

# The City of SPRUCE GROVE



## 2012 Transportation Master Plan

May 2012



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## 1.0 INTRODUCTION

The City of Spruce Grove is located in Parkland County west of the City of Edmonton. The City is bounded on the north by Highway 16 (the Yellowhead Route), on the east and south by rural lands within Parkland County, and on the west by the Town of Stony Plain. In addition to Highway 16 the City is bisected by Highway 16A (the Parkland Highway) and by the Canadian National Railway main line. The current population is approximately 25,000 residents.

Typical urban infrastructure has been mandated in the City for several decades. The City is well-served by a system of four-lane divided arterial roads on a one-mile grid, with collector roads that feed subdivisions. All roads north of Highway 16A have curbs, gutters, sidewalks and street lighting. An excellent trail system has been developed paralleling the arterial roads and diverging through linear parks. A commuter bus service to Edmonton has been initiated and there is a local transit service for handicapped and elderly residents. Roads south of Highway 16A and the CN tracks service industrial employment zones with more rural-type sections and lack bike and pedestrian facilities.

The City retained Urban Systems Ltd to review the key transportation issues and update the Transportation Study of July 2000 for the City of Spruce Grove. This report documents the findings of this work.

### 1.1 Project Management

Preparation of the Transportation Master Plan was directed by the City's Director of Engineering and a Project Management Committee including the General Manager of Planning and Infrastructure, the Director of Planning and Development, the Director of Public Works, and the Supervisor of Park Planning and Recreation Administration. The Management Committee met with the consultants on a monthly basis throughout the course of the study. Additional City staff were invited to Management Committee meetings as required.

### 1.2 Purpose of the Transportation Master Plan (TMP)

The purpose of a Transportation Master Plan (TMP) is to prepare a long-term plan to guide the development of transportation infrastructure to support other goals and objectives of the City, principally the economic growth of the community. The TMP documents and analyzes current travel conditions, forecasts future travel conditions, and develops appropriate long-term transportation strategies for the community to consider.

The TMP is used as a basis for adopting safe, innovative, sustainable approaches to all modes of transportation, as a guide to future development, as a basis for partnership discussions with other agencies, and as a basis for preparing long-term Capital Plans for funding and construction of the recommended improvements. These recommendations will support the City in applying for grants and other funds, and in negotiating development conditions with the private sector. The TMP also forms the basis for the City to develop work programs and budgets.



### 1.3 Municipal Development Plan and Other Documents

The City of Spruce Grove completed an update of its Municipal Development Plan (MDP) ***“Your Bright Future”*** in 2010. The MDP forecasts economic growth in terms of new jobs and new residents, the development capacity of lands within its boundaries, and the infrastructure and social programs required to support the community. The MDP also includes significant policies and objectives that have direct implications on the transportation networks. The MDP requires a Transportation Section and exhibits of the transportation networks which form the legal schedules of the MDP bylaw. The Transportation Master Plan has been developed on the basis of the MDP and elements of the Transportation Master Plan should be directly incorporated into the MDP as further amendments are made.

Other documents and studies were reviewed in developing the Transportation Master Plan. These include the ***City of Spruce Grove Corporate Plan*** (2010 to 2012), the ***City of Spruce Grove Strategic Plan*** (2012 to 2014), the ***Spruce Grove Transportation Study*** (July 2000), several ***Area Structure Plans*** (ASP’s) for Spruce Grove, several ***Functional Planning Studies*** for Spruce Grove roads, the ***Spruce Grove Specialized Transit Service; Three Year Operations and Business Plan*** (2010 to 2013), the ***Spruce Grove and Stony Plain Transit Feasibility Study*** (2007), the ***Town of Stony Plain Transportation Study*** (2011), the ***Parkland County Municipal Development Plan*** (2010 Consolidation), the ***City of Edmonton Transportation Master Plan*** (2009), the ***Capital Region Board Integrated Regional Transportation Master Plan*** (2011) and plans by Alberta Transportation.







## 1.4 Public Involvement

A key component in development of the Spruce Grove Transportation Master Plan was the consultation process with the public.

The study process was initiated with a public **Open House** to obtain opinions about current conditions, perceived deficiencies, and preferences for future transportation investments. A detailed survey was distributed at the Open House and made available to other residents who were not able to attend the Open House. Information on the transportation systems and preferences was also posted on the **City of Spruce Grove Web-Site**.

The key public involvement process was the formation of a **Stakeholder Advisory Group**. The stakeholder group included representatives from:

- ▶ Spruce Grove Residents including the Spruce Grove Citizens on Patrol
- ▶ Business Associations including the Spruce Grove Chamber of Commerce, the Urban Development Institute, and the Spruce Grove Economic Advisory Committee
- ▶ Health and Accessibility Advocates including the Tri-Community Health & Wellness Foundation, the Spruce Grove Golden age Club, the Seniors Advisory Council for Alberta, the Family and Community Twining Society (FACTS), and the Parkland County School Division 70
- ▶ Transportation Providers and Advocates including the Spruce Grove Specialized Transit Service and the Alberta Bicycle Association

- ▶ Regional Transportation Agencies including Alberta Transportation and the Capital Region Board
- ▶ Adjacent municipalities including Parkland County and the Town of Stony Plain

The Stakeholder Advisory Group met four times throughout the course of the study in intensive 3-hour workshops. The stakeholders completed the following work:

- ▶ reviewed data on the existing conditions and future growth forecasts,
- ▶ provided advice on transportation goals and objectives,
- ▶ provided opinions of future travel behaviour,
- ▶ identified potential road, transit, bicycle and pedestrian projects
- ▶ reviewed options on specific transportation projects
- ▶ resolved conflicts between alternatives transportation projects
- ▶ provided priorities on potential transportation projects

Updates of the TMP were also presented to Spruce Grove City Council on three separate occasions.

The development and conclusions of the Transportation Master Plan are significantly due to the dedication, intelligence, and cooperation of the Stakeholders and City Council in providing ideas, advice, and direction.



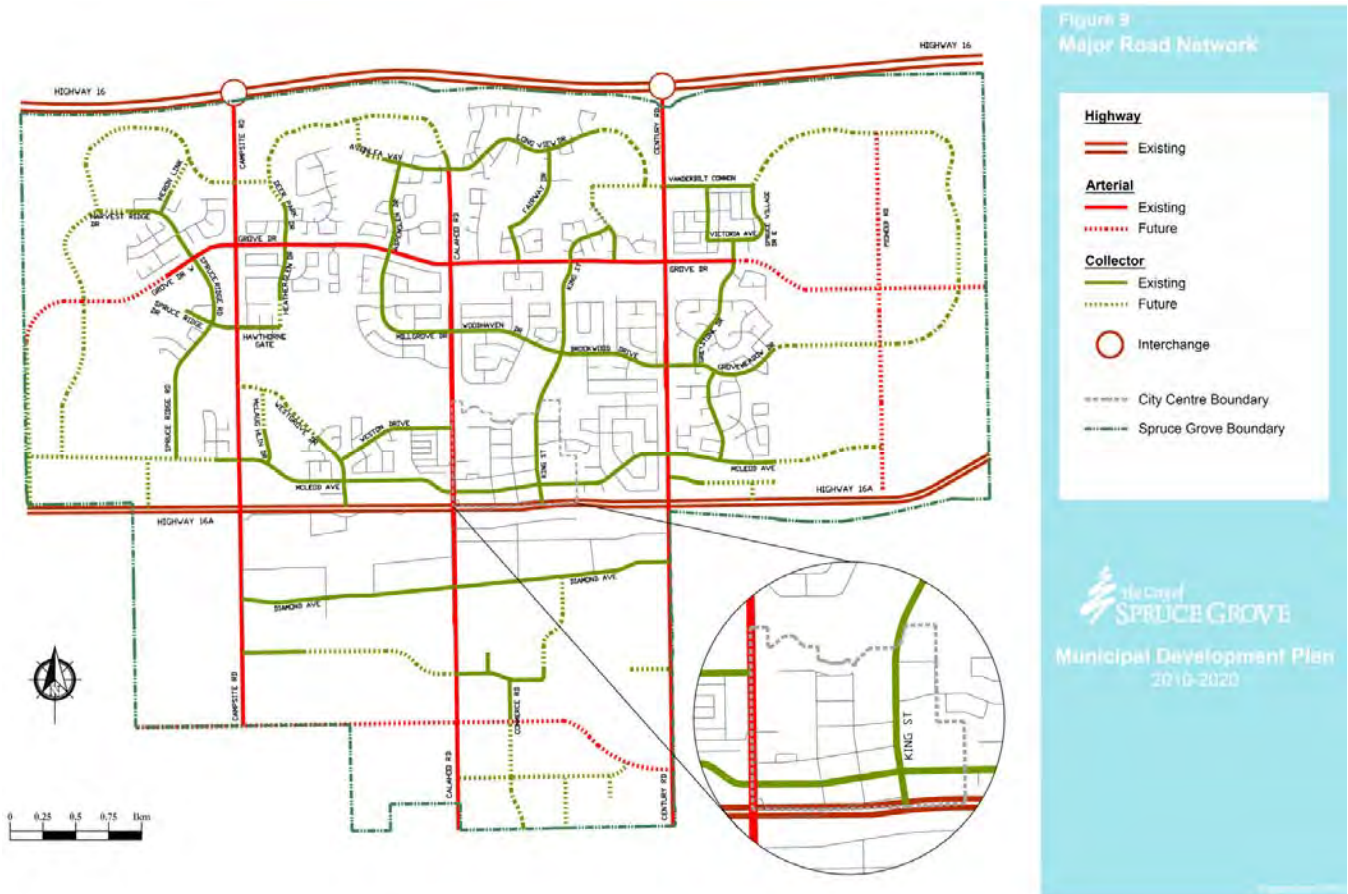
## 2.0 EXISTING CONDITIONS

Evaluating a community's existing transportation conditions is an essential element in developing a long-range Transportation Master Plan. An inventory of the existing transportation infrastructure, how it is being used, and where deficiencies in the system limit mobility, will help in developing a plan for the future.

## 2.1 Existing Road Network and Traffic Volumes

The City of Spruce Grove has a distinct road network plan adopted in the Municipal Development Plan with a hierarchy of Highway (Freeway/Expressway), Arterial, and Collector road facilities. The Major Road Network Plan is illustrated in **Figure 2.1** and includes existing and future roads.

**Figure 2.1: Spruce Grove Road Network Plan**

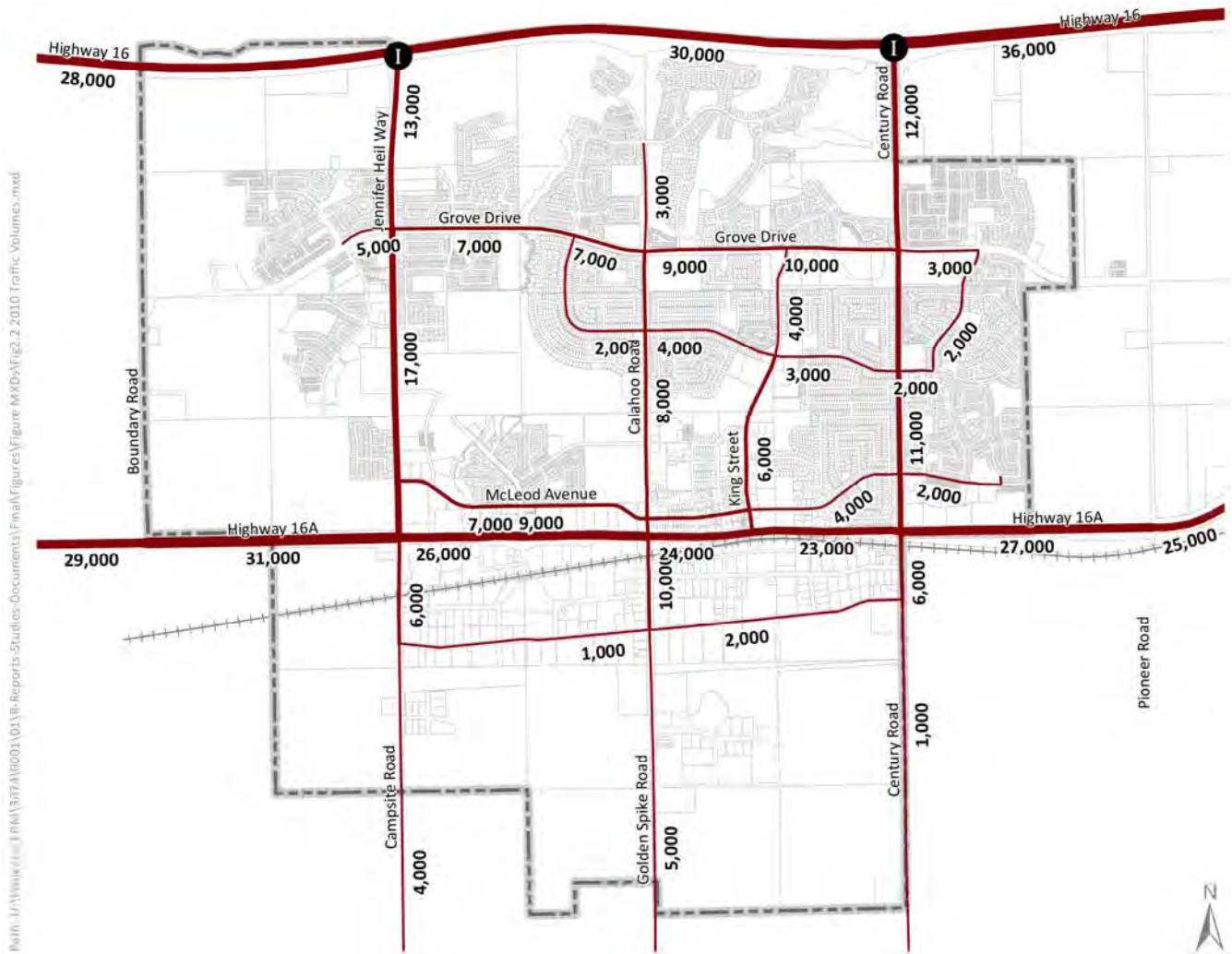




Highway 16 operates as a limited access **Freeway** on the northern boundary of the City. The highway is owned and operated by Alberta Transportation for high speed regional and long-distance trips. Two interchanges at Century Road and at Jennifer Heil Way provide freeway access to Spruce Grove. Highway 16A runs through the southern end of the developed City and acts as a low speed six-lane **Expressway or Arterial** with access limited to public streets predominantly at signalized intersections.

Average weekday traffic volumes on Highway 16 range between 30,000 and 36,000 vehicles per day while average weekday traffic volumes on Highway 16A range between 23,000 and 31,000 vehicles per day, as shown in **Figure 2.2**. Most of the traffic on both of these Freeway/Expressway facilities does not originate in Spruce Grove.

Figure 2.2: Spruce Grove 2010 Daily Traffic Volumes





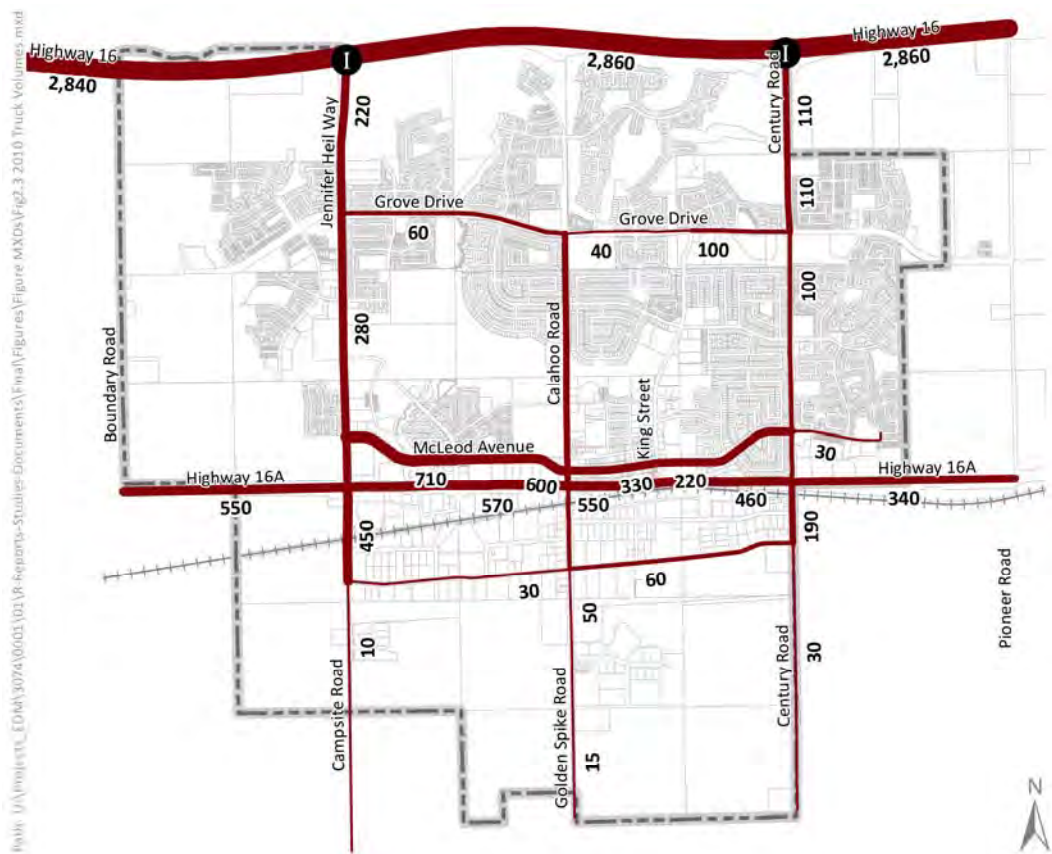


**Arterial** roads in Spruce Grove accommodate medium to high traffic volumes for local and regional trips. Traffic arterials are designed to connect neighbourhoods to one another and the community to regional freeways and expressways. These arterials are predominantly four-lane divided road facilities with wide boulevards and limited or no access to business and residential frontages. In the north-south direction, Jennifer Heil Way/Campsite Road, Calahoo Road/Golden Spike Road, and Century Road accommodate connections between city neighbourhoods and Highways 16 and 16A. In the east-west direction, Grove Drive connects the City's northern neighbourhoods and provides access to the north-south arterials. Traffic volumes on these arterial roads range from about 7,000 vehicles per day along Grove Drive to nearly 17,000 vehicles per day along Jennifer Heil Way.

**Collector** roads serve a dual purpose; they connect local and arterial roads and also provide direct property access. Major collectors in Spruce Grove include King Street, McLeod Avenue, Brookwood Drive, Woodhaven Drive, Millgrove Drive, and Diamond Avenue. These collectors carry daily traffic volumes ranging between 2,000 and 7,000 vehicles per day. **Local Streets** provide direct property access and connect to either collector or arterial roads.

Existing **truck volumes** have also been recorded from traffic counts collected by the City of Spruce Grove and Alberta Transportation, as shown on **Figure 2.3**. Truck volumes are heavy on Highway 16 but lighter on Highway 16A and arterial roads such as Campsite and Century Boulevard. Commercial truck volumes along McLeod Avenue also illustrate the delivery of goods to high density retail commercial zones.

Figure 2.3: Spruce Grove 2010 Daily Truck Volumes





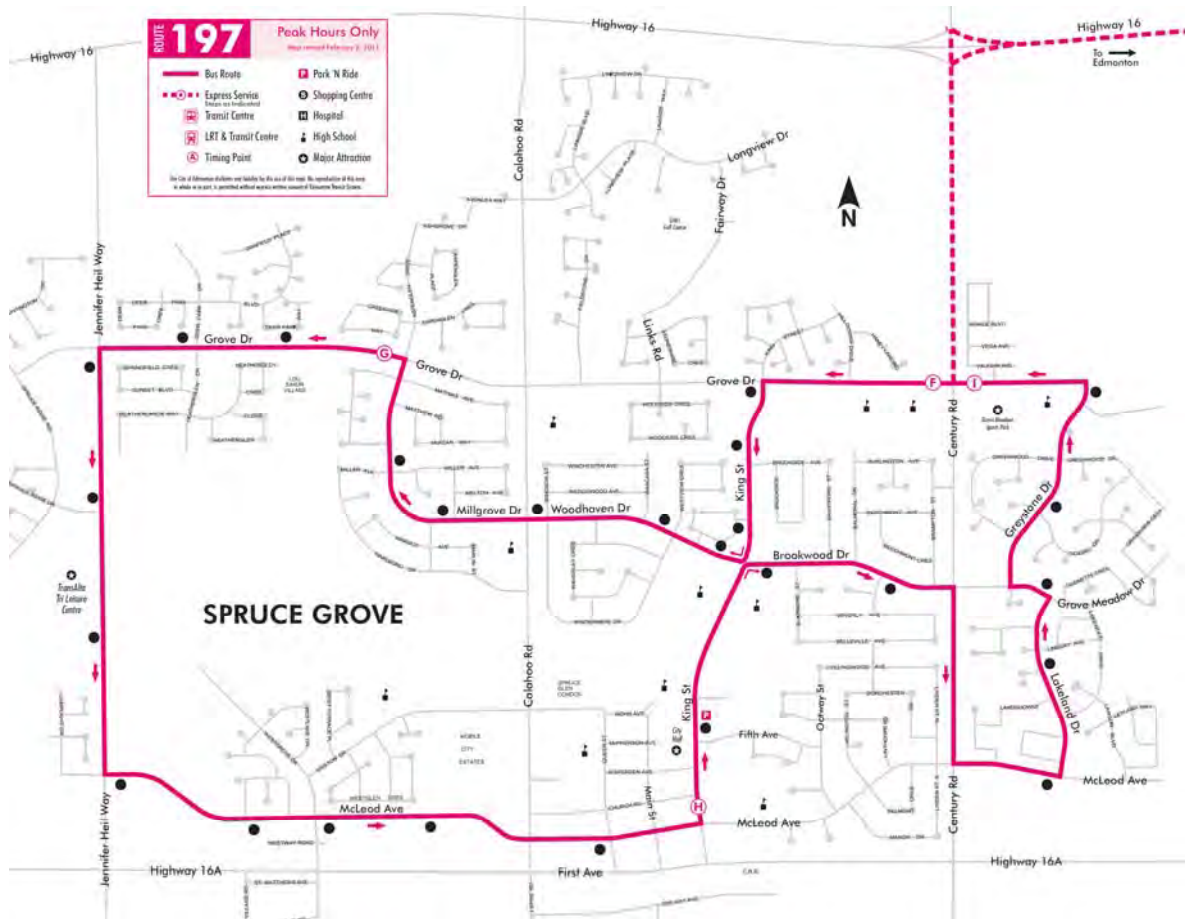


## 2.2 Existing Transit Network and Passenger Volumes

The City of Spruce Grove has no distinct transit network plan with a hierarchy of services similar to the road network plan. The City is currently served by a single transit route designed primarily for Edmonton-bound commuters. Edmonton Transit Services (ETS) Route 197 provides direct service between Spruce Grove and Edmonton via Highway 16

with stops at NAIT, Downtown Edmonton, and the University of Alberta. The route operates only during weekday peak commuter periods; effectively 5:30 to 8:00 am in the morning and 3:30 to 7:00 pm in the afternoon. Within Spruce Grove, Route 197 travels in a counter-clockwise loop in order to maximize coverage area as shown on **Figure 2.4**. The loop takes approximately 30 minutes to complete. Currently Route 197 might best be described as a **Transit Collector**, due to the limited commuter service and low frequency.

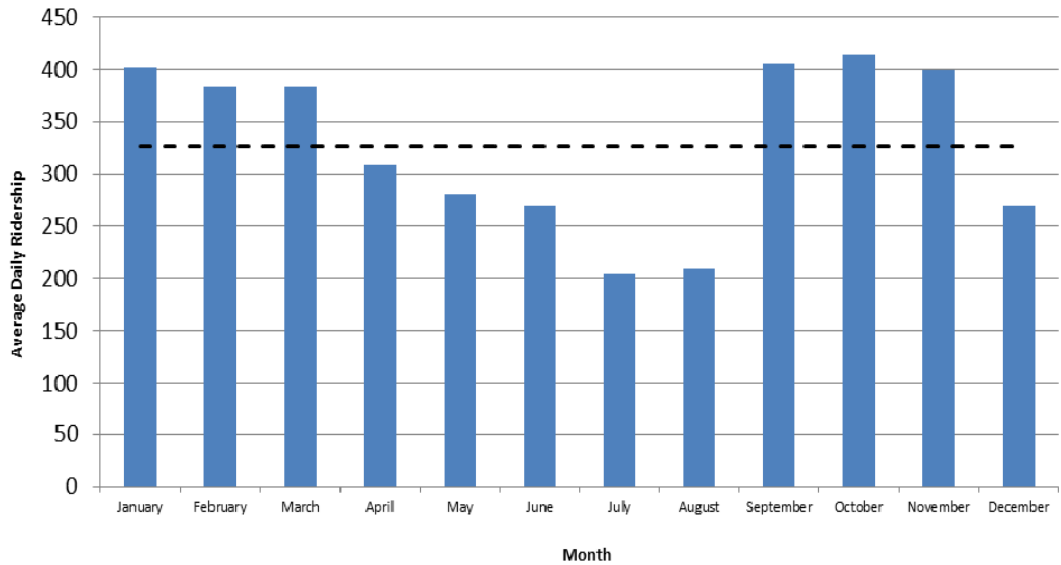
Figure 2.4: ETS Route 197



Approximately 350 person-trips per weekday are accommodated by transit between Spruce Grove and Edmonton as shown on data from ETS on **Figure 2.5**. Ridership shows a significant seasonal variation, lower in April through August and December which may reflect university-related ridership.

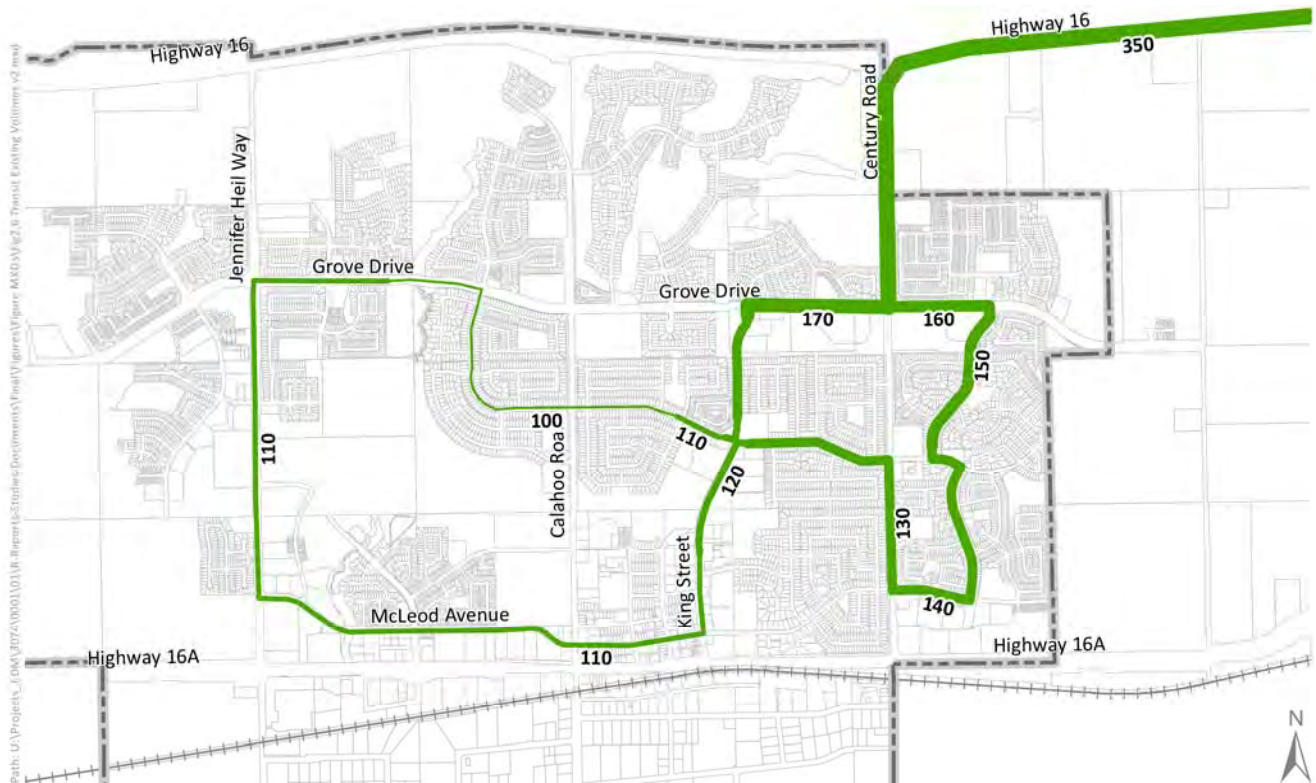


Figure 2.5: 2010 Route 197 Seasonal Ridership



Transit passenger volumes are not usually recorded in the same way that automobile traffic is recorded. Transit operators are typically interested in total ridership by route. However, the ETS data does provide boardings and alightings by bus stop and this data has been converted to illustrate ridership in the same manner that vehicular traffic is illustrated as shown on **Figure 2.6**. This data illustrates a number of transit users boarding and alighting near the head of the loop at Grove and Century to avoid circling around the community for 30 minutes.

Figure 2.6: Spruce Grove 2010 Daily Transit Passenger Volumes

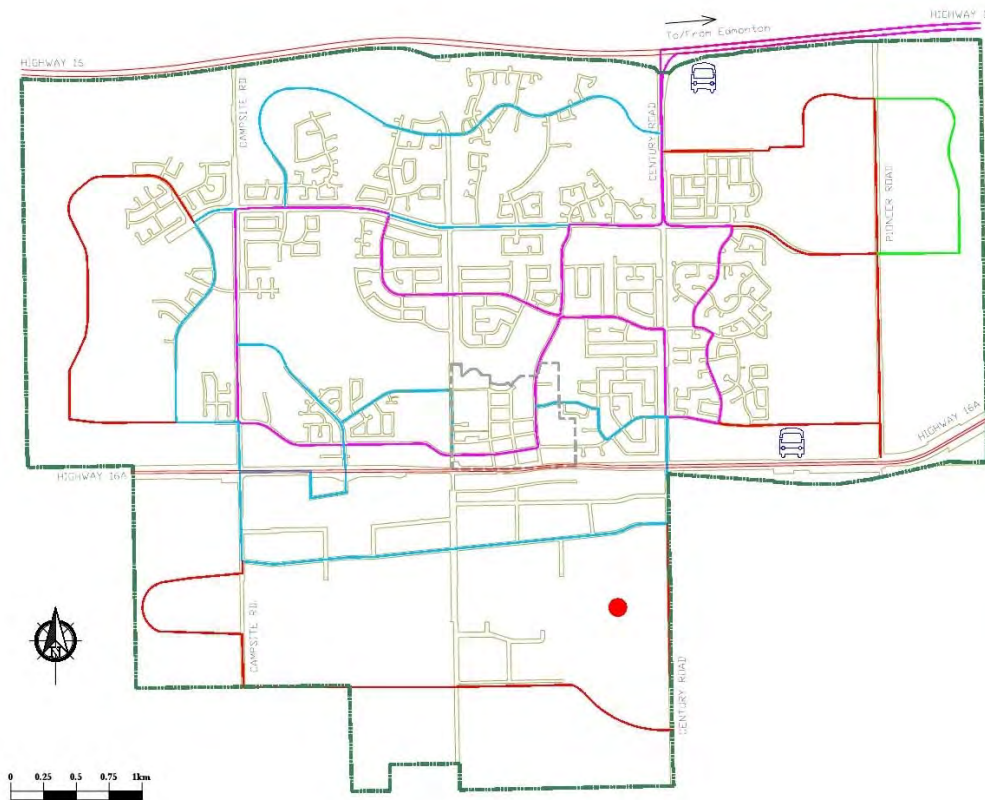




Spruce Grove is also served with the **Specialized Transit Service (STS)**. STS is a non-profit, door-to-door public transportation service for all seniors (55+) and persons with mobility challenges. STS is available for use by residents of the City of Spruce Grove, Parkland Village and defined limits of Parkland County. STS operates three wheelchair accessible vehicles; two small vans and a 20-passenger van serves larger groups including a maximum of four wheelchairs. STS operates on weekdays providing about 550 medical, social and shopping trips per month to a wide variety of destinations.

The Spruce Grove Municipal Development Plan provides an illustration of what roads bus routes should operate on in the future to provide a maximum walk distance of about 400 meters to all residents and it suggests a timeframe that these routes should be in operation as illustrated in **Figure 2.7**. There is no indication about what level of transit service (express, arterial, or collector) would be provided.

Figure 2.7: Spruce Grove Transit Network Plan







### 2.3 Existing Active Transportation (Bicycle and Pedestrian) Networks

The City of Spruce Grove does not have a distinct bicycle or pedestrian network plan defined by expressways, arterials, or collectors. It does have a highly developed trail network as shown in **Figure 2.8**. There are currently no separate bikeways, or bicycle lanes or “sharrows” on streets. There are some commercial sidewalks and most streets have sidewalks. None of these facilities are inventoried in the GIS system.

Figure 2.8: Trail Network Plan







Most of the trails are shared between pedestrians and bicycles. Many of the trail facilities crisscross Heritage Grove Park and other green zones while others parallel arterial streets. Many of the trails are for recreational uses, while others connect schools and commercial areas. There are no trail facilities in the industrial area south of Highway 16A. Most of the existing trails would be classified as **Bicycle Arterials** and **Pedestrian Arterials**.

There are no counts recorded for bicycle traffic. Pedestrian volumes have been recorded at key intersections where traffic counts were collected and

these counts have been converted into daily pedestrian activity as shown on **Figure 2.9**. These counts may not represent the highest activity areas for pedestrians since the counts were related to crossings of roads, not along sidewalks or trails that may not have crossed the roads. The intersection of Woodhaven-Brookwood Drive and King Street is identified as having the most pedestrian activity with about 500 pedestrian crossings per day. This intersection is close to two schools, three bus stops, and a number of apartment buildings, and a trail paralleling King Street crosses Woodhaven-Brookwood Drive at this location.

**Figure 2.9: Spruce Grove 2010 Daily Pedestrian Volumes**

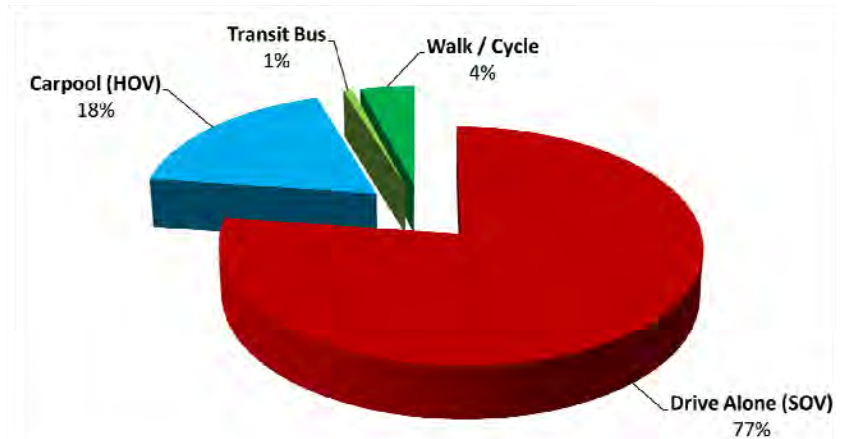




## 2.4 Existing Travel Behaviour in Spruce Grove

Data from the 2006 Canada Census provides a profile of travel behaviour for residents of Spruce Grove as shown in **Figure 2.10**. This data only represents the commuter trip to work. The vast majority of Spruce Grove’s workers drive alone in single occupant vehicles (**SOV**). Another 18% share a ride in carpools or high-occupancy vehicles (**HOV**). About 4% of the workers either **walk** or **cycle** to work and only about 1% use **public transit**. While travel behaviour may be somewhat different for other trip purposes such as trips to school, shopping, business, social and recreational purposes, it is highly likely that the SOV mode of travel dominates for all trip purposes.

**Figure 2.10: Spruce Grove 2006 Work Trip Travel Behaviour**





## 3.0 TRANSPORTATION GOALS AND POLICIES

The long-range Spruce Grove Transportation Master Plan requires basic long-term goals, principle objectives to achieve those goals, and then specific policies that will accomplish the objectives.

The Transportation Master Plan reflects the goals and objectives that have been adopted in the **Municipal Development Plan (MDP): “Your Bright Future”**.

While the MDP goals on environmental management, economic development, and partnerships have significant influence on the Transportation Master Plan, it is the MDP goals on Form and Infrastructure that are particularly relevant, as follows:



### *Form and Infrastructure*

- Goal 5 Spruce Grove manages growth to ensure the City is economically, environmentally, and socially sustainable.
  - Goal 6 Spruce Grove remains a compact, safe, and efficient community that emphasizes connectivity, accessibility, special places, and parks and open space and promotes a high standard of community design incorporating green and health living principles.
-



### 3.1 Transportation Goals

The Transportation Master Plan Goals represent the same basic goals and objectives of the MDP but they are presented in a format that focuses on the provision of transportation facilities and services. These goals usually do not change over the course of time because they represent fundamental values of the community. The five overall goals of the City of Spruce Grove 2012 Transportation Master Plan are:

- Goal 1**     ***Connect residential, business, and industrial communities effectively and efficiently.***  
The City will provide an effective network of transportation facilities to allow the efficient movement of people and goods between all of the residential, business, and industrial communities in the City.
  
- Goal 2**     ***Enhance mobility and economic vitality by providing reasonable transportation choices to all residents and businesses.*** Within its own financial capability and that of its partners, the City will provide all residents, employees and customers a wide range of mobility choices, such as driving a personal vehicle, car-pooling, using public transit, walking and cycling.
  
- Goal 3**     ***Promote the safety and security of the transportation system.*** The City will place a high priority on the safety and security of people, equipment, goods, and property in the design and operation of the transportation system.
  
- Goal 4**     ***Reduce vehicular travel with higher degree of mixed land uses.*** The City will prioritize transit, walking and cycling in higher density residential and commercial districts as they develop within the City in order that the total number of vehicles on the roads may be minimized.
  
- Goal 5**     ***Promote healthy and environmentally responsible transportation choices.*** The City will partner with other agencies to educate the public on healthy transportation choices and to minimize the environmental impacts of the transportation system.





### 3.2 Transportation Objectives and Policies

The objectives and policies provide the guidance necessary to develop specific transportation facilities and programs that will achieve those goals. The objectives and policies may change from time-to-time as the community grows, as travel behaviour, needs and technologies change. The objectives and policies should to be reviewed and updated about every five years.

**The City of Spruce Grove adopts the following objectives and policies to achieve the long-term goals of the Transportation Master Plan by the Year 2040.**

#### Transportation Demand Management

**Objective 1: Reduce the proportion of peak hour commute trips by single occupant vehicles.**

The City will reduce the proportion of commuter trips made by Single Occupant Vehicles (SOV) from about 77% in 2010 to about 65% by the Year 2040.

**Policy 1.1 Adopt peak hour travel behaviour targets**

**for 2020, 2030 and 2040.** The City will achieve the following travel behaviour targets for trips made in the peak weekday commute hours by using a variety of Transportation Demand Management techniques:

**Peak Hour Travel Behaviour Targets**

<i>MODES OF TRAVEL FOR COMMUTERS</i>	<i>YEAR 2010</i>	<i>YEAR 2020</i>	<i>YEAR 2030</i>	<i>YEAR 2040</i>
Drive alone or Single occupant vehicle (SOV)	77%	73%	69%	65%
Carpool or High occupant vehicle (HOV)	18%	19%	20%	21%
Public transit	1%	3%	5%	7%
Walking and cycling	4%	5%	6%	7%
	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



**Policy 1.2 Approve higher density residential and commercial districts to allow for shorter trips.** The City will approve districts with higher residential and commercial densities in appropriate locations, such as the City Centre and the Gateway site. Higher density land uses allow transit services to be provided at an economical level. Mixed land uses allow residents the opportunity to walk or cycle to work or school. Parking standards may be reduced for higher density developments to reflect lower vehicle demands.

**Policy 1.3 Promote carpools, transit, walk and cycle modes over motorized modes.** The City will identify subareas where it is feasible to promote higher use of the alternative modes, such as transit, walking and cycling. Even in lower density areas, carpools can become an efficient means of reducing travel by SOV.

**Policy 1.4 Develop and fund a TDM program which partners with businesses and institutions to achieve travel behaviour targets.** The City will develop a specific program to promote alternative modes, partnering with agencies such as school districts and health providers. The City will investigate the benefits of employer-based TDM programs, such as Ride-Matching for carpools, and identify specific partners that will support the TDM programs, such as major employers and business agencies.

**Policy 1.5 Monitor congestion levels to schedule implementation of TDM strategies.** The City will investigate multi-modal level-of-service measurements to promote awareness of alternative modes of travel and will gather new data on multi-modal congestion to support the implementation of TDM strategies.

## Road Infrastructure Development

### Objective 2: Adopt a long-range road network plan to meet the needs of the City.

The City will adopt a hierarchy of road facilities including freeways, expressways, arterials, collectors, and local streets to meet the vehicular traffic needs of travel within and through the City.

**Policy 2.1 Develop road design and operating standards.** The City will develop appropriate design and operational standards such as road capacity, design speed, lane widths, access management, traffic controls, and surface treatments for each road category.

**Policy 2.2 Develop strategic placement of major arterial roads, interchanges and rail crossings.** The City will develop a strategic network grid of major road facilities including freeways and arterials, with locations of potential interchanges, grade separations and railway crossings determined.

**Policy 2.3 Partner with provincial agencies and other jurisdictions to provide system continuity.** The City will partner with the Alberta Transportation, Capital Region Board, Parkland County, Stony Plain and other adjacent municipalities to ensure that the major road facilities, including freeways, expressways and arterials, provide the public with continuous corridors throughout the City and connect to key destinations beyond the City.

**Policy 2.4 Provide for transit and high occupancy vehicles in the peak hours.** The City will investigate the use of special lane designations for buses and carpools (HOV and HOT lanes) on freeways and expressways, and transit signal priority (TSP) in key



corridors where transit ridership and carpooling is to be encouraged.

**Policy 2.5 Require provision of appropriate road facilities in all new developments.** The City will publish a hierarchy of road facility design standards for use by developers and their consultants to ensure that minimum standards are maintained in future developments.

**Policy 2.6 Promote road safety within neighborhoods.** The City will provide a process to allow neighborhoods to evaluate road safety and develop appropriate traffic calming techniques to manage traffic speeds.

### Public Transit Development

#### Objective 3. Adopt a long-range transit service network plan to meet the needs of the City.

The City will adopt a hierarchy of transit facilities including the equivalents of express busways (BRT), transit arterials, and transit collectors, to meet the ridership needs of travel within and through the City.

**Policy 3.1 Develop transit facility and service standards.** The City will develop appropriate design and operations standards such as corridor capacity, design speed, bus frequency, station/stop frequency, traffic controls, and station/stop amenities for each transit facility category.

**Policy 3.4 Require provision of appropriate transit facilities in all new developments.** The City will publish a hierarchy of transit facility design standards for use by developers and their consultants to ensure that minimum standards are maintained in future developments.

**Policy 3.2 Develop strategic placement of major transit corridors, stations, and park-and-ride facilities.** The City will develop a strategic network grid of major transit facilities including busways and arterials, with locations of potential station/stops, park-and-ride facilities for bicycles and vehicles, bus only connections, grade separations and railway crossings determined.

**Policy 3.5 Prioritize transit services for commuters in higher density land uses.** The City will set priorities and provide land-use incentives in higher density transit-oriented-districts (TOD) and special corridors to achieve higher than average use of transit facilities (ie. proportions of 25% or more of commuter trips as transit passengers).

**Policy 3.3 Partner with the transit authority and other jurisdictions to provide system continuity.** The City will partner with the Capital Region Board, Edmonton Transit Service, and local municipalities to ensure that the major transit facilities, including equivalents of freeways and arterials, provide the public with continuous corridors throughout the City and connect to key destinations beyond the City





## Active Transportation Infrastructure

### Objective 4. Adopt long-range pedestrian and bicycle network plans.

The City will adopt a hierarchy of active transport facilities including the equivalents of freeways, arterials and collectors, to meet the walking and cycling travel needs within the City.

**Policy 4.1 Develop pedestrian and bicycle facility standards.** The City will develop appropriate design and operations standards such as capacity, design speed, lane widths, safety separation, traffic controls, and surface treatments for each pedestrian and bicycle category.

**Policy 4.2 Develop strategic placement of major trail corridors and station connections.** The City will develop a strategic network grid of major bicycle and pedestrian facilities including bike-ped freeways (trails), and arterials (bike lanes and sidewalks), with locations of potential destinations clearly identified, such as major employment centres, schools, transit stations/stops, and crossings of major natural and man-made barriers determined, such as rivers, railways, freeways and arterial streets.

**Policy 4.3 Require provision of pedestrian and cycling facilities, including bicycle parking facilities, in all new developments.** The City will publish a hierarchy of pedestrian and bicycle facility design standards for use by developers and their consultants to ensure that minimum standards are maintained in future developments. Bicycle parking standards will also be provided to developers to ensure that end-of-trip facilities are available.

**Policy 4.4 Prioritize pedestrian and cycling facilities for all schools and public facilities.** Encouraging young people to walk or cycle to school and other activities on a daily basis is a healthy option for current and future trip needs. The City will partner with the School District to ensure that facilities and education are provided on the benefits of walking and cycling. The City will prioritize pedestrian and cycling facilities in the City Centre, near transit arterials, BRT stops and all transit stations or exchanges.

**Policy 4.5 Partner with other jurisdictions to provide system continuity.** The City will partner with Alberta Transportation, Parkland County, Stony Plain and other local municipalities to ensure that the major bicycle and pedestrian facilities provide the public with continuous corridors throughout the City and connect to key destinations beyond the City.







## Implementation, Operations and Maintenance Policies

### Objective 5. Adopt 5-year Capital and O&M Programs to support travel mode targets.

The City will develop separate capital facility programs for roads, transit, bicycles and pedestrians to ensure that a balanced transportation network is achieved over the long-term planning horizon of 30 years. Funding for facilities should be proportionate to the target share of travel behaviour for the Year 2040.

#### **Policy 5.1 Prepare 5-year Roads Capital Programs.**

The City will prepare 5-Year Capital Programs to ensure that the major road facilities, including freeways, interchanges, grade separations, and arterials are constructed in a timely manner by the City, Alberta Transportation, and other partner agencies. The plan will include potential funding sources.

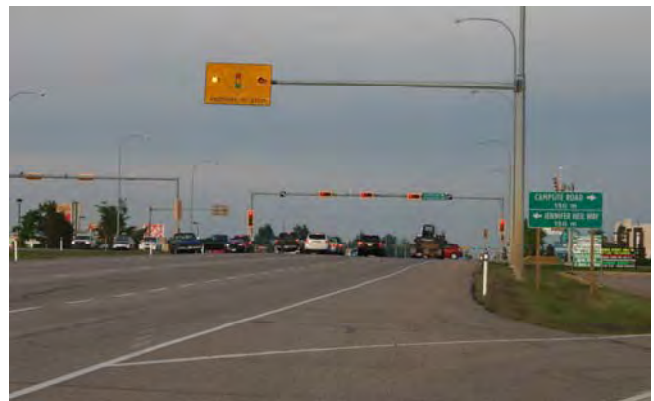
#### **Policy 5.2 Prepare 5-year Transit Capital Programs.**

The City will prepare 5-Year Capital Programs to ensure that the major transit facilities, including busways (BRT), major stations and stops, park-and-ride facilities, and bus-only facilities are constructed in a timely manner by the City, Alberta Transportation, the Capital Region Board, and other partner agencies. The plan will include potential funding sources.

**Policy 5.3 Prepare 5-year Active Transport Capital Programs.** The City will prepare 5-Year Capital Programs to ensure that the major active transport facilities, including pathways, bike-lanes, sidewalks, and bike parking facilities are constructed in a timely manner by the City, Alberta Transportation, Capital Region Board, and other partner agencies. The plan will include potential funding sources.

**Policy 5.4 Develop Asset management inventories and programs for all facilities.** The City will prepare inventories of all Transportation Capital Facilities and develop an asset management plan to ensure that these facilities are well maintained and that programs and budgets are developed to replace the facilities at the end of their life-cycles.

**Policy 5.5 Develop maintenance schedules and operational plans to achieve the travel behaviour targets.** To achieve the desired travel behaviour targets, alternative modes must be given equal or higher priorities to vehicles. The City will prepare operational plans to ensure that priorities are given to the operations of transit buses, bicycles and pedestrians over other motor vehicles where appropriate. Maintenance schedules will be developed for all transportation facilities to ensure that pedestrians and cyclists have safe and continuous, year-round access.





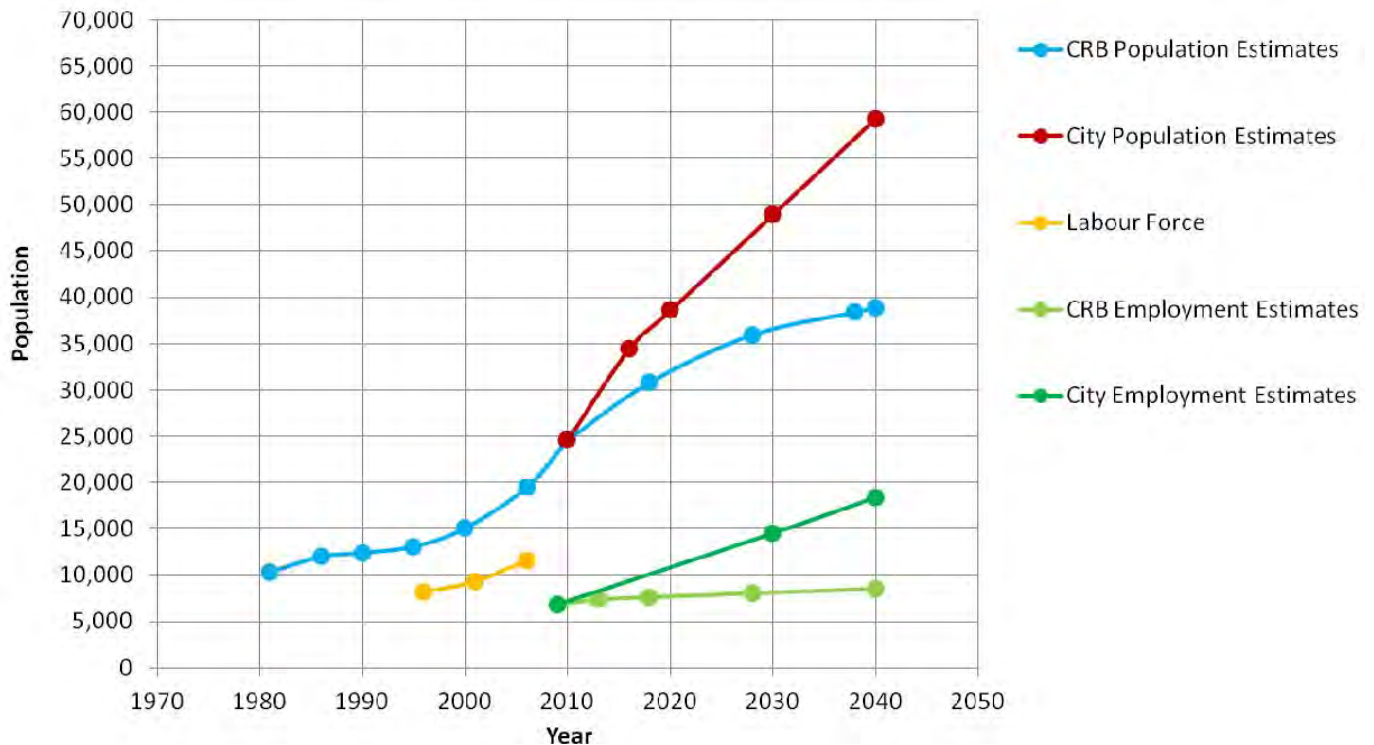
## 4.0 DEVELOPING THE TRANSPORTATION MASTER PLAN

Evaluating a community’s future transportation conditions requires forecasting a number of variables that determine how we travel on a collective basis. The first of these variables involves how many trips will be made in the forecast year and this is most dependent on estimates of future growth and land use. The second most critical variable is our future travel behaviour, or how much we will travel by car, by bus, by walking or by cycling. And the final most important variable is forecasting what transportation facilities we will have in the future and how people will use them. The long-term forecast year selected by Spruce Grove for the Transportation Master Plan was 2040.

### 4.1 Economic Growth and Future Land Use

The number of trips generated in Spruce Grove by the year 2040 is dependent on the number of residents and the number of jobs forecast over about 30 years from now to the year 2040. Over the past 30 years, the population in Spruce Grove has grown by 150%, from about 10,000 residents in 1980 to nearly 25,000 residents in 2010 as shown on **Figure 4.1**. In the next 30 years, the population could grow by a further 60% to about 40,000 residents (CRB 2010 forecasts) or by a further 140% to 60,000 residents (Spruce Grove 2011 forecasts) as shown on Figure 4.1. Employment in Spruce Grove is projected to grow from about 8,000 jobs in 2010 to about 18,000 jobs in 2040.

**Figure 4.1: Spruce Grove Population and Employment Forecasts**



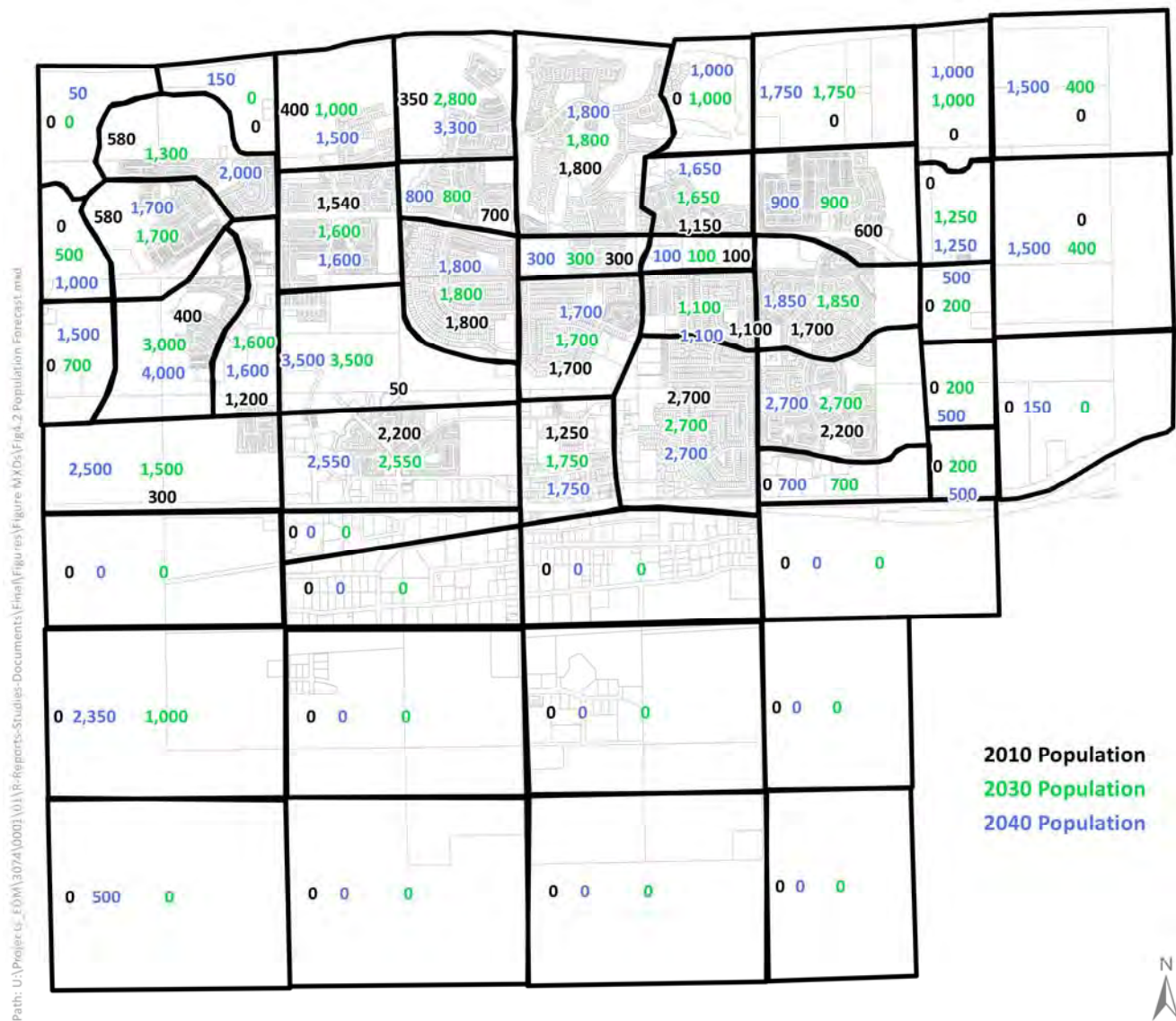


### Future Residential Land Uses

The location of residents and jobs in Spruce Grove will have a significant impact on how and where trips are made in the future. Existing and future population projections by area zone are shown in **Figure 4.2** to illustrate where people might reside in the future. Most of the residential areas in north central Spruce Grove are built out and future

residential growth will occur in the northeast, northwest and southwest, with some densification in the central core. These are the best estimates of future land use conditions that were available in August of 2011; development patterns will change from these best estimates as property owners and developers actually bring their products to market.

**Figure 4.2: Spruce Grove Population Forecasts by Traffic Zone**





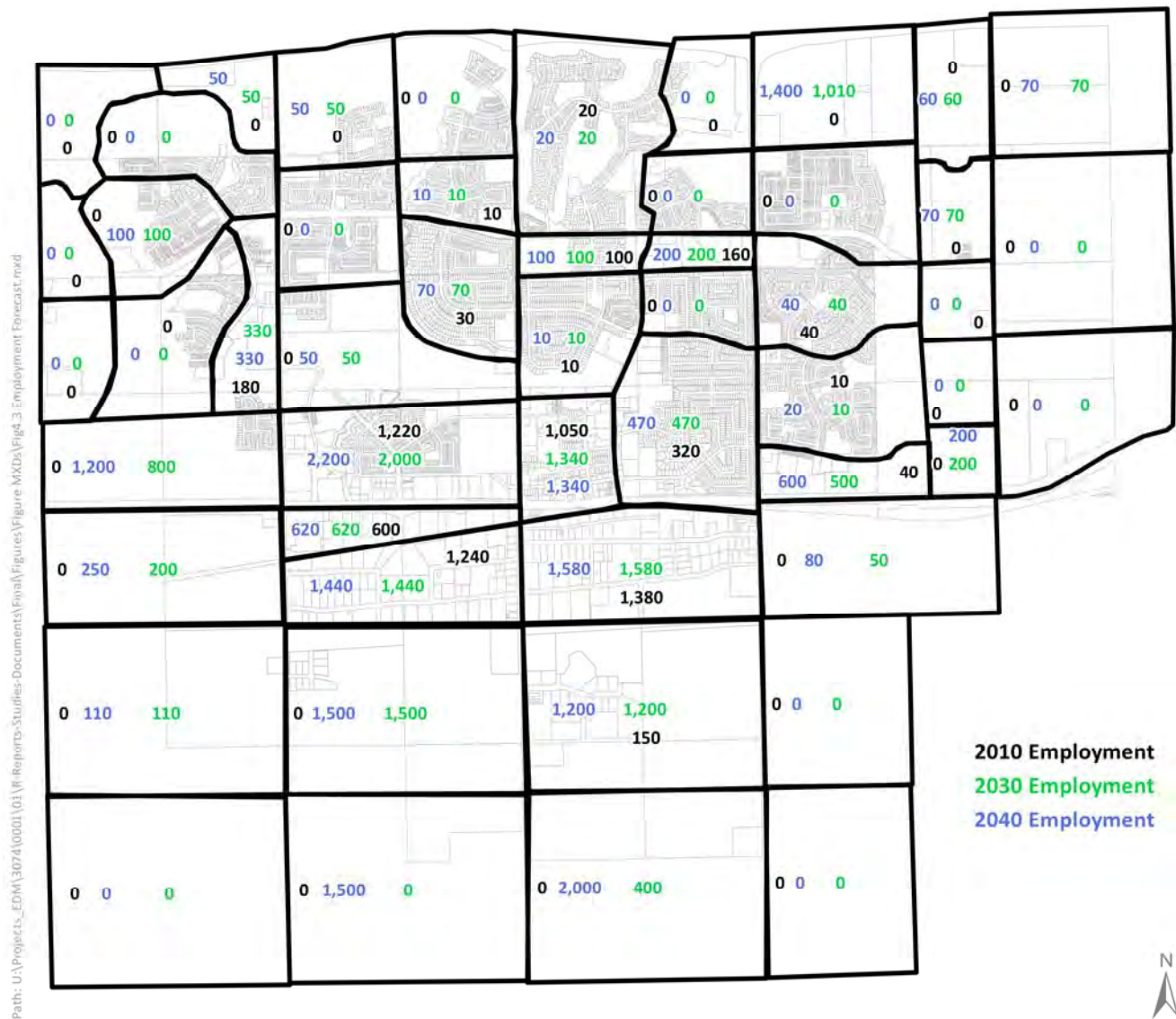


### Future Employment Land Uses

Similarly, the estimated locations of future jobs are shown on **Figure 4.3**. Retail and service jobs are expected to the east and west along Highway 16A, as well as in the mixed use development at Century Road and Highway 16. South of Highway 16A, significant land is available for industrial and business

park land uses. Again, these are the best estimates of future land use conditions that were available in August of 2011; development patterns will change as the economy shifts and owners bring their properties to market. Some annexation of County lands towards Highway 628 is expected in the 30 year horizon.

**Figure 4.3: Spruce Grove Employment Forecasts by Traffic Zone**







## 4.2 Transportation Diversity

Economic growth in North America has been supported by a diverse infrastructure providing many opportunities and many ways to travel. Our transportation infrastructure includes roads, bridges, sidewalks, bicycle paths, transit stations, railways, and airports. In addition, we provide supporting infrastructure to improve the safety and efficiency of the travel, such as drainage systems, illumination, safety barriers, way-finding signs and traffic control signs and signals.

In urban areas we primarily travel by four modes:

- ▶ *private vehicles*
- ▶ *public transit*
- ▶ *cycling*
- ▶ *walking*

The choice of using any or all of the primary modes provides greater equity and opportunity for all travelers. Most residents may prefer to drive a private vehicle. However, many residents cannot drive a private vehicle because of limitations based on age, physical or mental ability, or costs. Many residents would prefer to choose a healthy, active lifestyle including the choice of a healthy mode of travel for their daily commute.

It is important, then, for a community to ensure that it provides for all modes of travel at a level that reflects the needs and preferences of its residents. Because the position of Spruce Grove involves significant daily travel to and through other communities, it must also ensure the compatibility of its transportation infrastructure with its neighbors in the region. The community must ensure that its public rights-of-way are designed in a manner that

provides for a continuity of each of the primary modes throughout the City and connects to the regional network so that residents can drive, cycle, walk, or take a bus to their many destinations. Network plans for each mode are an essential part of the Transportation Master Plan.

## 4.3 Transportation Hierarchy

















Transportation facilities do not come in a “one size fits all” format. For each of the four primary travel modes there is a hierarchy of infrastructure generally related to the distance of the trip, the desired speed of the trip, the combined volume of traffic, and the compatibility with other modes in the public right-of-way. A community’s road, transit, cycling, and pedestrian facilities can be classified by their characteristics and basic functions. The hierarchy of road facilities is commonly known in four groups:

- ▶ *freeways/expressways,*
- ▶ *arterials,*
- ▶ *collectors and*
- ▶ *locals*

A truly effective multi-modal plan requires other facilities to be categorized in a similar manner. Each facility category serves a specific function and purpose in the broader network. Such a hierarchy is shown on **Figure 4.4**. The hierarchy uses standard terminology associated with vehicular traffic to categorize road, public transit, cycling, and pedestrian facilities. This hierarchy is used to assess existing facilities and provide balanced network development for the future.



Figure 4.4: Multi-Modal Transportation Hierarchy

Hierarchy Classification and Basic Function	VEHICULAR TRAFFIC		PUBLIC TRANSIT		BICYCLES		PEDESTRIANS
<b>Freeway/Expressway</b> <ul style="list-style-type: none"> <li>Regional and long-distance trips</li> <li>Very high capacity</li> <li>Free flow Traffic</li> <li>Limited or grade separated access</li> <li>Predominately single use</li> </ul>	<b>Freeway Expressway</b> Separate road for motor vehicles only. 		<b>Transitway</b> Separate facility for commuter rail, light rail, monorail, subway, or busway. HOV lanes. 		<b>Bikeway</b> Separate bike path or trail, bike track. 		<b>Pedway</b> Separate Pedestrian path, plaza, bridge or concourse. 
<b>Arterial</b> <ul style="list-style-type: none"> <li>Regional and local through trips</li> <li>High capacity</li> <li>Priority flow at intersections</li> <li>Access separate lanes for different modes</li> </ul>	<b>Traffic Arterial</b> Streets with high volumes shared with other modes. 		<b>Transit Arterial</b> High transit volume-priority lanes or signals. Principal corridor for buses, trolleys. 		<b>Bicycle Arterial</b> Separate bike lane on street or shared path. 		<b>Pedestrian Arterial</b> High traffic sidewalk or path shared with bikes. Major commercial street sidewalks. 
<b>Collector</b> <ul style="list-style-type: none"> <li>Local and feeder trips</li> <li>Moderate capacity</li> <li>Connects locals to arterials</li> <li>Property access</li> <li>Shared lane use</li> </ul>	<b>Collector Street</b> Street with moderate traffic volumes shared with other modes. 		<b>Transit Collector</b> Medium bus volume. Peak-period commuter service. School bus routes. 		<b>Bicycle Collector</b> Street or path signed for bicycles (sharrows). School routes. 		<b>Pedestrian Collector</b> Medium traffic sidewalks. School routes and bus routes. 
<b>Local</b> <ul style="list-style-type: none"> <li>Local trips</li> <li>Low capacity</li> <li>Low speed</li> <li>Local access</li> <li>Shared use</li> </ul>	<b>Local Street Traffic</b> Low speed and volume street. Residential or commercial. 		<b>Local Transit</b> Routes with small buses. Paratransit, jitneys. 		<b>Local Bicycle</b> Any low-speed residential or local street. 		<b>Local Pedestrian</b> Residential or local commercial street. 



**For vehicular traffic** the four basic levels of hierarchy are:

- ▶ **Vehicular freeways and expressways** provide very high speeds and very high capacities to move many vehicles long distances throughout a region; **freeways** have no stopping and access is by grade separated interchanges; **expressways** have limited stops and priority at any intersections.
- ▶ **Vehicular arterial streets** provide moderate speeds and a high capacity with frequent stops at intersections predominantly controlled by traffic signals; limited access to major private properties is allowed.
- ▶ **Vehicular collector streets** provide lower capacities at moderate speeds and access to private properties is generally allowed.
- ▶ **Vehicular local streets** provide low capacities at low speeds and are frequently shared with bikes and pedestrians.

**For public transit** the four basic levels of hierarchy are:

- ▶ **Transit freeways and expressways** provide very high speeds and very high capacities to move many passengers long distances throughout a region; **freeways** include underground subways or overhead skytrains that have grade separated movements; **expressways** include at-grade light-rail transit (LRT) or bus rapid transit (BRT) that have limited stops and priorities at intersections.
- ▶ **Transit arterials** include streets designed for high-frequency bus routes; there should be a bus every 10 to 15 minutes in the peak

commute hours and every 30 minutes all day-long

- ▶ **Transit collectors** include streets designed for lower-frequency bus routes; there should be a bus at least every 60 minutes.
- ▶ **Transit locals** include most streets capable of accommodating infrequent bus use, such as a school bus or demand-activated vans or handi-buses, such as STS vehicles

**For bicycles** and other non-motorized personal vehicles the four basic levels of hierarchy are:

- ▶ **Bicycle freeways and expressways** can provide high speeds and high capacities to move many cyclists long distances throughout a region; **freeways** include separate bicycle paths with grade separations; **expressways** include vertically or horizontally separated bicycle tracks.
- ▶ **Bicycle arterials** include separate bicycle lanes on streets and shared bike/ped paths
- ▶ **Bicycle collectors** include shared vehicle lanes (sharrows) and other traffic calmed streets
- ▶ **Bicycle locals** include wide sidewalks and most local residential streets

**For pedestrians** the four basic levels of hierarchy are:

- ▶ **Pedestrian freeways and expressways** include separate pedestrian-only paths, plazas, bridges or concourses.
- ▶ **Pedestrian arterials** include very wide commercial sidewalks and shared bike/ped paths.
- ▶ **Pedestrian collectors** include wider sidewalks to accommodate higher pedestrian needs on school routes and transit routes.
- ▶ **Pedestrian locals** include narrower sidewalks or shoulders on highways



### 4.4 Travel Behaviour and the Future Trendline

Data from the 2006 Canada Census provided a profile of the current travel behaviour of residents of Spruce Grove as described in Section 2.4. This data represented the commuter “trip to work” and noted that the vast majority of Spruce Grove’s workers drove alone in **single occupant vehicles (SOV)**. Another 18% shared a ride in carpools or **high-occupancy vehicles (HOV)** while about 4% of the workers walked or cycled to work and only about 1%

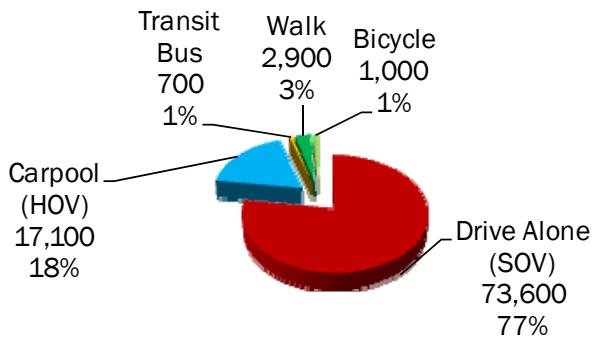
used public transit. Based on the current population and employment, it is estimated that about 95,000 person trips are made each day in Spruce Grove and that this generates nearly 82,000 vehicle trips.

#### Future Trendline Travel Behaviour

Based on the population and employment growth estimates, we can expect about 231,000 person trips to be made each day in Spruce Grove by 2040. If the current travel behaviour remains the same over the next 30 years, this will generate nearly **200,000 vehicle trips per day**, as shown on **Figure 4.5**.

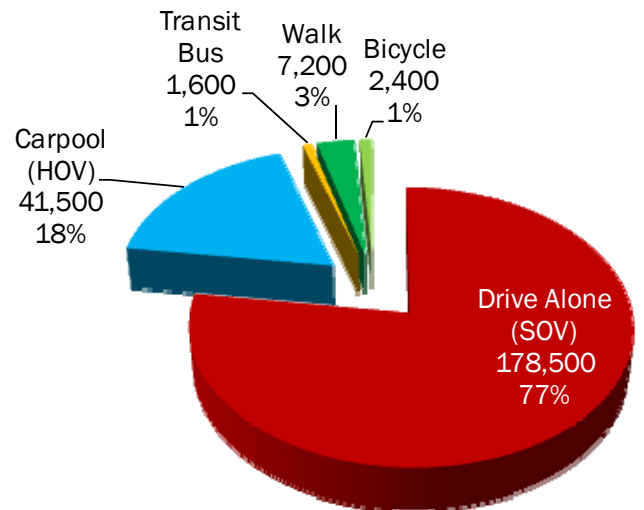
Figure 4.5: Spruce Grove Trendline Travel Behaviour

2010 Existing Travel Behaviour



TOTAL DAILY PERSON TRIPS = 95,300  
TOTAL DAILY VEHICLE TRIPS = 81,700

2040 Trendline Travel Behaviour



TOTAL DAILY PERSON TRIPS = 231,300  
TOTAL DAILY VEHICLE TRIPS = 198,300



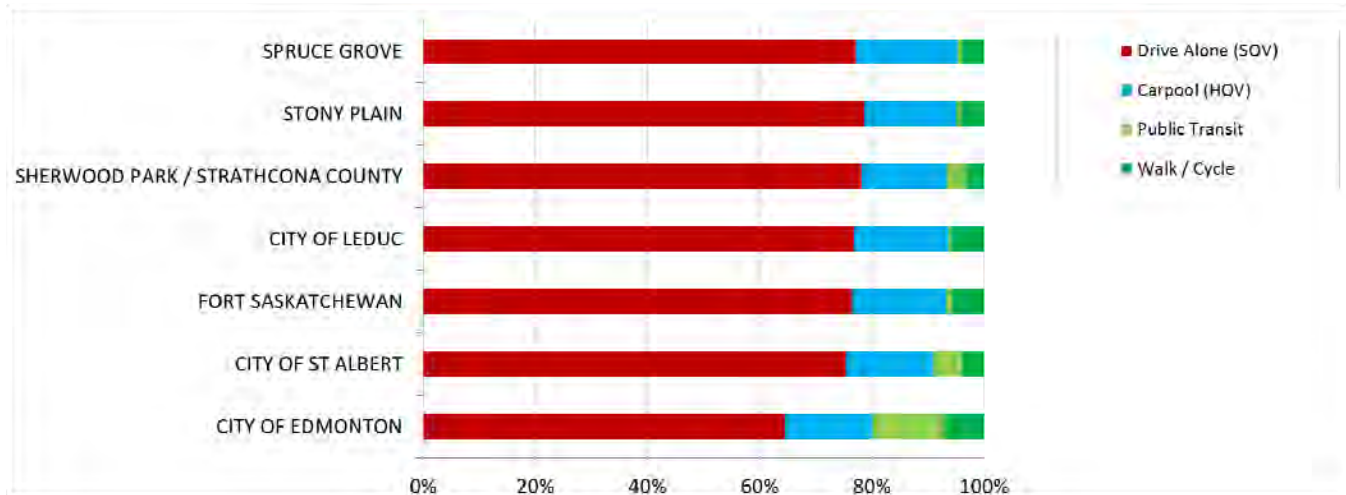


### 4.5 New Vision for Future Travel Behaviour

The travel behaviour in Spruce Grove is comparable to many other similar sized communities in the Capital Region as shown on **Figure 4.6**. Most towns and cities have SOV shares between 75% and 79%, except for the City of Edmonton. The City of Edmonton has a much higher proportion of pedestrians, cyclists and transit users, and therefore a much lower proportion of drive alone commuters. Transit ridership is much higher in Sherwood Park and St. Albert where more transit services are provided. Walking and cycling are much higher in the City of Leduc and Fort Saskatchewan. Spruce Grove has a very high proportion of HOV or carpooling.

Most communities aspire to achieving healthier lifestyles and reductions in environmental impacts such as green-house gases. Communities typically want more people walking, cycling and riding a bus to achieve these goals. St. Albert or Sherwood Park may seek to achieve the levels that Edmonton’s commuters exhibit today, while Edmonton may seek higher levels still. As smaller towns and cities grow they gain more opportunities to encourage their residents and employees to use these alternate means of travel. It is the responsibility of each community to set its own goals.

**Figure 4.6: 2006 Peer Group Work Trip Travel Behaviour**



#### New Vision Travel Behaviour

A new vision for future travel behaviour was developed through consultations with Spruce Grove stakeholders, staff, the public, and City Council. The community set goals in the Municipal Development Plan (MDP) Your Bright Future to manage growth in a manner that is economically, environmentally and socially sustainable and which maintains a compact,

safe and efficient community that emphasizes connectivity and accessibility, incorporating green and healthy living principles. The Transportation Master Plan builds on these MDP goals and several other MDP objectives and policies with its own goals to provide an efficient and effective transportation system that provides mobility options and which supports a healthy lifestyle. New Vision travel



behaviour targets were developed through surveys and consultations.

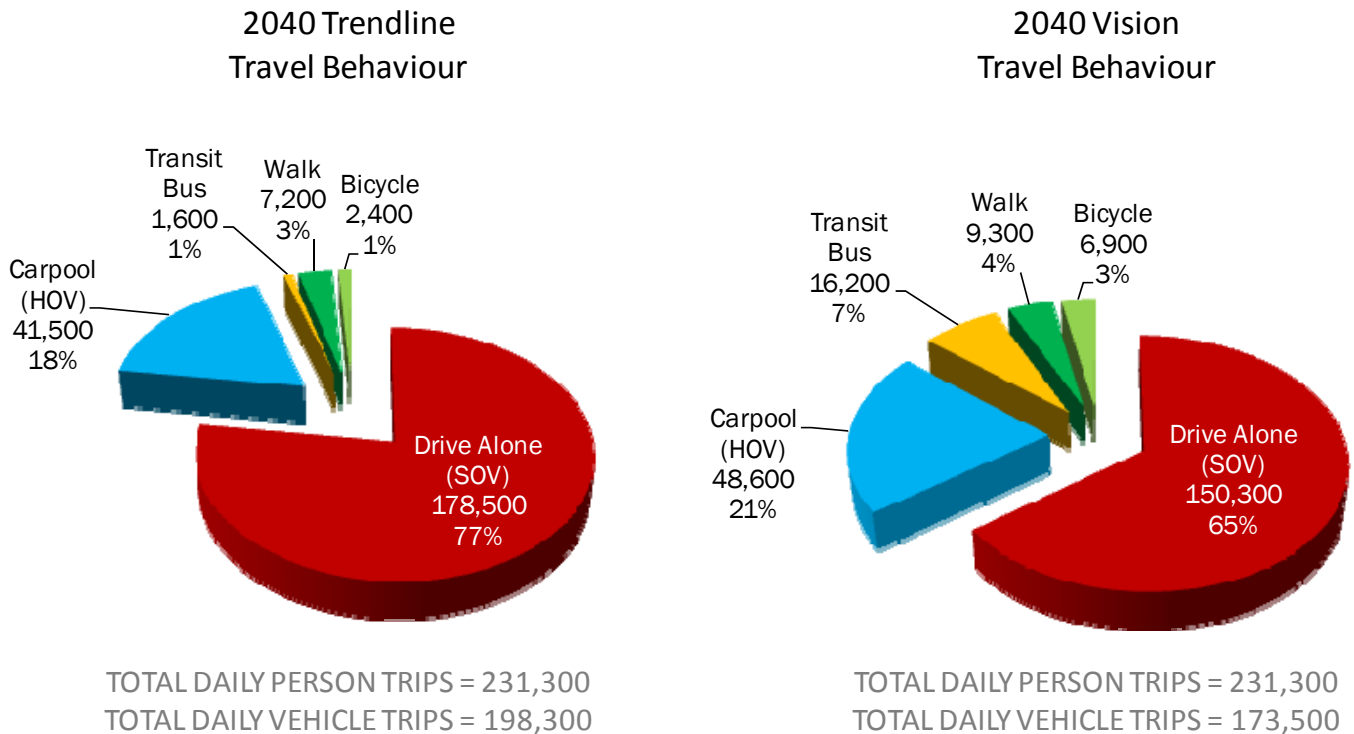
The new Vision targets reductions in the proportion of people travelling in single occupant vehicles (SOV) from 77% of personal travel to 65% of personal travel by the year 2040. This target is identified in Objective 1 of the Transportation Master Plan Policies. To accomplish this reduction, persons travelling in carpools (HOV) will need to increase from 18% to 21%, by bus will need to increase from 1% to 7% and by walk/cycle will need to increase from 4% to 7%.

The 2040 Vision Plan travel behaviour targets will not be achieved immediately; the plan gives us 30 years to get there. Targets for intermediate years are provided in Policy 1.1 of the Transportation Master Plan Policies and will act as a guideline for “report

cards” that can be graded every 5 to 10 years to ensure that the plan is moving in the correct direction

With the forecast population and employment growth, the same number of person trips will be generated in 2040 as with the Trendline travel behaviour profile; about 231,000 per day. However, with the reduction of SOV travel and the increases in HOV, bus and walk/cycle, this will result in a reduction of about 25,000 vehicle trips per day, from nearly 200,000 per day to less than 175,000 per day, as shown on **Figure 4.7**. This traffic reduction of 25,000 vehicles per day is approximately equivalent to the capacity of a 4-lane divided arterial road, such as Century Road or Jennifer Heil Way. While the reduction will not occur on any one corridor, the effects will be felt on many critical intersections reducing congestion throughout the City.

**Figure 4.7: Vision Travel Behaviour Compared with Trendline**





The change in travel behaviour will also result in a significant increase in the use of public transit. If the Trendline travel behaviour remained, there would only be about 1,600 bus passengers per day by 2040 to and from Spruce Grove. This would likely sustain only the existing bus route, although all-day service might be possible on the one route.

With the Vision Plan travel behaviour, transit ridership could increase to more than 16,000 passengers per day, and the increased ridership would sustain many more bus routes, more frequent buses all-day long, and weekend bus service. The bus service would be similar to some of the transit services currently provided in St. Albert and Sherwood Park, providing commuter bus routes to Edmonton and local bus routes to serve local jobs, shopping, and high school students.



## 5.0 TRANSPORTATION MASTER PLAN FOR 2040

### 5.1 Future Road Network and Traffic Volumes

The City of Spruce Grove has a distinct road network plan adopted in the Municipal Development Plan with a hierarchy of Highway (Freeway/Expressway), Arterial, and Collector road facilities. The Recommended Road Network Plan is shown on **Figure 5.1** and is recommended as an update of the Major Road Network plan within the Municipal Development Plan.

#### 5.1.1 Freeways and Expressways

**Highway 16** operates as a limited access **freeway** on the northern boundary of the City. The highway is owned and operated by Alberta Transportation for high speed regional and long-distance trips. There are currently 2 lanes in each direction and Alberta Transportation plans to expand the capacity to 3 lanes in each direction within the 30 year horizon. Two interchanges currently provide freeway access to Spruce Grove; one at Century Road and one at Jennifer Heil Way. The interchanges are designed in a simple “diamond” configuration with single-lane ramps and single-lane left turns. The interchange at Century Road is currently being evaluated for upgrades.

**Highway 16A** runs through the southern end of the developed City and acts as a lower speed six-lane **Major Arterial** with limited access at signalized and unsignalized intersections within Spruce Grove. The road is owned and operated by the City within its boundaries. East of Spruce Grove Highway 16A is owned and operated by Alberta Transportation for high speed regional and long-distance trips and

operates effectively as an **expressway** with limited access at a few unsignalized intersections and grade separated interchanges at key cross-roads, such as Highway 60 and Anthony Henday Drive. Highway 16A leads into Stony Trail in the City of Edmonton.

**Highway 628** is located south of the developed City and currently acts as a rural 2-lane road. It is owned and operated by Alberta Transportation which plans to ultimately expand the capacity to 3 lanes in each direction for high speed regional and long-distance trips between Stony Plain, Spruce Grove and other developments in Parkland County, connecting to Edmonton’s Whitemud Freeway. The route will eventually operate effectively as a freeway with grade-separated interchanges at Highway 60, Anthony Henday Drive and other key roadways. The right-of-way for Highway 628 will be realigned between Campsite Road and Pioneer Road. The first stage of construction was contemplated as a 2-lane highway and was warranted prior to 2006 according to the 2006 Functional Design Study. The second stage of construction to twin the highway to 2 lanes in each direction was recommended within 10 to 15 years of first stage construction presumably between 2016 and 2021 based on the 2006 warrant. Highway 628 leads into the Whitemud Drive expressway in the City of Edmonton.







### 5.1.2 Arterial Roads

Arterial roads in Spruce Grove accommodate medium to high traffic volumes for local and regional trips. These traffic arterials are designed to connect neighbourhoods to one another and the community to regional freeways and expressways. These roads are mainly four-lane divided facilities with wide boulevards, protected left-turn lanes and limited access to business and residential frontages. Arterial roads are typically spaced about 1.6 kilometers (1 mile) apart on a grid system to provide connectivity to all areas of a city.

In the north-south direction, **Jennifer Heil/Campsite Road, and Century Road** are the key arterial roads that accommodate connections between city neighbourhoods and Highway 16 and Highway 16A. **Calahoo Road/Golden Spike Road** provides connections south of Grove Drive but does not interchange with Highway 16. In the 30 year plan, these arterial designations will extend south to Highway 628. In addition, **Boundary Road** on the west City limits and **Pioneer Road** on the east City limits will be improved to arterial status south of Grove Drive and eventually to Highway 628.



In the east-west direction, **Grove Drive** connects the City's northern neighbourhoods and provides access to the north-south arterials. It is recommended that Grove Drive should terminate at Boundary Road on the west and at Pioneer Road on the east. An east-west "**New Industrial Road**" will be developed as an arterial road between Highways 16A and 628 in the industrial area, eventually connecting between Boundary Road and Pioneer Road and possibly beyond.

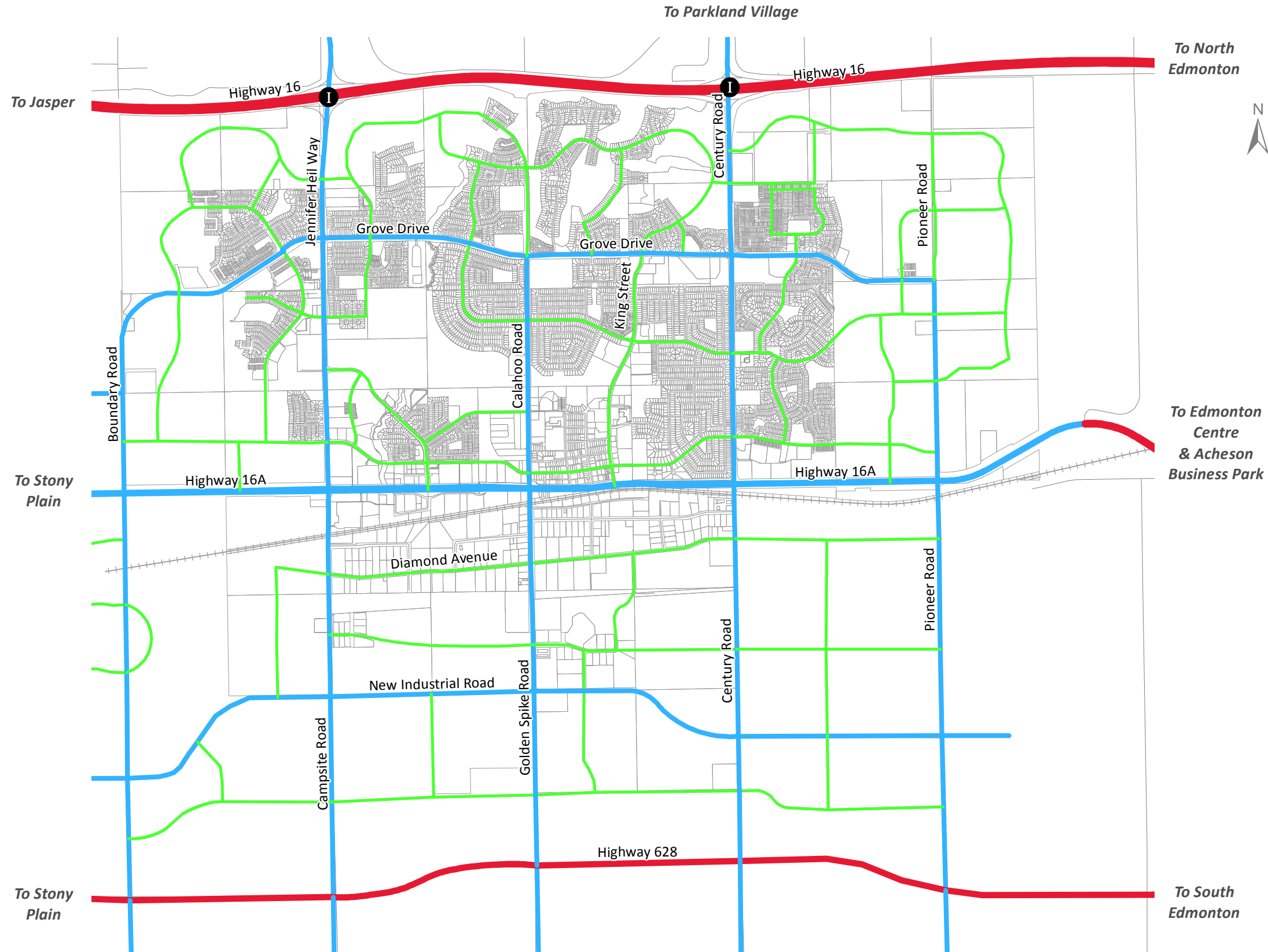
### 5.1.3 Collector Roads

**Collector roads** serve a dual purpose; they provide a connection between local and arterial roads and also provide direct property access. Major collectors in Spruce Grove currently include King Street, McLeod Avenue, Brookwood Drive, Woodhaven Drive, Millgrove Drive, and Diamond Avenue. Collector roads are typically spaced about 0.5 to 0.8 kilometers (0.3 to 0.5 miles) apart on a grid or curvilinear system and provide direct connections to arterial streets. They are typically developed as subdivisions are planned and implemented. Collector roads may also form key connections for bus routes and in this case should allow convenient routing to minimize bus operational costs; collector roads may accommodate arterial bus routes. Conceptual locations for collector roads are shown on **Figure 5.1**; their final alignments will be determined in development phases.





Figure 5.1: 2040 Road Network Plan



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### 5.1.4 HOV Lanes

Carpools are currently used by about 18% of Spruce Grove commuters. The Vision Plan has set a target to increase this mode of travel to 21% of commuters, or nearly 50,000 person trips per day. Incentives for people to use carpools, or high occupancy vehicles (HOV), generally include lower travel costs and preferential parking privileges.

One of the most compelling incentives for carpool use is travel-time savings. Many major urban areas have employed high occupancy vehicle lanes (HOV lanes) to provide significant travel-time savings for commuters who carpool. HOV lanes are usually restricted to carpools, buses, motorcycles, and emergency vehicles. HOV Lanes are most commonly used on freeway or expressway facilities such as Highway 1 and Highway 99 in Vancouver, but may also be used on major arterial roads such as Harvey Avenue (Highway 97) in Kelowna and Centre Street in Calgary.



HOV lanes would provide significant incentives for commuters from Spruce Grove to Edmonton on Highway 16 or Highway 16A. It is estimated that more than 45,000 person trips per day will use carpools or buses on the corridor between Spruce Grove and Edmonton. It is recommended that a review of the benefits of designing any further widening of Highway 16 or Highway 16A over the next 30 years

for HOV lanes should be undertaken by Alberta Transportation with its Capital Region partners.

### 5.1.5 Future Traffic Volumes

Average weekday traffic volumes have been projected using a VISUM travel demand forecasting model for the 30-year horizon of 2040. The model uses the future population and employment estimates illustrated in Figures 4.2 and 4.3, the future Vision travel behaviour illustrated in Figure 4.7, and the basic road network illustrated in **Figure 5.1** as inputs to develop traffic forecasts. Average weekday traffic volumes for the forecast year 2040 are shown in **Figure 5.2**.

Much of the traffic on the **Freeway/Expressway** facilities does not originate in Spruce Grove. Daily traffic volumes on **Highway 16** are predicted to range between 40,000 and 48,000 vehicles per day, while the general capacity is estimated at 50,000 to 60,000 average daily trips (ADT) as a four-lane freeway and 90,000 to 100,000 ADT as a six-lane freeway. The projected volumes are within the generalized capacity. Daily traffic volumes on **Highway 16A** are predicted to range between 32,000 and 40,000 vehicles per day, while the general capacity is estimated at 45,000 to 50,000 ADT as a six-lane major arterial and 45,000 to 50,000 ADT as a four-lane expressway east of Pioneer Road. The projected volumes are within the generalized capacity. Daily traffic volumes on **Highway 628** are predicted to range between 33,000 and 40,000 vehicles per day while the general capacity is estimated at 45,000 to 50,000 ADT as a four-lane expressway east of Stony Plain. The projected volumes are within the future generalized capacity.

General capacity for a **four-lane divided arterial road** is estimated at 25,000 to 30,000 ADT while the general capacity of a two-lane arterial road with left



turn lanes (three-lane arterial) is estimated at about 12,000 to 15,000 ADT. Traffic volumes on **Boundary Road** are projected at about 21,000 vehicles per day north of Highway 16A. A four-lane divided arterial road will be required to accommodate the projected traffic within the plan period. South of Highway 16A, Boundary Road is in the jurisdiction of Stony Plain. Traffic volumes on **Jennifer Heil Way** are projected to range from 17,000 to 20,000 vehicles per day and the existing four-lane divided arterial road will accommodate the projected traffic. Traffic volumes on **Campsite Road** are projected to range from 12,000 to 19,000 vehicles per day. A three-lane arterial road will likely accommodate the projected traffic on Campsite Road by 2040, but it is recommended that a right-of-way for an ultimate four-lane divided road should be protected. Traffic volumes on **Calahoo Road** are projected to range from 11,000 to 16,000 vehicles per day and the existing four-lane divided arterial road south of Grove Drive will accommodate the projected traffic. Traffic volumes on **Golden Spike Road** are projected to range from 10,000 to 16,000 vehicles per day. A three-lane arterial road will likely accommodate the projected traffic on Golden Spike Road by 2040, but it is recommended that a right-of-way for an ultimate four-lane divided road should be protected. Traffic volumes on **Century Road** are projected to range from 19,000 to 21,000 vehicles per day north of Highway 16A while South of Highway 16A, traffic volumes are projected to range from 12,000 to 18,000 vehicles per day. The existing four-lane divided arterial road north of Highway 16A will accommodate the projected traffic. South of Highway 16A, Century Road will need to be widened to at least three lanes but the right-of-way should be protected for an ultimate four-lane divided road. Traffic volumes on **Pioneer Road** are projected to range from 7,000 to 12,000 vehicles per day. A three-lane arterial road will likely accommodate the projected

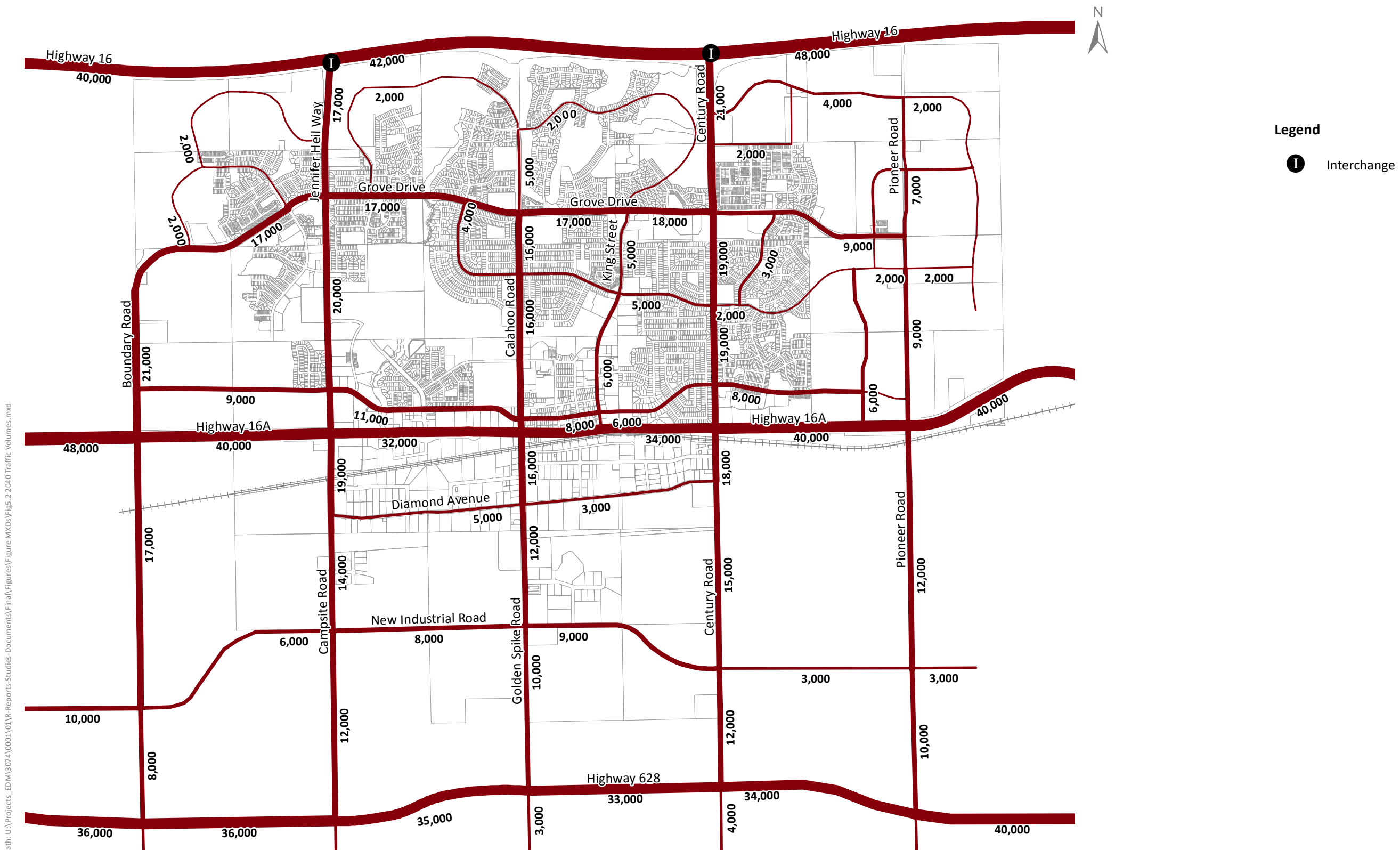
traffic by 2040, but it is recommended that a right-of-way for an ultimate four-lane divided road should be protected.

Traffic volumes on **Grove Drive** are projected to range from 9,000 to 18,000 vehicles per day. The existing four-lane divided arterial road should be extended from Boundary Road to Pioneer Road to accommodate the projected traffic. Traffic volumes on the **New Industrial Road** are projected to range from 3,000 to 9,000 vehicles per day. A three-lane arterial road will likely accommodate the projected traffic by 2040, but it is recommended that a right-of-way for an ultimate four-lane divided road should be protected. Traffic volumes on **McLeod Avenue**, a collector street, are projected to range from 6,000 to 11,000 vehicles per day. A three-lane collector road would likely accommodate the projected traffic to 2040, but it is recommended that a special study of the corridor be undertaken with any revitalization of the downtown core.





Figure 5.2: 2040 Daily Traffic Volumes



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### 5.1.6 Traffic Levels of Service

Levels of service are calculated at intersections to evaluate the average delay that vehicles and their passengers will experience. Average delay is measured as the number of seconds that a vehicle is stopped at a traffic control device, such as a stop sign or a traffic signal; some vehicles will experience less delay and some vehicles will experience more delay than the average. Traffic engineers have devised a simple grade-level equivalent, much like a report card, based on the tolerance of the community for delay; Level "A" is the best and Level "F" is the worst. The average delay per vehicle at intersections for each grade level is shown in the following table.

LOS	SIGNALS	STOP SIGNS
A	≤10 sec	≤10 sec
B	10-20 sec	10-15 sec
C	20-35 sec	15-25 sec
D	<b>35-55 sec</b>	25-35 sec
E	55-80 sec	35-50 sec
F	≥80 sec	≥50 sec

Each community usually adopts a level of service standard that is compatible with the overall goals and objectives of the community and with the economic ability of the community to make improvements in capacity. The level of service standard is applied for the "worst-case" peak hour of traffic operations; usually the PM Peak Hour where commuters, shoppers, and other trips combine to produce the highest traffic volumes. The levels of service for the other 23 hours of each day are generally much better than during the PM Peak Hour.

Many small and rural communities adopt very high levels of service, such as LOS "C". Most larger urban

and suburban communities adopt lower levels of service for the peak commute hours, recognizing that accommodating high levels of service for only one hour each day is very costly in capital and environmental costs, and recognizing that use of other modes in the peak commute hours cannot be encouraged if more improvements are made for the traffic for this limited period. Suburban communities generally adopt LOS "D" or "E", while some major urban areas have actually accepted LOS "F" in specific corridors or zones.

Spruce Grove has not formally adopted a traffic level of service. It is recommended that the City adopt LOS "D" or even LOS "E" for the long-term future. This will help the City achieve its Vision for future travel behaviour.

### 5.1.7 Traffic Improvements

Level of service (LOS) evaluations were undertaken by analyzing the traffic operations at twelve bellwether intersections for the PM Peak Hour of the forecast year 2040. The twelve intersections included:

- ▶ Highway 16 interchanges at Jennifer Heil Way and at Century Road (two intersections each)
- ▶ Highway 16A at Jennifer Heil, at Calahoo, at Century, and at Pioneer
- ▶ Highway 628 at Campsite, at Golden Spike, and at Century

The analyses were undertaken assuming that the arterial road grid was complete as illustrated in **Figures 5.1 and 5.2** and that Highway 628 was open to traffic as a four-lane freeway/expressway to Edmonton. The analyses were also based on the existing configurations of traffic lanes at intersections on Highway 16 and Highway 16A, except for the intersection at Pioneer Road. In the case of Pioneer Road, it was assumed that a three-lane road would



be provided by 2040 and that left turn and right turn lanes would be provided on Highway 16A.

The three intersections on Highway 628 also required assumptions of basic lanes for the forecast year 2040. East-west approaches of the four-lane Highway 628 expressway were assumed as a left-turn lane, a through lane, and a through/right-turn lane while north-south approaches on Campsite Road, Golden Spike Road and Century Road were assumed as three-lane roads.

The level of service analyses completed for each of the bellwether intersections indicate that all intersections will operate at a LOS “D” or better in the PM Peak hour in the forecast year 2040, with the following exceptions:

- ▶ Highway 16 at Century Road (interchange)
- ▶ Highway 16A at Jennifer Heil Way
- ▶ Highway 16A at Pioneer Road

The above intersections will require additional improvements by the forecast year 2040, particularly left-turn lanes, to operate at acceptable levels of service.

### 5.1.8 Sensitivity to Travel Behaviour

The projected 2040 traffic volumes have assumed that the Travel Behaviour Vision illustrated in Figure 4.7 has been achieved by 2040, as well as the implementation of Highway 628. In most cases, the road facilities proposed will be sufficient to accommodate future traffic volumes even if these assumptions are not achieved. However, without a shift in travel behaviour and the implementation of Highway 628, the traffic pressure on **Century Road north of Vanderbilt Drive** may require a six-lane arterial road and further improvements to the Highway 16 interchange. While a six-lane arterial on Century Road is not recommended at this time, it may be prudent to reserve the right-of-way in the event that the desired travel behaviour is not achieved.





## 5.2 Future Transit Network and Ridership

The City of Spruce Grove has a single bus route today and a bus route network plan adopted in the Municipal Development Plan which illustrates service within 400 metres of every household. A long-term hierarchy of Expressway, Arterial, and Collector transit facilities is recommended in a comparable fashion to the Road Network Plan. The Recommended Transit Network Plan is shown on **Figure 5.3** and is recommended as an update of the MDP Transit Network plan.

### 5.2.1 Transit Expressways

The current Route 197 operates as a limited stop service from Century Road on the northern boundary of the Spruce Grove to Edmonton but only during commute hours. The limited stop service is generally known as Bus Rapid Transit (BRT) or the equivalent of a Transit Expressway. However to be considered a true Transit Expressway (BRT) service would need to be provided throughout the day, seven days a week, with a bus frequency of every 10 to 15 minutes in peak periods and every 30 minutes for the rest of the day.

Transit service on Highway 16 should increase by 2040 to include one or more bus routes with a combined operating frequency of every 10 to 15 minutes in peak periods and every 30 minutes for the rest of the day. One route might operate from Jennifer Heil Way, particularly if a route to Stony Plain is developed. The **Highway 16 BRT** would be significantly enhanced by HOV lanes, providing a time-saving incentive for commuters to use transit. If HOV lanes were provided by Alberta Transportation, there may be an opportunity to build an HOV Only access interchange.

Transit service on Highway 16A should also be implemented by 2040 to include one or more bus routes with a combined operating frequency of every 10 to 15 minutes in peak periods and every 30 minutes for the rest of the day. The **Highway 16A BRT** would lead directly to the Jasper Place transit exchange at Stony Plain Road and 157 Street. The Jasper Place exchange provides opportunities to transfer to many other bus routes in Edmonton and is a future Light Rail Transit (LRT) station on the West LRT Line. The BRT route on Highway 16A would also be significantly enhanced by HOV lanes, providing a time-saving incentive for commuters to use transit.

### 5.2.2 Transit Arterials

Transit Arterials are roads where one or more bus routes operate through-out the day, seven days a week, with a bus frequency of every 10 to 15 minutes in peak periods and every 30 minutes for the rest of the day, similar to BRT routes. However, Transit Arterials have more frequent bus stops to allow direct local service to residential and commercial land uses.

Transit Arterials should provide a basic grid network in the same way that road arterials provide minimum grid spacing. However, Transit Arterials are not necessarily located on Road Arterials; there may be excellent reasons to locate Transit Arterials on Collector Roads. Transit Arterials are best for bus routes operated in lineal, two-way directions, providing cross-town service. One-way neighborhood loop routes are not conducive to the level of service required for a Transit Arterial. Bus routes that operate on Transit Arterials may, in fact, continue beyond the local jurisdiction to provide no-transfer service on regional Transit Expressways.

Transit Arterials should lead to transit centres and be capable of accommodating higher levels of passenger





amenities, such as wider sidewalks, bus shelters, and in-time electronic schedule information. Transit signal priority (TSP) may also be required on some Transit Arterials. Because of the higher levels of amenities and services provided on Transit Arterials, the alignments of Transit Arterials should be considered as long-term, permanent locations; the buses on Transit Arterials should not be rerouted every few years.

With higher bus frequencies, improved amenities and certainty of routes, it is beneficial that Transit Arterials are located closer to higher density land uses, such as apartments and townhouses, and office and retail commercial. This provides the greatest opportunity for higher levels of ridership which in turn justify the increased bus frequency and day-long services. Designating a road as a Transit Arterial should also provide property owners with a degree of certainty that there will always be a higher level of transit service provided.

**King Street, Jennifer Heil Way, and McLeod Avenue** are excellent candidates for Transit Arterials due to the higher density of residential and commercial land uses within a few blocks of the routes. **Grove Drive** is an excellent candidate due to the number of schools and activity centres located along it. **Pioneer Road** and an un-named parallel collector road would be good candidates to service the eastern communities of the city.

### 5.2.3 Transit Collectors

Transit Collectors are roads where usually only one bus route operates with a frequency of 30 minutes in peak periods and 60 minutes for the rest of the day; the route might only operate five or six days a week. Just like collector roads, collector bus routes collect passengers to transfer to arterial routes.

Collector bus routes may operate on arterial or collector roads and are generally positioned to provide a minimum walking distance of 400 meters to a bus stop. Collector routes may include one-way neighborhood loop routes and typically require fewer passenger amenities than Transit Arterials. Collector bus routes are flexible and may change locations from time to time as land use patterns and demographics change. Collector bus routes are also productive in lower density industrial areas.

### 5.2.4 Transit Centres and Park & Ride Facilities

Transit Centres provide convenient focal points for several bus routes to connect and allow transfer activities by passengers. Transit centres can be stand-alone facilities, or can include park and ride facilities, or can be integrated into higher density land uses to access the higher ridership potential.

The **Gateway** site is an excellent location for a transit centre. The Gateway lands in the southeast quadrant of Highway 16 and Century Road are owned by the





City of Spruce Grove and are ready for immediate development. The Pioneer Area Structure Plan provides higher density commercial and mixed-use land uses. The location is at the corner of two recommended Transit Arterials and has direct access to the recommended Highway 16 Transit Expressway (BRT). The site offers potential shared use park & ride facilities with retail commercial land uses.

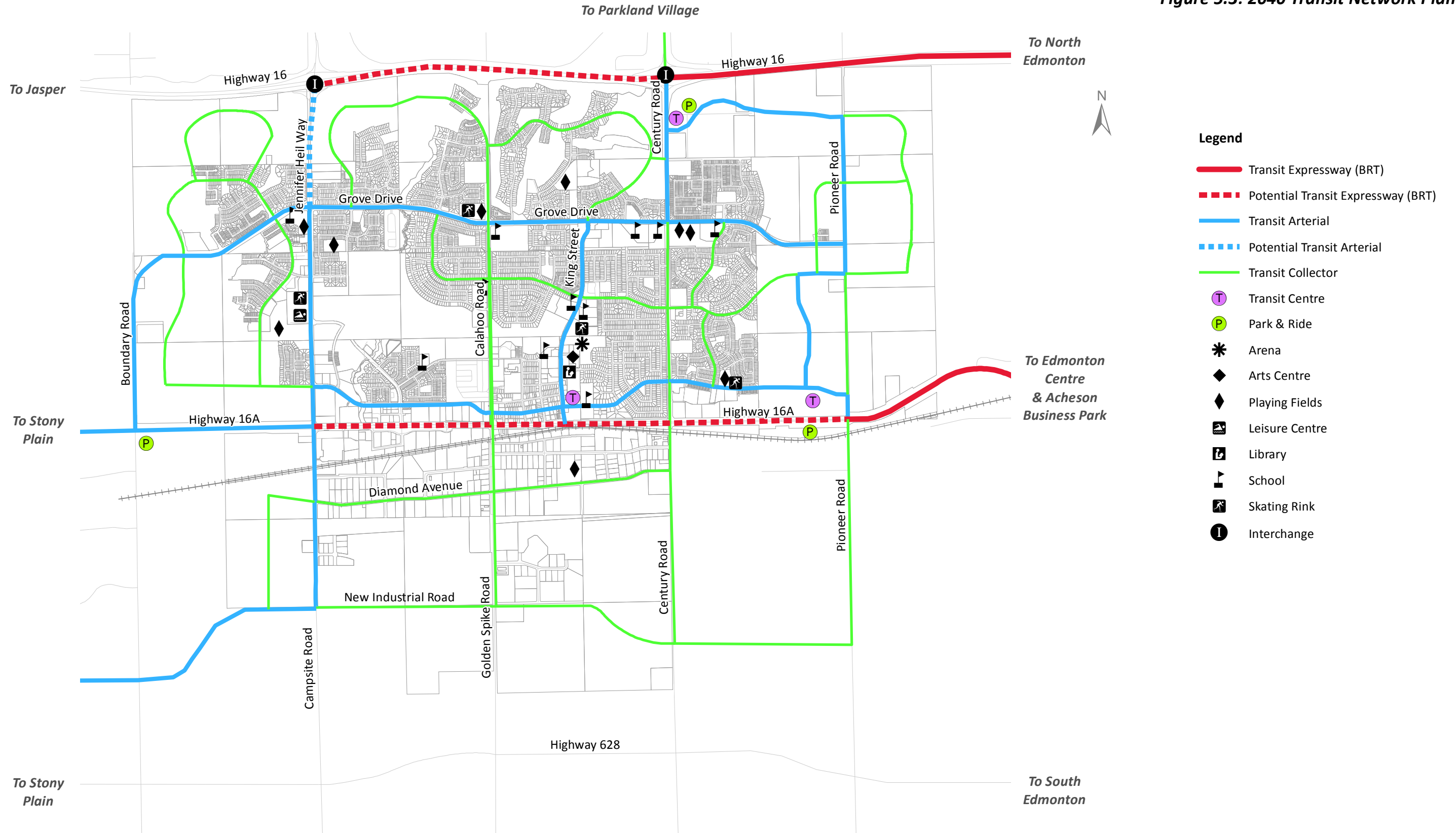
The **East Urban Village** site also provides excellent potential for a transit centre leading to the recommended Highway 16A Transit Expressway (BRT). The Spruce Grove East Area Structure Plan proposes an Urban Village at the corner of McLeod Avenue and a future collector street that would intersect with Highway 16A. The Urban village would include some mixed use developments and promote pedestrian access from the nearby neighbourhoods. A potential park & ride site could be located south of Highway 16A with the bus routes connected.

The **Columbus Park** site on McLeod Avenue provides an excellent opportunity to support existing land uses and potential revitalization of the downtown core. The location is at the corner of two recommended Transit Arterials and has direct access to the recommended Highway 16A Transit Expressway (BRT).

The **West Park & Ride** site is located south of Highway 16A immediately west of Spruce Grove in Stony Plain. This site is recommended as a potential location for commuters from Stony Plain who could board one of the Transit Arterials from Stony Plain, assuming that a partnership can be formed to support further bus routes.



Figure 5.3: 2040 Transit Network Plan



- Legend**
- Transit Expressway (BRT)
  - - - Potential Transit Expressway (BRT)
  - Transit Arterial
  - - - Potential Transit Arterial
  - Transit Collector
  - T Transit Centre
  - P Park & Ride
  - \* Arena
  - ◆ Arts Centre
  - ◆ Playing Fields
  - 🏠 Leisure Centre
  - 📖 Library
  - 🎓 School
  - 🛼 Skating Rink
  - I Interchange

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### 5.2.5 Future Transit Ridership

Average weekday transit passenger volumes have been projected for the 30-year horizon of 2040 using the future population and employment estimates illustrated in Figures 4.2 and 4.3, the future Vision travel behaviour illustrated in Figure 4.7, and the basic transit network illustrated in Figure 5.3. Transit ridership estimates are higher near higher density residential and commercial land uses because these land uses exhibit a propensity for more transit riders. The potential transit ridership for 2040 has been allocated between local and inter-municipal destinations as shown in **Figure 5.4**.

Average weekday ridership volumes between Spruce Grove and Edmonton are estimated at 9,200 passengers per day (ADP) if the Vision Travel Behaviour can be achieved. These transit trips have been evenly distributed (4,600 ADP each) between the Highway 16 and Highway 16A Transit Expressways (BRT). Unlike the vehicular traffic estimates which included significant through traffic from Stony Plain and other origins, all of the transit ridership on these Transit Expressways originates in Spruce Grove. The passenger volumes could be higher if commitments were made by other jurisdictions to promote ridership.

Transit volumes on Transit Arterial are projected to be about 3,000 passengers per day on Century Road, about 2,500 passengers per day on King Street and Jennifer Heil Way, and between 2,100 and 5,000 passengers per day on Grove Drive, and between 2,500 and 3,900 passengers per day on McLeod Avenue. Transit Arterial routes leading to Stony Plain, such as Highway 16A and Campsite Road are projected to carry only about 500 passengers per day for trips destined to Spruce Grove.

### 5.2.6 Transit Levels of Service

Transit levels of service can be evaluated by comparing the ridership estimates to average bus loads and determining the number of buses per hour required to carry the loads. An average occupancy of about 25 passengers per bus throughout the day is assumed. Transit passenger loads of 1,500 to 2,500 passengers per day would be required to sustain a Transit Arterial with bus frequencies of every 10 to 15 minutes in the peak periods. When passenger volumes reach 5,000 passengers per day, a bus frequency as high as every 5 minutes could be required to accommodate the peak period loads, unless higher capacity buses were provided.

The ridership analyses indicate that all of the recommended Transit Arterial routes within Spruce Grove would likely achieve the required passenger load levels. Proposed routes leading into Stony Plain would require a commitment from Stony Plain to support a similar travel behaviour Vision.

### 5.2.7 Specialized Transit Service (STS)

The Specialized Transit Service should be continued throughout the plan period. The STS provides a valuable and essential service to seniors and persons with mobility challenges. As regular bus service expands, all residents will have greater access to local and regional destinations. Buses acquired for mainline and local service should be equipped for wheelchair access and this will reduce the potential demands for STS services. However, the need for specialized service will still grow as the resident population grows and ages.







## 5.3 Future Active Transportation Network (Bicycle and Pedestrian)

The City of Spruce Grove has an excellent existing trail network; sidewalks and new paths are required in the design standards for all new roads. However, the existing network of trails has been focused on recreational needs in the community, and commuter routes and facilities have some significant gaps. The industrial area south of Highway 16A, for example, has been generally neglected with respect to bicycle and pedestrian facilities. A long-term hierarchy of Expressway, Arterial, and Collector bike/ped facilities is therefore recommended in a comparable fashion to the Road Network Plan to ensure continuity of the active transportation network. The Recommended Active Network Plan is shown on **Figure 5.5** and is recommended to be included in the Municipal Development Plan.

### 5.3.1 Bike/Ped Expressways

Freeway or expressway status for bicycle or for pedestrians would require facilities which are solely designated for bicycles or for pedestrians. Through the Stakeholder Advisory Group process, no need for separate expressway-level active transportation facilities was identified, although options along Highway 16A and Highway 628 might be considered in the long-term.

### 5.3.2 Bike/Ped Arterials

Arterial facilities for bicycle and pedestrians include facilities which are typically shared with other modes. The most significant Bike/Ped Arterial facilities in Spruce Grove are the networks of paved trails or pathways which are shared between cyclists and pedestrians. These facilities provide an excellent grid

network that works for both recreational purposes and, in most cases, day-to-day commuting purposes. Some Pedestrian Arterial facilities will be required in highly concentrated sites, such as retail shopping areas and civic centres. Arterial sidewalks of 3.0 to 4.0 meters in width allow for competing uses such as sidewalk cafes and retail displays. These facilities are best identified during the development permit phases.

The Bike/Ped Arterial grid is planned on a basic spacing of about 0.4 to 0.8 kilometers ( $\frac{1}{4}$  to  $\frac{1}{2}$  mile). The finer grids are typically located along corridors with higher density land uses or community facilities, such as the schools along Grove Drive or the commercial uses along McLeod Avenue. The Bike/Ped Arterial grid in the industrial area south of Highway 16A is recommended on a 1.6 km (1 mile) grid with a finer grid of collector facilities.





### 5.3.3 Bike/Ped Collectors

Bike/Ped Collectors are minor trails, paths or sidewalks that collect and distribute travellers to significant destinations and to other modes of travel. Collector paths may include shale surfaces and may connect major trails to residential communities. Collector sidewalks of 1.8 to 2.0 meters (wider than the standard 1.5 meter width) should be provided along both sides of all Transit Arterial routes and along primary routes to schools where Arterial shared use trails are not provided.

### 5.3.4 Bike/Ped Levels of Service

Levels of service for bike/ped facilities are usually evaluated on the basis of route continuity and safety. By including bike/ped facilities in subdivision design standards, continuity and safety will be provided for developing areas. It is expected that Bike/Ped Arterials will also be constructed as Arterial roads are improved, such as Century Road, Golden Spike and Campsite Road. However, there are some significant existing gaps that will need to be resolved and implemented. East-west Bike/Ped Arterial Routes between Century Road and Calahoo Road are required north of Highway 16A. These could include facilities along McLeod Avenue, 1<sup>st</sup> Avenue, or Highway 16A, but a special study of the corridor could be undertaken with any revitalization of the downtown core.

Significant safety improvements are required for pedestrians and cyclists to cross Highway 16A at Century Road, Golden Spike and Campsite Road. These pedestrian and bicycle facilities must also be

considered in detail when crossing the CN mainline. These projects could be undertaken immediately.

### 5.3.5 Bicycle Parking

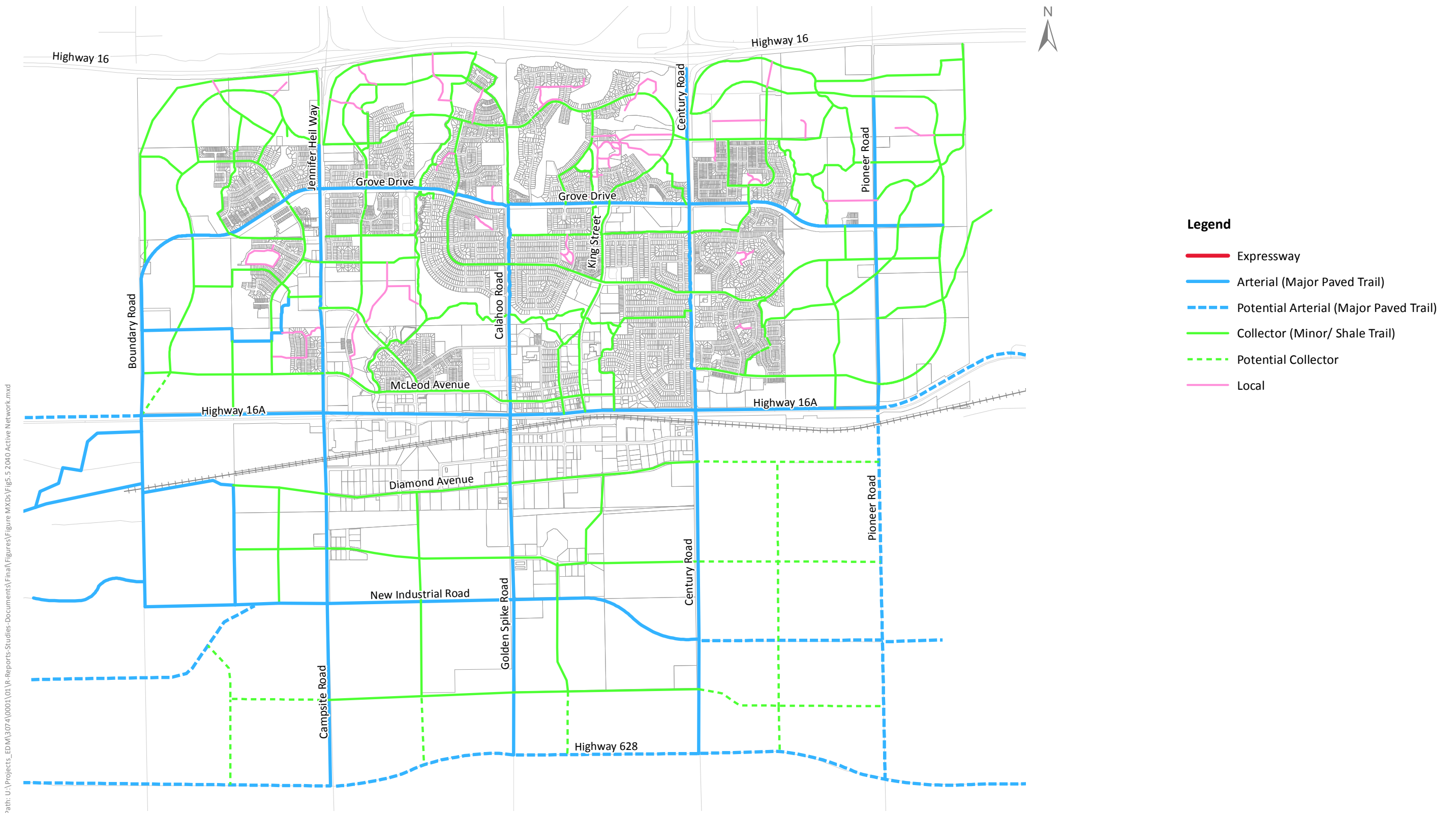
Parking facilities for bicycles should be implemented in the development codes. Secure bike parking facilities for employees at retail and office commercial developments and secure bike parking at schools and park & ride sites are required to facilitate and encourage commuter cycling. The City could take a leadership role by implementing secure bike parking facilities at all civic buildings and encouraging school retrofits through green project funding. Secure bike parking facilities should also be provided at all transit centres and park & ride facilities.







Figure 5.5: 2040 Active Network Plan



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## 6.0 TRANSPORTATION IMPLEMENTATION PLAN

The Transportation Master Plan for Spruce Grove requires significant investments to be made in capital projects over 30 years. The Implementation Plan is based on the continuation of strong growth in the economy of the Capital Region and assumptions about development that will occur in Spruce Grove.

Long-term implementation plans are assembled in a series of Five-Year Capital Plans. These capital plans allow the City to prepare draft annual budgets to allocate future resources. They also allow the City to develop partnerships with other jurisdictions, to schedule major multi-year projects, and to prepare grant applications.

The Five-Year Capital Plans are meant to be flexible. They are typically adjusted on an annual basis to reflect acceleration or deceleration in the economic growth, and to reflect changes in the list of capital projects that will best serve new development or redevelopment within the City.

### 6.1 *Transportation Master Plan Capital Budget*

Preliminary cost estimates have been prepared for the transportation projects identified in the Transportation Master Plan. Generalized cost estimating procedures were used and do not include right-of-way acquisition. Contingency allowances were used to provide for specific project issues such as engineering costs. Rebuilding existing roads, trails and other transportation facilities are generally not included unless capacity improvements are being made.

These estimates are meant to provide an order of magnitude for the long-term plan that will allow the City to evaluate its allocation of resources and to begin discussions with other partners, such as adjacent jurisdictions, local developers, private industries, and provincial levels of government for funding the projects.

#### 6.1.1 Local Capital Budget

The local Arterial and Collector capital projects will cost about \$167.6 million over the 30 year period or about \$5.6 million per annum, as shown on **Table 6.1**. These projects include new traffic lanes on arterial and collector streets, new traffic signals, curb and gutter drainage, basic landscaping and lighting, transit stops with benches and shelters on designated arterial and collector streets, multi-use paths and sidewalks on arterial and collector streets, off-street pathways, transit centers and park and ride facilities.

About 19% of the local capital budget is allocated to Active (bicycle and pedestrian) facilities which exceeds the 2030 travel behaviour target of 7% Active. The proportion of the local capital budget allocated to transit facilities is only 3%, less than half the 2030 travel behaviour target of 7% Transit.

**Table 6.1: 30 Year Local Capital Budget**

	ARTERIAL	COLLECTOR	TOTALS	% BUDGET	TRAVEL TARGET
Vehicular	\$42,013,000	\$87,659,000	\$129,672,000	78%	86%
Transit	\$3,961,000	\$1,745,000	\$5,706,000	3%	7%
Active	\$11,711,000	\$20,538,000	\$32,249,000	19%	7%
Totals	<b>\$57,685,000</b>	<b>\$109,942,000</b>	<b>\$167,627,000</b>	<b>100%</b>	<b>100%</b>
Annual	<b>\$1,923,000</b>	<b>\$3,665,000</b>	<b>\$5,588,000</b>		

### 6.1.2 Regional Capital Budget

The regional or expressway facilities of the Master Plan Capital Budget are estimated at about \$61.6 million or \$2.1 million per annum as shown on **Table 6.2**. These transportation facilities are located on the rights-of-way of Highways 16, 16A and 628 within the assumed future City boundaries. They are considered as regional transportation facilities because of the nature of the traffic and services.

expressway with a multi-use trail, widening Highway 16 to 6 lanes with improvements to the Highway 16 / Century Road interchange, and a regional park-and-ride facility near Highway 16A in Stony Plain. The overwhelming proportion of these regional costs is related to vehicular traffic (95%) and greatly exceeds the travel behaviour targets. Only 5% of the total regional budget is allocated to the alternate modes of transit, bicycles and pedestrians.

The proposed regional projects within the 30 year time period include building Highway 628 as a 4-lane

**Table 6.2: 30 Year Regional Capital Budget**

	EXPRESSWAY	% BUDGET	TRAVEL TARGET
Vehicular	\$58,474,000	95%	86%
Transit	\$670,000	1%	7%
Active (Bike/Ped)	\$2,472,000	4%	7%
Totals	<b>\$61,616,000</b>	<b>100%</b>	<b>100%</b>
Annual	<b>\$2,054,000</b>		



The total local and regional costs are estimated at \$229 million or about \$7.6 million per annum with 82% of the budgets allocated to roads, 3% of the budgets allocated to transit facilities and 15% of the budgets allocated to active (bike/ped) facilities. The relationship of total budgets to travel behaviour targets is shown on **Figure 6.1**.

## 6.2 Five-Year Capital Plans

The Transportation Master Plan has been assembled in a series of Five-Year Capital Plans. These plans will assist the City in preparing annual budgets to allocate resources and to develop partnerships with other jurisdictions in scheduling major multi-year projects such as the Highway 628 corridor and a transit authority for Priority Growth Area “A”.

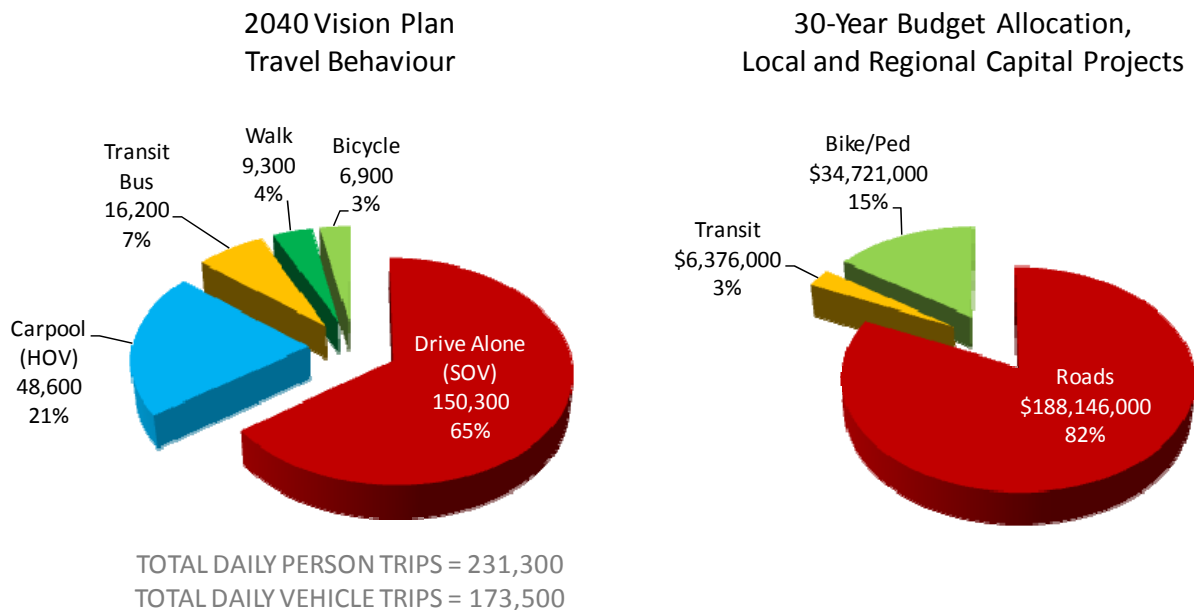
The Five-Year Capital Plans are meant to be flexible. They should be adjusted on an annual basis to reflect changes in the capital projects as will best serve development within the City. As with annual plans, as projects become completed, new projects will be added to the then current Five-Year Plan.

### 6.2.1 Adjusting Capital Plans

The Five-Year Capital Plans assume that the projected growth will occur in a relatively steady pattern over the next 30 Years and that the objectives for changing travel behaviour can be achieved. If the growth patterns subside, or if the community decides to change the travel behaviour targets, or if the community decides to accept a lower level of transportation service, then the projects in the Five-Year Plans can be deferred over a longer period of time.

Adjusting the proposed Five-Year Capital Plans to defer or to advance the project completions can be undertaken at any time. Typically a Five-Year Capital Plan is adjusted on an annual basis as projects are completed and as project priorities change in accordance with development patterns. The twenty or thirty year capital plan is typically adjusted every five years with a review of the long-term Transportation Master Plan.

**Figure 6.1: Target Travel Behaviour and Capital Budget Allocations**





### 6.2.2 First Five-Year Capital Plan

The first Five-Year Capital Plan operates from 2013 to 2017. The plan proposes that the first stage of Highway 628 should be completed from Edmonton to Century Road, Jennifer Heil Way should be improved between MacLeod and Highway 16A, Pioneer Road should be built from Grove Drive to Highway 16A, a Transit Centre should be built at the Gateway/ Westwinds Centre, and many trails and sidewalks should be completed. The project list is shown on **Table 6.3** and the projects are illustrated on **Figure 6.2**.

The City budget for the first Five-Year Capital Plan is estimated at about \$27.2 million or about \$5.4 million per annum, as shown on **Table 6.4**. The regional expressway component (building Highway 628 with a trail) would add a further \$15.5 million or about \$3.1 million per annum. The plan assigns significant investments in the first stage of Highway 628 from Edmonton to Century Road to reduce the impacts on Highway 16A and Century Road. Investments in transit and active modes create an early incentive to change travel behaviour

**Table 6.3: First Five Year Capital Plan 2013 to 2017**

#	PROJECT NAME	LIMITS	VEHICULAR	TRANSIT	ACTIVE
E8/9	Highway 628	Century to Pioneer	Expressway	Optional	Arterial
A3	Jennifer Heil Way	Grove to Highway 16A	Arterial	Arterial	Arterial
A6	Calahoo Road	Grove to Highway 16A	Arterial	Collector	Arterial
A9/10	Century Road	Hwy 16 to Hwy 16A	Arterial	Art/Coll	Arterial
A13	Pioneer Road	Grove to Highway 16A	Arterial	Arterial	Arterial
A17/18	Grove Drive	J. Heil to Century	Arterial	Arterial	Arterial
C2	Harvest Ridge Drive	Grove to Grove	Collector	Collector	Collector
C5	Spruce Ridge Road	Unknown to Grove	Collector	Collector	Collector
C7	MacLeod Road Ext.	J. Heil to Boundary	Collector	Collector	Collector
C11	Calahoo Road Ext.	Avonlea to Deer Park	Collector	Collector	Collector
C12	Avonlea Extension	Deer Park to Calahoo	Collector	None	Collector
C17	Westgrove Drive	J. Heil to Highway 16A	Collector	None	Collector
C20	MacLeod Avenue	J. Heil to Calahoo	Collector	Arterial	Collector
C25	Longview Drive	Calahoo to Grove	Collector	Collector	Collector
C28	King Street	Grove to Highway 16A	Collector	Arterial	Collector
C51	Pioneer Connector	Grove to east of Pioneer	Collector	Collector	Collector
T1	Gateway / Westwinds Transit and Park & Ride		Local	Arterial	Arterial
Trails	21 Off-street Trails	various	None	None	Collector

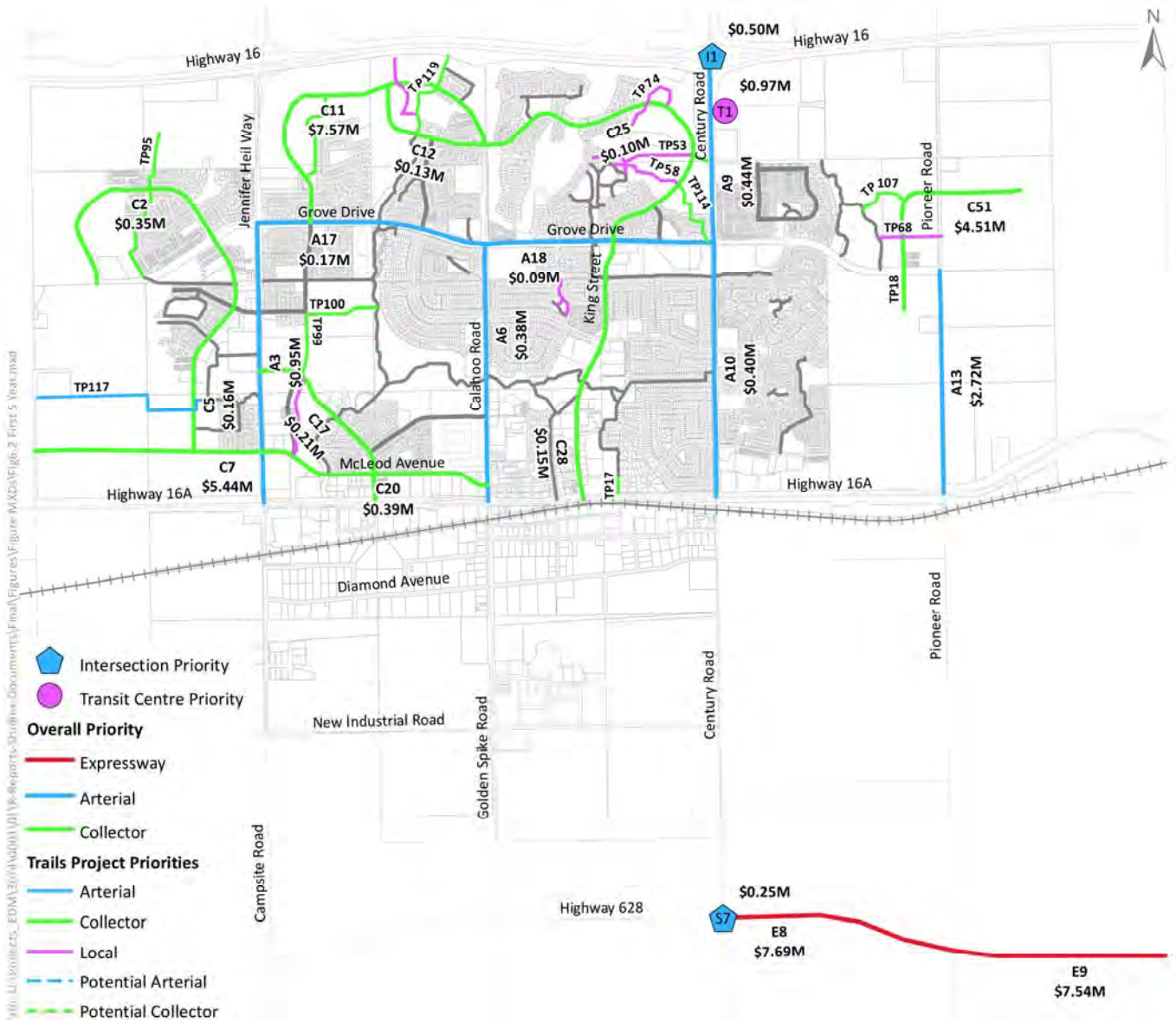




**Table 6.4: First Five Year Capital Budget 2013 to 2017**

	ARTERIAL	COLLECTOR	CITY SUB TOTAL	EXPRESSWAY	TOTAL	% BUDGET	TRAVEL TARGET
<b>Vehicular</b>	\$3,096,000	\$15,683,000	<b>\$18,779,000</b>	\$14,488,000	<b>\$33,267,000</b>	78%	86%
<b>Transit</b>	\$1,606,000	\$636,000	<b>\$2,242,000</b>	\$0	<b>\$2,242,000</b>	5%	7%
<b>Active</b>	\$1,913,000	\$4,255,000	<b>\$6,168,000</b>	\$993,000	<b>\$7,161,000</b>	17%	7%
<b>Totals</b>	<b>\$6,615,000</b>	<b>\$20,574,000</b>	<b>\$27,189,000</b>	<b>\$15,481,000</b>	<b>\$42,670,000</b>	<b>100%</b>	<b>100%</b>
<b>Annual</b>	<b>\$1,323,000</b>	<b>\$4,115,000</b>	<b>\$5,438,000</b>	<b>\$3,096,000</b>	<b>\$8,534,000</b>		

**Figure 6.2: First Five Year Plan**





### 6.2.3 Second Five-Year Capital Plan

The second Five-Year Capital Plan operates from 2018 to 2022. This plan proposes that Highway 628 would continue west to Campsite Road, Boundary Road would be connected to Grove Drive, a regional Park and Ride would be developed at the east end of Stony Plain, and a transit centre would be developed on MacLeod Avenue near Columbus Park. The project list is shown on **Table 6.5** and the projects are illustrated on **Figure 6.3**.

The City budget for the second Five-Year Capital Plan is estimated at about \$40 million or about \$8 million per annum, as shown on **Table 6.6**. The regional and expressway component of the budget would add about \$16 million (\$3.2 million per annum). The most significant elements of this five-year budget are the continued investment in trails, but also in new arterial and collector roads and transit facilities.

**Table 6.5: Second Five Year Capital Plan 2018 to 2022**

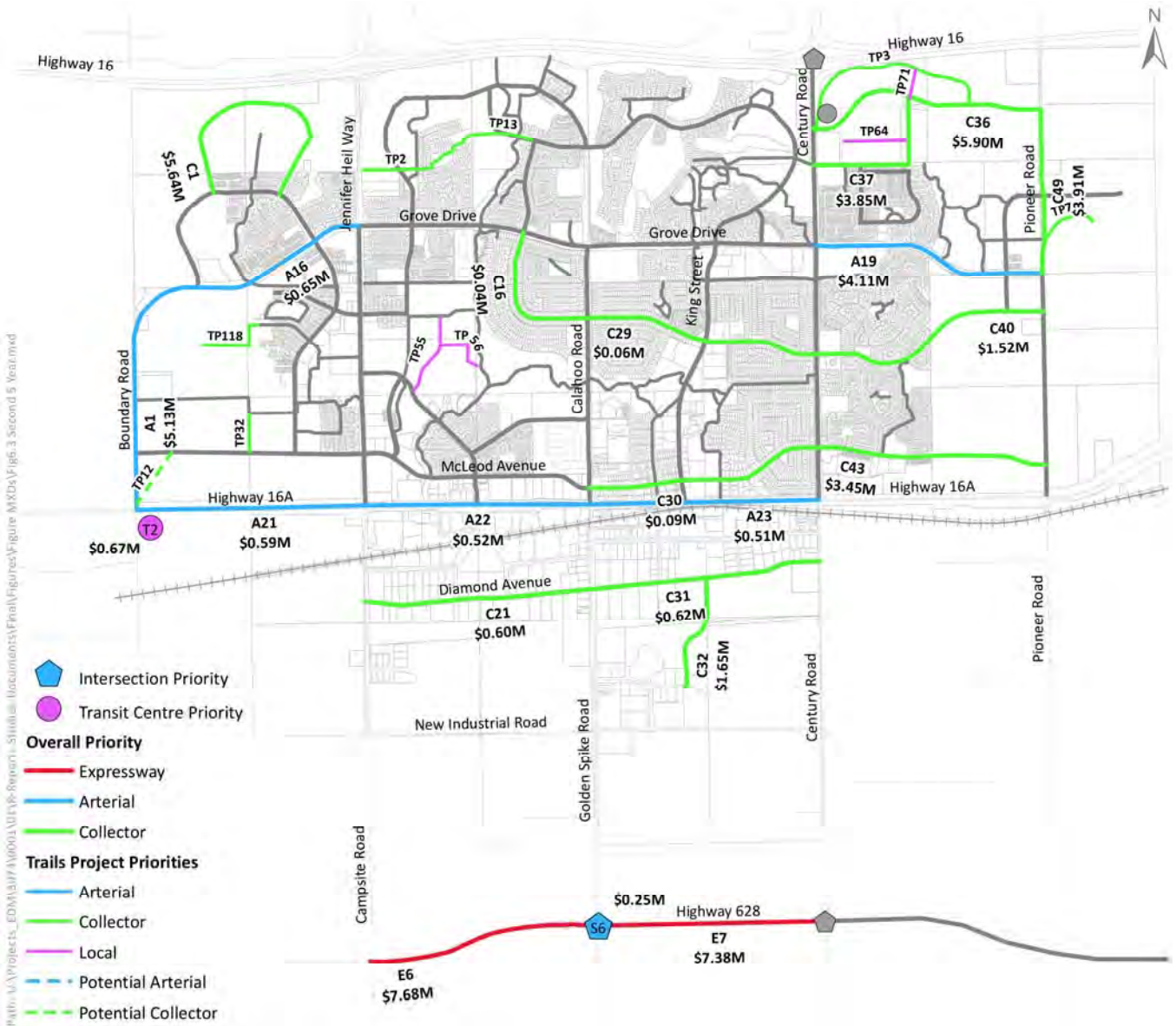
#	PROJECT NAME	LIMITS	VEHICULAR	TRANSIT	ACTIVE
E6/7	Highway 628	Century to Campsite	Expressway	Optional	Arterial
A1	Boundary Road	Grove to Highway 16A	Arterial	Arterial	Arterial
A16	Grove Drive	Boundary to Spruce Ridge	Arterial	Arterial	Arterial
A19	Grove Drive	Century to Greystone	Arterial	Arterial	Arterial
A22/23	Highway 16A	J.Heil to King	Arterial	Optional	Arterial
C1	Heron Link	Harvest Ridge to Harvest R.	Collector	Collector	Collector
C16	Millgrove Drive	Grove to Calahoo	Collector	Collector	Collector
C21/31	Diamond Avenue	Campsite to Century	Collector	Collector	Collector
C29	Woodhaven Drive	Calahoo to King	Collector	Collector	Collector
C30	MacLeod Avenue	Calahoo to King	Collector	Arterial	Local
C32	Schram Street	Diamond to Unknown	Collector	None	Collector
C36	Un-named	Century to Pioneer	Collector	Arterial	Collector
C37	Un-named	Century to North	Collector	None	Collector
C40	Grove Meadow Dr	Century to Unknown	Collector	Collector	Collector
C43	MacLeod	Century to Lansdowne	Collector	Arterial	Collector
C49	Pioneer	Grove to North	Collector	Arterial	Arterial
T2	Stony Plain Regional Park & Ride		Local	Arterial	Collector
T3	Columbus Park Transit Centre		Collector	Arterial	Arterial
Trails	11 Off-street Trails	various	None	None	Collector



Table 6.6: Second Five Year Capital Budget 2018 to 2022

	ARTERIAL	COLLECTOR	CITY SUB TOTAL	EXPRESSWAY	TOTAL	% BUDGET	TRAVEL TARGET
Vehicular	\$8,340,000	\$22,717,000	\$31,057,000	\$14,318,000	\$45,375,000	81%	86%
Transit	\$646,000	\$705,000	\$1,351,000	\$670,000	\$2,021,000	4%	7%
Active	\$2,816,000	\$4,808,000	\$7,624,000	\$990,000	\$8,614,000	15%	7%
Totals	\$11,802,000	\$28,230,000	\$40,032,000	\$15,978,000	\$56,010,000	100%	100%
Annual	\$2,360,000	\$5,646,000	\$8,006,000	\$3,196,000	\$11,202,000		

Figure 6.3: Second Five Year Plan





### 6.2.4 Third Five-Year Capital Plan

The third Five-Year Capital Plan operates from 2023 to 2027. This plan proposes to complete Highway 628 from Campsite Road to Boundary Road, upgrade Campsite Road and Golden Spike Road south of Highway 16A, and upgrade Century Road north of Highway 628. A new transit centre would be built in the Spruce Grove East community with a park and ride nearby. The City budget for the third Five-Year

Capital Plan is estimated at about \$19.6 million or about \$3.9 million per annum, as shown on **Table 6.8**. The regional and expressway component of the budget would add about \$7.9 million (\$1.6 million per annum). The project list is shown on **Table 6.7** and the projects are illustrated on **Figure 6.4**. The most significant element of the budget is the continued investment in roads and transit facilities.

**Table 6.7: Third Five Year Capital Plan 2023 to 2027**

#	PROJECT NAME	LIMITS	VEHICULAR	TRANSIT	ACTIVE
E5	Highway 16A	Campsite to Boundary	Expressway	Optional	Arterial
A4	Campsite Road	Hwy 16A to New Industrial	Arterial	Arterial	Arterial
A7	Golden Spike Road	Hwy 16A to New Industrial	Arterial	Optional	Arterial
A12	Century Road	Hwy 628 to New Industrial	Arterial	Optional	Arterial
A27	New Industrial Road	Campsite to Golden Spike	Arterial	Collector	Arterial
C9	Un-named	Campsite / Diamond	Collector	Collector	Collector
C14	Calahoo Road	Grove to Longview	Collector	Collector	Collector
C22	Un-named industrial	Campsite to Golden Spike	Collector	Collector	Collector
C39	Victoria Avenue	Grove to Victoria	Collector	None	Collector
C42	Lakeland Drive	MacLeod to Grove Meadow	Collector	None	Collector
T4	Spruce Grove East Transit Centre		Local	Arterial	Collector
T5	Spruce Grove East Park and Ride		Local	Arterial	Collector
Trails	7 Off-street trails	various	None	None	Collector

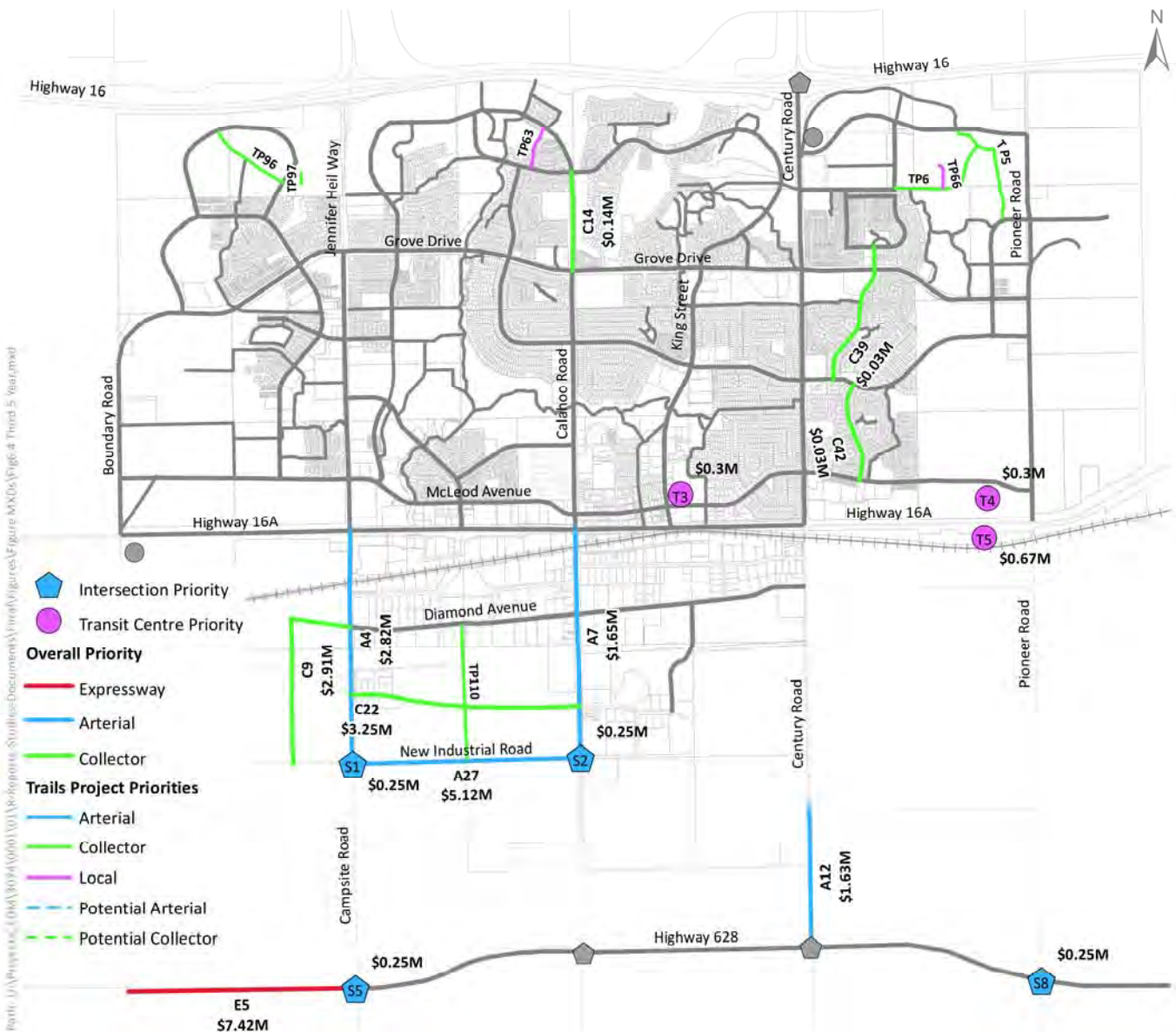




**Table 6.8: Third Five Year Capital Budget 2023 to 2027**

	ARTERIAL	COLLECTOR	CITY SUB TOTAL	EXPRESSWAY	TOTAL	% BUDGET	TRAVEL TARGET
<b>Vehicular</b>	\$9,655,000	\$5,025,000	<b>\$14,680,000</b>	\$7,428,000	<b>\$22,108,000</b>	80%	86%
<b>Transit</b>	\$1,208,000	\$206,000	<b>\$1,414,000</b>	\$0	<b>\$1,414,000</b>	5%	7%
<b>Active</b>	\$1,824,000	\$1,669,000	<b>\$3,493,000</b>	\$489,000	<b>\$3,982,000</b>	14%	7%
<b>Totals</b>	<b>\$12,687,000</b>	<b>\$6,900,000</b>	<b>\$19,587,000</b>	<b>\$7,917,000</b>	<b>\$27,504,000</b>	<b>100%</b>	<b>100%</b>
<b>Annual</b>	<b>\$2,537,000</b>	<b>\$1,380,000</b>	<b>\$3,917,000</b>	<b>\$1,583,000</b>	<b>\$5,501,000</b>		

**Figure 6.4: Third Five Year Plan**





### 6.2.5 Fourth Five-Year Capital Plan

The fourth Five-Year Capital Plan operates from 2028 to 2032. This plan proposes construction of additional lanes on Highway 16 east of Century Road with an upgrade of the interchange. Improvements of Century Road and Campsite south of Highway 16A will likely be required as collectors fill out the south industrial area. The project list is shown on **Table 6.10** and the projects are illustrated on **Figure 6.5**.

The City budget for the fourth Five-Year Capital Plan is estimated at about \$44 million or about \$8.8 million per annum, as shown on **Table 6.10**. The regional expressway component of the budget would add about \$4.9 million (\$3 million per annum). The most significant elements of the budget are the continued investment in road and bicycle facilities along arterial and collector roads, completion of arterial and collector roads in the industrial area and improvements to Highway 16.

**Table 6.10: Fourth Five Year Capital Plan 2028 to 2032**

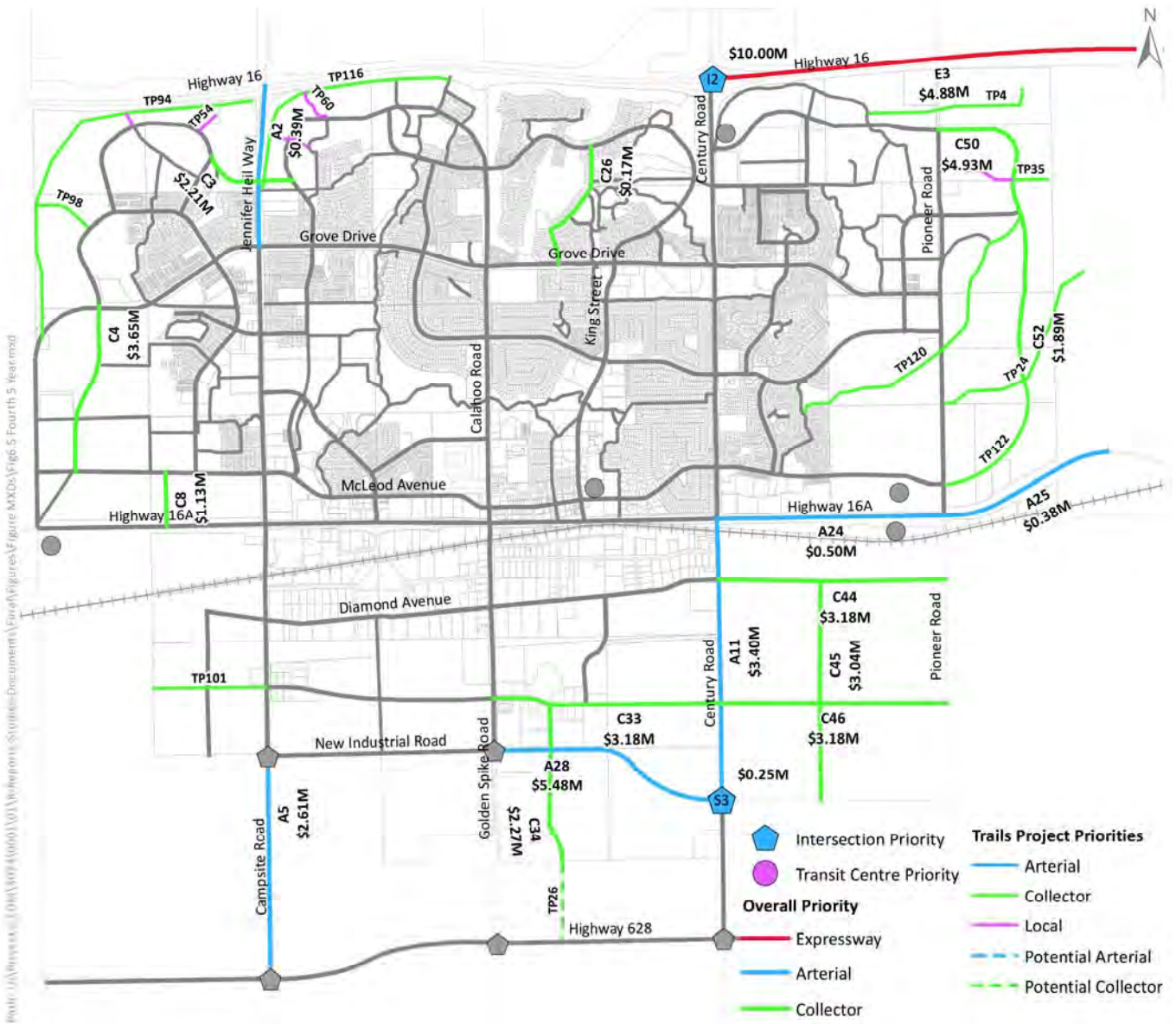
#	PROJECT	LIMITS	VEHICULAR	TRANSIT	ACTIVE
E3	Highway 16	Century to East City Limits	Freeway	Expressway	None
A2	Jennifer Heil Way	Highway 16 to Grove	Arterial	Optional	Arterial
A5	Campsite Road	Hwy 628 to New Industrial	Arterial	Optional	Arterial
A11	Century Road	Hwy 16A to New Industrial	Arterial	Collector	Arterial
A24/25	Highway 16A	Century to East City Limits	Arterial	Expressway	Arterial
A28	New Industrial Road	Golden Spike to Century	Arterial	Collector	Arterial
C3	Harvest / Deer Park Connector	Heron to Deer Park	Collector	None	Collector
C4	Spruce Ridge Connector	Grove to MacLeod	Collector	Collector	Collector
C8	Highway 16A Connector	MacLeod to highway 16A	Collector	Optional	Collector
C26	Fairway Drive	Grove to Longview	Collector	None	Collector
C33/34	Industrial Collectors	Golden Spike to Century	Collector	None	Collector
C44/45/46	Industrial Collectors	Century to Pioneer	Collector	None	Collector
C50/52	Spruce Grove East	East of Pioneer	Collector	Collector	Collector
Trails	18 Off-street trails	various	None	None	Collector



**Table 6.10: Fourth Five Year Capital Budget 2028 to 2032**

	ARTERIAL	COLLECTOR	CITY SUB TOTAL	EXPRESSWAY	TOTAL	% BUDGET	TRAVEL TARGET
Vehicular	\$9,921,000	\$24,501,000	\$34,422,000	\$14,875,000	\$49,297,000	84%	86%
Transit	\$261,000	\$120,000	\$381,000	0	\$381,000	<1%	7%
Active	\$2,830,000	\$6,383,000	\$9,213,000	0	\$9,213,000	16%	7%
Totals	\$13,012,000	\$31,004,000	\$44,016,000	\$14,875,000	\$58,891,000	100%	100%
Annual	\$2,602,000	\$6,201,000	\$8,803,000	\$2,975,000	\$11,778,000		

**Figure 6.5: Fourth Five Year Plan**





### 6.2.6 Capital Plans Beyond 2032

The Capital Plan beyond 2032 completes areas of the City and future annexations over about a ten-year period. This plan proposes construction of additional lanes on Highway 16 west of Century Road and completion of Pioneer Road from Highway 16A to Highway 628. Improvements of Century Road and

Campsite south of Highway 16A will likely be required as collectors fill out the south industrial area. The projects are illustrated on **Figure 6.6**. The City budget for this ten-year period is estimated at about \$36.8 million or about \$3.7 million per annum, as shown on **Table 6.11**. The freeway component of the budget would add about \$7.4 million (\$740,000 per annum).

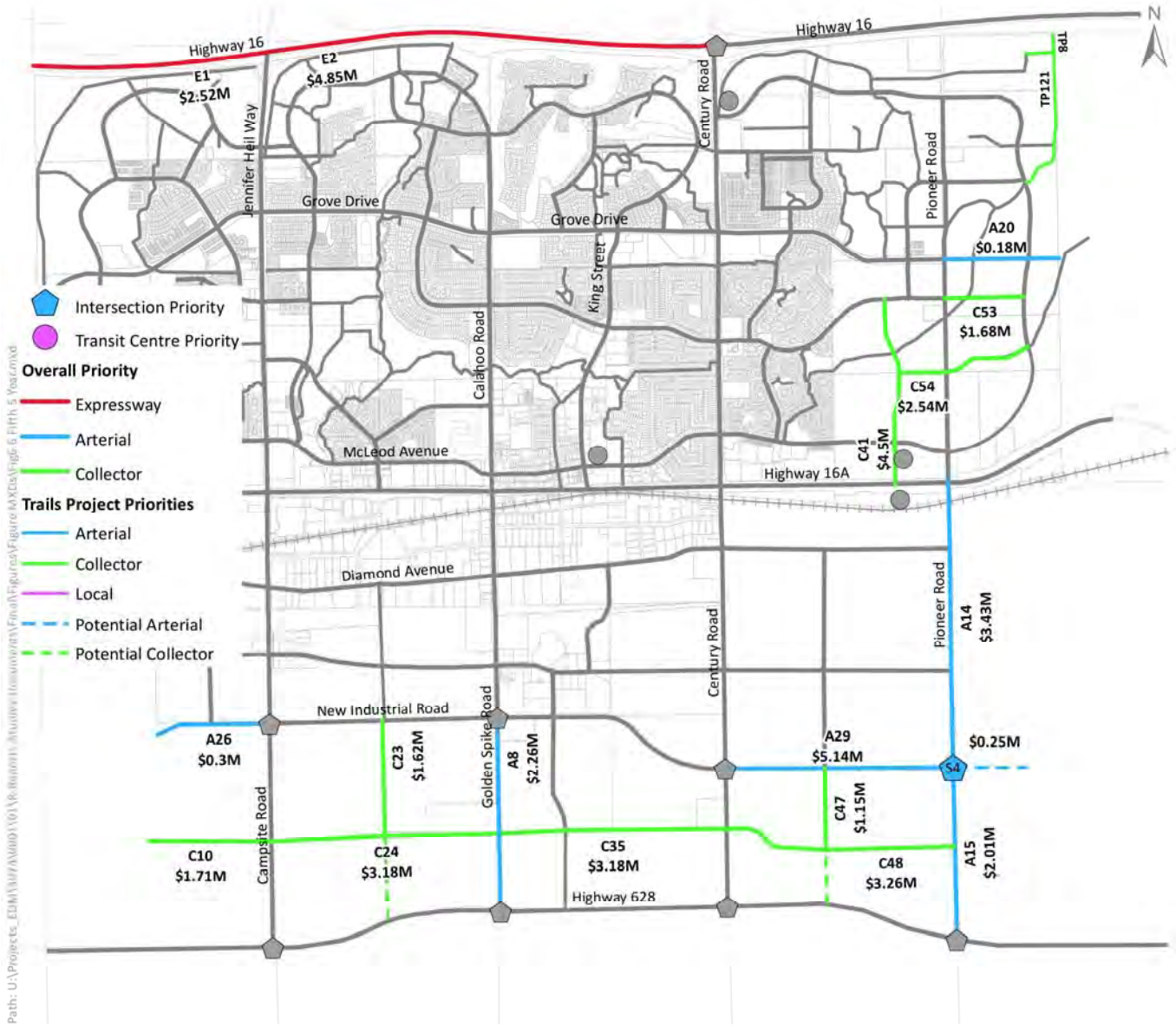
**Table 6.11: Ten Year Capital Budget beyond 2032**

	ARTERIAL	COLLECTOR	CITY SUB TOTAL	EXPRESSWAY	TOTAL	% BUDGET	TRAVEL TARGET
Vehicular	\$11,001,000	\$19,733,000	<b>\$30,734,000</b>	\$7,365,000	<b>\$38,099,000</b>	86%	86%
Transit	\$240,000	\$78,000	<b>\$318,000</b>	0	<b>\$318,000</b>	1%	7%
Active	\$2,328,000	\$3,423,000	<b>\$5,751,000</b>	0	<b>\$5,751,000</b>	13%	7%
Totals	<b>\$13,569,000</b>	<b>\$23,234,000</b>	<b>\$36,803,000</b>	<b>\$7,365,000</b>	<b>\$44,168,000</b>	<b>100%</b>	<b>100%</b>
Annual	<b>\$1,357,000</b>	<b>\$2,323,000</b>	<b>\$3,680,000</b>	<b>\$737,000</b>	<b>\$4,417,000</b>		





Figure 6.6: Ten Year Plan Beyond 2032





## 6.3 Funding Sources

### 6.3.1 Partnerships

Partnerships should be formed with a number of public agencies and private developers. Alberta Transportation is the obvious partner on regional projects such as Highways 16, 16A and 628. The Capital Region Board, Stony Plain and Parkland County should also be involved in all of the regional projects, including the development of a transit system.

Many of the roads and trails will require partnerships with neighboring jurisdictions. The most relevant of these will be Stony Plain for facilities such as Boundary Road. Other large projects such as development of transit centres and park and rides may require special partnerships with developers. Partnerships can also be formed with provincial and federal agencies where green funds or economic redevelopment is planned, such as the downtown area.

### 6.3.2 Highway Corridors

The Highway 16/16A/628 Corridor will require significant effort and cooperation to develop a common vision to find the correct balance of facilities for cars, carpools, trucks, buses and even bicycles. To ensure that the corridor development moves forward in a timely manner, it may be necessary for the local Priority Growth Area “A” jurisdictions to provide leadership in developing the plan schedule. A strong local partnership will also enhance the potential for provincial and federal funding on a consistent basis. The cost of the highway upgrades just within the future assumed City boundaries are estimated at about \$61 million or \$2 million per annum. Investigation of the value and need for High Occupancy Vehicle (HOV) lanes for carpools and commuter buses is highly recommended. The

Highway corridor plans are a fundamental element of all of the other arterial transportation systems.

### 6.3.3 Transit Authority

It is likely that a local transit authority will be required within the first Five-Year program if the targets for transit ridership are to be achieved. It is unlikely that the Capital Region Board will develop a regional transit authority within that time frame. This may require Spruce Grove to initiate an authority on its own, such as the authority operated by St. Albert. However, Stony Plain and Parkland County could be significant partners with Spruce Grove under Priority Growth Area “A” to develop a transit authority to provide local and regional services. Residents of Stony Plain and the County already take advantage of the transit services provided by Spruce Grove. Parkland County is investigating transit services for its Acheson Industrial Park. It is highly recommended that Spruce Grove initiate negotiations with Stony Plain and Parkland County to develop a jointly owned and operated transit authority. An authority operated by Priority Growth Area “A” may have more leverage in attracting federal and provincial funds to purchase

### 6.3.4 Development Levies

The City of Spruce Grove currently collects levies from developers to pay for the increased capacity needs of the arterial transportation system. It is estimated that about \$53.7 million of the \$57.7 million of arterial projects identified in this plan are the result of increased capacity for new development trips. It is recommended that the City should revise its development levy process on a regular basis to ensure that these revenues reflect the current needs.

### 6.3.5 Direct Developer Costs

In addition to the Development Levies the costs of new local and collector roads are primarily the responsibility of developers. Some retrofitting of



existing collector roads with transit facilities and additional trails and sidewalks will be the responsibility of the City through its general tax revenues. However, it is estimated that about \$107.5 million of the \$109.9 million of collector projects identified in this plan are the direct responsibility of new developments.

## 6.4 Transportation Facilities Management

Building the transportation infrastructure proposed in this Transportation Master Plan also requires investments in managing, operating and maintaining these capital facilities.

### 6.4.1 Asset Management

Asset management is a program that inventories all infrastructure assets of the City including civic buildings, water and sewer facilities, and transportation infrastructure. Assets must be maintained throughout their lifetime, and then they must be replaced at the end of their lifetime. The appropriate investments in maintenance will maximize the life-cycle value of the infrastructure. Many municipalities in North America are experiencing the severe impacts of deteriorating infrastructure and are developing intensive Asset Management programs to evaluate investments and to budget for replacements.

Asset management also includes monitoring the effectiveness of the infrastructure investments. For road facilities it is common to collect traffic data through permanent or temporary counting devices. It is highly recommended that permanent counting devices should be installed at 15 to 20 locations throughout the City to maintain a record of the growth and efficiency of traffic movements. In the

same manner, passenger count data should be obtained from ETS or the new transit authority on a regular basis for evaluation of the multi-modal objectives. Counting devices may also be useful for some bicycle and pedestrian trails to evaluate crossing needs. It would also be prudent to monitor the travel behaviour in the City over the period of the Transportation Master Plan to ensure that targets are being achieved. The future reliability of Canada Census data to obtain this information may be in some question, so other forms of annual census or surveys may be required.

### 6.4.2 Operational Management

Operations management includes the day-to-day activities that are required to maintain the proper use and utility of the transportation infrastructure. To gain the maximum value of the transportation infrastructure, the facilities must be operated at an efficient level. This includes operations such as traffic signals, on-time bus arrival information, and security surveillance for trails. It also includes clearing snow on a priority basis for arterial transit and bicycle routes, as well as immediate response to accidents on expressways. The operations management requires setting up the key priorities for all modes to ensure that they are operating at peak efficiency.

### 6.4.3 Operations and Maintenance Costs

Operations and maintenance costs (O&M) costs must be budgeted and monitored to ensure that the transportation facilities are operating efficiently and that there is an appropriate allocation of resources. The O&M costs can be budgeted in the same manner as the capital costs, starting with the life-cycle costs in an Asset Management Program, and developing Five-Year and Annual budgets. It is recommended that the O&M costs be segregated by mode whenever possible to ensure that the true costs of different transportation facilities are visible.