



Chapter 10 Transportation—Managing the Flow of the Supply Chain

- Transportation involves the physical movement of goods between origin and destination points.
- The transportation system links geographically separated facilities in a company's supply chain.
- Transportation facilitates the creation of time and place utility.
- Transportation also has a major economic impact on the financial performance of businesses.



Role of Transportation in Supply Chain Management

Transportation is a key supply chain process that must be included in supply chain strategy development, network design, and total cost management.

- Transportation provides the critical links between supply chain partners, permitting goods to flow between their facilities.
- Transportation service availability is critical to demand fulfillment in the supply chain.
- Transportation efficiency promotes the competitiveness of a supply chain

Challenges to carrying out transportation's role

- Supply chain complexity
- Competing goals among supply chain partners
- Changing customer requirements
- Limited information availability
- Synchronizing transportation with other supply chain activities
- Transportation capacity constraints and rising transportation rates
- Changing governmental requirements that affect cost and service
- Growing safety and environmental regulation



Modes of Transportation

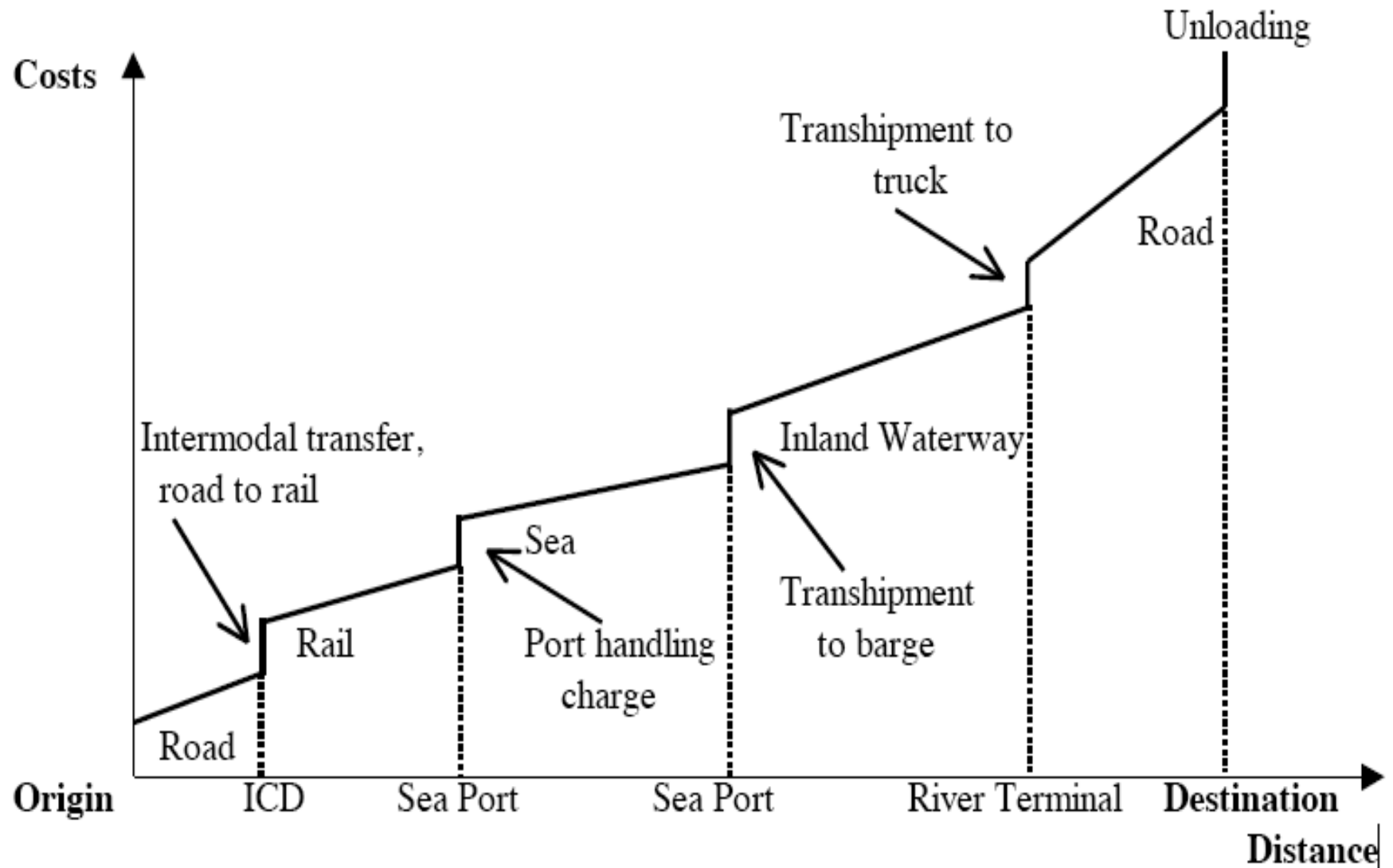
- truck
- rail
- air
- water
- pipeline
- multimodal transportation

Multimodal Transportation

Movement of goods (in the same loading unit) through successive modes of transport without further handling

- Use the best features of different modes
- Expands accessibility
- Facilitates global trade
- Standardized containers promotes multimodal growth
- Serves as an effective bridge for rail system gaps
 - Disjointed rail network
 - Break of gauge

Multimodal Transportation – Cost/Distance Graph



Terms of Sale & Responsibilities

Table 10-2

Key Responsibilities Under FOB and Freight Payment Terms

FOB TERM AND FREIGHT PAYMENT RESPONSIBILITY	WHO OWNS GOODS IN TRANSIT?	WHO HANDLES FREIGHT CLAIMS?	WHO SELECTS AND PAYS CARRIER?	WHO ULTIMATELY BEARS FREIGHT COSTS?	BEST USED WHEN ____ HAS GREATER INFLUENCE WITH CARRIER
FOB Origin, Freight Collect	Buyer	Buyer	Buyer	Buyer	Buyer
FOB Origin, Freight Prepaid	Buyer	Buyer	Seller	Seller	Seller
FOB Origin, Freight Prepaid & Charged Back	Buyer	Buyer	Seller	Buyer The seller adds freight costs to goods invoice.	Seller
FOB Destination, Freight Prepaid	Seller	Seller	Seller	Seller	Seller
FOB Destination, Freight Collect	Seller	Seller	Buyer	Buyer	Buyer
FOB Destination, Freight Collect & Allowed	Seller	Seller	Buyer	Seller The buyer deducts freight cost from goods payment.	Buyer

Modal Characteristics

- Accessibility
 - Motor transportation has advantage over air, rail, and water
- Transit Time
 - Air and motor transportation has advantage over rail, water, and pipeline
- Reliability
 - Motor carriers and air carriers are generally more reliable than water carriers and rail carriers
- Product Safety
 - Goods suffered less damage when transported by air and motor, as compare to rail and water
- Cost
 - Motor and air transportation are more expensive than rail and water transportation

Modal Selection Criteria

- Cost
- Speed
- Durability of cargo
- Cargo value
- Route
- Cargo security and safety
- Equipment availability
- Cargo characteristics (e.g. oversize, dangerous goods)
- Difference in border management process (e.g. rail shipments generally have less cross border delays)



Carrier Selection Trend

- Core carrier concept
 - Long term relations with a small number of carriers
 - Leverage purchasing dollars to drive down transport cost and secure capacity and service quality commitments from carrier
 - Reduce carrier management cost and optimize dock space usage
 - Improve IT connection, get better track and trace ability



Transportation Rate & Service Negotiation Recommendations

- Centralize contract negotiations
- Leverage volume with a small number of carriers
- Develop contracts for tailored set of transportation services at specific prices and specific duration
- Achieve mutual productivity improvements, then get a share of carrier's gains

Preparing Shipments for Transportation

- Corporate transportation routing guide
 - Ensures compliance with service contracts
 - Maintain centralized control over internal and external freight routing & tendering decisions

- Cost-saving actions
 - Consolidate freight
 - Coordinate shipment deliveries
 - Take full advantage of equipment capacity
 - Make accurate freight count
 - Inspect and note cargo loss & damage

Freight Documents

Bill of lading

- Originates the shipment
- Provides all the information the carrier needs
- Stipulates the contract terms, including carrier's liability for loss and damage
- Acts as a receipt for the goods the shipper tenders to the carrier
- Certificate of title to goods in some cases (Order Bill of Lading)

Freight bill

- Carrier's invoice for services provided
- Lists shipment origin & destination, address of shipper & consignee, itemizes cargo, total weight & total charges

Freight claims form

- Filed with the carrier to recoup monetary losses if carrier fails to properly protect the shipment.
- Carriers are not liable for freight claims if the damage is attributable to:
 - Natural disaster or some other “act of God”
 - Military attack or similar “act of public enemy”
 - Government seizure of freight or “act of public authority”
 - Failure to adequately package the freight or other negligent “act of the shipper”
 - Extreme fragility, perishability, or similarly problematic “inherent nature of the goods”

Transportation Performance Metrics

- Key performance indicators (KPI) are used to evaluate
 - current performance versus historical results
 - internal goals
 - carrier commitments
- Challenge lies in narrowing down available metrics to a manageable number of KPI
- KPI should encompass service quality and efficiency

Common metrics for monitoring carrier performance

Table 10-5

Transportation Performance Scorecard

PERFORMANCE CRITERIA	WEIGHT FACTOR	PERFORMANCE EVALUATION	POTENTIAL SCORE	CRITERIA SCORE
On-time delivery	8	>98% = 5 96.01–98% = 4 94.01–96% = 3 92.01–94% = 2 <92% = 0	40	
Loss and damage rate	5	<0.5% = 5 0.5–1% = 4 1–1.5% = 3 1.5–2% = 2 >2% = 0	25	
Billing accuracy	3	>99% = 5 97–99% = 3 95–96% = 1 <95% = 0	15	
Equipment condition	2	Safe, clean, correct type = 5 Poor condition, incorrect = 0	10	
Customer service	2	Superior = 5 Good = 4 Average = 3 Fair = 2 Unacceptable = 0	10	
Total Score			100	



Transportation Management System (TMS)

- Critical applications include the following:
 - Routing and shipment scheduling
 - Proper routing & scheduling impact customer satisfaction & supply chain performance
 - Load planning
 - Preparation for safe, efficient deliveries
 - Load tendering
 - Delivery appointment scheduling
 - In-Transit Visibility



Maintain In-Transit Visibility

- Manage key events as product moves across the supply chain
- Information technology facilitates the ability to monitor product movements
- Visibility tools must be linked to other capabilities and processes to have an impact on supply chain event management