

## "GREEN LINE LRT LONG TERM VISION: 160 AVENUE N TO SETON" EXECUTIVE SUMMARY

Over one million new residents will be welcomed to Calgary and over 500,000 new jobs will be created by 2076. Providing fast, frequent and reliable transit for Calgarians as the city grows, is essential to keep Calgarians moving. The Green Line LRT is Calgary's next light rail transit (LRT) line, and one of The City's top infrastructure priorities.

The "Green Line LRT Long Term Vision: 160 Avenue N to Seton SE" provides a guide for future investments that demonstrates The City's commitment to providing Calgarians with more ways to move around the City and more choices of where they live, work and play.

The long term vision document for the Green Line will provide greater detail on:

- The need for the Green Line
- The benefits of the Green Line for Calgary and its citizens now and into the future
- The four-layered approach of planning the Green Line
- A description of the community context and character areas through which Green Line connects
- How the Green Line integrates with the current transportation network
- The alignment and station locations
- Opportunities for future development and investment
- A strategy for realizing the full vision of the Green Line



"Once the corridor is built out, the Green Line will serve an estimated 240,000 trips per day, connect 10 transit oriented development stations, and provide an affordable service for all Calgarians."

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# Green Line LRT

Long term vision: 160 Avenue N to Seton

**JUNE 2017** 

# **Green Line Vision**

A transit service that improves mobility choices for Calgarians, connecting people and places, and enhancing the quality of life in the city.

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### **FOREWORD**



"In order to ensure that Calgary realizes its full potential as a global city, it is crucial to invest in infrastructure that will not only meet the needs of Calgarians today, but will continue to serve future generations. Green Line LRT is a key investment in the future of Calgary."

- Fabiola MacIntyre, Green Line Manager

On behalf of The City of Calgary Administration I am pleased to present the *Green Line LRT Long Term Vision: 160 Avenue N to Seton.* This document is a result of collaboration across City departments, extensive public engagement and could not become a reality without the support of City Council.

ImagineCalgary, the long range plan for sustainability, outlined a vision of the future of our city, which balanced a vibrant culture and robust economy with a healthy environment. A significant part of that vision centred around a high quality public transit system. The Green Line LRT forms one of the key components of Calgary Transit's future.

The Green Line LRT has been designed to be both a transit system and a platform for development and City Shaping; a system that not only provides efficient service and connections to destinations throughout the city, but creates areas where people can live affordably with access to amenities, services and sustainable mobility options. The long term vision of the program will allow us to invest intentionally now and into the future to ensure that Calgarians have more choices in where they live, work and play and how they move around the city.

Through our public engagement process over the last two years, we have met with thousands of Calgarians who live or travel along the future Green Line LRT route. They have shared their hopes, aspirations and concerns about the program with us, and have inspired a series of stories that are mentioned throughout this report. The stories are meant to illustrate what life could be like in Calgary in the future, once the full Green Line vision is realized.

We are proud of the vision created and are excited to see it through to the next chapter of the Green Line LRT.

Fabiola MacIntyre Green Line Manager

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## **GLOSSARY OF TERMS**

#### Accessibility

The ability to reach a destination by all modes, including walking, wheelchairs, cycling, transit vehicles (buses, light rail transit), private vehicles and commercial vehicles including trucks.

#### **Built out Green Line**

New population and jobs forecast for the year 2076 in place at all Green Line Stations

#### **Character Areas**

A classification of municipal areas based on a combination of urban form. landscape, biodiversity, geodiversity and economic diversity.

#### Charrette

An intense, collaborative community design event that productively engages diverse community stakeholders and urban design experts, typically completed in a week or less.

#### City Shaping

Investing in people, places, programs and reliable multi-modal transportation, that will enhance the way our citizens live, work, play and move.

#### **Complete Streets**

Adopted by Calgary City Council in 2014, the Complete Streets design guide creates a new selection of multi-modal streets that emphasize walking, cycling and transit, incorporate elements of green infrastructure and function in the context of surrounding land uses.

## Direct jobs

Jobs which are required to construct the project (construction/on-site jobs)

#### District energy

District energy systems produce steam, hot water or chilled water at a large central plant. The steam, hot water or chilled water is then piped underground to individual buildings for space heating, domestic hot water heating and air conditioning. As a result, individual buildings served by a district energy system do not need their own boilers, furnaces, or air conditioners.

#### Four-layered approach

The four layer planning approach is the strategy for delivering the Green Line long term vision. This approach illustrates the complexity and interdependence of transit infrastructure (Layer 1), connections to stations (Layer 2), land use planning (Layer 3), and city shaping (Layer 4), all contributing to more accessible, complete and vibrant communities.

#### Fully constructed Green Line

In accordance with RouteAhead the full 46 km of Green Line LRT, from 160 Ave N to Seton is assumed to be built over 30 years (~2043).

## Green Line Urban Integration (GLUI)

A set of guiding principles and a framework for design development that also helps communicate how the Green Line LRT will fit within communities.

#### Indirect jobs

Supporting jobs which supply goods and services to the construction industries (suppliers and manufacturers)

Consumer related jobs (e.g. food and entertainment providers) created as a result of increased household income from the direct and indirect jobs.

The ability to move from place to place by a variety of travel modes including walking, cycling, transit and automobile.

#### Neighbourhood hubs

A gathering centre of a community to foster greater local activities and connections between residents, businesses and organizations.

#### Primary Transit Network

The network of fast, frequency and reliable transit service, that operates every 10 minutes or better, 15 hours per day, seven days per week.

#### Station access priorities

Identifies the modes of transportation for each station that will increase transit ridership at the station the most, based on how favourable the station area is for walking, cycling or transit. Station access is a priority for the automobile at all park and ride sites.

#### Transit hubs

A major transit station, typically serving many transit routes, that enables the efficient transfer of people between major intersecting transit services.

#### Transit Oriented Development (TOD)

Redesigning neighbourhoods around transit stations so that a wide range of uses is within a short walk of the station; the area's streets, businesses and public places attract people and activity; and where owning a car is an option, not a necessity.

### **Urban Corridor**

Designated areas of high job and population growth, identified in the Calgary Municipal Development Plan, they are multi-modal streets located in strategic areas and linked city-wide by the Primary Transit Network.

## Abbreviations

ASP: Area Structure Plan

BRT: Bus Rapid Transit

CTP: Calgary Transportation Plan

GLUI: Green Line Urban Integration

LRT: Light Rail Transit

LRV: Light Rail Vehicle

MDP: Municipal Development Plan

MSF: Maintenance and Storage Facility

PTN: Primary Transit Network

## Report limitations

The Green Line LRT Long Term Vision: 160 Avenue N to Seton is intended to guide design and future investments towards achieving the vision over time. The vision may be amended as design advances, as community context changes over time, and can be informed by further public engagement, or as

Renderings shown throughout the report are for illustrative purposes to provide the context of the Green Line station areas, future potential development, and to contrast the station areas today and the conceptual fully constructed or built

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## HOW TO USE THIS DOCUMENT

The "Green Line LRT: Long term vision: 160 Avenue N to Seton" document is a holistic guide for future investments towards transforming communities along the Green Line LRT corridor considering people, places, and programs and connected by reliable transit.

This document like other City of Calgary visionary documents provides specific goals and directions for the transformation of the Green Line corridor. Aligned with The City's long term vision to support growth and to develop sustainable communities, a focused plan is required. The "Green Line LRT: Long term vision: 160 Avenue N to Seton" is the plan based on measurable and evidence based targets. Realizing the vision for the Green Line LRT will take decades, partnerships, and strategic investments. This document will guide Calgary over the course of the implementation until the infrastructure is fully constructed and the development is built out, providing the following outcomes:

- Certainty of a fast, frequent, and reliable transit by setting the alignment and stations;
- Identification of the missing links to connect the stations to the neighbouring community and complemented by multimodal options for the corridor;
- Concepts and development targets for the most viable station sites for Transit Oriented Development over the next 30 years; and
- Identification of targets and opportunities for coordinating investments for the people who will live, work, play and move along the corridor.

Forming the holistic long term vision are a series of focused documents, "Laying the tracks for delivering the Green Line LRT". Each document below represents an individual layer in the four layer program approach, they are intended to be read alongside each other forming a compendium of documents.



Figure A: "Laying the tracks for delivering the Green Line LRT"

Green Line LRT Long Term Vision: 160 Avenue N to Seton



# Introduction

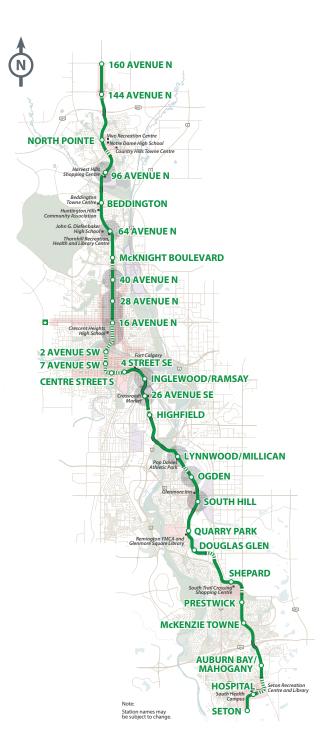
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## INTRODUCTION

"Once the corridor is built out, the Green Line will serve an estimated 240,000 trips per day, connect 10 transit oriented development stations, and provide an affordable service for all Calgarians."

Over one million new residents will be welcomed to Calgary and over 500,000 new jobs will be created by 2076. Providing transit for Calgarians today and into the future as the city grows, is essential to keep Calgarians moving. The Green Line LRT is Calgary's next light rail transit (LRT) line, and one of The City's top infrastructure priorities.

The Green Line is firmly embedded in Calgary's plan for the future. The Calgary Transportation Plan (2009) and RouteAhead (2013) include the Green Line as a priority LRT line to be built in Calgary. However, shaping our city to welcome growth along the Green Line LRT requires a plan. The "Green Line LRT Long Term Vision: 160 Avenue N to Seton SE" provides a guide for future investments to demonstrate our readiness for delivery and our commitment to a common vision. This long term vision has intentionally considered transit oriented development (TOD) and City Shaping, adjusting the transit line and station locations to maximize their potential for ridership and accessibility. Calgarians in all walks of life for generations to come will benefit by connecting people to programs, spaces and places they care about.



Green Line LRT Long Term Vision: 160 Avenue N to Seton

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Green Line LRT Long Term Vision: 160 Avenue N to Seton



# Background

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## ALIGNMENT WITH CITY POLICIES

## "Mobility is the lifeblood of a city." - RouteAhead

Since 1909, Calgary Transit has been efficiently connecting people and places by providing mobility and accessibility.

Delivery of the Green Line LRT program is a key part of realizing the Council approved, land use and transportation plans for the Calgary region. The primary planning and policy documents that guide the delivery of Calgary Transit service in general, and the Green Line LRT program in particular, are imagineCALGARY, the Municipal Development Plan (MDP), Calgary Transportation Plan (CTP) and RouteAhead.



In 2005, imagineCALGARY engaged over 18,000 Calgarians to help create a 100-year vision for Calgary, *imagineCALGARY Plan for Long Range Urban Sustainability*.

In 2007, City Council directed creation of a land use and transportation plan to align with *imagineCALGARY*. The process was called *Plan It Calgary*, to accommodate another 1.3 million people in Calgary over the next 60 years.





*Plan It Calgary* designed for 30 and 60 years into the future, leading to the creation of the *Municipal Development Plan (MDP)* and the *Calgary Transportation Plan (CTP)* in 2009.

One of the most important initiatives of the *MDP* and *CTP* is the emphasis on fast, frequent, accessible and well connected transit service along select corridors where the highest population and job densities occur, referred to as the *Primary Transit Network (PTN)* and is further defined as transit service at least every 10 minutes, 15 hours per day, all week long. All BRT routes and LRT lines, including the Green Line LRT, are part of the PTN.





In 2013, *RouteAhead*, a long term plan to guide Calgary Transit operations and investments over the next 30 years, was approved by Council. *RouteAhead* highlights that transit is a valued service that contributes to the well-being of our citizens and our community.

Route Ahead focuses on three key areas - *Customer Experience, Network Planning and Financing Transit,* establishing a clear vision for public transportation in Calgary that will assist decision-makers regarding capital and operating budgets, fares and service hours.

Route Ahead 2040 Vision: You can access transit stops and stations easily, whether by foot, bike or, in some locations, by car. The system is accessible to all customers. The Primary Transit Network is fast, frequent and reliable. You are able to show up at a stop/station on the Primary Transit Network 15 hours a day, seven days a week and not need a schedule.



A holistic guide for future investment, the *Green Line LRT Long Term Vision: 160 Avenue N to Seton* provides a plan for implementation meeting the objectives of the vision documents before it.



## **ASSESSING THE NEEDS OF CALGARY**

Calgary will continue to grow, attracting new citizens, visitors, business and talent to the city. There are two major contributors to increased demand on the city's transit network: population growth and changes in the way people choose to move around the city.

Needs of Calgarians and the city were assessed and based on the expectations of Calgarians and communities, the service and transformation that is required to support the city's growth, and trends and forecasting of future generations and technologies.

In order to meet the needs of a growing and changing population, it is crucial to invest in infrastructure to support future generations of Calgarians. Investments should focus on projects that support sustainable growth and contribute to vibrant, safe, and healthy communities. The decisions made today will shape the future economic, social, environmental and cultural well-being of Calgarians.

## ASSESSING THE NEEDS OF CALGARY



The Green Line is an investment in a more sustainable future for Calgary. It will provide future generations with high quality transit service and will enable people to live and work close to transit, help manage urban sprawl, connecting Calgarians across the city and improve the overall livability and quality of life for citizens. As well as addressing the need for attractive transit options, the Green Line also needs to ensure that the future service:

#### SUPPORTS FUTURE GROWTH

#### **Growing populations**

Today, the southeast is the fastest growing area of the city, with the residential population expected to double in the next 25 years. North Calgary is well-established and a densely populated area, and will continue to grow with over 50,000 new residents anticipated over the next 20 years.

YEAR	POPULATION		GROWTH SINCE 2016	
	NORTH	SOUTHEAST	NORTH	SOUTHEAST
2016	170,000	135,000		
2026	195,000	200,000	15%	48%
2036	225,000	240,000	32%	78%
2046	255,000	275,000	50%	104%
2076	345,000	365,000	103%	170%

Figure 1: Population growth in the north and southeast from 2016 to 2076

## ASSESSING THE NEEDS OF CALGARY



#### **Expected job increases**

The number of jobs along the Green Line route are expected to increase over the long term. There is expected to be over 115,000 new jobs created in north and southeast Calgary over the next 25 - 30 years, creating destinations for thousands of Calgarians. Providing transit to employment hubs located outside the downtown will be key to reducing congestion and pressure on the downtown core, and will provide opportunities for economic diversification by creating affordable and accessible places to do business.

YEAR	JOBS		GROWTH SINCE 2016	
	NORTH	SOUTHEAST	NORTH	SOUTHEAST
2016	40,000	110,000		
2026	55,000	130,000	38%	18%
2036	65,000	150,000	63%	36%
2046	95,000	170,000	138%	55%
2076	110,000	210,000	175%	91%

Figure 2: Job growth in the north and southeast from 2016 to 2076

## **Enabling Transit Oriented Development**

As of 2009 the MDP targets 50% of the future residential growth to TOD and corridor areas. More compact and efficient use of land in combination with mixed land uses will help to create complete communities and reduce urban sprawl.

The efficient use of valuable station area land reduces the need to develop more land area on the periphery of the city.

Higher density development attracts new residents and employees that support facilities and businesses in established communities and ensures community health.

### Creating a more resilient city

High efficiency, high capacity transit is important to the resiliency of the city. LRT trains can respond to planned events such as the Stampede Parade, Flames' games, major concerts as well as unplanned events like severe weather events.

## ASSESSING THE NEEDS OF CALGARIANS



Jane used to take the Route 302 from Douglas Glen to downtown, where she transferred to the Red Line to take the LRT to the U of C. The 302 was often delayed by at-grade freight rail crossings or congestion on Deerfoot Trail and since her classes didn't correspond with the peak period service, her waiting time for the Route 302 could be up to half an hour. Now she can take the frequent and reliable service on the Green Line to 16 Avenue N station and connect to the North Crosstown BRT, which travels to U of C.

#### THE NEED FOR ATTRACTIVE TRANSIT OPTIONS

The growth of the city demands a reliable transit system that keeps pace and offers alternative mode choices. Users expect the transit network to operate on a reliable schedule and provide fast and frequent service connecting Calgarians to destinations they care about. For transit to be an attractive first choice for getting around the city, the Green Line should focus on:

#### Ride time

Provide rapid transit service to Calgarians when compared to the automobile. Currently, it takes over an hour to travel to downtown from Seton by transit, while a similar trip can take as little as 25 minutes by car.

#### Reliability and frequency

Maintaining a reliable and predictable schedule is key to transit users when choosing this mode. Currently, buses travelling on 52 Street SE, Ogden Road SE and Deerfoot are often delayed due to high volume of vehicles commuting on this route. In the near future, the existing Bus Rapid Transit (BRT) routes will no longer be able to maintain reliable service due to a combinations of factors such as traffic congestion and limited network connectivity.

#### **Affordable**

Approximately 13,000 households are within 10 minutes of a planned station today. Currently, car ownership according to CAA is approx. \$9,500 a year. There is a need to provide an alternative for Calgarians who can't afford or choose not to drive.

#### Connections

Calgarians want a choice in how they travel to the destinations that are important to them in a way that's affordable and efficient.

Residents of the surrounding region also commute into Calgary every day. Currently, 45% of workers from Airdrie commute to Calgary daily for work (City of Airdrie Transit Master Plan, June 2016, pg.34). Existing communities most likely to access the Green Line include Airdrie, Crossfield, Chestermere, Strathmore, Okotoks and High River.

Calgary Transit currently sees approximately 10% of the ridership at the terminal LRT stations coming from regional commuters. There is a need to provide additional transportation options for these regional commuters in order to manage demand on the road network as the region grows.

## ASSESSING THE NEED FOR CALGARY



Erica is a five year old girl who lives with her parents and sister Heather in Renfrew. Her dad spends two hours each morning taking Erica to school, Heather to pre-school and Mom to volunteering at Festival Hall in Inglewood. He then heads to his job at Foothills Industrial. With Green Line, Mom can easily take Heather to her pre-school downtown, before using the service to get to Inglewood. Dad can walk Erica to school before taking the Green Line to South Hill to get to work. For Erica and Heather, the Green Line is a part of their daily life and will be their mode of choice for years to come.

#### **RESPONDS TO MOBILITY TRENDS**

Mobility trends in Calgary are changing, showing a shift towards increased transit ridership with periodic fluctuations as a result of changes in the economy. As the population grows and development occurs around stations, more people will chose to live more transit oriented lifestyles.

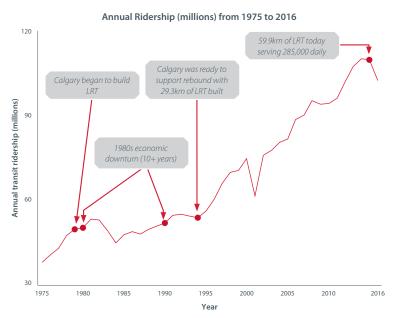


Figure 3: Changes in annual transit ridership from 1975 to 2016

## ASSESSING THE NEED FOR CALGARY



Ken is a senior executive working in the oil industry in downtown Calgary. Now that the Green Line extends to 144 Avenue N, Ken has many options to access the train. When he bikes, he is only a five minute bike ride to the train due to the great new pathways constructed to connect to the station. When he walks, he grabs coffee and the daily paper before boarding the train and uses his commute to catch up on email and keep in touch with his family and friends, allowing more free time at home.

#### SUPPORTS A GROWING ECONOMY

There is a need to invest in transit infrastructure that will play a role in attracting talent to Calgary and contribute to diversification. Good transit service is a factor necessary to attract industries and companies to Calgary as it makes employment centres more accessible to employees.

#### **DEMONSTRATES ENVIRONMENTAL RESPONSIBILITY**

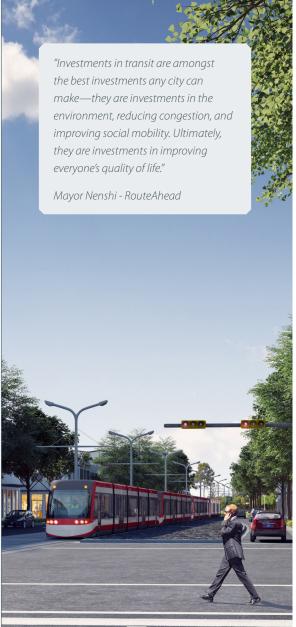
There is a need for investment in transit service that draws on diverse energy sources and reduces carbon emissions. Continued reliance on personal vehicles will increase greenhouse gas emissions. In order to meet environmental targets there is a need to invest in making transit a convenient alternative to the car that contributes to a lower carbon footprint.

### PROMOTES SOCIAL EQUITY AND CULTURAL VIBRANCY

In order to grow as an inclusive and livable city, there is a need for infrastructure that supports high quality transit service and other mobility options for all ages and socio-economic groups. There is also a need to ensure accessibility for Calgarians to Calgary's cultural assets like the National Music Centre and Calgary Stampede (both within walking distance of future Green Line stations).



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#### **CREATION OF THE GREEN LINE**

The first LRT line in Calgary opened in 1981, and has rapidly expanded over the past 35 years to become the backbone of the regional transit network. Today, Calgary's LRT system is the most successful in North America, transporting over 285,000 passengers on the average weekday, consisting of 59.9 kilometres of track and 45 stations.

Through strong partnerships with the Provincial and Federal governments, Calgary has extended the Red and Blue lines to accommodate Calgary's growth. These lines now reach towards the edges of Calgary, providing transportation options to riders throughout Calgary as well as the greater Calgary region.

Centre Street North has evolved into the busiest bus rapid transit (BRT) corridor in the city. Ten bus routes transport 35,000 Calgarians travel up and down this corridor every day. In the near future demand along this corridor will exceed the capacity of the current BRT system during the morning and evening rush hours, discussions of the need for another LRT line to connect north Calgary with downtown began.

The need for an LRT line in southeast Calgary had been under consideration since the mid-1980s, when it became apparent more transportation options were needed in these rapidly expanding communities. The already established ridership north of the Bow River, combined with the rapidly expanding population and job growth in the southeast, offered an opportunity to efficiently serve both areas with one new line - and so the Green Line vision was born.

The City moved forward initially with a proposal to build the portions of the Green Line as a bus-only transitway, which could later be converted to an LRT system. While it would not provide the capacity and reliability of an LRT route, this option would bring improved service to communities along one portion of the line, without the significant initial capital investment required for LRT. The bus transitway infrastructure would be converted at an additional cost to LRT, and extend to the far southeast and north when sufficient funding was available. With support from the Province's GreenTRIP Fund, The City moved forward with planning of the Green Line Transitway in 2013-2015.

In July 2015, the Government of Canada announced that up to \$1.53 billion from the Public Transit Infrastructure Fund would be awarded to the Green Line light rail transit (LRT), contingent on The City's application. This, combined with The City's commitment of \$1.56 billion over 30 years and with a matching contribution from the Government of Alberta, would make the Green Line the single largest public infrastructure investment in Alberta's history.

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## ADDRESSING THE NEEDS WITH GREEN LINE

The eventual long term vision for the Green Line LRT, from 160 Ave N to Seton will see 64,000 fewer weekday auto trips, and will serve over 220,000 weekday transit riders at build out.

#### **GREEN LINE WILL SUPPORT FUTURE GROWTH**

Investing in Green Line LRT service, in combination with strategic upgrades to Deerfoot Trail, will ensure coordinated, complementary travel choices are in place to meet the growing needs of the city on opening day and when the Green Line is fully constructed.

Figure 4 shows the population growth for communities served by local bus service to a Green Line station. Figure 5 shows the population growth within a 10 minute walk to a Green Line station.

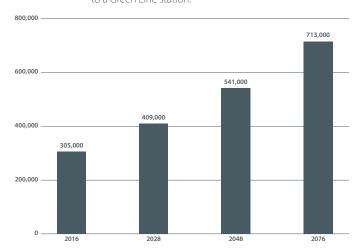


Figure 4: Population growth from 2016 to 2076 for communities within the local transit service area

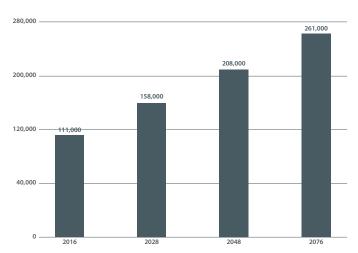


Figure 5: Population growth from 2016 to 2076 for communities within 10 minute walk of a Green Line station

## ADDRESSING THE NEEDS WITH GREEN LINE

Construction of the Green Line LRT is expected to create over 22,000 direct jobs, assuming it is built over the next 30 years.

#### **GREEN LINE WILL CREATE JOBS**

Over the course of construction, the Green Line is estimated to create over 111,000 new jobs including direct construction jobs, supporting jobs (engineering, planning, administration, etc), and induced jobs.

#### **GREEN LINE WILL SERVE FUTURE JOBS**

With over 115,000 jobs along the corridor expected over the next 25-30 years, Green Line will connect people from their homes to their jobs, and the rest of the city.

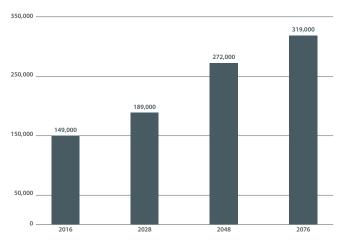


Figure 6: Job growth from 2016 to 2076 for communities within the local transit service area

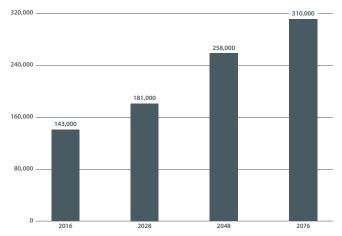
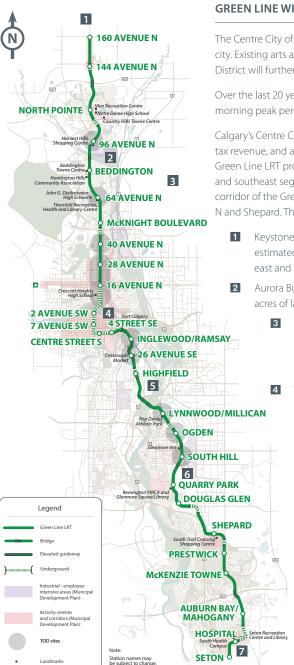


Figure 7: Job growth from 2016 to 2076 for communities within 10 minute walk of a Green Line station

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## ADDRESSING CALGARY'S NEEDS WITH GREEN LINE LRT



#### GREEN LINE WILL CONNECT TO JOBS

The Centre City of Calgary contains the highest density of people and jobs in the city. Existing arts and cultural centres and the future Culture and Entertainment District will further strengthen the importance of serving Centre City.

Over the last 20 years, the percent of transit trips into downtown, during the morning peak period has increased from 33% to 49%.

Calgary's Centre City generates more than 35% of the city's total non-residential tax revenue, and as a result, has been called the 'economic engine' of Calgary. Green Line LRT provides improved transit service connections, between north and southeast segments of Calgary, to this critical area of the city. Along the corridor of the Green Line there are many employment areas such as 16 Avenue N and Shepard. The following are a few of the employment area highlights:

- Keystone Hills Area with an approved Area Structure Plan will have an estimated 12,000 jobs when built out in the communities immediately east and west of Green Line LRT.
- Aurora Business Park, a planned business park with 183 developable acres of land, is located 4 km west of Calgary International Airport.
  - 3 The newly expanded international airport has 23,000 employees today, and is expected to increase to 35,000 by 2076 and will be connected to the Green Line by a future airport line.
    - The Centre City including downtown Calgary sees the highest employment density in the city. Centre City is home to 156,500 jobs today and is expected to grow to 200,000 jobs by 2076.
      - Much of the success and high LRT ridership (285,000 trips per week day on the current Red and Blue LRT lines) is attributable to the high concentration of jobs in Centre City.
      - **5** Within 10 minutes walk of Highfield station, there will be over 7,100 industrial jobs once the Green Line is fully constructed making Highfield Station the highest employment area on the Green Line corridor, outside of downtown.
      - Quarry Park is now home to major corporate head offices such as Imperial Oil. The surrounding area currently employs over 7,600 people, and will see a total of 16,000 jobs by 2076.
      - **7** South Health Campus with 2,800 employees today, is expected to grow to 5,100 employees by 2076.

Green Line LRT Long Term Vision: 160 Avenue N to Seton

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Green Line LRT Long Term Vision: 160 Avenue N to Seton



## ADDRESSING CALGARY'S NEEDS WITH GREEN LINE LRT

## GREEN LINE WILL ENABLE TRANSIT ORIENTED DEVELOPMENT

The City of Calgary has made significant investments and long range policy commitments to optimize the use of public transportation infrastructure by encouraging development that supports transit use.

Transit Oriented Development (TOD) focuses on future growth and development close to transit stations. The result is the provision of affordable and active lifestyles that support the use of transit in the community.

The long term vision for the Green Line includes 10 TOD sites along the corridor. Community planning and investment in all 10 TOD sites will be ongoing. Sites were selected based on geospatial data, market analysis, long term development plans, and stakeholder input (community, developers, and subject matter experts).

Figure 8 summarizes the potential retail, office and residential development.

#### Note:

Figure 8 shows eight of the ten identified TOD station areas along the Green Line corridor.

- Development potential for "16 Avenue Station" was completed as a corridor analysis between 9 Avenue N and 28 Avenue N, including the 28 Avenue N station area.
- 96 Avenue N is identified as a potential TOD station area, however additional analysis is required in coordination with the Aurora Business Park concept plans.

64 Avenue Station Possible development in the area **Development potential** Residential 208,000 m<sup>2</sup> HIGH \$ Retail 11,390 m<sup>2</sup> Strong presence of development parcel Diverse selection of housing choices Office 4,340 m<sup>2</sup> Strong presence of community services 40 Avenue Station Possible development in the area Development potential Residential 208,000 m<sup>2</sup> HIGH \$ Retail 17,700 m<sup>2</sup> · Excellent street connectivity Excellent land use mix Office 6,700 m<sup>2</sup> 16 Avenue Station Possible development in the area Development potential Residential 300,000 m<sup>2</sup> HIGH \$ | Retail | 31,400 m<sup>2</sup> Good street connectivity High land value Office 12,000 m<sup>2</sup> Inglewood/Ramsay Station Development potential Possible development in the area Residential 87,000 m<sup>2</sup> HIGH \$ | Retail 8,800 m<sup>2</sup> · High land value Office 2,100 m<sup>2</sup> 26 Avenue Station Possible development in the area Development potential Residential 357,000 m<sup>2</sup> HIGH \$ | Retail 20,000 m<sup>2</sup> Presence of underutilized land Presence of large parcels Office 8,400 m<sup>2</sup> Lynnwood Station Development potential Possible development in the area Residential 32,000 m<sup>2</sup> MEDIUM \$ Retail 0 m<sup>2</sup> Presence of underutilized land Presence of large parcels Office 0 m<sup>2</sup> Ogden Station Possible development in the area **Development potential** Residential 95,000 m<sup>2</sup> HIGH \$ | Retail | 5,600 m<sup>2</sup> Good street connectivity Office 3,900 m<sup>2</sup> South Hill Station Possible development in the area Development potential Residential 280,000 m<sup>2</sup> MEDIUM \$ | Retail | 14,000 m<sup>2</sup> Office 52,500 m<sup>2</sup>

Figure 8: Potential future development at identified Transit
Oriented Development station sites

## ADDRESSING CALGARY'S NEEDS WITH GREEN LINE LRT



Mable is no longer able to continue driving because of her eyesight. Over the last fifty years she's relied on her car to get groceries, play at her bridge club twice a week and visit family and friends. Since moving to the new senior's housing at the 64 Avenue *Green Line station she walks to the* new library and grocery store five minutes away and with her annual senior's transit pass, uses the Green Line as well as the rest of the transit network to visit friends around the city. The table below summarizes the developable area and forecasted population and increased office area at TOD Priority Sites.

TOD PRIORITY SITE	DEVELOPABLE AREA ¹ (HA)	POPULATION <sup>2</sup>	OFFICE AREA INCREASE <sup>3</sup> (MILLION SQ-FT)
96 Ave N	69	7,000	
64 Ave N	18	6,600	
40 Ave N	26	6,100	3.3 - 4.6
16 Ave N (9 Ave N to 28 Ave N)	12	25,200	
Inglewood/ Ramsay, 26 Ave SE	40	17,500	
Lynnwood/ Millican, Ogden	97	12,600	0.5 - 2.1
South Hill	32	9,700	

- (1) Developable area: underutilized/vacant/underdeveloped land within 600m of station.
- (2) Population forecast within station area transportation zone in 2048.
- (3) New office development along Green Line corridor, 2015 to 2045 (Market Study).

### GREEN LINE WILL CREATE A MORE RESILIENT CITY



Scotiabank Saddledome, host to numerous events annually

In tandem with the road network, the Green Line will enable The City to respond, manage and recover from major planned or unplanned events. Major annual events like Stampede, sporting events and city-wide festivals will rely on infrastructure like the Green Line to move people efficiently.

Green Line will also be key to helping congestion on Deerfoot Trail and will be an essential piece of the Provincial Transportation Strategy to offset demand in peak periods.

The long term vision also includes a four kilometer Centre City tunnel which will further mitigate road congestion in the downtown and is specifically designed with portals to withstand major flood events.

## ADDRESSING CALGARY'S NEEDS WITH GREEN LINE LRT

Northbound and Southbound travel times will be consistent (currently, it takes longer to travel northbound during the evening peak)

Peak hour capacity in the north will more than double from 3,200 to 8,300 passengers per direction per hour when the Green Line corridor is built out.

Peak period frequency in the southeast will double from every 10 minutes to every 5 minutes.

Off-peak frequency in the southeast will improve from every 30 minutes to every 10 minutes.

Commuter travel times for the Green Line in the southeast will decrease 20-25 minutes during peak hours (compared to current day BRT service)

#### GREEN LINE WILL BE AN ATTRACTIVE TRANSIT OPTION

For transit to be an attractive, viable option, speed and reliability are two key factors. For existing service in north Calgary, the Green Line will increase capacity, addressing demand in peak hours. For southeast Calgary, regular frequency of trains and reducing travel time are both important priorities.

#### Ride time

The ride times for the Green Line will be as follows:

- 70-80 minutes: Full line from 160 Avenue N to Seton
- 30-35 minutes: North portion from 160 Avenue N to 7 Avenue SW
- 40-45 minutes: South portion from Seton to 7 Ave SW

#### Reliable and frequent

For the thousands of Calgarians that will use the Green Line on a daily basis, they will be able to consistently travel to where they want to go and arrive on time, knowing that the Green Line will arrive every 10 minutes, 15 hours a day, 7 days a week.

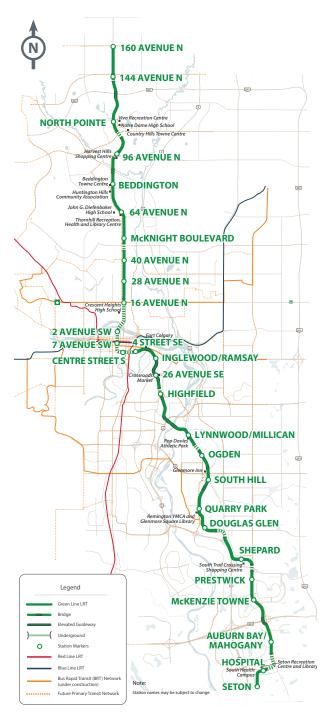
#### Affordable

By utilizing the Green Line, households are estimated to save \$4,000 per year on transportation costs. Savings are expected to result in approximately \$1,000 in additional annual spending for these households. It is common for households that move to established LRT station areas to downsize car ownership.



Amin and Anna have recently received their Canadian citizenship and are looking for a place to call home in Calgary. After hearing about the Green Line from an information session, they bought a home in Riverbend within a 10 minute walk to South Hill Station. Their lifestyle has now changed as they walk to the station to connect to destinations such as the Bow Valley College. With the money they save from not owning a vehicle, they can go for the occasional dinner at their favourite restaurant near the 16 Avenue N Station.

## ADDRESSING CALGARY'S NEEDS WITH GREEN LINE LRT



#### Connections

The Green Line is an important piece of Calgary's Primary Transit Network, adding 46km and 28 stations to the existing 59.9 kms and 45 stations Calgary enjoys today. This will enable Calgarians to make fast, frequent and reliable transit connections to a number of destinations throughout the city. Green Line LRT and bus service will connect at transit hubs along the Green Line. Transit hubs will allow customers to connect to local and surrounding area transit service, Primary Transit Network and regional transit connections, conveniently and comfortably.

In total, the Green Line will serve over 27 neighbouring communities and provide access to many destinations along the corridor including:

- 44 parks
- 41 schools
- 28 seniors' housing complexes
- 16 cultural facilities including National Music Centre, Stampede Park, Chinatown, Glenbow Museum, BMO Convention Centre, Saddledome
- 23 recreation facilities (e.g. pools, soccer & baseball fields, arenas)
- 8 Alberta Health Services facilities
- 13 police and fire protection stations
- 18 community associations
- 6 post secondary institutions
- 10 Provincial and federal services (ex. registries)
- 6 libraries, including new downtown central library
- 103 City of Calgary Community Services
- 2,830 affordable housing units nearby

## ADDRESSING THE NEEDS OF CALGARIANS WITH GREEN LINE LRT



Elena is a new Canadian who works as a nurse at the South Health Campus in Seton. She doesn't have a vehicle and often works nights. She wanted her home to be near an LRT station so she could commute to and from work easily and efficiently. She has decided to live in Auburn Bay, only one stop away from the Hospital Station on the Green Line. She is now able to live and work near a number of amenities like restaurants, shops, the library and a recreation centre, all within a 10 minute walk of a Green Line station.

#### **GREEN LINE RESPONDS TO MOBILITY TRENDS**

The Green Line LRT will address shifts in mobility trends by providing a service that allows people to easily access safe and reliable transit. Stations will be positioned strategically within communities along the route, with consideration for pedestrian, cycling, and vehicle connections. The Green Line will complement the range of mobility options available today, including car share programs and other emerging trends

The Red and Blue LRT lines provide a strong foundation for moving many people by transit. With the addition of the Green Line LRT and Crosstown BRT lines, Calgarians will have more choices for fast, frequent and reliable transit service in the city.

#### STIMULATING THE ECONOMY

There are a number of economic benefits of the Green Line such as productivity gains for those who save time by choosing transit as well as potential increases in property tax revenue. Companies now have the option to move to locations that meet their business needs. Options along the Green Line include the Centre City, Quarry Park, South Hill, Aurora Business Park which is in close proximity to Calgary International Airport, South Health Campus, Shepard Industrial and Greenview Industrial. Attracting companies whether they are relocating, starting up or new to the City, now have the choice and flexibility of multiple locations along the Green Line.

The following are the near and long term benefits of the Green Line:

**Increased Gross Domestic Product (GDP)** - As a result of Green Line LRT, approximately \$21 billion in additional real gross domestic product can be created within the Calgary economic region between 2017 and 2046.

**Increased property values -** Assessed property values along the full Green Line LRT corridor are forecasted to increase by approximately \$3.2 billion by 2046. This represents approximately \$1.1 billion in present value terms.

**Increased income tax revenue -** \$940 million in additional Provincial income tax (between 2016 and 2046)

#### GREEN LINE WILL IMPROVE THE QUALITY OF LIFE OF CALGARIANS

Construction of the Green Line and 28 LRT stations, will improve access for all Calgarians to over 100 community services within a ten minute walk of Green Line stations. Nearby services include schools, health services, libraries, recreation centres, seniors housing, playgrounds and parks. Primary Transit Network and regular bus service connections to the Green Line will further improve access to the city-wide destinations that people need to reach every day.



For people too young or old, who cannot afford, or choose not to drive an automobile, Green Line LRT provides an attractive, affordable and convenient transportation choice. Today the Green Line corridor serves over 13,000 low income people within a ten minute walk of the planned stations. Similarly, affordable housing for 8,500 people are located near Green Line planned stations. In addition to improving access that is affordable, the mobility challenged will benefit from a fully accessible Green Line LRT service.

Existing and expanded cultural and entertainment destinations within a ten minute walk of Green Line stations include Chinatown, the Eau Claire Market, the new Central Library, the Calgary Tower, Olympic Plaza, Victoria Park, Stampede Park, the Saddledome and historic and walkable communities such as Crescent Heights, Inglewood and Ramsay.

Fast, frequent, reliable and accessible Green Line LRT connections to essential community services and cultural and entertainment destinations will directly and indirectly improve the quality of life for all people in Calgary

#### **ENVIRONMENTAL BENEFITS**

The Green Line LRT presents opportunities to achieve greater energy efficiency. The Green Line will:

- Directly reduce greenhouse gas (GHG) emissions by 67,000 tonnes of carbon dioxide equivalent annually amounting to 14,200 fewer vehicles on the road.
- 22 million litres of gasoline and diesel fuel consumed annually would be displaced by renewable electricity (or lower carbon energy) used to power Green Line.
- A two per cent reduction of smog-forming tailpipe emissions is projected.
- Land use densification in transit nodes and corridors will be facilitated by Green Line LRT development resulting in further long-term environmental benefits.
- In terms of city-wide daily travel, the construction of the full Green Line LRT, from 160 Ave N to Seton, coupled with land development assumptions to 2076 is estimated to shift daily trips from auto to transit by 2%.
- Potential for integrated district energy/combined heat and power systems at Green Line stations with higher population and employment densities.

Green Line LRT Long Term Vision: 160 Avenue N to Seton



Green Line LRT Long Term Vision: 160 Avenue N to Seton



# Program approach

TT2017-0534 GREEN LINE LRT ALIGNMENT AND STATIONS: 160 Avenue N to Seton Att-1.pdf ISC: UNRESTRICTED



### **GREEN LINE PROGRAM APPROACH**

The Green Line LRT program has evolved from its earlier iterations to fit into the context of the city. The north segment was initially planned to run along the Nose Creek alignment and the southeast segment was envisioned to be built initially as a bus based transitway that would later be converted to an LRT. Today, the long term vision is to deliver a continuous LRT route from 160 Avenue N to Seton integrating into 27 neighbouring communities. The evolution of conceptual designs, through to functional planning studies and finally to the establishment of the alignment and stations has been determined through a holistic methodology referred to as the *four layered approach*.

The four layered approach involved collaboration and engagement across all City departments, external partners, industry and extensive public engagement, and helped inform the alignment and station placement. The highlights of the program's engagement is in the following Engagement Summary section.

Consideration was also given to how the LRT infrastructure would integrate within the communities along the line, referred to as Green Line Urban Integration. A common vision was developed to tie the full 46 km line together, with the ability to take on a slightly different look and feel based on the unique character of each area. A summary of the Character Areas was developed (page 42) to capture the essence of the corridor variances.

The details of the program approach outlined on the following pages form the strategy that helps the Green Line deliver an integrated and attractive service that is both responsive to the communities along the line and to the Calgarians that use it.



"It will improve access for all Calgarians.

Green Line will significantly improve my lifestyle, I work in the Highfield area and it would connect me right to work"

Beltline resident

## **ENGAGEMENT SUMMARY**

Engagement for Green Line builds on the work completed for the North Central LRT Corridor Study in 2013/2014, and the Green Line Southeast Stations, Alignment and TOD report in 2015.

The overall engagement program has involved community and business leaders, property owners, stakeholder groups, and the public including transit customers. City staff and members of Council were also engaged to ensure coordination, a shared understanding and an integrated approach to planning for transit.

Engagement in the southeast primarily focused on refining the route alignment and station locations in four locations (Inglewood/Ramsay, Ogden, Lynnwood/Millican, and Quarry Park). These areas were under review from the original Southeast Functional study, and were thought to have the potential for better integration and connectivity into communities than was shown in the earlier plans. Engagement for the north and Centre City portions of the line focused on setting station locations and refining how the route alignment could fit along the north corridor and determining how to connect the north and southeast through the downtown.

Engagement in all areas also focused on identifying connections to and from the future stations, and community integration of the Green Line into each community. Transit Oriented Development (TOD) plans were also developed through multi-day design workshops, or "charrettes" for areas in both the north and southeast that showed high potential for redevelopment.













## A FOUR LAYERED APPROACH

The Green Line is about planning for Calgary's future growth, with the goal of providing more choices to citizens in the way they move, live, work and play. This will be achieved through a layered approach that will integrate core transit infrastructure, connections to stations, Transit Oriented Development (TOD) supportive infrastructure, and City Shaping connections to services and local and regional destinations. Collaboration with City departments, external partners, industry and all levels of government will be essential to ensuring all four layers are successfully implemented.

"The design of the transportation system has a significant impact on the urban form of the city. It contributes to the shape of our communities and employment centres, and it determines how we move within and among these places. It supports the economy by facilitating the timely movement of goods, services and people within the city and to regional or international destinations. It can either enhance or degrade the environment depending on how well it is integrated with its surroundings and the degree to which we depend on fossil fuels to reach our destinations. The decisions made today about where and what to build will affect Calgarians for 100 years or more – just as decisions made in the past affect us today."

The Calgary Transportation Plan (2009)





2 Connections to stations



Transit
Oriented
Development



4 City-shaping

## A FOUR LAYERED APPROACH: TRANSIT INFRASTRUCTURE



#### LAYER 1: TRANSIT INFRASTRUCTURE

Layer 1 will consist of everything the City of Calgary will build to operate low-floor light rail in the Green Line corridor. This includes trackways, overhead contact system/electrification, power, structures of a variety of types, all components necessary to operate trains safely adjacent to or crossing other modes, stations and passenger facilities such as Park and Ride, off-street bus transfer stops, bicycle parking at the station etc.

In contrast to existing LRT in Calgary, the Green Line will use modern low-floor light rail vehicle (LRV) technology that better integrates into the community, and incorporates curb level and less obtrusive station and platform infrastructure.



North Pointe station concept

#### Alignment and stations

In addition to meeting the key operating objectives of Ride Time, Ridership, Reliability and TOD, the Green Line alignment and station locations have been planned and designed with optimizing ridership and with community characteristics in mind.

The Green Line alignment considered existing and future community services and economic benefit, TOD potential, key project risks and environment sensitivities.

Green Line LRT Long Term Vision: 160 Avenue N to Seton

ISC: UNRESTRICTED

## A FOUR LAYERED APPROACH: TRANSIT INFRASTRUCTURE

#### SUPPORTING INFRASTRUCTURE



Existing Blue Line - Saddletowne bus terminal



Existing Red Line - Southland Park and Ride



Calgary Transit staff maintaining a Light Rail Vehicle

#### **Bus terminals**

On or off street bus terminals are strategically located and designated transit spaces that support customer transfers, bus operations and customer amenities. Dependent on the transit service, bus terminals range in size and style but always have customer amenities such as shelters and benches. Bus terminals are designed to provide seamless connections between transit services and efficient bus operations.

#### Park and Ride

Park and Ride is an important service that provides an attractive means to access LRT when coming with a vehicle. Green Line Park and Ride lots are located beyond 5 km of the downtown and will serve 15% of the estimated transit trips in these areas with approximately 5000 to 6000 parking stalls.

Park and Rides will align with The City's Transit Oriented Development (TOD) Guidelines to ensure that land use can transition over time to attract future development. Future ridership and activity within a TOD area can be maximized by redeveloping surface Park and Ride lots.

### Maintenance and storage facilities (MSF)

Critical to keeping the trains, clean, stored and in good working order is the requirement of a maintenance and storage facility. The Green Line LRT is estimated to operate 150 to 175 low floor vehicles and requires both a primary MSF and a satellite facility to ensure cost efficient operations with reduced travel distances for the start and end of service.

Numerous sites were investigated and the final locations serving the Green Line LRT are just north of 126 Avenue SE and on the Aurora Business Park lands, east of Harvest Hills Boulevard on 96 Avenue N.

The primary facility located at the south end of the line near the Shepard station will be on approximately 70 acres of land. Locating the MSF near the end of the line lessens the time needed to launch service at the start of the day where peak demand is for customers travelling to the downtown. The primary facility is also able to accommodate testing of new low floor vehicles as well as host a separate Operations Control Centre. Similarly the satellite facility located on approximately 20 acres of land at the north end of the Green Line LRT, near the 96 Avenue N station allows for service to start more efficiently for those who commute from the north into the downtown.

### A FOUR LAYERED APPROACH: TRANSIT INFRASTRUCTURE



#### Low floor light rail vehicles

The Green Line LRT is envisioned to be operated using a modern urban low floor light rail vehicle (LRV). This vehicle technology is different from the existing Calgary C-Train technology in several ways. With access to and from the vehicle being at regular street curb heights, Green Line stations will have a smaller footprint, compared to the current high floor platform configuration of the Red and Blue lines. The low height of station platforms means that stations can be more compact with no need for long access ramps at either end of the station.

The ability to navigate the low floor LRV's around tight turns and relatively steep grades makes the low floor LRV an attractive option. The low floor LRT technology has been the standard in Europe for decades and is now becoming the technology of choice for new LRT systems cross Canada and the United States.

# A FOUR LAYERED APPROACH: CONNECTIONS TO STATIONS



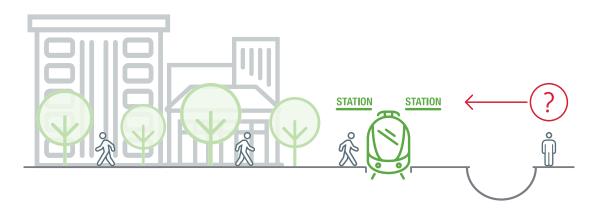
#### **LAYER 2: CONNECTIONS TO STATIONS**

Layer two of Green Line focuses on infrastructure connecting riders to stations. This includes pedestrian, cycling, bus and automobile connections to the Green Line to ensure stations are accessible to riders. Enabling citizens to safely and conveniently access stations will be crucial to building Green Line ridership.

Connections to stations analysis

- Essential components of Layer 2 covered by Green Line funding include areas within a 10 minute walk to stations where there is missing or unsafe infrastructure that inhibits pedestrian access.
- Other components like bicycle pathways, walkways and road works will be addressed through other programs and initiatives.
- Consideration was also included for the parallel pathway along the corridor from 160 Avenue N to Seton to ensure mobility connections are provided to the station and connected to the communities adjacent to the Green Line.

Ensuring Calgarians can safely and conveniently access stations as well as to increase potential riders by improving access to stations is the goal of this layer.



**Green Line LRT** Long Term Vision: 160 Avenue N to Seton

3

### A FOUR LAYERED APPROACH: TRANSIT ORIENTED DEVELOPMENT



3 Transit
Oriented
Development (TOD)

# Transit Oriented Development

Communities where residents can live, work, play and learn in a mixeduse environment that is in close proximity to rapid public transit and where the private automobile is an option, not a necessity.

#### LAYER 3: TRANSIT ORIENTED DEVELOPMENT (TOD)

Transit Oriented Development (TOD) refers to a form of development that is typically characterized by multi-storey buildings, designed to encourage walking, cycling and transit use. A core element of a TOD is a major transit station that is within walking distance of a large number of residents and businesses and is therefore a convenient and attractive mobility choice. The streets in a TOD are designed to contain residences, shops and services and allow for easy pedestrian connections to the various destinations. TOD plays a key role in developing complete communities that help achieve the City's vision for the future as outlined in the Municipal Development Plan (MDP) and the Calgary Transportation Plan (CTP).

The Green Line will be constructed within a variety of communities including some of Calgary's oldest and newest, established and developing. Planning for the right type of development for each area will ensure long term success.

Regardless of the community, TOD strives to increase people's mobility options and reduce the need to design our communities for high automobile use. Transit oriented development supports economic transit operations by increasing ridership.

### **EQUITABLE AND SUSTAINABLE TOD**

TOD offers numerous social, environmental and economic benefits for people and communities. Benefits include reduced costs of living, better access to jobs and local economic growth in communities, to healthier lifestyles and important reductions in greenhouse gas emissions through reduced automobile use. Equitable and sustainable TOD fosters healthy and prosperous communities, in which diverse groups of people have greater mobility and lifestyle choices and access to employment, recreation and education opportunities.



#### TRANSIT ORIENTED DEVELOPMENT (TOD) MARKET STUDY/READINESS

A market study was conducted to provide information towards identifying the station areas with the highest potential for Transit Oriented Development and the most viable scales and types of development. The study focused on the 30-year time period (2015 – 2045) for the successful completion of TOD development around the stations and the potential for multifamily developments. It identified current market value conditions based on the average age and condition of the building stock. It looked at market demand and the viable absorption of mixed-use and multifamily residential buildings.

The study also identified key populations and land use targets for the individual segments of the Green Line. These factored in existing growth rates along with the goal of refocusing redevelopment around the stations. The study identified that each new TOD should have a large enough population to support (at a minimum) a full complement of the businesses that are typically found in a neighbourhood-scale shopping district. This will help ensure that the TOD functions as a highly walkable mixed-use neighbourhood. A population of about 7,500 to 10,000 is required to support a 150,000 square foot to 200,000 square foot neighbourhood scale shopping district. Such a district provides a full range of retail and service businesses such as a supermarket, drug store, cafe, restaurants, specialty food stores and banks.

"Much of this development would occur in communities along the Green Line north corridor even if the new transit line is not constructed. However, the new line will help focus new multifamily development in the north near new station locations."

#### North market study forecasts

- 45,000 new multifamily units over the next 30 years.
- About 19,500 of these new units will be located near the Green Line.

#### Southeast market study forecasts

- Calgary's southeast can expect 41,000 new multifamily units over the next 30 years.
- About 20,000 of these new units will be located near the Green Line

To support TOD each station is recommended to have a minimum of:

- 4,000 units to support a walkable mixed use neighbourhood.
- These units will primarily be 4-6 story wood-frame construction but can include some concrete units.

"Calgary's South can expect a growth of 9 million square feet of office space over the next 30 years.

Most of this space will be accommodated by existing office locations (Quarry Park, Seton, and Shepard Regional Centre). Therefore, it is recommended that only one new office node, supporting one million square feet, should be developed. A strong candidate for this is South Hill."

### A FOUR LAYERED APPROACH: CITY SHAPING



#### **LAYER 4: CITY-SHAPING**

City Shaping is leveraging Calgary's investment in transit infrastructure to strengthen and support the social needs of communities along the Green Line. It is indicative of The City's effort to create a series of well-planned, connected, accessible, affordable and vibrant communities, starting from Green Line LRT construction and evolving into the future. City Shaping is about investing in people, places and programs that are near high quality transit service, making it easy and convenient for Calgarians to access them.



#### People

The focus of City Shaping is on people and communities and their connection to the Green Line. Founded on public engagement and existing City policy, City Shaping will focus on the experience and quality of life improvements as a result of the Green Line. Individual and community well-being is paramount and the people served by the Green Line will remain a key priority of the planning, design, development and investment decisions ahead.



#### **Places**

City Shaping puts a priority on citizen experience through enhanced public spaces by activating the Green Line through the development of urban villages, and walkable centres. An integrated mix of living, working and recreation, these hubs of activity will include housing that allows residents to access parks and recreation facilities, schools, health centres, libraries, multi-purpose plazas, commercial opportunities and protective services - all vital for developing vibrant, affordable and resilient communities



#### Programs

City Shaping will optimize the opportunity for City programs and services along the Green Line. Opportunities to provide programming such as free afterschool programs, environmental education, fitness programs and safety education programs, encourages healthy and active lifestyles, supports inclusion, diversity and accommodates the needs of an aging population.



#### **Reliable Multi-Modal Transportation**



Opportunities for people, places and programs will be linked by the 46 km and 28 stations of the Green Line as well as providing new opportunities to use other modes of transportation beyond the car. The Green Line will also connect to the larger transit network providing access to many of the City's major attractions.

### A FOUR LAYERED APPROACH: CITY SHAPING

96% of Calgarians agree that The City should invest more or the same amount in affordable housing for low-income families\*

\*2016 Citizen Satisfaction Survey



National Music Centre - 5 minute walk from the Green Line 4 Street SE station

#### **OUTCOMES FOR CALGARIANS**

Physically active, mentally and physically strong, and live in neighbourhoods with healthy natural environments.

- » Enhance access to a full range of health, parks and recreation services, infrastructure and facilities in communities along the Green Line.
- » Protect and strengthen the biodiversity, urban forest and natural areas along the Green Line.
- » Promote increased physical activity along the Green Line through enhanced connections encouraging active modes of transportation.

Connected to significant cultural destinations and to local spaces that foster cultural activities and connection to Calgary's heritage and to each other.

- Ensure the community spaces near Green Line stations are designed to strengthen sense of place and encourage social gathering, and cultural and recreational activities including festivals and events.
- Conserve and integrate Calgary's built, natural and indigenous heritage is into the design of transit stations and community spaces along the Green line.
- » Create new opportunities to experience arts and culture outside the core while enhancing connectivity to significant cultural centers and districts along the Green Line.

Access to housing, transit and social and community services.

- » Reduce physical and economic barriers to enhance access to community programs, services and facilities that accommodate all generations.
- » Protect, support and improve housing affordability in communities along the Green Line.

### Feel prepared and protected.

- » Maintain or improve the Council approved emergency response times in communities along the Green Line.
- Promote and maintain safe and healthy behaviours that support effective emergency responses, and provide education on prevention and protection from dangers and vulnerabilities in communities along the Green Line.
- » Ensure that residents along the Green Line feel safe in their neighbourhood.



#### COMMUNITY CHARACTER ALONG THE LINE

The Green Line will have a distinct character at various points along the route, with the goal of striking a balance between efficient ride times and addressing the specific needs of each area. Understanding and defining the character of each area is important. Design elements, from track infrastructure and station design to streetscape and public art can be adjusted to preserve and strengthen the character of each individual community. There are 5 types of Character Areas along the Green Line corridor:

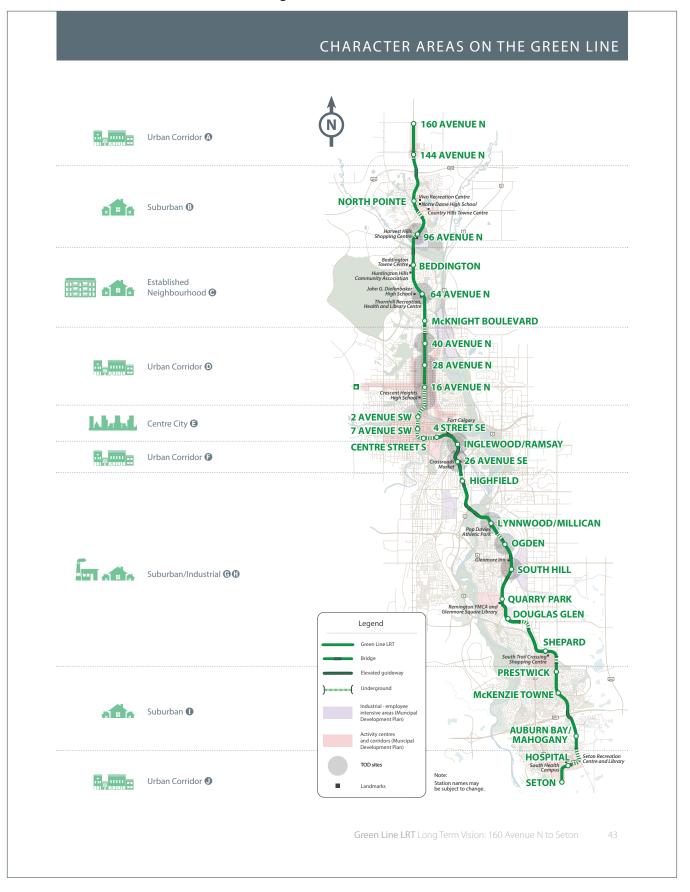
**Suburban** - This character area can primarily be found in the far north and southeast segments of line, from Auburn Bay/Mahogany to Prestwick in the southeast and from just north of Beddington to North Pointe. These communities are typically residential with some mixed use areas with single family homes, apartments and town houses. The Green Line in these areas will be focused on providing much needed transit capacity and efficient and reliable ride times for commuters.

Suburban/Industrial - This character area is exclusive to the southeast, where there is a 14 km segment between the Highfield industrial area and Shepard (the site of the future maintenance facility). There is also a mix of residential development in these areas, combined with commercial/industrial uses such as a business park. These areas are adjacent to heavy rail lines, and will therefore have a protected right-of-way for the Green Line, allowing the train to travel at higher speeds, and provide service to a number of activity centres at South Hill, Quarry Park and Shepard.

**Established Neighbourhood** - As the Green Line reaches the established communities along the northern segment of the line, it will provide connections to businesses and amenities that are primarily currently accessed by car. These neighbourhoods are planned similar to the block grid pattern found in the Centre City, however they are primarily residential use with some mixed use areas with medium density.

**Urban Corridor** - The Green Line will improve access and supplement an already existing network of pathways, bikeways and roads in this character area. In communities such as Inglewood/Ramsay, Crescent Heights and Tuxedo (16 Avenue and 28 Avenue N stations), the transit service will aim to complement and improve established communities by planting the seed for redevelopment, while respecting the character and history of the area. These areas are characterized by a compact built environment with rich mixed use that encourages people to walk and cycle.

Centre City - This area benefits from excellent public transit connections with short walkable blocks laid out in a grid pattern. They consist of high-rise residential buildings mixed with office buildings. The Green Line will intersect with the Red and Blue LRT lines in the Centre City, providing further connections to other areas of the city. The Centre City is the major activity centre in Calgary, and the primary destination for many transit customers. It will also provide residents of the Centre City with unprecedented access to other areas of the city, including the South Health Campus, and a number of community services.



### CHARACTER AREAS ON THE GREEN LINE

#### North

- 160 Avenue N and 144 Avenue N stations are in an Urban Corridor area north of Stoney Trail. This developing area is part of the Keystone Hills Area Structure Plan, and is characterized by a high level of residential and employment intensification. The communities will contain mixed use development and walkable/bikeable amenities. Street patterns will be grid-like and buildings will front onto the Green Line alignment.
- (9) North Pointe and 96 Avenue N stations are in a Suburban area bounded by Stoney Trail at the north edge and Beddington Trail at the southeast edge. The Northern Hills communities have been planned with recreation centres, trails and amenities. Buildings back onto the transit corridor and there is limited access into adjacent communities.
- The communities between Beddington Trail and McKnight Boulevard are considered Established Neighbourhoods, and include the stations at Beddington Boulevard, 64 Avenue N and McKnight Boulevard. Green Line will travel through the mature neighbourhoods of Beddington Heights, Huntington Hills and Thorncliffe. Characteristics of the communities include low density commercial centres, wide boulevards with trees, service roads, and street-oriented houses and yards. There is high potential for intensification in these areas.
- The area from McKnight Boulevard and the Bow River is also classified as an Urban Corridor. Three stations and planned TOD sites are located here; 40 Avenue N, 28 Avenue N and 16 Avenue N. The Green Line will be running on Centre Street as it passes through historic neighbourhoods with small blocks in Highland Park and Tuxedo Park, and then under Crescent Heights. Development on Centre Street is primarily older commercial, but has high potential for intensification.

#### **Centre City**

The Centre City character area is located southeast of the Bow River and west of the Elbow River containing the communities of Eau Claire, Chinatown, downtown, Beltline and Victoria Park. Four stations are located here including 2 Avenue SW, 7 Avenue SW, Centre Street S and 4 Street SE. Centre City is a high density, mixed use area comprised of high-rise commercial and residential buildings with streetwall frontages and major redevelopment planned around the 2 Avenue and 4 Street stations. This area is a major pedestrian and entertainment area and connects with the existing Blue and Red LRT Lines.

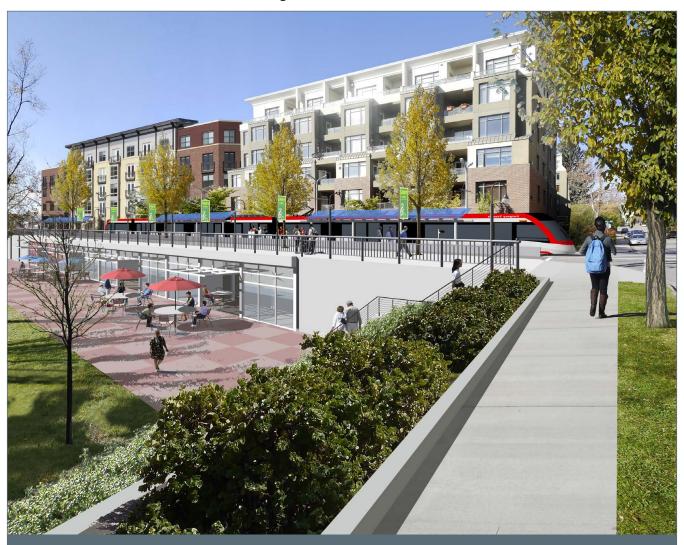
#### Southeast

- The third Urban Corridor on the alignment is located between the Elbow River and Blackfoot Trail. This includes the historic areas of Inglewood, Ramsay, Highfield, Alyth/Bonnybrook. The area is comprised of traditional historic neighbourhoods and industrial areas that are in transition to mixed use, maker, and light industrial space.
- **(b)** The longest segment of the line is classified as Suburban/Industrial between Blackfoot Trail and 130 Avenue SE. Seven stations are located here that include Highfield, Lynnwood/Millican, Ogden, South Hill, Quarry Park, Douglas Glen and Shepard.
- **①** The traditional industrial areas of Highfield, Ogden and Shepard have larger land parcels that are home to many established businesses. Some areas are experiencing redevelopment. The area has strong potential for major redevelopment at key locations including several undeveloped areas.
- A second Suburban area is located between 130 Avenue SE and Auburn Bay Avenue SE, with three stations; Prestwick, McKenzie Towne and Auburn Bay/Mahogany. The Green Line would run on the side of the road, rather than in the centre in these areas. The communities are self-contained and oriented away from the LRT corridor, with back fences facing the future LRT.
- The final segment on the alignment is a fourth Urban Corridor. The Hospital and Seton stations are located here. The area includes a major medical centre employer in a master planned community with mixed use development.

Green Line LRT Long Term Vision: 160 Avenue N to Seton



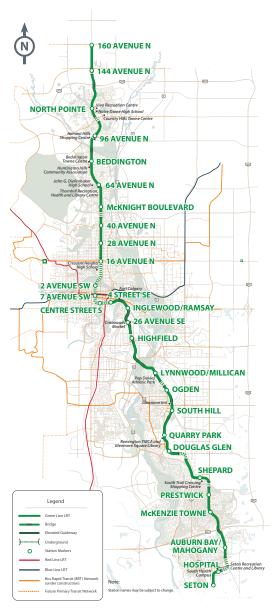
Green Line LRT Long Term Vision: 160 Avenue N to Seton



# Program description

TT2017-0534 GREEN LINE LRT ALIGNMENT AND STATIONS: 160 Avenue N to Seton Att-1.pdf ISC: UNRESTRICTED

### ALIGNMENT AND STATION OVERVIEW



At 46 kilometers long, the Green Line LRT offers unprecedented opportunities to shape future growth in Calgary by influencing development along the route. Once fully constructed, the Green Line LRT will offer fast, frequent and reliable transit, connecting communities in the north and southeast with the downtown core, and provide connections to key city facilities and services.

As part of an integrated and human focused approach to the Green Line, all infrastructure has been designed to integrate closely with Calgary's unique communities and with future development in mind whilst meeting all safety and operational standards set by The City of Calgary, the Province of Alberta and other governing regulatory bodies.

Once fully constructed the Green Line LRT will include:

- 46 Km of track
- 28 Stations
- 11 Bridges

Stoney Trail North Nose Creek
Elbow River Blackfoot Trail

Highfield Blvd (under review) 46 Avenue SE (under review)

Deerfoot Trail Bow River
78 Avenue SE 90 Avenue SE

Stoney Trail South

- 1 Km of elevated track between Inglewood/Ramsay and 26 Avenue SE stations
- 10 Park and Ride Facilities (5000 to 6000 stalls in total)

North Pointe 96 Avenue N
Beddington Lynnwood/Millican
Douglas Glen Shepard

Prestwick McKenzie Towne

Auburn Bay / Mahogany Seton

• 9 tunnels

144 Avenue N (under review)Country Hills Blvd96 Avenue NMcKnight BlvdCN/HighfieldOgden RoadBarlow Trail / 114 Avenue SE130 Avenue SE

Seton Blvd SE / Market Street SE

- 4 km Centre City tunnel from 19 Avenue N to 4 Street SE
- 2 light rail vehicle (LRV) Maintenance and Storage Facilities (MSF)

Main Facility at Shepard (north of 126 Avenue SE)
Satellite Facility at Aurora (south of 96 Avenue N)

• 150 to 175 Low floor light rail vehicles

**Green Line LRT** Long Term Vision: 160 Avenue N to Seton

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### 160 AVE N TO 144 AVE N: URBAN CORRIDOR



#### 160 AVE N TO 144 AVE N: URBAN CORRIDOR



Conrad, his wife, and their two sons have moved to the new community of Keystone Hills. They love the area because it is affordable and full of amenities, and also has great access to the city. They have a home-based business but enjoy commuting into the city for client meetings without worrying about parking and traffic. His youngest son will be starting Grade 10 at the new high school near 144 Avenue N, and his eldest son is in his second year of Engineering at the U of C and will be using the Green Line to commute to school every day. With both kids free to move around the city without relying on a car, Conrad and his wife can enjoy the finer things in life, including more quality time together.

This 2 km section of the line at the northern extent of the Green Line will serve the future area of Keystone Hills including the community of Livingston. Currently in the early stages of planning and development, this area is projected to see a full build out over the next 30 years.

#### **Transit Connections**

Transit service in the new communities surrounding 144 Avenue N and 160 Avenue N station will be designed to be direct and efficient due to the grid-like street network. Future transit service will connect to many destinations identified in the Keystone Hills Area Structure Plan and with future primary transit service on 160 Avenue N and 144 Avenue N, transit users can access various parts of the city with fast, frequent and reliable service.

#### **Active modes connections**

Station access will primarily be by transit and walking however the communities within this area have also been planned with the principles of good cycling in mind. The Area Structure Plans for these developments reflect complete street standards of The City. The main street and suburban area of the development each have a high standard for mobility of all modes.

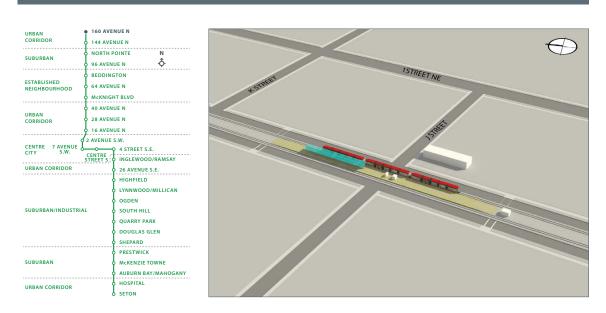
#### **Transit Oriented Development**

As part of the Keystone Hills Area Structure Plan this area will be characterized by a high level of residential and employment intensification. Once built out the resulting communities will be walkable and sustainable. The Green Line LRT will be an important link between the local communities, major activity centres and communities to the south.

### **City Shaping**

Planning for growth also offers the opportunity for new civic services and amenities to be thoughtfully planned and coordinated for these future communities. Services such as a community centre, fire station and recreational opportunities will be integrated, offering spaces for culture and social activities and interaction.

# 160 AVENUE N STATION

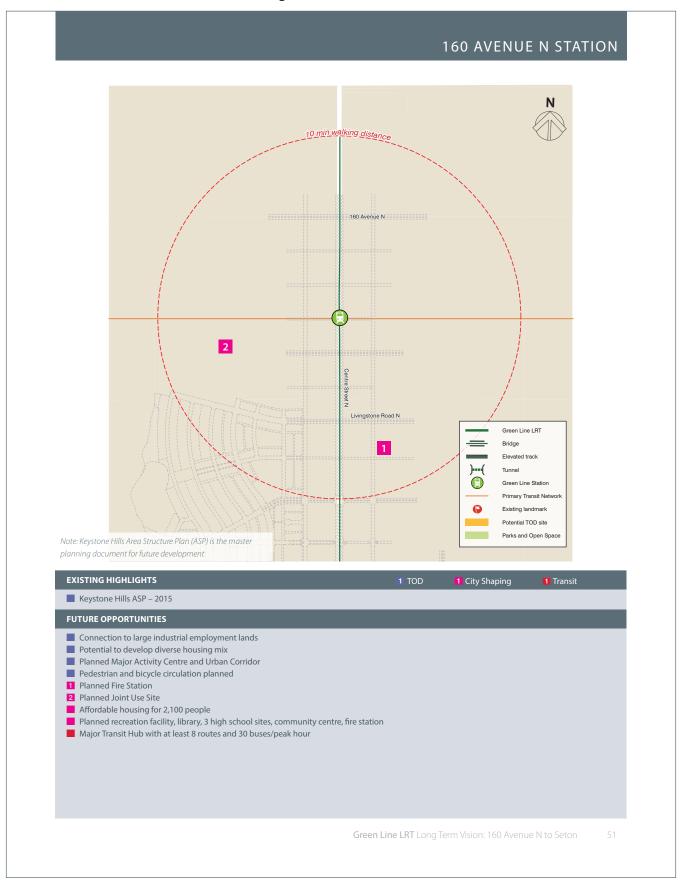


INITIAL STATE (2015)		FULLY CONSTRUCTED	FULLY CONSTRUCTED	
Population	0	Population	10,350	
Jobs	0	Jobs	1,950	
		LRT riders	N/A (Note: Station assumed to	
			be built beyond 2043)	

# TRAN

### TRANSIT BENEFITS

Transit hub	Yes	STATION ACCESS PRIORITIES
Primary Transit Network Connection	Yes	
Regional Connections	Yes	
Park and Ride	No	
Distance from Downtown/Centre City	16 km	



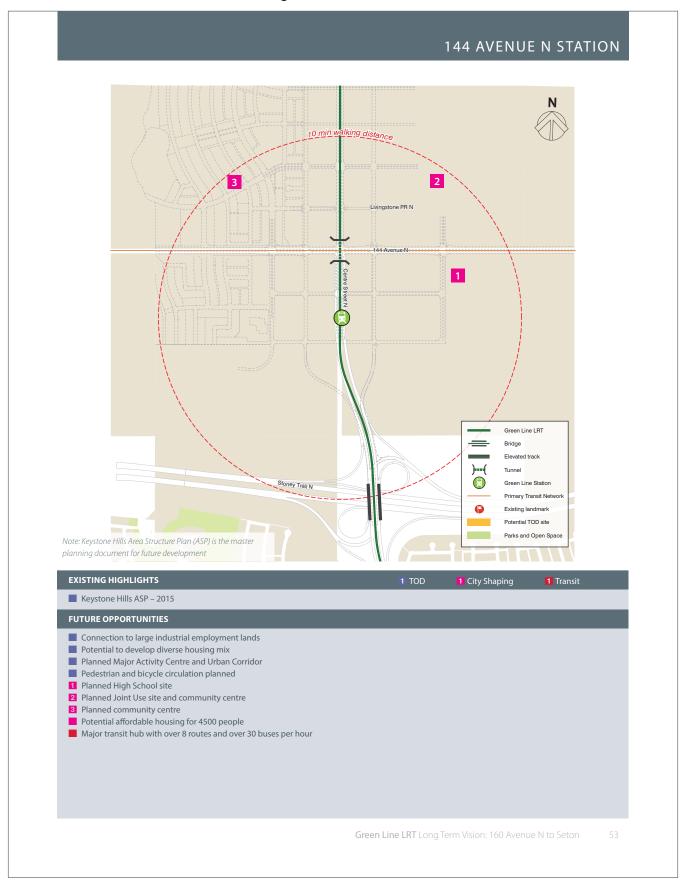
# 144 AVENUE N STATION

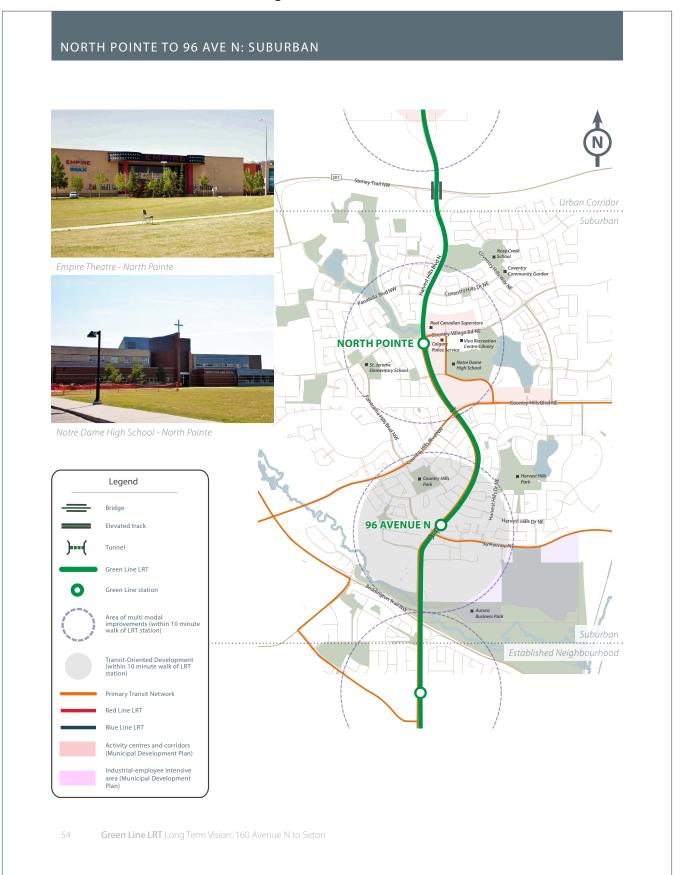


INITIAL STATE (2015)		FULLY CONSTRUCTED	
Population	0	Population	10,350
Jobs	0	Jobs	1,950
		LRT riders	8,750

# TRANSIT BENEFITS

Transit hub	Yes	STATION ACCESS PRIORITIES
Primary Transit Network Connection	Yes	
Regional connections	Yes	
Park and Ride	No	
Distance from Downtown/Centre City	15 km	





#### NORTH POINTE TO 96 AVE N: SUBURBAN



Kelly is a Real Estate Manager who specializes in industrial distribution centres. Previously Kelly had difficulty attracting this industry to Calgary as transit options to industrial areas were limited. With the Green Line LRT, stations in industrial areas such Aurora near the 96 Avenue N station as well as Highfield and Lynnwood, are easily accessible. The workforce can now connect and access industrial employment areas, conveniently by transit. Employers are also able to choose from a large pool of applicants due to increased connectivity and access from the City's primary transit network.

As the line transitions from Harvest Hills Boulevard N to Centre Street N traversing Beddington Trail and the popular Nose Creek Pathway, the Green Line LRT interfaces with a significant Employee Intensive hub known as the future Aurora Business Park. Serving the Community Activity Centre of North Pointe and the neighbourhoods of Country Hills, Harvest Hills, Panorama Hills, and Coventry Hills, the dedicated LRT system will provide users with a quick, reliable transit option to connect them with numerous destinations along the line as well as the greater city.

#### **Transit Connections**

North Pointe and 96 Avenue N are identified as transit hubs where transit customers can connect with local routes, future Primary Transit Network and regional services. The transit network will connect the communities within this character area to major employment areas such as Aurora business park, Calgary International Airport, city services and local and regional retail destinations. Future PTN on Country Hills Boulevard and 96 Avenue N will create strong east west connections.

#### **Active modes connections**

The older communities around the stations of North Pointe and 96 Avenue N were originally built to best accommodate car movement and many streets were built with sidewalks on only one side creating a barrier to walking and cycling users. The Green Line will leverage the regional pathways system and established routes to improve the connections around and through the neighboring communities. The parallel pathway through this area travels largely in the Green Line right-of-way connecting each station together, enabling connections and circulation to station.

### **Transit Oriented Development**

The early TOD planning for these communities considered the future extension of the LRT and protected for the necessary right-of-way along Harvest Hills Boulevard North. Suburban communities are typically characterized by having a commuter workforce. The Green Line will service the surrounding population base and enable enhanced north-south mobility for the commuter population.

#### **City Shaping**

In coordination with active modes connections, City Shaping along the suburban corridor can be enhanced with connections to indoor and outdoor recreation amenities and to The City's Nose Creek Pathway system. Green Line will link students to the high school, library, playfields and community amenities all within walking distance of the station areas.

# NORTH POINTE STATION









INITIAL STATE (2015)		FULLY CONSTRUCTED	
Population	3,050	Population	3,050
Jobs	2,250	Jobs	3,250
		LRT riders	7,100

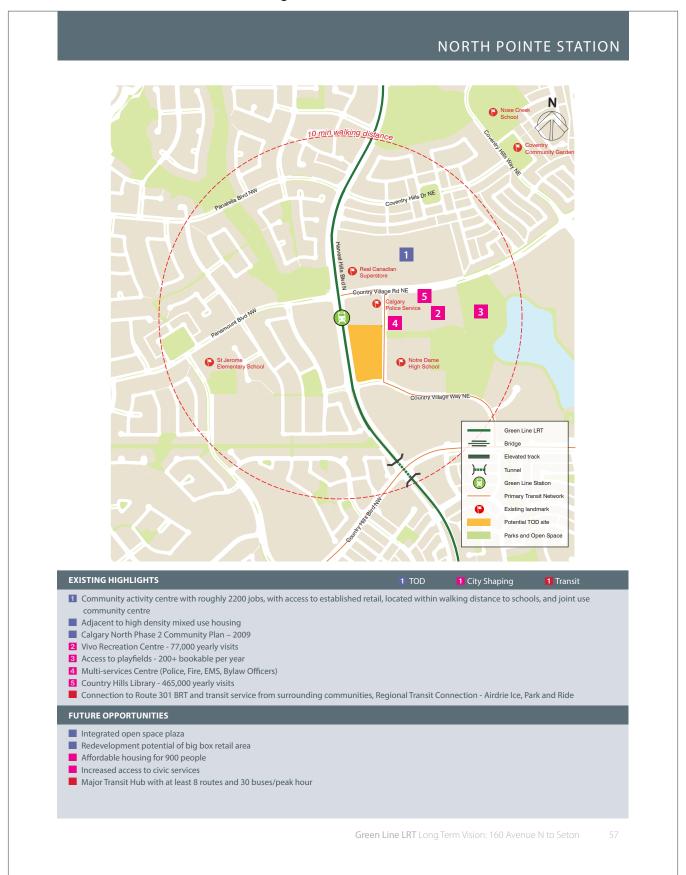


#### TRANSIT BENEFITS

Transit hub	Yes	STATION ACCESS PRIORITIES
Primary Transit Network Connection	Yes	
Regional connections	Yes	
Park and Ride	Yes - existing	
Distance from Downtown/Centre City	12 km	

Green Line LRT Long Term Vision: 160 Avenue N to Seton

ISC: UNRESTRICTED



# 96 AVENUE N STATION







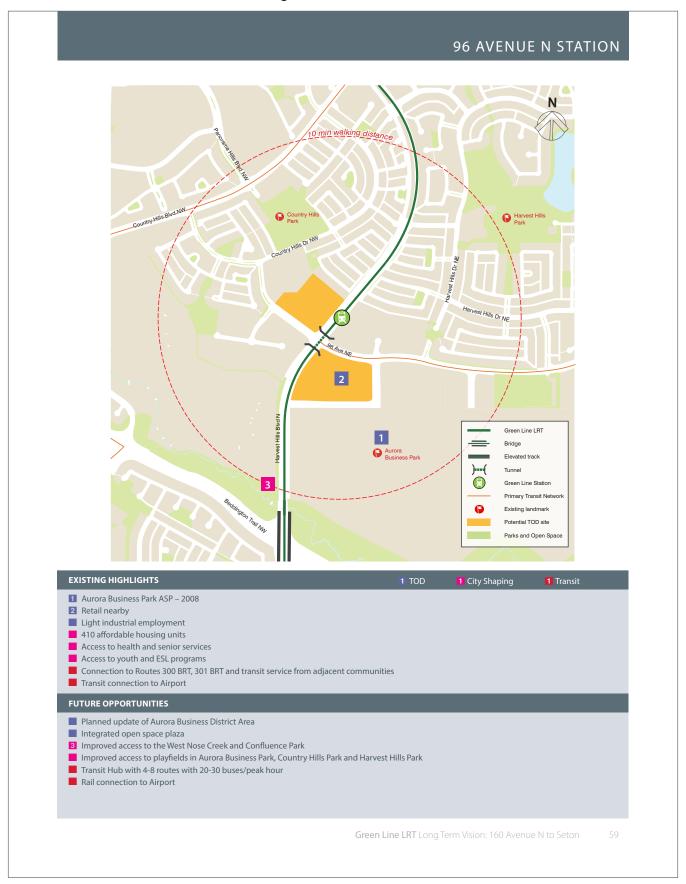


INITIAL STATE (2015)		FULLY CONSTRUCTED	
Population	8,100	Population	7,800
Jobs	1,550	Jobs	6,100
		LRT riders	14,650



#### TRANSIT BENEFITS

Transit hub	Yes	STATION ACCESS PRIORITIES
Primary Transit Network Connection	Yes	
Regional connections	Yes	
Park and Ride	Yes	
Distance from Downtown/Centre City	10 km	



# BEDDINGTON TR TO MCKNIGHT BLVD: ESTABLISHED NEIGHBOURHOOD Established Neighbourhood Beddington Dr NE Huntington Hills Community Association **BEDDINGTON** N G. DIEFENBAKER HIGH SCHOOL ARY BOARD OF EDUCATION **64 AVENUE N** John G. Diefenbaker High School - Thornhill Legend Elevated track Green Line LRT MCKNIGHT BOULEVARD Green Line station Area of multi modal improvements (within 10 minute walk of LRT station) Established Neighbourhood Primary Transit Network Red Line LRT Blue Line LRT Activity centres and corridors (Municipal Development Plan) Industrial-employee intensive area (Municipal Development Plan) Green Line LRT Long Term Vision: 160 Avenue N to Seton

#### BEDDINGTON TR TO MCKNIGHT BLVD: ESTABLISHED NEIGHBOURHOOD



Carolyn and Sylvia are sisters who share two halves of a duplex in Beddington. They love the mature neighbourhood, the proximity to their grandkids and the independence they have by living close to the Green Line and the nearby grocery store. Every Tuesday and Thursday morning, they can take the Green Line one stop to the Thornhill Recreation Centre to do their water aerobics fitness class, and sometimes, they even treat themselves to a coffee and a donut afterwards.

This segment geographically represents single family homes and multi-family dwellings serving the communities of Highland Park, Thorncliffe/Greenview, Huntington Hills, and the Community Activity Centre of Beddington Heights.

#### **Transit Connections**

Transit service in this area will be characterized by strong local routes connecting communities to Beddington station, the primary transit hub in this character area. Other routes will connect at 64 Avenue N station, a future TOD destination for city services. McKnight Blvd station will also have a local Centre Street transit route that will connect users outside the station area walk shed.

#### **Active modes connections**

The three stations in this area all serve communities which have missing sidewalks and cycling infrastructure. In each case the stations will serve valuable neighbourhood hubs, and as the connections to the stations improve so will cycling and walking access to nearby retail such as the local Safeway and Co-op, library and community centre. The parallel pathway through this area connects through the community on both the east and west side of Centre Street. The route will use both existing connections and future planned connections. Riders of the Green Line LRT will have access to resources without the need for a car in many cases.

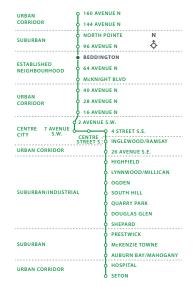
### **Transit Oriented Development**

Established neighbourhoods in this area will experience TOD by revitalizing older developments and offering a sustainable mobility option in a once automobile dominated single-family residential area. Organic smaller scale densification is expected to gradually increase the residential population without losing the established feel of the area.

### **City Shaping**

City Shaping within established neighborhoods offers redevelopment potential of several of The City's aging community infrastructure. Collaboration of these sites between the public and private sector and citizens, brings a community based approach to the civic sites emphasizing what is valued by citizens. Redevelopment creates opportunities for co-location of facilities and services and partnerships, to enhance affordability and vibrancy within established neighborhoods.

# **BEDDINGTON STATION**









INITIAL STATE (2015)		FULLY CONSTRUCTED	
Population	12,000	Population	14,400
Jobs	1,700	Jobs	2,850
		LRT riders	5,800

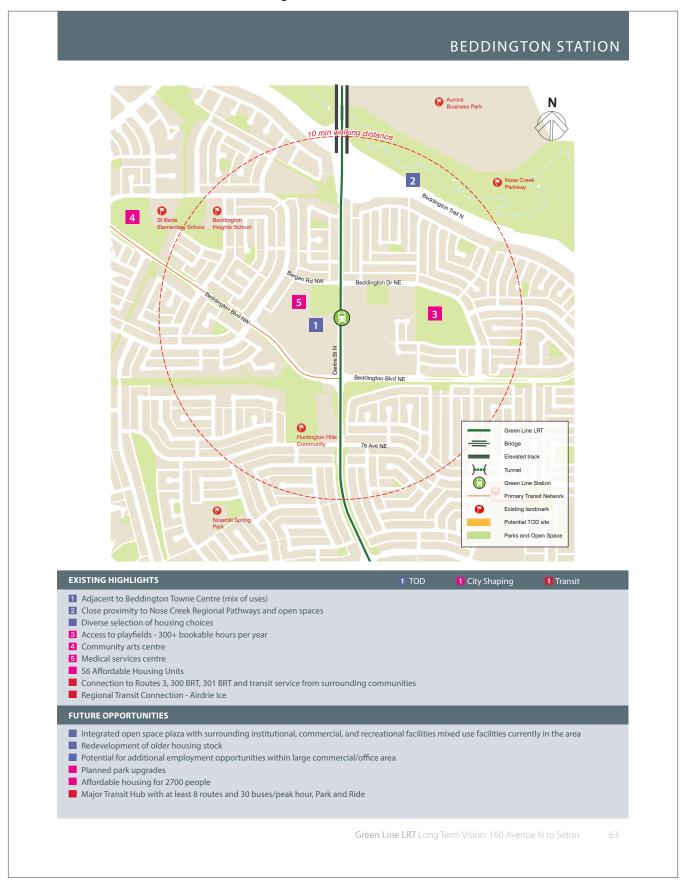


#### TRANSIT BENEFITS

Transit hub	Yes	STATION ACCESS PRIORITIES
Primary Transit Network Connection	Yes	
Regional connections	No	
Park and Ride	Yes	
Distance from Downtown/Centre City	9 km	

Green Line LRT Long Term Vision: 160 Avenue N to Seton

ISC: UNRESTRICTED



# 64 AVENUE N STATION







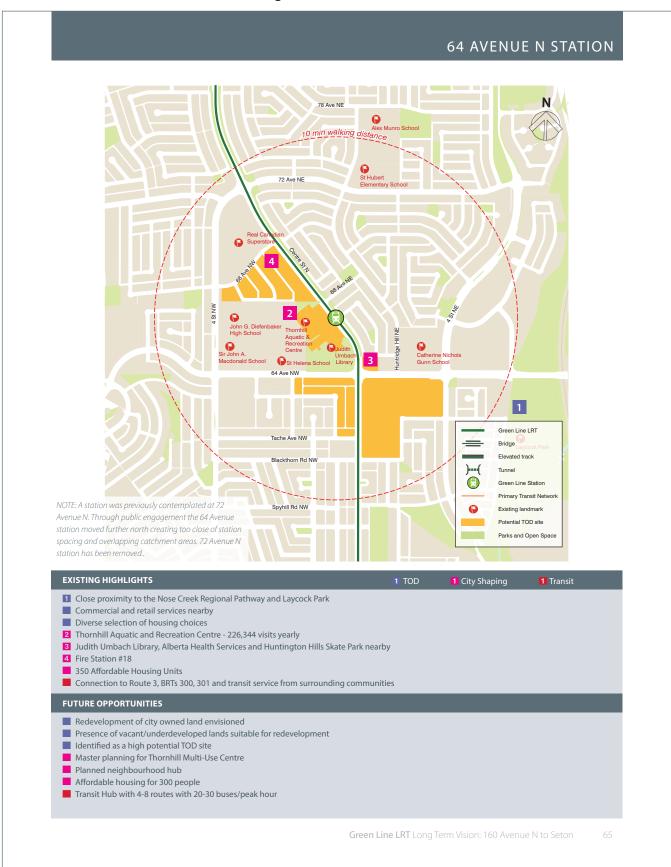


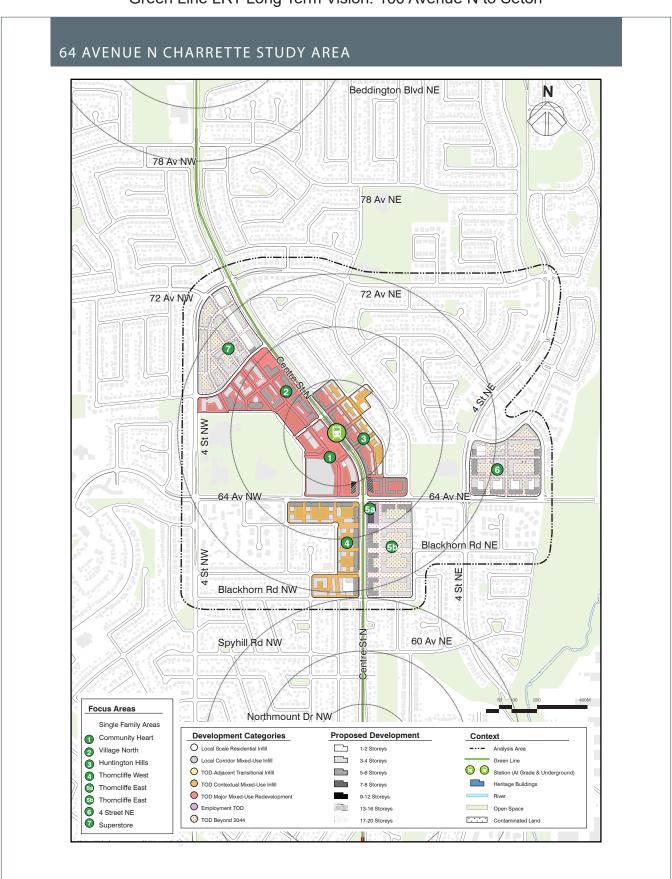
INITIAL STATE (2015)		FULLY CONSTRUCTED	
Population	3,350	Population	3,600
Jobs	1,700	Jobs	1,850
		LRT riders	3,600



#### TRANSIT BENEFITS

Transit hub	Yes	STATION ACCESS PRIORITIES
Primary Transit Network Connection	No	
Regional connections	No	
Park and Ride	No	
Distance from Downtown/Centre City	7 km	





### 64 AVENUE N CHARRETTE STUDY AREA

At the core of this study area lies the Thornhill Civic Centre which includes the Thornhill Aquatic and Recreation Centre, the Judith Umbach Library, park space, a daycare facility and an Alberta Health Services clinic. The existing transit stops serve as important crossover points in the network.

The key element of the development concept was built on the desire of the community for the development of a new "heart" around the Green Line station and Civic Centre. This was fully aligned with the long-range plans for the expansion and upgrading of the civic facilities. Working together, the stakeholders developed the concept of a vibrant, mixed-use transit village to be built around a new urban transit plaza.

- The plaza was designed to serve as both a public event space as well as a transfer zone for transit customers. In its proposed form it could host markets, concerts and community events.
- A defined public space or "living room" for the community. This concept proposes a new urban block street pattern around the plaza lined with new civic and mixed-use buildings.
- Revitalized recreation and aquatic centre, library and the other facilities could
  be built as urban, street-fronting buildings with mixed-use ground floors
  rather than as stand-alone structures. It further proposed that buildings
  should contain residential units on the upper floors if possible. The integration
  of a District Energy facility to service the new developments was also
  recommended.
- A high-rise residential tower at the intersection of 64 Avenue N and Centre Street was proposed. On the east side of Centre Street, adjacent to the plaza and station, the concept suggests new 4 to 6-storey residential development.
- The mid-term plan foresees redevelopment in the form of 4 to 6-storey
  affordable housing based on a new, urban block pattern. This area would
  connect to the long-term prospect of redevelopment of the supermarket site.
  Here too, the large surface parking lot format would evolve into an urban grid
  street network with street fronting buildings.
- Introduce an urban street pattern in place of the large, surface parking areas and suburban developments on site today.
- Enhanced pedestrian and bicycle connectivity throughout the area, across
  Centre Street and improve intersections. The primary cycling route was
  envisioned to follow 4 Street NW. Although some on-street parking would be
  provided, the majority of parking was proposed to either be underground or
  in structures. This further enhances the urban setting and pedestrian focus. It
  also provides for convenient, visible parking opportunities for visitors.

# 64 AVENUE N: WHAT COULD IT LOOK LIKE?



The proposed location of the future 64 Avenue N Station looking north along Centre Street N.



View of the future 64 Avenue N Station with the centre running train within the Centre Street N right-of-way and a transit plaza with bus loop.

# 64 AVENUE N: WHAT COULD IT LOOK LIKE?



View of the future 64 Avenue N Station with development of the public library and a new recreational centre to the west of the plaza.



View of the future 64 Avenue N Station with further development including mixed use residential uses on either side of Centre Street and a district energy plant to the northwest of the transit plaza.

Green Line LRT Long Term Vision: 160 Avenue N to Seton

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# McKNIGHT BLVD STATION









INITIAL STATE (2015)		FULLY CONSTRUCTED	
Population	7,400	Population	8,200
Jobs	1,200	Jobs	1,750
		LRT riders	1,900

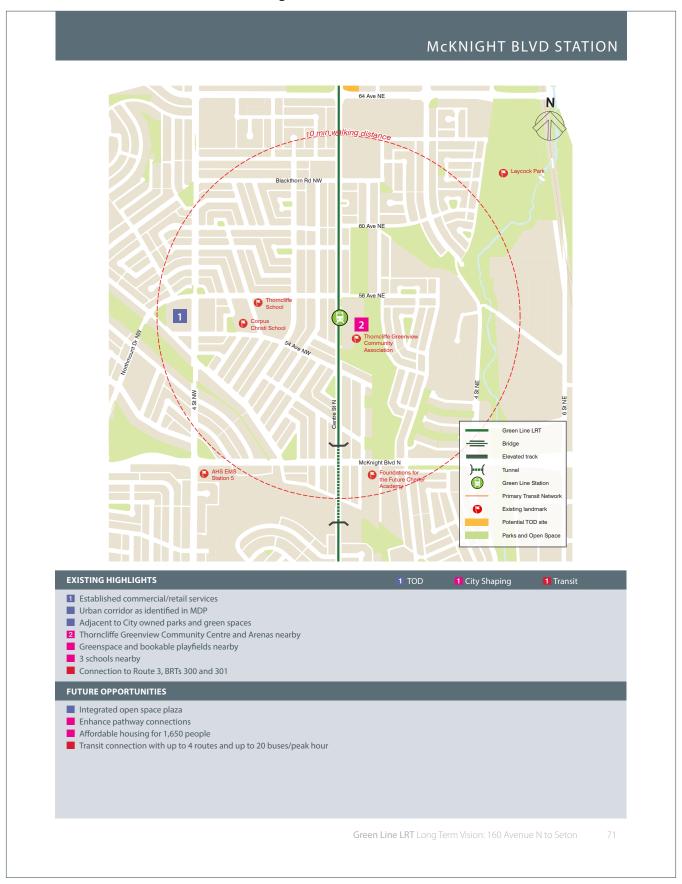


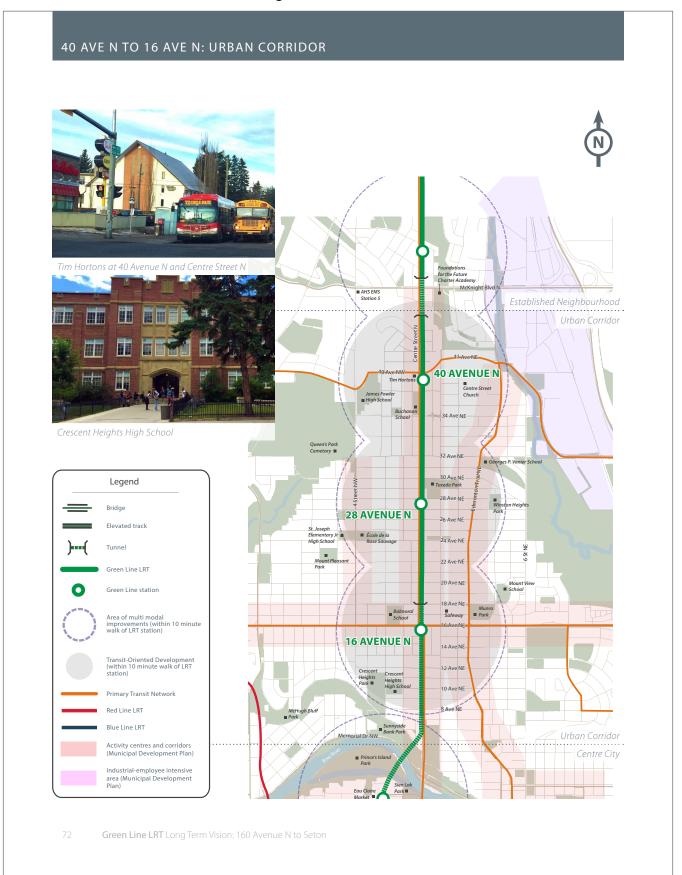
#### TRANSIT BENEFITS

Transit hub	No	STATION ACCESS PRIORITIES
Primary Transit Network Connection	No	
Regional connections	No	
Park and Ride	No	
Distance from Downtown/Centre City	6 km	

Green Line LRT Long Term Vision: 160 Avenue N to Seton

ISC: UNRESTRICTED





#### 40 AVE N TO 16 AVE N: URBAN CORRIDOR



Angie is in the advance placement program at Crescent Heights High School and is planning to one day become a physiotherapist. She is working hard to get into university in a year, and has started assisting with the 3-5 year old climbing class at Vivo in the early afternoons, during her last period spare. Thanks to the Green Line, earning extra college credit has never been easier - Angie can hop on a train when she finishes class and make it to Vivo for the tots climbing class at 3pm, and can even make it back home in time for dinner.

Located north of the Centre City the Green Line LRT will enhance an already bustling area of the city by further improving transit service and providing an alternative travel option to the already existing network of pathways, bikeways, and roads. Serving the established communities of Crescent Heights, Tuxedo Park, Mount Pleasant, Renfrew, and Winston Heights/Mountview. Many of the proposed station locations serve local shops and amenities, recreation facilities, schools, libraries, and religious institutions.

#### **Transit Connections**

Community transit use in this character area is high due to the grid street network which optimizes service coverage, provides direct connections and reduces travel time. Major east-west transit connections will supplement Green Line stations at 40 Avenue N and 16 Avenue N. 40 Avenue N is a future PTN and 16 Avenue N will have a new BRT service in 2018. These connections will connect transit users to major destinations outside of the Centre City such as the Northwest Hub and Northeast Industrial

#### **Active modes connections**

The stations in this area all serve communities which depend heavily on walking and cycling. The grid network allows people to easily access stations and local destinations with greater trip flexibility. The station at 40 Avenue N has a large industrial area to the southeast which will require additional cycling and walking infrastructure to support the increased active modes activity generated by the TOD near the station. The pathway through this area is located on parallel streets to the east and west of the Green Line LRT, providing a traffic calmed pathway for pedestrians and cyclists to access retail on Centre Street or a Green Line station.

#### **Transit Oriented Development**

Transit Oriented Development will occur around the stations and extend along Centre Street. These communities offer a number of community services, retail, and dining establishments. The current housing stock varies from single family housing, duplexes, townhouses, to condo buildings, which provide choices for residents. Within this area, redevelopment has already started due to it close proximity to downtown and is expected to continue as the Green Line is built out. Four-six storey residential infills are expected to slowly repopulate the area along Centre Street.

### **City Shaping**

The linear urban corridor offers great connections to high use parks, open spaces and variety of school sites. Parks, schools and programs provide City Shaping opportunities to enhance services within the area, and to link them with the high potential, high density TOD redevelopment. A new affordable housing development within a 5 minute walk to the future 16 Avenue N station is an initial example of the link between affordable access to housing, transit and community services, improving quality of life for people living along the Green Line LRT.

# 40 AVENUE N STATION







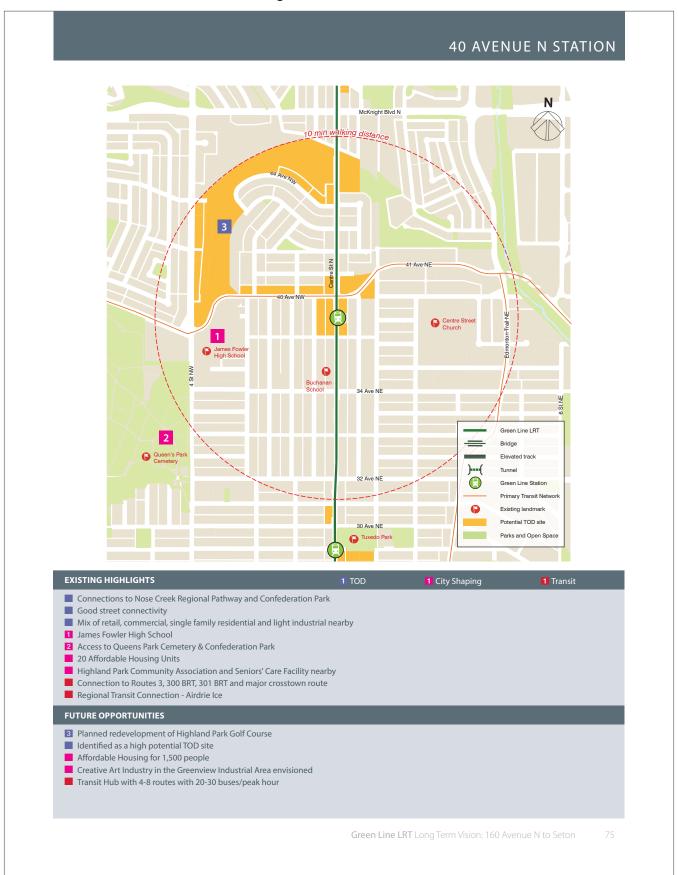


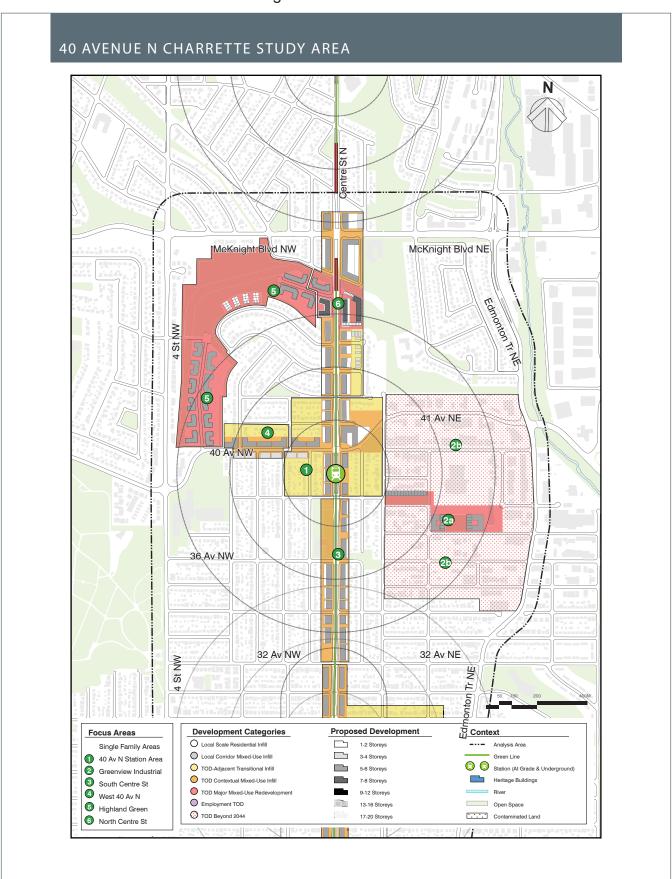
INITIAL STATE (2015)		FULLY CONSTRUCTED	
Population	4,600	Population	7,400
Jobs	3,200	Jobs	4,050
		LRT riders	4,100



#### TRANSIT BENEFITS

Transit hub	Yes	STATION ACCESS PRIORITIES
Primary Transit Network Connection	Yes	
Regional connections	No	
Park and Ride	No	
Distance from Downtown/Centre City	4.5 km	





### 40 AVENUE N CHARRETTE STUDY AREA

This study area focused on three main themes: the redevelopment of a large, cohesive former golf course into a TOD community; the redevelopment of Centre Street as a new main street; and the transformation of an established industrial area towards a contemporary mix of residential and light industrial uses served by the LRT.

The concept developed for the station area includes:

- The long-term goal for knowledge worker employment growth and the creation of an Innovation District in the present-day Greenview Industrial Park.
- An urban transit plaza that extends east to west along 40 Avenue N would link Centre Street and the station to a sloped park space that connects to the Innovation District.
- The proposed development of TOD villages that create nodes at the southeastern and eastern ends of the former golf course.
- A large, cohesive park space was proposed to link these two nodes and create a recreation area for the community.
- Buildings with heights of 5 to 6 storeys and retail uses on their ground floors were proposed adjacent to the station on Centre Street.
- Residential and mixed-use buildings of 6 storeys in height were recommended between 32 Avenue N and McKnight Boulevard.
- The concept also envisions buildings of 4 to 6 storeys along 40 Avenue N between Centre Street and 3 Street NW.
- The concept provides for higher buildings in the two TOD villages at the former golf course.
- The southeastern TOD node of the golf course was envisioned to consist of 6 to 12 storey buildings in a clustered arrangement.
- 3-storey townhouses could be integrated into the eastern slope of the site and connect to the
  existing residential neighbourhood.
- The northeastern TOD node would include 8 storey buildings with retail uses at grade on the
  western side of Centre Street and 16 storey mixed use development (retail and residential) to
  the east of Centre Street.
- A series of green avenues that act as connections within the community and transitions between existing and proposed development. Proposals were made to also re-purpose portions of residential streets to create new pocket parks that would support traffic calming measures.
- The most fundamental change to the street network is the introduction of the Green Line onto Centre Street and the subsequent reduction of automobile lanes from two lanes each way to one. To align with this capacity reduction, the concept supports the proposal to change the Municipal Development Plan street classification for Centre Street up to McKnight Boulevard from Urban Boulevard to Neighborhood Boulevard. The concept also provides angled parking.
- On sides streets in the vicinity of the station to support the retail activity of the main street.
   A focus was placed on enhanced pedestrian and bicycle connections and safer intersections throughout the community and in particular across Centre Street. This was aligned with a series of neighbourhood greenways that connect the open spaces and prioritize people and bicycles.

# 40 AVENUE N: WHAT COULD IT LOOK LIKE?



The proposed location of the future 40 Avenue N Station looking north along Centre Street N.



View of the future 40 Avenue N Station with the centre running train and single travel lane in each direction.

# 40 AVENUE N: WHAT COULD IT LOOK LIKE?



View of the future 40 Avenue N Station with mixed-use residential and commercial development along the east side of Centre Street.



 $\textit{View of the future 40 Avenue Station with the further build-out of mixed use developments along \textit{Centre Street}.}$