

Unit 1

Introduction to Logistics

In a world which increasingly relies on the division of labor and fragmentation of work flows, goods and commodities need to be transported from their place of origin to their place of consumption or place of use. The span time between the production and the utilization of goods has to be bridged. This is also true for both the people and the information involved in the fragmented work flow and which are available in different locations and at different times within the system. The tasks and activities associated with this within the economic process were first systematically subsumed under the term logistics in mid-twentieth century. Initially, the term emerged in a military context since military systems are characterized by their tendency for concised classification. The European Committee for Standardization CEN (Comite´ Europe´en Normalisation) defines logistics as (European Logistics Association (ELA) (2005), p. 54)

- the planning, execution and control
- the movement and placement of people and/or goods
- the supporting activities related to such movement and placement, within a system organized to achieve specific objectives.”

Here, the term system is to be understood as a dynamic unit of interconnected elements and subsystems, connected with each other in specific relations. These elements and subsystems form the system structure and – by virtue of their interaction with each other – result in the system behavior. The defining characteristic of a system is its orderliness.

The purpose of logistics is to plan, organize, coordinate, and implement the bridging of the dimensions of time and space within a system. Logistics is thus one of the most important functions of the economy. This ranges from the procurement of raw materials to their processing and to the delivery of the goods to the end-user.

The central tasks of logistics can be graphically described by the so-called seven R’s (see in Fig. 2.1)

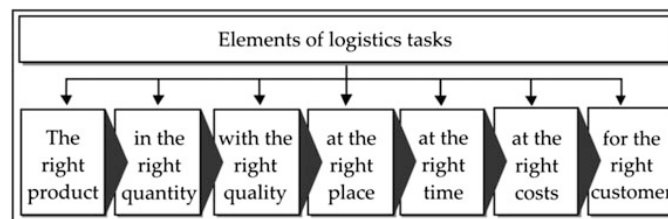


Fig. 2.1 Elements of logistics tasks

(Cf. Klaus 2002, p. 11; Pfohl 1972, p. 28 et seq.; Juñemann 1989, p. 18)

H. Gleissner and J.C. Femerling, Logistics, Springer Texts in Business and Economics,

DOI 10.1007/978-3-319-01769-3_2, # Springer International Publishing Switzerland 2013

Logistics can be defined as the management of the flow of goods, information and other resources, energy and people between the point of origin and the point of consumption in order to meet the requirements of consumers. Logistics involves the integration of information, transportation, inventory, warehousing, material handling, packaging and security. Logistics may have an internal focus (inbound logistics), or external focus (outbound logistics). If the company manufactures a product from parts purchased from suppliers, and those products are then sold to customers, one can speak about a *supply chain*.

WHAT IS LOGISTICS MANAGEMENT?



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Supply Chain can be defined as a network of facilities and distribution options that performs the function of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. *Logistics management* is part of supply chain management. Logistics management plans, implements, and controls the efficient flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements. Successful supply chain operators work in close partnerships with their customers; they jointly explore the opportunities for increasing efficiency of the supply chain and improving service levels by using the latest systems and techniques. This approach is also referred to as *logistics re-engineering*. The re-engineering process considers the following factors: the nature of the product, the optimal or preferred location of source or manufacture, freight and transport costs and the destination market, seasonal trends, import and export regulations, customs duties and axes, etc. A professional working in the field of logistics

management is called a *logistician*. The main functions of a qualified logistician include, among other things, inventory management, purchasing, transportation, warehousing, consultation and organizing and planning of these activities. Logisticians are responsible for the life cycle and supply chain operations of a variety of products. They are also responsible for customs documentation. They regularly work with other departments to ensure that the customers' needs and requirements are met. Today, efficient logistics and transportation system are important prerequisites of the development of any economy.

In modern competitive environment, it is not enough to offer a product that meet customers' requirements. The way of its delivery is also very important. The art and science of delivering goods with speed and precision can help businesses operate more efficiently, lower costs and gain new customers. Logistics has evolved throughout centuries to become an integral part of every business. Logistics has been performed since the beginning of civilization. Raw materials and finished products had always to be moved, though on a small scale. Gradually, people began moving from rural to urban areas; the geographical distance between the point of production and the point of consumption increased considerably. There was a time when companies used to develop a product range, plan their distribution channels, schedule marketing campaigns and deliver the finished product to their retailers themselves. However, since the early 1990's logistics operations have become much more complex. The global logistics market has grown radically over the years. The major benefits of efficient logistics operations can be summarized as follows:

- Cost savings by centralizing inventory management.
- Faster order fulfilment by relying on a global transportation network.
- Improved cash flow.
- Flexibility to change distribution patterns for new products based on ever-changing customer demands.

The main customer groups (market segments) served by the logistics industry are the following:

- Parcel and documents express delivery services.
- Freight by air, ocean, road or rail.
- Warehousing and distribution.
- Supply chain solutions.

Exercise

Match the parts you find under A with the parts under B to make meaningful sentences.

A.

- 1) Supply chain
- 2) Successful supply chain operators
- 3) Service providers
- 4) The re-engineering process considers
- 5) Logistics involves
- 6) The main functions of a qualified logistician include
- 7) Logisticians work with other departments

B.

- a) work in close partnerships with their customers
- b) inventory management, purchasing, transportation, and warehousing
- d) is the ability to ensure that the right products are sourced, made available at the right place and at the right time
- c) the integration of information, transportation, inventory, warehousing, material-handling, and packaging, and security
- e) to ensure customer needs and requirements are met
- f) the nature of the product, the optimal or preferred location of source or manufacture, the projected volumes
freight, etc.
- g) use the latest systems and techniques to re-engineer the process

Unit 2

Key Terms Related to Logistics

What is definition?

1. Discussion:

1. What is definition
 2. When to use definition
 3. Why we need definition
 4. How to define something
-

2. Definition of the word 'definition' (<https://en.wiktionary.org/wiki/definition>)

Pronunciation

- IPA: /ˌdɛfɪˈnɪʃ(ə)n/, /ˌdɛfɪˈnɪʃən/

Noun

definition (*plural definitions*)

1. (*semantics*) A statement of the meaning of a word or word group or a sign or symbol (dictionary definitions).
2. A statement expressing the essential nature of something; formulation
3. The action or process of defining.
4. The act of defining; determination of the limits.
5. A product of defining.
6. The action or power of describing, explaining, or making definite and clear.
Her comic genius is beyond definition.

3. How to write an extended definition

An extended definition is a one or more paragraphs that attempt to explain a complex term. Some terms may be so important in your report, there may be so much confusion about them, or they may be so difficult to understand that an extended discussion is vital for the success of your report. (*Retrieved from <https://www.prismnet.com/~hcexres/textbook/def.html>*)

- Remember that a word doesn't have one "right" meaning
- Classify the term by specifying what classes and parts of speech a word belongs to according to a standard dictionary definition
- Place the concept in relation to other concepts in order to show how the concept is different from other concepts that might be confused with it

- Make the concept clearer by listing and describing its parts, or its subtypes, or its phases of development
- Give only facts, not opinions
- Use simple and familiar terms
- Do not define by repeating the word
- Clarify the concept with enough details, not too small or too large
- Give examples of the term; an instance of the term as it is seen in everyday life to illustrate the meaning
- Use negation to explain what the term does not mean
- Show synonyms, or terms that mean nearly the same thing as the term being defined
- Describe how the thing being defined is used (show its usage) (e.g. A Spoon can be defined as an eating utensil that is used for eating liquids)

4. A formal definition consists of three parts:

1. The term (word or phrase) to be defined
2. The class of object or concept to which the term belongs.
3. The differentiating characteristics that distinguish it from all others of its class

For example:

- **Water** (*term*) is a liquid (*class*) that is made (made) up of molecules of hydrogen and oxygen in the ratio of 2 to 1 (*differentiating characteristics*).
- **Comic books** (*term*) are sequential and narrative publications (*class*) consisting of illustrations, captions, dialogue balloons, and often focus on super-powered heroes (*differentiating characteristics*).
- **Astronomy** (*term*) is a branch of scientific study (*class*) primarily concerned with celestial objects inside and outside of the earth's atmosphere (*differentiating characteristics*).

(Retrieved from <https://owl.english.purdue.edu/owl/resource/622/01/>)

5. Grammatical points: Reduced Adjective Clauses

Study the rules from <http://web2.uvcs.uvic.ca/elc/studyzone/490/grammar/reduced-adjective-clauses-rules.htm>

6. Task:

Write definitions of the following words:

- materials

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- goods

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- freight

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- warehouse

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- distributing centers

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2.2 Definitions of key logistics terms

- **Logistics** is the part of supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements (Council of Logistics Management, 1991).
- **Logistics** is the process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods, including services and related information, from the point of origin to the point of consumption. The goal of logistics is to successfully meet customer requirements. This definition includes inbound, outbound, internal and external movements. Retrieved from:

<http://searchmanufacturingerp.techtarget.com/definition/logistics>

- **Logistics** is generally the detailed organization and implementation of a complex operation. In a general business sense, logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations. The resources managed in logistics can include physical items such as food, materials, animals, equipment, and liquids; as well as abstract items, such as time and information. The logistics of physical items usually involves the integration of information flow, material handling, production, packaging, inventory, transportation, warehousing, and often security. In military science, logistics is concerned with maintaining army supply lines while disrupting those of the enemy, since an armed force without resources and transportation is defenseless. Military logistics was already practiced in the ancient world and as modern military have a significant need for logistics solutions, advanced implementations have been developed. In military logistics, logistics officers manage how and when to move resources to the places they are needed.

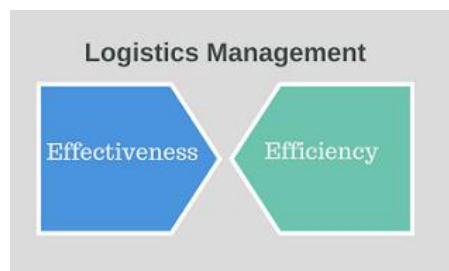
Retrieved from: <https://en.wikipedia.org/wiki/Logistics>

- **Logistics management** is the part of supply chain management that plans, implements, and controls the efficient, effective forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements. A professional working in the field of logistics management is called a logistician. Continue reading at <https://en.wikipedia.org/wiki/Logistics>
- **Logistics management** is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point-of-origin to the point-of-consumption in order to meet customers' requirements. Defined by The Council of Logistics Management (CLM)

- "**Logistics** typically refers to activities that occur within the boundaries of a single organization and Supply Chain refers to networks of companies that work together and coordinate their actions to deliver a product to market. Also, traditional logistics focuses its attention on activities such as procurement, distribution, maintenance, and inventory management. Supply Chain Management (SCM) acknowledges all of traditional logistics and also includes activities such as marketing, new product development, finance, and customer service" - Michael Hugos

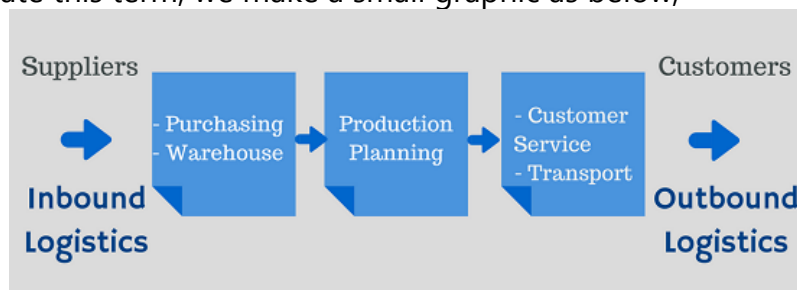


- **Logistics** is about getting the right product, to the right customer, in the right quantity, in the right condition, at the right place, at the right time, and at the right cost (the 7 Rs)" - John J. Coyle et al
- "**Logistics Management** deals with the efficient and effective management of day-to-day activity in producing the company's finished goods and services" - Paul Schönsleben

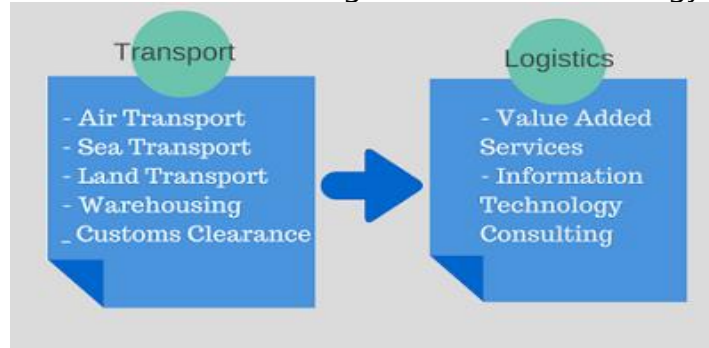


- "**Inbound Logistics** refers to movement of goods and raw materials from suppliers to your company. In contrast, Outbound Logistics refers to movement of finished goods from your company to customers"

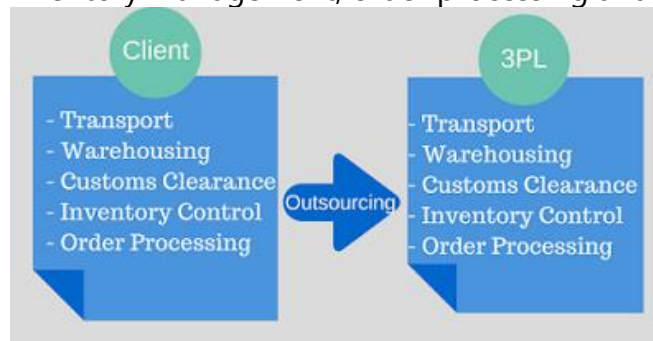
To illustrate this term, we make a small graphic as below,



- "**Transport and Logistics** refers to 2 types of activities, namely, traditional services such as air/sea/land transportation, warehousing, customs clearance and value-added services which including information technology and consulting"



- "**3PL** refers to the outsourcing of activities, ranging from a specific task, such as trucking or marine cargo transport to broader activities serving the whole supply chain such as inventory management, order processing and consulting."



- "**4PL** refers to a party who works on behalf of the client to do contract negotiations and management of performance of 3PL providers, including the design of the whole supply chain network and control of day-to-day operations"



- **Inbound Logistics** involves the activities of receiving, storing, and distributing raw materials for use in production. It is an integral element of business operations for a manufacturing firm. Inbound logistics services cover all activities required to bring goods from a sourcing location to a warehouse or production plant, such as transportation, inventory, warehousing and materials handling. Receiving and storing raw materials is a big responsibility for manufacturers. Big companies may have separate facilities for storing raw materials. Smaller companies often maintain receiving areas within the plant, in which the manufacturing process takes place. The organizational element of the materials receiving process is important because it significantly affects the efficiency, with which staff can distribute materials. Delays in this process can set back production and cost the company money or opportunities.
- **Outbound Logistics** is the process related to the storage and movement of the final product and the related information flows from the end of the production line to the end user. Outbound logistics focuses on distribution. Shipping, freight and warehousing are all key functions that fall under this category. This also includes communication with recipients and carriers. Inbound and outbound systems share some common activities (e.g. transportation, inventory, warehousing, materials handling). Nevertheless, like inbound systems, outbound systems have some activities that are unique in nature.
- **"Supply Chain** is the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer" - Martin Christopher
- **"Supply Chain Management (SCM)** refers to the coordination of production, inventory, location, and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served" -Michael Hugos
Retrieved from: <http://www.supplychainopz.com/2012/04/what-is-logistics-and-supply-chain-management.html>

SUPPLY CHAIN MANAGEMENT



Suppliers, Producers (Farmers),
Open market, Self-owned



Warehouse



Processors
(Manufacturers)



Distribution



Wholesalers/ Retailers



Consumers



Key Vocabulary

Logistics (N) The detailed organization and implementation of a complex operation.

Ex. They are involved with the communications and the logistics.'

supply chain (N) The sequence of processes involved in the production and distribution of a commodity.

Ex. 'If you want to be able to differentiate your products, the supply chain is critical for that.'

Transportation (N) The action of transporting someone or something or the process of being transported.

Ex. 'The price of oil affects transportation costs, which in turn affect the price of food.'

Inefficient (Adj) Not achieving maximum productivity; wasting or failing to make the best use of time or resources.

Ex. 'inefficient transport systems'

Efficient (Adj) (of a system or machine) achieving maximum productivity with minimum wasted effort or expense.

Ex. 'The more information the system has, the more efficient and effective it will be.'

Effective (Adj) Successful in producing a desired or intended result.

Ex. 'effective solutions to environmental problems'

just-in-time (Adj) Denoting a manufacturing system in which materials or components are delivered immediately before they are required in order to minimize storage costs.

Ex. 'We offer good service with just-in-time deliveries and minimum lead times.'

Distribution (N) The action of sharing something out among a number of recipients.

Ex. 'There cannot be much in it for the producer with all the distribution and retailer costs.'

Outsource (V) Obtain (goods or a service) by contract from an outside supplier.

Ex. 'you may choose to outsource this function to another company or do it yourself'

Handle (V) Feel or manipulate with the hands.

Ex. 'heavy paving slabs can be difficult to handle'

Warehouse (N) A large building where raw materials or manufactured goods may be stored prior to their distribution for sale.

Ex. 'In an attempt to both improve service and cut costs, Amazon decided to build its own warehouses and distribution facilities.'

Storage (N) The action or method of storing something for future use.

Ex. We have large warehouse for storage the goods.

Inbound (Adj & Adv) Travelling towards a particular place, especially when returning to the original point of departure.

Ex. 1. as adjective 'inbound traffic'

2. as adverb 'we have three enemy planes inbound on bearing two ninety'

Outbound (Adj & Adv) Travelling away from a particular place, especially on the first leg of a return journey.

- Ex. 1. as adjective 'an outbound flight'
2. as adverb 'flying outbound'

Manufacturer (N) A person or company that makes goods for sale.

- Ex. 'the manufacturers supply the goods to the distribution centre'

raw material (N) The basic material from which a product is made.

- Ex. 'these seafood could be used as raw material'

Telecommunication (N) Communication over a distance by cable, telegraph, telephone, or broadcasting.

- Ex. 'In place of crystal balls they have given us 'Internet-enabled computing', video conferencing and mobile telecommunication.'

Inventory (N) A complete list of items such as property, goods in stock, or the contents of a building.

- Ex. 'in our warehouse you'll find a large inventory of new and used bicycle'

Control (N) The power to influence or direct people's behaviour or the course of events.

- Ex. 'the whole operation is under the control of a production manager'

Requirement (N) A thing that is needed or wanted.

- Ex. 'choose the type of window that suits your requirements best'

Unit 3

Types of Logistics Services and Logistics Companies

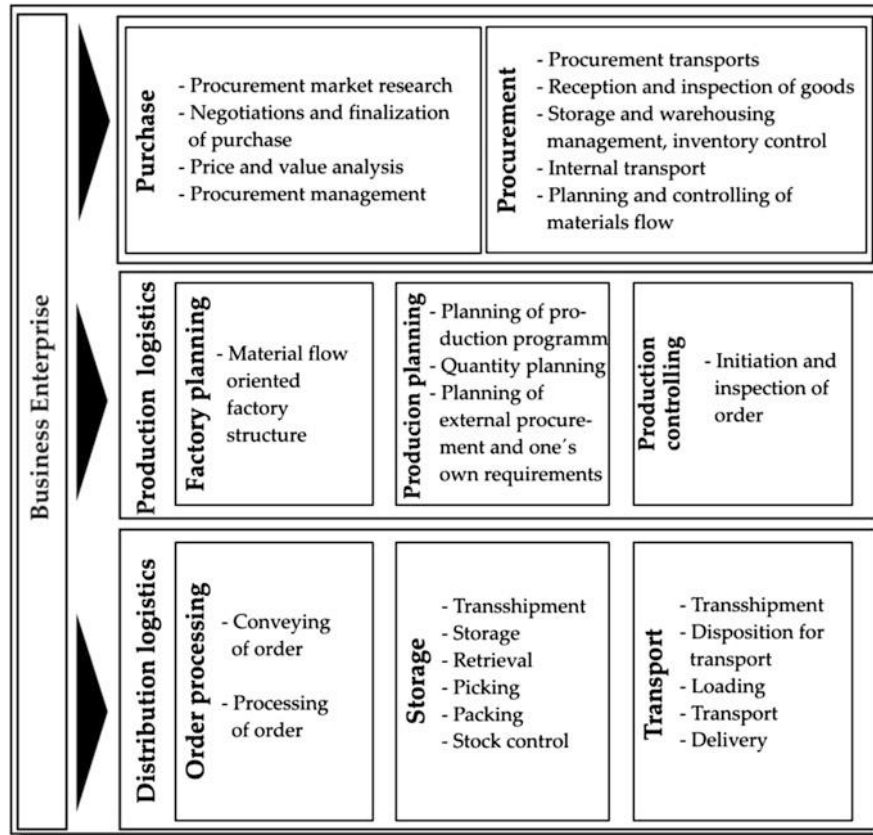


Fig. 2.7 Differentiation of business enterprise (Cf. Schulte 2009, p. 267)

H. Gleissner and J.C. Femerling, Logistics, Springer Texts in Business and Economics,

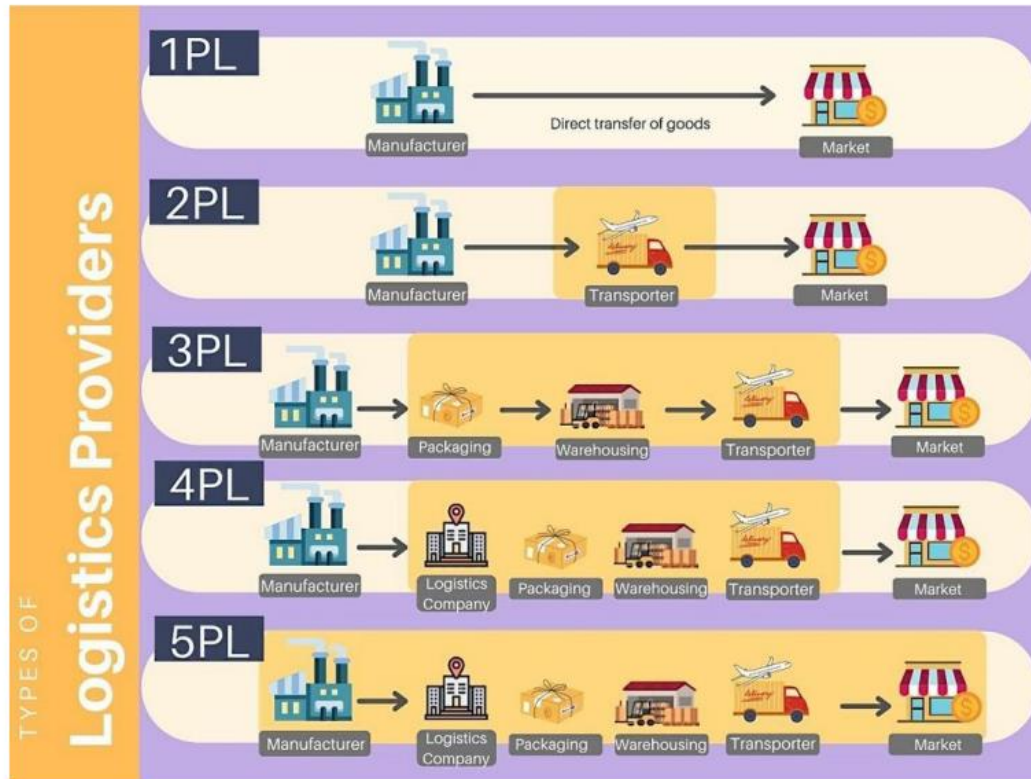
DOI 10.1007/978-3-319-01769-3_2, # Springer International Publishing Switzerland 2013

Service level	Delivery time	Definition: span of time between placing of order by the customer and reception of goods by the customer
		Can be influenced by: - order conveyance and order processing - dispatch and transport - storage site
	Delivery quality	Definition: Fullfilment of customer requirements in relation to the characteristics and composition of the goods
		Can be influenced by: - condition (packing/ loading/ transport) - kind + quantity (order processing/ picking)
Delivery flexibility	Definition: The ability to adapt delivery modalities and product delivery to customer requirements	
	Can be influenced by: - order processing - packing and transport	
Readiness to deliver	Definition: Probability of processing an order within a given time	
	Can be influenced by: - inventory management (availability)	

Fig. 2.8 Determinants of the logistical service level (Cf. Pfohl 1972, p. 177 et seq)
H. Gleissner and J.C. Femerling, Logistics, Springer Texts in Business and Economics,
DOI 10.1007/978-3-319-01769-3_2, # Springer International Publishing Switzerland 2013

Types of logistics Providers

<https://www.shiplilly.com/blog/types-of-logistics-providers-explained-in-plain-english/>



There are various levels of logistics services including 1PL, 2PL, 3PL, 4PL, 5PL, etc. Part of this arrangement is to deal with the complex requirements of the market today. New levels are increasingly being created to deal with business problems in the most efficient way possible. Currently, the most common categories include 3PL, 4PL, and 5PL. However, the entire range is 1PL to 10PL. The first five can be categorized as follows:

1PL — First-Party Logistics

A venture or small enterprise that sends goods or products from one location to another is referred to as 1PL. For example, a farm that transports eggs directly to shopping markets or grocery stores is a 1PL. 1PL companies will have a dedicated fleet of trucks to handle its shipping needs.

2PL — Second-Party Logistics

An organization or enterprise that maintains assets like vehicles or airplanes to transport products from one place to another is a 2PL. In this case, the provider only handles the transportation aspect in the supply chain. Examples of this approach include shipping and trucking companies. The same local farm might hire a 2PL to transport their vegetables, cereals, or eggs from the farm to the supermarket.

3PL — Third-Party Logistics

A 3PL provider offers outsourced logistics services, which encompass anything that involves management of one or more facets of procurement and fulfillment activities. In business, 3PL has a broad meaning that applies to any service contract that involves shipping and storing items. It is common for these providers to lease warehouse space and they also do not own a fleet of trucks. Instead, they outsource these aspects to other carriers for purposes of shipping and freight. A 3PL service, which is popular today with both small and larger businesses, may be a single provider, such as transportation or warehouse storage, or it can be a bundle of services capable of handling supply chain management.

For example, a 3PL provider could be responsible for packaging the vegetables, cereals, or eggs in cartons to add value and then transferring them from the farm to the grocery store or supermarket. Here is another example of how 3PL arrangements operate: A book publisher hires writers, editors and graphic designers to produce publications, but it may not want to handle the consumer ordering process or transportation of book shipments. Instead, the book publisher uses a fulfillment center to process its online orders and hires a trucking carrier to haul its freight. The fulfillment center and carrier both act as 3PL providers. It's possible for a single 3PL provider to fulfill and ship book orders, too. By contracting with a 3PL provider, the book company can use supply and distribution services only when needed, thus controlling costs more effectively while focusing on its core competency of producing books.

4PL — Fourth-Party Logistics (Supply chain management)

4PL refers to a party who works on behalf of the client to do contract negotiations and management of performance of 3PL providers, including the design of the whole supply chain network and control of day-to-day operations. In the 4PL model, a venture outsources the management of logistics activities as well as the implementation throughout the supply chain. This means under this arrangement, the companies do not have any physical assets to be used for moving products. Instead, they play a consulting role in managing the process for their clients. They will contract 3PLs, freight companies, and other companies to deliver the

necessary support. Some clients consider them to be a fulfillment concierge, based on their expertise in assembling and managing an outsourced supply chain. For example, the 4PL may manage the communication with the farmer to produce more vegetables, cereals, or eggs.

5PL — Fifth-Party Logistics

5PL is a rather new model. A 5PL operator is a logistics service provider that plans, organizes and implements logistics solutions on behalf of other commercial entities. It controls all of the operations in a supply chain with the usage of information technology and combines the proven methods of 3PL and 4PL. That is, the provider sources services and negotiates appropriate contracts on clients behalf under this arrangement. Additionally, it negotiates rates with other service providers, like trucks, airlines, etc. The 5PL theory recently gained hype with the popularization of e-commerce. Along with the integration and management of a supply chain, the 5PL organizations provide some other beneficial services, such as call facilities or online payments.

Beyond 5PL

Before the 1980s, it was rare to outsource logistics. Outsourcing started as a response to changing regulations in the industry. The introduction of new technologies also significantly transformed supply chains. This led to the introduction of 3PL, 4PL, 5PL, and other services to meet new needs.

With the development and deployment of artificial intelligence or AI, further changes in the industry were inevitable. Indeed, some are already envisioning 10PL services in the future, yet they have not been operationalized and commercialized.

Grammatical points: Adjective Clauses (relative clauses) in definitions

Study the rules from

<http://web2.uvcs.uvic.ca/elc/studyzone/490/grammar/reduced-adjective-clauses-rules.htm>

1. A venture or small enterprise that sends goods or products from one location to another is referred to as 1PL.

Main clause:

.....

Subordinate or adjective clause:

.....

Sentence 1:

.....

Sentence 2:

.....

2. For example, a farm that transports eggs directly to shopping markets or grocery stores is a 1PL.

Main clause:

.....

Subordinate or adjective clause:

.....

Sentence 1:

.....

Sentence 2:

.....

3. An organization or enterprise that maintains assets like vehicles or airplanes to transport products from one place to another is a 2PL.

Main clause:

.....

Subordinate or adjective clause:

.....

Sentence 1:

.....

Sentence 2:

.....

4. 3PL is a service that allows you to outsource operational logistics from warehousing, all the way through to delivery, and ultimately enables you to focus on other parts of your business.

Main clause:

.....

Subordinate or adjective clause:

.....

Sentence 1:

.....

Sentence 2:

.....

5. 4PL refers to a party who works on behalf of the client to do contract negotiations and management of performance of 3PL providers, including the design of the whole supply chain network and control of day-to-day operations.

Main clause:

.....

Subordinate or adjective clause:

.....

Sentence 1:

.....

Sentence 2:

.....

6. A 5PL operator is a logistics service provider that plans organizes and implements logistics solutions on behalf of other commercial entities.

Main clause:

.....

Subordinate or adjective clause:

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Sentence 1:

.....

Sentence 2:

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Retrieved from:

<http://www.supplychainopz.com/2012/04/what-is-logistics-and-supply-chain-management.html>

<https://bizfluent.com/about-6398422-meaning-logistics-services-.html>

<https://www.tradegecko.com/supply-chain-management/what-is-3pl>

<https://searcherp.techtarget.com/definition/3PL-third-party-logistics>

<https://study.com/academy/lesson/logistics-of-goods-and-services.html>

<https://txemainlogisticsworld.wordpress.com/2010/04/12/logistics-activities/>

<https://www.marketing91.com/logistics-activities/>

<https://medium.com/@arkindia6/brief-overview-of-1pl-2pl-3pl-4pl-and-5pl-6022afdb837>

<https://corporatefinanceinstitute.com/resources/knowledge/strategy/supply-chain/>

<http://thebizlab.info/supply-chain-operations/>

Unit 4

Job Positions Related to Logistics

7 Things You Need to Know About a Career in Logistics

By Callie Malvik on 11/21/2016 3 Comments

A career in logistics – what does that even mean? You probably have a basic understanding of what logistics entails, but that bit of knowledge won't be enough to launch a successful career. Let's start with the basics. Logisticians are in charge of a business or organization's supply chain, so they generally work in supply chain management (SCM). Typical job duties include developing relationships with suppliers, insuring all materials are transported in a timely manner, understanding customer needs and finding ways to minimize the cost of moving goods and materials. Do you like what you hear so far? If you think you'd make a top-notch logistician, here are some facts and expert insight you should hear before getting started.

1. Logistics is a BIG business

Nobody dreams of working in logistics when they're a child. It's not a field that many people are aware of. But the fact of the matter is, it's an industry that plays a HUGE role in our economy. In fact, the U.S. transportation system moved a daily average of about 55 million tons of freight in 2013, which was valued at nearly \$50 billion. U.S. business logistics costs rose to \$1.48 trillion in 2015, which shows the sheer magnitude of this important, yet often overlooked, industry.

2. There aren't enough candidates to fill logistics positions This behind-the-scenes career field is often overlooked by aspiring business professionals. Everyone knows about careers in marketing or finance, but careers in logistics tend to fly under the radar. As a result, employers and recruiters have trouble filling these positions. In fact, the logistics business will be looking to fill roughly 1.4 million jobs by 2018, as stated in a Fortune.com article. The increase in jobs combined with a shortage of qualified candidates means one thing—exciting opportunity for those willing to meet the requirements.

3. Work locations can vary

Logisticians have a lot to do every day, but exactly where do they do it from? There's no standard work setting, according to Rohit Sharma, a 12-year SCM veteran who now runs Perchingtree Inc. Logisticians can work anywhere from a factory setting to an office to a mobile location like a delivery or pickup center. This myriad of possibilities means it's important to ask potential employers exactly what kind of environment in which you'll be working, he advises.

4. It's a high-pressure job

As a logistician, so many other people in SCM will depend on you. It's your diligence and planning that will allow everyone else to do their job, but you may encounter sticky situations when the unexpected occurs.

"Logistics itself is a very challenging area within the SCM domain as most of the points of failure occur during logistics functions," Sharma says. However, SCM is a field with many opportunities and logisticians who earn promotions often have a less stressful position, he says.

5. SCM understanding is crucial

Logistics is an important piece of the SCM puzzle, but it's only one piece. Sharma says the most successful logisticians have a strong understanding of SCM as a whole.

"A lot of challenges occur as people working in individual parts do not know how the parts come together which also causes stress," Sharma says. To combat this, he recommends exploring courses and training offered by APICS, an organization for those in supply chain and operations management, to better understand SCM and the role a logistician plays.

6. It's been dubbed a "Best Business Job"

That's right! U.S. News & World Report ranked logistician number six on their Best Business Jobs list and number 26 on their 100 Best Jobs list. Several factors contribute to these rankings, including median salary, job prospects and stress level. With recognition like this, it's no wonder you're interested in pursuing this profession.

7. Education is an important first step

How can you qualify yourself to help fill the void? By getting educated! We used real-time job analysis software to examine nearly 50,000 logistics job postings from the past year. The data revealed that 76 percent of employers prefer candidates to have a bachelor's degree. The BLS also states that while an associate degree will qualify you for some positions, bachelor's degrees are becoming more desirable due to the increased complexity of the field.

<https://www.rasmussen.edu/degrees/business/blog/things-you-need-to-know-about-career-in-logistics/>

1. Customer Service Representative

Key Duties:

- Receive calls and provide accurate, updated information to customers
- Process orders
- Provide effective after-sales service

Required Skills:

- Fluent in both spoken Mandarin and French
- Excellent interpersonal skills
- Strong problem-solving skills

Career Path:

A successful Customer Service Representative may advance to Customer Service Director or Sales Manager.

2. Purchasing Manager

Key Duties:

- Forecast procurement needs
- Communicate with suppliers
- Track purchasing activity

Required Skills:

- Good negotiation, persuasion and written communication skills
- Effective costs analysis skills
- Familiar with import/export processes

Career Path:

Success as a Purchasing Manager may lead to employment as a Logistics Manager or Materials Controller.

3. Supply Chain Manager

Key Duties:

- Develop customized strategies to provide effective customer services and reduced costs
- Overall responsibility for efficient flow of products from suppliers to customers
- Communication with customers, suppliers and internal parties to ensure smooth operation

Required Skills:

- Familiar with logistics and supply chain management
- Fluent in both spoken and written English
- Minimum 3 years' work experience including handling shipping documents

Career Path:

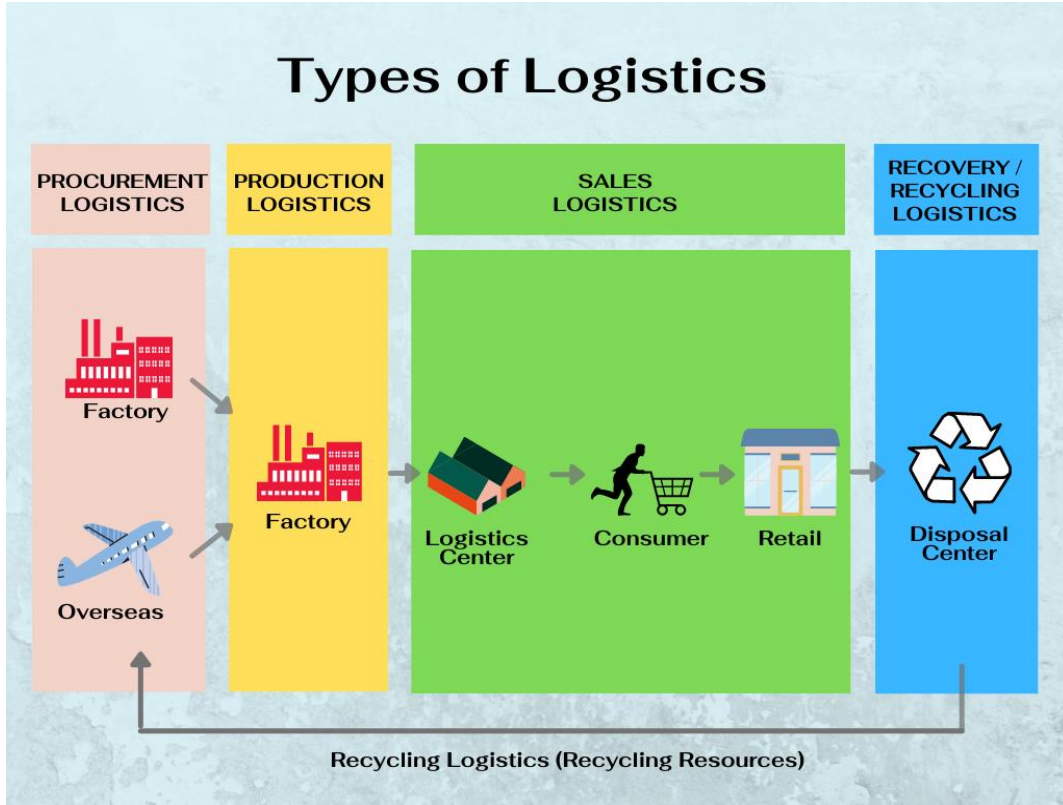
A highly successful Supply Chain Manager may be promoted to Director of Materials Management or Director of Logistics.



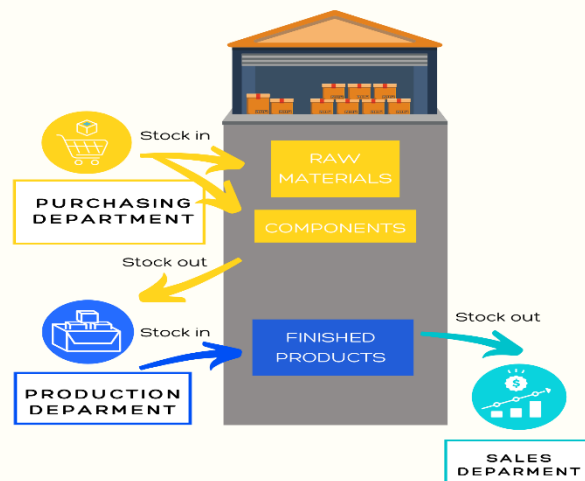
Educational qualification	Must have MBA in marketing
Work experience	Must have prior work experience in marketing & sales
Skills & Knowledge	<ol style="list-style-type: none">1. Must be a good communicator2. Must be able to lead a team.3. Must be able to handle social media like Facebook and Twitter4. Must have strong analytical and problem solving skills5. Must understand business, and be able to come up with innovative products and launch them
Attributes	<ol style="list-style-type: none">1. Should be calm in complex situations2. Can show leadership in managing multiple teams3. Should be emotionally strong

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Unit 5 Inventory Management and Procurement



Inventory Management PROCESS FLOWCHART



INVENTORY MANAGEMENT PROCESS



1

Goods are delivered

**Goods**

2

Good are reviewed,
sorted and stored



3

Inventory levels
are monitored



4

Stock orders
are placed



5

Stock orders
are approved



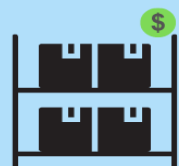
6

Goods are taken
from stock



7

Inventory levels
are updated

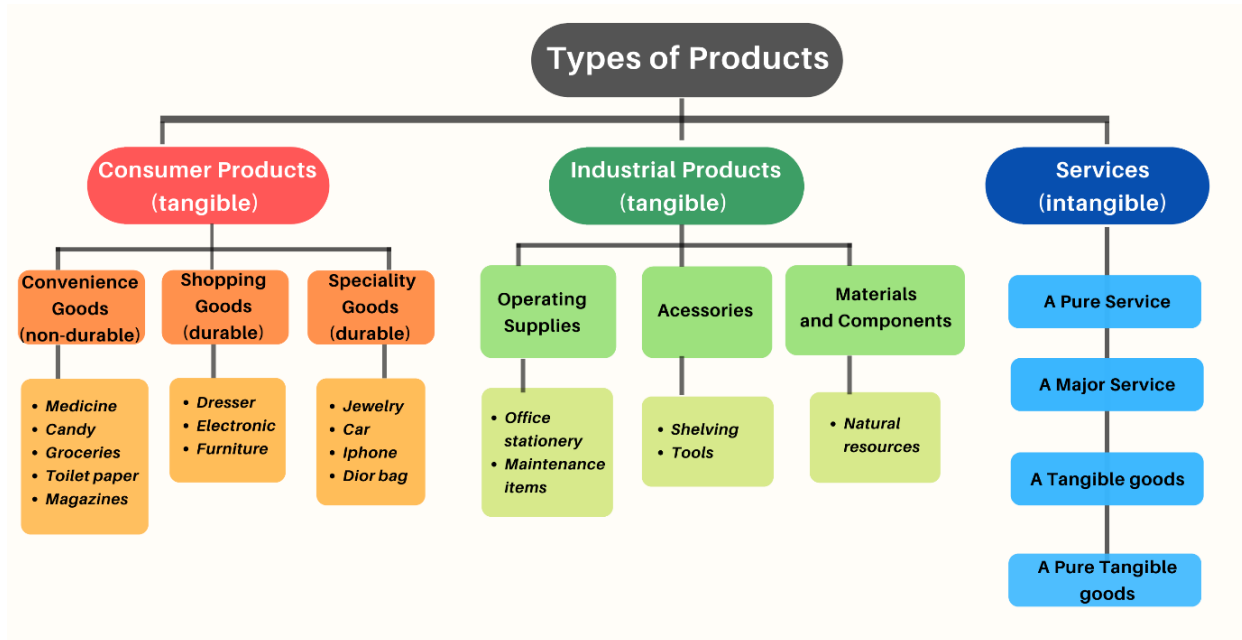


8

Low stock levels trigger
purchasing

Unit 6

Types of Goods



Type # 1.

According to durability, products can be classified into two categories:

1. Durable Products:

The products which are tangible and can be used repeatedly many a times are termed as durable goods. For example- television, refrigerator, clothes, machines, etc.

2. Non-Durable Products:

The products which are tangible and perish within one or few uses are termed as non-durable products. For example- salt, pepper, soap, etc.

Type # 2.

This classification of consumer goods is based on buying behavior or consumer's shopping habits. This types of products can be classified into following categories:

1. Convenience Products:

Goods falling in this group are bought by a consumer purely on the basis of convenience. This means that the buyer purchases these products frequently, and immediately with minimum efforts. For example- newspaper, toothpaste, washing-detergent, cigarette, tobacco, etc.

2. Shopping Products:

The products which customer purchases less frequently and after careful comparison, on the basis of suitability, quality, price and style, are known as shopping products. For example- major appliances, clothing, furniture, cars, etc.

3. Speciality Products:

The term 'specialty' is derived from special that means something unique or distinctive. Goods in this category are highly priced and have brand identification or unique characteristics. For instance, brands such as Rolex watch (heritage), Harris Tweed (hand woven), Rolls Royce (customized), and Montblanc pens (handmade) fall into this category. These goods do not involve comparison because their specialty or uniqueness makes them beyond comparison. These products are pre-sold.

Type # 3.

Those products that are purchased for further processing or for use in operating a business are called industrial products.

1. Farm Products:

Products which are produced on farms and supplied as raw material to different organisations are termed as farm products (e.g. wheat, cotton, livestock, vegetables, fruits, etc.)

2. Raw Materials:

Raw means unprocessed and untreated material. For instance, potatoes, salt, and cooking oil are raw material for a company that produces chips such as Lays and Bingo. Similarly, meat is raw material for a salami maker. Raw material is worked upon and processed for creating end product.

3. Manufactured Products:

Some of the raw materials take the form of manufactured parts or components. For example, car companies use manufactured parts such as tyres, batteries, lamps, and air conditioning assemblies to produce cars. The products which have been manufactured but still, are used as products for further industrial use are known as manufactured products.

4. Capital Items:

Capital items are used in the production process. What sets apart capital items from others is that these are long-term assets such as plant, machinery, and equipment. Capital items can belong to a factory or an office. For example, a lift truck or welding machine belongs to a factory, while a computer or fax machine belongs to an office.

5. Supplies:

Any short-term good or material which is necessary for the day-to-day operations of a business is termed as supplies. There are two types of supplies: operating and maintenance. Products in this category usually contribute to the production of end product. These products are also called consumables. Supplies are requirements whose presence does not matter but their shortage can have a significant effect.

Type # 4.

Goods can also be classified as Perishable and Non-perishable goods.






























Perishable goods which spoil very quickly and require immediate refrigeration have short life time, short shelf life, or one that easily deteriorates due to environmental conditions. These items include fresh foods (e.g. meat, meat by-product, seafood, fruit and vegetables), dairy products, flowers and pharmaceutical products. This short lifetime complicates the inventory management as they must be processed and move through the supply chain for sale to customers before they perish and lose either part of their value or their entire value.



Non-perishable foods, also known as “**shelf-stable**” foods, are items that can be safely stored at room temperature, according to the United States Department of Agriculture (USDA). In order to make perishable foods to become non-perishable, they need to be dried or treated by heat to completely destroy any foodborne bugs that could lead to spoilage or cause an illness. Then, this food can be packaged in sterile, airtight containers such as cans. It’s worth noting that preservation of these items is crucial; all foods will eventually spoil if they have not been properly preserved. Non-perishable food items are those with a much longer shelf life and don't require refrigeration. The fantastic thing about non-perishables is that you can buy these well in advance and store them for long periods of time. Typically, non-perishable foods include canned goods, dry goods and dehydrated foods (e.g. Powdered milk, Bottled water, Canned soups, Pancake mix, Syrup, Vegetable oil, Lentils, Dried beans, Dried pasta, Noodles)






Unit 7

Modes of Transportation

	 QUICKNESS	 CAPACITY	 ACCESSIBILITY	 SAFETY	 COST
Road (Truck)					
Ocean					
Rail					
Air					
Pipeline					

 Very Low |
  Low |
  Moderate |
  High |
  Very High

Modes of transportation

	 QUICKNESS	 CAPACITY	 ACCESSIBILT	 SAFETY	 COST
Road (Truck)	> Ocean > Rail < Air > Pipeline	< Ocean < Rail > Air < Pipeline	> Ocean > Rail > Air > Pipeline	< Ocean < Rail < Air < Pipeline	> Ocean > Rail < Air > Pipeline
Ocean	< Road < Rail < Air = Pipeline	> Road > Rail > Air = Pipeline	< Road = Rail > Air > Pipeline	> Road = Rail < Air = Pipeline	< Road < Rail < Air < Pipeline
Rail	< Road > Ocean < Air > Pipeline	> Road < Ocean > Air < Pipeline	< Road = Ocean > Air > Pipeline	> Road = Ocean < Air = Pipeline	< Road > Ocean < Air = Pipeline
Air	> Road > Ocean > Rail > Pipeline	< Road < Ocean < Rail < Pipeline	< Road < Ocean < Rail = Pipeline	> Road > Ocean > Rail > Pipeline	> Road > Ocean > Rail > Pipeline
Pipeline	< Road = Ocean < Rail < Air	> Road = Ocean > Rail > Air	< Road < Ocean < Rail = Air	> Road = Ocean = Rail < Air	< Road > Ocean = Rail < Air

A Diversity of Modes

Transport modes are the means by which people and freight achieve mobility. They fall into one of three basic types, depending on over what surface they travel – land (road, rail and pipelines), water (shipping), and air. Each mode is characterized by a set of technical, operational and commercial characteristics:

- **Road transportation** Road infrastructures are large consumers of space with the lowest level of physical constraints among transportation modes. However, physiographical constraints are significant in road construction with substantial additional costs to overcome features such as rivers or rugged terrain. Road transportation has an average operational flexibility as vehicles can serve several purposes but are rarely able to move outside roads. Road transport systems have high maintenance costs, both for the vehicles and infrastructures. They are mainly linked to light industries where rapid movements of freight in small batches are the norm. Yet, with containerization, road transportation has become a crucial link in freight distribution.
- **Rail transportation** Railways are composed of a traced path on which are bound vehicles. They have an average level of physical constraints linked to the types of locomotives and a low gradient is required, particularly for freight. Heavy industries are traditionally linked with rail transport systems, although containerization has improved the flexibility of rail transportation by linking it with road and maritime modes. Rail is by far the land transportation mode offering the highest capacity with a 23,000 tons fully loaded coal unit train being the heaviest load ever carried.
- **Pipelines** Pipeline routes are practically unlimited as they can be laid on land or under water. The longest gas pipeline links Alberta to Sarnia (Canada), which is 2,911 km in length. The longest oil pipeline is the Transiberian, extending over 9,344 km from the Russian arctic oilfields in eastern Siberia to Western Europe. Physical constraints are low and include the landscape and pergelisol in arctic or subarctic environments. Pipeline construction costs vary according to the diameter and increase proportionally with the distance and with the viscosity of fluids (from gas, low viscosity, to oil, high viscosity). The Trans Alaskan pipeline, which is 1,300 km long, was built under difficult conditions and has to be above ground for most of its path. Pipeline terminals are very important since they correspond to refineries and harbors.
- **Maritime transportation** Because of the physical properties of water conferring buoyancy and limited friction, maritime transportation is the most effective mode to move large quantities of cargo over long distances. Main maritime routes are composed of oceans, coasts, seas, lakes, rivers and channels. However, due to the location of economic activities maritime circulation takes place on specific parts of the maritime space, particularly over the North Atlantic and the North Pacific. The construction of channels, locks and dredging are attempts to facilitate maritime circulation by reducing discontinuity. Comprehensive inland waterway systems

include Western Europe, the Volga / Don system, St. Lawrence / Great Lakes system, the Mississippi and its tributaries, the Amazon, the Panama / Paraguay and the interior of China. Maritime transportation has high terminal costs, since port infrastructures are among the most expensive to build, maintain and improve. High inventory costs also characterize maritime transportation. More than any other mode, maritime transportation is linked to heavy industries, such as steel and petrochemical facilities adjacent to port sites.

- **Air transportation** Air routes are practically unlimited, but they are denser over the North Atlantic, inside North America and Europe and over the North Pacific. Air transport constraints are multidimensional and include the site (a commercial plane needs about 3,300 meters of runway for landing and take off), the climate, fog and aerial currents. Air activities are linked to the tertiary and quaternary sectors, notably finance and tourism, which lean on the long distance mobility of people. More recently, air transportation has been accommodating growing quantities of high value freight and is playing a growing role in global logistics.
- **Intermodal transportation** Concerns a variety of modes used in combination so that the respective advantages of each mode are better exploited. Although intermodal transportation applies for passenger movements, such as the usage of the different, but interconnected modes of a public transit system, it is over freight transportation that the most significant impacts have been observed. Containerization has been a powerful vector of intermodal integration, enabling maritime and land transportation modes to more effectively interconnect.
- **Telecommunications.** Cover a grey area in terms of if they can be considered as a transport mode since unlike true transportation, telecommunications often do not have a physicality. Yet, they are structured as networks with a practically unlimited capacity with very low constraints, which may include the physiography and oceanic masses that may impair the setting of cables. They provide for the instantaneous movement of information (speed of light in theory). Wave transmissions, because of their limited coverage, often require substations, such as for cellular phone networks. Satellites are often using a geostationary orbit which is getting crowded. High network costs and low distribution costs characterize many telecommunication networks, which are linked to the tertiary and quaternary sectors (stock markets, business to business information networks, etc). Telecommunications can provide a substitution for personal movements in some economic sectors.

Types of transportation

1. Road Transportation

Road transportation has come a long way since the days of horse and wagon shipments. Truck freight alone accounts for more than 54% of all northern border freight between Canada and the United States. Truck transportation is ideal for industries that require quick, small shipments directly to a business, warehouse or consumer's door and is equipped to handle possible delays.

Types of Road Transportation

- 1.1 Automobile
- 1.2 Bus
- 1.3 Cycling
- 1.4 Motorcycling
- 1.5 Heavy duty vehicles (Truck)
- 1.6 Van

1.1 Automobile

This is motorized vehicle consisting of wheels and it is powered by an internal engine and does not operate on railways like trains and trolleys. Automobiles are used to transport people and items from one location to another location on roads.

1.2 Bus

This is a road vehicle designed to carry passengers and goods to various locations. Some buses are designed with a large capacity to convey about 18 to 60 passengers at a time on larger roads. Examples of the common types of buses are the single-decker rigid bus, double-decker buses, articulated buses, midibuses and minibuses.

1.3 Cycling

This is also referred to as biking or the use of bicycle; this means of transportation is often used for conveying people or goods within short and moderate distance trips. It is one of the cheapest means of transportation. Cycling is a very efficient, an effective mode of transportation with zero emission and it is as time-effective or even better as motorized traffic in dense and congested urban areas.

1.4 Motorcycling

Motorbikes can be shipped in open or enclosed carriers. Open carriers do expose your motorcycle to the elements, and your bike will share the truck with other motorcycles and cars. With enclosed motorcycle shipping, the bike will either be in an enclosed truck or within its own container, shielded from the elements. Due to the additional equipment, special trucks and work involved with enclosed motorcycle transport, this method will cost more. However, this is worth it if you have a high-end or vintage bike that you need to protect at all costs.

(<https://nationwideautotransportation.com/blog/motorcycle-shipping-cost/>)

1.5 Heavy duty vehicles (Truck)

These are vehicles designed for heavy work for example the pick-up truck, Truck tractors with a GVWR above 26,000 pounds, heavy duty vans, heavy-duty trailers and tankers. Most heavy-duty vehicles are powered by diesel engines especially in older

models, they can emit high levels of particulates, nitrogen oxides, and other pollutants that cause both chronic disease and premature death, especially in urban areas and among the most vulnerable populations.

(<https://www.jotscroll.com/forums/3/posts/194/road-transport-types-advantages-and-disadvantages-of-road-transport.html>)

1.6 Van

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2. Ocean Transportation

Ocean transport accounts for more than 90% of the world's trade economy. The United States alone relies on water transportation for almost 70% of all international merchandise trade. Whenever your business requires transport for heavy, cumbersome loads — or country to country shipping — ship transportation is usually the way to go.

Types of Ocean Transportation

- 2.1 Bulk Carriers
- 2.2 General Cargo Ships
- 2.3 Container Ships
- 2.4 Tankers
- 2.5 Barges

2.1 Bulk Carriers

Bulk carrier ships are seen with large hydraulic hatches covering their holds. These types of ships are used to transport grain, ore, wood chips and other materials/products down into a hold. They are sent to be load-on and off at special ports. The average bulk carrier is around 800 feet long.

2.2 General Cargo Ships

Like the Bulk Carriers, these ships have large hydraulic hatches covering the holds along with overhead rigging. They can have four to five holds (a hold is also called the cargo space) and long protruding rigging for winches. Some of these ships can be special and have refrigerated spaces to carry perishable items. They are normally 500 feet.

2.3 Container Ships

A standard in freight types of sea transport, these are the primary ships used today. They are designed to carry large steel containers that are normally 20 and/or 40 feet long. Large cranes and help from trucks assist in loading up and off of these ships. They are some container ships that are designed where the bow opens up and smaller ships called barges are pulled in.

2.4 Tankers

Tankers are the most common ships that haul oil. Although there are many types of tankers that carry different types of liquids and gases, they are all generally the same

in their use. Tankers can be spotted by their large surface area protruding from the main deck. This is to load on and off the cargo.

Tankers can come in many different sizes with the largest one sporting a length of nearly a quarter mile long.

2.5 Barges

These vessels normally require a towboat to move or can be used with container ships. Barges are used to primary move three types of cargo: grain & ore, containers, and liquid & gases. Essentially these can be thought of the miniature versions of cargo ships, container ships, and tankers.

By having these different types of sea transport allows for carriers to pick and choose the one most fitting for the job. It wouldn't make sense to standardize one ship to fit all – although most of these ships can be used uniquely to transport their unintended cargos.

(<https://www.mach1global.com/five-types-of-sea-transport/>)

3. Rail Transportation

Since the invention of the railway, trains have played an important part in trade and logistics around the world. As of January 2020, rail freight accounted for roughly 15% of northern border freight between the United States and Canada, with the top three commodities being motor vehicles and parts, mineral fuels and plastics. Rail transport is suitable for conveying bulky goods over long distances, it is one of the oldest modes of transportation.

Types of Rail Transportation

- 3.1 Freight train
- 3.2 Boxcar
- 3.3 Tanker car
- 3.4 Autorack

3.1 Freight train

Freight train is a train that carries only goods.

(<https://www.jotscroll.com/forums/3/posts/195/rail-transport-definition-types-advantages-and-disadvantages.html>)

3.2 Boxcar

Boxcars can carry a wide variety of crated or palletized freight, including paper, lumber, packaged goods, beverages and boxes.

3.3 Tanker car

It carries liquid commodities, like chemicals, molasses, edible tallow, water and diesel fuel.

3.4 Autorack

It carries finished vehicles, including cars, trucks and SUVs.

(https://www.up.com/customers/track-record/tr181121_rail_car_types.htm)

4. Air Transportation

Air transport is the newest shipping method, but it is often the best choice if you want fast, uncompromising delivery. Air transport is accessible across most of the world and is ideal for shipments that need to be moved quickly across long distances, including

overseas. Air transportation also has a vast scope compared to rail and ship freight, as it is an ever-expanding industry with several thousand airports and landing strips in operation across the globe.

Types of Air Transportation

- 4.1 Commercial airplanes
- 4.2 Helicopters

4.1 Commercial airplanes

These are the common ways in which people travel through the air, the commercial planes provide a fast means of transportation compared to other modes of transport such as road transport, rail transport and water transport. Airplanes are capable of carrying hundreds of people from one location to another at a time; the seating is sometimes divided into two or four classes. For instance, most domestic flights usually have two classes which are: First Class and Economy Class. While international flights may have up to four classes such as First Class, Club Class, Business Class, Premium Economy and Economy Class.

4.2 Helicopters

Helicopters are another fast means of air transport; these move people through the air. Helicopters when compared with commercial airplanes are much more limited when it comes to passenger space and can only transport a few people at a time, whereas some commercial airplanes can transport hundreds of people at a time.

(<https://www.jotscroll.com/forums/3/posts/192/modes-of-transport-five-5-types-of-transportation.html>)

5. Pipeline Transportation

Pipeline transportation is one of the modes of transport that involves the use of hollow pipes in the transportation of water, crude oil, (petroleum), biofuels and gas. This mode of transportation is safer and cheaper than using tankers or trailers in the transportation of these liquids.

Pipelines were originally used only to carry water; they were very useful for transporting water for drinking or for irrigation over long distances when it needs to move over hills or where canals or channels were poorly developed due to considerations of evaporation, pollution, or environmental impact. However, their uses today are beyond just the transportation of water, pipelines are majorly used to transport a variety of commodities like oil, natural gas, milk, chemicals and heavier gas products like propane and butane and even some solids like coal (in a liquidified form known as Slurry). Of all the mentioned commodities, oil and natural gas are by far the most important, especially in North America where pipeline development is more advanced than in anywhere else.

Types of Pipelines Transportation

- 5.1 Oil and gas pipelines
- 5.2 Slurry pipelines
- 5.3 Water and sewer pipelines
- 5.4 Beer pipelines
- 5.5 Hydrogen pipeline

- 5.6 Pipelines for other liquids/solid particles using air

5.1 Oil and gas pipelines

basically, oil and natural gas are moved from the place of production to the refinery and then back to the market, all these movements are by the use of pipelines. However, oil and gas can also be transported using other means such as truck, train, or barge as they are efficient, but these involve high cost and risk. While gas collection and transmission lines are made of steel, most distribution lines (i.e. smaller lines connecting from the main or transmission lines to customers) built in the United States since 1980 use flexible plastic pipes, and they are easy to lay and do not corrode.

5.2 Slurry pipelines

Slurry pipelines a specially constructed pipeline for transporting of ores, such as coal, iron, or mining waste- called tailings, over long distances. A mixture of the ore concentrate and water, called slurry is pumped to its destination and the water is filtered out. Due to the abrasive properties of slurry, the pipelines can be lined with high-density polyethylene (HDPE). Slurry pipelines are used as an alternative to railroad transportation when mines are located in remote and inaccessible areas. These types of pipelines offer an economic advantage over railroad transport and much less noise disturbance to the environment, particularly when mines are in extremely remote areas.

5.3 Water and sewer pipelines

Water pipelines are long tubes constructed to transport drinking water from the treatment plants to consumers. The varieties of water pipelines include large diameter main pipes, which supply entire towns, smaller branch lines that supply a street or group of buildings, or small diameter pipes located within individual buildings. The pipes form an underground network of pipe beneath cities and streets. Water pipelines are usually laid a few feet (one meter or more) underground, depending on the frost line of the location and the need for protection against accidental damage by digging or construction activities. However, sewer pipelines pipeline on the other hand are underground pipelines that connects directly to the sewer; these play important roles in construction work, whether in homes, Schools, offices, hospitals or in any other public property.

5.4 Beer pipelines

these pipelines are built under ground to move beer from its brewery in the city center to its bottling facility a few miles away, these has been made to replace the traditional method of transporting beer by tankers. The world's first longest beer pipeline was opened in the Belgian city of Bruges, The pipeline is 3,276 meters (2 miles) long, and runs 34 meters (111 feet) below the surface at its deepest point. It passes under the town's historic canals and ramparts. Roughly 4,000 liters of beer which is enough to fill 12,000 bottles, flows through the pipeline in an hour. The beer pipeline is equipped with the latest technology to ensure the quality of the beer is maintained throughout its movements. It also has a cleaning and flushing system to keep the pipe clean.

5.5 Hydrogen pipelines

these pipelines are used to connect the point of hydrogen production or delivery of hydrogen with the point of demand.

5.6 Pipelines for other liquids/solid particles using air

There are other pipelines for transporting different commodities such as milk, brine, liquid fertilizer, capsules, cement, barite, bentonite etc. to the storage tanks or to their various destinations before moving to the market or demand location.

(<https://www.jotscroll.com/forums/3/posts/199/pipeline-transportation-types-advantages-and-disadvantages-importance.html>)

Specific Types of Transportation

1. Truck Freight — Road Transportation

Road transportation has come a long way since the days of horse and wagon shipments. Truck freight alone accounts for more than 54% of all northern border freight between Canada and the United States. Truck transportation is ideal for industries that require quick, small shipments directly to a business, warehouse or consumer's door and is equipped to handle possible delays.

The top benefits of truck freight include:

- **Implements fewer restrictions:** Compared to other modes of transportation — especially air transport — there are far fewer restrictions for truck freight, including heavy or hazardous materials. Trucks are also easier to track than other modes of transportation, due to built-in navigational systems and real-time tracking abilities, so you always know exactly where your shipment is located.
- **Costs less than air and ship transportation:** Truck freight is very economical compared to air and ship transportation because associated expenses, such as fuel and truck maintenance, are far less costly.
- **Allows for more accessibility:** Road transportation is highly accessible. Most companies have easy access to a major highway system, while not every company has access to railroads, airports or ships for other forms of transportation.
- **Offers more options:** With truck freight, you have limitless options available to you. There are many different specialized trucking companies that can accommodate perishable, hazardous or oversized goods. Depending on the shipping company, you can also choose from things like parcel, full truck and less than truckload shipping. When you only need to ship a small number of packages, parcel shipments are an excellent option. Similar to parcel shipping is [less than truckload \(LTL\) shipping](#). LTL freight services are ideal when your shipment is less than a truckload but too large or oddly shaped for parcel shipments. When compared to full truckload shipments, parcel and LTL provide an enticing level of flexibility that other transportation methods cannot.
- **Allows for door-to-door shipment:** Perhaps the most significant benefit associated with truck freight is the ability to ship a product directly to the consumer's front door. Although last-mile delivery is not always available due to the type and size of the product or final destination, the possibility of door-to-door shipment is why many companies opt for truck freight over other methods.

Despite these numerous benefits, there are a few important factors to consider before selecting truck freight, such as:

- **Time:** Truck freight can take longer and is more susceptible to shipment delays than other methods. The average truck travels roughly [50 to 60 miles per hour](#) on major roadways. Other factors, such as road closures, bad weather or heavy traffic, can also have unpredictable impacts on delivery times.

- **Control:** Due to how truck freight works, you do not have as much control over how your products are handled. Road travel can be rough on some shipments, and some companies may mishandle your product — that's why it's crucial to work with a trusted logistics company [backed by awards and client testimonials](#).
- **Global warming:** Motorways are detrimental to the beauty of the countryside and to urban living, motor vehicles cause a lot of air pollution in the city leading to global warming and other environmental hazards. (<https://www.jotscroll.com/forums/3/posts/194/road-transport-types-advantages-and-disadvantages-of-road-transport.html>)

2. Ship — Marine Transportation

Ocean transport accounts for more than 90% of the world's trade economy. The United States alone relies on water transportation for almost 70% of all international merchandise trade. Whenever your business requires transport for heavy, cumbersome loads — or country to country shipping — ship transportation is usually the way to go. The benefits of maritime transportation include:

- **Accommodates more space and weight:** Cargo ships range in length, and can carry thousands of tons of weight. For this reason, ships are often the best — and only — option for oversized products or bulk quantities that must move at the same time.
- **Costs less than air transportation:** Marine transportation is often a more economical choice than air transport due to the lower cost of fuel. Cargo ships operate on a set schedule, so there is also less opportunity for costly shipping delays.
- **Enhances the safety of the shipment:** Because ships operate on a set route and planned schedule, your shipment will go through minimal handling. Most of the time, it will be securely stored in a slow-moving vessel, which is preferable for easily damaged goods.
- **Flexibility:** Water transport has a natural route network that is free to use. This allows flexibility of service, frequency of movement, and little congestion. (<https://www.jotscroll.com/forums/3/posts/197/water-transport-definition-types-advantages-and-disadvantages.html>)

Sea transportation may not always be the most economical or accessible choice, depending on the location of your warehouse. However, the most significant factor to consider about maritime transit is how long it takes to move a shipment:

- **Speed:** Although ships are capable of carrying much bigger loads than other transportation methods, maritime shipping takes much longer. It is not usually the preferred shipping method for businesses that rely on speedy delivery.
- **Depending on weather condition:** Due to poor weather conditions, there may be delays at locks and docks, while navigation may be impeded majorly. (<https://www.jotscroll.com/forums/3/posts/197/water-transport-definition-types-advantages-and-disadvantages.html>)
- **Unsuitable for short distance:** It is unsuitable for short distance journeys since transshipment is both costly and time-consuming.

3. Train — Rail Transportation

Since the invention of the railway, trains have played an important part in trade and logistics around the world. As of January 2020, rail freight accounted for roughly 15% of northern border freight between the United States and Canada, with the top three commodities being motor vehicles and parts, mineral fuels and plastics. Rail transport is suitable for conveying bulky goods over long distances, it is one of the oldest modes of transportation.

The benefits of rail transport are:

- **Offers more carrying capacity:** Trains can transport heavy, bulk cargo — such as coal — over long distances. They can handle more weight than truck transportation.
- **Reduces the chances of delays:** Trains operate on a fixed schedule, making them a predictable and reliable form of transportation. Because railroads operate independently, train shipments are often less prone to delays that plague truck freight, like traffic jams or inclement weather.
- **Minimizes its environmental impact:** Although the environmental impact of a shipment depends on a combination of several different factors, trains tend to be less impactful than trucks, planes and ships because they require less fuel to operate.
- **Cheaper Transport:** It is a cheaper mode of transport as compared to other modes of transport. Most of the working expenses of railways are in the nature of fixed costs. Every increase in the railway traffic is followed by a decrease in the average cost. Rail transport is economical in the use of labour also as one driver and one guard are sufficient to carry much more load than the motor transport.

(<https://www.yourarticlelibrary.com/geography/transportation/advantages-and-disadvantages-of-railway-transport/42134>)

- **Safety:** Railway is the safest form of transport. The chances of accidents and breakdowns of railways are minimum as compared to other modes of transport. Moreover, the traffic can be protected from the exposure to sun, rains, snow etc.

(<https://www.yourarticlelibrary.com/geography/transportation/advantages-and-disadvantages-of-railway-transport/42134>)

The main factors to consider with rail transport are:

- **Transit time:** Rail transport is slower than truck and air freight, and they often require multiple transfers throughout the shipment process.
- **Accessibility:** Not every area has access to railroad tracks, so rail transport almost always requires other forms of transportation to move products. Rail transportation is often combined with truck freight for efficient delivery.
- **Lack of Flexibility:** Another disadvantage of railway transport is its inflexibility. Its routes and timings cannot be adjusted to individual requirements.

(<https://www.yourarticlelibrary.com/geography/transportation/advantages-and-disadvantages-of-railway-transport/42134>)

4. Plane — Air Transportation

Air transport is the newest shipping method, but it is often the best choice if you want fast, uncompromising delivery. Air transport is accessible across most of the world and is ideal for shipments that need to be moved quickly across long distances, including overseas. Air transportation also has a vast scope compared to rail and ship freight, as it is an ever-expanding industry with several thousand airports and landing strips in operation across the globe.

The most significant benefits of air transport are:

- **Allows for speedy deliveries:** Despite the possibility of occasional flight delays, air transport is significantly faster than ship, truck or plane delivery under most circumstances. Additionally, airplanes operate on a fixed schedule. This reliability is an asset when arranging shipment, particularly for perishable goods that require prompt — often overnight — delivery.
- **Offers enhanced security:** Planes offer this speed with little to no compromise to the quality of the product, providing optimal protection and safe handling due to rigorous flight checkpoints and little interference during flight.
- **Offers enhanced security:** Planes offer this speed with little to no compromise to the quality of the product, providing optimal protection and safe handling due to rigorous flight checkpoints and little interference during flight.
- **No Investment in Construction of Track:** It does not require huge capital investment in the construction and maintenance of surface track. (<https://www.yourarticlelibrary.com/geography/transportation/air-transport-characteristics-advantages-and-disadvantages/42130>)
- **Emergency Services:** It can operate even when all other means of transport cannot be operated due to the floods or other natural calamities. Thus, at that time, it is the only mode of transport which can be employed to do the relief work and provide the essential commodities of life. (<https://www.yourarticlelibrary.com/geography/transportation/air-transport-characteristics-advantages-and-disadvantages/42130>)

However, a few disadvantages to consider about air transport are:

- **Cost:** Air transport is more expensive than truck transport due to the higher cost of fuel and additional expenses like tickets, maintenance, checkpoints, special handling fees for certain materials, shipping containers and more. When ground logistics are an option, and guaranteed quick delivery is not required, trucks are often the more economical decision. For companies who can afford the cost and rely on fast shipments, air transport is ideal.
- **Limitations:** Due to the nature of air transport, there are certain limitations in place that some companies may find difficult to navigate, including size, weight and product restrictions. Airplanes have a set weight capacity that they cannot exceed, and many materials are too hazardous to transport via flight.

- **Legal Restrictions:** There are many legal restrictions imposed by various countries in the interest of their own national unity and peace. (<https://www.yourarticlelibrary.com/geography/transportation/air-transport-characteristics-advantages-and-disadvantages/42130>)

How to choose the best type of logistics transportation

Choosing the right type of logistics transportation for your company is crucial for the success of your business, the safety of your product and the happiness of your customers. Before you choose a logistics transportation method, consider the following factors and use the information to guide your decision making:

What to consider

1. The Characteristics of goods

First, analyze the shipment you are transporting. Is your product hazardous, perishable or challenging to handle? What are the dimensions (product size) of the shipping container?

The size and weight of goods also play a role in deciding which mode of transport to use. Land and air transport cater mainly for light and small shipments while rail- and sea transport cater for heavy shipments. Deciding which mode of transport to use will also be dependent on how dangerous, fragile or of high value the products are. Air and land transport are usually the best option to use for breakable products of high value. This information is critical for choosing a shipping method that can accommodate your products within budget. (<https://tradelogistics.co.za/factors-to-consider-when-choosing-the-most-suitable-mode-of-transport/>)

Product value and transportation speed

Product value and transportation speed are other considerations in selecting a suitable mode of transportation. The more a company has to spend on transportation, the less competitive the prices are. Delivery speed is a determinant factor for mode selection, since it affects the cost applied to a shipment. The delivery date is considered more crucial than the shipment size.

Product durability (<https://www.abivin.com/post/how-to-choose-transportation-mode-in-logistics>)

Another consideration for manager is product durability. Fragile freight like glass or electronic devices require special packaging with a smooth ride. Temperature-sensitive products: food or pharmaceuticals goods, demand specific packaging with a transportation mode than can withstand the cold and heat of the weather.

Air and land transport are usually the best option to use for breakable products of high value. (<https://tradelogistics.co.za/factors-to-consider-when-choosing-the-most-suitable-mode-of-transport/>)

2. Location

Next, consider two locations — where the shipment is leaving and its final destination: **Shipping origin:** Where are you shipping from? Where you or your products are located is important, as it's the starting point for your mileage tracking.

Borders: Are you shipping across country borders and require special clearance? While one method of transportation might be the most suitable option for your product, it

may be more expensive and time-consuming than other means if you are not located within easy access to these options.

Shipping destination: Where are you shipping to? The shipping destination is one of the most significant factors to consider. Calculate the total shipping distance, factoring in all stops and checkpoints.

3. **The consumer**

Are you shipping to an individual or a business? This might indicate which speed or method is preferable.

4. **Existing relationships**

Examine the resources to which you already have access. What shipping and logistics companies do you have a relationship with already? What services do they offer?

(<https://www.purolatorinternational.com/types-of-transportation-in-logistics/>)

5. **Safety and security of goods in transit**

Safety and security of goods in transit also influence which mode of transport to use. Land transport may be preferred to railway transport because your losses are generally less. When you consider the increased cases of accidents safety becomes another important factor.

Everyone will wish to ensure maximum available safety for their loved ones. **In case of logistics** also safety matters a lot especially while **dealing with fragile material**. (<https://planningtank.com/transportation/factors-to-consider-when-choosing-mode-of-transport>)

Sea transport exposes the goods to the perils of sea; hence from a safety point of view, sea transport **is the most risky**. Also, to protect the goods in transit, certain types of packaging are recommended, which might influence costs. Goods may also require special facilities such as refrigeration or special security measures that need to be taken into consideration. (<https://tradelogistics.co.za/factors-to-consider-when-choosing-the-most-suitable-mode-of-transport/>)

6. **Budget**

When selecting the best and most suitable transport for exportation of products, the budget is the most important consideration. Costs vary based on the type and amount of goods needed to be transported. It is important to keep in mind that the cost of transport influences the cost of goods.

If you are transporting heavy or bulky products over a long distance inland, then rail transport will be the most economical.

Land transport, typically by trucks, is best suited for small amount of goods being transported over short distances. It also saves packing and handling costs. It is the cheapest because suppliers do not have to make big investments in infrastructure and equipment. To transport good from other continents, it is always cheaper to use sea rather than air, although it takes more time.

Water transport is without a doubt the cheapest mode of transport, very suitable for heavy or bulky goods that need to be transported over long distances where time is not an important factor.

Budget and Cost of Transport

When selecting the best and most suitable transport for exportation of products, the budget is the most important consideration. Costs vary based on the type and amount of goods needed to be transported. It is important to keep in mind that the cost of transport influences the cost of goods.

If heavy or bulky products are being transported over a long distance, inland, then rail transport is the most economical. Land transport, typically by trucks, is best suited for small amount of goods being transported over short distances, as it also saves packing and handling costs. The cheapest mode of transport is water transport, albeit the slowest too, but most suited for heavy or bulky goods that need to be transported over long distances, where time is not an important factor. Air transport is the best option for transportation of perishable, fragile and valuable goods, even though it is the most expensive.

It is important for importers and exporters to consider the overall cost of transportation, keeping the "hidden costs" such as insurance premiums, commissions and finance charges in mind.

7. **Timescale** (<http://www.navata.com/cms/choosing-the-right-mode-of-transport/>)

Air transport is the best option for long distances requiring urgent and speedy transport, to meet deadlines or because the goods are perishable or fragile.

Motor transport is faster than rail transport for short distance deliveries. However, for longer haul journeys rail is faster and more economical.

Time: The time of year you're moving your product — during the holiday season, for instance — might impact overall shipment times.

Maritime transport is often not suitable where time is a factor.

A study conducted on freight transports between Sydney and Perth found the average door-to-door transit time for each of the following transport modes:

Road = 2-4 days

Rail = 7 days

Maritime = 10-14 days

(<https://www.linkedin.com/pulse/5-factors-consider-selecting-mode-freight-c-mason-kratz>)

Urgency: How urgent is your shipment? Can you afford a delay — both financially and in the eyes of your consumers?

Mode of Transportation

Different Modes of Transportation Used in Logistics Management

<https://www.goship.com/blog/modes-of-transportation-in-logistics/>

<http://www.miserywatch.com/different-modes-of-transportation-used-in-logistics-management/>

Transportation is an important element in logistics. As logistics management involves, management of the goods from the point of their origin to the point of consumption, transportation plays a major role in logistics. Using the appropriate transportation is [essential part of logistics management](#). Effective transport helps improve a supply chain by decreasing waste of materials and time. This helps supply chain professionals transport products and deliver them to the right location, on time – which is a priority for any successful business.

There are different means of transport used by [transportation logistics specialist](#) for moving goods from the point of their origin to the point of their consumption. Let us examine some of the popular modes of transport and their importance.

Airfreight

Airfreight is the most preferred means of transportation for moving goods over long distances. Reputed transportation logistics specialists use airfreight for transporting highly perishable items, fragile items and high-value items over long distances. Airfreight is the fastest mode of transport and ensures timely delivery of products. Bigger logistics companies have their own fleet of aircrafts while the smaller players use air cargo. The fees of airfreight are higher when compared to others, but it is the most reliable and fastest means of transporting products.

Land transportation

Land transportation involves transporting goods via road and rail. Land transportation costs much less when compared to airfreight. It is most suitable form of transport for moving goods within short to medium distances. There is a chance of delays in land transportation due to road conditions, weather conditions and traffic issues. Most of the transportation logistics specialists have their own fleet of trucks and vehicles with latest features for land transportation. These vehicles are fitted with most advanced tracking systems that enable easy tracking of the vehicle and also the consignment. Drivers of these vehicles should be licensed and well versed with the safety regulations of the different areas they operate, to enhance the safety of the cargo.

Sea freight

Sea freight is the most suitable mode of transportation for large cargo. It is the most preferred mode for transporting goods over long distances. Sea freight costs lesser than airfreight but might take long time to reach the destination.

These are the three forms of transport used by transportation logistics specialists to transport goods. They use any one or a combination of these different modes of transport for faster and reliable delivery of products.

Logistics is a very diverse and complex industry. It involves many modes of transportation and ways of shipping goods. Sometimes, it may be challenging for a company to choose the right mode of transportation to reach the best result. It can be especially difficult if you are new to domestic or global shipping. However, knowing the differences and benefits of each shipping method will help you define the option that will work best for you.

Different modes of transportation

There are several main transportation modes in the freight shipping industry:

- Ocean
- Air
- Rail
- Road
- Intermodal and Multimodal

All of these modes are extremely important and play a significant role in the industry. However, there are many differences in terms of price, shipped commodities, transit distance, etc. While some modes may be the perfect solution to one business, at the same time may be absolutely useless to another one.

Ocean shipping

Ocean shipping is the most popular way of moving large volumes of goods overseas. Compared to air, the ocean is a much more cost-efficient option yet a rather slow one. This mode of transportation works best for shippers who need to move goods on a distance longer than 400 km. Also, it works for oversized, hazardous, liquids, and weird-shaped freight. Ocean shipping is common among large and mid-sized businesses because they need global shipping on a regular basis. The freight is stacked in containers that are later loaded onto the ships or barges.

Air shipping

Probably the fanciest shipping mode, the air is a reliable and extremely quick way to ship freight. Obviously, extraordinary speed comes at a higher price. Because of its larger cost, the air is mostly used by bigger companies but small businesses often use it too. This option is the perfect solution for retail companies and light industries. Essentially, there are specialized aircraft for hefty cargo but in general, planes are not developed for handling oversized freight of unusual shape.

Over-the-Road Shipping

Over-the-road transportation is the most popular, the most frequently used, and the most in-demand mode of transportation. It works for everyone, from individual

shippers to large enterprises. Also, road transport comes with a wide variety of equipment and shipping modes. There are two main types of over-the-road transportation: [full truckload \(FTL\)](#) and [less-than-truckload \(LTL\)](#). FTL shipping means that one shipper takes the entire truck capacity to move the freight when LTL suggests partial use of the trailer by several shippers. There are also various types of trailers that serve different shipping needs: [dry van](#), [flatbed](#), [refrigerated](#), etc. It is easy to get a freight quote from [the carrier](#) and choose the needed equipment.

Intermodal and Multimodal

Choosing the right mode of transportation may be difficult, especially if you have a long and complicated route. Intermodal and multimodal can transportation solve this problem, as they are two types of combination transportation modes. Generally, [intermodal](#) and [multimodal](#) shipping suggest the combination of road, rail, ocean, or air for a single shipment. The only difference between both methods is that intermodal is handled under a [single bill](#), while multimodal goes with separate bills from all the carriers involved. Generally, intermodal and multimodal can be very beneficial to the shipper in terms of price and flexibility.

Ultimately, each mode of transportation has its advantages and drawbacks. Depending on the size and needs of your business, you have a variety of options to choose from.

Modes of Transportation explained: Which type of cargo and freight transportation is the best?

- # [Logistics](#)

The mode of transportation is an important consideration when planning the shipment process. Besides the costs, the urgency of the shipment, the value of the goods being shipped as well as the size and weight of the goods need to be evaluated when determining the form of transportation. In this article, we want to help you determine, which mode is best to transport your cargo and freight!

Use our free tool to get a freight estimate right away:

[calculator]

Ocean

[Seaborne trade accounts for about 90% of the global trade](#), and as per UNCTAD, 1687 million tons (2015 estimate) were carried in around 177.6 million containers (2015 estimate) covering 998 billion ton-miles (2016 estimate).

Because of size or volume, there are several types of cargoes that cannot be or is economically unviable to move by other modes of transport than the sea.

Ocean freight is a less expensive method of shipping goods, but the drawback is a longer transit time. Another benefit for ocean freight is while size and weight may be an issue for air; it is not for ocean freight.

Ocean freight is used quite extensively for the movement of bulk commodities such as agri-products (wheat, maize, soya, etc.), coal, iron ore or for wet bulk products such as crude oil and petroleum. Also, larger, odd-shaped items including engines and propellers may move via this mode as well, depending on how sensitive the delivery time is.

Ocean freight is also a preferred mode of transport for the movement of high volume and heavy cargo such as minerals, metals, ores, steel coils, etc. which would be impossible to move by air freight.

Additionally, businesses are placing more of an emphasis on the environmental impact on shipping. An air freight service emits a higher amount of polluting gases with less space capacity compared to sea freight services which are considered a much greener transportation mode with a higher carrying capacity.

Key benefits of ocean freight include

- Suitable for wide range of products with long lead times
- Large volumes. A single, ultra-large container ship can carry +/-20,000 twenty-foot equivalent units (TEU)
- Most environmental friendly among all modes of transport
- Economical. Liner shipping is the most efficient mode of transport for goods
- Extensive coverage around the world
- Multiple carrier options for the shippers

Air

Over the next 15 years, as the world GDP grows, there will be a demand for higher value goods. As per Boeing's 2016 – 2017 [world air cargo forecast](#), there will be a proportionate growth in the value per ton of total traded goods around the world.

To meet the demand for growth, world air cargo traffic is forecasted to grow an average 4.2 percent per year.

Air freight is a critical mode of transport. It serves markets and supply chains that demand speed. One of greatest examples goes back to 1997 when Apple began innovating on the nitty-gritty details of supply-chain management. Almost immediately upon Steve Jobs' return. At the time, most computer manufacturers transported products by sea, a far cheaper option than air freight.

Steve Jobs took advantage of the benefit of air freight and used an innovative strategy. He paid \$50 million to buy up all the available holiday air freight space to ensure that the company's new, translucent blue iMacs would be widely available during Christmas season giving them a massive competitive advantage over their rivals. – "It was an 'Oh s—' moment," [recalls former HP supply chain chief Mike Fawkes.](#)"

Other industries such as the automotive and retail industry also utilize air freight to achieve 'just-in-time' (JIT) inventory replenishment. JIT option allows stores, production lines to place order fulfillment based on demand as, and when required. It provides greater flexibility and reduces inventory and storage costs.

Also, perishable goods such as foods, flowers, and some pharmaceuticals also take advantage of shorter transit time. Another positive for air freight is that there's less handling of cargo overall, so the likelihood of damage or theft is less likely when utilizing air.

But air freight also has its own disadvantages such as being one of the most expensive due to the requirement of speed and the fuel that is used.

It also has its size and weight limitations. Regulatory bodies limit what can and cannot be transported by air, and as such, oddly shaped or very large items may be more suitable for other modes of transport.

Key benefits of air freight include

- Quick transit
- Less handling of cargo
- Less documentation
- Reliable arrival and departures
- Enhanced level of security for your cargo

Rail

Another mode of transport which is also considered a 'green' option is rail. Trains burn less fuel per ton-mile than road vehicles and a train, which can have as many as 100 wagons, only needs one driver. There are, however, some additional costs which are incurred in a rail journey: at each end of the rail transit, a road delivery will be needed, and there will be a lift cost to transfer the container between the train and the road vehicle.

On average, longer journeys tend to be less expensive by rail, and shorter journeys are less costly by road. Where the point of cost neutrality comes is governed by many factors which are route and commodity specific, but in general, the point of cost neutrality can be expected to lie in the range of 130 to 150 miles.

In 2015, the first freight train carrying ISO freight containers from China arrived in the Port of Rotterdam in 18 days as against the normal 44 odd days by the sea.

This movement of containerized cargo by rail from China to logistics hubs in Europe such as in the Netherlands, UK is seen as a significant step in the development of trade

between the two continents. It has encouraged multinationals such as Hewlett-Packard and Ricoh to use the route from Europe to China for their cargoes.

The Manager of European Transport at Ricoh notes that if one can set up an effective planning, rail is a relatively quick mode of transport taking only 20 days to China. In addition, the move by rail also has some advantages such as all containers being transported to the location in one go, while being environmentally friendly as a train releases far less CO₂ than a plane.

Key benefits of rail freight include

- Reliable transit times and schedules
- Railroads are the most efficient form of land transportation. One train can haul the equivalent of over 400 trucks
- Fast and cost-effective deliveries over long distances. Typically over 500 miles
- Traditionally, rail has a strong safety record.
- Helps in alleviating road congestion, thus lowering emissions

Road

Road freight is one of the most common of all modes of transportation. It is widely used in continents such as Europe, Africa, and North America. The single customs document process provides a seamless movement of goods even across various states and countries.

Road freight provides several advantages over other modes of transportation such as

- Cost-effectiveness
- Quick and scheduled delivery
- Local, over border, long or short haul deliveries even in rural areas
- Flexible service
- Saving in Packing Cost compared to other modes
- Track and trace of cargo and truck
- Complete door-to-door service and it is one of the more economical means of transport.

However, truck transport is limited somewhat as to what it can carry by the size of the vehicles used and by size and weight restrictions. Another limitation is that it is affected by weather, road conditions and traffic.

Multimodal

Another option to keep in mind is multimodal solutions – the utilization of more than one mode of transport.

Multimodal is a combination of different modes of transportation such as rail, road, and sea which allows the customer to cost-effectively manage shipments from start-to-end, ensuring optimum care and efficiency every step of the way.

One such example is the cross region rail network combined with truck. Providers including DHL, Geodis, UPS and DB Schenker are offering such a solution along China's Silk Road network.

According to UPS, the service can offer savings of up to 65% versus air freight costs while providing transit times up to 40% faster than standard ocean movements. Sea-Air is another example of multimodal transport. The service is considered less expensive than air and quicker than ocean service.

An alternate solution to pure air or ocean, [Sea-Air](#) provides the global transportation industry time and cost savings along with eco-friendliness. Sometimes using this mode of transport helps to avoid [demurrage fees](#).

Key benefits of multimodal transport include

- Cargo can be moved to any part of the world using multiple modes of transport
- Reduces the distance for the goods between the manufacturer and consumer
- Customers can deal with one entity to handle all modes of transport under one document
- Efficient and cost-effective delivery options

Conclusion – What mode of transportation should you use?

There are numerous options for transporting goods, and there may not be one solution for your transportation needs. Each mode of transport has its advantages and disadvantages. Prioritizing your needs, understanding your shipment and comparing costs is important when planning your shipment and choosing the best mode of transport.

Unit 8 Pictorial Marking

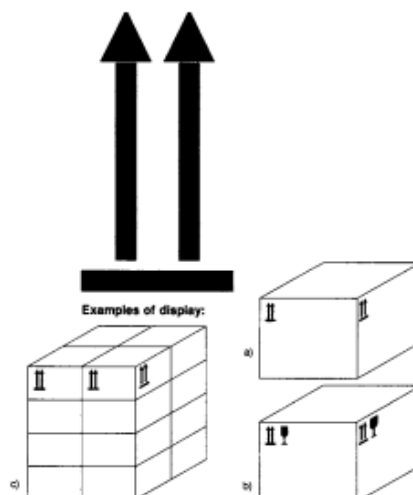
Standard Practice for Pictorial Markings for Handling of Goods¹



FUNCTION: To indicate a) that the contents of the package are fragile;
b) That it has to be handled with care

REMARKS: Place on at least two adjacent sides in upper corner
When used with symbol 2, that symbol shall be closest to corner (see 2b)
ISO 7000/ No. 0621

SYMBOL 1 "Fragile Handle With Care"



FUNCTION: To indicate the correct upright position of the package

REMARKS: Shall be shown near the left hand upper corner on all four upright sides of the package
Arrows should never be shown on top of the package
ISO 7000/ No. 0623

SYMBOL 2 "This Way Up"



FUNCTION: To indicate that hooks are prohibited for lifting the package

REMARKS: For bags, symbol should be visible no matter how bags are stacked

This symbol is different than the ISO standard symbol for the same meaning or implication

SYMBOL 3 “Use No Hooks”



Examples of display:



FUNCTION: To indicate where the slings shall be placed for lifting the package

REMARKS: Place on at least two opposite faces of the package

ISO 7000/ No. 0625

SYMBOL 4 “Sling Here”



FUNCTION: To indicate that the package shall be kept dry

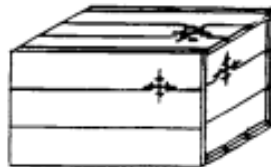
REMARKS: Place on at least two adjacent sides in upper corner

ISO 7000/ No. 0626

SYMBOL 5 “Keep Dry”



Examples of display:



FUNCTION: To indicate the center of gravity of the package

Example shows center of gravity not identical to that assumed by geometrical shape of package

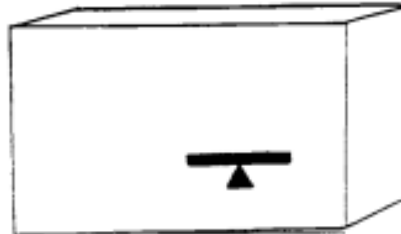
REMARKS: Place on all six sides of package, relating to real position of center of gravity when different than geometric center

ISO 7000/ No. 0627

SYMBOL 6 “Center of Gravity”



Examples of display:



FUNCTION: To indicate center of balance in plane parallel to floor

REMARKS: Place on at least two opposite sides of package, whenever center of balance is different than geometric center

SYMBOL 7 "Center of Balance"



TOP HEAVY

FUNCTION: To indicate that the package is top heavy and may tip over easily

REMARKS: Place on at least two opposite sides of package

Use on any package over 90 kg (200 lb) weight and over 1.2 m (48 in.) high where center of gravity is higher than $\frac{1}{2}$ standing height and height is two times or greater than shorter base dimension

Required in National Motor Freight Classification Item 680

SYMBOL 8 "Package May Tip Over Easily"



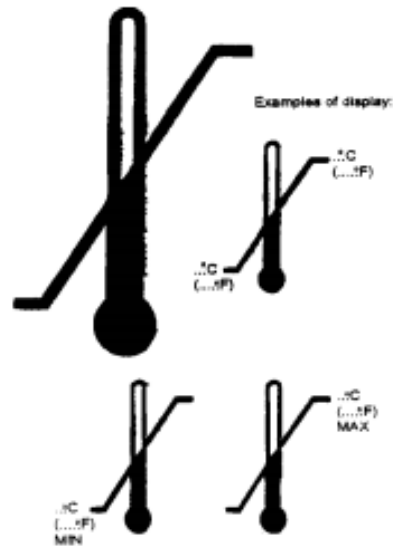
FUNCTION: To indicate that the package shall be kept away from heat

SYMBOL 10 "Keep Away from Heat"



FUNCTION: To indicate that the package shall be kept away from cold

SYMBOL 11 "Keep Away from Cold"



FUNCTION: To indicate the temperature limits within which the package shall be kept and handled

REMARKS: ISO 7000/ No. 0632

SYMBOL 12 "Temperature Limits"



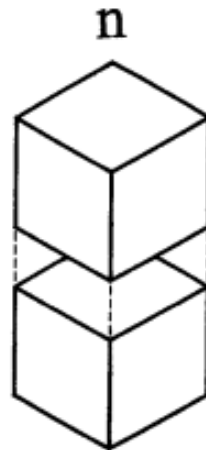
FUNCTION: To indicate that stacking of the package is not allowed

No other load shall be placed on any package with this symbol

REMARKS: Use on at least two adjacent sides

This symbol is different than the ISO standard symbol for the same meaning or implication

SYMBOL 13 "Do Not Stack"



FUNCTION: To indicate the limited stacking possibilities of the package when like packages are placed on top

REMARKS: Use on at least two adjacent sides, where N = number of packages, maximum for stacking

This symbol is different than the ISO standard symbol for the same meaning or implication

SYMBOL 14 “Stacking Limitation by Number”

--- kg max (...to max)



FUNCTION: To indicate the limited stacking possibilities of the package when unlike packages are placed on top

REMARKS: Use on at least two adjacent sides
ISO 7000/ No. 0630

SYMBOL 15 “Stacking Limitation by Weight”



FUNCTION: To indicate where hand trucks shall not be placed when handling the package

REMARKS: Place on lower part of each side of package where hand trucks are not to be used

This symbol is different than the ISO standard symbol for the same meaning or implication

SYMBOL 16 “No Hand Trucks Here”



FUNCTION: To indicate that the lift truck type depicted shall not be used to handle the package

REMARKS: Place on each side of package where the lift truck is prohibited from handling

This symbol is different than the ISO standard symbol for the same meaning or implication

SYMBOL 17 “Do Not Use This Lift Truck for Handling”



FUNCTION: To indicate what type handling device may be used for handling of package or unit load

REMARKS: Place on each side of package where the handling device may be used

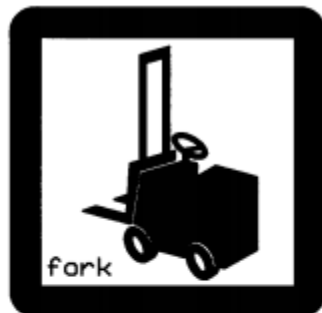
SYMBOL 20 "Use This Handling Device"



FUNCTION: To indicate what type handling device may be used for handling of package or unit load

REMARKS: Place on each side of package where the handling device may be used

SYMBOL 22 "Use This Handling Device"



FUNCTION: To indicate what type handling device may be used for handling of package or unit load

REMARKS: Place on each side of package where the handling device may be used

SYMBOL 21 "Use This Handling Device"



FUNCTION: To indicate what type handling device may be used for handling of package or unit load

REMARKS: Place on each side of package where the handling device may be used

SYMBOL 23 "Use This Handling Device"



FUNCTION: To indicate where clamps shall be used for handling the package

REMARKS: Place symbol on two opposite sides of package so it is in visible range of clamp truck operator when approaching the package

Used primarily in international trade
ISO 7000/ No. 0631

SYMBOL 24 "Clamp Here"



FUNCTION: To indicate where clamps shall not be used for handling the package

REMARKS: Place symbol on two opposite sides of package so it is in visible range of clamp truck operator when approaching the package

This symbol is different than the ISO standard symbol for the same meaning or implication

SYMBOL 25 “Do Not Clamp Here”



FUNCTION: To indicate that the contents are magnetically sensitive and should not be placed near anything which is magnetic

REMARKS: Place symbol on at least two opposite sides of package

Required in National Motor Freight Classification Item 682

SYMBOL 33 “Magnetically Sensitive”



FUNCTION: To indicate that the package is qualified for air transport

REMARKS: This symbol is approved by FAA and IATA

Use on at least 2 adjacent sides of the package

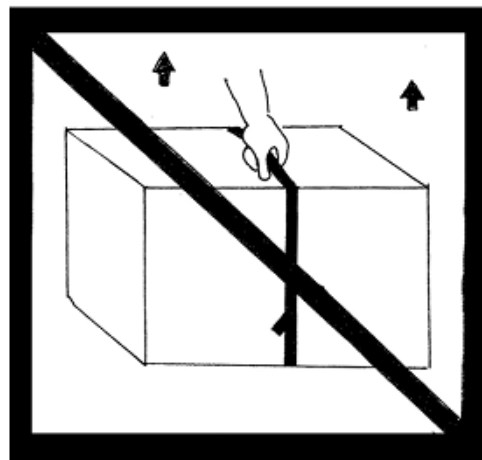
SYMBOL 40 "Air Eligible"



FUNCTION: To indicate that the package is NOT qualified for air transport

REMARKS: Use on at least 2 adjacent sides of the package

SYMBOL 41 "NOT Air Eligible"



Function: To indicate that strapping should not be used to move (lift or pull) on packages

Remarks: Use on top and sides of packages where strapping is applied

SYMBOL 42 Do Not Use Strapping to Move (Lift or Pull) Packages