

# TRANSPORTATION – An integral part of Supply Chain

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Transportation is an integral part of supply chain. It is a process or method to move people or goods from one place to another. The Oxford dictionary defines it as;

*‘The action of transporting someone or something or the process of being transported’*

This definition is more general in terms of movement of anything from one place to another. In broad terms, it covers movement of all kinds i.e. people, trade items, goods, animals, liquid, online selling items etc.

For businesses, it is important to understand and adapt the most feasible transportation method in order to avoid negative impact on the business. It correlates with the main concept of supply chain i.e. responsiveness vs. efficiency. A short elucidation of these terms are as follows;

## Supply Chain Responsiveness vs. Efficiency

- Supply chain responsiveness – ability to;
  - ✓ respond to wide ranges of quantities demanded
  - ✓ meet short lead times
  - ✓ handle a large variety of products
  - ✓ build highly innovative products
  - ✓ meet a very high service level
- There is a cost to achieving responsiveness
- Supply chain efficiency: cost of making and delivering the product to the customer
- Increasing responsiveness results in higher costs that lower efficiency

Source: \*1

Hence, transportation is a process to move the product between stages in the supply chain. It has a great Impact on responsiveness and efficiency of a business, selecting faster transportation allows greater responsiveness but lower efficiency. It effects inventory and facilities also.

If responsiveness is a strategic competitive priority for a business over others, then faster transportation modes can provide greater responsiveness to customers who are willing to pay for it. Businesses can consider slower transportation modes for the customers whose priority is price (cost). There is a possibility to consider both inventory and transportation to find the right balance.

The courier services like Fed-ex, DHL, ARAMEX etc. are good examples. These are complete logistics organizations; and not only courier delivery service. The traditional postal service

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organizations get tough competition from them. Many postal services have groomed themselves to provide cargo services to improve their service and customer retention by keeping the right balance between responsiveness and efficiency.

## *Mode of transportation*

There are multiple modes of transportation available to cater the market needs;

1. Rail – inexpensive for large quantities
2. Road/Truck – quick & inexpensive, flexibility
3. Air – most expensive, very fast
4. Water – slowest, economical for large overseas shipments
5. Pipeline – transport of oil, gas, and water
6. Digital – music, books etc.
7. Intermodal – combination of modes

### **1. RAIL**

It is one of the inexpensive mode of transportation, it requires initial high fixed cost in infrastructure development but when operational it becomes very reliable mode of transportation.

Rail mode is very much economical in the regions where large areas of land are connected from rail network like most of the Europe, USA and Canada.

Canada is stretched far-flung in terms of land, reaching from one end to another sometimes requires days by land transport. The Rail system helps a lot to agriculture industry in Canada. The West part of Canada is more agriculture land, which requires good transportation system to move related products like grains, corn, etc. to the processing units and the other provinces in huge quantities.

The regions like Gulf Cooperation Council (GCC) which comprises of six countries including Saudi Arabia, UAE, Qatar, Bahrain, Kuwait and Oman, has started to develop the rail network within their countries and connecting each other for their long term vision for greater cooperation and high volume trade among themselves.

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ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"><li>• Good for high weight/high bulk items</li><li>• Rates may be negotiated</li><li>• Fast routes between centres – sometimes can be direct to user via own railhead</li><li>• Environmentally friendly</li><li>• Channel tunnel permits delivery to Europe without transshipment</li><li>• Not so badly affected by weather</li><li>• Relatively high security</li><li>• Need to consider packaging carefully</li><li>• Multimodal, specialized</li></ul>	<ul style="list-style-type: none"><li>• Most train journeys need some form of transshipment.</li><li>• Time from origin to destination may be long particularly if delivery by road to the departure point and from the destination is required</li><li>• Rail gradients can cause problems for heavy loads</li></ul>

Source: \*2

## 2. ROAD / TRUCK

Truck is another mode of land transportation. It may be a little expensive than rail but offers huge advantage of shorter delivery time and small packages delivery mode like door-to-door delivery.

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"><li>• Distances of 500 km or less, road is generally less expensive, most flexible and quickest mode.</li><li>• Currently, only costs of using roads are excise duty, fuel tax and highway tolls.</li><li>• Less packaging requirements</li><li>• High security, under control of one driver, door-to door basis, vehicle easily monitored.</li><li>• Multimodal, specialised</li></ul>	<ul style="list-style-type: none"><li>• Low load capacities, compared to other modes of transport.</li><li>• High environmental costs – air pollution, noise etc.</li><li>• Larger trucks, due to weight restrictions, have to run part empty.</li><li>• Victim of own success</li></ul>

Source: \*2

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## 3. AIR

Airlines are one of the fastest mode of transportation. It carries both passengers and cargo. It has high fixed cost in infrastructure developments including planes, airports, trained and professional staff, equipment etc. Due to the privatization of most of the airlines, they are now pure commercial companies, hence, having tough competitions from competitors. There is a price war going on currently, in order to get bigger share of the market. This completion is healthy for the customers who depends on the air transportation in terms of travelling or cargo movement.

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"><li>• Speed</li><li>• Fixed cost of airfreight is low compared with rail, water and pipeline</li><li>• Good for high value items and perishables</li><li>• Air transport availability has created entirely new industries</li><li>• Facilitates JIT, if items are foreign sourced</li><li>• High security method. Crating only needed for delicate items</li><li>• Less packaging required</li><li>• Insurance rates may be reduced</li><li>• Multimodal and specialised</li></ul>	<ul style="list-style-type: none"><li>• Cost – expensive but consider any trade-offs</li><li>• Restrictions on size and weight of goods carried and availability of aircraft</li><li>• Global freight operation</li><li>• Airport storage is expensive</li><li>• Environmentally, not so friendly – noise and gaseous emissions</li></ul>

Source: 2

## 4. WATER

Water Transport is the slowest mode of transportation for commercial activities. It has certain limitation by its nature, in terms of movement of shipping carriers. The sea shipping is the main course, and there are some regions which use In-land waterway transit system.

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## Sea freight transport

<b>ADVANTAGES</b>	<b>DISADVANTAGES</b>
<ul style="list-style-type: none"><li>• Relatively low cost</li><li>• Very high capacity</li><li>• Continuous operation</li><li>• Not so affected by adverse weather</li><li>• High security, especially for containers</li><li>• Multimodal, specialised</li></ul>	<ul style="list-style-type: none"><li>• Low speed, difficult to expedite</li><li>• For non-container goods, time spent on loading and unloading goods can be disproportionate to the journey time</li><li>• Services possibly less frequent</li><li>• Need to pay attention to packaging requirements</li><li>• Need to consider nature of goods i.e. effect of extremes of temperature</li><li>• May require more than one mode of transport</li><li>• Piracy on the increase</li></ul>

Source: \*2

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## Inland water freight

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"><li>• Good for high volume/high weight</li><li>• Uses high capacity vessels – can create barge trains</li><li>• Shallow draft water has been shown to be the most energy efficient manner of freight transportation for bulk materials</li><li>• Fewer accidents than road or rail</li><li>• Seldom is there congestion</li><li>• Environmentally friendly</li><li>• Can have own delivery point at the side of factory, if factory is located on waterway</li></ul>	<ul style="list-style-type: none"><li>• Uneconomic for small loads</li><li>• Speed is slow</li><li>• Specialised loading and terminal facilities are essential</li><li>• Possible need for more than one method of transport, if factory is not adjacent to waterway</li></ul>

Source: \*2

### 5. PIPELINE

Pipeline is used for the transport of oil, gas and water. It is one of the most reliable mode of transportation for such kind of products. There are a lot of successful operations worldwide effectively utilizing pipelines transportation for crude oil from one country to another, sometimes across continents.

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ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"><li>• Underground pipelines are safe, cost effective, efficient and environmentally desirable</li><li>• Systems can be fully automated and do not interfere with human movement</li><li>• Pipeline systems are closed and can be operated regardless of weather conditions</li><li>• Pipelines are cheap to operate</li></ul>	<ul style="list-style-type: none"><li>• High initial cost of pipeline construction</li><li>• Disturbances during construction</li><li>• Pneumatic pipelines have low efficiency</li><li>• Inflexibility especially if goods have to be increased in quantity</li><li>• Over ground pipelines may be open to sabotage</li></ul>

Source: \*2

## 6. DIGITAL

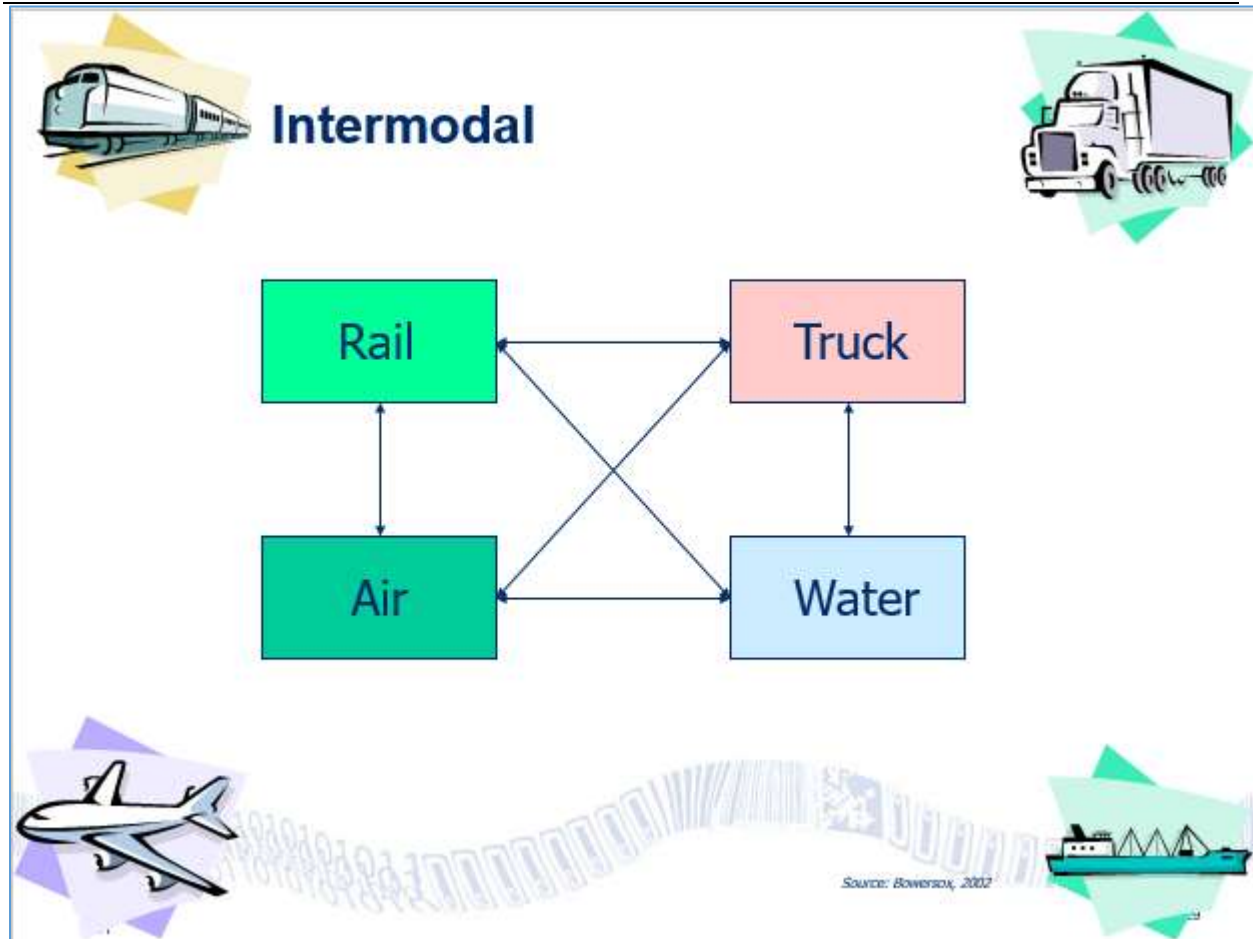
With the advent of internet in trade and commerce for almost 2 decades, Digital communication has revolutionized the way of boundary-less trade. It has been proven highly effective business model for many organizations. It carries low fixed cost, fast delivery time and inexpensive method of delivery. The trade items may include music, e-books, movies, live transmission broadcast etc.

## 7. INTERMODAL

Intermodal mode of transportation is defined as the shipments that employ more than one mode in a single through movement from origin to destination. The combination may vary among Rail –Truck, Truck – Air, Truck – Water etc.

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## REFERENCES

\*1: Supply Chain Management, Strategy, Planning and Operation, 4th Edition

\*2: Lycos

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