
# The Calgary Goods Movement Strategy

## Stage 4 Report: Strategy, Actions and Priorities

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**Prepared for The City of Calgary by:**

**Watt Consulting Group**
*In association with*
**David Kriger Consultants Inc.** *and* **CPCS Transcom Ltd.**

Contact:
Tomasz Kroman
Senior Consultant
Watt Consulting Group Ltd.
403.569.8721
tkroman@wattconsultinggroup.com
#310, 3016 5 Avenue N.E.
Calgary, T2A 6K4


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# Executive summary

## Strategy development and context

Calgary is connected to local, national and international markets in several ways. Major railways, interprovincial highways, cross-border highways and a large international airport distribute products to and from businesses in Calgary and all over the world. Calgary residents and businesses alike rely on the timely availability of goods and products in order to meet their daily needs.

The Municipal Development Plan (MDP) and the Calgary Transportation Plan (CTP) set out the future direction for Calgary's urban form and transportation system. Both plans recognize that efficient goods movement is essential to Calgary's wellbeing and quality of life, as well as to the achievement of transportation, land use, economic and environmental aspirations and goals.

To support these plans and sustain Calgary's economic growth and prosperity, The City of Calgary commissioned a Goods Movement Strategy (the "Strategy"). The Strategy will help determine what transportation infrastructure improvements need to be made to help Calgary thrive as a distribution hub over the next 30 years. The Strategy also will help The City support businesses and residents alike through continued improvements to Calgary's transportation network. These improvements will help move goods efficiently to markets in Calgary and beyond.

The objectives of the Strategy are to:

- Identify and prioritize short, medium and long-term actions, strategic directions and investments in transportation infrastructure to enhance the goods movement network in Calgary.
- Support the MDP's urban growth policies and the CTP's sustainable transportation initiatives, as well as identifying proposed changes to the CTP's Primary Goods Movement Network.
- Complement City and regional economic development initiatives by articulating the strong linkage between efficient goods movement and the economy.
- Review and, where appropriate, consolidate The City's bylaws related to goods movement. This includes the truck route map and Bylaw 60M90.

The key outcomes of the Strategy are goods movement strategic directions and supporting actions and investments.

The Strategy was driven by stakeholder-defined challenges, aided by supporting research and analysis. Stakeholders, which included other municipal governments around Calgary, other levels of government, transportation carriers, and goods-movement dependent industries, had multiple opportunities to participate in the development of the Strategy. They contributed their understanding of challenges and potential solutions and commented on the draft Strategy through several Advisory Groups, one-on-one interviews, workshops and public information sessions. More than 3,600 truck drivers on the roads and highways around Calgary were interviewed, to provide insight into the characteristics of trucks travelling to, from and through the city.

### Public education campaign

A multi-media educational campaign informed the stakeholder engagement. It featured advertisements, media interviews, online information, videos and information posters at locations around Calgary. The campaigned aimed to educate Calgarians about the importance of goods movement in Calgary and how it impacts their day-to-day life. It had two key messages:

- Goods movement is about how the products that we consume and manufacture reach their destinations within and outside Calgary.
- Calgary is a vibrant community that depends on the movement of goods for its economic wellbeing.

## Profile of goods movement in Calgary

Goods movement, sometimes referred to as freight or cargo, is the movement of a physical product from one location to another. The Strategy considers road-based modes (trucks, vans and bicycles), rail, air and pipelines, all of which are present in Calgary.

Calgary is served by a comprehensive multi-modal goods movement network, including provincially owned highways and City-owned roads, CN and CP rail lines and pipelines. There are also a number of important facilities for transferring goods between modes, including the Calgary International Airport and rail intermodal and transload facilities for containerized and non-containerized goods, respectively. These facilities allow goods to be transported over long-distances quickly (in the case of air) and cost-effectively (in the case of rail), before being transferred to truck for shipment to their final destination.

Although the CTP emphasizes the movement of people, it recognizes goods movement as a critical element of Calgary's economy. It does so by designating the Primary Goods Movement Network on key roads and highways. The Network defines high-priority routes where the most concentrated goods movement activity occurs. It emphasizes accessibility and connectivity to the airport, industrial areas and intermodal rail terminals and along heavily used goods movement corridors. By designating these routes as high priority, the Network is intended to facilitate the movement of goods and services through the implementation of measures that improve traffic flow and control access and by promoting the situation of industrial and goods-generating land uses close to the network.

Goods movement is a key contributor to and enabler of Calgary's economy. In recent years, Calgary has evolved into one of western Canada's leading multi-modal goods movement hubs. Transportation, warehousing and wholesale trade alone accounted for nearly 8% or $9 billion of the Calgary Region's gross domestic product in 2015. These industries and related industries directly and indirectly supported almost 134,000 jobs in the Calgary Region in 2014. The recent additions of large-scale distribution centres add to the growing footprint of warehousing and logistics in the Calgary Region. These businesses can only thrive when they are complemented with a sustainable multi-modal transportation network to carry goods to, from and within Calgary and people between their jobs and homes. Likewise, all Calgarians rely on goods movement to get the products they need. Almost everything Calgarians use on a daily basis must be transported by vehicle, whether it is directly to their home or a nearby business.

## Goods movement challenges

Stakeholders identified several challenges related to goods movement, which were grouped into six challenges:

1. Congestion and other inefficiencies on the roads and highways in and around Calgary. These challenges include bottlenecks, congestion, operational concerns, capacity constraints, conflicts with other traffic and the desire for new or expanded connections.

2. Emerging and ongoing needs and trends. These challenges concern changing economic conditions and the impacts of industry-wide trends such as rapid growth in e-commerce purchasing and in the related customer demand for express delivery, use of drones and robots to make deliveries, disruptive technologies such as Uber-like sourcing that allows anyone to be a courier, and the emergence of electric delivery vans and self-driving (automated) trucks. The pace and extent of these trends are still evolving. However, it is clear that these trends and technologies will be factors in moving goods in and around Calgary in the future.

3. Protection of strategic goods movement infrastructure. Calgary International Airport, the CN and CP intermodal terminals and other rail terminals and rail lines all have a vital role in Calgary's goods movement industries and in the regional economic overall. These and other strategic goods movement infrastructure must be protected from encroaching land uses to ensure that it can continue to serve the function intended. Ensuring appropriate separation between goods movement infrastructure and other sensitive land uses can also minimize encroachments and promote safety.

4. Last kilometre deliveries and accessibility. Goods will continue to be delivered to Calgary businesses and residents, even as e-commerce and other factors change how deliveries are made. There is a need to consider how local circulation, loading and site access and design influence delivery and accessibility.

5. Maintaining flexibility in future plans. There is a need to account for the new technologies noted above, as well as for economic changes and climate change impacts. However, some of these changes might not be immediately apparent. Anticipating the full impacts of these new technologies on infrastructure plans is difficult. There is a need for infrastructure plans to continue meeting the needs already identified today. It is important to incorporate flexibility in planning for technological changes; that is, doing something now to prepare for the future, even if it is unclear when or even if a technology will be deployed.

6. Implications of regional needs. Goods vehicles need to move seamlessly across the Calgary Region and Western Canada more broadly. For Calgary to continue to develop as a Western Canadian distribution hub, there is a need to consider goods movement in a regional context, so that the appropriate connections are maintained between Calgary and the neighbouring municipalities.

## Vision

To guide the development of the Strategy, the following vision for the Strategy and for goods movement was developed:

> **The Goods Movement Strategy supports a multi-modal system that is safe, economical, reliable, efficient and environmentally sustainable.**
>
> **Within Calgary, goods movement is widely recognized as an essential contributor to the economic, social and environmental wellbeing of residents and businesses.**

The vision links the Strategy to The City of Calgary's policy basis in economic, social and environmental concepts. It establishes the importance of goods movement in planning, and it provides a framework within which goods movement initiatives can be assessed.

## The Strategy

The Strategy proposes 26 actions grouped according to six strategic directions (Table ES-1). Strategic direction 1 is specific to addressing network inefficiency and congestion through infrastructure solutions specific to Calgary. Strategic directions 2 through 6, inclusive, provide actions that are primarily non-infrastructure related although they may impact new and existing infrastructure in Calgary.

*Table ES-1 Strategic directions and actions*

| | Strategic direction | Action |
|---|---|---|
| | Continue to invest in transportation infrastructure to enhance goods movement | 1. Review signal timings to enhance the flow of goods along key corridors while maintaining a safe environment for all corridor users<br>2. Ensure the impacts to goods movement are identified in the evaluation of key infrastructure projects in the network<br>3. Collaborate with Alberta Transportation to enhance the movement of goods along Deerfoot Trail, Stoney Trail and other regional highways<br>4. Work with the Province and neighbouring municipalities to align corridor plans and funding priorities across the region, to improve connectivity for goods movement |
| | Collaborate with external partners to enhance regional goods movement | 1. Collaborate with regional partners, including the Calgary Metropolitan Region Board, on future land use and transportation plans that impact goods movement across the Calgary region, and continue to provide technical assistance for these plans.<br>2. Promote cross-jurisdictional consistency on design standards and operational practices, including a regional truck network map.<br>3. Establish a goods movement council, consisting of key representatives from the public and private sectors. It will address goods movement challenges, and coordinate and |

| | | |
|---|---|---|
| | | advance projects benefitting goods movement activities in the region |
| | Promote planning for logistics centres and industrial areas | 1. Evaluate ways to improve the flow of trucks and other vehicles on the road and highway network while maintaining a safe environment for all road users<br>2. Promote the development of key goods movement facilities as mobility and employment centres<br>3. Improve mobility options for commuters to industrial areas<br>4. Develop freight-supportive land use planning guidelines that protect complementary land use near major freight hubs and corridors<br>5. Enhance Calgary's attractiveness as a distribution hub by deploying new technologies to enhance the region's competitive advantage. |
| | Enhance last-kilometre deliveries | 1. Promote the inclusion of off-street delivery facilities into new or reconstructed non-residential developments<br>2. Enhance the supply and use of on-street loading areas<br>3. Improve delivery vehicle access and circulation<br>4. Encourage the development of new truck parking/service areas to aid in the routing of trucks travelling to, from or through Calgary<br>5. Partner with the private sector to enhance and invest in infrastructure to improve goods movement<br>6. Investigate new ways to minimize construction disruptions<br>7. Partner with the private sector to pilot new delivery solutions |
| | Develop flexible plans to adapt for a changing future | 1. Review and update the processes of land use planning, site planning, corridor plans, functional plans, etc. to prepare for new technologies that could change goods movement<br>2. Plan for changes in distribution and delivery requirements<br>3. Promote sustainable transportation modes for delivery of goods<br>4. Collaborate with the private sector and other stakeholders to address environmental and climate change impacts generated by goods movement |
| | Enable data collection and collaboration on goods movement research | 1. Collect, share and maintain goods movement data in collaboration with academic institutions and other partners.<br>2. Support the creation of an urban freight research centre in Calgary, in collaboration with academic institutions and other partners<br>3. Conduct a new commodities flow survey and update regional transportation model used by The City and regional partners |

## Next steps

The Strategy should not be viewed as a menu from which individual actions can be selected and implemented. The need for all 26 of these actions has been identified through the stakeholder consultation, best practice review and discussions with other jurisdictions. No one single action in a given strategic direction can resolve all the challenges. The actions largely complement each other. They also would benefit commuters and other travellers who share the same transportation network.

They would inform land use planning, development approval, economic development and other planning and investment decisions.

At the same time, for budgetary considerations and for reasons of practicality, it can make sense to phase the actions, according to the time frames described in the Strategy's implementation plan. This could start with a bundle that includes all ongoing and short-term actions, lays the groundwork for the medium- and long-term actions and establishes linkages with the research community for future outcomes. Goods movement bundles have been implemented successfully in several cities, such as London, New York City and Philadelphia. These have all initiated a range of practical, visible actions that have positively impacted goods movement while also clearly signalling the commitment of public- and private-sector stakeholders, researchers and others to continue to work together to enhance goods movement in their communities.

# 1 Strategy development and context

## 1.1 Objectives

Calgary is connected to local, national and international markets in several ways. Major railways, interprovincial highways, cross-border highways and a large international airport distribute products to and from businesses in Calgary and all over the world. Calgary residents and businesses alike rely on the timely availability of goods and products in order to meet their daily needs.

The Municipal Development Plan (MDP) and the Calgary Transportation Plan (CTP) set out the future direction for Calgary's urban form and transportation system. Both plans recognize that efficient goods movement is essential to Calgary's wellbeing and quality of life, as well as to the achievement of transportation, land use, economic and environmental aspirations and goals.

In support of this recognition, The City of Calgary commissioned a Goods Movement Strategy (the "Strategy"). The Strategy will help determine what transportation infrastructure improvements need to be made to help Calgary thrive as a distribution hub over the next 30 years. The Strategy also will help The City support businesses and residents alike through continued improvements to Calgary's transportation network. These improvements will continue to help move goods efficiently to markets in Calgary and beyond.

The objectives of the Goods Movement Strategy are to:

- Identify and prioritize short, medium and long term actions, policies and investments in transportation infrastructure to enhance the goods movement network in Calgary.
- Support the MDP's urban growth policies and the CTP's sustainable transportation initiatives, as well as identifying proposed changes to the CTP's Primary Goods Movement Network.
- Complement City and regional economic development initiatives by articulating the strong linkage between efficient goods movement and the economy.
- Review and, where appropriate, consolidate The City's bylaws related to goods movement. This includes the truck route map and Bylaw 60M90.

The Strategy has two sets of outcomes, which are detailed in this report. These are:

- Policies specific to goods movement that can be incorporated into future CTP, MDP and other City plans. The consolidated truck route bylaws also inform City policies.
- Actions and investments. The Strategy identifies potential investment areas in infrastructure and operations that warrant further investigation, for facilities that are under the jurisdiction of The City and other levels of government. The Strategy also identifies actions and investments in technology, operations and practices, based on best practices in Calgary and elsewhere that could be led by The City of Calgary in conjunction with other private- and public-sector stakeholders.

The Goods Movement Strategy complements other City transportation plans that detail the development of the transit network (Route Ahead), the pedestrian network (Step Forward) and the bicycle network (Cycling Strategy).

## 1.2 Policy context

The Strategy is informed by a comprehensive policy context that involves all three levels of government. The context speaks to a range of aspirations and policies. It also defines the regulatory oversight for the use of the multi-modal goods movement network.

Among City policies, the MDP and CTP provide a context to support goods movement. They link goods movement to The City's land use, economic and sustainability policies and aspirations. The MDP notes the economic importance of the Calgary International Airport, intermodal rail terminals and the transportation and logistics industry. It points out the need to ensure that these and other industrial sites are well connected to a road and highway network that can support the efficient movement of trucks, goods and services.

Other City policies and plans support or are relevant to goods movement. These include Investing in Mobility, the Complete Streets Policy, the Environmental Policy, the 2020 Sustainability Direction, the Triple Bottom Line Policy Framework, the Economic Development Strategy and the Industrial Lands Strategy.

Three City bylaws regulate the movement of trucks in Calgary:

- Bylaw 26M96 regulates the movement of all types of traffic on Calgary's streets, including trucks and commercial vehicles.
- Bylaw 60M90 regulates the movement of trucks in Calgary and defines a truck route network.
- Bylaw 13M2004 regulates the movement of dangerous goods in Calgary, and defines a dangerous truck route network, as amended by bylaw 23M2005.

These bylaws are supported by the Truck Route Network Development Policy (policy TP005), the Dangerous Goods Route Network Development Policy (policy TP001) and the High Load Corridor Development Policy (policy TP006). The City of Calgary is also part of TRAVIS, which is the Provincially led multi-jurisdictional permitting system for over-sized and overweight loads.

At the regional level, the 2014 Calgary Metropolitan Plan noted the importance of an integrated efficient infrastructure system for the movement of people and goods. This plan was a voluntary collaborative initiative of the Calgary Regional Partnership (CRP), whose members included The City of Calgary and several surrounding municipalities. The CRP has since been dissolved. The newly established Calgary Metropolitan Region Board (CMRB) is charged with creating land use and servicing plans that, among other outcomes, promote coordinated development and infrastructure to serve Calgary and nine surrounding municipalities. Goods movement is not specifically mentioned as yet, although this Strategy is expected to inform future CMRB initiatives.

Provincial and federal policies, legislation and regulations have also been put in place to ensure the safe and efficient movement of goods. Relevant provincial policies and regulations include the Commercial Vehicle Safety Regulations and the 2018-2021 Transportation Business Plan.

Relevant Government of Canada legislation includes the Canada Transportation Act, the Transportation of Dangerous Goods Act and the Railway Safety Act. The Trade and Transportation Corridors Initiative aims to "build stronger, more efficient transportation corridors to international

markets" through strategic infrastructure investments and policy measures in different parts of Canada, with funding support provided by the National Trade Corridors Fund.[1]

## 1.3 Development of the strategy

### 1.3.1 Approach

The development of the Strategy has been organized according to four stages:

1. Foundation profiled current conditions and trends and established the policy context.
2. Issues and challenges gathered stakeholder views on issues and challenges that relate to goods movement in and around Calgary.
3. Opportunities explored how these issues and challenges can be addressed.
4. Strategy and actions brought together the preceding stages to develop a policy framework for the Strategy, within which actions, investments and priorities were then identified. This stage also developed plans for implementing the Strategy and monitoring its progress.

Figure 1.1 summarizes the four-stage process, along with a list of the key tasks that were conducted in each stage. It can be seen that stakeholder engagement featured prominently in each stage.


*Figure 1.1 – Approach*

[1] Transport Canada. Trade and Transportation Corridors Initiative. https://www.tc.gc.ca/eng/trade-transportation-corridors-initiative.html and National Trade Corridors Fund, http://www.tc.gc.ca/en/programs-policies/programs/national-trade-corridors-fund.html.

Background research supported the Strategy. The research included an analysis of truck travel patterns within Calgary, interviews with other jurisdictions on how they address goods movement challenges and a review of best practices in other cities across North America and elsewhere. The research also included a survey of more than 3,600 truck drivers on the roads and highways around Calgary. The survey profiled the characteristics of trucks travelling to, from and through the city (Figure 1.2).

The research and surveys were used to generate and assess potential solutions to the identified challenges. Together with solutions offered by the stakeholders, these were then assessed for feasibility in Calgary. The recommended solutions were then vetted by stakeholders before finalization as the Strategy's policies and actions.

*Figure 1.2 Roadside Truck Survey*

## Key role for stakeholder engagement

The Strategy was driven by stakeholder-defined challenges and inputs, aided by supporting research and analysis. Stakeholders had multiple opportunities to participate in the development of the Strategy, contributing their understanding of challenges and potential solutions and also commenting on the draft Strategy:

- Four Advisory Groups were convened, to provide detailed input from a range of perspectives throughout the development of the Strategy. These were:
  - Operational Advisory Group, which addressed short term needs and opportunities.
  - Strategic Advisory Group, which took a long view on challenges and opportunities.
  - Regional Advisory Group, which comprised the neighbouring municipalities.
  - Internal Advisory Group, which comprised City staff and emergency services.
- One-on-one interviews with representatives of key industries and infrastructure owners.
- Workshops with academia and the logistics community.
- Public information sessions and a survey of the public.

## Public education campaign

A multi-media educational campaign informed the stakeholder engagement. It featured advertisements, media interviews, online information, videos and information posters at locations around Calgary (see Figure 1.3). The campaign aimed to educate Calgarians about the importance of goods movement in Calgary and how it impacts their day-to-day life. It had two key messages:

- Goods movement is about how the products that we consume and manufacture reach their destinations within and outside Calgary.
- Calgary is a vibrant community that depends on the movement of goods for its economic wellbeing.

The education campaign advanced the aims of the Strategy by increasing awareness and by attracting comment from the public.


*Figure 1.3: Billboard in downtown Calgary*

### 1.3.2 Organization of this report

This report presents the Strategy. It has seven chapters:

- Chapter 1 (this chapter), which introduces the Strategy.
- Chapter 2 profiles the goods movement network in Calgary and its use.
- Chapter 3 summarizes key goods movement challenges.
- Chapter 4 presents a vision for goods movement and a framework for the Strategy.
- Chapter 5 presents the strategic directions and actions that define the Strategy.
- Chapter 6 is a plan to guide the implementation of the Strategy and monitor its outcomes.
- Chapter 7 closes the Strategy with a discussion of next steps.

Four appendices complement the Strategy:

- Appendix A lists the technical reports and engagement that were prepared to support the Strategy, along with the links where they may be found.
- Appendix B lists infrastructure projects for future scoping and detailed analysis.
- Appendix C lists recommended updates to Calgary's Primary Goods Movement Network.
- Appendix D presents recommendations concerning the consolidation of the truck bylaws.

# 2 Goods movement in Calgary

## 2.1 Why is goods movement so important?


**Goods movement is a key contributor to and enabler of Calgary's economy.** In recent years, Calgary has evolved into one of western Canada's leading multi-modal goods movement hubs. The Transportation and Warehousing sector and the Wholesale Trade sector directly accounted for nearly 8% or $9 billion of the Calgary region's gross domestic product (GDP) in 2015. These sectors in turn support other economic activity, yielding a combined GDP impact of up to $14.5 billion (2007$) in 2015 and directly and indirectly supporting up to 134,000 jobs in the Calgary region.[2] The recent additions of a 600,000 square foot Amazon Fulfillment Centre and other large-scale distribution centres add to the growing footprint of warehousing and logistics in the Calgary region. These businesses can only thrive when they are complemented with a sustainable multi-modal transportation network to carry goods to, from and within Calgary and people between their jobs and homes.

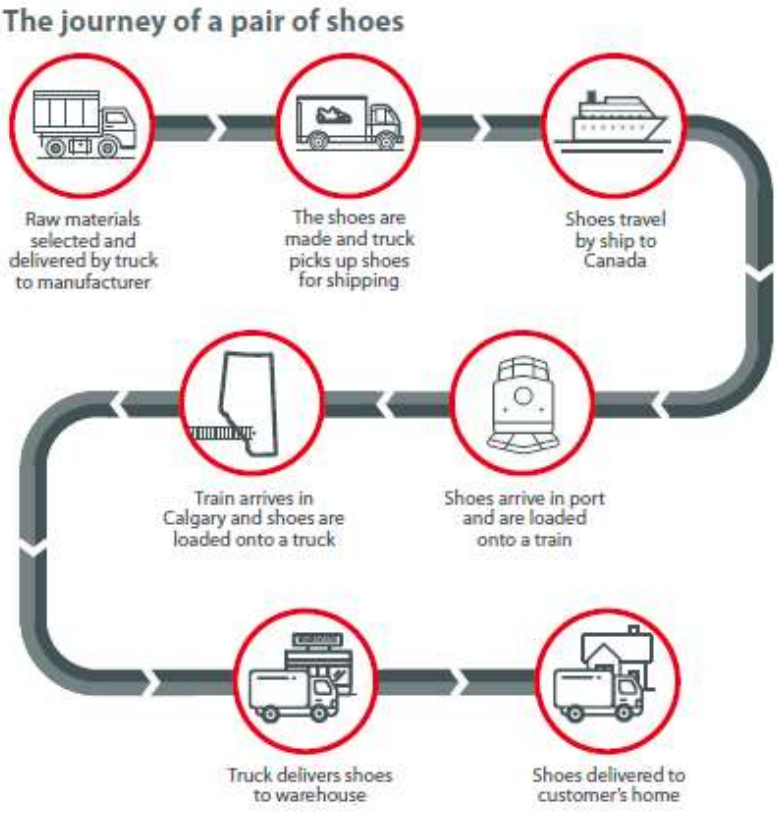



*Figure 2.1 How shoes might arrive in Calgary*

Likewise, all Calgarians rely on goods movement to get the products they need. Almost everything Calgarians use on a daily basis must be transported by vehicle, whether it is directly to their home or a nearby business. Often, multiple modes are needed - **Error! Reference source n ot found.** illustrates that a pair of shoes manufactured overseas moves by ship, rail and truck in its journey from the factory to a purchaser's home. An efficient goods movement system helps ensure Calgarians have access to a wide-range of products at reasonable costs. As the textbox below shows, substantial amounts of goods are imported into and exported from Calgary by rail and truck.

[2] Consultant's analysis of data from the Conference Board of Canada.

**The Calgary Region is an important importer and exporter of goods**

Statistics Canada estimated that **$10 billion** in goods moved **from** the Calgary region to other regions of Canada by truck and rail in 2012, and **$13 billion** in goods moved **to** the Calgary region by truck and rail.[3]

## 2.2 What is goods movement?

**Goods movement, sometimes referred to as freight or cargo, is the movement of a physical product from one location to another.**[4] The Strategy is multi-modal; that is, it considers all the vehicle-types and supporting infrastructure that enable goods to be delivered to Calgary residents and businesses. As shown in Figure 2.2, the Strategy considers road-based modes (trucks, vans and bicycle), rail, air and pipelines, all of which are present in Calgary.

Because nearly all goods need to be transported by truck eventually, and the role The City of Calgary plays in managing road infrastructure, the focus of the Strategy is on trucks and road-based transportation generally. However, all modes of transportation are important to ensuring an effective goods movement system. Marine ports, which are not physically present in Calgary, are also noted in the Strategy because they are part of the supply chain for many of the goods that shipped to and from Calgary, as illustrated in the example in Figure 2.1.

*Figure 2.2: Freight transportation modes considered in the Strategy*

[3] Statistics Canada. Domestic regional trade flows in Canada: Experimental estimates from the new Surface Transportation File, 2004 to 2012," CANSIM Table 386-0004. These estimates exclude flows by air. These estimates also exclude intra-Calgary flows.

[4] The Strategy also considers service vehicles, which do not generally carry goods but are engaged in providing commercial services, such as appliance repair.

## 2.3 How and where do goods move?

### 2.3.1 Multi-modal goods movement network

Calgary is served by a comprehensive multi-modal goods movement network, including provincially owned highways and City-owned roads, CN and CP rail lines and pipelines (Figure 2.3). There are also a number of important facilities for transferring goods between modes, including the Calgary International Airport and rail intermodal and transload facilities for containerized and non-containerized goods, respectively. These facilities allow goods to be transported over long- distances quickly (in the case of air) and cost-effectively (in the case of rail), before being transferred to truck for shipment to their final destination.

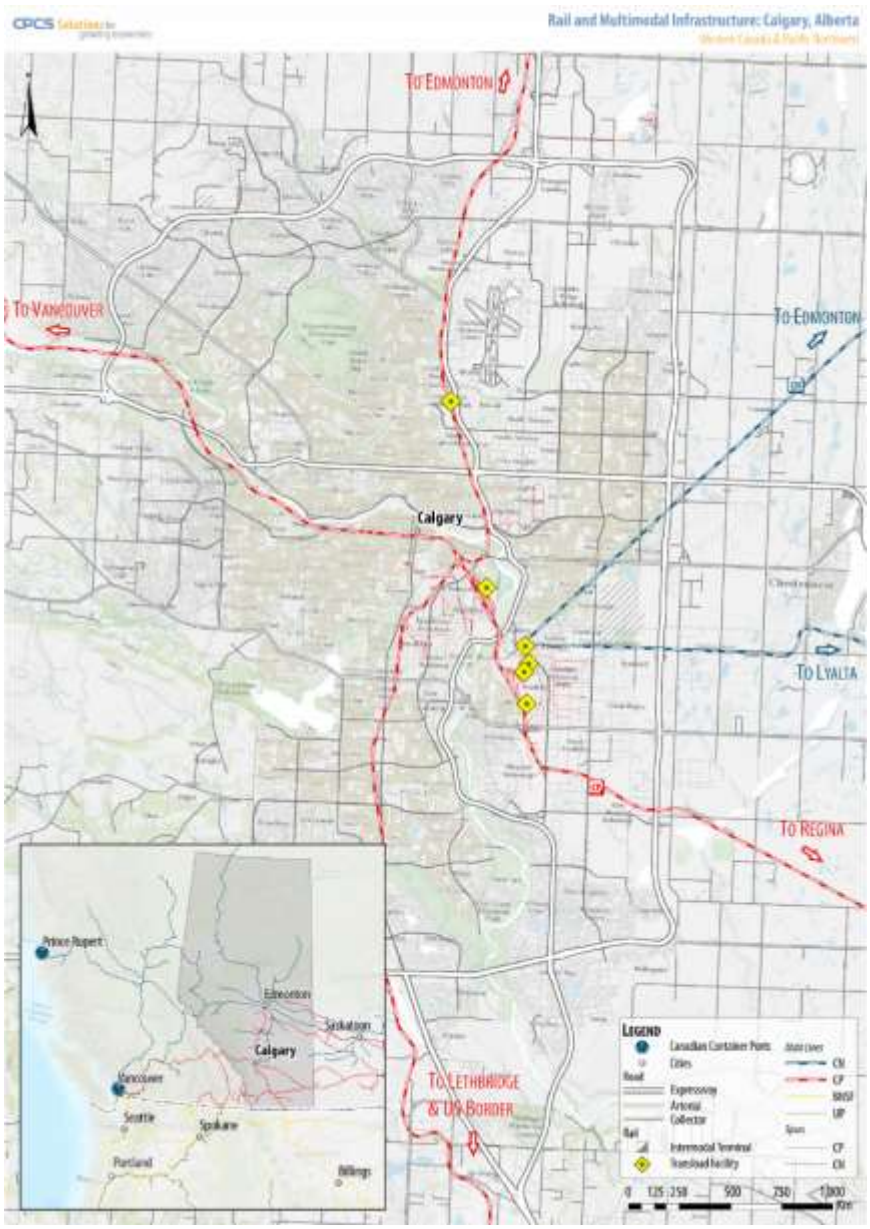



*Figure 2.3: Calgary's multi-modal goods movement network*

Although the CTP emphasizes passenger movement, it recognizes commercial vehicles as a critical element of Calgary's economy. It does so by designating the Primary Goods Movement Network on key roads and highways. The Network, shown in Figure 2.4, defines high-priority routes where the most concentrated goods movement activity occurs. It emphasizes accessibility and connectivity to the airport, industrial areas and intermodal rail terminals and along heavily used goods movement corridors. By designating these routes as high priority, the Network is intended to facilitate the movement of goods and services through the implementation of measures that improve traffic flow and control access and by promoting the situation of industrial and goods-generating land uses close to the network.

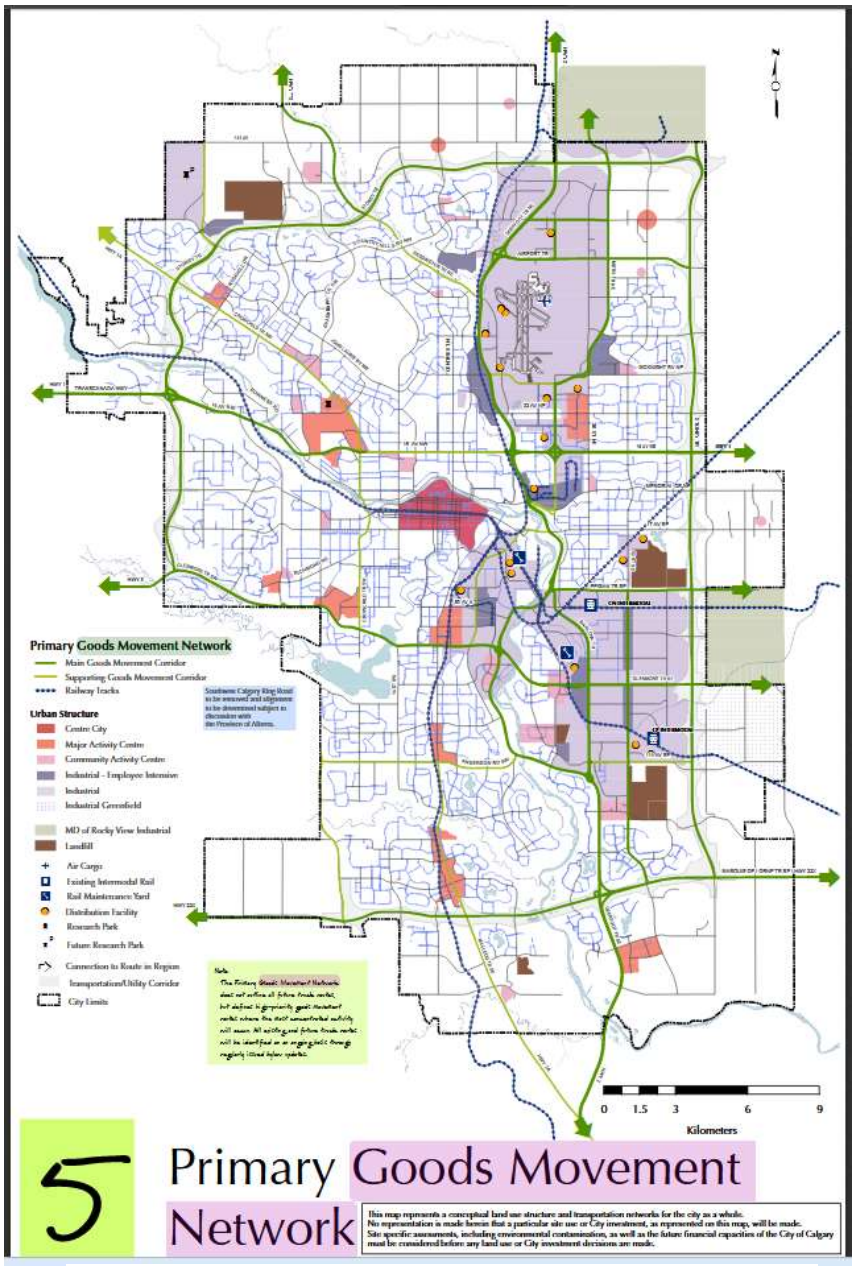



*Figure 2.4: Calgary's primary goods movement network*

### 2.3.2 Goods movement employment

The location of jobs in goods movement (transportation and logistics) industries provides some indication of where goods movement activity within Calgary is likely to start and end. These locations also indicate the key destinations to which workers in these industries must commute. Figure 2.5 shows employment data in these industries, plotted by location, industry subsector and number of employees. Excluding downtown, which likely represents head-office jobs of companies in transportation and logistics industries, most of Calgary's employment in goods movement-related industries is clustered into two areas: in the northeast, south of Calgary International Airport, and in the city's southeast between the CP and CN rail networks.

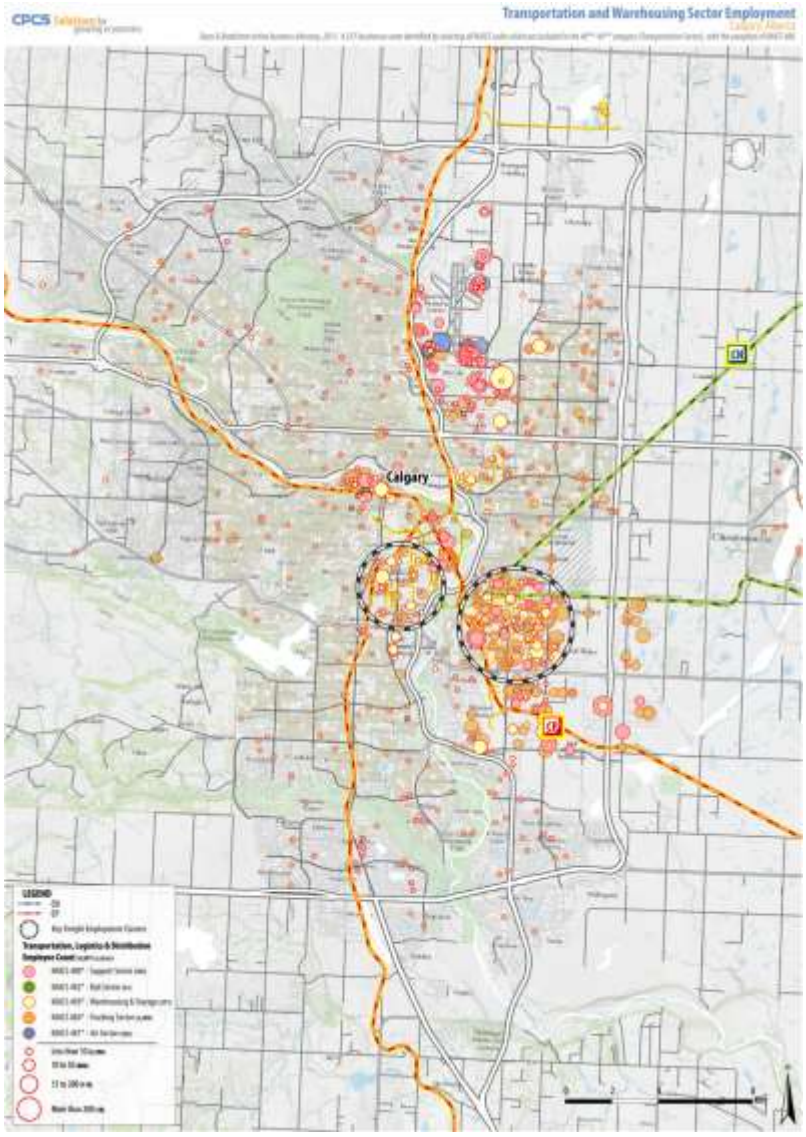



*Figure 2.5: Calgary's transportation and logistics sector employment locations*

Around the airport, there is primarily air sector and support sector employment, which includes activities that relate to passenger transportation. However, there are also several warehousing and storage and trucking sector employers, which likely support the transit of freight through the airport.

In southeast Calgary, warehousing and storage, trucking and rail sector employment is clustered around areas with rail spur access, which also corresponds to the locations of many transload facilities and CP's intermodal terminal. A smaller cluster of employment is also located between CP's line south to Lethbridge and its line east to Regina. Figure 2.5 depicts the two clusters inside the dashed black-and-white rings.

### 2.3.3 Truck

Truck is the most important mode for the movement of goods within, to and from Calgary. In 2014, about 70% of all goods by weight entered and exited Calgary by truck.[5] In 2015, approximately 120,000 truck trips were made within Calgary daily, according to City of Calgary estimates.

Figure 2.6 shows the most significant clusters of truck trip ends (where trips start and end) in the Calgary Region.[6] Areas of high goods movement industry employment tend to be key generators of truck trips. In addition to the key northeast and southeast locations within Calgary described in the previous section, industrial areas to the north and east of the city, such as Balzac, are important truck trip generation clusters.[7]

A 2017 survey of trucks travelling at the perimeter of Calgary found that there is a significant amount of truck trips within and between these clusters daily, as shown in Figure 2.7. Daily truck trip volumes to and from the southeast and northeast industrial areas are especially high. This activity underscores the importance of goods movement activity both within Calgary and between Calgary and the surrounding region, and the corresponding need for a regional perspective in planning for goods movement needs.

*Given the significant volumes of goods that move between Calgary and the surrounding region every day, a regional approach is required for planning for goods movement.*


In fact, truck volumes across the city have been growing, generally in line with growth in Calgary's population and employment, and with volumes crossing the City's boundaries increasing fastest as new industrial and commercial development takes place in the surrounding region. Since 2001, the average annual truck growth rate across the boundary of the City

[5] Consultant analysis of Statistics Canada Canadian Freight Analysis Framework, 2014, https://www150.statcan.gc.ca/n1/en/catalogue/50-503-X2018001.

[6] The trip ends were used to identify freight clusters, which are contiguous traffic analysis zones with significant truck trip generation according to the GPS trip end data.

[7] Employment data outside the city of Calgary are not shown in Figure 2.5.

of Calgary has slightly outpaced population growth, with truck trips on the highway around Calgary having grown by more than half over the last 15 years.

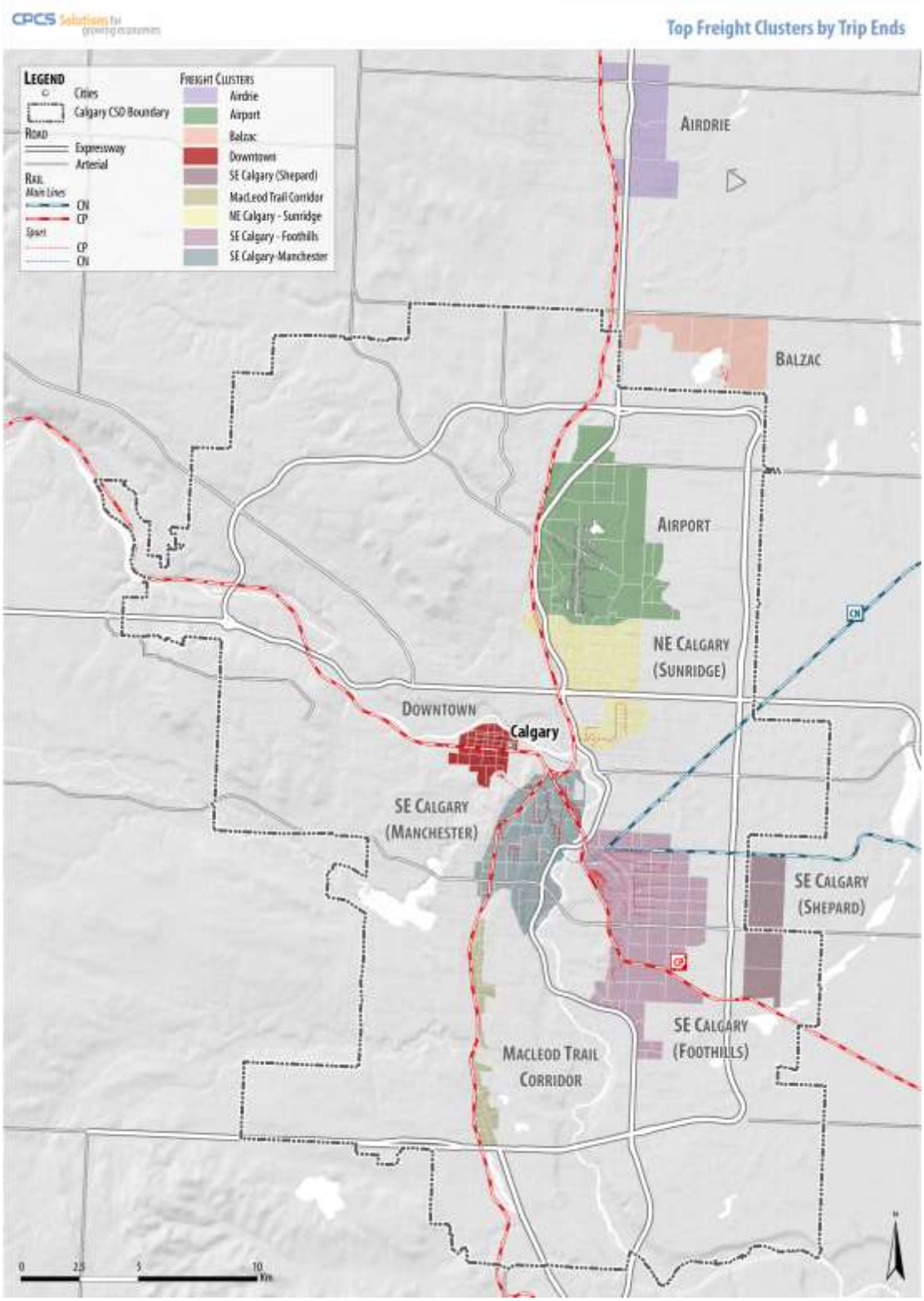



*Figure 2.6: Top freight clusters by trip ends*

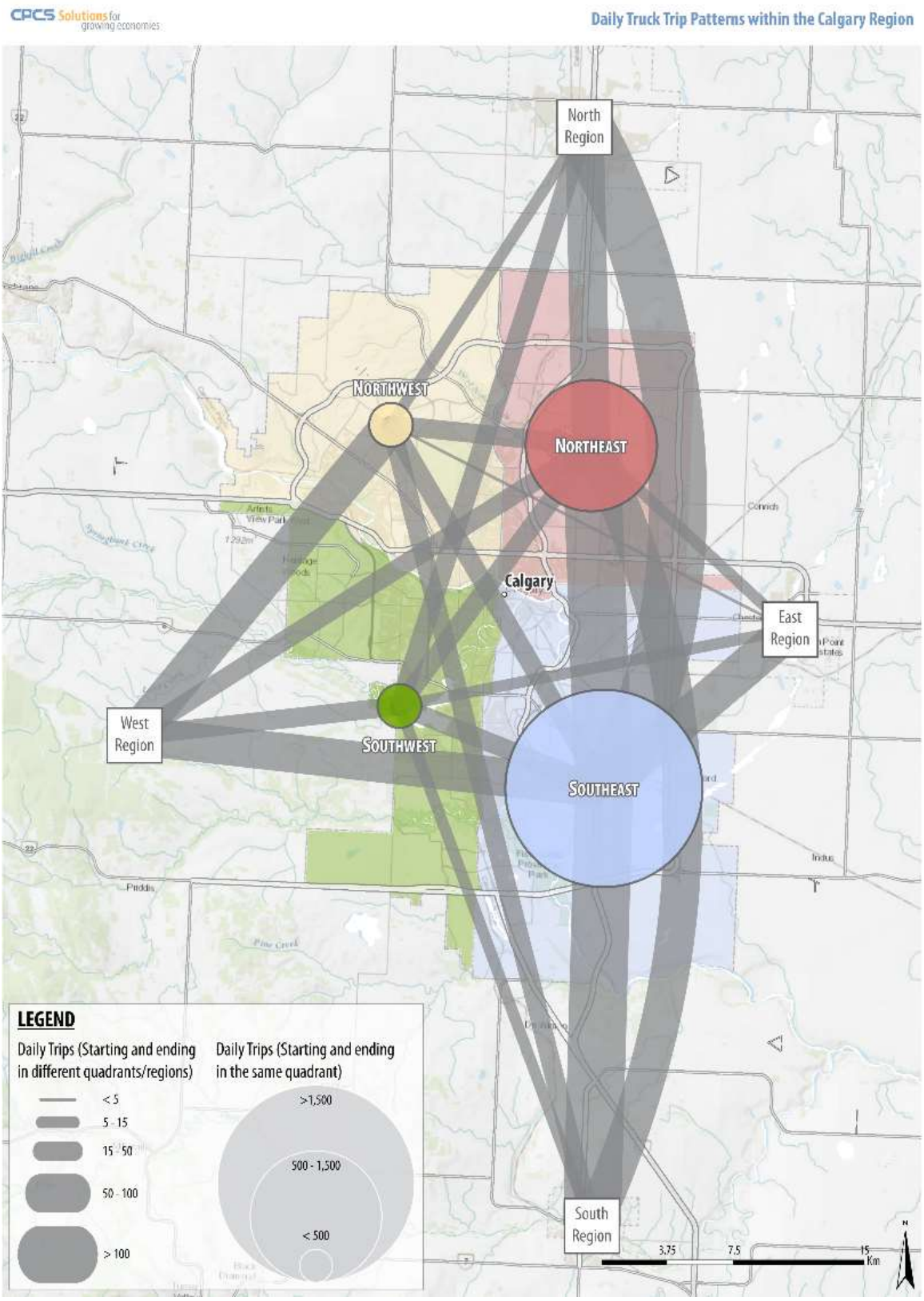



*Figure 2.7: Daily truck trip patterns within the Calgary region*

Truck trips within the Calgary Region are expected to continue to grow approximately in line with population and employment (Figure 2.8), although a number of emerging and recent trends, such as the recent oil price fluctuations, might affect where and how much goods move in the future.[8]

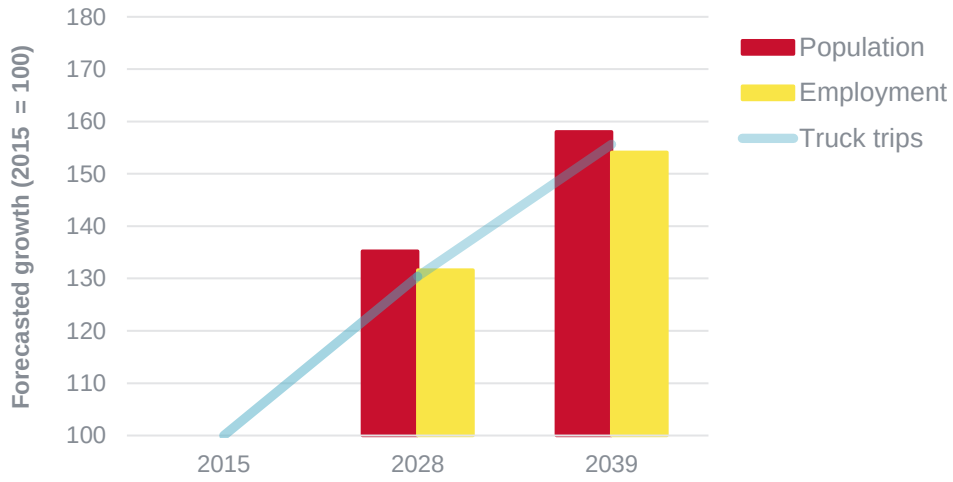



*Figure 2.8: Truck trip, population and employment forecasts, Calgary Region (2015-2039)*

The 2017 truck survey also captured long-distance trucking activity. About one-third of long-distance trips to/from is between British Columbia and Calgary (Figure 2.9). By compass heading, the next highest percentage of long-distance truck trips is to and from Central and Northern Alberta, including Edmonton, at 27% and 21% respectively. Trucks also come from and are destined to all other compass headings. They highlight Calgary's role as an important hub for goods between the US and Eastern Canada, and Calgary.

Trucks carry all types of goods. Based on the 2017 survey of truck trips around Calgary, construction-related materials, such as gravel and cement, were the most frequently cited specific goods carried by trucks (Figure 2.10). Based on more general classification by category of goods, food and farm products and general freight (such as consumer products destined to retail stores) were the most frequently cited products entering and leaving Calgary.

The 2017 survey and other data demonstrate the importance of Calgary's highway system. The northeast quadrant of Stoney Trail experiences some of the highest truck volumes,[9] which is consistent with the ring road's role in connecting the major industrial areas and the inter-city highway network, as well as serving as a by-pass for trucks around Calgary (Figure 2.11). Highway 2 from the north and the south are also some of the busiest truck entry points to Calgary. Calgary also benefits from multiple

[8] These forecasts do not factor in the results of the 2017 truck origin-destination survey.

[9] As GPS data are only collected from a sampling of trucks, the volumes shown in Figure 2.11 only provide an illustration of truck volume intensity, not absolute volumes.

highways to the east and west that allow goods to enter and exit the city. There are also a number of important highway and non-highway corridors for goods within Calgary, notably Deerfoot Trail, Glenmore Trail and roads in southeast of Calgary.

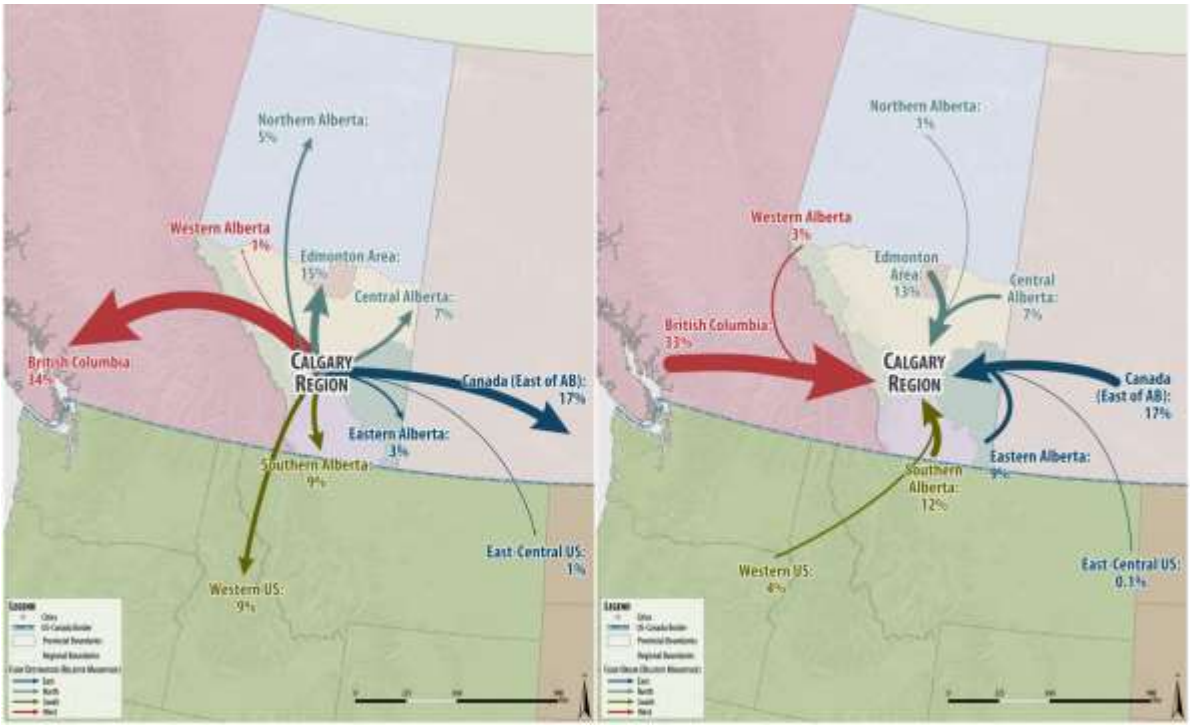



*Figure 2.9: Long-distance truck trips inbound to Calgary (L) and outbound from Calgary (R)*


*Figure 2.10: Specific (L) and general category of goods (R) carried to/from Calgary*


*Figure 2.11: Relative truck volume intensity*

### 2.3.4 Rail

Calgary is served by two Class 1 railways, the Canadian National Railway (CN) and the Canadian Pacific Railway (CP).[10] CP's transcontinental mainline from Vancouver to Montreal passes directly through Calgary. CN's east-west mainline runs through Edmonton between the Canadian West Coast (Prince Rupert and Vancouver) and Eastern Canada, the United States Midwest and the United States Gulf Coast. As a result, CN serves Calgary from a line that connects to the mainline through Edmonton. The busiest rail line in Calgary, CP's east-west mainline, can carry upwards of 25 trains per day (Figure 2.12).

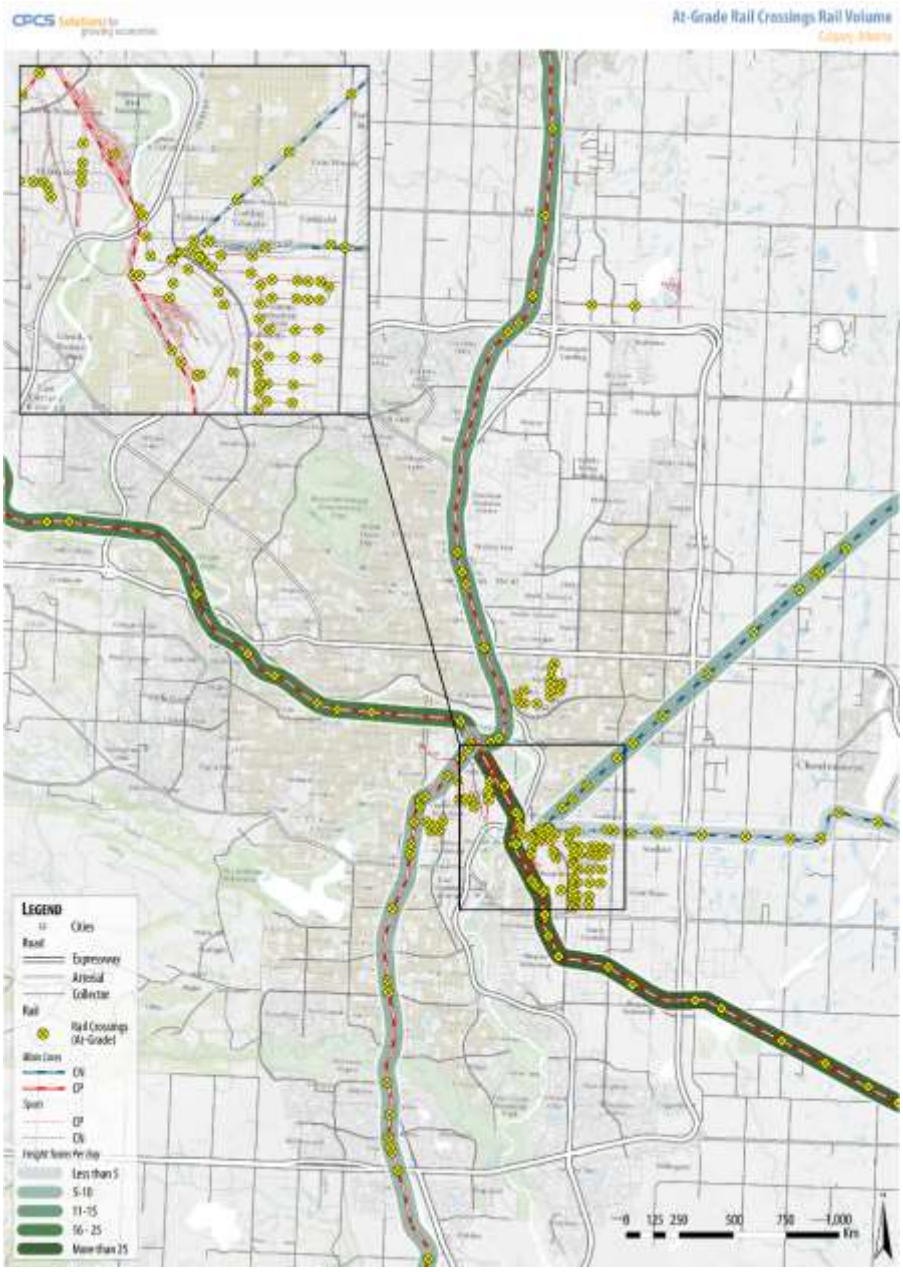



*Figure 2.12: At-grade crossings and order-of-magnitude train volumes*

[10] Railway classes are defined according to annual revenues.

Relative to truck and other modes, rail is most efficient at carrying high volumes of containerized and non-containerized goods. In 2014, rail carried nearly 30% of goods by weight into and out of the Calgary region, in particular miscellaneous products (such as consumer goods destined to retail stores), metals (e.g. steel for construction) and plastics and chemical products (Figure 2.13).[11] In containerized traffic alone, in 2016, 220,000 containers transporting 2.8 million tonnes of cargo were transported to Calgary by rail, and 140,000 containers containing 1.7 million tonnes were transported from Calgary.[12]

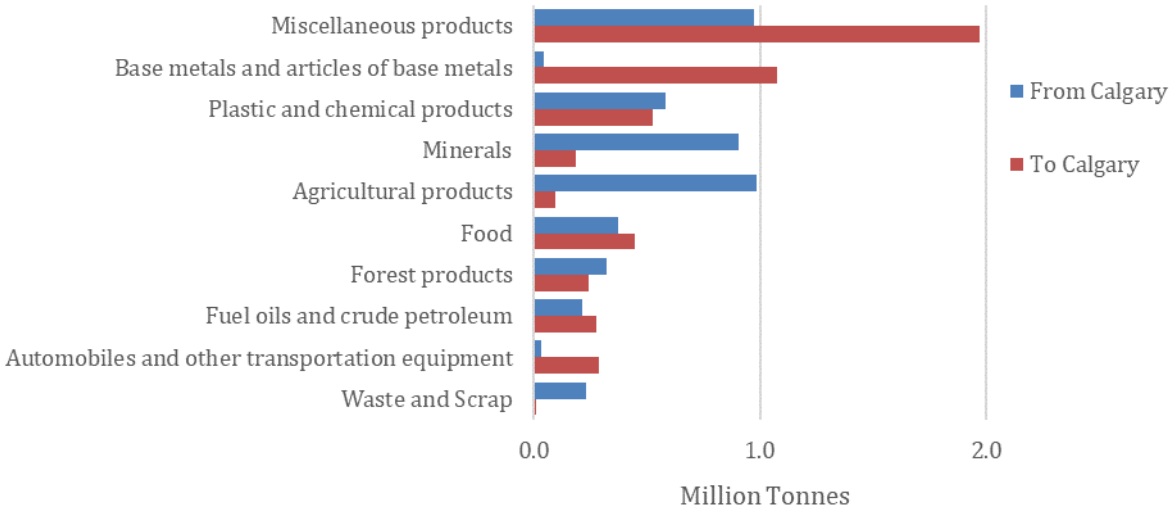



*Figure 2.13: Top ten categories of goods transported by rail to and from Calgary in 2014*

### 2.3.5 Air

The Calgary International Airport (YYC) is Canada's fourth busiest airport. It is served by major air cargo and courier services. A recent $2 billion expansion added a new 14,000 foot runway and more industrial warehousing space, and has increased the YYC's ability to handle anticipated growth in airfreight. The YYC Global Logistics Park, which occupies over 330 acres of land, is accessible by shippers and receivers in the area from the major road and highway network. YYC operates 24/7 and cargo can be transported from YYC to anywhere in the

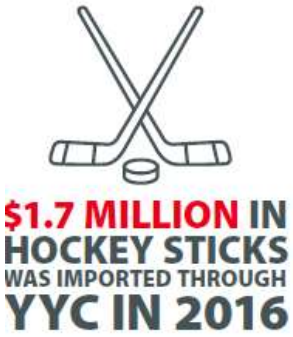
*Air cargo carries sensitive high-value cargo needed by Calgary businesses and residents, such as certain food products and pharmaceutical products, for example.*

[11] Consultant analysis of Statistics Canada Canadian Freight Analysis Framework, 2014, https://www150.statcan.gc.ca/n1/en/catalogue/50-503-X2018001.

[12] Consultant analysis of data provided by Transport Canada.

world within 48 hours.[13] Most cargo moves in the belly of passenger aircraft, although YYC is also served by cargo-only flights.

The airport handles approximately 135,000 tonnes of air cargo each year. Although these quantities are small relative to other modes, air cargo carries sensitive high-value cargo needed by Calgary businesses and residents, such as food products and pharmaceutical products. As a result, although air cargo only carried 0.3% of goods by weight into and out of Calgary in 2014, it carried over 10% of goods by value.




YYC is also a key international gateway for Western Canada. Approximately $2.1 billion worth of products was exported internationally by air in 2016. Approximately $2.9 billion worth of products delivered by air was cleared through customs at the airport.

### 2.3.6 Pipelines

Liquid product and natural gas pipelines operate in and through Calgary. For example, ATCO Pipelines owns and operates natural gas transmission pipelines that deliver natural gas from producers to customers in Calgary. These pipelines largely follow the major highway corridors in Calgary.

Trans-Northern owns and operates the Alberta Products Pipe Line, the main source of delivery for refined petroleum products in southern Alberta. This pipeline carries refined fuel products from refineries in the Edmonton area to distribution terminals in Calgary, including terminals at YYC. This pipeline carries approximately 48,000 barrels of refined fuel products per day.[14]

[13] Calgary Airport Authority, YYC Global Logistics Park.

[14] Trans-Northern, Our Pipelines.

# 3 Challenges

Through the development of the strategy stakeholders identified two groups of challenges: infrastructure- and non-infrastructure-related challenges.

Infrastructure-related challenges refer primarily to bottlenecks and other concerns at specific areas within Calgary. Four specific challenges are discussed below under Challenge 1. Non-infrastructure-related challenges refer to a number of broader policy issues across Calgary. Twenty-two individual challenges are discussed below under Challenges 2 – 6.

## Challenge 1: Congestion and other inefficiencies on roads

Stakeholders looked at roads and highways within and around Calgary. They identified challenges related to bottlenecks, congestion, operational concerns, capacity constraints, conflicts with other traffic and the desire for new or expanded connections. Separately, indicators, such as the Peak Travel Time Index (TTI), were developed using truck GPS data to idtheentify possible challenge areas (Figure 3.1).[15] The Peak TTI is a measure of the gap between performance under the highest (peak) truck volumes and free-flow (i.e., uncongested) performance, with a higher TTI value indicating worse performance in the peak. Figure 3.1 shows several sections of Deerfoot Trail, within the southeast and northeast industrial areas and downtown Calgary,[16] among other locations, as being especially subjected to higher TTI values and lower performance. By comparison, the Stoney Trail generally operates under free-flow conditions during the peak.

Based on this input and analysis four challenges were identified:

1. Stoney Trail has been successful in getting trucks around Calgary, but some additional needs remain, including additional connections.
2. Operational and capacity constraints cause bottlenecks at several locations, notably along Deerfoot Trail.
3. Some additional connections and corridors are desired, notably to improve east-west flow.
4. Traffic disruptions due to construction can be problematic and should be minimized.

Recommended improvements are detailed in Strategic Direction 1 and in Appendix B.

[15] The Peak TTI is the ratio of the free-flow truck speed to actual peak truck speed. The free-flow truck speed is defined as the average overnight speed. The peak speed is defined as the average speed in the worst hour among the six peak hours as defined. A factor of 1.5 is generally used by the US Federal Highway Administration for reliability-related metrics as indicative of a road not being reliable – i.e., indicative of stop-start conditions, high levels of congestion and so on. Source: National Performance Management Measures, US Federal Register, 2017.

[16] Travel times in downtown Calgary are generally low, given the dense road network and the high level of all types of passenger and goods movement throughout the day.

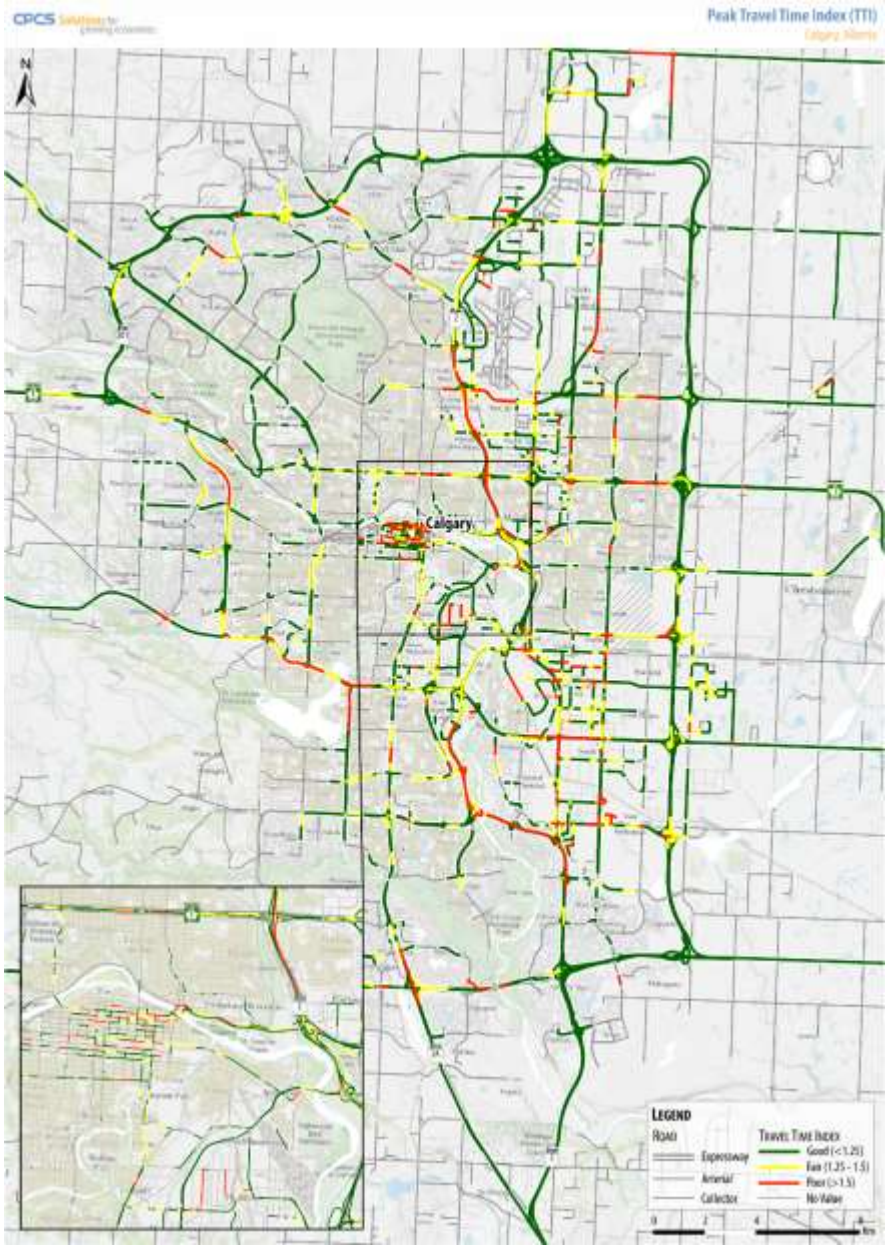



*Figure 3.1: Peak truck travel time index by corridor*

## Challenge 2: Emerging and ongoing needs and trends

Several emerging trends have started to impact the goods movement industry. These include rapid growth in e-commerce purchasing and in the related customer demand for express delivery, tests of deliveries made by drones and robots, disruptive technologies such as Uber-like sourcing that allows anyone to be a courier, and the emergence of electric delivery vans and self-driving (automated) trucks. The pace and extent of these trends are still evolving, especially for the new technologies, given the need to resolve challenges concerning reliability, regulations, liability, safety and public acceptance and to provide supporting infrastructure. However, it is evident that these trends and technologies will be

factors in moving goods in and around Calgary in the future. In the meantime, the demands for moving goods will continue to grow.

Stakeholders identified the following three challenges:

1. Changing demands and economic conditions will impact where and how goods are moved, such as the increasing growth of e-commerce changing how deliveries are made, e.g. to delivery lockers (Figure 3.2) where consumers can pick up their purchase at their convenience rather than having to wait at home for the delivery. Delivery lockers also get around concerns about the security of an unattended delivery.
2. Economic downturns can result in heightened competitiveness and cost cutting among truckers. This can impact safety compliance among small or independent truck owners who do not always have the resources to devote to the regular maintenance of their vehicles.[17] Economic downturns can also impact small or independent truck owners' ability to implement fuel efficiency measures.
3. Potential environmental impacts, such as from a spill or accident involving vehicles carrying dangerous goods (e.g. Figure 3.3), should be better anticipated in plans or designs that minimizing mixing traffic from industrial/commercial and residential developments, rather than mitigated after an incident occurs.


*Figure 3.2: Example parcel delivery locker*


*Figure 3.3: Example truck carrying dangerous goods*

## Challenge 3: Protection of strategic goods movement infrastructure

Goods movement activities impact the surrounding community. Many stakeholders acknowledged that these activities cannot always be given priority over other transportation system users. However,

[17] This issue was raised specifically in the context of trucking carriers.

stakeholders emphasized that strategic goods movement infrastructure must be protected from encroaching land uses to ensure that it can continue to serve the function intended. For example, any noise curfew would limit air cargo operations and an airport's ability to attract and retain cargo airlines. Ensuring appropriate separation between goods movement infrastructure and other sensitive land uses can also minimize encroachments and promote safety.

1. Strategic goods movement infrastructure, especially airports, rail lines and rail terminals, needs to be protected from conflicting land uses, to enable them to continue to effectively serve the region (Figure 3.4).
2. Complementary land use around strategic goods movement infrastructure needs to be protected. Access for goods movement needs to be protected even as lands are redeveloped.
3. Truck routes need to be protected to serve goods movement even when roads are reconfigured (Figure 3.5).
4. Conflicts between rail and truck traffic need to be minimized.
5. Efficient access to aggregates-producing lands needs to be maintained as the surrounding areas develop. Conflicts between aggregates haulers and other traffic need to be minimized.
6. Roads into new development areas are not adequate to support heavy construction vehicles, so these vehicles often must use adjacent neighbourhood roads to access the sites. There is a lack of roads connecting to new development areas, meaning that heavy construction vehicles must often go through existing neighbourhoods to reach these areas.

*Figure 3.4: CP mainline through Calgary showing residential developments in the background*

*Figure 3.5: Aggregates truck turning left from 112 Ave N.W. to Country Hills Blvd N.W.*

## Challenge 4: Last kilometre deliveries and accessibility

Goods will continue to be delivered to Calgary businesses and residents, even as e-commerce and other factors change how deliveries are made. Stakeholders identified six challenges regarding how local circulation, loading and site access and design influence delivery and accessibility:

1. Changing demands for deliveries generate impacts in residential areas.
2. Delivering goods without impacting local residents can be challenging (e.g. Figure 3.6) shows a late-night delivery adjacent to bike lanes and residential buildings).
3. Parking and operational layouts in recent suburban developments are not necessarily designed for the efficient use by couriers and express deliveries (e.g. Figure 3.7). This can impede deliveries, especially when snow is present.
4. Building and site design can constrain the delivery of goods (e.g. Figure 3.8) shows how deliveries at a commercial site can impact adjacent parking).
5. The planning, supply and location of loading zones can constrain the delivery of goods (e.g. Figure 3.9) shows a delivery van being ticketed while parked adjacent to its associated business).
6. Planning decisions impact goods movement; that is, goods movement cannot always be prioritized in planning decisions with respect to parking and circulation, but this comes at a cost for goods movement.

*Figure 3.6: Food distribution company attempting evening delivery in Toronto*

*Figure 3.7: Curbs and parking at McKenzie Towne*

*Figure 3.8: Goods movement vehicle delivering to businesses in Toronto blocking parking*

*Figure 3.9: Goods movement vehicle receiving parking ticket in Toronto*

## Challenge 5: Maintaining flexibility in future plans

The emergence of many technologies, such as autonomous vehicles and drones, is expected to have a profound impact on where and how goods (and people move). Some technologies, such as truck platooning (Figure 3.10), could be more readily adoptable to today's road/intersection configurations and geometries than are fully autonomous vehicles, which might require dedicated lanes of their own (Figure 3.11).[18]

*Figure 3.10: Truck platoon*

*Figure 3.11: Dedicated lane for autonomous vehicles (concept)*

However, stakeholders made clear that the pace and breadth of the uptake of new technologies depend on resolving the various challenges described under Challenge 2. Anticipating the full impacts of these new technologies on infrastructure plans is difficult – for example, the need for a dedicated lane for autonomous vehicles or recharging stations for electric trucks. As a result, many stakeholders emphasized the need for infrastructure plans to continue meeting the needs already identified today, while building in flexibility as and when conditions change.

[18] In both cases, investments in telematics and vehicle-to-vehicle, vehicle-to-infrastructure and infrastructure-to-infrastructure communications may also be required, aside from the physical road and intersection configurations and geometries.

It is important to incorporate flexibility in planning for technological changes; that is, doing something now to prepare for the future, even if it is unclear when or even if a technology will be deployed. Some examples include:

- Protecting right-of-way for new transportation infrastructure.
- Adding the ability to repurpose transportation infrastructure in the future – for example, reserving a lane on an existing highway for autonomous vehicles.
- Drafting less prescriptive regulations and ensuring they are kept up to date as new technologies are deployed.
- Identifying the conditions or thresholds that might determine when planning for a new technology might become more critical.

Stakeholders noted the need for balance. They noted that building in flexibility today comes at a cost – for example, creating a dedicated autonomous vehicle lane today when the uptake is still non-existent. The costs include increased construction costs, sprawl and reduced regulatory enforceability.

## Challenge 6: Implications of regional needs

The Calgary region has emerged as a key Western Canadian distribution hub. To enable continued growth, as illustrated in Chapter 2, goods movement vehicles need to move seamlessly across the Calgary Region and Western Canada more broadly. Stakeholders identified four specific challenges that need to be considered and/or addressed:

1. The Calgary Region will continue to be attractive as Western Canada's hub, but not all new development will occur in Calgary, so connections across the region are important. The new Amazon distribution centre is a case in point (Figure 3.12).
2. For the Strategy to be a meaningful guide and tool for attracting businesses, industry requires ongoing communications and predictability in infrastructure commitments – i.e., that a commitment to build a new road or interchange is kept, even if the improvement is not scheduled until well into the future. This in turn requires predictable and stable funding for transportation infrastructure and the establishment of plans beyond the short term.
3. Increasingly, distribution centres and warehouses are located in suburban, low density sites that are not always well served by transit. However, it is challenging to get logistics workers to their jobs at these locations and, especially, to serve overnight shift workers at these 24/7 operations.

4. Congestion at the Port of Vancouver – more specifically, at the landside accesses – and the relatively low supply of room to expand around the individual ports (as exemplified by Figure 3.13), are potential concerns to the extent that they could result in delays and unreliable delivery times for goods destined to Calgary. Although alternative West Coast ports exist, notably Prince Rupert, their lack of direct rail connectivity to Southern Alberta presents further limitations.

**Giant Amazon distribution centre near Calgary to create 750 jobs**

600,000-sq.-ft. warehouse in Balzac will create 750 full-time jobs

CBC News · Posted: Oct 26, 2017 12:21 PM MT | Last Updated: October 26, 2017

Amazon confirmed Thursday it is building a 600,000-square-foot warehouse just outside Calgary at Balzac in Rocky View County. (Jennifer Lee/CBC)

*Figure 3.12: Announcement of new development north of Calgary*

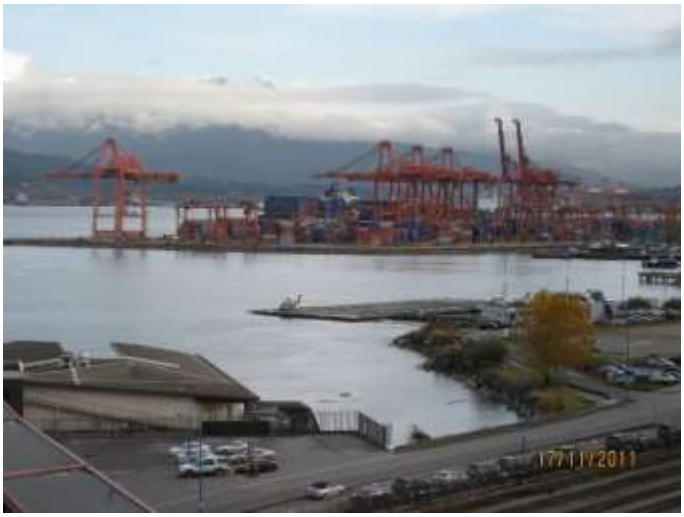


*Figure 3.13: Port of Vancouver Centerm in downtown Vancouver*

# 4 Vision and Strategy framework

## 4.1 Vision

To guide the development of the Strategy, the following vision for the Strategy and for goods movement is proposed:

> **The Goods Movement Strategy supports a multi-**
>
> **modal system that is safe, economical, reliable, efficient and environmentally sustainable.**
>
> **Within Calgary, goods movement is widely recognized as an essential contributor to the economic, social and environmental wellbeing of residents and businesses.**

The proposed vision serves three primary purposes:

1. It links the Strategy directly to Calgary's Triple Bottom Line policy's basis in economic, social and environmental concepts.
2. It establishes the importance of goods movement in planning. It suggests that decision-makers must consider the extent to which goods movement investments and priorities will be balanced with those of passenger movement.
3. It provides a framework within which goods movement initiatives can be prioritized and evaluated using qualitative and quantitative tools, such as benefit-cost and multi-criteria analysis, with other initiatives.

**Five interrelated elements of the vision**

- **Safe** for all users of the system, including passenger modes.
- **Economical** to implement, operate, maintain and use.
- **Reliable** in terms of the service offered to users, door-to-door travel times (which is not necessarily the same as offering short travel times) and network redundancy (allowing diversion between routes and modes, as situations dictate).
- **Efficient** in terms of directness and connectivity, including seamless interchanges between modes and being efficient to operate and maintain.
- **Environmentally sustainable**, minimizing fuel consumption, greenhouse gas (GHG) emissions and air pollutant emissions from the process of distrubting goods, equipment and the infrastructure used for goods movement, minimizing intrusions in environmentally, socially or culturally sensitive areas and the consumption of land and other resources.

## 4.2 Strategy framework

The Strategy proposes six strategic directions. Strategic direction 1 is specific to addressing network efficiency and congestion through infrastructure solutions specific to Calgary. Strategic directions 2 through 6, inclusive, provide actions that are primary non-infrastructure related, though may impact new and existing infrastructure in Calgary.

**Strategic direction 1: Continue to invest in transportation infrastructure to enhance goods movement**

This strategic direction, through four actions, proposes potential infrastructure solution areas to address network challenges raised by stakeholders. It **does not** commit The City to specific infrastructure improvements, timelines or budgets. It **does** say that The City will subsequently examine the infrastructure deficiencies identified by stakeholders through the Strategy and will ensure that the benefits to goods movement are taken into account in the identification, planning, evaluation and prioritization of these and other infrastructure improvements (see textbox below)

**Strategic direction 2: Collaborate with external partners to enhance regional goods movement**
This strategic direction proposes three actions to enhance collaboration among public- and private-sector goods movement stakeholders.
**Strategic direction 3: Promote planning for logistics centres and industrial areas**

This strategic direction proposes five actions to enhance goods movement road network and help the Calgary International Airport, rail terminals, rail corridors and other strategic freight hubs continue to thrive in the future are proposed.

**Strategic direction 4: Enhance last-kilometre deliveries**

This strategic direction proposes seven actions to improve deliveries at and within buildings due to existing and emerging delivery requirements.

**Strategic direction 5: Develop flexible plans to adapt for a changing future**

Recognizing and anticipating technological and other changes in the future, this strategic direction proposes four actions to help plan for a changing future.

**Strategic direction 6: Enable data collection and collaboration on goods movement research**

This strategic direction proposes three actions to improve access and use of data and research to anticipate and better plan for goods movement needs.

**Importance of considering goods movement during evaluation**

In most cases, further analysis will be required to define and evaluate the actions proposed in this Strategy. To ensure this project and policy development takes place, The City could consider developing a dedicated fund with which to undertake the design of new infrastructure proposals put forward by goods movement stakeholders, similar to the approach undertaken in the Region of Peel.

In line with the Vision, it is critical that the potential impacts to goods movement be considered in any evaluation of new transportation infrastructure or policies. While there are typically more passenger vehicles on the road, improving the efficiency of goods movement can have disproportionate benefits. For example, saving one minute of travel time for a passenger vehicle can results in a savings of the order of $20 whereas for a goods movement vehicle this value can be of the order of $100 or more (see box). As a result, whether qualitatively or quantitatively, it is important that a goods movement lens be taken with any transportation evaluation.

## Value of time for goods movement and reliability considerations

The actual value of time for a given vehicle can vary depending on its contents. For example, according to one source, a truck in traffic typically has a cost of $75 per hour, which accounts for the direct operating cost of the vehicle. However, a vehicle carrying auto parts to a production plant might have a value of time of $13,000 per minute, if unexpected delays in arrival will cause the shutdown of the assembly line. (InterVISTAS Consulting cited in Anderson, B, The Border and the Ontario Economy). Analogously, in Alberta, a truck delivering a critical piece of machinery to a plant in the oil sands might have a similarly high value of time, if its late arrival means the plant will have to shut down or remain shut down for repairs. For example, at $50 per barrel, a one-minute shutdown of a 100,000 barrel per day oil sand plant equates to $3,500 per minute in revenue.

InterVISTAS Consulting (2009) Cross-Border Flow Analysis Report 5: Case Study for Company 5 (Automotive Parts Manufacturer) prepared for Industry Canada.

Figure 4.1 shows the high-level alignment between the strategic directions and challenges. Some of the directions, such as Strategic direction 2: Collaborate with stakeholders, are cross-cutting in that they help enable the implementation of other actions, whereas others are focused on one particular challenge.

*igure 4.1: Strategic direction alignment with challenges*

| | ***Challenge 1:*** **Congestion and other inefficiencies on roads** | ***Challenge 2:*** **Emerging and ongoing needs and trends** | ***Challenge 3:*** **Protection of strategic goods movement infrastructure** | ***Challenge 4:*** **Last kilometre deliveries and accessibility** | ***Challenge 5:*** **Maintaining flexibility in future plans** | ***Challenge 6:*** **Implications of regional needs** |
|---|---|---|---|---|---|---|
| ***Strategic direction 1:*** **Continue to invest in transportation infrastructure to enhance goods movement** | ✓ | | | | | ✓ |
| ***Strategic direction 2:*** **Collaborate with external partners to enhance regional goods movement** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ***Strategic direction 3:*** **Promote planning for logistics centres and industrial areas** | | | ✓ | | | |
| ***Strategic direction 4:*** **Enhance last-kilometre deliveries** | | | | ✓ | | |
| ***Strategic direction 5:*** **Develop flexible plans to adapt for a changing futurr** | | ✓ | ✓ | | ✓ | |
| ***Strategic direction 6:*** **Enable data collection and collaboration on goods movement research** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

# 5 Strategic directions and actions

## Strategic direction 1: Continue to invest in transportation infrastructure to enhance goods movement

**Challenge:** Investigate potential operational and capacity improvements that can improve the movement of goods in and around Calgary.

**Potential projects**

Appendix B identifies transportation infrastructure projects in Calgary that could be implemented in the short-term (0-5 years), medium-term (5-15 years) and long-term (>15 years). It also identifies project areas in and around Calgary where The City should consider collaborating with the Province and other neighbouring municipalities to implement projects, and/or otherwise ensure alignment across plans and funding priorities.

### Action 1.1: Review signal timings to enhance the flow of goods along key corridors while maintainting a safe environment for all corridor users

The review of signal timings, coordination and progressions along key truck corridors provides an opportunity for operational quick wins that can improve the fluidity of goods movement while maintaining a safe environment for all corridor users. Appendix B lists the project areas.

**Impact of reducing delays**

Reducing delays for goods movement vehicles not only results in direct cost savings (for example, fewer trucks and drivers are on the road). Reducing delays also helps improve the competitiveness of the Calgary region to businesses, by making it easier and less costly to move its goods to and from Calgary. To that end, if travel times could be reduced by one minute on a corridor with 4,500 trucks per day - comparable to volumes on the busiest sections of 52 Street S.E. - through optimization of signal timing, then the savings to goods movement vehicles could be $2 million per year.[19]

### Action 1.2: Ensure the impacts to goods movement are identified in the evaluation of key infrastructure projects in the network

The City already has identified a number of projects in planning and design phases that could benefit goods movement. Stakeholders identified a number of infrastructure improvements that could potentially benefit goods movement, including adding capacity in a number of corridors. The City should proceed with these projects that already have committed funding. For other projects, it should ensure

[19] Source: Consultant's estimates based on City of Calgary Average Annual Weekday Traffic (2016) and estimated truck percentage. Because these estimates combine truck percentages and estimated truck volumes from differing years, they should be considered indicative only of the order of magnitude of truck volumes. The value of time used for commercial vehicles was assumed to be the unweighted average of the value of times for light, medium and heavy duty vehicles in The City of Calgary's Regional Transportation Model, rounded to $100 per hour. The savings were annualized based on a factor of 250 days per year (i.e. weekdays).

that a goods movement perspective is incorporated explicitly in any evaluation and prioritization - for example, quantifying benefits from reductions in truck delay and accounting for them the evaluation.

### Action 1.3: Collaborate with Alberta Transportation to enhance the movement of goods along Deerfoot Trail, Stoney Trail and other regional highways

From the perspectives of truck volumes and delay, Deerfoot Trail and Stoney Trail are the two most important corridors for trucks in the Calgary Region. Although these corridors are under the jurisdiction of the Province, because of their importance to goods movement The City should work with the Province to study and implement improvements. There are also potential improvements to other Provincial highways as well that should be considered.

**Importance of Deerfoot Trail**

Sections of Deerfoot Trail have the highest level of truck delay in Calgary, based on an analysis of truck GPS trace data and issues identified by stakeholders. In addition, $80 million in goods touch Highway 2 every day in and around Calgary. While these highways are not under the jurisdiction of The City, The City should prioritize potential collaborations to address to ensure the overall competitiveness of the region.

### Action 1.4: Work with the Province and neighbouring municipalities to align corridor plans and funding priorities across the region, to improve connectivity for goods movement

Goods movement activity occurs within Calgary and the surrounding region. To maximize the benefits of new infrastructure to goods movement while minimizing costs, The City should endeavour to align plans with surrounding municipalities, starting with any regional-level plans developed. As well, regional stakeholders raised the need for a funding model for intersections and connections to Provincial highways. Consideration is also needed with respect to dealing with agricultural vehicles in the more rural areas of the region.

## Strategic direction 2: Collaborate with external partners to enhance regional goods movement

**Challenge:** Ensure collaboration among The City, regional partners and industry stakeholders to help implement goods movement solutions and address ongoing challenges.

### Action 2.1: Collaborate with regional partners, including the Calgary Metropolitan Region Board, on future land use and transportation plans that impact goods movement across the Calgary region, and continue to provide technical assistance with these plans

The City of Calgary should extend its existing cooperation with neighbouring municipalities to sharing staff-level expertise, data and tools with other municipalities in the region to address regional goods movement challenges. In particular, smaller jurisdictions without staff knowledgeable about goods movement may benefit from the sharing of best practices on challenges like policy, planning and design.

### Action 2.2: Promote cross-jurisdictional consistency on design standards and operational practices, including a regional truck network map

As described above, the Calgary Region is a key generator of truck trips across the Province and beyond. However, some standards and practices vary by jurisdiction, which can inhibit the efficient movement of goods. In addition to sharing technical expertise with its neighbours, The City of Calgary should also regularly engage other municipalities across the Province to ensure alignment in regulations and design (such as bylaws, oversize-overweight restrictions, goods movement routes and design/engineering standards). Coordination is also important across business units within The City.

### Action 2.3: Establish a goods movement council, consisting of key representatives from the public and private sectors

The City of Calgary should create and participate in a Goods Movement Council. Goods movement councils, often called freight councils, are effective tools used in many cities to speak for the freight industry with one voice, to promote dialogue between private- and public-sector stakeholders, and to advance or advocate for projects benefiting goods movement. In order for the council to maintain private-sector participation, it needs to deliver actions with immediate impacts as well as long-term benefits. It would also be appropriate for The City, as the largest and central municipality in the region, to manage the freight council's activities.

| Basis for continuing engagement |
| --- |
| Through its comprehensive engagement process, the Strategy has already begun to establish a dialogue among key goods movement stakeholders. The Strategy will provide the opportunity to continue this dialogue and potentially establish partnerships for implementing and possibly funding the Strategy's actions. It will also provide the opportunity for collaborating on other future initiatives. |

## Strategic direction 3: Promote planning for logistics centres and industrial areas

**Challenge:** Enhance the goods movement road network and help the Calgary International Airport, rail terminals, rail corridors and other freight hubs to thrive in the future.

### Action 3.1: Evaluate ways to improve the flow of trucks and other vehicles on the road and highway network while maintain a safe environment for all road users

'Building one's way' out of goods movement challenges like congestion is not always the best option, or even necessarily a viable option. The City of Calgary should also study ways to improve the use of existing infrastructure so that it better serves the movement of goods. Specific approaches that should be studied are:

- **Preferential use truck lanes:** Exclusive or preferential truck lanes can increase the efficiency, reliability and safety of truck movements and can be considered on busy freight corridors.
- **Traffic control:** These include variable message signs, adaptive signal technologies, emerging smart signals, traffic signal optimization and truck priority at intersections through the use of Intelligent Transportation System and other technologies.
- **Traffic incident management:** Delays due to collisions and snowstorms can lead to significant reliability concerns on corridors such as Deerfoot Trail. Some traffic incident management

techniques include dedicated facility service patrols, traffic screens to reduce rubbernecking, drones to expedite accident reconstruction and improved response coordination.

**Benefits of incident management**

Some of the strategies to improve traffic incident management can have benefits that exceed the costs by sixfold or more.[20]

- **Freight network hierarchy:** This means expanding the designation of the Main and Supporting Goods Movement Corridors in the CTP's Primary Goods Movement Network to account for all roads. This allows the full network to accommodate goods movement in different manners that are appropriate to each road's function and land use - for example, ensuring freight-oriented design on primary freight corridors versus simply ensuring freight needs are accommodated in complete streets. Defining a network can help decision-makers better integrate the needs of goods movement alongside other road users, so as to avoid conflicts between different road users such as trucks and bicycles.
- **Review of snow storm bans**: Snow storm parking bans and lower clearance priorities for local roads in residential neighbourhoods can impede courier and express deliveries after a major event. The effectiveness of these bans and priorities should be reviewed insofar as they impact these deliveries.

### Action 3.2: Promote the development of key goods movement facilities as mobility and employment centres

There are a number of facilities in Calgary that have strategic value for goods movement, including the Calgary International Airport and rail intermodal facilities. Calgary should promote the development of these facilities by:

• accounting for their unique needs for goods movement connectivity, as included in the Appendix B list of improvements.

• ensuring that the lands adjacent to these facilities are developed for uses that are compatible with these facilities.

• ensuring that these lands and other commercial-industrial sites around Calgary are appropriately planned so that they can move goods efficiently.

### Action 3.3: Improve mobility options for commuters to industrial areas

The City of Calgary should consider partnering with private sector employers to fund or subsidize shuttle buses to connect remote employment centres with transit hubs – including outside municipal boundaries (coordinated if necessary with neighbouring transit systems). The City should ensure that pathways/sidewalks and bikeway paths are available at these remote employment centres in order to promote the use of transit and active modes.

[20] Source: Based in information gathered during literature review conducted for the Strategy.

### Action 3.4: Develop freight-supportive land use planning guidelines that protect complementary land use near major freight hubs and corridors

Land use conflicts occur when incompatible land uses are located in close proximity, and can result in disruption to freight activities as well as dissatisfaction on the part of local residents and communities. These conflicts can be partly mitigated through good planning. Some initiatives that The City of Calgary should consider adopting or adapting include:

- **Freight planning guidelines:** such as the Ontario Ministry of Transportation's Freight-Supportive Guidelines, which are intended to incorporate goods movement needs into all aspects of community, corridor and site planning.
- **Railway proximity guidelines:** notably those issued by the Federation of Canadian Municipalities in association with the Railway Association of Canada.[21] The development of railway proximity guidelines for use in Calgary should ensure that emergency responders are consulted in order to address issues such as emergency access and buffers to contain dangerous goods releases.
- **Protection of freight needs:** ensuring that new development does not interfere with operations at major freight generators, by restricting flight path access, curtailing 24-hour operations or restricting noise at pre-existing uses.
- **Land protection:** Reserving lands around freight facilities for complementary land uses, and avoiding proposals for incompatible residential developments around critical freight facilities such as the airport, rail terminals or major activity hubs.
- **Cargo-oriented development:** Similar to freight villages, this involves concentrating freight uses in a single area – especially around rail, air, or other major transportation hubs – providing the appropriate massing of development, and ensuring that the local transportation network and accesses are designed to support freight activity while minimizing intrusion into neighbouring areas.

### Action 3.5: Enhance Calgary's attractiveness as a logistics and distribution huby by deploying new technologies to enhance the region's competitive advantage

The City of Calgary should strengthen Calgary's position as Western Canada's distribution hub and as an inland port by staying on top of the latest technological developments – including providing fibre communications and other utilities to potential industrial sites and subsidizing access to these sites. In collaboration with Calgary Economic Development, The City should market these and other advantages to attract investments to enable Calgary reach its potential as a logistics and distribution hub.

## Strategic direction 4: Enhance last-kilometre deliveries

**Challenge:** Improve deliveries at and within buildings to better account for emerging delivery requirements.

[21] The City of Calgary is in the process of preparing a Calgary-specific "Development Next to Freight Rail Corridors Policy" for subsequent adoption by Council.

### Action 4.1: Promote the inclusion of off-street delivery facilities into new or reconstructed non-residential developments

The City of Calgary should ensure an adequate supply of off-street loading space in new developments to accommodate,-the growth in courier and express delivery demand, the increased use of active transportation for deliveries and other changing delivery requirements. To achieve this, The City should:

- Ensure that building design standards are kept current to respond to changing delivery requirements. These standards should aim to improve the efficiency of deliveries on the site and within the building while minimizing disturbances and inconvenience to occupants of the building and its neighbours.
- Support the use of flexible spaces, such as alleys, as spaces for delivery vehicles.
- Promote the use of off-peak deliveries to reduce peak congestion, by reviewing current bylaws that may currently limit the use of off-peak deliveries and working with private sector stakeholders to conduct demonstration projects to alleviate potential concerns and obstacles.

Prior to undertaking this action, The City should consult the goods movement and development industries in particular, to ensure that any proposed changes achieve their intended goals while minimizing development impacts.

### Action 4.2: Enhance the supply and use of on-street loading areas

Access to on-street loading areas for deliveries is critical, especially downtown and in other high-density areas. To ensure an adequate supply of on-street loading areas where demand exists or is growing while keeping in mind the needs of other road users, The City of Calgary should:

- Designate additional curbside loading areas, even if only for specified delivery times, in consultation with delivery companies, and use increased enforcement or smart technologies to ensure that they are used properly.
- Educate the public, especially local residents and businesses, on the need to maintain access to curbside loading areas for their designated purpose, at all times of the day.
- Investigate opportunities to improve the efficiency of loading zones via an online parking reservation system or apps to allow for real-time visibility.[22]
- Consider creative solutions such as the use of staging areas, transload facilities or flexible use of public space (e.g. sidewalks) for couriers in order to encourage park-and-walk activity.
- Use time-of-day management in local areas with high levels of foot traffic.

### Action 4.3: Improve delivery vehicle access and circulation

The City of Calgary should implement strategies to improve courier and truck circulation, such as:

- Encouraging the use of alley space for deliveries.
- Developing an online route finding for commercial vehicles.

- Improving truck wayfinding through improving the quality of online maps, providing downloadable data and using variable message signs.
- Encouraging greater use of Stoney Trail, working with the Province to review signage and explore greater use of e-information systems.
- Protecting access for aggregate movement in and around the quarries and aggregates processing facilities in Northwest Calgary.
- Ensuring that emergency vehicle accesses and alternate routes are available.

### Action 4.4: Encourage the development of new truck parking/service areas to aid in the routing of trucks travelling to, from or through Calgary

The City of Calgary should plan now to ensure the truck parking supply is adequate to meet new hours-of-service reporting requirements. The City should also work with Alberta Transportation, landowners and the private sector to establish a location for a truck stop along Stoney Trail between McKnight and Country Hills Boulevard as a means to divert through truck trips to the ring road from other routes, and enable it through appropriate land use and access management.

### Action 4.5: Partner with private sector to enhance and invest in infrastructure to improve goods movement

The City of Calgary, working with the business community, should investigate the feasibility of having individual businesses augment existing public funding sources by contributing directly to investment in local transportation and other infrastructure that directly benefits the community.

### Action 4.6: Investigate new ways to minimize construction disruptions

The City of Calgary should investigate the feasibility of additional measures that can reduce the disruptive effects of construction on trucks and other vehicles. Potential measures include reviewing the effectiveness of existing communication and consultation, early coordination with utilities, coordination of multiple road and utility projects at once, greater deployment of off-peak construction, accelerated construction, and alternative finance and procurement approaches to incentivize on-time completion.

### Action 4.7: Partner with the private sector to pilot new delivery solutions

Many of the actions described here might be implemented best through pilot projects at specific locations, in order to uncover and address specific challenges that might not be apparent until they are actually procured and in operation. Pilot projects can reduce costs and risks while also establishing partnerships with the private sector or other governments to allow for broader implementation. The City of Calgary should investigate the potential for deploying pilot tests for the actions described here, along with the appropriate mechanisms. The City should also invite proposals for innovative pilot projects from the private sector that could enhance goods movement in ways that complement or extend the actions described here.

## Strategic direction 5: Develop flexible plans to adapt for a changing future

**Challenge:** Incorporate flexibility into future plans by recognizing and anticipating technological and other changes in the future.

### Action 5.1: Review and update the processes of land use planning, site planning, corridor plans, functional plans, etc. to prepare for new technologies that could change goods movement

The City of Calgary should update its transportation plan evaluation practices to incorporate a protocol to evaluate goods movement innovations and new technologies, based on clear principles. The City should pilot innovative technology initiatives (e.g. Smart Cities), including those with a freight focus; and should use opportunities for reconstruction and other road works to install fibre and other technologies to prepare for the future deployment of these technologies on a larger scale. The City should also anticipate potential changes in infrastructure requirements, such as establishing dedicated lanes for autonomous vehicles, by recognizing and planning for flexibility in corridor plans and understanding, at a conceptual level, the possible implications on costs, land requirements and so on. The City should ensure that new developments account for access by new technology vehicles, bicycles and other alternatives to trucks.

### Action 5.2: Plan for changes in distribution and delivery requirements

The City should plan for the deployment of innovative business solutions such as designated locker stations to accommodate changing e-commerce habits. The City should also support the efficient movement of goods by helping to promote freight exchanges to help operators "match" trips and loads.

### Action 5.3: Promote sustainable transportation modes for delivery of goods~~, where practical~~

Industry is already using alternative fuel vehicles (see Figure 5.1). The City should support further use of non-motorized or alternative fuel vehicles in appropriate settings – for example, partnering with couriers to pilot-test cargo bicycles for last-kilometre delivery in selected urban areas (Figure 5.2 shows a recent UPS initiative that is supported by the City of Toronto).

### Action 5.4: Collaborate with the private sector and other stakeholders to address environmental and climate change impacts generated by goods movement

The City should work with private industry to implement potential greenhouse gas reduction measures for goods movement, through promotion and the distribution of educational materials, etc. Potential measures range from short-term operational practices and educational programs, to the deployment of fuel reduction, alternative fuel and vehicle technologies and long-term planning.


*Figure 5.1: Hybrid electric delivery van in Calgary*


*Figure 5.2: UPS Canada cargo bicycle in Toronto*

## Strategic direction 6: Enable data collection and collaboration on goods movement research

**Challenge:** Access and use data and research to anticipate goods movement needs and better plan for solutions.

### Action 6.1: Collect, share and maintain goods movement data in collaboration with academic institutions and other partners

The City of Calgary should update and augment its traditional data sources, such as establishment surveys and complement these with emerging data sources such as truck GPS traces or other telematics data.

### Action 6.2: Support the creation of an urban freight research centre in Calgary, in collaboration with academic institutions and other partners

The City should collaborate with academia to address specific goods movement and logistics research needs and coordinate the collection and analysis of data through a formation of a new research centre. The research centre would support the implementation of individual actions by conducting dedicated research on specific questions. For example, some research topics suggested by stakeholders are quantifying the impacts of different GHG-reduction measures, breaking down collisions statistics for different types of goods vehicles and measuring the costs of alternative last kilometre delivery options.

### Action 6.3: Conduct a new commodities flow survey and update regional transportation model used by The City and regional partners

The City should update its regional transportation model on the basis of the information collected through the external truck origin-destination survey. It should consider implementing a commodity flow survey, and use any findings from it to update its regional transportation model.

# 6 Implementation and monitoring

## 6.1 Implementation plan

This section summarizes the actions and lists them according to timing and other attributes. This list complements the descriptions from the previous chapter by adding the necessary implementation details, which are described below.

Table 6.1 describes the benefits and costs of each action. The table indicates the role of The City of Calgary and others in implementing the action as well as a time frame for implementation. Since many of the actions are multifaceted, a detailed cost is not projected; instead, costs are rated on a three-point scale (represented as $, $$, $$$), where the first level represents low-cost policy directions or studies, the second level represents larger-effort strategies and programs, and the third level represents significant infrastructure investments. The time frame is presented as short-, medium- or long-term, depending on the most probable amount of time required to implement the action. “Ongoing” is also included to refer to continuous actions with indefinite start/end times.

All 26 actions are subject to detailed evaluation prior to implementation. The implementation plan serves as a road map for the actions. Almost all actions are phrased in terms of studying or reviewing a specific action item (or similar), as a prelude to ultimately implementing the action. The benefits reflect the outcome of the implemented action, not of the preparatory study or review alone. This wording reflects the necessity of further detailing and consultation before an action can be prioritized, funded and implemented.

Three actions can be considered as enablers to broader actions, in that they support the planning and detailing of goods movement actions rather than resulting directly in a specific change. These are Action 2.3 regarding the implementation of a freight council, Action 6.1 regarding data and Action 6.2 regarding information sharing and research.

*Table 6-1. Implementation plan*

| Action | Benefit | Cost | Leading/supporting roles | Time frame |
|---|---|---|---|---|
| **Strategic direction 1: Continue to invest in transportation infrastructure to enhance goods movement** | | | | |
| Action 1.1: Review signal timings to enhance the flow of goods along key corridors | Updating, as appropriate, signal timings at intersections and corridors that have high volumes of truck traffic can reduce delay and minimize stop-start conditions for all private sector goods movement stakeholders (the “private sector”) and for all traffic generally. | $ - $$ | City of Calgary to review and, as appropriate, implement.<br>Appendix B lists transportation infrastructure improvements projects that could be implemented in the short-term, medium-term and long-term. | Short-term |
| Action 1.2: Ensure the impacts to goods movement are identified in the evaluation of key infrastructure projects in the network | Private sector and other road users benefit from more direct routing and reduced congestion, thereby improving productivity, lowering costs and potentially reducing accidents. Land owners in industrial areas benefit from increased accessibility. The public sector gains from potential tax revenues through the development of newly accessible lands, while supporting CMRB development aspirations. | $$$ | City of Calgary to review and, as appropriate, prioritize and implement.<br>Appendix B lists transportation infrastructure improvements projects that could be implemented in the short-term, medium-term and long-term. | Long-term |
| Action 1.3: Collaborate with Alberta Transpor-tation to enhance the movement of goods along Deerfoot Trail, Stoney Trail and other regional highways | Private sector and other road users benefit from increased opportunities to bypass congested urban roads, reduced congestion and improved accessibility. Residents and businesses along urban roads, such as 16 Avenue North, benefit from reduced through truck traffic. Land owners in industrial areas benefit from increased accessibility. The public sector gains from increases in tax revenues through the development of newly accessible lands. | $$ - $$$ | City of Calgary to work with Alberta Transportation to review and, as appropriate, prioritize and implement. This might also include developing a solid funding model from the Province for improving or adding interchanges and intersections on Provincially-owned facilities.<br>Appendix B lists the projects that were identified by stakeholders, to be considered for further analysis. | Medium-term |

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| Action 1.4: Work with the Province and neighbouring municipalities to align corridor plans and funding priorities across the region, to improve connectivity for goods movement | Municipalities across the Calgary Region gain from increased attractiveness of lands to potential businesses and from optimization of capital works, hence reduced costs. The private sector and the Calgary Region work force benefit from greater economic potential as new industries are developed. | $ - $$ | City of Calgary to lead, in coordination with other municipalities and, likely, the CMRB. | Ongoing |
| **Strategic direction 2: Collaborate with external partners to enhance regional goods movement** | | | | |
| Action 2.1: Collaborate with regional partners, including the Calgary Metropolitan Region Board, on future land use and transportation plans that impact goods movement across the Calgary region, and continue to provide technical assistance with these plans | Private sector benefits from greater coordination. City of Calgary and other municipalities benefit from shared knowledge. | $ | City of Calgary to lead, in coordination with other municipalities and, possibly, CMRB. | Ongoing |
| Action 2.2: Promote cross-jurisdictional consistency on design standards and operational practices, including a regional truck network map | Private sector benefits from greater coordination of bylaws, oversize-overweight restrictions, and design/engineering standards. | $ | City of Calgary to lead, in coordination with other municipalities and Alberta Transportation. | Short-term |

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| Action 2.3: Establish a goods movement council, consisting of key representa-tives from the public and private sectors | Goods movement industry stakeholders ensure their voice is heard on a regular basis. The goods movement industry can speak “with one voice.” Public agencies benefit from a closer understanding of goods movement needs, challenges and emerging trends. All benefit from improved coordination of actions and priorities.<br>This action can be seen as an enabling action. | $ | City of Calgary to create a freight council with private sector, public sector and other partners. | Short-term |
| **Strategic direction 3: Promote planning for logistics centers and industrial areas** | | | | |
| Action 3.1: Evaluate ways to improve the flow of trucks and other vehicles on the road and highway network | All of these sub-actions would improve the time and reliability performance of goods movement. Several sub-actions could also have benefits to passenger vehicles from reduced congestion. Safety benefits in many cases. | $$ - $$$ | City of Calgary should conduct targeted studies to study traffic flow options, and produce a strategic goods movement network (hierarchy) to serve as a road map for other sub-actions. | Medium-term |
| Action 3.2: Promote the development of key goods movement facilities as mobility and employment centres | Consolidating complementary uses in hubs improves efficiency and can reduce conflicts with passenger vehicles and other traffic.<br>Developing the airport as a transportation hub supports regional economic development. | $$ | City of Calgary to use land use, transportation, industrial lands and economic development policies to support freight hubs, and work with Calgary Airport Authority towards enhancing the airport vicinity as an air hub. | Long-term |
| Action 3.3: Improve mobility options for commuters to industrial areas | Freight-dependent businesses benefit from employees having easier access to work. Improves competitiveness of Calgary (ready access to employee base). | $$ | City of Calgary to study alternative transit options in combination with neighbouring municipalities, work with businesses to establish Smart Commute programs and engage ride-sharing services to discuss opportunities for collaboration. | Medium-term |

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| Action 3.4: Develop freight-supportive land use planning guidelines that protect complemen-tary land use near major freight hubs and corridors | Avoiding these conflicts increases efficiency and safety for shippers and carriers; also benefits residents and the general public. | $ | City of Calgary to review which best practice ideas could be applied from other jurisdictions and, in consultation with stakeholders and facility owners, develop / update land use policies to minimize conflicting land uses at appropriate locations. | Ongoing |
| Action 3.5: Enhance Calgary's attractiveness as a logistics and distribution hub | Greater economic competitiveness for the region. | $$ - $$$ | City of Calgary to work with private sector and use freight council to stay on top of latest developments, and make necessary investments, in coordination with the CMRB and local municipalities. | Long-term |
| **Strategic direction 4: Enhance last-kilometre deliveries** | | | | |
| Action 4.1: Promote the inclusion of off-street delivery facilities into new or reconstructed non-residential developments | Faster and more efficient deliveries. Benefits to residents from reduced disturbances. | $$ | City of Calgary to review development standards and update as appropriate. Some concerns might be addressed through the existing development planning process. | Medium-term |
| Action 4.2: Enhance the supply and use of on-street loading areas | Faster and more efficient deliveries. | $ - $$ | City of Calgary to review curbside management strategy and update as appropriate. | Short-term |
| Action 4.3: Improve delivery vehicle access and circulation | Greater efficiency for shippers and carriers. | $ | City of Calgary to review opportunities to improve circulation, prioritizing challenges raised by industry while accounting for other factors as well. | Medium-term |
| Action 4.4: Encourage the development of new truck parking/ service areas to aid in the routing of trucks travelling to, from or through Calgary | An increased supply of truck parking improves operating efficiency; also improves safety as informal/illegal parking spots are avoided. | $ | City of Calgary to review adequacy of truck parking supply and, working with landowners, the trucking industry and Alberta Transportation, identify potential locations for truck parking. | Medium-term |

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| Action 4.5: Partner with private sector to enhance and invest in infrastructure to improve goods movement | Private funding can in some cases supplement public funding on local infrastructure. | $ | City of Calgary to investigate feasibility of BIAs to supplement funding for local infrastructure. | Medium-term |
| Action 4.6: Consider new ways to minimize construction disruptions | Fewer construction disruptions mean reduced delays and improved reliability for the trucking industry. | $-$$ | City of Calgary to carry out a review of additional opportunities to reduce construction impacts on traffic. | Medium-term |
| Action 4.7: Partner with the private sector to pilot new delivery solutions | Industry partners can provide fresh approaches leveraging new technologies and tools. Openness to new solutions can support Calgary's reputation as an attractive place to do business. | $ | City of Calgary to announce invitation to industry stakeholders to pitch and test innovative delivery solutions, and work with other levels of government to ensure enabling laws are in place. | Medium-term |
| **Strategic direction 5: Develop flexible plans to adapt for a changing future** | | | | |
| Action 5.1: Review and update the processes of land use planning, site planning, corridor plans, functional plans, etc. to prepare for new technologies that could change goods movement | Having a defined protocol is helpful for evaluating the impacts of innovative disruptions – including planning for both upsides and downsides of new technologies. | $ | City of Calgary to develop / update technology policy documents to guide adaptations to new technologies that influence goods movement. | Short-term |
| Action 5.2: Plan for changes in distribution and delivery requirements | E-commerce is fundamentally changing how deliveries are made, and this action will improve the understanding of its implications on planning and operations of municipal infrastructure. | $ | City of Calgary to study e-commerce needs and implications on future, including detailed review of best practices elsewhere. | Short-term |
| Action 5.3: Promote sustainable transportation modes for delivery of goods, where practical | Non-motorized modes for last-kilometre delivery can have environmental, safety and congestion benefits. | $ | City of Calgary to support non-motorized last-kilometre solutions, working with private sector to implement demonstration projects. | Ongoing |
| Action 5.4: Collaborate with the private sector and other | Range of solutions – focus on those solutions, such as vehicle technologies | $ - $$$ | City of Calgary to support education and awareness of GHG reduction measures | Ongoing |

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| stakeholders to address environmental and climate change impacts generated by goods movement | and operational efficiencies, that can save money for industry while also benefiting the environment. | | and, with the provincial and federal governments and others, investigate feasibility of implementing supporting infrastructure. Private sector to investigate and implement GHG reduction measures. | |
| **Strategic direction 6: Enable data collection and collaboration on goods movement research** | | | | |
| Action 6.1: Collect, share and maintain goods movement data in collaboration with academic institutions and other partners | Better goods movement data mean improved decision-making.<br>This action can be seen as an enabling action. | $-$$ | City of Calgary should update existing but now-dated data sources, add new and emerging data sources and integrate these together. | Medium-term |
| Action 6.2: Support the creation of an urban freight research centre in Calgary, in collaboration with academic institutions and other partners | Academic organizations and private partners all bring complementary capabilities to the table, and can augment public sector research.<br>This action can be seen as an enabling action. | $-$$ | City of Calgary to work with academic research centres and private partners to investigate setting up a joint goods movement research centre. | Medium-term |
| Action 6.3: Conduct a new commodities flow survey and update regional transportation model used by The City and regional partners | Greater ability to plan for and enhance goods movement infrastructure, through a better understanding of the value of the improvements. | $$ | The City with its regional partners. | Medium-term |

## Other strategy outcomes

The Strategy reviewed the need for updates to the CTP's Primary Goods Movement Network. The Strategy also examined the desirability of consolidating and updating City of Calgary's truck bylaws. While the outcomes do not constitute policies, they are nonetheless important to supporting the Strategy and its implementation.

The review of the Primary Goods Movement Network looked at how conditions have changed since the CTP was approved in 2009. Based on a review of where trucks travel, stakeholders' comments and connectivity to new and expanded multi-modal terminals in and around Calgary, the review recommended several additions to the Primary and Supporting Goods Movement Networks. The recommended additions are listed in Appendix C. No roads or highways were identified for removal from the Network.

The review of the three truck bylaws found that Bylaw 26M96, the Traffic Bylaw, is linked to provincial laws that regulate all vehicular traffic movement, hence it would be difficult to extract those parts that pertain specifically to goods movement. As a result, it should be maintained as a separate self-contained document. However, the bylaw has been updated several times since its 1996 enactment, and so it is recommended that The City consider reviewing it to simplify and update its language.

Bylaws 60M90, the Truck Route Bylaw, and 13M2004, the Dangerous Goods Bylaw as amended by Bylaw 23M2005, both pertain specifically to goods movement within Calgary. They are already supported by a City map that shows truck routes and dangerous goods routes within City boundaries, and so it is recommended that The City combine the two bylaws in order to provide the relevant information in a single document. It wording also should be updated. Other recommendations are to include certain links where truck routes are discontinuous in order to complete connections between the other truck routes, the introduction of future connections to major projects that are now being planned or are under construction and the introduction of future connections to developing areas. In addition, it is recommended that the map be updated for clarity. Details can be found in Appendix D.

## 6.2 Monitoring plan

This section proposes a series of qualitative and quantitative indicators that can be used to assess how much progress has been made on implementing the Strategy's actions and how well the Strategy is working. The indicators can also be used to adjust the implementation plan based on the progress to date.

Table 6.2 lists the indicators. The indicators are tied to the five elements of the vision: "a multi-modal system that is *safe, economical, reliable, efficient* and *environmentally sustainable*" (see also Section 4.1). A sixth category is also included to account for communications and information to support the Strategy. The table describes the indicator, its purpose and data source. Comments are also noted, where appropriate.

*Table 6-2. Indicators for monitoring the Strategy's implementation*

| Vision element/indicator | Description | Object | Data source | Comments |
|---|---|---|---|---|
| **Safe for all system users** | | | | |
| Reported fatal and serious injury crashes and injuries | Number of reported fatal and serious injury crashes and injuries involving trucks per 1,000 population or per million truck vehicle-kilometres travelled (VKT). | Reduce rate | CPS accident records. | |
| Reported bicycle-truck collisions. | Subset of the preceding measure. | Reduce rate | CPS accident records. | |
| Reported accidents involving dangerous goods spills. | Number and severity of crashes involving trucks in which spills occurred. | Reduce number | CPS / CFD records. | |
| **Economical to implement, operate, maintain and use** | | | | |
| Economical implement-tation | Unit costs of implementing improvements on Primary Goods Movement Network and truck route network, relative to those of other routes. | Reduce relative to other unit costs. | Capital budgets. | Encourage improvements on routes that will be used by trucks over other investments, all else being equal. |
| Economical operation and maintenance | Unit costs of operating and maintaining Primary Goods Movement Network and truck route network, relative to those of other routes. | Reduce relative to other unit costs. | Operating, maintenance and rehabilitation budgets. | Encourage improvements on routes that will be used by trucks over other investments, all else being equal. Encourage implementation of appropriate pavement and other structures to support trucks. Encourage appropriate operation, |

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| | | | | maintenance and rehabilitation schedules to keep trucks on desired routes. |
| Variance in truck operating costs | Changes in vehicle operating costs for selected routes. | Reduce average operating costs: function of changes in average travel times and reliability. | Sample truck fleets to determine changes in costs as travel times / reliability change. Alternatively, use truck travel time and travel time reliability measures as proxies. | Data may be held as confidential by trucking fleets. Costs likely will vary by fleet type and size. Requires common definition of composition of operating costs. Hence proxies may be more practical alternative. |
| **Reliable service, travel times and network redundancy** | | | | |
| Truck travel times | Mean door-to-door journey times (or speeds) by time of day on selected routes. | Reduce travel times (speeds) by time of day. | GPS traces or travel time surveys, taken at discrete time intervals. | Depending on the data source, can be difficult to isolate travel times for trucks. |
| Reliability of truck travel times | Standard deviation of door-to-door travel times (or speeds) by time of day on selected routes. | Reduce journey time (speed) variability by time of day. | GPS traces or travel time surveys, taken at discrete time intervals. | Depending on the data source, can be difficult to isolate travel times for trucks. |
| Congestion | % on-time deliveries made, i.e., % made within defined delivery schedules. | Improve % on-time deliveries. | Sample truck fleets to determine % deliveries that have been made within a defined delivery schedule. | Data may be held as confidential by trucking fleets. May not be representative for all fleet types and sizes. |
| Redundancy | % on-time courier deliveries made, i.e., % made within defined | Improve % on-time deliveries. | Sample couriers to determine % | Aims to measure accessibility for couriers. Data may be held |

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| | or promised delivery schedules. | | deliveries that have been made within a defined delivery schedule. | as confidential by trucking fleets. May not be representative for all fleet types and sizes. |
| **Efficient directness, connectivity, intermodal interchange** | | | | |
| Truck contribution to the traffic stream. | % truck traffic on selected routes. | Increase % of trucks on desirable routes (e.g., Primary Goods Movement Network / reduce % on other routes (e.g., local roads). | Traffic counts | Aim is to promote use of certain routes over others. |
| Directness | Actual distance travelled against potential shortest path, via Primary Goods Movement Network for selected routes. | Bring actual distances closer to potential shortest distances. | GPS traces versus model- or Google- (or similar-) based shortest paths. | |
| Connectivity | % of door-to-door trip distance made on Primary Goods Movement Network for selected routes. | Increase % of trip distance made via Primary Goods Movement Network. | GPS traces | |
| Intermodal interchange | Proximity / availability of on-street loading spaces to destination. | % of deliveries made with vehicle legally | Establishment surveys, especially including couriers. | New establishment survey required. |

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| | | parked within short (to be defined) distance of destination. | | |
| **Environmentally sustainable, reducing fuel use, GHG and air pollutants** | | | | |
| Share of road-based goods trips made in alternative fuel vehicles or by active transportation | % shares of goods VKT made in alternative fuel vehicles or by active transportation. | Increase %. | Surveys of establishments. A simpler alternative is to count goods trips by mode at screenlines and estimate a synthetic origin-destination matrix. | Could be derived for the entire city or for specific areas such as downtown.<br>New establishment survey required. New screenline counts required. |
| Efficiency of road-based goods trips | Fullness of delivery trips. | Increase average vehicle fullness / reduce empty VKT. | Establishment surveys or roadside surveys | New establishment survey required. |
| Spills of dangerous goods from or involving trucks. | Reportable incidents of spills, including runoff. | Reduce number and severity of incidents. | Calgary Fire Department | Proxy measure of utilization of trucks, appropriately designed dangerous goods routes, etc. |
| **Communications and information to support the Strategy** | | | | |
| Goods movement council | Establishment of an ongoing goods movement council. | Number of participating organizations (membership to be determined. | City of Calgary | |

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| Awareness and education | Deployment of Strategy's educational materials. | Number and type of applications, references, etc. | City of Calgary | |
| Guides and standards | Updates / implementation of design standards to account for changing delivery requirements, evaluate new technologies, promote common infrastructure design standards, etc. | Account for changing goods movement needs in standards, plan evaluation, etc. | City of Calgary in consultation with private sector, other municipalities, Alberta Transportation, etc | |
| Goods movement data | Enhancement / update of data for goods movement planning. | Implement ongoing goods movement data collection. | City of Calgary | |
| Research | Establishment of research collaborations. | Establish ongoing goods movement research. | City of Calgary, with academic and industry partners | |
| Demonstra-tions | Implementation of programs to demonstrate sustainable technologies and practices, etc. | Pilot-test technologies that could reduce GHGs and fuel consumption. | City of Calgary with academic and industry partners | |

# 7 Next steps

The Strategy should not be viewed as a menu from which individual actions can be selected and implemented. The need for all 25 of these actions has been identified through the stakeholder consultation, best practice review and discussions with other jurisdictions. No one single action can resolve all the challenges within a given area. The actions largely complement each other. They also would benefit commuters and other travellers who share the same transportation network. They would inform land use planning, development approval, economic development and other planning and investment decisions.

At the same time, for budgetary considerations and for reasons of practicality, it can make sense to phase the actions, according to the time frames described in Table 6-1. This can be achieved by starting with a bundle that includes with all the ongoing and short-term actions, lays the groundwork for the medium- and long-term actions and establishes linkages with the research community for future outcomes. Goods movement bundles have been implemented successfully in several cities, such as London, New York City and Philadelphia. These have all initiated a range of practical, visible actions that have positively impacted goods movement while also clearly signalling the commitment of public- and private-sector stakeholders, researchers and others to continue to work together to enhance goods movement in their communities.

The Strategy's stakeholder engagement confirmed that there is a broad interest across the stakeholder community in continuing the initiative. A logical first step, then, to implementing the Strategy would be to launch the freight council (Action 2.3): this is a low-cost measure that formalizes the ongoing participation of public- and private-sector partners in working together to set priorities and keep the momentum going. This is also the tactic used in other urban areas to keep things moving while also setting the groundwork to address future needs. Successful examples include Peel Region in the Toronto area (Canada's largest multi-modal freight hub) and, more recently, TransLink's freight council.

Three What We Heard reports, which describe stakeholder feedback gained throughout the development of the Strategy, can be accessed at the Strategy's engagement page, https://engage.calgary.ca/goodsmovement.

- Stage 1 Report Back // What We Heard, What We Did, June 2017
- Stage 2 Report Back // What We Heard, What We Did, August 2017
- Stage 3 engagement, October 2017 to February 2018, What we heard report, March 2018

Further analysis will be required to identify and assess potential impacts the new designations might have on surrounding communities and traffic movement.