



GREYSTONE COLLEGE
OPENING UP GLOBAL CAREER OPPORTUNITIES



Modes of Transportation

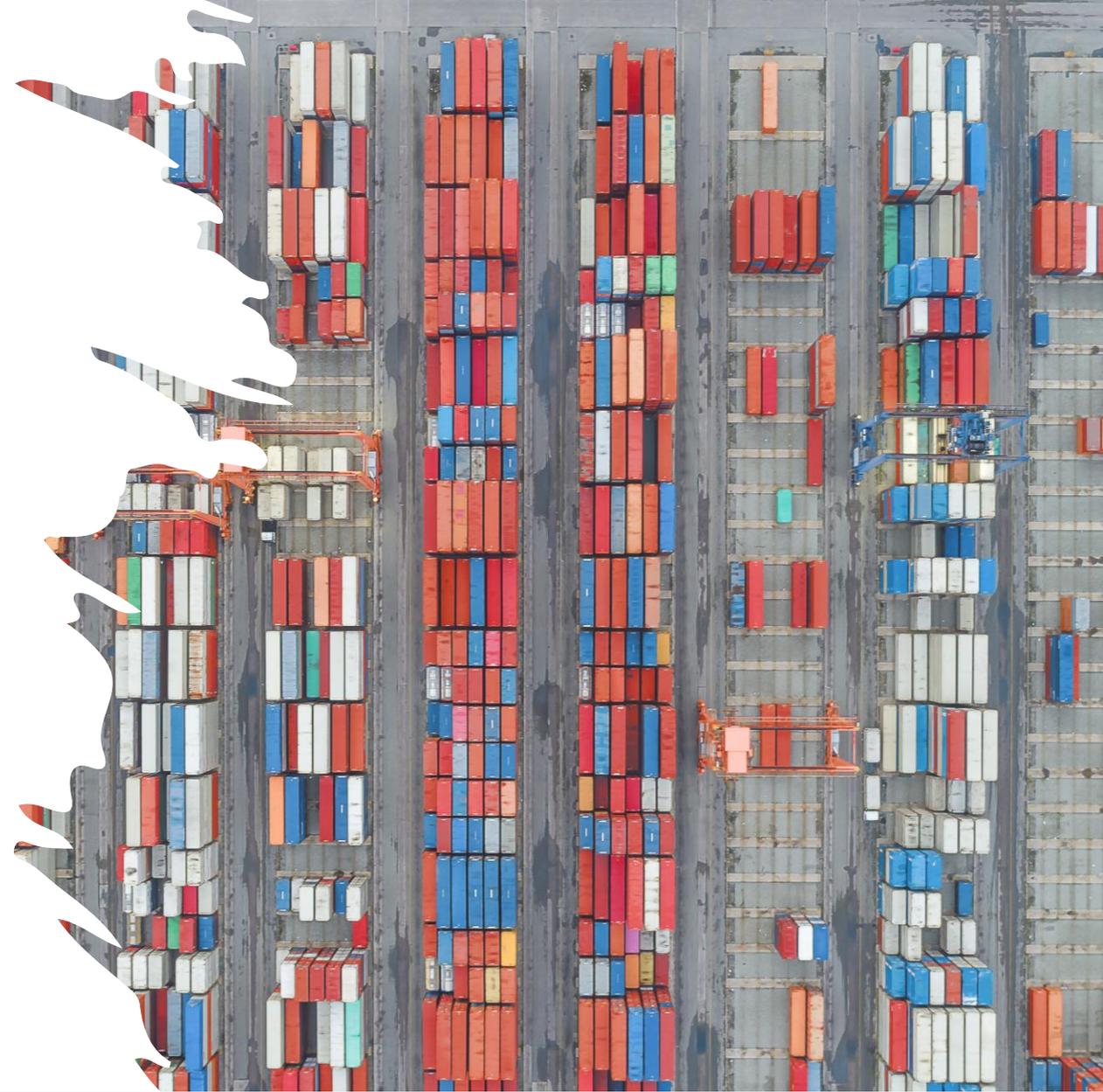
Unit 8

Agenda

- Fundamentals of Transportation
- Different Modes of Transportation
- Extra Resources

Fundamentals of Transportation

Functions of Transportation and
Stakeholders in the Transportation Process



Overview of Transportation in the Supply Chain

Transportation is the largest expenditure in logistics, usually representing over 60% of a typical firm's total logistics spend

Fundamentally transportation managers are responsible for moving inventory around a firm's supply chain

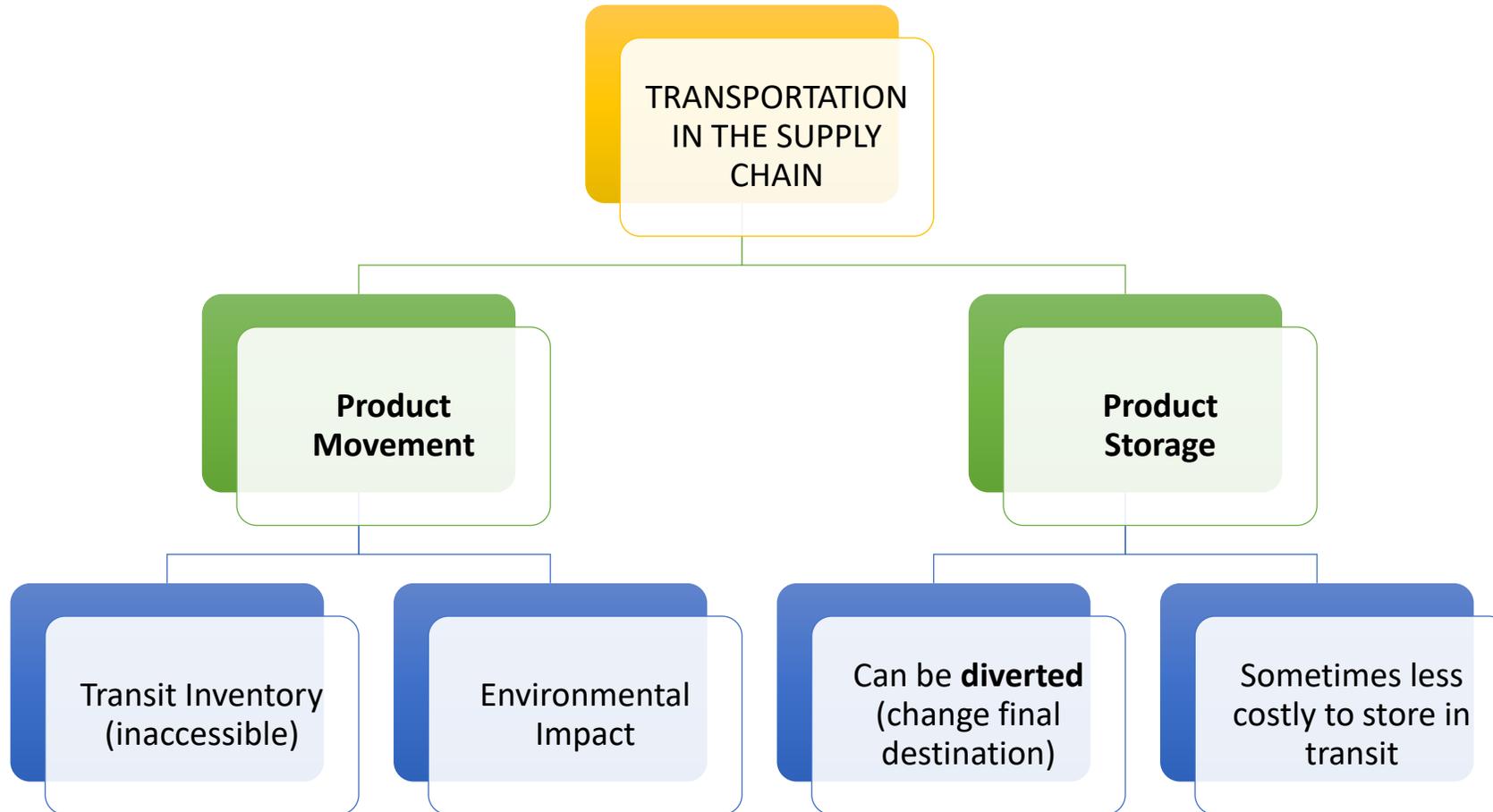
A wide variety of transportation solutions are available to support a given supply chain's logistical requirements

Precise transportation execution helps a firm provide service and reduce cost, inventory, storage, and materials handling

If not managed effectively and efficiently, transportation can be a major barrier to a successful supply chain strategy

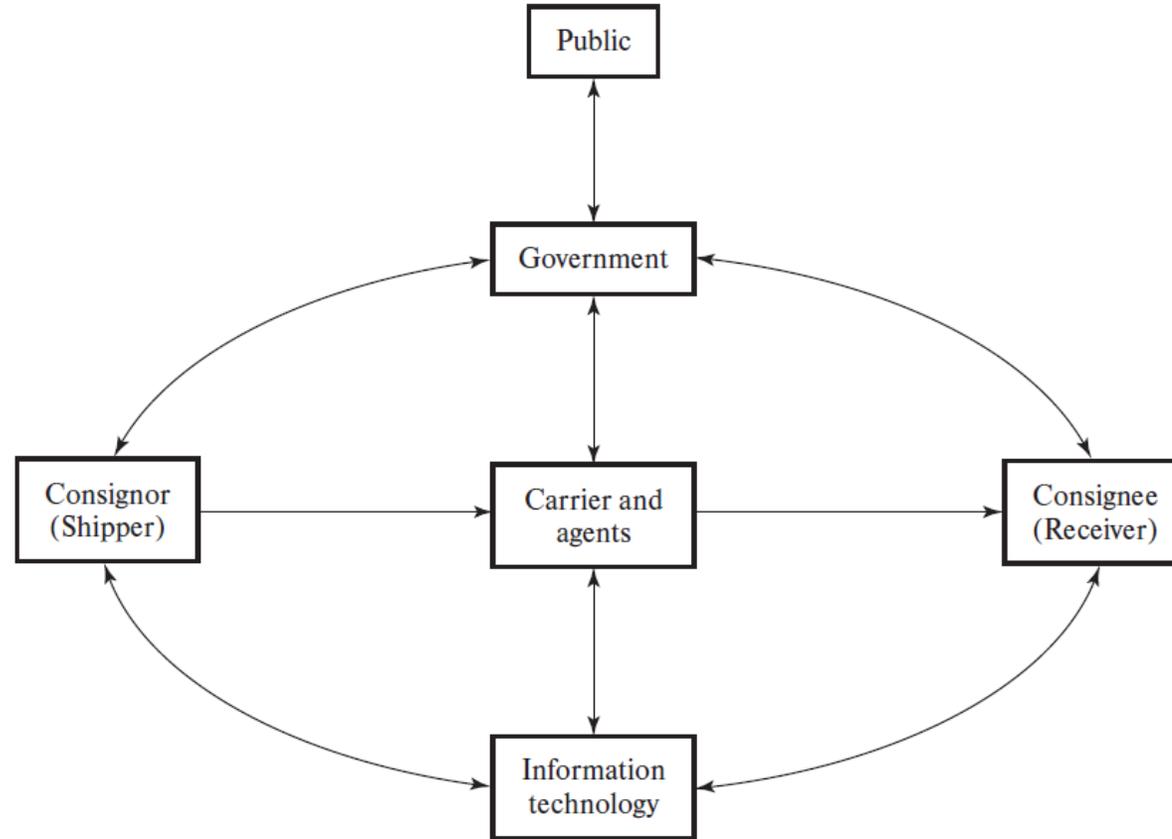
The value of transportation is far greater than simply moving products from one location to another

Two Functions of Transportation



Stakeholders

FIGURE 8.1
Transportation
Participants



Stakeholders

Shipper (provider of goods) and Consignee (recipient of goods)

- Success is determined by moving the goods from origin to destination within a specified timeframe at the lowest possible costs

Carrier and Agents

- Carriers perform transportation services
- Transport agents (brokers and freight forwarders) facilitate carrier and customer matching

Government

- Desires a stable and efficient transportation environment to support economic growth

Stakeholders

Information Technology

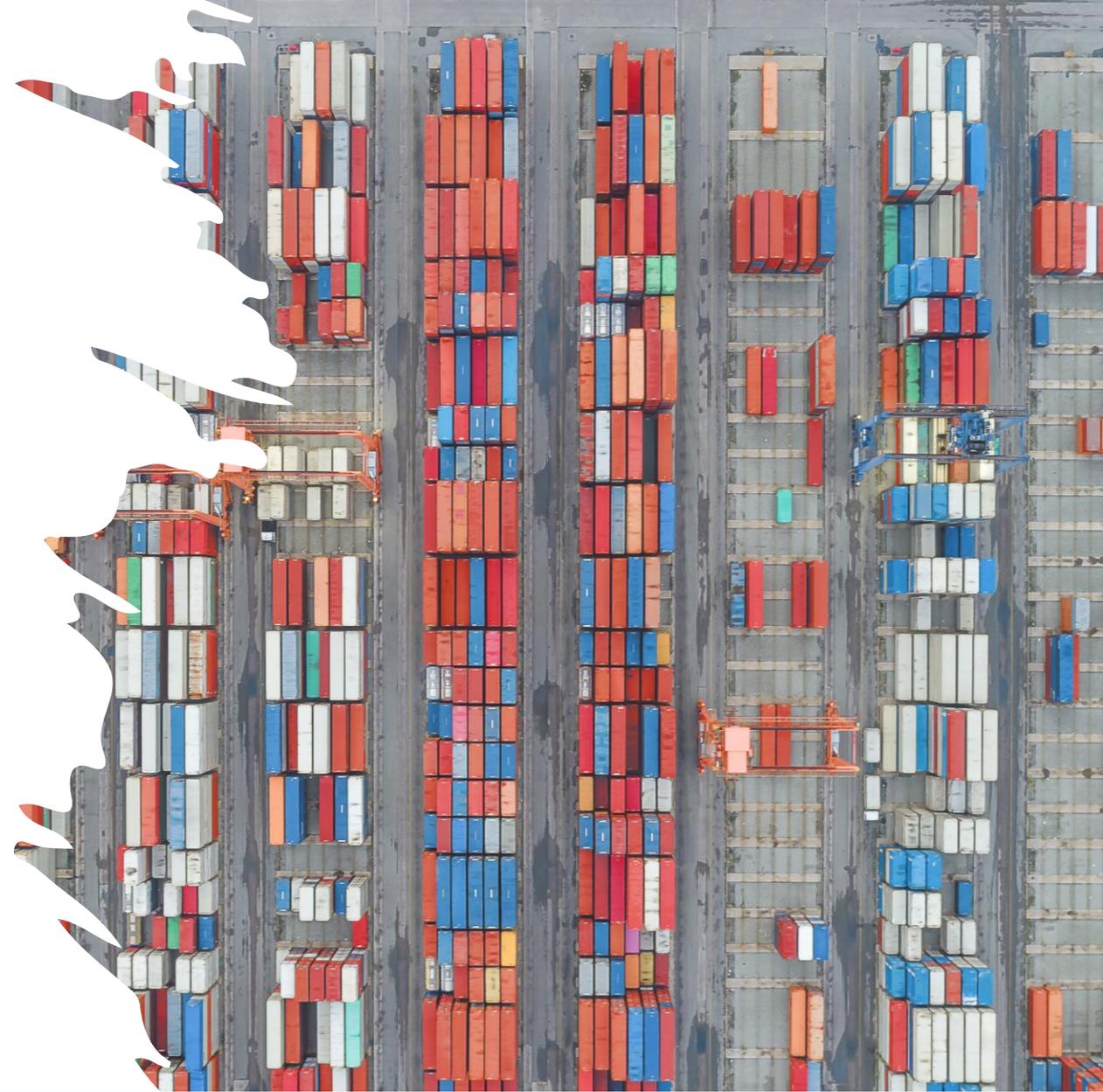
- Information technology services allow carriers to share real-time information within their company and their customers

Public

- The public is concerned with transportation accessibility, expense, and effectiveness, as well as environmental protection, security, and safety

Special Intermediaries

- **Freight Forwarders:** Consolidate smaller order quantities from multiple companies into one larger order to gain better economies of scale.
 - <http://www.sinotrans.com/col/col3903/index.html>
- **Shipper Association:** Similar to a freight forwards but a non-profit company. Companies working together in order to consolidate smaller orders (usually similar industries)
 - <https://www.crsalog.com/>
- **Brokers:** Help to match consigners to consignees



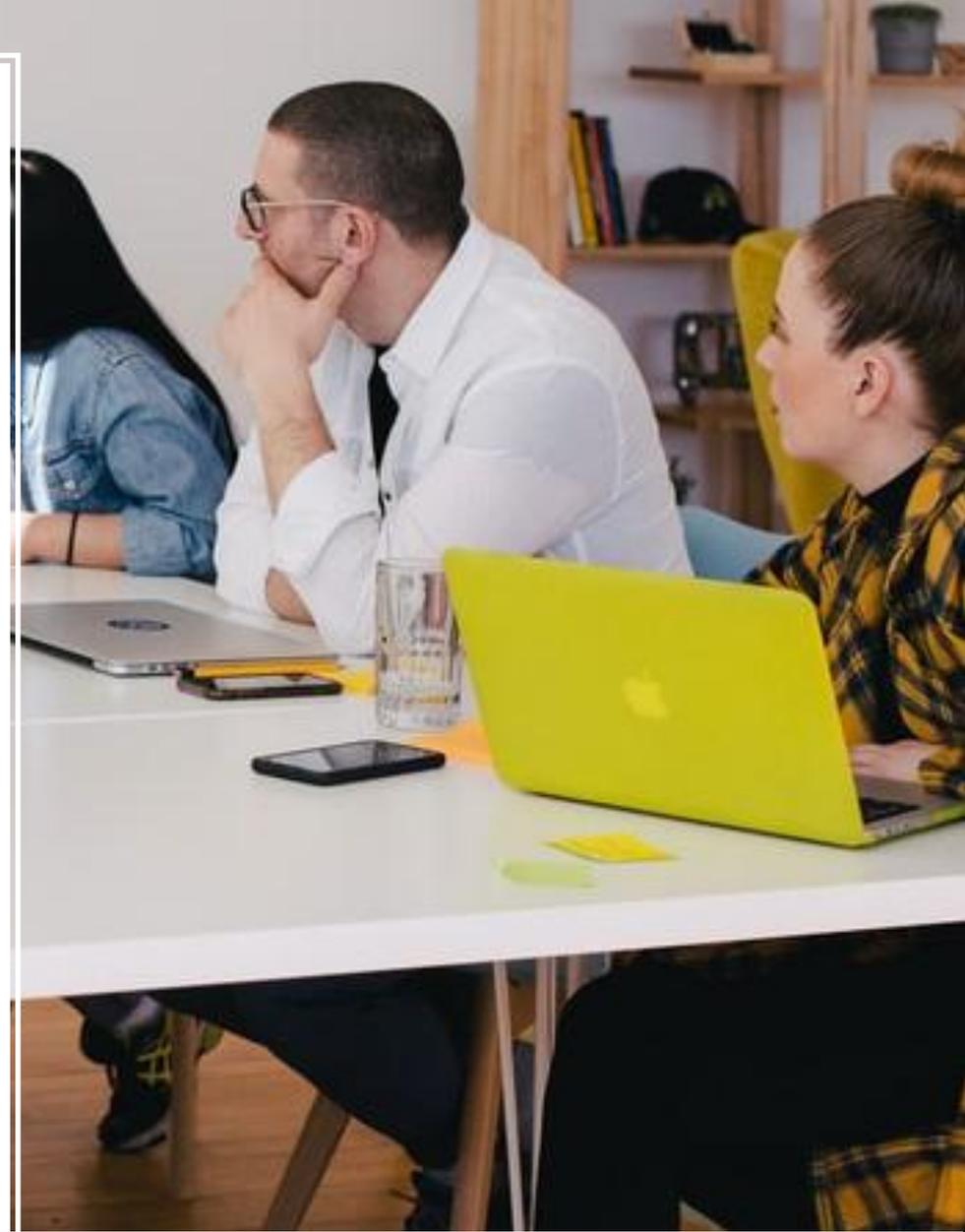
Different Modes of Transportation

Overview of transportation in Canada and the 5 main modes

Activity: Transportation Rankings

Rank different modes of transportation (rail, truck, water, pipeline and air) from 1-5 in terms of the following categories (with 1 being the best and 5 being the worst)

- Speed
- Availability
- Dependability
- Capability
- Frequency
- Composite score



Ranking Transportation Modes

Operating Characteristics	Rail	Truck	Water	Pipeline	Air
Speed	3	2	4	5	1
Availability	2	1	4	5	3
Dependability	3	2	4	1	5
Capability	2	3	1	5	4
Frequency	4	2	5	1	3
Composite Score	14	10	18	17	16

Consider: Geography of Canada



<http://ontheworldmap.com/canada/>

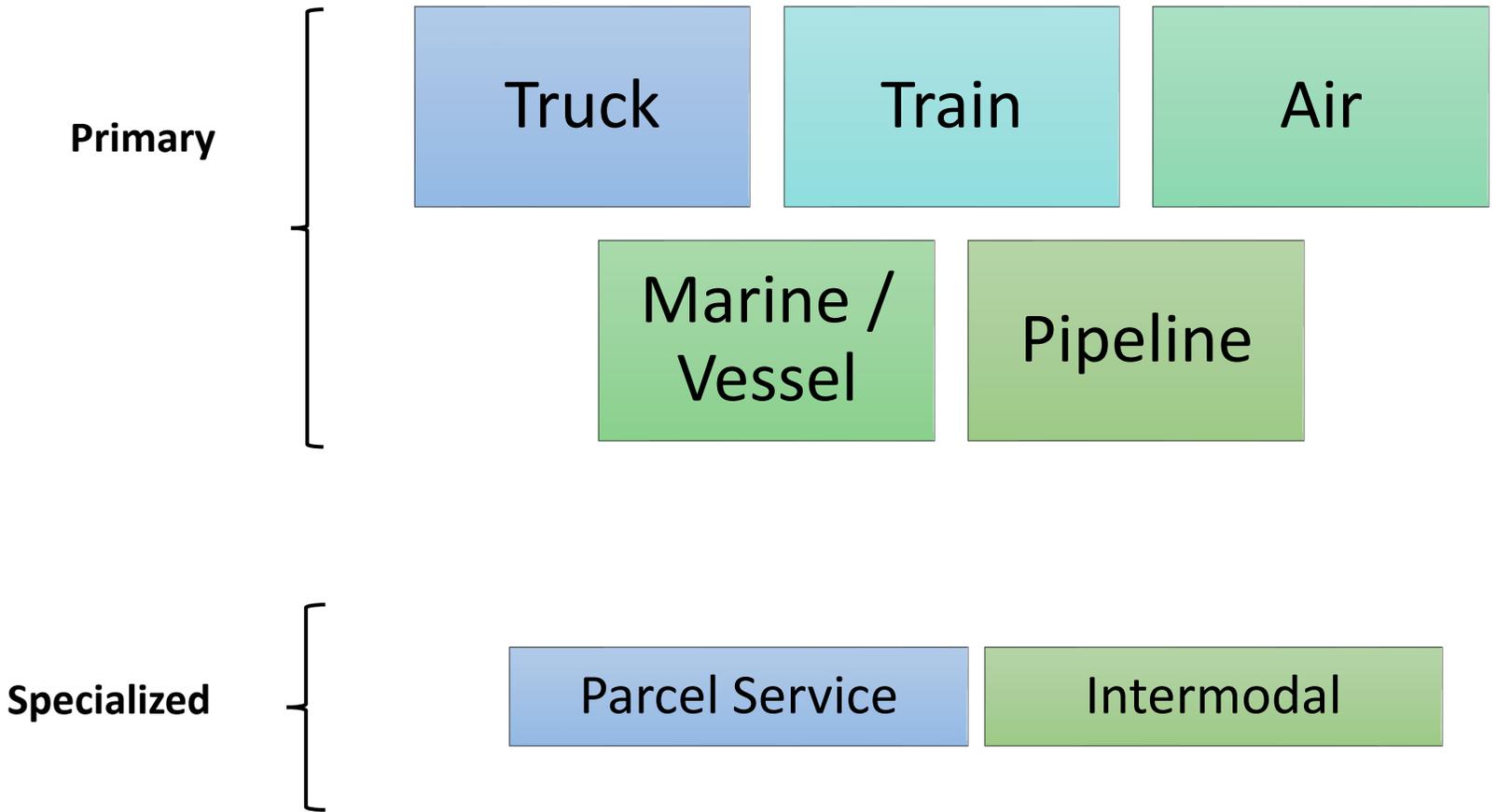
Transportation in Canada

- Transportation services accounted for \$68.5 billion or 4.2% of GDP in 2014. Almost 1 million employed across all segments
- The federal government is responsible for international transportation (imports and exports) and interprovincial (between Canada's 10 provinces and 3 territories) transportation.
- Government and policy changes trending towards deregulation and increased emphasis on international trade. Air Canada and CN were privatized. Several other crown services in transportation are trending towards privatization.
- Safety, security (especially in air travel), environmental concerns



Major Corridors in North America

Transportation Modes



1. Truck Transportation

Pros

- Fast and cost-effective over short distances
- Ability to provide a door-to-door service

Cons

- Expensive and takes more time over long distances
- Capacity is limited
- Labour shortage in Canada
- Impacted by weather and traffic



https://www.youtube.com/watch?v=QlPrAKtegFQ&ab_channel=WendoverProductions

1. Truck Transportation

- 1.3 million two-lane equivalent lane-kilometres of public road, including 38000 kms of national highway
- Difficult terrain in Canada
- Major labour shortages in Canada (and USA)

Less-than-truckload (LTL)

- Shipments of about 70kg to 4500kg
- Does not fill an entire truck
- ABF Freight, FedEx Freight, UPS Freight

Truckload (TL)

- Shipments greater than 4500 kg
- Tends to move directly from the shipper to the consignee's location
- J.B. Hunt, Swift Transportation, Werner Enterprises

2. Train Transportation

Pros

- Cost effective and relatively fast over long distances
- Can carry large quantities
- Environmentally-friendly

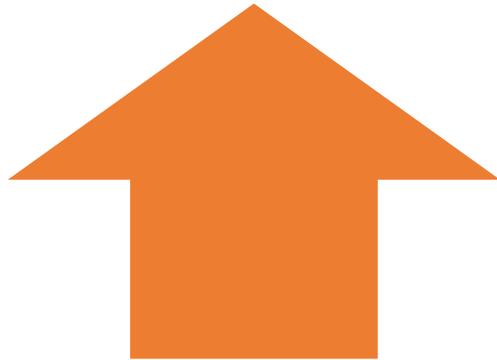
Cons

- Not effective for short distances
- Requires track infrastructure



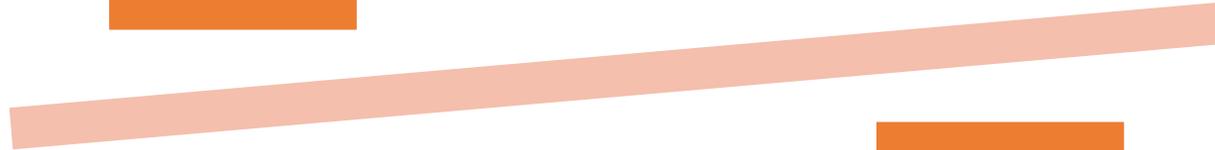
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3. Air Transportation



Pros

- Fastest mode of transportation
- Very safe (reduced damage potential)



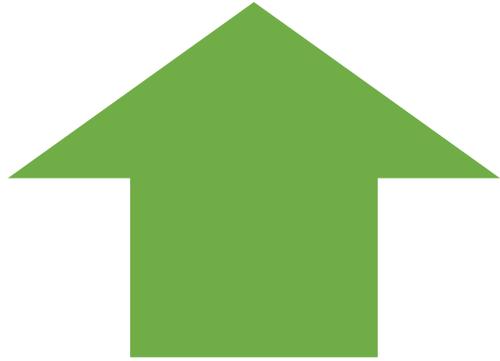
Cons

- Weight and size limitations
- Cargo type limitations
- Very costly
- Limited schedules
- Least environmentally-friendly option



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4. Marine/Vessel Transportation



Pros

- Cost effective over large distances
- Very large capacity



Cons

- Takes a very long time
- Limited schedules
- Weather concerns (damage potential)



https://www.youtube.com/watch?v=8d5d_HXGeMA&ab_channel=WendoverProductions



5. Pipeline

- Used for chemical, gas, and liquid transportation over longer distances
- Good option for transportation in remote areas
- Requires significant infrastructure
- After the initial investment, it becomes a very cost-effective transportation method



5. Pipeline

- Keystone Pipeline is one of the most well-known oil pipeline systems in Canada and the US
- It was initially designed to transport tar sands oil to the market
- TC Energy terminated the project in June 2021, due to its many controversies
- For more information:
 - How the Keystone XL Pipeline Got (So) Political | The New York Times (2015)
<https://www.youtube.com/watch?v=pK8KhiSLcH8>

Infrastructure Statistics in Several Other Countries

Table 12.1 Infrastructure Statistics in Several Countries

	Brazil	China	Germany	Nigeria	United States
Airports ^a	7	71	14	10	189
Highway (paved)	212,798 km	3,453,890 km	645,000 km	28,980 km	4,304,715 km
Pipeline (oil)	4,831 km	23,072 km	2,826 km	4,441 km	240,711 km
Broad gauge (1.676 meters) rail	5,822 km	100 km			
Standard gauge (1.435 meters) rail	194 km	190,000 km	43,209 km	293 km	293,564 km
Narrow gauge (1.000 meter) rail	23,341 km	670 km	220 km	3,505 km ^b	
Water (inland)	50,000 km	110,000 km	7,467 km	8,600 km	41,009 km

^aNumber of paved runways over 3,047 meters (approximately 10,000 feet).

^bgauge = 1.067 meters

Parcel Service

- Canada Post is a crown corporation since 1981
 - Traditionally carriers of significant size, capability, and influence (FedEx, UPS)
 - Impact as E-commerce has grown
 - Highly specialized services with significant flexibility
- Also offered by Purolator, FedEx, and UPS throughout Canada (and many other small, regional carriers)
- You can find their rates through:
<https://www.canadapost.ca/cpotools/apps/far/business/findARate?execution=e1s1>

Intermodal Transportation

- Combines multiple modes of transportation into a single service the customer, allowing them to gain the advantages of several modes of transportation within a single shipment.
- Based on **TOFC** (Trailer on a Flatcar) and **COFC** (Container on a Flatcar)
- CN offers intermodal services: <https://www.cn.ca/en/our-services/intermodal/>

Containerization

- Intermodal transportation is based on containerization
- Standard sizes are 8 feet x 8 feet; length is either 20 or 40 feet (ISO). Truck trailers can be up to 53 feet long.
- **Land Bridge:** Using land transportation to bridge two marine routes (North America is often used as a bridge from Asia to Europe)

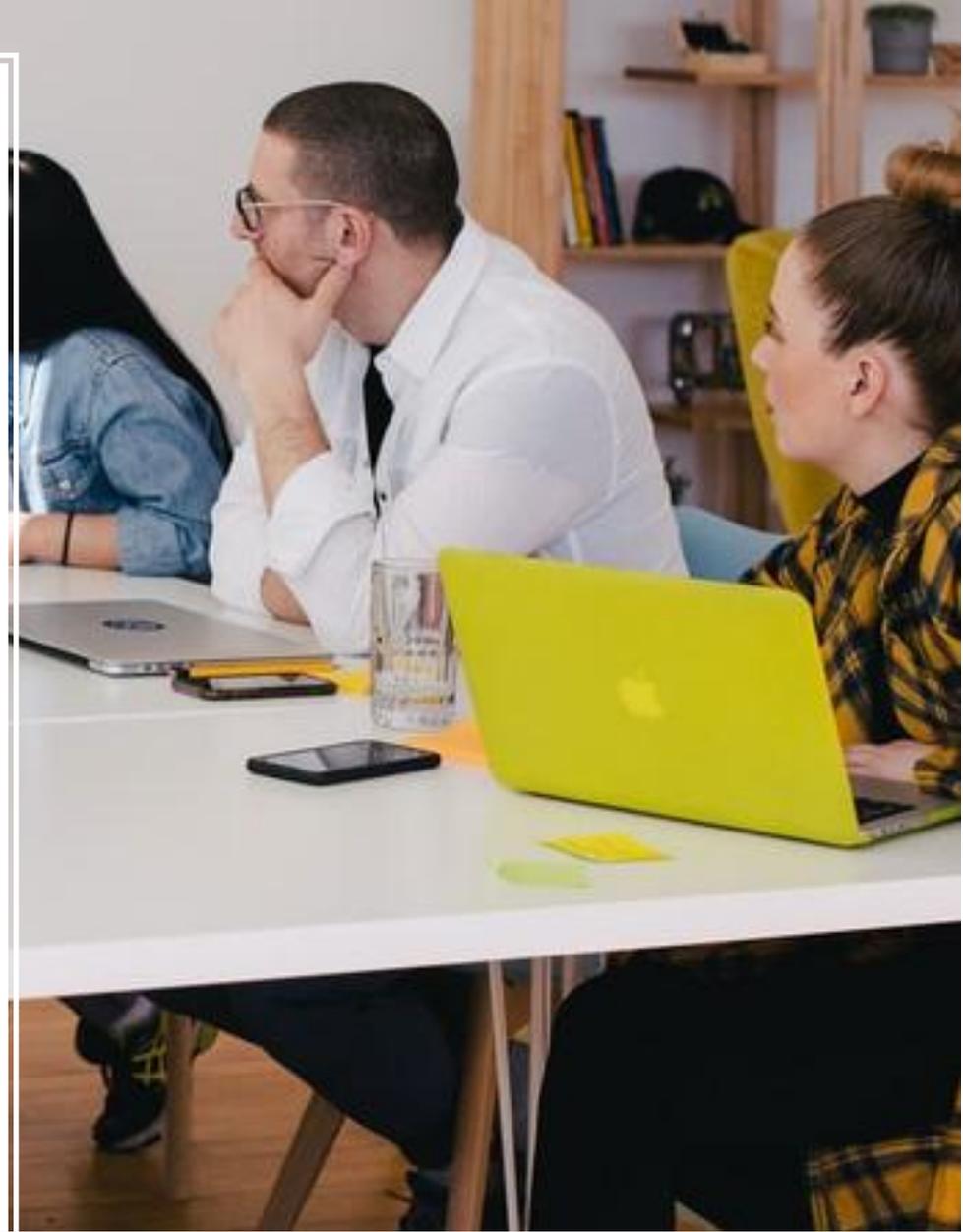


Activity: All about the shortages

You may have heard about the issues surrounding a global shortage of goods. Watch this video to help you understand what's going on.

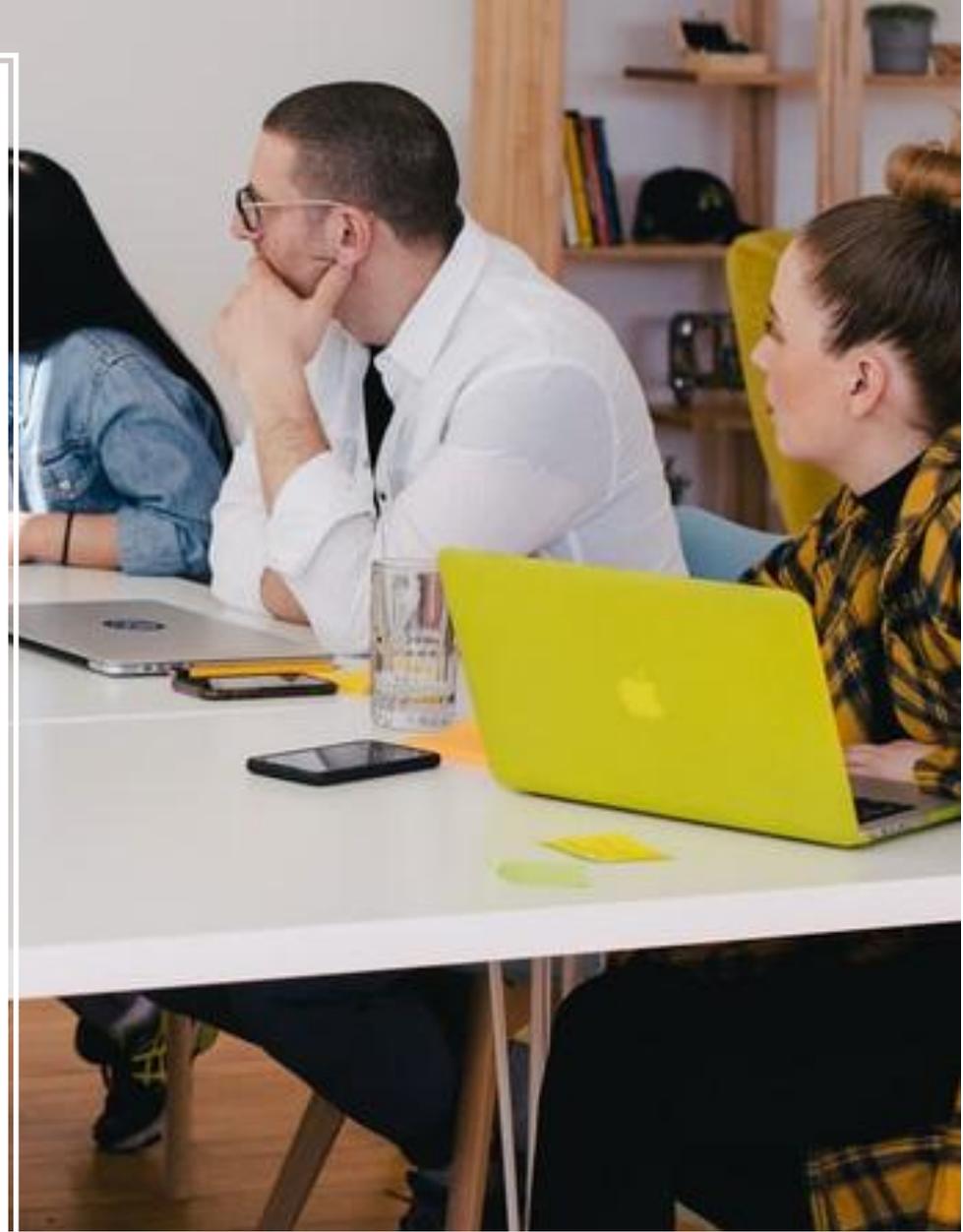
Why there are now so many shortages (It's not COVID)

- <https://www.youtube.com/watch?v=b1JIYZQG3II>



Project: Modes of Transportation

For your project, find out what modes of transportation are possible for your goods. What are the pros and cons of each mode?



Extra Resources (Videos to watch)

- How overnight delivery works

<https://www.youtube.com/watch?v=y3qfeoqErtY>

- How commercial airlines choose routes

<https://www.youtube.com/watch?v=E3jfvncofiA>

- How marine shipping works

<https://www.youtube.com/watch?v=DY9VE3i-KcM>



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