and facilities will ensure not only that residents across the city have attractive travel choices, but that investments are made in those areas of the city that will have the greatest potential to increase transit ridership. This strategy will also serve to reduce pressures on core area bridges by increasing the people-carrying capacity of the existing roadway network.

4.6.2 10 Year Priorities

Between 5 and 10 years, the City will want to examine changes in vehicle and transit passenger travel demands across core area bridges and identify any changes in traffic patterns resulting from the opening of the Traffic and North Commuter Parkway bridges. In concert with the monitoring program for transit investments, changes in core area bridge travel should be noted and assessed in relation to the long-term Plan. These results may inform further investments in either operational improvements on either side of the bridge and/or transit services and facilities serving customers that cross the river.

During this period, the City should continue to invest in significantly expanding and improving transit services to support the largest customer markets. At the same time, investments in transit facilities such as the Red and Blue Line BRT corridors as well as other support facilities and customer programs will be required. In particular, dedicated BRT lanes and stations should be implemented along 25th Street and 22nd Street to enhance the customer experience by avoiding areas of recurring congestion and further increasing the people-carrying capacity of Saskatoon's major roadways. During this period, it is anticipated that investments in rapid transit will also be required to support Corridor Growth, which will in turn, serve to provide more sustainable travel patterns and choices.

4.6.3 Long-term (Beyond 10 Years)

The long-term plan includes the implementation of a 33rd Street river crossing to serve development on the University of Saskatchewan lands as well as other planned Strategic Growth areas of the city, and to support east-west travel with Preston Avenue/ Attridge Drive. As suggested, the City will want to monitor progress on planned growth and development in these key areas in order to maintain the vision for the Growth Plan. At the same time, the City will also want to examine and monitor travel demand patterns to ensure planned investments in transit are achieving their intended objectives and projected ridership before investing in a new core area river crossing.

Assuming that growth is occurring as planned and that transit investments are resulting in significant ridership increases across core area bridges, the City could start planning the design of the 33rd Street river crossing and connections through to Preston Avenue/ Attridge Drive. Although a conceptual configuration was presented in the Plan, the assessment should consider needs and optional strategies to support all modes of travel. At the same time, the City will want to ensure that the urban street character is preserved and/or created on both sides of the river rather than providing a corridor that is simply designed to serve transportation needs. Consistent with the aspirations presented with Corridor Growth, the river crossing and connecting streets must be designed to create a vibrant street environment and to support the land uses that surround them.

4.7 Financing Core Bridges

A 33rd Street crossing and connection through the University lands to Preston Avenue/ Attridge Drive is the preferred long-term recommendation to serve planned growth, particularly in the core areas of the city. In support of the Growth Plan, the City recently completed a study on funding growth related infrastructure (Financing Growth Study). Consistent with the Planning and Development Act, the City has the authority to impose development levies for roadway related infrastructure (including bridges) needed to support growth. There are essentially three approaches that may be used to fund the crossing and associated roadworks as highlighted below:

- **Development Levies.** The City of Saskatoon imposes development levies for local and offsite services required to service new development. With the exception of growth that does not require a subdivision of land, levies for roadways can be applied as a city-wide charge where all development pays the same rate regardless of location.

  The levy is calculated by determining all growth related capital required to service the forecasted growth areas. Costs of the capital projects are determined using the most recent tenders. The total cost for each category of capital projects is then divided by the total projected growth in order to determine the rate for the development levy. The levy is reviewed each year by adding new growth related projects, removing completed projects, and updating the growth forecast and costs using the most recent tenders.

- **Property Taxes and Government Grants.** Provincial and federal cost sharing has been used extensively to fund major roadway and transportation related infrastructure related to growth that may or may not be supported by development levies. Within the City, the costs for major roadway improvements such as the North Commuter Parkway are also funded through property taxes and other government grants. Unfortunately, grants are not recognized as a predictable or reliable source of funding. In fact, grant programs often favour projects that are shovel ready and disadvantage those that are not delivered for many years.

- **Subdivision Agreements.** For ‘on-site’ related growth, Subdivision Agreements may require construction of adjacent major roadways. Although they are an unlikely source of funding for the 33rd Street crossing, local area improvements on the east side may be required as part of the University land use plans.

APPENDIX A - ALTERNATIVE RAPID TRANSIT EVALUATION

Part 1 - Alternative Rapid Transit Technologies

Ultimately, rapid transit is intended to shape and support growth in addition to providing an attractive transportation choice. Rapid transit stations and corridors are more than a 'utility' for the community. They should be designed as vibrant urban environments that are attractive and comfortable for people. Rapid transit systems are also unique from the rest of the transit system in that they are identifiable corridors with mostly or entirely separate travel lanes, enhanced transit stations for the comfort of passengers and real-time information that can enhance the customer experience and system operation. Depending on the demands, the goals for growth and an enhanced experience can be achieved with either a bus or rail based system. This section of the report examines forecast rapid transit ridership levels and patterns along the designated rapid transit corridors and the capacity of bus and rail rapid transit technologies.

The general features of Bus Rapid Transit (BRT) and Light Rail Transit (LRT) considered for Saskatoon are summarized in **Table A.01.**

- **In the long-term (thirty years), the Red Line candidate rapid transit corridors in Saskatoon are projected to carry as many as 2,400 passengers per hour in the PM peak direction. Figure A.01** illustrates the forecast 2040 afternoon peak hour transit ridership for each corridor carrying transit services including the candidate rapid transit corridors. Along the Blairmore – University Heights – Holmwood segments of the rapid transit routing, the peak directional ridership of 2,400 passengers occurs in the eastbound direction on College Drive, just east of the University. Within and on the western portions of the downtown, peak directional ridership on 22nd Street and 3rd Avenue is projected to be as much as 1,600 passengers during the PM peak hour. Beyond the Downtown and University areas of the east-west rapid transit route, projected long-term ridership along 22nd Street, Preston Avenue and Attridge Drive segments of the rapid transit corridor is approximately 1,000 passengers or less per direction during the PM peak hour.

Figure A.01 - PM Peak Hour Transit Ridership Forecast (2040)

	Bus Rapid Transit (BRT)	Light Rail Transit (LRT)
OVERVIEW	 Conventional and articulated buses operating in an exclusive, dedicated road space with priority through signalized intersections and enhanced customer information at stations. Some segments may be shared with general purpose traffic.	 Rapid transit service operating in a dedicated transit right-of-way using rail vehicles
RIGHT-OF-WAY	Bus lanes operating in: a. Centre Lanes separated from traffic b. Side Lanes separated from traffic c. Curb Lanes shared with right turn vehicles at key intersections d. Roadway shoulders without curb and sidewalks	Rail tracks with LRT vehicles operating in: a. Centre Lanes separated from traffic b. Side Lanes separated from traffic c. Curb Lanes shared with right turn vehicles at key intersections
MAXIMUM FREQUENCIES	As much as every 1-2 minutes	As much as every 2 minutes
VEHICLE TYPES	Typically 20 metre articulated buses, using low floor technology for universal access. Approximately 120 passengers seated and standing.	Light rail vehicles range in size up to 40 metres and can carry up to 4 cars. Approximate capacity of 250 passengers per car seated and standing.
SYSTEM CAPACITY	As much as 5,000 and 10,000 passengers per hour per direction on urban roads and dedicated transitways.	Up to 20,000 passengers per hour per direction.
2040 ONE-WAY TRAVEL TIMES SAVINGS (BLAIRMORE TO UNIVERSITY HEIGHTS)	25 to 50 minutes	25 to 50 minutes
2040 ONE-WAY TRAVEL TIMES SAVINGS (BLAIRMORE TO HOLMWOOD)	30 to 50 minutes	30 to 50 minutes
EXAMPLES	Ottawa, Winnipeg, York Region and Eugene	Edmonton, Calgary, Portland, Seattle, Strasbourg and Berlin

Table A.01 - General Features of Bus Rapid Transit (BRT) and Light Rail Transit (LRT)

A

As previously indicated, the Blue Line rapid transit service between Nutana Suburban Centre and Lawson Heights generates significantly less ridership in the long-term than the east-west corridor. Combining the Idylwyld and Broadway routes, the maximum peak hour ridership on any specific segment of the candidate rapid transit corridor for the long-term is estimated to be less than 600 passengers in the peak direction.

- **The peak directional ridership of 1,600 and 2,400 passengers per hour along the Red Line (Blairmore-University Heights-Holmwood) could be accommodated in 30 to 40 buses per hour (as opposed to 1,450 to 2,150 vehicles per hour).** Similar to other cities in North America, roadway space in the established areas of Saskatoon is finite. In other words, the street network is largely built out and most major roadways are already four travel lanes or more without additional right-of-way for widening. As previously described, forecast delays and congestion in the core areas of the city are projected to increase dramatically over the next thirty years.

- **Looking ahead, the carrying capacity of the transportation system inside Circle Drive must be increased in order to accommodate growing travel demands with limited opportunity to expand the roadway network.** Transit in general, and rapid transit specifically, provides the opportunity to substantially increase the people carrying capacity of the transportation system. The forecast peak directional ridership of 2,400 passengers (at the maximum load point in the east-west rapid transit corridor) could be accommodated with approximately 40 buses per hour (or 1 bus every 90 seconds) as illustrated in **Figure A.02** below. Alternatively, this travel demand would require approximately three lanes of urban roadway in each direction in order to support up to 2,150 vehicles.

Figure A.02 - Carrying Capacity of Cars and Buses

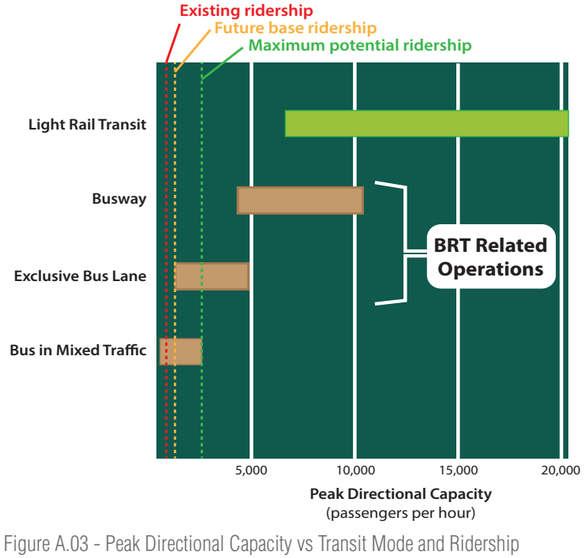


Figure A.03 - Peak Directional Capacity vs Transit Mode and Ridership

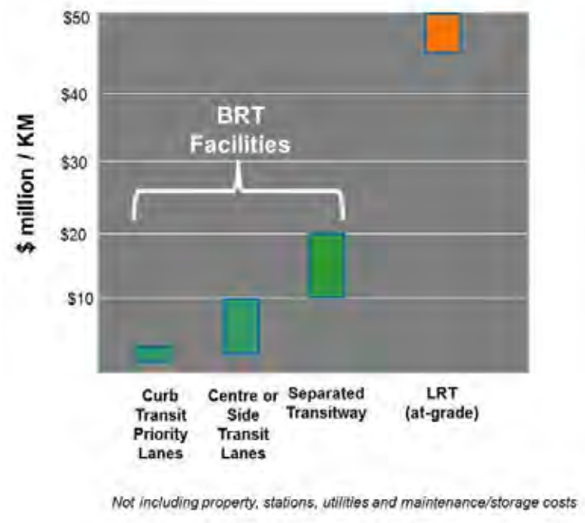


Figure A.04 - Typical Rapid Transit Facility Capital Costs

- **The capacity of a Bus Rapid Transit (BRT) technology can comfortably serve the projected peak ridership for more than the next thirty years.** The carrying capacity of a transit corridor can act as a constraint to growing ridership once operating capacities are approached or exceeded. **Figure A.03** illustrates the capacity ranges and projected thirty year peak ridership levels for each of the candidate rapid transit corridors. These forecasts suggest that the maximum passenger loads along the Red Line rapid transit corridor are well within the capacity of a dedicated bus lane operation for an urban street environment. Outside the core areas of the city, peak directional ridership projections along the rapid transit corridor could be accommodated in mixed-use lanes with general purpose traffic. In the very long term however, the City will want to implement dedicated lanes to reduce delays due to traffic congestion and increase capacity of the transit system.

- **Although a higher capacity system such as Light Rail Transit (LRT) may be required to support long-term ridership well beyond the next thirty years, the capital and operating cost differences between bus and rail technologies are significant. Bus based systems can typically cost anywhere from $100 to $120 per service hour to operate where rail based systems can cost approximately $400 to $500 per hour.** Beyond the significant operating cost differences, the capital cost for bus based rapid transit systems can also be significantly different as illustrated in **Figure A.04.** BRT facilities can cost anywhere from $2 million per kilometre to as much as $20 million per kilometre, while rail based or LRT systems can cost up to $50 million per kilometre. These costs do not include fleet, stations, property, utility and storage, and maintenance for vehicles. Considering the projected ridership for the next thirty years, Saskatoon is well within the capacity of a BRT system. As such, the additional investment required to implement and operate LRT could not be justified with a business case where the system benefits would exceed the expected costs.

Part 2 - Alternative Routing for Rapid Transit

The Red Line Rapid Transit connection serves travel between Blairmore, University Heights and Holmwood. This east-west corridor supports the largest ridership in the city today. In fact, many of the existing transit generators are located along these proposed east-west rapid transit corridors illustrated below in **Figure A.05**.

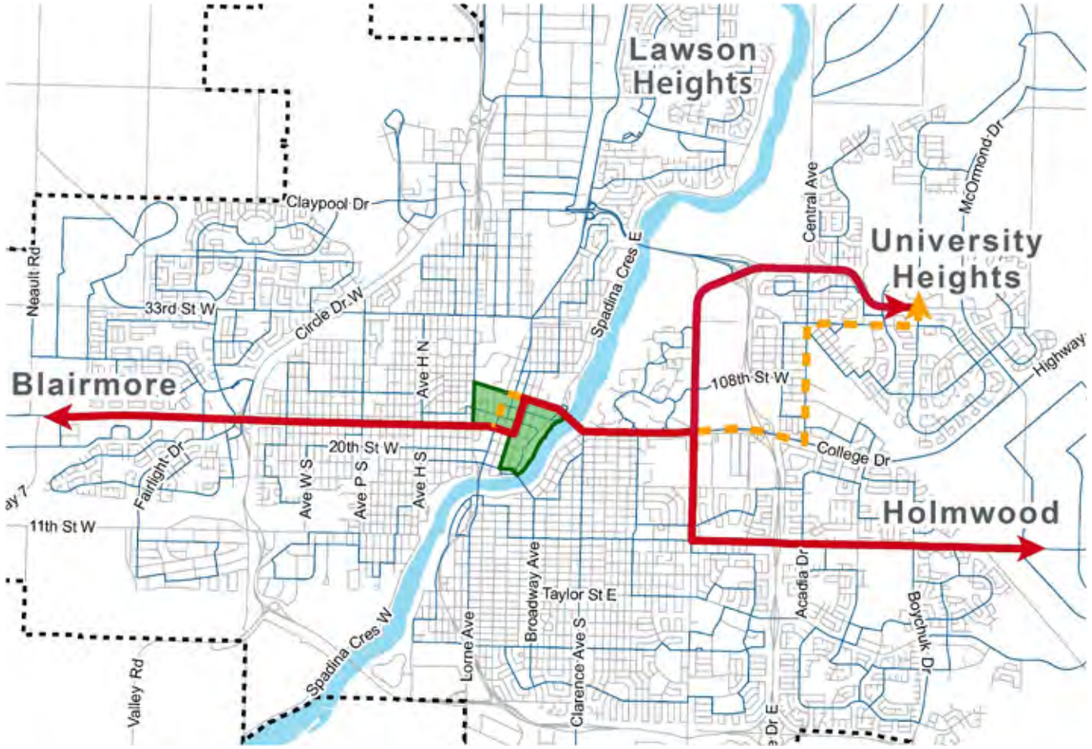


Figure A.05 - Alternative Routing

The proposed corridors for the east-west rapid transit service are briefly highlighted below by segment:

A) DOWNTOWN RED LINE ROUTING (3RD AVENUE OR 1ST AVENUE DOWNTOWN);

3rd Avenue or 1st Avenue would serve as the north-south connection between 22nd Street and 25th Street within the downtown. Both 3rd and 1st Avenues are four lane roadways with on-street parking on both the east and west sides of the street. Peak hour, peak directional traffic volumes on 1st Avenue are approximately twice that of 3rd Avenue, which is generally a function of the difference in network connectivity. 1st Avenue serves north-south travel entering the downtown area from the Senator Sid Buckwold Bridge and serves as an alternative to Idylwyld Drive, while 3rd Avenue generally serves the downtown area between 19th Street and 25th Street.

Criteria	DOWNTOWN RED LINE OPTIONS	
	3RD AVENUE	1ST AVENUE
Existing Population	◐	○
Existing Employment	●	◐
Potential for Transit Oriented Growth	●	◐
Ridership Potential	●	●
Roadway Suitability	●	○
Comments	^ Connects with more jobs and residents ^ Similar ridership potential 2,000 passengers/hr in pk direction ^ Secondary downtown street with 400 veh/hr / direction today & 900 v/h/d future ^ Permanent transit lane physically possible	^ Ridership potential (2040): 2,000 passengers/hr in pk direction ^ Vehicle volumes: 800 Ex. (1,300 Fut. Base) vehicles/hr in pk direction ^ Permanent transit lane physically possible ^ Primary N-S traffic corridor ^ Higher traffic volumes impacted
Recommendation	PREFERRED OPTION	NOT RECOMMENDED

● HIGH ◐ MODERATE ○ LOW

Table A.02 - Evaluation of Alternative Downtown Red Line Routing

The comparative assessment of each route alternative through the downtown is summarized in **Table A.02** in terms of relative land use patterns, potential transit ridership, and roadway suitability. Based on this review, 3rd Avenue serves a larger proportion of the population and employment within the downtown area than 1st Avenue today and in the long-term. In other words, a larger number of residents and jobs are located within closer walking distance to 3rd Avenue than the 1st Avenue corridor.

The implementation of rapid transit along either north-south corridor will also require the removal of one general purpose traffic lane in each direction and potentially on-street parking in select locations to accommodate station areas. Existing and forecast traffic volumes, as well as the broader network connectivity, suggests that the impacts of reducing travel lanes on 1st Avenue is slightly greater than 3rd Avenue. Based on these factors, 3rd Avenue is recommended as the preferred rapid transit corridor through the downtown area.

B) EAST SIDE ROUTING OPTIONS (UNIVERSITY HEIGHTS TO COLLEGE / PRESTON);

Alternative routes between University Heights and College Drive at Preston Avenue include: College Drive / Central Avenue / 115th Street; or Preston Avenue / Attridge Drive. College Drive and Central Avenue are classified as major arterial roads and 115th Street is classified as a major collector roadway. East of Preston Avenue, College Drive supports six travel lanes and Central Avenue and 115th Street support two travel lanes and on-street parking in some sections. Preston Avenue (north of College Drive) and Attridge Drive are classified as major arterial roads that support four to six travel lanes. On-street parking is restricted along both roadways.

Criteria	EASTSIDE RED LINE OPTIONS	
	VIA CENTRAL AVENUE	VIA ATTRIDGE
Existing Population	●	○
Existing Employment	○	●
Potential for Transit Oriented Growth	◐	●
Ridership Potential	○	◐
Roadway Suitability	◐	●
Comments	^ Ridership potential (2040): 500 passengers/hr in pk direction ^ Vehicle volumes: 800 Ex. (1,500 Fut. Base) vehicles/hr in pk direction ^ Established community and 'main street' through Sutherland ^ Central Ave - Limited travel lanes & ROW crossing delays	^ Ridership potential (2040): 700 passengers/hr in pk direction ^ Vehicle volumes: 800 Ex. (2,400 Fut. Base) vehicles/hr in pk direction ^ Serves major regional shopping centre & significant planned growth ^ Serves north UofS campus and research park
Recommendation	NOT RECOMMENDED	PREFERRED OPTION

● HIGH ◐ MODERATE ○ LOW

Table A.03 - Evaluation of Alternative East Side Red Line Routing

Table A.03 summarizes the assessment of the relative land use, ridership and roadway suitability of each corridor for rapid transit. In terms of land use patterns, the Preston / Attridge routing offers greater potential for rapid transit based on existing employment and future potential transit-oriented growth than Central Avenue. In the long-term, potential ridership along the Central / 115th Street route is projected to be moderately lower than Preston / Attridge route.

When comparing roadway suitability, Preston / Attridge routing also rates higher. The constrained right-of-way and impact of rapid transit on parking would increase the impacts of rapid transit along Central Avenue and 115th Street. In comparison, rapid transit could generally be accommodated within the right-of-way along Preston Avenue and Attridge Drive with potential widening in some locations. Based on these factors, the Attridge / Preston routing is recommended as the preferred rapid transit corridor on the east side connecting University Heights to College Drive nearby the University.

Part 3 - Optional Configurations and Evaluations

As indicated in the following figure, there are three types of bus lane configurations available for consideration in Saskatoon: curbside, centre and side bus-only lanes. As indicated in the Technical Report, centre and side running lanes are more costly than curbside lanes. Curbside lanes can be implemented in stages, for select periods and directions to ultimately becoming bus-only lanes throughout the day and week. Ultimately, centre and side running lanes will be required to accommodate long-term conversion to LRT. These laning configurations are illustrated in **Figure A.06.**

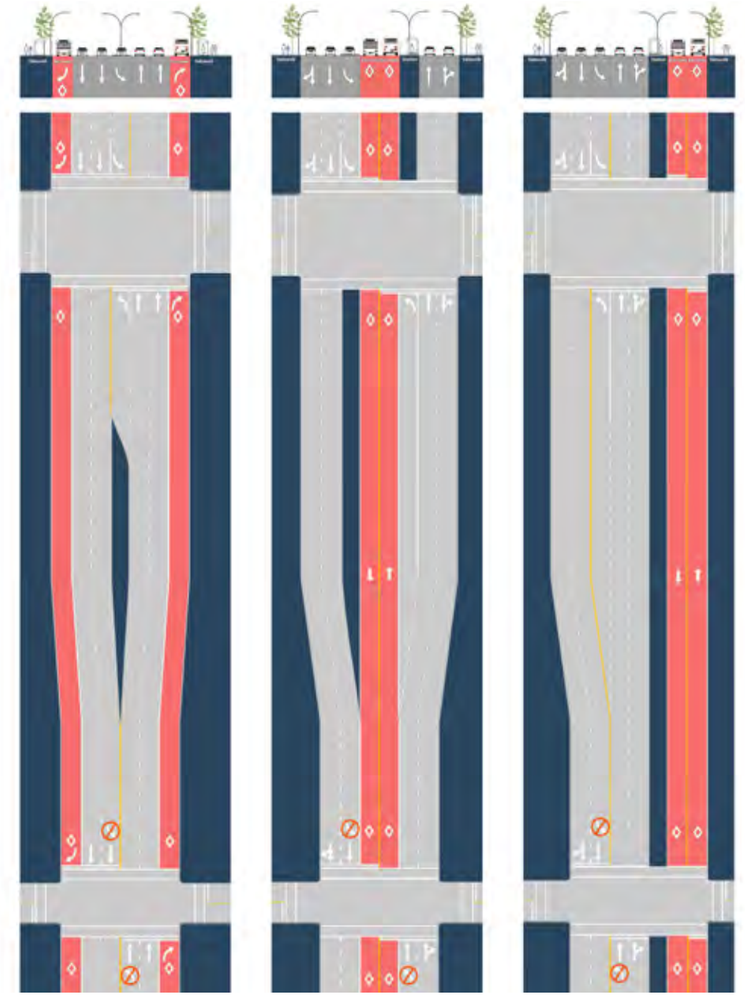


Figure A.06 - Alternative BRT Laning Configurations (6 Lane Road)

A high level evaluation framework is used to highlight and compare the qualitative and quantitative costs, impacts and benefits of each configuration for each corridor segment of the Red Line BRT. At this level, the evaluation framework is really intended to provide an overview of the requirements for each facility, to highlight the benefits and impacts and to provide stakeholders with a comparative evaluation of the dedicated bus lane options. Further planning and design will be required to implement specific configurations and station locations. In the long-term, the actual configurations may shift from curb to centre or side facilities as services and ridership grow and sufficient rights-of-way are acquired along each of the corridors (particularly at station areas).

The following section describes the three accounts examined within this review, along with related measures.

A

- The transport account considers the impacts and benefits of a proposed concept on the transportation system that include, but are not limited to, the transit system, traffic circulation and conditions, bicycle and pedestrian facilities as well as parking where applicable. The specific measures and assumptions are briefly summarized below:
  - Peak transit travel time reductions (minutes) relative to a business-as-usual condition using model conditions with half a million people.
  - Transit operation in terms of shared or exclusive bus only and traffic access.
  - Period of operation where bus only designation may either be flexible for peak periods only or permanent operation 24 hours a day, 7 days a week.
  - Roadway width change required to support bus only lanes.
  - Travel lane changes for general purpose traffic if impacted.
  - On-street parking impacts where removal / relocation of on-street parking may be required.
  - Side street and driveway access changes to adjacent properties where impacted.

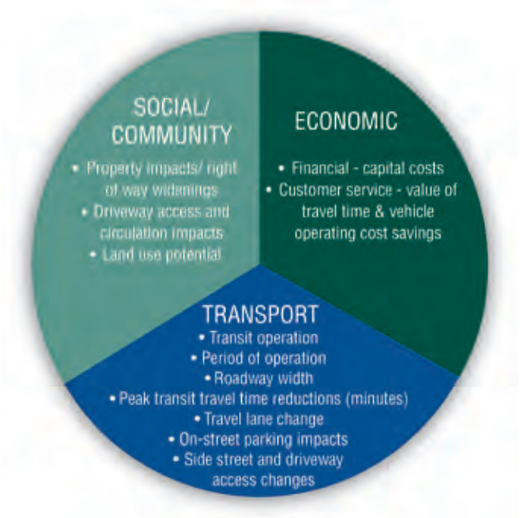


Figure A.07 - Evaluation Framework

- The social account including any impacts on right-of-way, driveway access, and any impacts or benefits to surrounding land uses along the corridor.
- The financial account highlights the overall monetary benefits and costs of each concept. Conceptual costs are estimated based on a linear estimate of the specific configuration based on industry experience in other cities ($2.0-$3.0 million per kilometre for curb bus lanes and $15-$20 million per kilometre for centre or side bus lanes). Structural works at interchanges or railroad grade separation are assessed at $35 million each. The travel time savings for transit passengers and transit operations with dedicated bus lanes are identified in comparison to a service level without dedicated bus lanes. The present values of the benefits and costs are calculated with the following standards generally used for business cases:
  - Travel time benefits are calculated based on a $19/hour value of time. This value of time figure is tied to an $80,010 average household income for Saskatchewan.
  - Transit operating savings are estimated based on a $90/hour value of time for the operator.
  - PM peak hour travel time savings are multiplied by a factor of 6 to represent weekday travel time savings. This approach accounts for two hours of peak conditions in the AM and PM periods as well as lesser degrees of travel time savings throughout the rest of the day. Regardless of configuration, dedicated bus lanes are assumed to ultimately be in operation all the time.
  - While it is recognized that travel time savings will likely occur on weekends as well as weekdays, to be conservative, annual travel time savings are calculated to reflect weekdays only (i.e. daily travel time savings are multiplied by 260 weekdays in a calendar year).
  - The economic evaluation is calculated over a 25 year term for the entire corridor from Blairmore to University Heights and Holmwood. The evaluation assumes an opening year of 2020. A discount rate of 6% is used for the purpose of the economic analysis.

A) 22ND STREET (BLAIRMORE TO 3RD AVENUE)

The segment of 22nd Street between Blairmore and 3rd Avenue extends approximately 6.6 km and includes both rural and urban roadway cross-sections (see **Figure A.08**, below). The 22nd Street corridor generally consists of three travel lanes per direction west of Confederation Drive and three lanes east through to 3rd Avenue. West of Circle Drive, the right-of-way ranges anywhere from 80 metres to 100 metres and connections to 22nd Street are limited to major roadways. East of Circle Drive, the right-of-way is approximately 30 metres to 32 metres with multiple side streets and driveway accesses throughout much of the corridor. On-street parking is limited to the north and south sides of 22nd Street between 1st Avenue to 3rd Avenue (approximately 40 stalls).

Table A.04 provides a comparative assessment of the feasible configurations for the 22nd Street corridor. As indicated, both curbside and centre bus lanes are feasible along 22nd Street. Side running lanes are not feasible as they would restrict driveway access along one side of the corridor.

Curbside lanes cost about $13.2 million to construct and reduce long-term transit travel times by 12 minutes in the peak direction, resulting in approximately $56.2 million of passenger travel time and system operation cost savings over 25 years. Curbside lanes broadly support current land use patterns and the potential for higher intensity uses along the corridor. It should be noted curbside bus-only lanes would generally be considered an interim condition, and that rail grade-separation along 22nd Street would not be a reasonable cost.

Figure A.08 - 22nd Street BRT Corridor

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	Curbside Bus Lanes	Centre Bus Lanes
		
TRANSPORT	○	●
PEAK TRANSIT TRAVEL TIME	12 minute reduction	19 minute reduction
TRANSIT OPERATION	Some shared lane sections	Exclusive bus only lanes
PERIOD OF OPERATION	Flexible based on demand (peak/all day)	24 hours, 7 days a week
ROADWAY WIDTH	Widen shoulder and no urban road change	Widen shoulder and roadway
TRAVEL LANES	Remove 1 travel lane/direction east of Confederation	Remove 1 travel lane/direction east of Confederation
ON-STREET PARKING	On-street parking removed (1st to 3rd)	On-street parking removed (1st to 3rd)
SOCIAL/COMMUNITY	●	○
RIGHT-OF-WAY WIDENING	No change required	Widen near major intersections/ stations (through redevelopment)
STREET /DRIVEWAY ACCESS	No impacts	Driveways limited to right-in/ right-out
LAND USE POTENTIAL	Supports current land use patterns and potential for change	Promotes change to transit-oriented land use patterns
FINANCIAL	●	○
CLASS D CAPITAL COST	$13,200,000	$119,000,000
CAPITAL COST (PV)	$9,900,000	$88,900,000
TRANSIT TRAVEL TIME SAVING	$51,700,000	$88,900,000
TRANSIT OPERATING	$4,500,000	$8,000,000
SUMMARY	Short-term Potential	Long-term Potential

○ LOWER BENEFIT OR HIGHER IMPACT ◐ SIMILAR BENEFIT / IMPACT ● HIGHER BENEFIT OR LOWER IMPACT

Table A.04 - 22nd Street Bus Lane Configuration Assessment

Centre bus lanes cost approximately $119 million to construct, including allowances for grade-separation at the railroad crossing. Centre bus lanes would reduce future transit travel times through the segment by 19 minutes in the peak direction, resulting in $97.9 million of passenger travel time and system operation cost savings over 25 years (1.7 times the savings generated by curbside facilities). As permanent transit facilities, centre lanes promote an evolution to transit-oriented land use patterns along the corridor.

Inside Circle Drive, general purpose travel lanes would need to be converted to bus lanes for all running way configurations due to the constrained right-of-way and established land uses surrounding the corridor. Curbside bus lanes would operate with shared right-turn traffic and could potentially accommodate high-occupancy vehicles (HOVs) of three or more passengers as transit service and ridership grows. Additionally, curbside lanes could operate on a part-time or peak-only basis, allowing the lane space to revert back to general purpose or parking use during off-peak periods. As road widening and additional rights-of-way are required at station areas for centre bus lanes, this configuration could not be implemented without significant cost or redevelopment and is therefore considered a long-term possibility. Curb lanes may be implemented in the short-term in the areas of highest congestion. The right-of-way for a centre bus lane configuration and station areas should be preserved for the long-term provision of centre lane operations and possible conversion to LRT.

B) 3RD AVENUE (22ND STREET TO 25TH STREET)

This section of 3rd Avenue would accommodate most bus services through the Downtown area, including both the Red Line (east-west) and Blue Line (north-south service) rapid transit services. Unlike the DART routes and other bus services operating through the core area today, most city-wide services would travel through the downtown without a layover. In the long-term, it is anticipated that this section of 3rd Avenue could accommodate more than 50 buses per hour per direction in the peak. Stations may be equipped with significantly longer platforms to permit multiple or staggered stop areas along the curb or in the centre of the road in order to limit delays and queuing.

Figure A.09 - 3rd Avenue BRT Corridor

This candidate BRT corridor extends approximately 600m and would include two station areas at the south and north ends of the segment—north of 22nd Street and south of 25th Street. The 3rd Avenue corridor currently supports two travel lanes in each direction with turn lanes at intersections and parking on both sides of the street (approximately 70 stalls). The roadway is 23 metres wide within a 30 metre right-of-way.

Table A.05 (following page) provides a comparative assessment of the configurations for the 3rd Avenue corridor. Curbside, centre and side lane configurations are feasible along 3rd Avenue. Curbside lanes cost about $1.2 million to construct and are projected to reduce long-term transit travel times modestly, resulting in $10.7 million of passenger travel time and system operation cost savings over 25 years. Curbside lanes support Downtown land use patterns and allow buses to pass one-another in adjacent general purpose lanes.

Centre or side bus lanes cost about $9 million to construct. Centre or side lanes reduce future transit travel times through the segment by 2.5 minutes in the peak direction, resulting in $26 million of passenger travel time and system operation cost savings over 25 years. These savings are 2.4 times the savings generated by curbside facilities. As permanent transit facilities, centre or side lanes can be designed to support a pedestrian environment and to transform land use patterns in the immediate area.

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Criteria	Curbside Bus Lanes	Centre OR Side Bus Lanes
		
TRANSPORT		
PEAK TRANSIT TRAVEL TIME	1 minute reduction	2.5 minute reduction
TRANSIT OPERATION	^ Shared with right turning vehicles ^ Allows for bus bypass in general purpose lanes	Exclusive bus only lanes
PERIOD OF OPERATION	Flexible based on demand (peak/all day)	24 hours, 7 days a week
ROADWAY WIDTH	No change required	No change required
TRAVEL LANES	Remove 1 travel lane/direction	Remove 1 travel lane/direction
ON-STREET PARKING	On-street parking removed (2 sides)	On-street parking removed (2 sides)
SOCIAL/COMMUNITY		
RIGHT-OF-WAY WIDENING	No change required	No change required
STREET /DRIVEWAY ACCESS	No impacts	^ **Centre**: Limited movement to right-in/right-out (laneways) ^ **Side**: Limited impacts if implemented on east side
LAND USE POTENTIAL	Supports Downtown land use patterns	Supports Downtown land use patterns and promotes increased focus near transit
FINANCIAL		
CLASS D CAPITAL COST	$1,200,000	$9,000,000
CAPITAL COST (PV)	$900,000	$6,700,000
TRANSIT TRAVEL TIME SAVING	$9,100,000	$22,600,000
TRANSIT OPERATING	$1,600,000	$4,000,000
SUMMARY	Short-term Potential	Short-term Potential

○ LOWER BENEFIT OR HIGHER IMPACT ◖ SIMILAR BENEFIT / IMPACT ● HIGHER BENEFIT OR LOWERIMPACT

Table A.05 - 3rd Avenue Street Bus Lane Configuration Assessment

Each of the configurations would include converting one travel lane in each direction. Although minimal or no change would be required to the roadway or right-of-way width, some on-street parking would be removed to accommodate BRT station activity. A west side running lane configuration would impact laneway access along 3rd Avenue. Only one parking lot, which can be alternately accessed, is affected if side running lanes are implemented on the east side.

Although the impacts of each configuration are comparable, the curb lane BRT configuration allows for use of bypass lanes for buses around BRT stations in areas of the system where passenger boarding and alighting activity will be significant. A curb lane operation is the preferred technical option for a bus-based system in order to make best use of limited street space and to maximize capacity for the BRT operation.

C) 25TH STREET / UNIVERSITY BRIDGE / COLLEGE DRIVE

The 25th Street and College Drive portion of the Red Line BRT corridor through the Downtown and University areas is approximately 2.7 kilometres long as illustrated in **Figure A.10**. This section of the BRT system will accommodate 30 to 40 buses per hour in the peak direction and significant passenger activity at West Campus stations within the University area.

25th Street has two through travel lanes per direction and a centre median lane, with no parking on either side. Driveways and laneway accesses are restricted to right-in / right-out only movements today. Within the Downtown area, 25th Street is approximately 21 metres wide within a right-of-way of 30 metres. The University Bridge itself supports four travel lanes and is 13 metres wide. East of the river to Cumberland Avenue, College Drive widens to three lanes per direction and includes a centre median, with no on-street parking. Driveway and side street accesses are present, particularly along the south side of the street. The roadway width between Clarence Avenue and Cumberland Avenue is 25 metres and the right-of-way is 32 metres. Between Cumberland Avenue and Preston Avenue, the road width and right-of-way is anywhere from 30 to 60 metres.

Table A.06 and **A.07** provide a comparative assessment of the feasible configurations for the 25th Street / University Bridge as well as the College Drive corridor configurations, respectively. These results indicate that curbside and centre lanes are feasible along 25th Street and the University Bridge. Side running facilities are deemed unfeasible as bridge widening would be required to separate bus lanes for a side running configuration. The City's structural engineers indicated that the deck could not be widened to support the additional space required for separating bus only lanes. Additionally, side running facilities would also restrict driveway access to properties along 25th Street. All three configurations are feasible east of Clarence Avenue on College Drive.

Unlike centre or side running facilities which are permanent, curbside bus lanes operate with shared right-turn traffic and could potentially accommodate high occupancy vehicles (HOVs) of three or more passengers as transit service and ridership grows. Additionally, curbside lanes could operate on a part-time or peak-only basis, allowing the lane space to revert back to general purpose use during off-peak periods.

Between 3rd Avenue and Clarence Avenue, curbside lanes cost about $3.8 million to construct and reduce future condition transit travel times by 9 minutes in the peak direction, resulting in $57.7 million of passenger travel time and system operation cost savings over 25 years. By contrast, centre bus lanes cost $28.8 million, 7.5 times the cost of curbside lanes, and reduce future condition transit travel times by 13 minutes, resulting in 25 year travel time and operations cost savings of $93.1 million. Both curbside and centre lanes require the conversion of one general purpose travel lane per direction and do not require widening of the right-of-way. Both curbside and centre lanes are identified as long-term options that are dependent on the provision of additional vehicle capacity across the South Saskatchewan River.

Between Clarence and Preston Avenues, curbside lanes cost about $3.2 million to construct and reduce future transit travel times by 3 minutes in the peak direction, resulting in $20.6 million of passenger travel time and system operation cost savings over 25 years. By contrast, centre or side running lanes cost $24 million, 7.5 times the cost of curbside lanes, and reduce future transit travel times by 5 minutes, resulting

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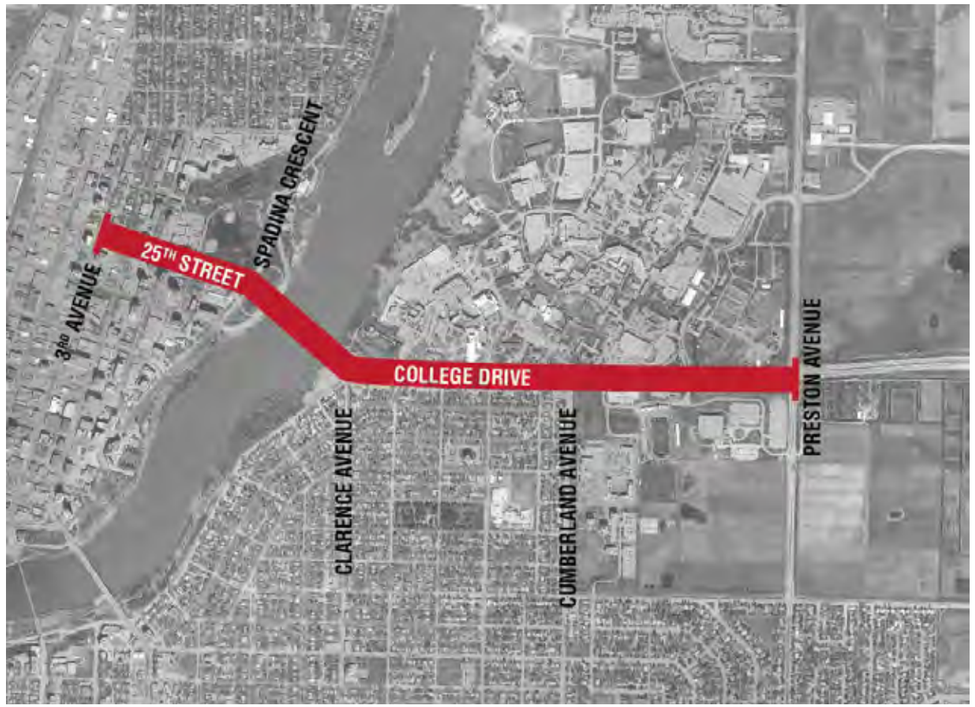

Figure A.10 - 25th Street and College Crive BRT Corridor

in 25 year travel time and operations cost savings of $47.7 million. North side running facilities require roadway modifications near stations and moderate right-of-way takings but fully integrate transit onto the University campus, separating transit passengers from busy College Drive and promoting the centrality of transit on campus. Because significant coordination with the University would be required, both centre or side bus lane configurations are considered medium-term possibilities. Curb bus lanes are considered a short-term option for implementation.

Criteria	Curbside Bus Lanes	Centre Bus Lanes
		
TRANSPORT	○	●
PEAK TRANSIT TRAVEL TIME	9 minute reduction	13 minute reduction
TRANSIT OPERATION	Shared with right turning vehicles	Exclusive bus only lanes
PERIOD OF OPERATION	Flexible based on demand (peak/all day)	24 hours, 7 days a week
ROADWAY WIDTH	No change required	No change required
TRAVEL LANES	Remove 1 travel lane/direction	Remove 1 travel lane/direction
ON-STREET PARKING	No on-street parking	No on-street parking
SOCIAL/COMMUNITY	◖	◖
RIGHT-OF-WAY WIDENING	No change required	No change required
STREET /DRIVEWAY ACCESS	No impacts	No impacts
LAND USE POTENTIAL	Supports Downtown land use patterns	Supports Downtown land use patterns
FINANCIAL	◖	◖
CLASS D CAPITAL COST	$2,200,000	$16,500,000
CAPITAL COST (PV)	$1,600,000	$12,300,000
TRANSIT TRAVEL TIME SAVING	$49,900,000	$80,600,000
TRANSIT OPERATING	$7,800,000	$12,500,000
SUMMARY	Short- and Long-term Potential	Short- and Long-term Potential

○ LOWER BENEFIT OR HIGHER IMPACT ◖ SIMILAR BENEFIT / IMPACT ● HIGHER BENEFIT OR LOWER IMPACT

Table A.06 - University Bridge / 25th Street Bus Lane Configuration Assessment

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Criteria	Curbside Bus Lanes	Centre OR Side Bus Lanes
		
TRANSPORT	○	●
PEAK TRANSIT TRAVEL TIME	3 minute reduction	5 minute reduction
TRANSIT OPERATION	Shared with right turning vehicles	Exclusive bus only lanes
PERIOD OF OPERATION	Flexible based on demand (peak/all day)	24 hours, 7 days a week
ROADWAY WIDTH	No change required	Moderate widening required at stations
TRAVEL LANES	Remove 1 travel lane/direction	Remove 1 travel lane/direction
ON-STREET PARKING	No impacts	No impacts
SOCIAL/COMMUNITY	○	●
RIGHT-OF-WAY WIDENING	No change required	Moderate widening required
STREET /DRIVEWAY ACCESS	No impacts	Driveway access removed
LAND USE POTENTIAL	Supports existing land use patterns	Fully integrates transit on the U of S campus
FINANCIAL	○	●
CLASS D CAPITAL COST	$3,200,000	$24,000,000
CAPITAL COST (PV)	$2,400,000	$17,900,000
TRANSIT TRAVEL TIME SAVING	$18,300,000	$41,900,000
TRANSIT OPERATING	$2,300,000	$5,800,000
SUMMARY	Short- and Long-term Potential	Medium- and Long-term Potential

○ LOWER BENEFIT OR HIGHER IMPACT ◖ SIMILAR BENEFIT / IMPACT ● HIGHER BENEFIT OR LOWER IMPACT

Table A.07 - College Drive Bus Lane Configuration Assessment

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D) PRESTON AVENUE – ATTRIDGE DRIVE (COLLEGE DRIVE TO MCORMOND DRIVE)

The Preston Avenue – Attridge Drive portion of the BRT route (from College Drive through Preston Crossing to University Heights Suburban Centre at McOrmond Drive) is approximately 5.7 KM in length, as illustrated below in **Figure A.11.**

Both Preston Avenue and Attridge Drive support two through travel lanes per direction and a centre median, with no parking on either side. While the 36 metre to 50 metre rights-of-way generally support widening for transit lanes, the Preston Avenue segment is constrained by a significant above ground hydro corridor along the east side of the road to the south of 108th Street, and along the west side of the road south to the north of 108th Street. The most significant constraint for any BRT configuration in the corridor is the grade-separated interchange at Circle Drive.

Figure A.11 - Preston Avenue and Attridge Drive BRT

As indicated in Table A.08, curbside lanes cost about $11.4 million to construct and reduce future transit travel times by 8 minutes in the peak direction, resulting in $16.1 million of passenger travel time and system operation cost savings over 25 years. Curbside lanes support current land use patterns and the potential for higher intensity uses along the corridor. It should be noted curbside bus-only lanes would generally be considered an interim condition, and that rail grade-separation along Preston Avenue would not be a reasonable cost.

Centre or side-running facilities cost about $125.5 million to construct, and include grade separation at the railroad crossing and allowances for structural modifications at the Circle Drive interchange. Centre

or side running facilities reduce future condition transit travel times through the segment by 13 minutes in the peak direction, resulting in $27.9 million of passenger travel time and system operation cost savings over 25 years. These savings are 1.7 times the savings generated by curbside facilities. As permanent transit facilities, centre lanes promote an evolution to transit-oriented land use patterns along the corridor.

Criteria	Curbside Bus Lanes	Centre OR Side Bus Lanes
TRANSPORT	○	●
PEAK TRANSIT TRAVEL TIME	8 minute reduction	13 minute reduction
TRANSIT OPERATION	Some shared lane sections	Exclusive bus only lanes
PERIOD OF OPERATION	Flexible based on demand (peak/all day)	24 hours, 7 days a week
ROADWAY WIDTH	Moderate widening required	Significant interchange reconfiguration
TRAVEL LANES	^ Remove 1 EB lane Preston Crossing to Circle Drive ^ WB queue jumper lane at Circle Drive interchange	Remove 1 EB lane Preston Crossing to Circle Drive
ON-STREET PARKING	No impacts	No impacts
SOCIAL/COMMUNITY	○	●
RIGHT-OF-WAY WIDENING	No change required	No change required
STREET /DRIVEWAY ACCESS	No impacts	No impacts
LAND USE POTENTIAL	Supports current land use patterns and potential for change	Supports change to transit oriented land-use patterns
FINANCIAL	◐	◐
CLASS D CAPITAL COST	$11,400,000	$125,500,000
CAPITAL COST (PV)	$8,500,000	$93,800,000
TRANSIT TRAVEL TIME SAVING	$14,900,000	$25,800,000
TRANSIT OPERATING	$1,200,000	$2,100,000
SUMMARY	Short- and Long-term Potential	Long-term Potential

○ LOWER BENEFIT OR HIGHER IMPACT ◐ SIMILAR BENEFIT / IMPACT ● HIGHER BENEFIT OR LOWER IMPACT

Table A.08 - Preston Avenue and Attridge Drive Bus Lane Configuration Assessment

Each configuration would require moderate to significant road widening along the corridor and some lane reallocations between Preston Crossing and Circle Drive. Along Preston Avenue, all BRT configurations will require roadway widening. Both centre and side bus lane configurations involve significant geometric changes at the Circle Drive interchange including modified loop ramps and approaches. A new structure north of the existing bridge over Circle Drive would be required to accommodate a side bus lane configuration. Curb lanes could simply merge with general purpose traffic through the interchange so as to manage overall project costs. Because of extensive widening and costs at the Circle Drive interchange, both centre or side bus lane configurations are reserved as long term possibilities. Curb bus lanes are considered a short- to medium-term option for implementation.

E) PRESTON AVENUE (COLLEGE DRIVE TO 8TH STREET)

The Preston Avenue portion of the BRT route from College Drive to 8th Street is approximately 1.6 kilometres in length as illustrated in **Figure A.12**. Between College Drive and 14th Street, Preston Avenue supports two travel lanes per direction and a centre median, with no parking on either side or driveway accesses. The roadway is generally 24 metres wide within a 33 metre right-of-way. Widening the roadway for BRT lanes is constrained by a transmission corridor on the east side of the road. South of 14th Street, the character of Preston Avenue changes significantly with single and multi-family homes as well as driveways and on-street parking on both sides of the street. South of 14th Street, the transmission line shifts to the centre median area. Between 8th Street and 14th Street, Preston Avenue is slightly narrower, with 20 metre and 30 metre roadway and right-of-way widths, respectively.

Figure A.12 - South Preston Avenue BRT Corridor

As summarized in **Table A.09**, only curb bus lanes are feasible through this section of the Red Line rapid transit corridor. Centre bus lanes are not feasible due to the transmission line, and side lanes would require the removal of driveway and side street access between 8th Street and 14th Street. Side running facilities can only be accommodated with changes to the adjacent land uses.

Curbside lanes cost about $5.6 million to construct and reduce future transit travel times by 7 minutes in the peak direction, resulting in $27.1 million of passenger travel time and system operation cost savings over 25 years. Curb lanes would require minor road widening and removal of on-street parking between 14th Street and 8th Street. Parking could be restricted in the peak directions only during the morning and afternoon, allowing for the retention of on-street parking between 14th Street and 8th Street during off-peak periods and directions. No change would be required to the existing right-of-way along the entire length of the segment. Curbside lanes are identified as the preferred short and long-term configuration for Preston Avenue.

Criteria	Curbside Bus Lanes (Only Option)
TRANSPORT	
PEAK TRANSIT TRAVEL TIME	7 minute reduction
TRANSIT OPERATION	Some shared lane sections
PERIOD OF OPERATION	Flexible based on demand (peak/all day)
ROADWAY WIDTH	Moderate widening required between College Drive and 14th Street
TRAVEL LANES	No change required
ON-STREET PARKING	On-street parking removed south of 14th Street (peak or permanent)
SOCIAL/COMMUNITY	
RIGHT-OF-WAY WIDENING	No change required
STREET /DRIVEWAY ACCESS	No impacts
LAND USE POTENTIAL	Disrupts residential parking
FINANCIAL	
CLASS D CAPITAL COST	$3,200,000
CAPITAL COST (PV)	$2,400,000
TRANSIT TRAVEL TIME SAVING	$25,400,000
TRANSIT OPERATING	$1,700,000
SUMMARY	Short- and Long-term Potential

Table A.09 - Preston Avenue (College Drive to 8th Street) Bus Lane Configuration Assessment

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F) 8TH STREET (PRESTON AVENUE TO McORMOND DRIVE)

The 8th Street portion of the Red Line BRT corridor from Preston Avenue to McOrmond Drive is approximately 4.7km in length, as illustrated below in **Figure A.13.** Between Preston Avenue and Boychuk Drive, 8th Street is a six lane roadway with centre median and no on-street parking. The roadway and right-of-way is approximately 28 metres and 40 metres, respectively. This segment of 8th Street has several driveways on both sides of the street, providing access to adjacent commercial properties. East of Boychuk Drive, 8th Street becomes a two lane rural roadway that will eventually serve the Holmwood suburban development area.

Figure A.13 - 8th Street BRT Corridor

Table A.09 provides a comparative assessment of the feasible configurations for the 8th Street corridor. While both curb and centre running lanes are feasible, side running facilities would restrict driveway access to properties along 8th Street as well as ramp access at Circle Drive; as such, side running lanes are not recommended.

Curbside lanes cost about $29.8 million to construct and reduce future transit travel times by 2 minutes in the peak direction, resulting in $4.4 million of passenger travel time and system operation cost savings over 25 years. Curbside lanes support current land use patterns and the potential for higher intensity uses along the corridor.

Centre-running facilities cost about $197.8 million to construct, and include grade separation of the railroad crossing east of Boychuk Drive. Centre running facilities reduce future condition transit travel times through the segment by 10 minutes in the peak direction, resulting in $12.8 million of passenger travel time and system operation cost savings over 25 years. These savings are three times the savings generated by curbside facilities. As permanent transit facilities, centre lanes promote an evolution to transit-oriented land use patterns along the corridor. The lower travel time savings relative to other corridors is a result of the higher travel speeds without any changes to the corridor today and forecast for the long-term.

If six general purpose lanes are maintained, curb bus lanes would require moderate roadway widening throughout, but could generally be accommodated within the existing right-of-way. Curb bus lanes would be shared with right-turn vehicles accessing side streets and driveways of adjacent properties. In order to maintain existing laning, significant road widening throughout and moderate right-of-way widening between Preston and Moss Avenue would be required for centre lane operations. In all cases, retaining walls are required at the Circle Drive interchange to increase roadway width under the structure. A wider 8th Street would further reduce the potential of transforming the automobile character and land use patterns of the corridor.

Because of the additional right-of-way required if six general purpose travel lanes were retained, a centre lane operation could not be implemented without significant redevelopment and is therefore considered a long-term possibility. As all facilities would be accommodated in new lane space, curb lanes are considered a medium-term implementation option. Short-term implementation possibilities may include localized transit priority improvements at select signals or short curbside lanes in areas of heavy congestion.

Criteria	Curbside Bus Lanes	Centre Bus Lanes
TRANSPORT		
PEAK TRANSIT TRAVEL TIME	2 minute reduction	10 minute reduction
TRANSIT OPERATION	Some shared lane sections	Exclusive bus only lanes
PERIOD OF OPERATION	Flexible based on demand (peak/all day)	24 hours, 7 days a week
ROADWAY WIDTH	Moderate widening required	Significant widening required including below Circle Drive overpass
TRAVEL LANES	^ No change required ^ Lanes must accommodate merging traffic near Circle Drive	No change required
ON-STREET PARKING	No impacts	No impacts
SOCIAL/COMMUNITY		
RIGHT-OF-WAY WIDENING	No change required	Moderate widening required between Preston and Moss Avenues
STREET /DRIVEWAY ACCESS	No impacts	Limited movement to right-in/right-out for minor streets and driveways
LAND USE POTENTIAL	Supports current land use patterns and potential for change	Supports change to transit oriented land-use patterns
FINANCIAL		
CLASS D CAPITAL COST	$29,800,000	$113,500,000
CAPITAL COST (PV)	$22,300,000	$84,800,000
TRANSIT TRAVEL TIME SAVING	$3,800,000	$11,000,000
TRANSIT OPERATING	$600,000	$1,800,000
SUMMARY	Short- and Long-term Potential	Long-term Potential

○ LOWER BENEFIT OR HIGHER IMPACT ◖ SIMILAR BENEFIT / IMPACT ● HIGHER BENEFIT OR LOWER IMPACT

Table A.10 - 8th Street (Preston to Holmwood) Bus Lane Configuration Assessment

Preferably, curbside lanes or centre bus lanes could be accommodated by converting an existing travel lane in each direction to permanent or peak-period only bus lane operation. This would reduce vehicle travel lanes and support the goal of transforming the corridor character and land use patterns.

G) Overall Summary

Although the investments in dedicated bus only lanes along the Red Line BRT corridors are essential to support the projected demands, they also allow transit to bypass areas of recurring congestion and provide significant travel time savings to customers and the system. Depending on the configuration, transit customers could experience up to a 30 minute (curb lane) to 50 minute (centre or side lane) travel time savings in the long-term between Blairmore and University Heights. Reduced delays and increased system reliability on top of improved bus frequencies will dramatically improve the transit customer experience. Additionally, the travel time savings will also benefit the transit system operation with reduced delays and platooning of buses caught in congested areas.

Criteria	Curbside Bus Lanes	Centre or Side Bus Lanes
COST RANGES CLASS D		
CAPITAL COST	$44.2 M - $66.3 M	$387.3 M - $412.3 M
CAPITAL COST (PV)	$33 M - $49.5 M	$289.4 M - $308 M
MAINTENANCE COST	$3.5 M	$3.5 M - $3.6 M
SALVAGE VALUE (20%)	$(6.6 M) - $(9.9 M)	$(57.9 M) - $(61.6 M)
TOTAL COST	$30 M - $43.2 M	$235.1 M - $250 M
SAVINGS		
TRANSIT TRAVEL TIME SAVINGS	$173 M	$297.1 M
TRANSIT OPERATING	$19.7 M	$35.8 M
TOTAL BENEFITS	$192.8 M	$332.9 M
ECONOMIC		
NET PRESENT VALUE	$149.6 M - $162.8 M	$82.9 M - $97.8 M
BENEFIT-COST RATIO	4.5 - 6.4	1.3 - 1.4

Table A.11 - Summary Costs and Benefits of Alternative BRT Configurations

The overall economic evaluation of curb, centre or side running facilities is summarized in **Table A.11**. As indicated, both curb and centre/side BRT configurations will generate a positive net present value and a benefit-cost ratio of greater than 1.0 – meaning all configurations are attractive investments for funding partnerships with local, provincial and federal governments. Curbside lanes are estimated to cost approximately $44 to $66 million, while centre or side bus lane configurations could cost as much as $390 to $410 million.

With an investment period of 25 years, curbside lanes result in a net present value ranging between $150 and $163 million and a benefit-cost ratio ranging from 4.5 to 6.4. Alternatively, centre or side-running lanes have a total lifecycle cost ranging between $235 and $250 million and result in $333 million of travel time and operations benefits over 25 years. The implementation of centre or side lanes (wherever possible) results in a net present value of $83 to $98 million and a benefit-cost ratio ranging from 1.3 to 1.4 over a 25 year term.

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APPENDIX B - PLANNED ROADWAY IMPROVEMENTS

Part 1 - Planned Future Roadway Improvements (all scenarios)

Project	Attributes
Perimeter Highway	4 lanes highway (110km/hr) Interchange type: ■ Half diamond interchange - Highway 11 and Highway 14 ■ Diamond interchange – 8th Street, Highway 5, Highway 41, Central Avenue ■ Cloverleaf Interchange: Highway 11, Highway 12 and Highway 16 (North) Interchange at Highway 16 (south near Rosewood)
Stonebridge Flyover	One off-ramp from Highway 11 SB onto Victor Road and one on-ramp from Victor Road to Highway 11 NB
North Commuter Bridge	6 lanes major arterial (70km/hr)
Boycuk Drive & Highway 16	Interchange at Boychuk Drive and Highway 16
Rosewood Interchange	Interchange at Rosewood Gate and Highway 16
8th Street over CPR	■ Extending 8th Street to Perimeter Highway ■ Diamond interchange at Perimeter Highway
College Drive & McOrmond Drive	Interchange at College Drive and McOrmond Drive
Attridge Drive & Central Avenue	Intersection modification only
McOrmond Drive/Central Avenue/Fedoruk Drive	4 lane major arterial (70km/hr)
Highway 684/Beam Road/Claypool Drive/33rd Street	■ Claypool Dr – 4 lane major arterial controlled access (60km/hr) ■ Highway 684 (up to Claypool Dr) – 4 lane major arterial (60km/hr) ■ 33rd Street – relocation
Traffic Bridge	2 lanes major collector (50km/hr)
Airport Drive & Circle Drive	Interchange
Marquis Drive & Highway 16	Interchange
Marquis Drive & Idylwyld Drive	Interchange

Table B.01 - Planned Future Roadway Improvements (all scenarios)

Source: City of Saskatoon

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