

E216 Distribution and Transportation

Problem 02 Ship to the Customers 2











SCHOOL OF **ENGINEERING**











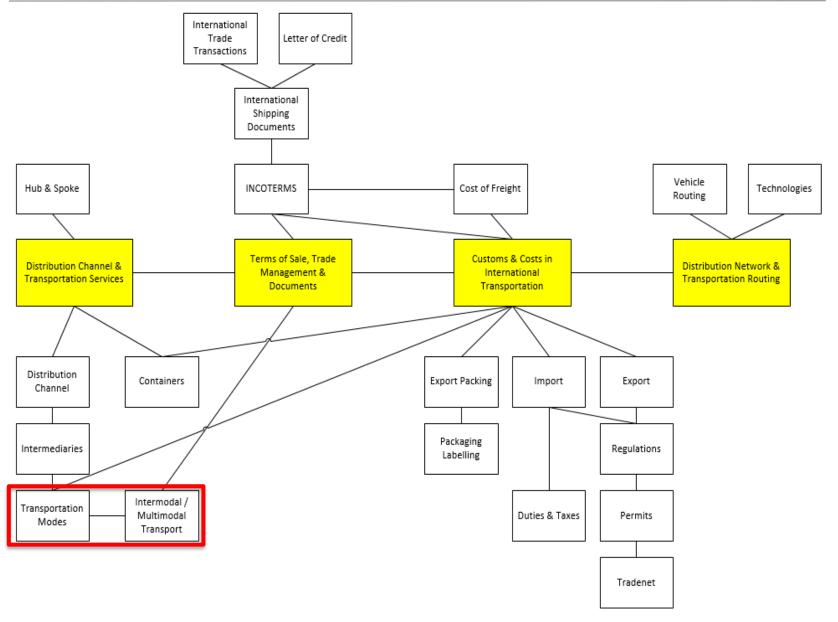






E216 Distribution & transportation - Topic Tree





Transport Terms



- Unimodal Transport Goods are transported by one or more carriers using one mode of transport only
 - If there is only one carrier, he issues his own transport document; if there is more than one carrier, one carrier may issue a through Bill of Lading covering the entire transport.
- Intermodal Transport
- Multimodal Transport









Intermodal VS. Multimodal



- Intermodal is the movement of cargo from origin to destination by several modes of transport where each of these modes have a different transport provider or entity responsible, each with its own independent contract. Multiple carriers during a single journey with multiple contracts
- Multimodal is the movement of cargo from origin to destination by several modes of transport where each of these modes have a different transport provider or entity responsible, <u>but under a single contract</u>. Single carrier during a single journey with single contract

In summary, the key functions of both terminologies are the same, but the differentiation lies in the contract and responsibility of the movement.

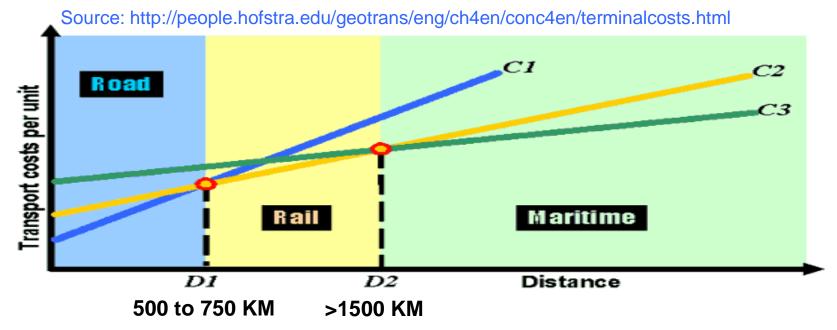
Advantages of Multimodal Transport



- Planned and coordinated as a single transport.
- Speedy transfer and transit times improve time-tomarket opportunities for sellers.
- Burden of multiple documentation and other formalities connected with segmented transport are greatly reduced.
- With more efficient movement of goods, freight rates are reduced.
- Multimodal Transport operator (MTO) provides single point of contact, thereby promoting greater efficiency and productivity while reducing confusion.

Why Intermodal/Multimodal Transportation?





Note: C1- Road; C2-Rail; C3-Maritime

- Relationship between transport costs, distance and modal choice:
 - ✓ Road transport is usually used for short distances
 - ✓ Railway transport for average distances.
 - ✓ Maritime transport for long distances
- Intermodalism:
 - ✓ The opportunity to combine modes.
 - ✓ Find a less costly alternative than a unimodal solution.



Sea-air

- Best of both worlds speed of air cargo and economy of seafreight.
- Preferred when the route combines large distances over land and water.
- Ideal for high-value items such as electronics and seasonal goods such as toys.

Air-road

- Road transport is used to move cargo which prove to be uneconomical to service by air, or where airlines do not enjoy landing rights.
- Also known as Birdyback, which utilizes containers that are transferred onto planes for part of the journey.



Rail-road-inland waterways-sea

 Commonly used when goods in the country of origin are moved from an inland clearance depot by road, rail or inland waterway to the seaport.





Mini-bridge

 Containers are moved on a vessel from a port in one country to a port in the destination country, and then moved by rail to a second port in the destination country; all under a through B/L (Bill of Lading).



Land bridge

 Containers are shipped overland as part of a sea-land route in the land bridge system.







Piggyback

- Goods are packed in trailers and hauled by tractors to railway stations where the same trailers are moved onto railway flat cars.
- The trailer train has retractable wheels that allow it to move as a truck would on roads and be connected to rail bogies.
- Flexibility of truck loading and efficiency of long-haul railway.



Land-sea-land

- Containers are moved by road to a seaport and transferred by a vessel to the destination port; upon unloading the containers are moved by truck or rail to final destination.
- Also known as Fishyback.

RO-RO (Roll On Roll Off)

 Usually used to transport new cars, making use of RO-RO ferries.





Sea-train

 Combines rail and sea transport using a rail-car instead of a RO-RO vehicle that is transported by sea and connected to the railway to complete the delivery.

LASH (Lighter Aboard Ship)

- Combining inland waterway movement with deep-sea transportation.
- Barges are loaded onto LASH container vessels and unloaded at the waterways to carry on to the destination port.



Freight Forwarder in General



- Freight forwarder provided specialist services to traders and shippers.
- Also known as Forwarding Agent or Third Party Logistics provider (3PL).
- Grown in importance and size due to globalization.
- Able to secure better transportation rates (from airline and vessel carriers) due to large volume consolidated from different customers
- Service commonly provided (but not limited to):
 - Advising on transportation and distribution
 - Arranging cargo insurance on behalf of customers
 - Assisting with documentation for import and export

Freight Forwarder in General



- Containerization
- Warehousing
- Transhipment
- Collection of cash-on-delivery charges
- When a forwarder acts as a principal, it becomes MTO:
 - ✓ Assumes the liability from the time the goods is picked up until the handover to consignee named in the transport document.
 - ✓ Sub-contractors engaged will still be under the forwarder's responsibility.









Air Freight Forwarder



- Act as marketing intermediaries for airlines and customers
 - Close liaisons with GHA (Ground Handling Agent) and Airline
- Import, Export and transhipment of freight in/ out of Airport
- Majority of Air Freight Forwarders are members of IATA
 - International Air Transport Association (IATA)



Air Cargo Industry





Containerization



- Load unit that can be used by several transport modes.
- Usable by maritime, railway and road modes.
- Foremost expression on intermodal transportation.
- Rectangular shape that can easily be handled.
- Reference size is the Twenty-foot Equivalent Unit (TEU).
- The most common container is the 20 footer (6 meters).

Buying Container's Space



Full Container Load (FCL)

- Cargo in the container belongs to one shipper or one consignee.
- Container is loaded by the shipper or the agent and is delivered to the container yard used by the MTO.
- Shipper is charged based on the type and number of container used.

Less than Container Load (LCL)

 Occur when cargo from an individual shipper is insufficient to fill the entire container.

Buying Container's Space



Consolidation

- Freight forwarders issue their own house bill of lading to individual shipper.
- Container is delivered to MTO as full load.
- Freight forwarder is charged based on the type and number of container used.



Intermodal Handling Equipment



Transtainers

 Large devices mounted on rails to transfer containers from vessels to trucks or rail wagons.



Gantry (or portal) crane

 Designed to lift containers and swap bodies, and built with 4 corners with 1 leg each and wheels at the bottom of each leg.

Intermodal Handling Equipment



Grappler lift

 Similar to the gantry crane, except that it is fitted with 4 arms designed specifically to handle swap bodies.





Reach stacker

 A heavy-duty materials handling truck that is fitted with a lifting arm and a spreader beam.

Transportation Mode Selection







Characteristics in Transportation Service Selection

Basic Cost Trade-Offs **Competitive Considerations**











Competitive Considerations



- Selection of transport mode may be used to create a competitive service advantage
- To Customer, a better transport service means lower inventory levels maintained and operating schedules met with greater certainty
- To Supplier, profits can be higher from the increase business, even from a more expensive transportation mode



Method 2 – Competitive Considerations

Sample Calculation (Truck Mode):

Volume Sold for Truck Transport Mode (per month) = 4,500kg

Profit on each $kg = $4.00 \times 20\% = 0.80

Total Profit = $$0.80 \times 4,500 = $3,600.00$

Transport Cost (per month) = Transport Rate x Volume in kg = $$0.30 \times 4,500$ = \$1,350.00

Total Net Profit (per month) = \$3,600.00 - \$1,350.00= \$2,250.00





Method 2 – Competitive Considerations for Beef

Mode	Rail	Sea	Truck	Air
Transportation Rate per kg (\$)	\$0.20	\$0.15	\$0.30	\$1.20
Lead Time in days (T)	4	6	3	2
Calculation				
If the company chooses	Rail	Sea	Truck	Air
Volume sold (kg)	4,000.00	3,000.00	4,500.00	5,000.00
Profit (\$)	\$3,200.00	\$2,400.00	\$3,600.00	\$4,000.00
Transport Cost (\$)	\$800.00	\$450.00	\$1,350.00	\$6,000.00
Net Profit	\$2,400.00	\$1,950.00	\$2,250.00	-\$2,000.00

Note: We assume that transport cost to be the only cost used in the computation of net profit



Rail has the highest overall net profit!



Demand 2,000 kg

Price of per item (\$) \$3.00

Inventory Carrying cost (\$) 15% of price per item per year

From the farm to Thailand Airport/ Port				
Mode		Truck		
Transportation Costs per kg (\$)		\$0.30		
Door-to-Door Transit Time in days (T)	4	3		

	Rail-Air	Truck-Air	Rail-Sea	Truck-Sea
Total Miscellaneous Charge (\$)	\$400.00	\$450.00	\$250.00	\$300.00

From Thailand Airport/ Port to Singapore				
Mode	Air	Sea		
Transportation Costs per kg (\$)	\$1.20	\$0.15		
Door-to-Door Transit Time in days (T)	2	6		

		Rail-Air	Truck-Air	Rail-Sea	Truck-Sea
Transportation Cost from the farm	Rail	\$400	\$0	\$400	\$ 0
to Thailand Airport/ Port	Truck	\$ 0	\$600	\$0	\$600
Transportation Cost from Thailand Airport/ Port to Singapore	Air	\$2,400	\$2,400	\$0	\$0
	Sea	\$0	\$0	\$300	\$300
Inventory Holding Cost (ICDT/365)		\$15	\$12	\$25	\$22
Miscellaneous Cost		\$400	\$450	\$250	\$300
	Total Cost	\$3,214.79	\$3,462.33	\$974.66	\$1,222.19



	Rail-Air	Truck-Air	Rail-Sea	Truck-Sea
Total Cost	\$3,214.79	\$3,462.33	\$974.66	\$1,222.19
Number of Days	6	5	10	9



	Rail-Air	Truck-Air	Rail-Sea	Truck-Sea
Total Cost	\$3,214.79	\$3,462.33	\$974.66	\$1,222.19
Number of Days	6	5	10	9

Highest cost, but it is the fastest

Lowest cost, but it takes longer



Learning Objectives



- Describe multimodal transport
- Explain the roles of freight forwarder
- Discuss about containerization in intermodal transport
- Identify intermodal handling equipment
- Identify and apply transportation mode selection









E216 Distribution & transportation - Topic Flow



