UNIT-6 Transport Management

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Learning Outcomes

By the end of this unit the learner will be able to:

- ✓ Discuss the Transport Rate in the Context of Transport Management.
- ✓ Describe the kinds of transport used in supply chains

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Unit 9

Introduction

TRANSPORT is concerned with the physical flow of materials between various points in the supply chain.

Transport Rate

If a business uses third-party transport, the value of moving a unit of material between locations is the **rate** or **tariff**. This is decided by the cost of the service provided, value to the consumer, the distance moved, size, weight, value of goods, and difficulty of journey, etc. This rate is a significant consideration for logistics and this can influence whole patterns of flow.

Comparatively cheap transport also changes the shape of supply chains, as businesses can cover a wider area from a facility. A solo logistics centre can bring materials fast and relatively inexpensively to any destination in Europe. This has supported a lot of companies to replace their nationwide warehouses by regional ones that wrap a wide area.

The rate is evidently important, but service users appear to have little pressure in setting it. A large business negotiating liberally with a transport corporation might have some flexibility. The transport industry is very aggressive, and large consumers can get fine deals. They also have the alternative of running their own fleets if outside operators charge too much. Often, though, the rates are fixed by contract between government policies, transport companies, or monopoly suppliers. Shipping conferences, for instance, quote settled rates between destinations, cartels of main transport operators employ industry agreed rates, and government owned rail and road industries fix prices through their monopoly. Transport is one of the classiest parts of logistics, but users frequently have small control over it.

In practice, businesses do have more control, as they can make a sequence of decisions about the type of transport. What form of transport is best? Should we run our own transport or employ a third-party carrier? What type of vehicles should we use? How do we deal with global transport? What routes should we utilize? Can we back-haul? Every business faces these questions, but they approach to different answers that are based on their particular circumstances.

Mode of Transport

The **mode of transport** explains the kind of transport used. There are mostly five different options – rail, road, water, air, and pipeline. Every mode has diverse characteristics and the best in any particular situation depends on the kind of goods to be moved, distance, locations, value, and a whole variety of other things.

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Rail

Rail transport is most frequently used for weighty and bulky loads over extended land journeys. Trains can uphold a consistent, sensibly high speed and can connect with other modes to take containers and mass freight. Rail services are arranged in diverse ways. They are roughly always public carriers rather than private carriers.

Costs can be decreased by sharing facilities. Some countries have numerous train operators using usually owned tracks, or tracks owned by a new company.

Another benefit of rail is that the unit transport price is low, so it can be used to shift large volumes of comparatively low-priced materials, such as coal and minerals. All train services have to be scheduled in advance, so that they can all fit onto the similar tracks.

A more clear concern is that trains can simply travel along particular routes between fixed terminals, and cannot end at intermediary points. Most consumers are some distance away from these terminals, so they have to move goods by road at both ends of the trip.

The problem of restricted access is widespread to numerous modes of transport, but there are ways of overcoming its effects. The most clear is to place facilities close to rail terminals. If demand is enough, it is worth constructing special facilities. A power station, for instance might find that it is inexpensive to construct a special rail line to a coal mine, than to use trucks.

Road

Road is the most extensively utilized form of transport and is used in about all supply chains. Its main advantage is flexibility, being able to visit about any location. Although the maximum speed on roads is inadequate, this skill to give a door-to-door service avoids shift to other modes and can offer a shorter general journey time.

Road transport has the benefit of being able to use wide road networks. Unlike rail, these already survive, so users do not have to construct and sustain their own tracks. Also, vehicles do not have to keep to such stiff timetables, so they can go on trips at short notice and with slight planning.

Depending on circumstances, road transport can usually carry loads up to, say, 20–30 tonnes. Though, the weight and mass limits mean that the road transport is more often used for smaller loads. These turn out to be relatively costly, so road transport is usually used for shorter distances.

Water

Both rail and road transports have the clear limitation of only being utilized on land. Most supply chains make use of shipping to cross the oceans at some point, and more than 90% of world trade is moved by sea.

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There are fundamentally three kinds of water transport –canals and rivers, coastal shipping and ocean transport.

There are lots of diverse types of vessel for a range of cargoes. Ships get substantial economies of scale, so many aims at moving large loads at low unit costs.

- *General cargo ships* are the typical design, with large holds that take any kind of cargo. Most of these are loaded by crane, though some have side doors that let vehicles to drive on and off.
- *Bulk carriers* take large quantities of inexpensive bulk materials in big holds, such as grain or ores.
- *Tankers* cart any liquid, but by far the main movements are oil, since of the economies of scale, these ships are constructed as big as possible.
- *Container ships* are particularly designed to bear standard containers and their capacity is commonly rated in TEUs (20-foot equivalent units) or FEUs (40-foot equivalent units). A typical container ship carries around 5000 of these, with larger ones carrying 10,000.
- *Ferries* are typically RO-RO (roll-on roll-off) vessels that take road vehicles over comparatively short distances.
- *Barges* are towed at the back of ocean-going tugs. These are utilized for shorter routes where sea circumstances are quite reliable
- *Combination ships* - in addition to the particular ships, a lot of other designs are used, often to let for leading patterns of trade. One helpful mixture is passenger/container, as the passengers are guaranteed priority treatment in ports.

The main disadvantage with water transport is, of course, its rigidity in being limited to suitable ports. One interesting feature of shipping is the sustained existence of conference services. This means that all carriers in a known area agree to charge a universal price and control the frequency of their service.

Air

Because of its little unit costs, water transport is the most general method for international transport. Sometimes, though, its slow speed is intolerable.

There are three major types of operation. The first kind is usual service, where main airlines use the cargo space in passenger aircraft that is not required for baggage. The second kind is cargo service, where operators operate cargo planes on usual schedules. The third type is charter operations, where an entire aircraft is hired for a specific delivery. In common with shipping, airlines have problems getting materials to and from their journeys. There are all kind of facilities situated around main airports for moving materials from sources onto the right planes, and then away from planes and out to consumers. Unluckily, these transfers again take time, and can decrease the benefits of air travel.

Another crisis for airlines is their costs, over which they have very small control. They have a blend of high fixed costs and high variable costs.

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Pipeline

The major uses of pipelines are gas and oil together with the utilities of sewage and water. They can also be utilized for a few other kinds of product like pulverised coal in oil.

Pipelines have the benefit of moving big quantities over long distances. Unfortunately, they have the drawbacks of being slow, inflexible and merely carrying large volumes of particular types of fluid. In addition, there is the vast initial outlay of building committed pipelines. Despite this first investment, pipelines are the cheapest method of moving liquids.

Choice of Mode

Sometimes, the option of transport mode seems clear: if you want to shift heavy items between Singapore and Brisbane you will make use of shipping. For land journeys, a lot of organizations seem glad to put materials on Lorries without much consideration for the alternatives. In practice, the selection of form depends on a diversity of factors. Maybe the major ones are the nature of materials to shift the volume and distance.

Other factors include:

- Value of materials, as costly items lift inventory costs and support faster modes;
- Importance, as even low-value items that would hold up operations need quick consistent transport;
- Transit times;
- Reliability;
- Cost and flexibility;
- Reputation and stability of carrier;
- Security, loss, and damage;
- Schedules and frequency of delivery; and
- Special facilities

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Intermodal Transport

The most excellent option is often to split the journey into stages and employ the best mode for every stage. This is based on many factors like the span of the journey, the comparative costs and the fine of moving between modes. Journeys that make use of quite a few modes of transport are called intermodal.

At the heart of intermodal transport are the arrangements for transferring materials between modes. The plan is to give a nearly seamless journey, and the most excellent way of achieving this is to employ modular or unitised loads.

Containership is also getting popular. More than 70% of freight movements now employ containers.

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Some of the advantages of containerisation are:

- Simplified transport and flow of goods;
- Easier and faster handling;
- Genuine door-to-door service;
- Faster deliveries;
- Reduced loss due to damage, misplacement, and pilferage;
- Reduced packing costs;
- Lower insurance costs;
- Separation of incompatible goods;
- Use of less congested routes; and
- Improved transport encourages trade.

Other Types of Intermodal Transport

A very broad range of materials can be placed into containers, but there are unavoidably some that cannot or are cheaper to transport by other means. These are skeleton truck bodies that can be moved to a rail car, but cannot place the uneven treatment of containers. Another substitute of containers is **Piggy-Back Transport,** where a lorry – or typically just the trailer – is driven onto a train for speedy movement over a longer distance.

Another addition to this thought uses **land bridges.** These are utilized when materials cross land on what is fundamentally a sea journey.

Ownership of Transport

Is it good for a business to run its own transport fleet, to employ public transport, or a blend of the both of them? With transport the more general terms are **in-house** or **own account transport** compared with **third-party transport.**

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Own Account Transport

This has a business using its own transport task force to shift its materials. The most ordinary shape of private transport has big companies running their own fleets of trucks. This has the benefit of flexibility, greater control, closer incorporation of logistics, and easier communications.

Only larger corporations can have enough money, the capital investment and costs of running their own fleet. There are, though, ways of avoiding these costs. Most of the own account fleets are funded by some type of hiring or leasing, which gives a means of obtaining vehicles without having to invest all the capital.

Third-Party Carriers

Specialised transport businesses propose a variety of services to other companies. The benefit of this arrangement is that specialised companies operate the transport, leaving the organisation to think of its core operations.

Most third-party transport is supplied by **Common Carriers.** These are businesses like TNT and Excel Logistics which shift materials on a one-off basis when asked by another organisation. Alternatively, a business can create a lasting relationship with a **Contract Carrier**.

This contract carrier then controls a part of the organisation's transport for some extensive period.

Choice of Ownership

There are numerous factors to think when choosing the most excellent type of ownership.

- **Operating cost:** In diverse circumstances either owning account or third-party transport may be cheaper, and there should be major other benefits prior to an organisation moves away from their cheaper alternative.
- **Capital costs:** Capital is always limited, and even if own account transport appears attractive, a business might find it hard to validate the investment in vehicles. We have mentioned option arrangements for spreading the costs, so this study should be done cautiously before reaching any ending.
- **Customer service:** Organisations must employ transport that provides satisfactory customer service in the finest possible way.
- **Control:** An organisation obviously has larger control over transport – and hence wider operations – if it runs its own transport.
- **Flexibility:** The arrangement and operations of a personal fleet are quite rigid, as you cannot make rapid adjustments to enable changing circumstances.
- **Management skills:** Managing transport wants specialised skills, which are not voluntarily obtainable in even the leading organisation. This gives a sturdy argument for third-party carriers.

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- Large transport companies can maintain the administration teams with specialist skills, awareness and experience of diverse conditions.
- **Recruitment and training:** As well as being the most extensively used, road transport is usually the most labor concentrated. This gives high employ costs. There is also a scarcity of skilled drivers, with a lot of organisations finding it hard to recruit and teach suitable people.

Other Services

A business can pass all its transport issues to a third-party carrier, but there are a lot of other people who can put forward their own specialised services. These can offer the special skills that are not generally obtainable within a single organisation.

- **Common carriers:** As we have observed, these shift materials between two points for any consumer, generally in a one-off delivery using ordinary facilities.
- **Contract carriers:** These recommend transport services, but generally, for a longer time
- **Intermodal carriers:** Traditionally, the carriers have concentrated on one kind of transport, such as shipping lines or road haulers. With the expansion of intermodal transport, various companies offer a wider variety of services and run diverse types of transport. They naturally look after all aspects of a trip between two particular points.
- **Terminal services:** Materials have to exchange from one form of transport to another, or move between diverse operators. These transfers might be done at ports, terminals, airports, or container bases, which are operated by separate organisations.

In this context, you might hear of **Demurrage**. Terminals make money from their throughput, which they desire to be as fast as possible. To push companies to gather their materials punctually (perhaps within a day or two), terminal operators charge demurrage, which is a fine for late collection and storage space.

- **Freight forwarders:** One difficulty with third-party carriers is the cost of moving smaller loads. Unit transport costs drop with increasing amount, and transport now stresses on standard loads, such as a occupied container load. If you merely have sufficient material to fill division of a container, you have the clear choice of leaving unfilled space – but then you are paying to shift the entire container and just using part of it. An option is to employ a freight forwarder. These are people who gather comparatively small loads, and merge them into bigger loads travelling between the similar points. Freight forwarders also offer all the management needed to shift materials through their journey, such as certification, customs clearance, indemnity, and so on.
- **Brokers:** A broker acts as a mediator between consumers and carriers. Efficiently, they look at the goods to be stirred discover the best routes and carriers and talk conditions. There are also specialised brokers who help with particular elements of the journey, such as customs brokers who arrange the documents required for customs clearance.

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- **Agents:** These are as a rule local people who symbolize, say, shipping companies. They give a neighborhood presence and act as mediators between far-away carriers and local consumers, exchanging information, arrangements, and so on.

The following list suggests some specific methods that have been proposed -

1. **Negotiations:** Finding satisfactory routes is so complex, with a lot of subjective factors and people affected, that the most excellent approach is to discuss a solution. This might not give the finest technical answer, but it has the support of everybody concerned.
2. **Adjust Previous Plans:** A lot of routing problems are quite stable, like postmen delivering letters. Then a helpful approach has an experienced router reviewing current circumstances and updating preceding routes to permit for any changes.
3. **Other Intuitive Methods:** These include a variety of methods that utilize the skills, knowledge and experience of routers, who usually employ a series of heuristic rules that have been victorious in the past.
4. **Maps:** Schedulers frequently find it easier to work with some type of diagrams, and the most admired are easy maps of key features. Then schedulers can sketch routes and iteratively develop them.
5. **Spreadsheet Calculations:** Using maps can demonstrate general patterns, but they lose some of the details. An option is to focus on spreadsheet calculations and look at the patterns in the numbers. A general format for this lists the consumers to be visited down the left-hand side and the time periods across the top.
6. **Simulation:** Simulation is one of the most flexible approaches to solving problems. It gives a lively view by imitating genuine operations over a classic period. An option is to simulate the procedure. You use a computer to make some typical features of the trip, and follow progress through the procedure. Rather than watching and timing a consumer being served, for instance, a computer generates usual service times – and any other features that you desire.
7. **Expert Systems:** These specialised programmes attempt to make computers copy the thinking of an expert scheduler. The fundamental skills, expertise, decisions and rules employed by experts are collected in a knowledge base.
8. **Mathematical Models:** Most of the preceding approaches rely, at least to some extent, on the proficiency of a router. More official mathematical approaches offer optimal – or near optimal – solutions with no human intervention.

The most general mathematical approach employs linear programming. These methods are somewhat complicated, so they are normally limited to small problems. If, however, you have a problem where little changes in routes might give important difference in costs, it is surely worth looking at arithmetical approaches.

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Further Reading:

- ✓ John J Liu, (2012), Supply Chain Management and Transport Logistics
- ✓ John Coyle, Robert Novack, Brian Gibson, Edward Bardi, (2012), Transportation: A Supply Chain Perspective
- ✓ J. Kenneth Hazen, Clifford F. Lynch, (2008), the Role of Transportation in the Supply Chain

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