Moving the Economy

A REGIONAL GOODS MOVEMENT STRATEGY
FOR METRO VANCOUVER

CONTEXT & BACKGROUND - JUNE 2017

TRANSLINK

Table of Contents

INTRODUCTION

The movement of goods is complex, entailing the interaction and coordination of many modes —road, rail, pipeline, marine, and air — and of numerous public agencies, private firms, and shippers and receivers. For individual businesses, communities, and governments to all achieve their objectives as best as possible, it is important to coordinate and consider how the entire system works together.

Goods move through and within the region for a variety of reasons, including:

- Local deliveries: transport of products to businesses and homes for use and consumption within the region; for example, a shipment of produce to a local grocery store, a package delivery to a residence, or delivery of construction material and equipment to a construction site;
- Processing and production: movement of materials and components to and from manufacturing facilities, which produce finished consumer goods or "intermediate" goods for further manufacturing; for example, a window glass production facility, or a timber processing plant;
- Imports and exports: shipping of commodities and goods to and from the global marketplace; for example, export of grain from Saskatchewan, import of textiles from Asia, or imports of industrial machinery and components for resource projects in Western Canada.

Goods movement can also sometimes conflict with passenger transportation needs or with other community aspirations. As a result, we need to ensure that goods movement objectives in the Metro Vancouver region are considered together with other transportation and land use objectives in an integrated regional policy framework guided by *Metro 2040: Shaping Our Future; the Regional Transportation Strategy*, and municipal Official Community Plans.

Goods Movement planning in Metro Vancouver must deal with an additional challenge in that Metro Vancouver is both a large metropolitan region and a major multi-modal international port.

- As Canada's third-largest urban area, the region is home to 2.3 million people and supports 1.3 million jobs across a diverse economy that must supply products to households and businesses alike.
- Metro Vancouver also has a critical provincial and national role as Canada's Asia-Pacific Gateway and as an important border crossing to the United States. Our network of roads, marine ports, rail terminals, and airports connects British Columbia and Canada to the United States, Asia, and the world. This role as a trade portal is critical to the viability of our national and provincial economies.

THE STATE OF GOODS MOVEMENT IN METRO VANCOUVER

1.0 Goods Movement Modes

This section provides an overview of the state of goods movement in Metro Vancouver today, describing the different modes and market sectors.

Goods movement is one part of a supply chain in a much greater system of production that takes unprocessed raw materials from suppliers and delivers the finished products to the final consumer. Supply chains can be very complicated and involve many shippers, receivers, operators, and infrastructure providers, over long distances. The stories of a time-sensitive parcel (see Figure 2), an office chair (Figure 6), and Okanagan cherries (Figure 8), illustrate possible supply chains for things that many residents of Metro Vancouver use, consume, process, or send around the world on a regular basis.

At various stages in the supply chain, goods need to be moved around. In the Metro Vancouver context, these goods are moved to, through, and within the region using one or a combination of five primary means: road, rail, pipeline, marine, and air. Each mode has unique characteristics, opportunities, and challenges, which are described in the following sections.

ROAD

RAIL

PIPELINE

MARINE

AIR

ROAD

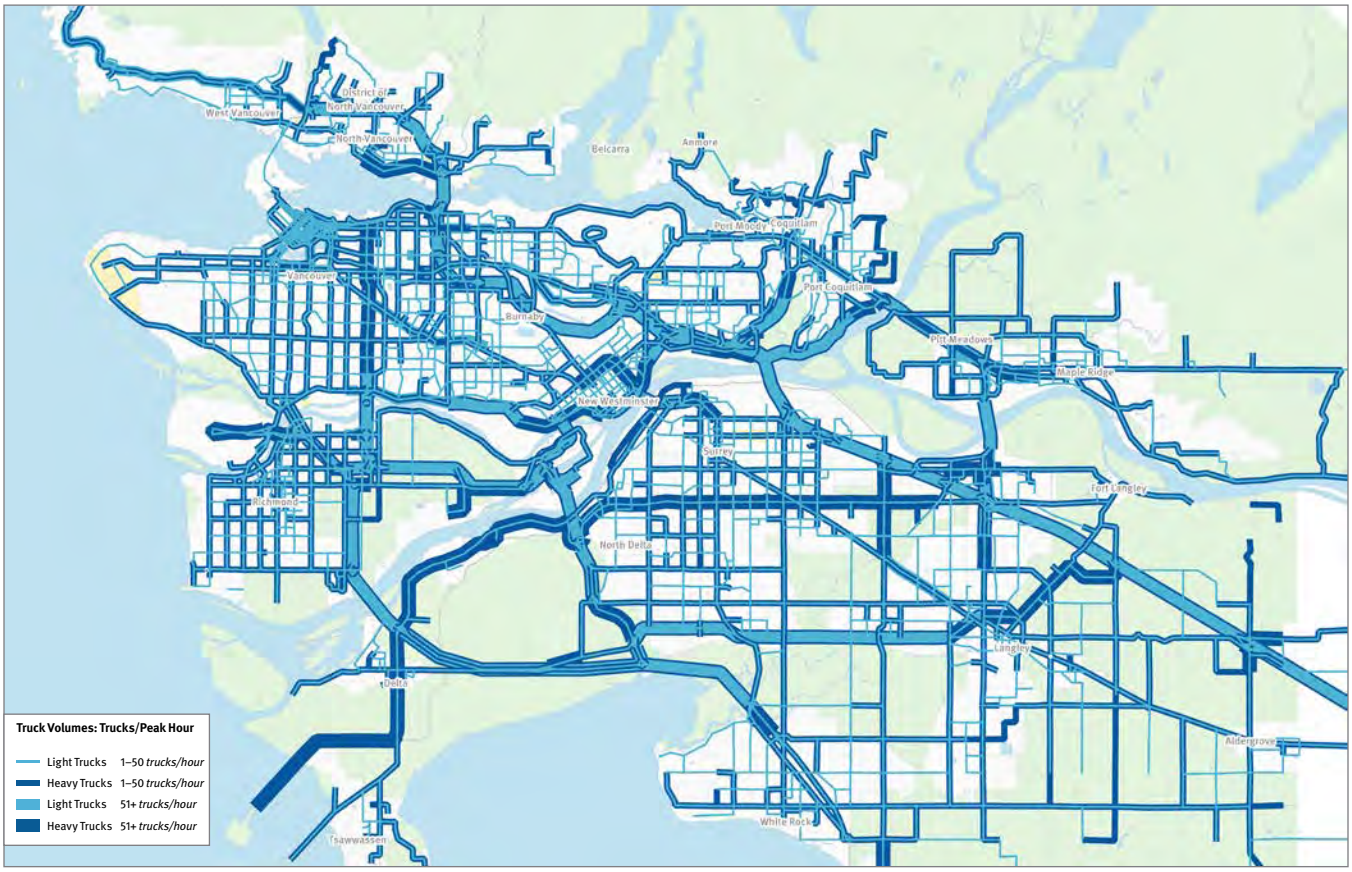


Figure 1: Truck Volumes on all Roads in Metro Vancouver (AFRI 2012)

1.1 Road

As shown in Figure 1, trucks use the entire network of highways, roads and streets to move goods throughout the region. The highest volumes of both light and heavy trucks are seen across much of Highways 1, 91, 99 and the eastern part of Lougheed Highway. Corridors with high volumes of heavy trucks include the east/west route from Deltaport (now replaced by the South Fraser Perimeter Road), access between the Port and Highway 91/99 along Knight Street in Vancouver, and access to the Pattullo Bridge along McBride/Royal Ave in New Westminster.

They also serve the intermodal terminals (YVR, the Port, the intermodal rail terminals, and the pipeline terminals) and provide long-distance connections across the province, Canada, and into the United States. Several different modes carry goods and services over the road network, including light, medium, and heavy trucks, vans, automobiles, taxis, cargo tricycles and bicycles, and pedestrian couriers. The use of each mode is based on the type of cargo, time-sensitivity, distance, and the location and infrastructure involved.

Metro Vancouver plays an important role in national and international goods movement as a trans-shipment gateway between Canada, the United States, and the Asia-Pacific Region, where goods are loaded and unloaded between ships, airplanes, trains, and trucks.

ROAD

In addition, a large percentage of road-based movements within the region serves a local origin and destination, delivering consumer goods and services, construction materials, or providing municipal services such as garbage pickup.

Of special note, express delivery and courier services are growing rapidly, as households and businesses move increasingly to online purchasing and purchasers expect a quick delivery as a result. One implication is that there is a growing demand for loading space at the front of the destination building, as opposed to queuing at the loading docks behind the building. Another implication is that increasingly deliveries are being made to residential areas (typically by cargo vans, which can manoeuvre on local streets). Since residents are often away during the day, some cities have started to offer secure lockboxes that they can access upon their return home.

Cargo bicycles and pedestrian deliveries are being used in some cities to serve dense urban cores, especially where traffic congestion is high, there are restrictions on vehicular traffic, and curbside unloading is difficult or not permitted. Another option is off-peak delivery, which allows vehicles to avoid congested times of day.

THE STORY OF A TIME SENSITIVE DOCUMENT

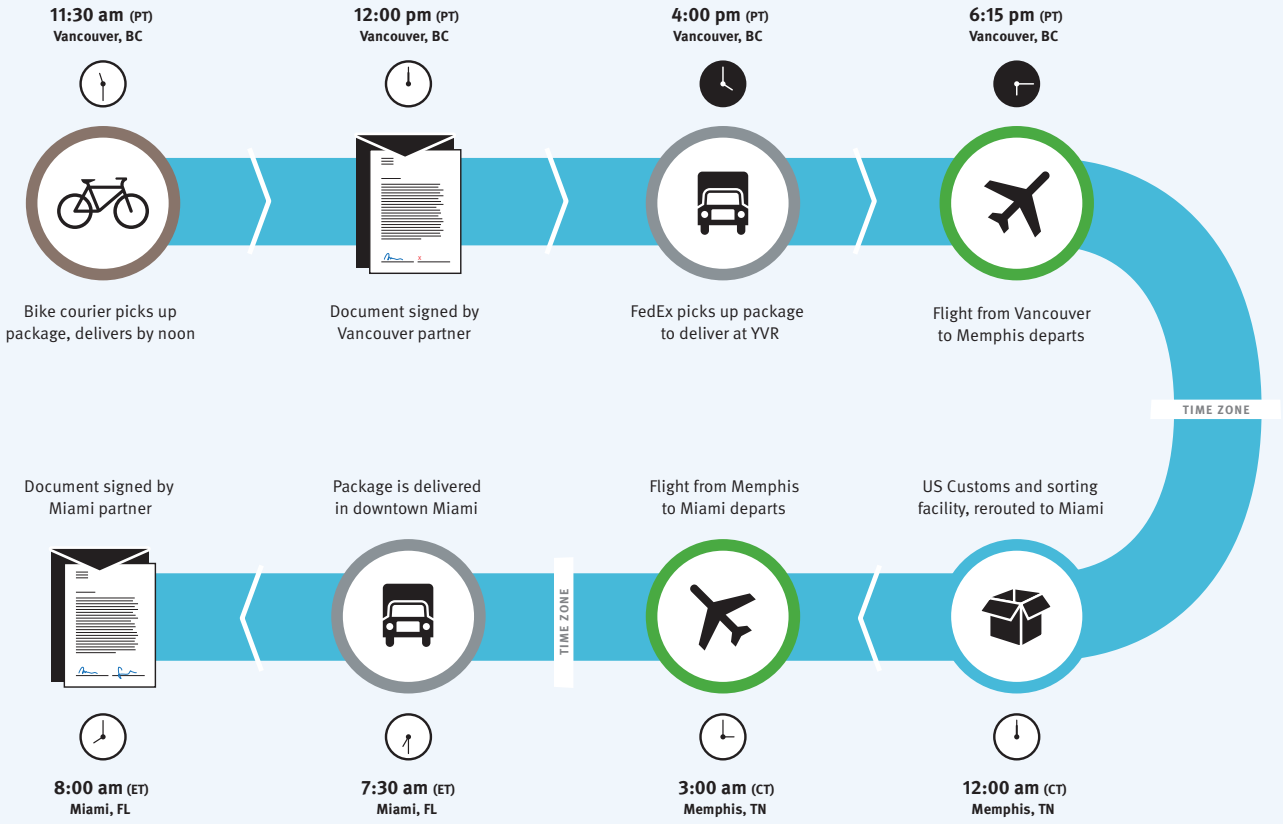


Figure 2: Delivering Time Sensitive Documents

The Story of a Time Sensitive Document: A package of legal documents is finalized at a law firm in downtown Vancouver at 11:00 am on Wednesday, and the documents need to be signed off by two partners of a business – one in Vancouver and the other in Miami. A bike courier, the quickest method of delivery in the downtown core thanks to the network of bike lanes, picks up the package at 11:30 am. It is delivered by noon to the Vancouver partner. Once signed, the package is picked up for priority overnight delivery to Miami. A FedEx van picks up the package at 4:00 pm and departs for the FedEx terminal at Vancouver International Airport (YVR). The fleet dispatcher monitors real-time traffic conditions and advises the driver on routing to avoid getting stuck in traffic. Sometimes, information on accidents or other bottlenecks is received too late and the package misses the last possible flight. At the FedEx terminal, the package is sorted, loaded into a cargo container by 5:30 pm, and then onto the airplane.

The flight from Vancouver to Memphis, FedEx's global hub, departs at 6:15 pm. Because of the long flight and the time zone difference, when it lands at 12:00 am, the flight from Vancouver is generally one of the last FedEx flights to arrive in Memphis. To meet the 8:00 am next day guarantee, the package now has 2 hours to make its way from the plane, through US Customs, and

THE STORY OF A TIME SENSITIVE DOCUMENT (continued)

through the sorting facility, which reroutes the package onto the plane bound for Miami. The plane departs Memphis at 3:00 am and lands in Miami at 6:00 am. The package is sorted again and put on a truck into downtown Miami. The package is delivered at 7:30 am Thursday — or 4:30 am back in Vancouver — 13 hours after it was sent.

Some industries are taking advantage of rapid overnight air couriers by offering 'end-of-runway' services. Physically located at cargo hubs very close to the airport, suppliers are able to fill orders by delivering high-value products at the end of the work day to overnight couriers at the airport, which then provide overnight delivery to customers across North America and around the world. Thus, an airport's ability to offer flights at extended hours supports new markets and economic development, assuming that late night flights do not interfere with any nearby residential areas.

RAIL

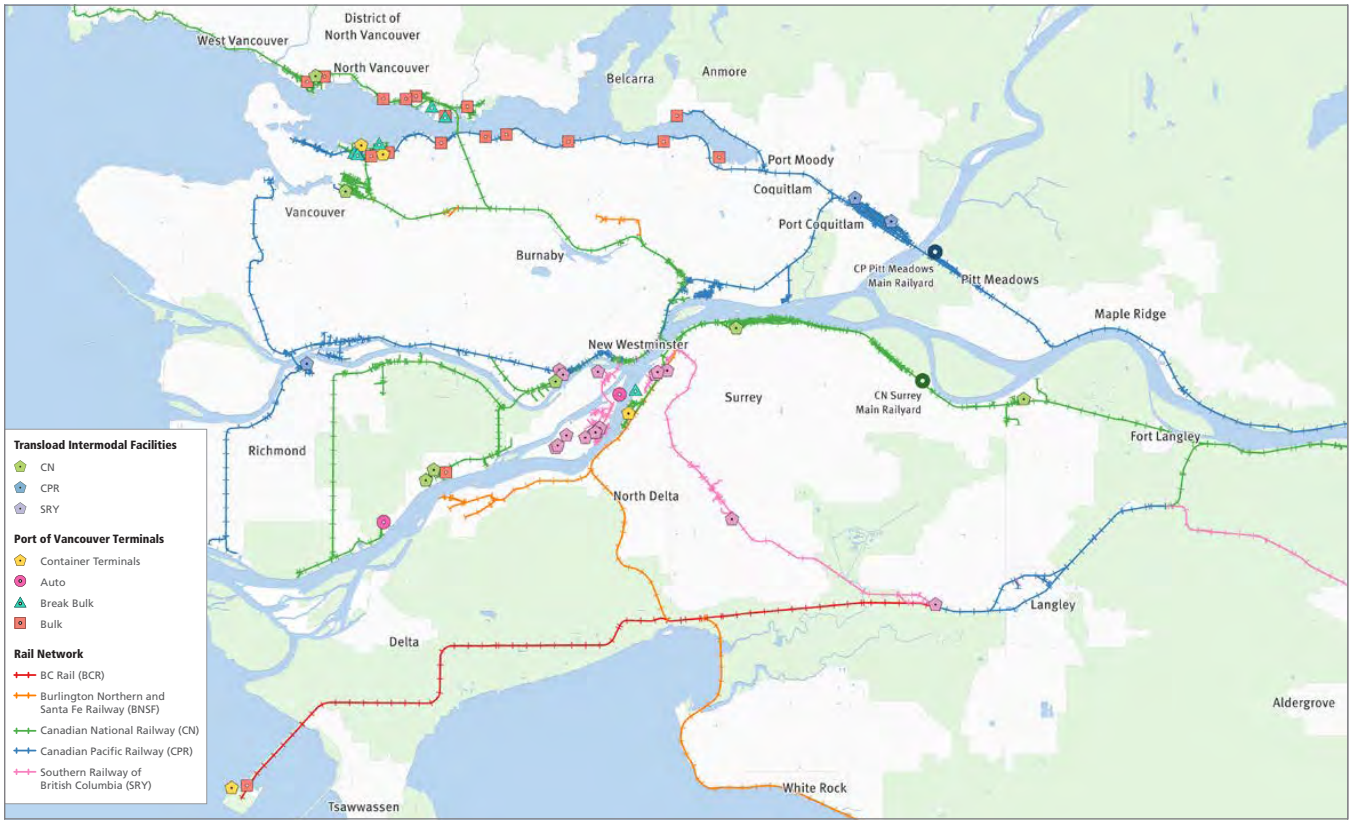


Figure 3: Marine Terminals, Railways, and Intermodal Facilities in Metro Vancouver

1.2 Rail

In BC, rail is of particular importance to the transport of coal, potash, sulfur, grain, forest products and manufactured goods to reach processing and intermodal facilities. Due to the topography of the Lower Mainland (with its inclines, slopes and waterways), the rail system must cross multiple roads and waterways, resulting in capacity constraints and bottlenecks at key locations (e.g. swing and lift operations at bridge crossings and at-grade rail/road crossings). While the rail mode of moving freight (and passengers) is considered to have positive impacts in alleviating road congestion, rail transport has its own set of challenges and limitations, such as inefficiencies in short distance operations (as compared to long distance travel), conflicts with adjacent land uses near-at-grade rail/road crossings, and rail bridge capacity.

Canadian national Railways (CN), Canadian Pacific Railway (CPR) and the Burlington Northern and Santa Fe Railway (BNSF) are the three Class 1 rail carriers with service in Metro Vancouver. CN's intermodal terminal is located just south of the Fraser River in Surrey, while CP's intermodal terminal is located in Pitt Meadows, north of the Fraser River. The region is also served by the Southern Railway of British Columbia (SRY), a short line railway providing local service to industries throughout the Lower Mainland and the Fraser Valley. Figure 3 shows the region's railways, as well as the two intermodal terminals, other transload facilities, and Port of Vancouver terminals.

PIPELINES

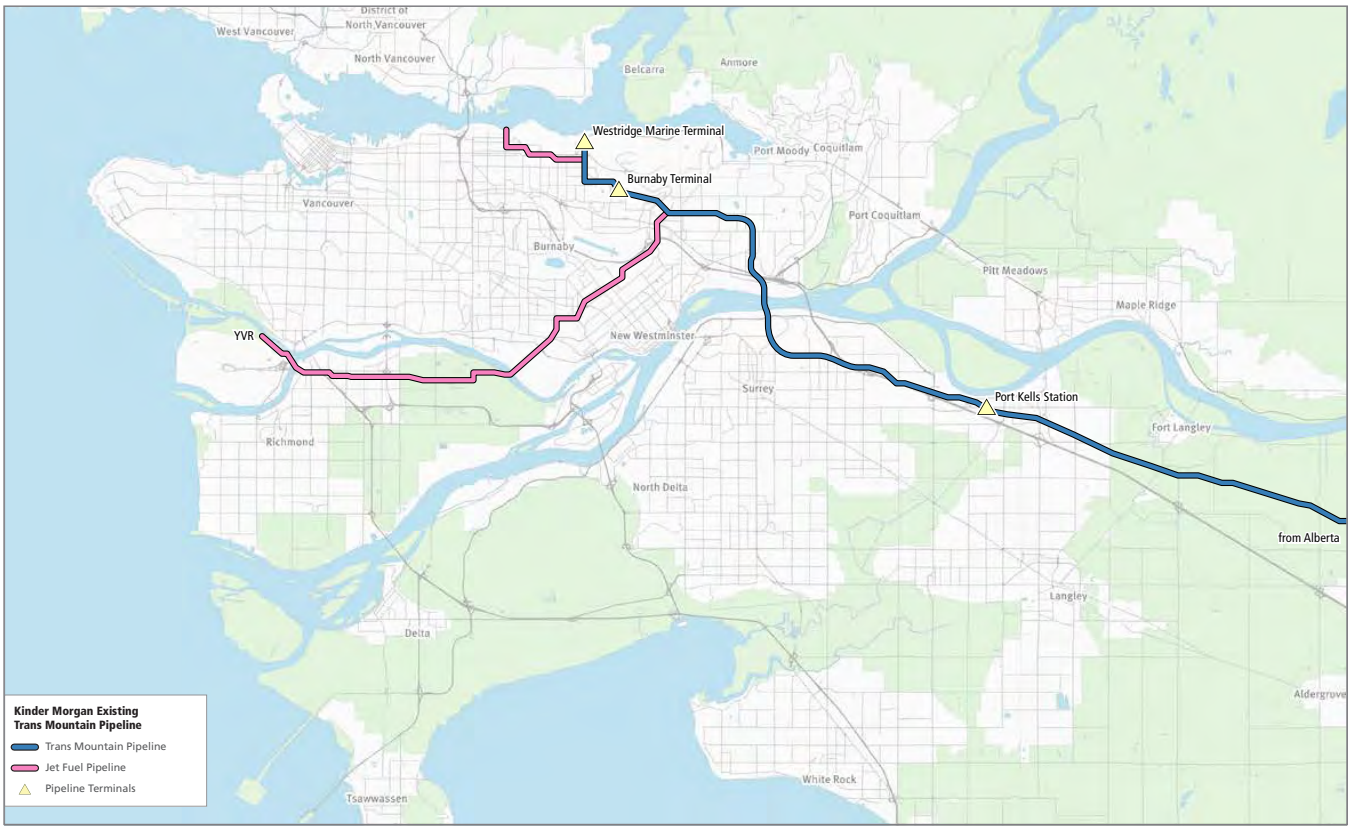


Figure 4: Pipelines and Fossil Fuel Transport in Metro Vancouver

(Note: this map is only intended to provide reference information on existing facilities. Discussion of new facilities is outside the scope of this Strategy)

1.3 Pipelines

Pipelines usually carry fossil fuels, notably oil and natural gas. They also carry other liquids and gases, including municipal water, sewage, carbon dioxide, slurried coal, and bitumen.

Figure 4 shows the Kinder Morgan Trans Mountain pipeline. This is the only existing pipeline that moves crude oil and natural gas from Alberta to the Pacific West Coast. One terminus of the line is in Burnaby, with a second branch terminating at refineries in the Puget Sound area. The 1,150 km pipeline has a capacity of 300,000 barrels per day, which is the equivalent of approximately 2,000 tanker trucks.

Trans Mountain also delivers jet fuel from the Chevron refinery in Burnaby to YVR airport through a 40 km pipeline. The pipeline delivers half of the needed supply, with the other half arriving by tanker truck or barge at the Westridge Marine Terminal in Burrard Inlet. To meet growing additional peak fuel demands, YVR will receive fuel by tanker trucks from Washington State.

MARINE

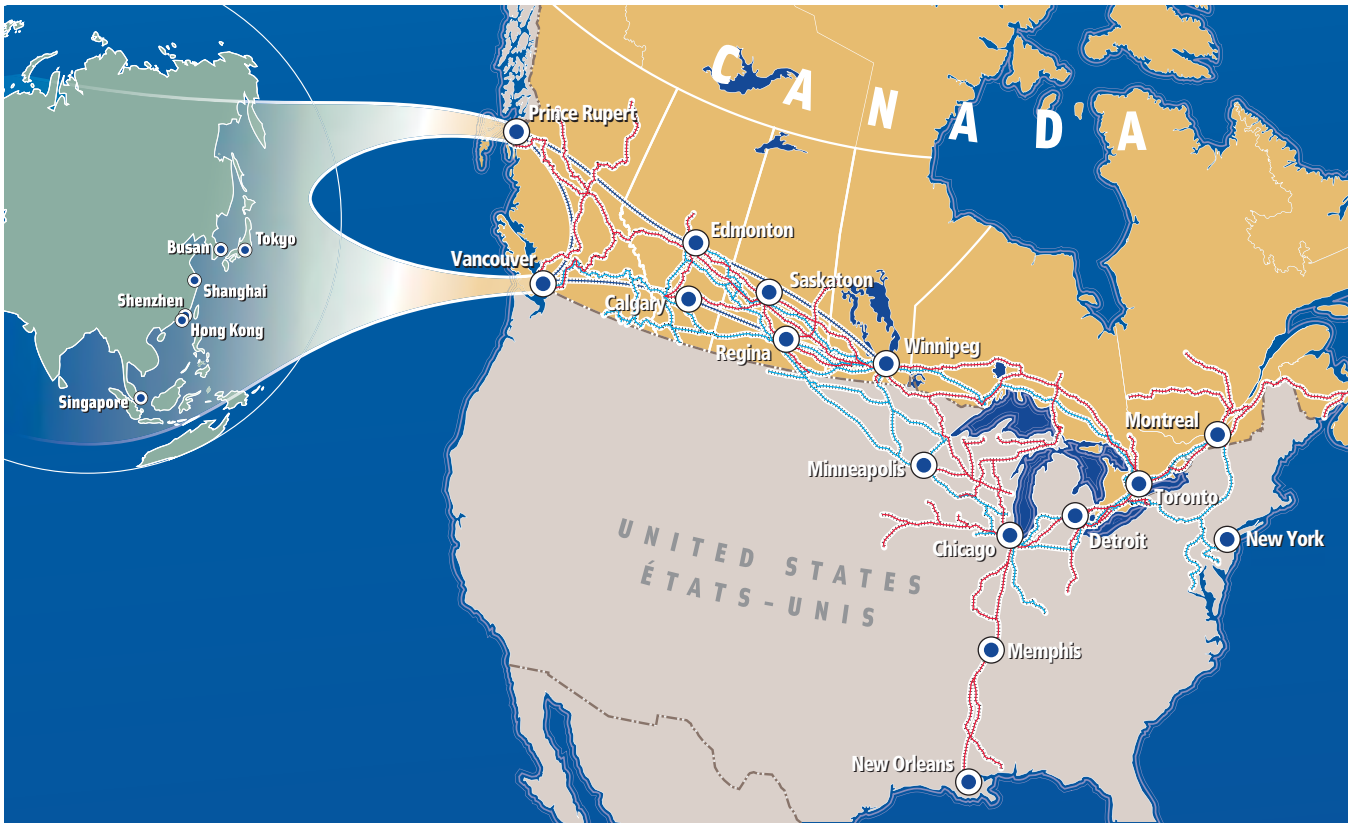


Figure 5: Metro Vancouver as Canada's Gateway to the Asia Pacific region (Courtesy of: Transport Canada)

1.4 Marine

Marine transport is used to transport bulk goods and large quantities of consumer products over long distances, and is sometimes competitive with rail and truck for delivery over shorter distances on the same continent. Marine transport in the Metro Vancouver region includes both ocean-going and short-sea shipping, depending on the cargo and its origin and destination.

Port of Vancouver (the Port) is the largest port in Canada and the second largest on the west coast of North America. The Port encompasses 28 marine cargo terminals connected to three Class I railways. It operates across five business sectors (automobiles, bulk, breakbulk, containers, and cruise), and handled 135 million tonnes of cargo in 2013. The majority of the Port's facilities are located on the north and south shores of the Burrard Inlet, which primarily handle bulk and breakbulk shipments. The Port's largest container operation is at Deltaport with additional short-sea shipping operations along the South Fraser River.

Figure 5 shows the Port's reach to Asia and, via Canada's railways, into North America. Bulk and breakbulk cargo is typically transferred directly between rail and marine, without ever touching the road in Metro Vancouver. A recent study indicates that two-thirds of all loaded import containers arriving at the Port by ship are moved directly onto rail, and the remainder by truck to either the final destination or to a transload facility. The land-side location and operations of these transload and intermodal facilities influence the movement of containers (empty and loaded), and are of importance to the region due to the various economic, environmental, and community impacts.

THE STORY OF AN OFFICE CHAIR

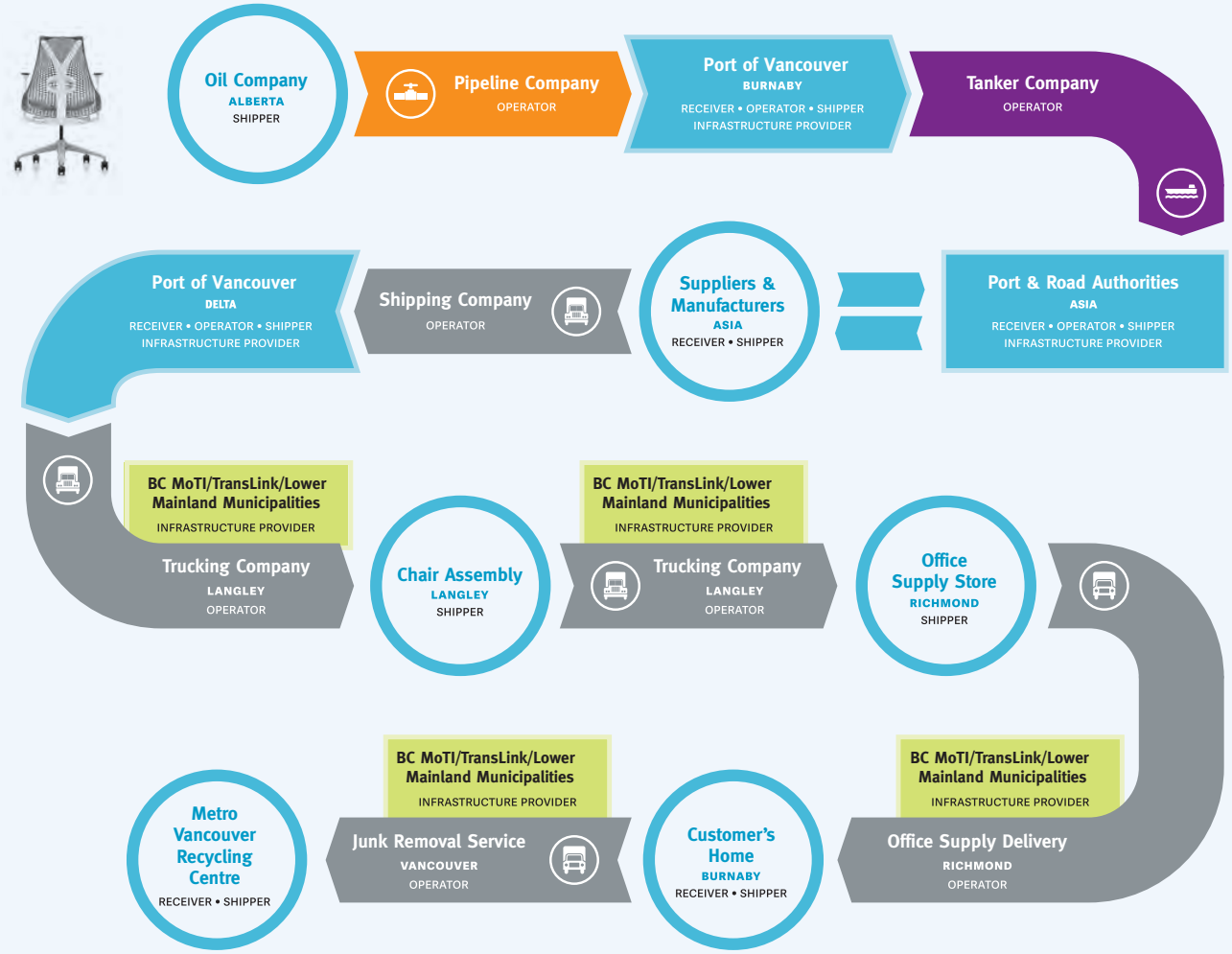


Figure 6: The Story of an Office Chair

The Story of an Office Chair: Oil from alberta is moved via pipeline to Burnaby, where it is loaded to a tanker bound for China. In China, the oil is offloaded from the tanker and loaded to a truck. The truck takes the oil to a factory, where is it made into plastic. This factory also receives foam parts made from rubber that originated in Malaysia. The final foam and plastic parts are finished and packaged together with metal nuts and bolts. The package of parts is loaded on a container ship and sent to Vancouver. The container is unloaded in Vancouver and drayed to a holding facility at the Port. A truck picks up the container and takes it to a warehouse and assembly facility in Langley, where the chair is assembled. The chair is picked up by truck and delivered to an office supply warehouse in Richmond. A customer purchases the chair online, and asks that it be delivered to her home in Burnaby. The next day, the delivery truck delivers the chair at the customer's home. Five years later, the chair breaks. The owner calls a local recycling service, which picks up the broken chair, disassembles it and then sells its components to a local manufacturer to build new furniture.

AIR

	TYO	TPE	HKG	TYO-SAO
YVR	7,502	9,590	10,268	18,548
SFO	8,225	10,389	11,126	18,646
LAX	8,752	10,921	11,663	18,665

Figure 7: Air Cargo Destinations served by YVR. (Courtesy of YVR)

1.5 Air

Metro Vancouver is home to four airports: the Vancouver International Airport (YVR), Boundary Bay Airport, Pitt Meadows Airport and Langley Airport. YVR is the largest airport, serving as a gateway between Canada, Asia, and the United States for both passengers and cargo. The Abbotsford International Airport (YXX), located just outside of Metro Vancouver in the Fraser Valley, is the second largest in the area and provides regularly scheduled domestic passenger service to destinations in BC and Alberta.

The demand for air freight is limited by cost, typically priced 4–5 times that of road transport and 12–16 times that of sea transport. Commodities shipped by air usually have high values per unit or are typically time-sensitive in nature, such as perishable agricultural and seafood products. Air also offers the ability to send products daily (or even more frequently), as demand warrants.

Air cargo can be transported by dedicated cargo aircraft, as well as in the cargo compartments of passenger aircraft. In 2013, 228 thousand tonnes of cargo were moved through YVR. Figure 7 shows YVR's air connections around the world. The figure also shows YVR's competitive distances to Asia, over San Francisco and Los Angeles

SHIPPING OKANAGAN CHERRIES TO METRO VANCOUVER AND CHINA

Figure 8: Shipping Okanagan Cherries to Metro Vancouver and to China

Shipping Okanagan Cherries to Metro Vancouver and China: The pickers arrive well before sunrise to pick the Okanagan cherries while the air is cool to ensure freshness. The cherries are packed and shipped by truck at the lowest safe temperature to ensure they arrive with the least amount of deterioration. The cherries are driven on the provincial highway system and local road network to a regional distributor/ wholesaler which repackages the cherries for shipment to local stores and for export, including flights bound for Asia. Air is the preferred mode of transport because it offers speedy delivery for this high-value perishable product, as well as daily replenishment if warranted.

YVR is the preferred air shipment point for BC cherries because of its shorter flight distance compared to Calgary (YYC) as well as a faster, higher capacity highway connecting producers to shippers. YVR has more air capacity to Asia and a concentration of freight forwarders that are familiar with handling the product.

Getting the cherries to YVR for the overnight flight depends on the trucks reaching the airport on time. Travel time reliability is important for the truck operators; traffic congestion or closures can have significant impact on the companies, product, and consumers.

Delivery to local stores is undertaken by specialized produce delivery trucks that vary in size according to the types of stores and restaurant suppliers they serve. Big box stores located on the urban periphery require, and can accommodate, large delivery trucks. Smaller, more urban stores require smaller volumes and can be served by smaller, more nimble vehicles. Curbside regulations, hours of operation, noise by-laws, and road congestion can all impact the delivery. Once the produce reaches the store, consumers arrive at the store by transit, on foot, bicycle, or auto to buy the products.

(Based on information provided by the Vancouver Airport authority).

2.0 Freight Market Sectors

Metro Vancouver's economy is diverse, including industrial, agricultural, technology and transportation activities that support the regional economy and the Asia-Pacific Gateway.

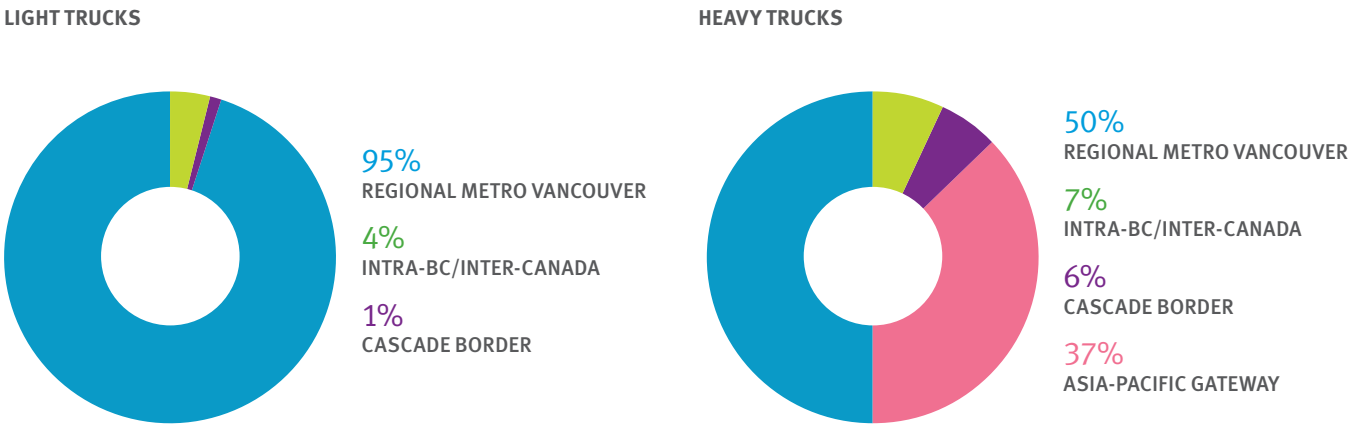


Figure 9: Truck Volumes by Freight Market Sector (AFRI 2012)

All of these sectors of the economy require efficient transportation and logistics to be competitive. Transportation and logistics itself is a major employment sector in our region — accounting for just over 20% of local jobs.

There is a great deal of road-based goods movement to fulfill our region's local needs. According to a 2012 Applied Freight Research Initiative (AFRI) regional truck survey, over 60% percent of heavy truck trips and 95% of light truck trips in the region serve a local destination. This includes local shipping, as well as traffic to and from manufacturing and processing facilities where goods are assembled or processed along the supply chain by businesses within Metro Vancouver. Local truck activity also directly serves residences, businesses, and retail destinations across the region.

The AFRI survey categorized truck trips in Metro Vancouver into four Freight Market Sectors: Cascade (cross-border), Gateway (international), Inter-Regional (elsewhere in BC and Canada) and Regional (within Metro Vancouver). These are explained further on the following page. Accompanying the descriptions are four figures that plot light and heavy truck volumes associated with each sector (Figure 10 - Figure 13). Cascade (cross-border) sector trips tend to be

concentrated on provincial highways and on a select number of MRN roads, while the regional (urban) trips are pervasive across the entire network. The Gateway (international) and Inter-Regional (elsewhere in BC and Canada) trips use a mix of provincial highways and MRN roads. Thus, usage by each sector of the highway and road network is not restricted to any one jurisdiction, although it is clear that the cross-border, inter-regional, and international trips rely on the provincial highway system, and that certain MRN roads that access the Port's terminals also carry significant heavy truck volumes. At the same time, the dispersion of marine and other terminals ensures that no one corridor is subjected to unacceptably high truck traffic volumes.

Also of note, there is a mix of light and heavy trucks, with virtually all vehicles moving to and from the Gateways being heavy trucks and, at the other end of the spectrum, light trucks dominating Regional (urban) deliveries, but with some heavy truck activity as well.

From the figures, it is clear that addressing goods movement demands and issues requires a coordinated region-wide effort, across all jurisdictions.

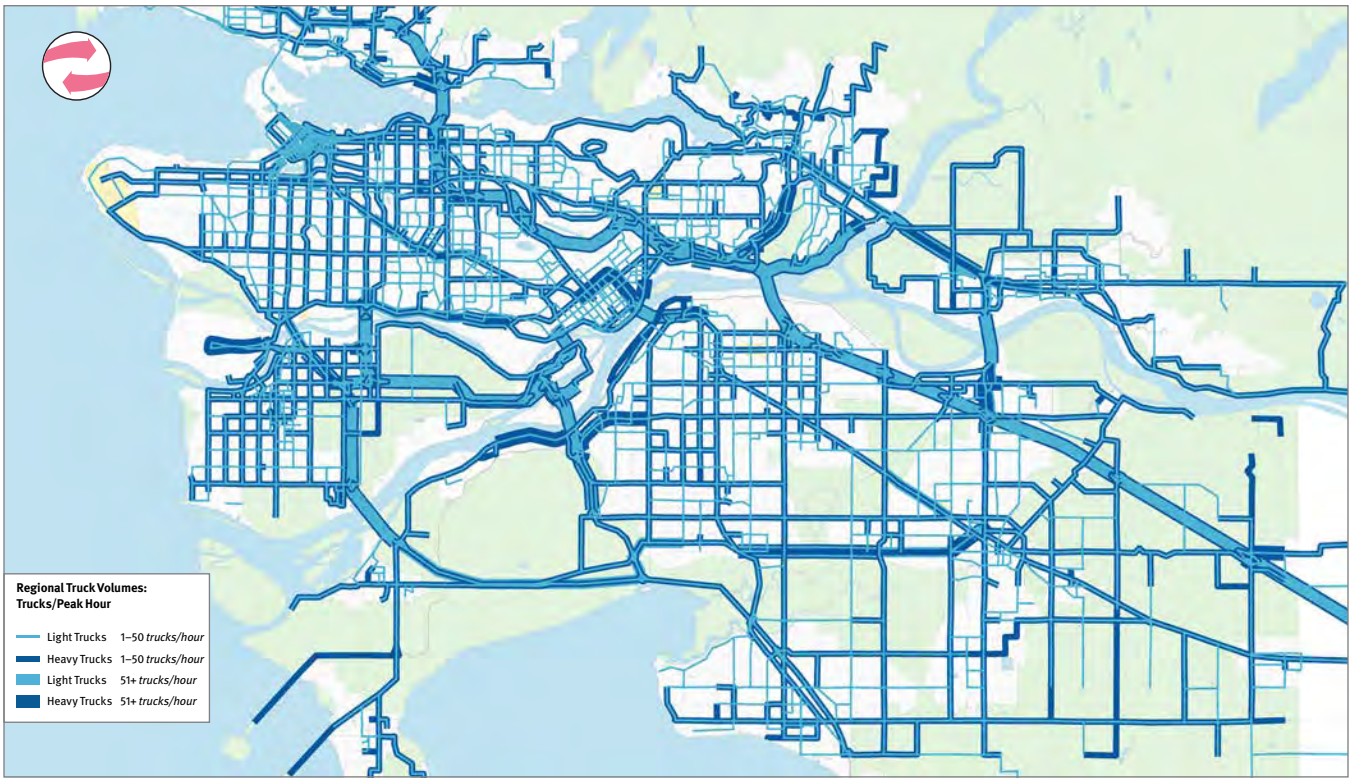


Figure 10: Map of Truck Volumes — Regional Sector (AFRI 2012)

2.1 Regional Sector

Regional goods vehicles providing local service are observed throughout Metro Vancouver: food supply trucks make deliveries to grocery stores and restaurants; commercial laundry services have trucks transporting to and from hotels, and trucks deliver food, construction materials, equipment, and new furnishings to residential areas. These destinations are distributed widely across the region and are present in most communities. As a result, local delivery vehicles use collectors, arterials, and the MRN, underscoring the importance of integrated land use and transportation planning. Rapid growth in online purchasing has brought with it an increased demand for courier and express deliveries for both households and work places.

Many of these trips cross multiple municipal boundaries, each with differing regulations and truck route standards. Regional road challenges may include: travel-time reliability, road congestion, lack of alternate routes, competition for road space and curb space, access to industrial land, and community livability impacts. In some cases, network bottlenecks and poor conditions on these local routes are the greatest causes of inefficiencies and pinch points along the entire route from origin to destination.

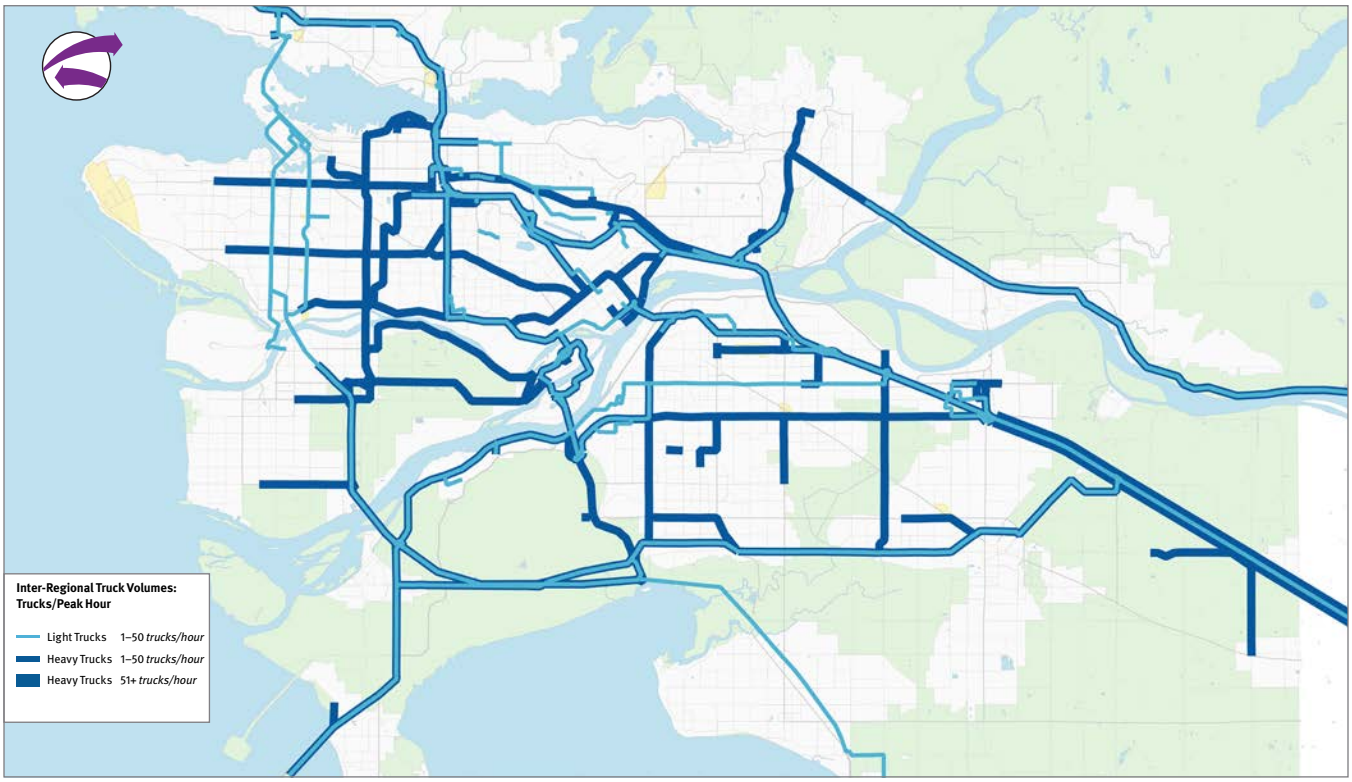


Figure 11: Map of Truck Volumes — Inter-Regional Sector (AFRI 2012)

2.2 Inter-Regional Sector

Inter-Regional includes all truck trips that travel across one of the three entry points into Metro Vancouver: the Eastern Gate for travel along Highway 1 or 7 west of Hope with trips to and from the interior of BC and some further to Alberta and beyond; the Northern Gate for travel north of Horseshoe Bay on Highway 99, destined to or originated from Squamish and Whistler; and the Western Gate between the Lower Mainland and Vancouver Island, including cargo transport by BC Ferries or other barge operators.

Inter-Regional and Regional truck trips rely heavily on the regional road networks in Metro Vancouver, and share similar operational challenges at the local level. Trucks from outside of Metro Vancouver, typically involving long distance travel, may face additional challenges due to limited information on truck routing and real time information on local traffic conditions.

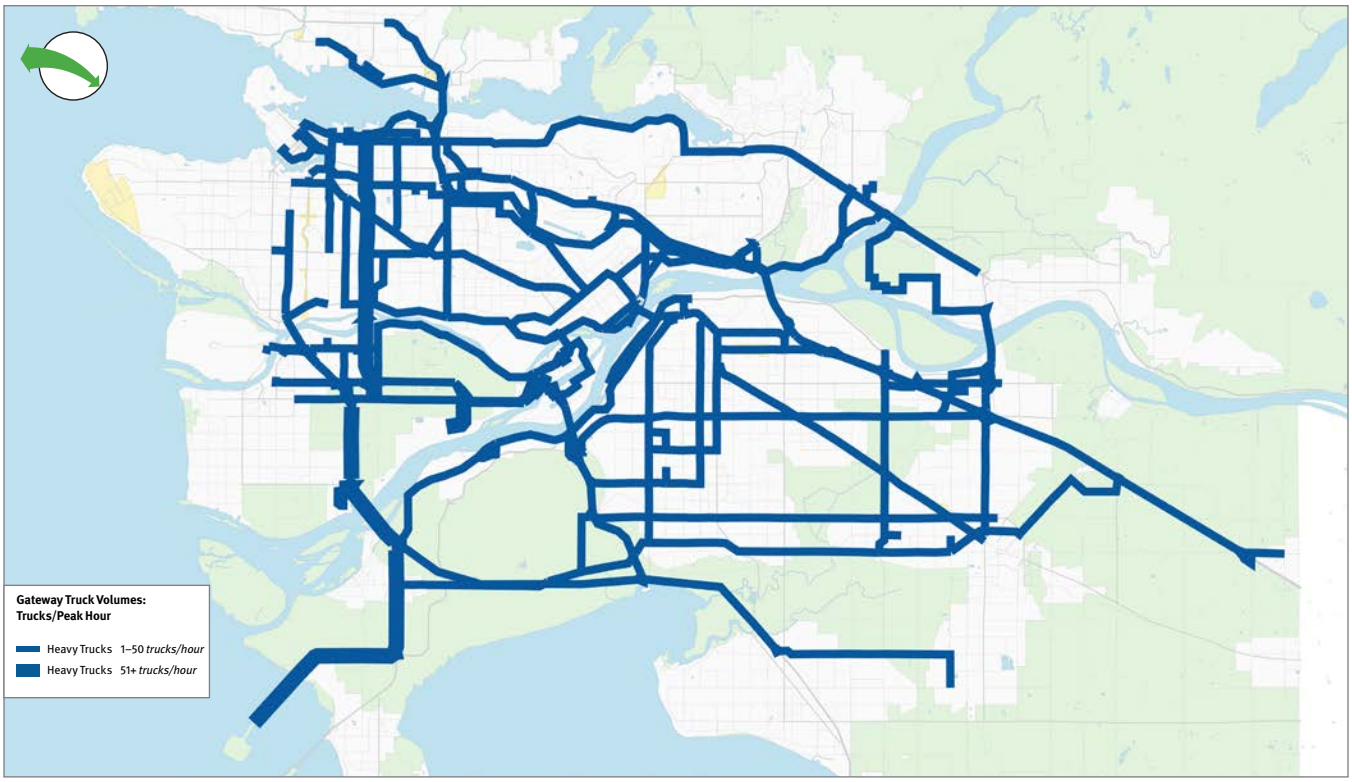


Figure 12: Map of Truck Volumes — Gateway Sector (AFRI, 2012)

2.3 Asia-Pacific Gateway Sector

Gateway related goods movement is mainly attributed to Port of Vancouver, and to a smaller degree YVR. About 70% of the Port's cargo is bulk consisting mostly of coal, chemicals, metals, grain, petroleum products and forest products bound for export. Bulk cargo arrives and leaves the region primarily via the marine and rail networks, while container cargo arrives and leaves through the rail, road, and marine networks. It is estimated that approximately 37% of all heavy truck trips in Metro Vancouver are on gateway-related trips.

As Asia-Pacific economies continue to grow, the importance of the Metro Vancouver region trade and travel will also continue to grow. With trade volumes through the marine terminals now surpassing pre-recession levels, the Port projects a 5.5% annual growth in terms of cargo, and a doubling of commodity trade between the years 2010 and 2020. Unique challenges faced by Gateway-related truck travel include productivity issues associated with empty container movements, off-hour accessibility to container terminals and intermodal facilities, congestion delay and travel time reliability on the regional road networks, particularly for carriers working within a reservation system or having to meet pre-assigned pick-up and delivery schedules.

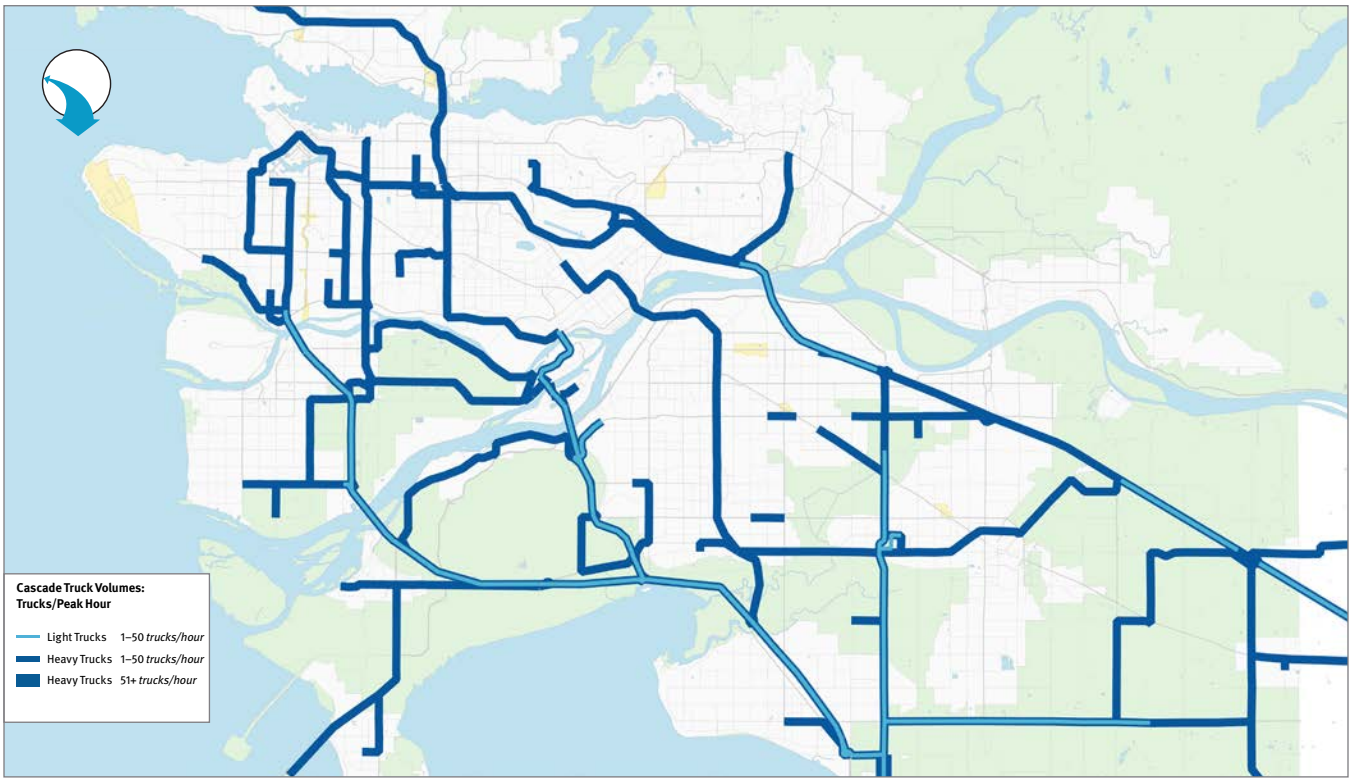


Figure 13: Map of Truck Volumes — Cascade Sector (AFRI 2012)

2.4 Cascade Sector

Cascade Border goods movement includes all land-based freight transport through the Canada-US borders in the Lower Mainland, including the land ports-of-entry by commercial vehicles and rail across the Cascade Gateway. Truck border crossings include the Pacific Highway, Lynden/Aldergrove and Huntington/Sumas ports-of-entry. Primary commodity flows across the Cascade Border include lumber, food, agricultural, manufacturing and other miscellaneous raw and intermediate materials and finished goods. Note that this traffic is generated both within Metro Vancouver and beyond.

Cascade Border goods movement faces unique planning and operational challenges, including border processing times, route and conveyance efficiencies at the various ports-of-entry, and distribution efficiencies between air, marine, rail, road, and pipeline.

3.0 What we have achieved so far

Through a consistent regional Vision, ongoing coordination, and ambitious investment we have achieved a transportation system that supports the local economy, connects the region to Canada and the world, and is frequently held up as a North American model of integrated multi-modal planning.

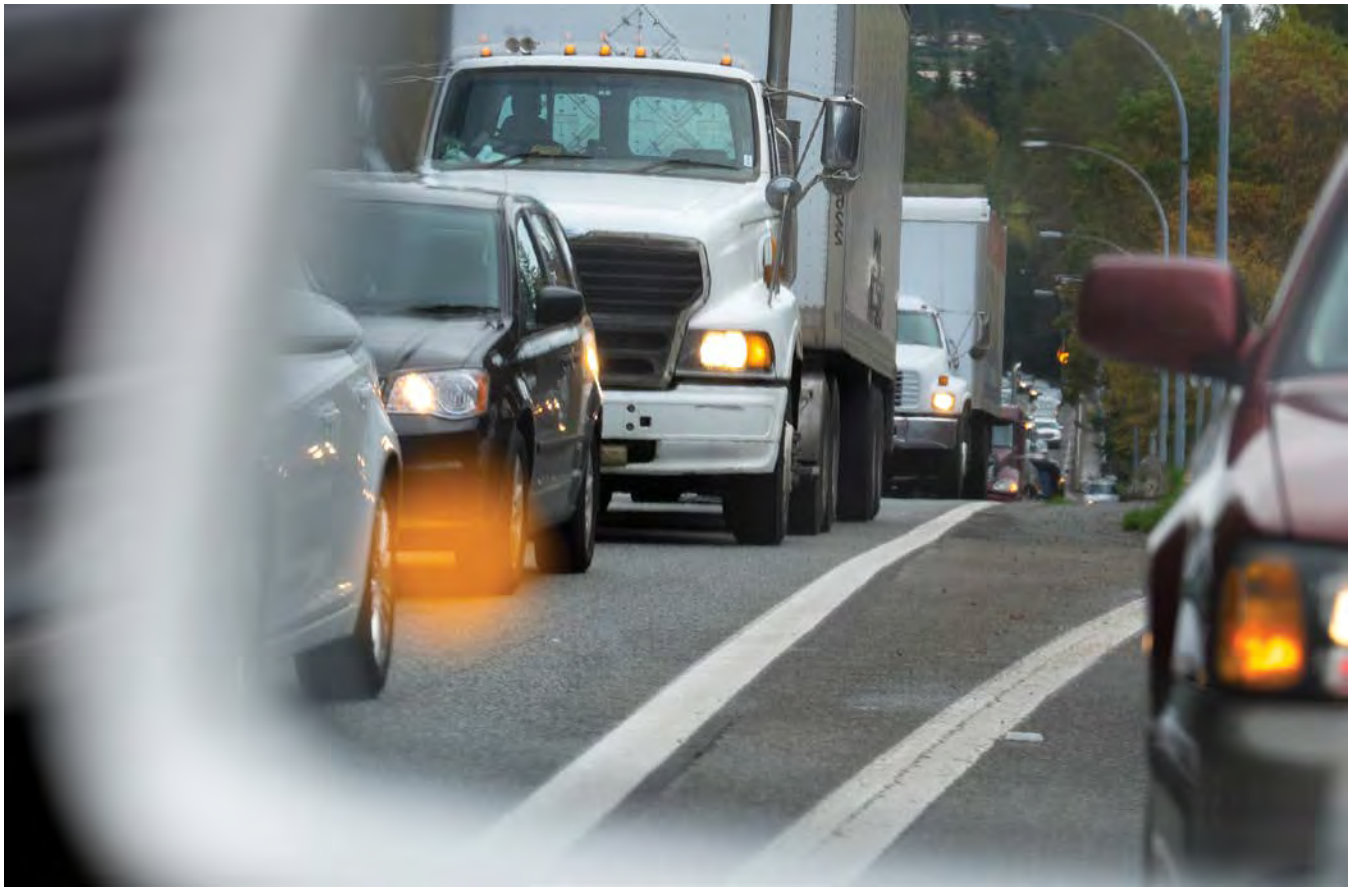
One of this region's enduring strengths has been its consistent vision for regional growth management. Metro Vancouver introduced its first "Livable Region Plan" in 1975. Given the region's limited land base and its rapidly growing population, the leaders of the day — and all those since — resolved to focus residential and commercial development in a series of compact centres that would be easy for people and goods to get around, and would preserve both green spaces and industrial land. Increasing protection for industrial land has also meant greater certainty with respect to future transportation investments to support goods movement.

On the investment side, thanks to support from local, provincial, and federal partners, our region has made sweeping changes to its transportation infrastructure in the last three decades in support of this vision.

We have built four rapid transit lines since 1986, with a project to extend an existing line and another project to add a new line getting underway; increased bus service by 50% since 2002; begun construction of a high-quality bikeway network; and improved walking conditions in many parts of the region. In so doing, we have been able to build a multi-modal system where 27% of all trips are now made by walking, cycling, or transit — up from 22% in 1994. If these investments had not been made, it is clear that there would have been significantly more congestion and delays to commuter and commercial trips alike.

At the same time, key investments have been made in maintaining and expanding the region's road and highway infrastructure. Over the past decades, we have seen the addition and expansion of strategic links in the road network that support more efficient goods movement. These include Highway 1, the Sea-to-Sky Highway, the South Fraser Perimeter Road, the border infrastructure project, the Coast Meridian Overpass, and the Powell Street Overpass. Key water crossings have been added, rebuilt or replaced, including the Pitt River Bridge, the Golden Ears Bridge, the Port Mann Bridge, and soon the planned George Massey Tunnel replacement. In addition, thanks to multi-partner collaboration, we now have significantly expanded capacity along the Roberts Bank Rail Corridor to and from the Deltaport facilities, and have established the Regional Transportation Management Centre (RTMC) to better coordinate regional traffic operations.

The result of everything we have achieved so far is a transportation system that supports the regional economy, connects the region to the rest of Canada, connects Canada to the rest of the world, and is frequently held up as a North American model of integrated, multi-modal planning.



4.0 The Challenges We Still Face

Even with the steps we have taken to improve goods movement in the region, significant challenges remain in meeting and balancing the needs of both goods movers and the communities in which they operate.

Thanks to a consistent regional Vision, ongoing coordination, and ambitious investment, we have achieved a transportation system that supports the local economy, connects the region to Canada and the world, and is frequently held up as a North American model of integrated multi-modal planning.

We still have work to do, however, to advance the region's goals (as set out in both Metro 2040 and the Regional Transportation Strategy) of enabling a sustainable economy, protecting the environment and climate, and developing healthy, safe, livable, and complete communities.

To do so, we need to continue to carefully manage urban growth and the transportation system as we add another 1 million people over the next 30 years. We also need thriving businesses that can provide the jobs, and the goods and the services that we need to live a good life. Those businesses, in turn, need to be well-served by efficient and reliable goods movement to thrive.

There are four key goods movement challenges that constrain the private sector from achieving its full potential. These challenges have mostly to do with delays and uncertainty, which serve to increase operating costs. In turn, these increased costs are passed on to customers, businesses, and residents alike. In our region, key causes of delay and uncertainty for goods movers include:

1. a lack of incentives and options for passenger car drivers to reduce their vehicle use leading to roadway congestion and reduced travel time reliability;
2. lack of coordination and consistency in regulations between jurisdictions;
3. limited availability of accessible industrial land; and
4. lack of public awareness of the value and positive contribution to our economy of goods movement.

In our region, as in almost every urban region, we must also grapple with several key challenges relating to the impacts of commercial vehicles on the communities in which they operate, including:

5. competition for scarce road space and curb-side parking space;
6. aging road infrastructure, which was built when design standards were based on smaller vehicle configurations;
7. safety and perceptions of safety;
8. vibrations and noise, especially adjacent to residential areas; and
9. emissions of visible smoke, smog-forming contaminants, and greenhouse gases.

4.1 Travel time reliability for movers of goods and services

Industry and business depend on being able to reliably predict the amount of time it will take to move goods and services from place to place. Frequent delays and uncertainty force the private sector to build larger buffers into their schedules which in turn serve to increase transportation costs. These increased costs are passed on to consumers, businesses, and residents alike.

Traffic congestion wreaks havoc on travel time reliability, which is why it is a top local transportation issue identified by the business and goods movement community in Metro Vancouver and elsewhere.

Congestion occurs when the number of road users (demand) exceeds road capacity (supply) at which point the efficiency of that part of the road network is compromised resulting in delays and unreliable travel times. There are two types of congestion: recurrent, which is typified by the daily build-up of traffic during the commuter peak periods, and non-recurrent or variable congestion, which is caused by crashes, construction, or other irregular events.

Non-recurrent congestion is unpredictable and often results in missed or late deliveries. While dispatchers are able to work with or around recurrent congestion by delaying or advancing when a trip is made, as the region's population continues to grow and congestion continues to worsen — even routine delays will become more severe and unpredictable.

Compounding this problem for commercial vehicles is the fact that delivery schedules are driven largely by customer requirements. There are also municipal regulations that restrict the times of day when deliveries can be made — often to the most congested times of day when people are travelling to and from work and going about their personal business. The rapid growth in online shopping by both households and businesses has generated an accompanying demand for express delivery.

Solving roadway congestion and dramatically improving travel time reliability for the movement of goods and services is a top priority of this Strategy. Solutions require a holistic, system- wide approach that includes delivering both the pricing and the investments outlined in the Mayors' Transportation and Transit Plan so that people have incentives and options to reduce personal car use.

4.2 Lack of coordinated planning and inconsistency in regulations between jurisdictions

Many actors influence the movement of goods throughout Metro Vancouver. Each actor has responsibilities — as mandated through legislation, through an internal charter or mandate, or via financial commitments to shareholders. Each actor also has a specific range of authority — from municipal and regional land use planning to management of municipal, regional, provincial, and federal road assets.

Plying these roads are commercial goods vehicles of all sizes, some of which are owner-operated and some are part of larger commercial fleets with salaried operators. Individual businesses make their own production and distribution decisions based on financial viability, the market and available infrastructure and services. These considerations transcend jurisdictions: road ownership and municipal boundaries generally are invisible insofar as goods movement choices are concerned.

However, commercial truck regulations, enforcement and permitting varies widely across the 23 members of Metro Vancouver and the provincial highway system, creating confusion and administrative burdens for those applying for and granting permits. The definition of a truck also varies across the region, with a Gross Vehicle Weight (GVW) ranging from 5,500 kg to 13,600 kg. Some municipalities have designated truck routes (which sometimes do not align with neighbouring municipalities), some use the services of the provincial Commercial Vehicle and Safety Enforcement (CVSE) Branch for administration and enforcement, others create their own regulations and do their own enforcement, and some have very few regulations, no designated truck routes, and do little to no enforcement.

While TransLink has a broad mandate to provide a regional transportation system that moves people and goods and supports the regional economy, in practice it has only limited tools available, including: co-managing the Major Road Network with municipalities, and having final approval over municipal requests to prohibit the movement of trucks on any non-provincial road within the region. This provision grandfathers truck route bylaws in existence at the time of TransLink's establishment, and requires TransLink to review any proposed changes.

Making these matters worse is the lack of robust data on how and why goods and services move in our region — a challenge that is not unique to Metro Vancouver. Collecting robust, reliable, and consistent data is critical to helping both the public and private sectors

make informed investment and planning decisions. The lack of access to shared data is a problem aggravated by the fragmented jurisdictions described above and could be addressed by a more proactive and coordinated approach to goods movement planning.

Ultimately, no single agency or organization is responsible for all aspects of goods movement, which is why we need especially strong coordination. While partners and stakeholders involved directly in the Asia-Pacific Gateway have successfully mobilized forums for coordination and joint initiatives, there is currently no formal mechanism that brings together regional goods movement stakeholders to coordinate actions around a common framework with each other and with Gateway partners.

4.3 Limited availability of accessible land for industrial uses

The availability of an adequate supply of vacant, accessible, developable, and appropriately zoned and serviced industrial land is a key driver in the maintenance and growth of the regional economy. Industrial land is vital for local production, distribution, service and repair operations, and logistics and freight handling operations for Gateway trade. Accordingly, one of the key pillars of *Metro 2040* is to ensure adequate space for industry and commerce throughout the region, located appropriately to their needs and in a manner that supports an efficient transportation system.

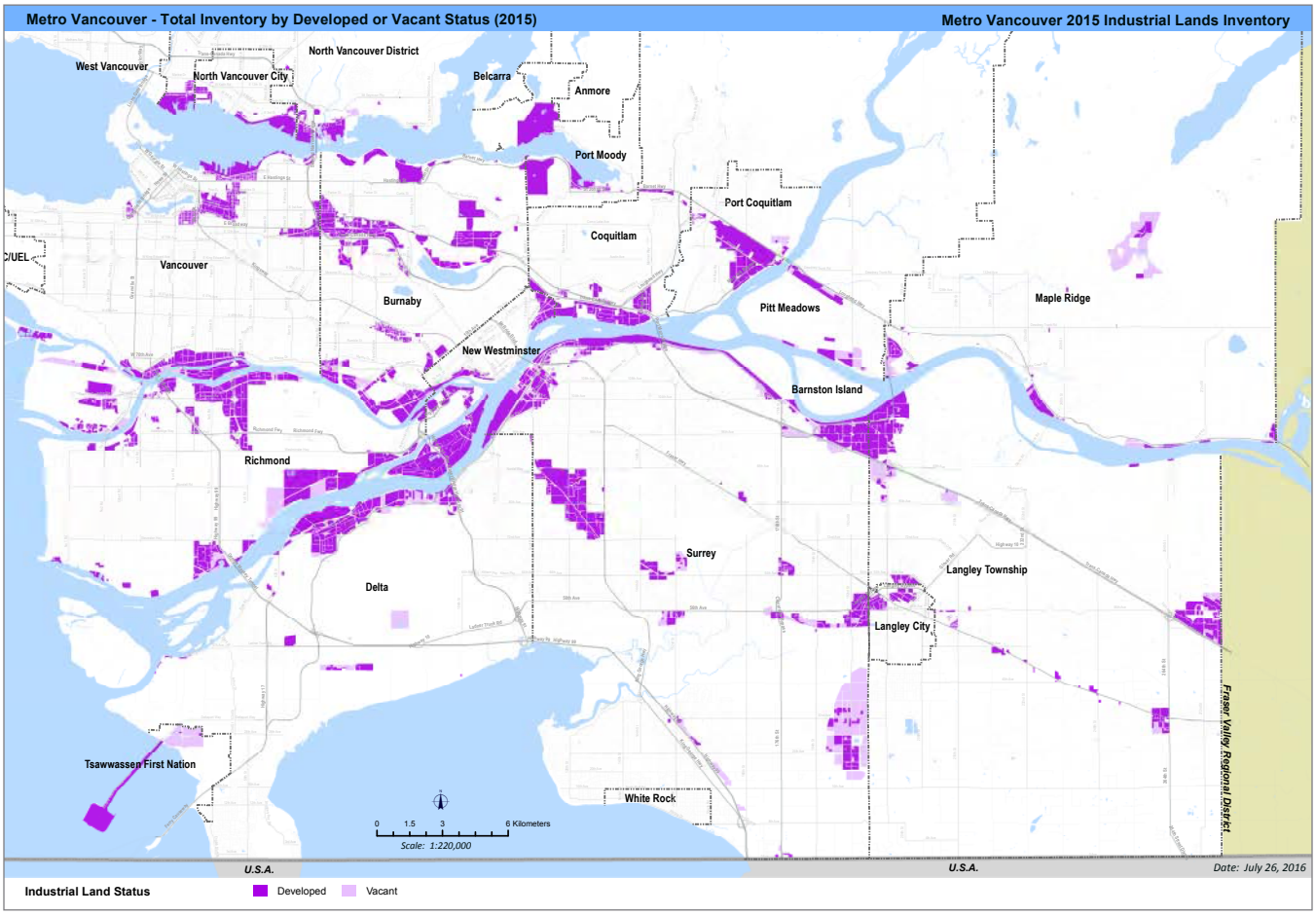


Figure 14: 2015 Industrial Land Inventory (courtesy of Metro Vancouver).

Despite this high-priority regional land use objective, it is becoming increasingly challenging for many businesses to find available and accessible industrial land. While Metro Vancouver's 2015 Industrial Lands Inventory estimated a modest gross increase in the total supply of industrial land since 2005, the Inventory also notes that not all industrial lands are equal. Many sites face development constraints that prohibit certain uses. Location is also critically important for many industrial uses, with businesses seeking proximity to suppliers, customers or both. Businesses involved in trade, transportation, warehousing, agricultural cold-storage, national and international logistics, and e-commerce all need good access to highways, ports, rail yards, and airports. Equally important, this access must be direct and must avoid traversing residential areas in order to reach these goods movement facilities.

As shown in Figure 14, much of the currently vacant industrial land in the region is poorly located with respect to transportation access and is simply not an option for these types of users.

Other factors include land prices, access to skilled labour (a problem when workers have few commuting options other than to drive on congested roads), and the length of time required for development approvals (critical for businesses that must be in operation in order to meet peak seasonal demands, such as the autumn Christmas retail supply).

As Metro Vancouver's 2013 report "Opportunities for the Intensive Use of Industrial Land" concludes — the region will start running out of industrial land in the 2020s and opportunities for intensification should be more seriously explored and encouraged. Many types of industrial land users, however, need horizontal rather than vertical space and so expansion means 'building out,' rather than 'building up.'

Given our limited land base and the high demand and prices for residential and commercial property, there is continued pressure to convert some of the best-located industrial land to residential, large-format retail or stand-alone office use, which typically generate higher per unit municipal tax revenues than existing industrial uses. Additionally, as residential and commercial uses start to build up around existing industrial sites, there also can be pressure to constrain trucking access to these sites, for example, through truck route restrictions.

Ultimately, the availability of land for key sectors of the region's economy is limited over the near term leading to firms leaving the region or setting up in less efficient locations from a transportation perspective. This can result in decreased diversification of the regional economy, affecting the region's prosperity and resiliency over the long-term.

4.4 Lack of public awareness of the value and impact of goods movement

Because of noise, vibrations, emissions, health and traffic safety concerns, many residents would prefer that trucks stay out of their communities altogether. However, residents of this region also all need food, clothing, shelter, and access to the array of products, goods, and services that help to support a good life. These items have to be sourced, created, transported and distributed to their final destinations — resulting in many of truck trips just to keep our communities and businesses well-stocked.

Many residents don't immediately connect the value they place on their access to goods and services with the value of the goods movement system that made that access possible. It also is not immediately obvious that our local economy generates a lot of goods movement trips. For example:

- one supermarket generates about 30 truck trips/day to deliver groceries and other products;
- one furniture store generates about 20 truck trips/day for stocking and delivery to customers;
- one gas station generates 2–3 tanker truck trips/week to fill up the fuel tanks;
- one high-rise construction site generates 25 truck trips/day to deliver concrete, steel, and other construction materials, and haul away waste.

In addition to this essential local goods movement, one of the reasons our region exists in the first place is that we are home to a natural, ice-free, deep-water port that connects Canada to the world. According to the Greater Vancouver Gateway Council, Metro Vancouver's role as a Gateway supports 182,000 jobs

(direct, indirect, induced) — about 15% of the region's jobs and lead to over $1.0 billion of local and provincial income and sales tax revenues. This value is, likewise, not immediately obvious to the average resident who experiences the negative impacts of heavy truck traffic much more directly.

4.5 Balancing Community livability with goods movement needs

While many people appreciate goods are delivered to their local stores to keep the shelves well stocked, most people also agree that heavy trucks and residential areas don't mix well. Trucks create noise, vibrations, and emissions while vying for road space and parking space in busy neighbourhoods and town centres where people live, work, and travel. While truck operators have excellent safety records, the imposing visual presence of heavy trucks combined with their large blind spots make many people sharing the road with them feel more vulnerable and less safe. As the region continues to grow denser there will be increased interaction between residents and heavy commercial vehicles, and these tensions will only continue to increase.

Road space and curb-side parking space can both be better managed and shared through improved pricing, regulations, enforcement, the designation of a consistently defined, region-wide truck route network; and the integration of trucks into Complete Streets design guidance. In addition, efforts to optimize use of the existing goods movement fleet – through technology solutions, land use changes, and new business models – can help to deliver the same economic activity with fewer truck trips on the region's roads. But the challenge of how to share increasingly scarce road space will remain a key one.

Safety and the feeling of safety can be improved through improvements to driver training, public education, and increased enforcement targeting dangerous drivers and commercial vehicle safety alike. However, heavy trucks have an imposing presence on the road, they create a substantial draft when passing at moderate speeds, and ultimately most people find sharing road space with them — whether in a car, on a bicycle, or on foot — to be quite stressful. Improvements to safety and perceptions of safety will remain a key issue.

Transportation noise and vibrations can be annoying, disrupt sleep, reduce property values,and adversely impacts health. Traffic noise is frequently a dominant concern voiced by the public about the development or expansion of roadway infrastructure. This noise comes from several sources. Noise from engines, exhaust systems, and power trains tend to dominate for low-speed or accelerating conditions. Tire and pavement noise tends to be most important at freeway speed. For trucks, the power-train is a major source of noise on arterial roadways, but tire and pavement noise tends to dominate at freeway speeds, where a heavy truck makes approximately as much noise as 10 cars. Thus, even when there are relatively few trucks on the road, truck noise tends to be more noticeable than automobile noise. Efforts to reduce noise and vibrations associated with trucks will be especially important to facilitate off-peak deliveries in a way that minimizes negative impacts on surrounding communities.

Traffic emissions are a local air quality and health concern — especially for residents who live in close proximity to a major arterial roadway. They are also a major issue for global climate change — with one-third of the region's greenhouse gas emissions coming from on-road vehicles, including 5% from heavy commercial vehicles. However, as vehicle emissions standards tighten, no longer do new commercial trucks belch black smoke, nor leave behind a thick stench of diesel fumes in their wake.

Indeed, today's diesel-powered trucks are cleaner and quieter than ever before and emissions will continue to drop as the fleet is renewed. Nevertheless, in the meantime, emissions from trucks remain another major challenge.

A top priority of this Strategy is to proactively address each one of these negative livability impacts to ensure that residents, workers, and visitors alike are able to enjoy a safe, clean, healthy, and quiet urban environment, and that goods movers can continue to successfully operate with the support of the communities they serve and move through.

5. Regional Goods Movement Strategy

TransLink is mandated to provide a regional transportation system that moves people and goods in a way that supports the Regional Growth Strategy and that helps to achieve regional and provincial social, economic, and environmental objectives.

To this end, *Moving the Economy: A Regional Goods Movement Strategy for Metro Vancouver - Strategies & Actions – April 2017 Draft (the RGMS)* guides goods movement-related investment and initiatives across the region in order to deliver goods and services:

- more efficiently to more people and more businesses;
- within a shared and increasingly limited space;
- in ways that are cleaner, quieter, and safer and
- in ways that support our region's prosperity.

The Strategy assesses the key challenges of goods movement in Metro Vancouver, articulates a clear vision, sets goals and measurable targets, and outlines a comprehensive package of strategies and actions needed to achieve these goals and targets.

No one agency or sector can manage goods movement alone. This is true of metropolitan regions across North America. Here in Metro Vancouver, it is even more important that we collaborate – all levels of government and the private sector together – to address goods movement challenges for our collective benefit, which is why the Strategy is a multi-partner collaboration, facilitated by TransLink, but intended as a guiding document that captures what all of the partners believe needs to happen to improve regional goods movement in Metro Vancouver.

A region-wide perspective is needed for two reasons:

- it provides a consistent and cohesive framework within which all levels of government can work together to achieve mutual and individual objectives; and
- a region-wide perspective recognizes that boundaries and jurisdictions are largely indiscernible to the way business operates, where businesses locates, and the routes used to move goods.

Through collaboration with a wide range of regional partners and stakeholders, the Strategy captures the entire range of actions that are needed and identifies a short-list of priorities together with lead roles, partnerships, and consultation opportunities.