**Time & Place Utility.**

- Transportation creates value or place utility. Time utility is primarily added by the warehousing and storage of product until they are needed by customer.

- Transportation is also a factor in the creation of time utility because it determines how fast and how consistently products move from one point to another. These factors are referred to as time-in-transit and consistency of service.
Transportation.

Freight Transportation Outlays vs. GDP.
Transportation Interface.

The transportation function must interface with other departments within and outside logistics, such as

- Accounting (freight bills)
- Engineering (packaging, transportation equipment)
- Inventory management (raw materials, parts, components, finished goods)
- Legal (warehouse and carrier contracts)
- Manufacturing (Just-in-time deliveries)
- Purchasing (expediting, supplier selection)
- Marketing/sales (customer service standards)
- Receiving (claims, documentation)
- Warehousing (equipment supply, scheduling)
Transportation Interface.

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<tr>
<th>Planning</th>
<th>Procurement</th>
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<th>Distribution</th>
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<td>· Network and asset rationalization.</td>
<td>· Landed costs.</td>
<td>· Interplant movements.</td>
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<td>· Lead times.</td>
<td>· Inbound in-transit inventory management</td>
<td>· JIT and other specialized services.</td>
<td>· Pick lists.</td>
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<td>· Vendor sourcing.</td>
<td>· Reduced raw material and work-in-process inventories.</td>
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<td>· Mode/carrier selection.</td>
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Legal Forms of Transportation.

- **Public**
  - Common
  - Contract
  - Exempt
    - Products
    - Territory
    - Organization
      - Regular Route
        - Scheduled Service
        - Non scheduled Service
      - Irregular Route
        - Radial Service
        - Nonradial Service

- **Private**
  - Ownership
  - Leasing
  - Combination
Transportation.

Public (for hire) Carriers.

**Common carriers.**
- Carriers in this legal classification are available to all users at published rates.
- All tariffs are approved by the cognizant regulatory agencies. Common carriers operate all modes of transportation.

**Contract carriers.**
- Carriers in this legal classification perform selected transportation functions.
- Rate differentials for the same type of service are allowed. Regulatory bodies issue permits for contract carrier, but the permits are generally less restrictive than those

**Exempt carriers.**
- Transportation companies in this classification primarily move unprocessed products, such as agricultural products and fish.
- Exempt carriers are exempt from economic restrictions by regulatory bodies. Exempt carriers generally include motor and water carriers.
**Private Carriers.**

- Carriers in this classification are operated by the producer or distributor of the cargo.
- A private carrier is not legally for hire by outside organization. Private carriage involves; ownership, leasing and a combination thereof.
- Private carriage involves ownerships, leasing, or a combination thereof, and can include all modes of transportation.
Operational Mode of Transportation.

Rail.

- Mass movement of goods. - large capabilities.
- Low unit cost of movement.
- Dependable form of transport.
- Long-haul movements.
- Fairly extensive rail system network - coverage to major markets and suppliers.
- Numerous ancillary service - switching, in-transit privileges, storage, etc.
- Goods transfer to other carriers.
- Specialized equipment.
Operational Mode of Transportation.

High Way.

- Flexibility - can go anywhere.
- Speed - 3~5 days delivery to any point in continental United States.
- Frequency - hourly and daily pickup and delivery service.
- Convenience - loading and unloading at the shipper's and receiver's places of business.
- Goods transfer to other carriers.
- Equipment diversity.
Operational Mode of Transportation.

Water.

- Mass movement of bulk commodities - large capabilities.
- Very low unit cost.
- Movement of low-unit-value commodities, such as sand, gravel, or shell, which otherwise would have limited distribution.
- Long-haul movements.

Pipe Line.

- Mass movement of liquid or gas products.
- Lowest unit cost of movement.
- Large capacity and volume of throughput.
- Most dependability of all the modes.
- Long-haul movements.
Operational Mode of Transportation.

Air.

- Highest movement speed.
- Overnight service to any point in the continental United State.
- Frequent service to major cities.
- Increasing capabilities - up to 200,000lb in a single aircraft.
## Characteristics of Transportation Mode.

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</table>
Operational Mode of Transportation.

Intermodal Transportation.

Truck-rail (Piggyback).
- Trailer-on-flatcar (TOFC) or container-on-flatcar (COFC).

Truck-water (Fishyback).
- Roll-on, roll-off (Ro-Ro): This method allows standard highway trailers and railcars to be driven directly on and off specially adapted ships via large side or stern doors.

Air-truck.
- It provides feeder and delivery service between major airport hubs and remote communities deprived of adequate air freight service.

Rail-water.
- The "hydro-train" rail-water service: It uses specially constructed ships or barges on which strings of freight cars are moved over water to the port nearest their ultimate inland destination.
Operational Mode of Transportation.

1. Trailer on flatcar (TOFC)

2. Trailer and tractor on flatcar

3. Roadrailier

4. Container on flatcar (COFC)

Auxiliary Users.

Freight forwarders.
  • Freight forwarders provide a major service to their customers by consolidating small shipments into larger ones for long-distance movement.
  • While providing lower line-haul rates and faster service for shippers, they retain a portion of the differential between vehicle-load and less-than-vehicle-load rates to defray the expenses of their operations and to earn a profit.

Shippers' associations.
  • While similar in function to freight forwarders, are actually voluntary organizations composed of members with mutual commercial interests who use the service to take advantage of the economies of consolidation.
Auxiliary Users.

Third-party providers.

- Third-party providers of logistics services exhibit some of the characteristics of auxiliary users. They provide an increasing variety of services to their client firms, including warehousing, order processing, data transmission, and shipping.


Transfer Facilities.

Packaged freight terminals.

- Carriers that transport small shipments, such as those engaged in highway or air operations, may utilize terminals to consolidate, mix, or deconsolidate packaged freight shipments.

- Small-shipment or package sorting facilities typically employ mechanical devices and computer-controlled sorting mechanisms. Their automated sorting equipments is normally located at centralized hub points on their route systems so that they can gain maximum productivity from their investment.
Transportation Infrastructure.

Transfer Facilities.

Container terminals.

- The growth of coordinated transport, or the use of two or more modes in the transportation of a single shipment, has led to the use of large containers that are compatible with two or more modes of carriage. The transfer of a standard 20ft × 8ft × 8ft container from one mode to another typically requires the use of a crane capable of lifting up to 85 tons.

Bulk commodity terminals.

- Transportation, storage, and handling of commodities in unpackaged form has become a sizable economic activity. It requires facilities for assembling, transferring, and breaking bulk commodities in great quantities. Such facilities often have the ability of transfer such commodities between vehicles of two cooperative transportation modes.
Transfer Facilities.

Carrier equipment transfer facilities.

- Rail, highway, and water carries operate terminals for the transfer of cars, trailers, and barges, respectively. It is at the carrier equipment transfer terminals that such trailer combinations are assembled and dissembled for handling over more restricted highway.
Transportation Rates.

Cost of Service vs. Value of Service.

Cost-of-Service Pricing.

- This approach establishes transportation rates at levels that cover a carrier's fixed and variable costs, plus allowance for some profit. Transportation costs can vary within the cost-of-service pricing approach because of two major factors: distance and volume.

- First, a carrier must be able to identify its fixed and variable costs. This involves a recognition of the relevant cost components and an ability to measure these costs accurately. Second, this approach requires that fixed costs be allocated to each freight movement (shipment). Allocation of fixed costs changes the price based on the volume of shipments. Clearly, this method creates problems.
Cost of Service vs. Value of Service.

Value-of-Service Pricing.

- This approach is based on charging what the market will bear; and is based on the demand for transportation services and the competitive situation.
- This approach establishes the upper limit on rates. The rates set will maximize the difference between revenues received and the variable cost incurred for carrying a shipment. In most instances, competition will be determine the price charged.
Categories of Rates.

There are two types of charges assessed by carriers.

- line-haul rates, which are charged for the movement of goods between two points that are not in the same local pickup and delivery area.

- Line-haul rates can be grouped into four types: (1) class rates, (2) exception rates, (3) commodity rates and (4) miscellaneous rates.

- Accessorial charges, which cover all other payments made to carriers for transporting, handling, or servicing a shipment.
Line-Haul Rates.

Class rates.

- Class rates reduce the number of transportation rates required by grouping products into class for pricing purposes. A product's specific classification is referred to as its class rating.

- The charge to move a specific product classification between two locations is referred to as the rate. By identifying the class rating of a product, the rate per hundredweight any two point can be determined.

- The following factors are used in determining freight classification: (1) Density, (2) Stowability, (3) Ease of handling goods, (4) Liability - value per pound, fragility, theft risk, flammability, explosiveness, environmental impact, perishability.
Transportation Rates.

Line-Haul Rates.

Exception Rates.

- Exception rates, or exceptions to the classification, provide the shipper with rates lower than the published class rates.

- This type of rate was introduced in order to provide a special rate for a specific area, or commodity when competition or volume justified the lower rate. When an exception rate is published, the classification that normally applied is changed.
Transportation Rates.

Line-Haul Rates.

Commodity Rates.

- Commodity rates apply when a large quantity of a product is shipped between two locations on a regular basis. These rates are published on a point-to-point basis without regard to product classification.

Contract Rates.

- Contract rates are those negotiated between a shipper and carrier. They are formalized through a written contractual agreement between the two parties. These types of rates are increasing in usage because of the growth of contract carriage.
Transportation Rates.

Line-Haul Rates.

Freight-All-Kinds (FAK) Rates.

- FAK have developed in recent years and apply to shipment instead of product. They tend to be based on the costs of providing the transportation service; the products shipped can be of any type.

- The carrier provides the shipper with a rate per shipment based on the weight of the products being shipped. FAK rates have become very popular with companies such as wholesalers and manufacturers that ship a variety of products to retail customers on a regular basis.
Other Transportation Rate System.

Distance rate system.
Distance rates are mileage rates and are based on the tapering rate principle, in which rates increase at a slower rate than distance. This reflects the effect of fixed terminal costs associated with a shipment.

Blanket rate systems.
A blanket rate does not increase as distance increases; the rate remains the same for all points in the blanket area the carrier designates. The postage stamp rate is one example of a blanket rate.

Rates based on route.
In addition to being a class or a commodity rate and a distance or a blanket rate, every rate is either a joint or a local rate and a combination or a through rate.
Other Transportation Rate System.

Rates based on quantity.

Quantities shipped are crucial competitive determinants. Rates based on quantity include minimum, any-quantity, in-excess, and multiple-vehicle rate.
**Transportation Rates.**

**Accessorial Service and Terminal Charges.**

**Accessorial Services.**

Accessorial types of service, often considered as privilege by the providing carriers, result from special needs of the shippers and competition among carriers.

- **Diversion and reconsignment.**
  Although diversion means a change in the routing of a shipment and reconsignment means a change of consignee for a particular shipment, the terms are used interchangeably. This service permits the delivery of shipments to one of alternative points, depending upon changes in market conditions or terms of sale.

- **Protective service.**
  Protective service are offered for goods that could be affected by the environment. Such services include ventilation, refrigeration, and heating.
Transportation Rates.

Accessorial Service and Terminal Charges.

**Accessorial Services.**

- **Special equipment.**
  Extra charges are sometimes assessed for the use of equipment that meet special needs. Enclosed tri-deck railcars used only to transport new automobiles are an example of such special equipment.

- **Transit privileges.**
  Transit privileges facilitates the flow of goods that requires some handling or at an intermediate point between origin and destination. Some of the types of transit privileges and the commodities for which they were designed are milling (grain), compressing (cotton), planing (lumber), fabrication (steel), blending (wind), and storage.
Transportation Rates.

Accessorial Service and Terminal Charges.

Accessorial Services.

- Stop-off privileges.
  This type of transit privilege permits the shipper or receiver to stop a shipment to partially load or unload it at an intermediate point.

- Split delivery.
  Split delivery is an additional service provided by highway carriers. It permits an unlimited number of segments of a larger shipment to be delivered within the limits of a specific split-delivery area.
Transportation Rates.

Accessorial Service and Terminal Charges.

Terminal Charges.

Certain services provided by terminal operations could generate added charges. Such services are most frequently reflected in demurrage, detention, and switching charges.

- Demurrage and detention.
  The words demurrage and detention both refer to charges paid to carriers by shippers or consignees for the delay for a car, vessel, or vehicle beyond a specified time period allowed for loading and unloading. The demurrage is used in rail, water, and pipeline transportation. Detention is assessed on highway vehicles and on trailers used in piggyback service.
Accessorial Service and Terminal Charges.

Terminal Charges.

- Switching charges.

Line-haul rail rates usually include switching services to the ultimate shipping destination. Under a reciprocal switching agreement (a frequent practice among carriers), the switching carrier will deliver to its destination a car that it did not handle in line-haul movement.
Transportation Rates.

FOB Pricing.

1. Terms of Sale FOB Shipping Point, FREIGHT COLLECT
   - Title passes to buyer
   - Freight charges paid by buyer
   - Seller → Buyer
   - Seller pays freight charges.
   - Buyer bears freight charges.
   - Buyer owns goods in transit.
   - Buyer files claims (if any).

2. Terms of Sale FOB Shipping Point, FREIGHT ALLOWED
   - Title passes to buyer
   - Freight charges paid by seller
   - Seller → Buyer
   - Seller pays freight charges.
   - Seller bears freight charges.
   - Seller owns goods in transit.
   - Seller files claims (if any).

3. Terms of Sale FOB Shipping Point, FREIGHT PREPAID AND CHARGED BACK
   - Title passes to buyer
   - Freight charges paid by seller, then collected from buyer by adding amount to invoice
   - Seller → Buyer
   - Seller pays freight charges.
   - Seller bears freight charges.
   - Seller owns goods in transit.
   - Seller files claims (if any).

4. Terms of Sale FOB Destination, FREIGHT COLLECT
   - Title passes to buyer
   - Freight charges paid by buyer
   - Seller → Buyer
   - Seller owns goods in transit.
   - Seller files claims (if any).

5. Terms of Sale FOB Destination, FREIGHT PREPAID
   - Title passes to buyer
   - Freight charges paid by seller
   - Seller → Buyer
   - Seller pays freight charges.
   - Seller bears freight charges.
   - Seller owns goods in transit.
   - Seller files claims (if any).

6. Terms of Sale FOB Destination, FREIGHT COLLECT AND ALLOWED
   - Title passes to buyer
   - Freight charges paid by buyer, then charged to seller by deducting amount from invoice
   - Seller → Buyer
   - Buyer pays freight charges.
   - Buyer bears freight charges.
   - Buyer owns goods in transit.
   - Buyer files claims (if any).
Bill of Lading.

- Domestic transportation utilizes a number of different documents to govern, direct, control, and provide information about a shipment.

- The bill of lading is probably the single most important transportation document. It originates the shipment, provides all the information the carrier needs to accomplish the move, stipulates the transportation contract terms, acts as a receipt for the goods the shipper tenders to the carrier, and, in some cases, shows certificate of title to the goods.
Bill of Lading.

Straight Bill of Lading.

- The straight bill of lading is a nonnegotiable instrument, which means that endorsement of the straight bill cannot transfer title to the goods the straight bill names. For firms using the straight bill of lading, the terms of sale upon which the buyer and seller generally dictate where title to the goods passes.

Order Bill of Lading.

- The order bill of lading is a negotiable instrument showing certificate of title of the goods it names. Using the order bill of lading enables the consignor to retain security interest in the goods. That is, the consignee must pay the goods' invoice value to obtain the original copy of the order bill of lading that must be presented to the carrier for delivery.
Freight Bill.

Freight Bill Documentation.

- The freight bill is the carrier's invoice for the charges the carrier incurs in moving a given shipment. The freight bill lists the shipment, the origin and destination, the consignee, the items, total weight, and total charges.

- Freight bills can be prepaid (i.e., shipper pays freight charges prior to shipment) or collect (i.e., consignees pays freight charges after arrival of the shipment). Most freight bills are generated electronically, which reduces preparation costs and clerical errors, and speeds up paperwork processing.
Others.

Shipping Manifest.

- When multiple shipments or stops occur on a single vehicle for transport, a shipping manifest is used. This document, used in combination with the bill of lading, lists transit stops, consignees, and product characteristics. In essence, the shipping manifest summarizes the multiple shipments that are being transported in a single move.

Freight Claim

- Although not used as frequently as the previous documents, the freight claim form is extremely important when loss or damage occurs in a transport move. Much of the identification information from the bill of lading is included on the freight claim form.

- Shippers must provide a detailed description of the loss or damage that occurred, as well as other accomplished materials to support the claim.
Performance Check.

1. Generally, the effective and efficient management of transportation becomes more important to a firm as transportation's share of product value ____________
   A. Increases.  
   B. Decreases.  
   C. Remains constant.  
   D. Varies considerably.

2. Many factors related to a product's characteristics help to determine the cost and pricing of transportation. Which of the following is NOT one of these ?
   A. Density.  
   B. Stowability.  
   C. Liability.  
   D. Price elasticity.
3. What is TRUE regarding density?
   I. Steel and canned goods exhibit high density.
   II. Electronics and clothing exhibit low density.
   III. Low density products tend to cost more to transport on a per-pound basis.


4. Line-haul rates can be grouped into four groups, which of the following is NOT one of the groupings?
   A. Class rates.       B. Bureau rates.
   C. Exception rates.   D. Commodity rates.
5. What types of the following are likely transported via air?
   I. Human organs and blood.
   II. Fluffy product like flowers.
   III. Diagnostic medicine.
   IV. High value products.
   
   A. I, III  
   B. I, III, IV  
   C. I, IV  
   D. I, II, III, IV

6. How did containerization change the materials handling function?
   A. From being capital intensive to labor intensive.
   B. From being labor intensive to capital intensive.
   C. From being an ancillary function to a secondary function.
   D. From economics.
Performance Check.

7. Which of the following transportation documentation was NOT identified as critical to the traffic manager's job?
   A. Shipping manifest.  
   B. Freight claim.  
   C. INCOTERM contract of sale.  
   D. Bill of lading.

8. What is an order bill of lading?
   A. An order for goods which a firm issues to a vendor.  
   B. The same as a freight bill.  
   C. A negotiable instrument that acts as a certificate of title.  
   D. A purchase invoice.
9. Which of the following of a service-related factor often considered in mode/carrier selection?
   A. Freight costs.
   B. Investment cost required to produce the inventory in the pipeline.
   C. Billing/invoicing accuracy.
   D. Inventory carrying cost of the required safety stock in the pipeline.

10. Computerized software that allows managers to monitor costs and service by providing historical reporting of key performance measures such as shipping modes, traffic lane utilization, and backhauls is classified under which system?
    A. Transportation analysis.
    B. Traffic routing and scheduling.
    C. Vehicle maintenance.
    D. Freight auditing.
Performance Check.

Solutions:

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