

E216 Distribution and Transportation

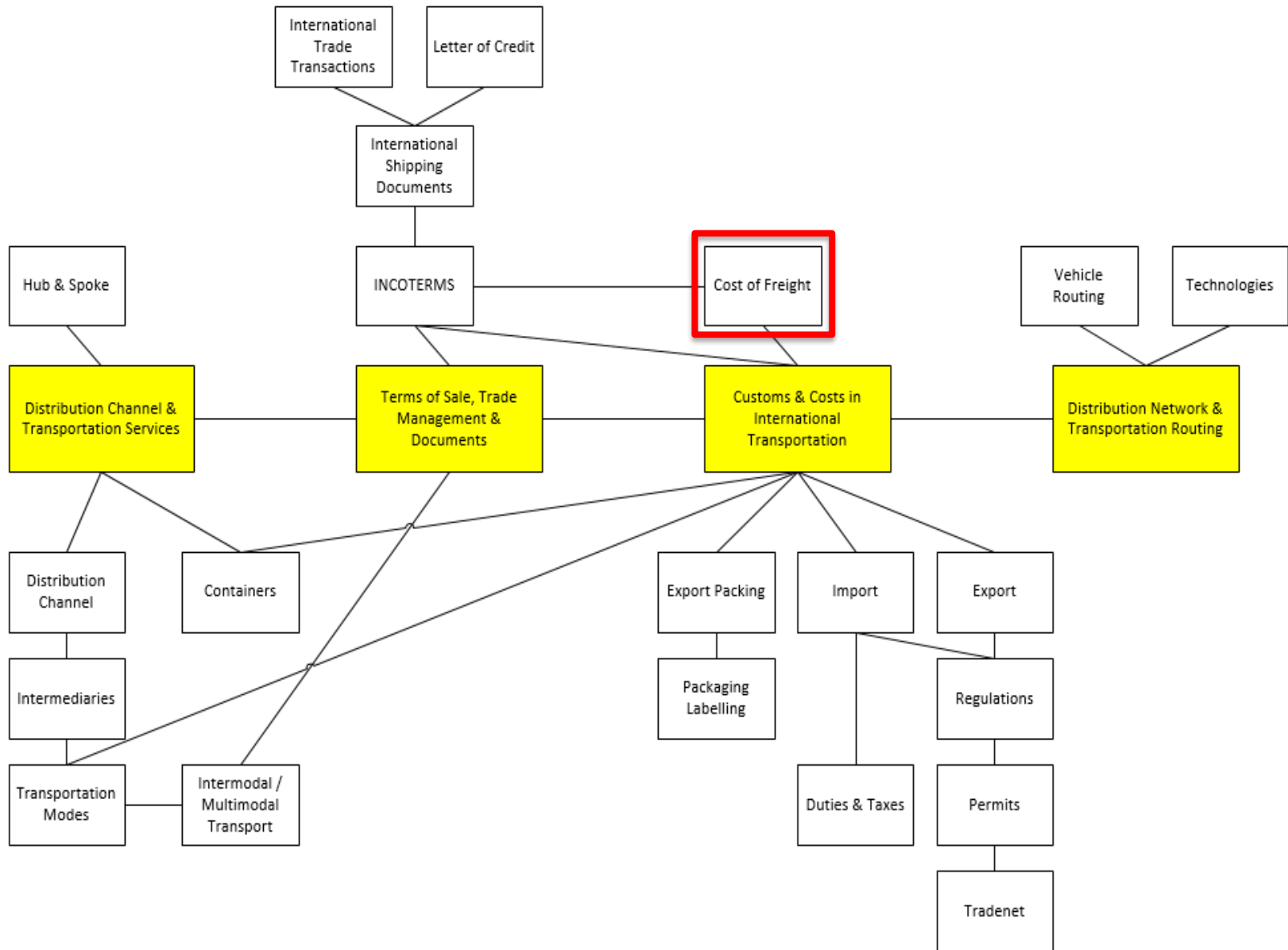
P06

How Much Does It Cost?

- Discuss basis for shipment rates
- Explain weight of shipment
 - Volumetric Weight
 - Revenue Ton
- Describe types of freight rates
 - Air Freight
 - Sea Freight

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E216 Distribution & transportation - Topic Tree



Basis For Shipping Rates



- Cost of Service
- Value of Service
- Distance
- Volume/ Weight of Shipment



Cost of Service

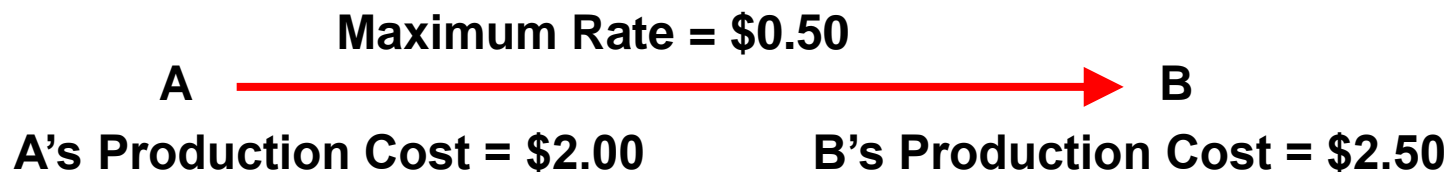


- A “buildup” approach
- Carrier established a rate based on **cost of providing the service plus a profit**
- An approach for low-value goods or in highly competitive situations
- May have difficulty allocating common/joint costs to a production unit
- Basis for cost and rate variations

Value of Service



- Charges a rate based on **perceived shipper value** rather than actual cost of service
- Shipper willing to pay more to transport high-value goods or when limited competition exists
- Considers the **demand side of pricing** – the ability of product to withstand transportation costs



E.g. Production cost at B is \$2.50 and Production cost at A is \$2.

- The highest rate a carrier can charge to move producer A's product to point B is \$0.50 per unit
- The upper limit value of service is \$0.50 in this case

Value of Service



	Coal	Gold
Production value per ton	\$45.00	\$10,000,000
Transportation charge per ton	\$5.00	\$2,000.00
Total selling price	\$50.00	\$10,002,000
Transportation cost as a percentage of selling price	10%	0.02%



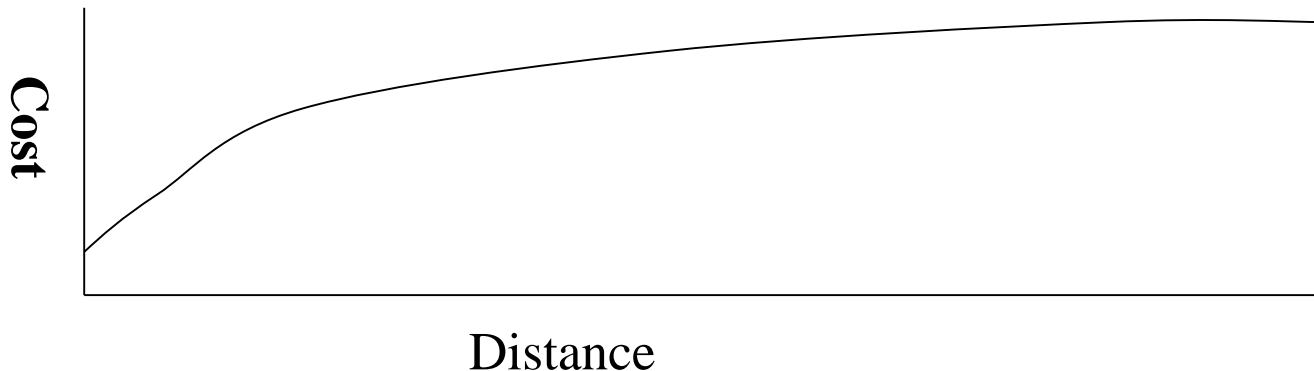
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Distance



- The longer the transportation distance, the higher the cost to carrier and the higher the transportation rate
- The increase in transportation rate is not directly proportional to distance
 - **“Tapering rate principle”**



- As distance increases, the cost per kilometer decreases, causing the rate to taper with distance
- Intercept point on vertical axis corresponds to terminal costs

Blanket Rates



- Blanket rates are rates that do not vary with distance (e.g. postage stamp)
- Rate is the same for all points in the blanket area the carrier designates (city's commercial zone, a given state, region, or a number of states)



Weight of Shipment



- For **air freight**, rates are usually based on **Volumetric Weight**
- For **sea freight**, rates are based on weight or measurement (W/M) basis, also known as **Revenue Ton (RT)**. If shipment is full container load, then container rates apply.
- For Railroads, rates are based on **carload (CL)** or **less-than-carload (LCL)** quantity
- For Motor carriers, rates are based on **truckload (TL)** or **less-than-truckload (LTL)** quantity
 - CL and TL rates are lower; LCL and LTL rates are relatively higher
 - Carriers may offer quantity discount for shipping large weight/volumes – rate decreases as weight/volume of shipment increases



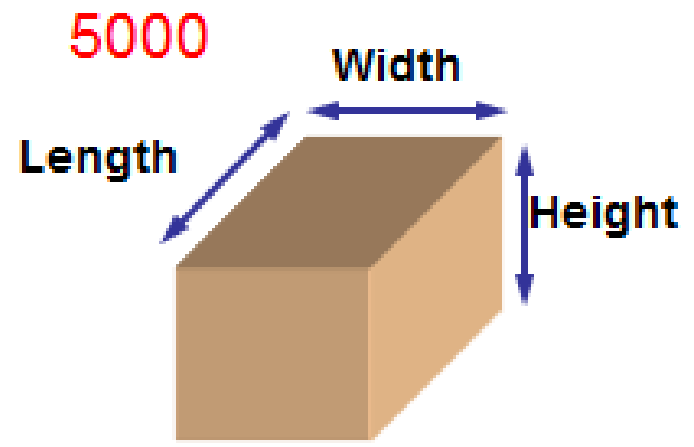
Volumetric Weight



- Large items with light overall weight can be charged according to the space they take up
- Volumetric Weight, or dimensional (Dim) weight, is used to calculate the shipment cost
- Used in airfreight

$$\text{Volumetric Weight (Kg)} = \frac{\text{Length} \times \text{Width} \times \text{Height (in cm)}}{5000}$$

Note: The volumetric divisor is taken to be 5000

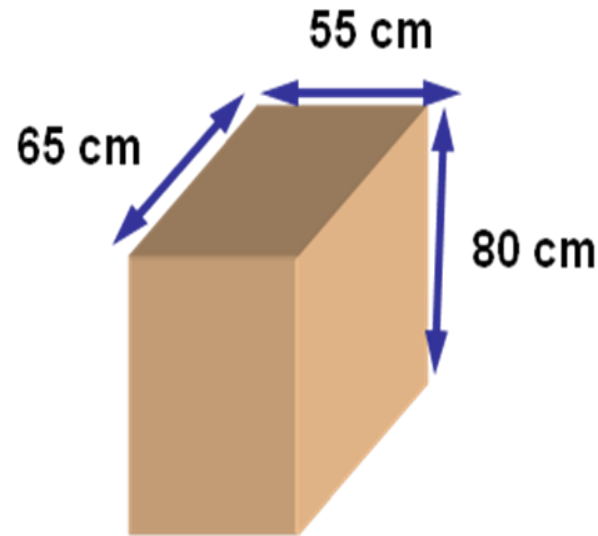


Volumetric Weight



Note:

- The volumetric divisor is taken to be 5000
- The diagram is not drawn to scale



$$\begin{aligned}\text{Volumetric Weight} &= \frac{\text{Length} \times \text{Width} \times \text{Height (in centimeters)}}{5000} \\ &= 65 \text{ cm} \times 55 \text{ cm} \times 80 \text{ cm} / 5000 \\ &= 286,000 / 5000 = 57.2 \text{ kg}\end{aligned}$$

- The higher of volumetric weight or actual weight is used to calculate air freight charges

Weight or Volume Calculation (Sea)



- Freight charges may sometimes be quoted in w/m - Weight or Measurement
- W/M rates are usually quoted in 1000 kilograms = 1 Metric Ton (MT) (**weight**) or Cubic Meters (CBM) (**measurement**)
- The higher of weight and measurement is chosen to calculate the freight rate, and will be considered the Revenue Ton (RT)

E.g. If the freight charge is \$6.00 per w/m, the freight charge of a 4000 kg (or 4 tons) shipment in a 3m³ box is \$24



Components of Air Freight Cost



- **Air Freight Rate** – Cost of transporting the freight by air. Measured in volumetric weight ranges
- **Fuel Surcharge** – Fuel charge on goods shipped due to increased fuel prices
- **Security Surcharge** - Security charge on goods shipped due to increased security. It may be insurance covering damage caused by war; also known as Airline War Risk Charge or War Risk Insurance
- **AWB Fee** – Charge on generating Airway Bill
- **Documentation Fee** – Handling of invoice, insurance, packing list and other shipping documents



Components of Air Freight Cost



- **Export/Import Permit Declaration fee** – TradeNet processing and transmission cost/ fee.
- **Customs Examination** – Cost of Customs examination of goods imported/exported. Also known as government stamp fees
- **Weight Verification Fee** – Cost of verifying the weight of goods, a requirement for export shipments
- **Export/Import Transfer Fees** – Cost of transferring cargo to/from truck to terminal
- **Agency Fees** – for consolidation, tracking of shipments



General Cargo Rates (GCR)



Published Rates	Minimum Weight (kg)	Rate
Normal	< 45	\$23.22
Quantity	45	\$20.32
Quantity	100	\$17.47
Quantity	200	\$15.25
Quantity	300	\$14.58
Quantity	400	\$12.41
Quantity	500	\$11.68

Note: These rates are dated. Cargo rates are time sensitive. For latest rates, check with your 3PL.

Export Air Freight Calculation



		No of cartons	1	2	3	4	5	6	7	8
		Higher of Weight or V. Weight	6.4	12.8	19.2	25.6	32	38.4	44.8	51.2
Air freight	SGD	UOM								
THA/SIN	(see GCR)	per kg	\$148.61	\$260.10	\$335.42	\$447.23	\$559.04	\$585.60	\$683.20	\$780.80
Fuel Surcharge	1.2	per kg	7.68	15.36	23.04	30.72	38.4	46.08	53.76	61.44
Security Surcharge	1.5	per kg	9.6	19.2	28.8	38.4	48	57.6	67.2	76.8
Airway Bill (AWB) Fee	100		100	100	100	100	100	100	100	100
Documentation	80		80	80	80	80	80	80	80	80
Permit Declaration	60		60	60	60	60	60	60	60	60
Customs Examination	40		40	40	40	40	40	40	40	40
Weight Verification Fee	5		5	5	5	5	5	5	5	5
Transfer Fees (min \$20)	0.5	per kg	20	20	20	20	20	20	22.4	25.6
Agency Fees	50		50	50	50	50	50	50	50	50
Total			\$520.89	\$649.66	\$742.26	\$871.35	\$1,000.44	\$1,044.28	\$1,161.56	\$1,279.64

Per carton calculation

Dimensions in cm LxBxH	40	40	20
Volume	32000	cm3	
Volumetric Weight	6.4	kg	
Weight	5	kg	

Note: We take the volumetric divisor to be 5000.

Fixed Fee

Published Rates	Minimum Weight (kg)	Rate (\$)
	0	\$23.22
Normal	45	\$20.32
Quantity	100	\$17.47
Quantity	200	\$15.25
Quantity	300	\$14.58
Quantity	400	\$12.41
Quantity	500	\$11.68

Components of Seafreight Cost



- **Ocean Freight Cost** – Cost of freight transportation by sea. Measured in Revenue Ton
- **B/L Fee** - For processing of Bill of Lading
- **Transport** – Local transport charges
- **Forklift Fees** – Transfer of shipment from truck to wharf for loading
- **Documentation** – Handling of invoice, packing list, B/L and other shipping documents



Components of Seafreight Cost



- **Customs Examination** – Customs examination of shipment
- **THC** – Terminal Handling Charges
- **Permit/ TradeNet Fee** – For TradeNet permit processing
- **Express B/L Fees** – Charges for courier service of Bill of Lading to consignee



Export Seafreight Calculation



	No of cartons		1	2	3	4	5	6	7	8	9
Ocean freight	SGD	UOM									
Ocean freight	50	per RT	1.6	3.2	4.8	6.4	8	9.6	11.2	12.8	14.4
Bill of Lading (B/L) Fee	130		130	130	130	130	130	130	130	130	130
Transport fee (minimum \$80)	20	per cbm	80	80	80	80	80	80	80	80	80
Forklift Fees (no minimum charge)	50	per 4 cbm	0.4	0.8	1.2	1.6	2	2.4	2.8	3.2	3.6
Documentation Fee	130		130	130	130	130	130	130	130	130	130
Customs Examination	60		60	60	60	60	60	60	60	60	60
Terminal Handling Charges	15	per RT	0.48	0.96	1.44	1.92	2.4	2.88	3.36	3.84	4.32
Permit/Tradenet Fee	30		30	30	30	30	30	30	30	30	30
Express B/L Fees	40		40	40	40	40	40	40	40	40	40
Total			472.48	474.96	477.44	479.92	482.4	484.88	487.36	489.84	492.32

Per carton calculation

Dimensions (in cm)	40	40	20		
Dimensions (in m)	0.4	0.4	0.2		
Volume (CBM)	0.032	m3			
Weight	0.005	ton			
Revenue Ton	0.032	RT			

UOM

Unit of measurement

B/L

Bill of Lading

RT

Revenue Ton

THC

Terminal Handling Charges

Fixed fee

Freight Rates are also affected by:



- **Type of Shipment** (FCL, LCL, palletized, etc)
- **Terms of Sale** (FOB/EXW/DDP)
- **Surcharges** (Fuel and War Risk Surcharge)
- **Insurance** (with/without insurance, additional insurance?)
- **Freight Adjustments**
 - ✓ Currency Adjustment Factor (CAF)
 - ✓ Bunker Adjustment Factor (BAF)
- **Destination** (Distance travelled, and tariffs on goods may be different)
- **Mode of Shipment**
- **Profit Margin**



Fastest and under **S\$1,500** transportation



Fastest under \$1500

No of cartons	Air	No of cartons	Sea	Total
0	\$0.00	8	\$489.84	\$489.84
1	\$520.89	7	\$487.36	\$1,008.25
2	\$686.78	6	\$484.88	\$1,171.66
3	\$852.66	5	\$482.40	\$1,335.06
4	\$1,018.55	4	\$479.92	\$1,498.47
5	\$1,184.44	3	\$477.44	\$1,661.88
6	\$1,350.33	2	\$474.96	\$1,825.29
7	\$1,518.62	1	\$472.48	\$1,991.10
8	\$1,539.22	0	\$0.00	\$1,539.22

4 cartons arrive by air, and balance 4 cartons arrive by sea

Most cost effective way



Cost Effective

No of cartons	Air	No of cartons	Sea	Total
0	\$0.00	8	\$489.84	\$489.84
1	\$520.89	7	\$487.36	\$1,008.25
2	\$649.66	6	\$484.88	\$1,134.54
3	\$742.26	5	\$482.40	\$1,224.66
4	\$871.35	4	\$479.92	\$1,351.27
5	\$1,000.44	3	\$477.44	\$1,477.88
6	\$1,044.28	2	\$474.96	\$1,519.24
7	\$1,161.56	1	\$472.48	\$1,634.04
8	\$1,279.64	0	\$0.00	\$1,279.64

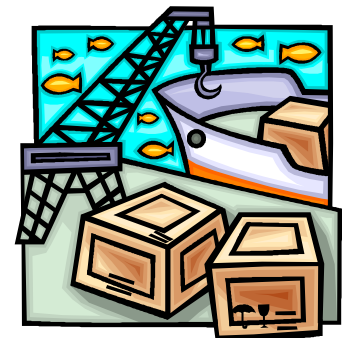
8 cartons by sea

Today's Problem



Basis of Shipment Rates:

- Cost and value of service
 - Distance; and
 - Volume or weight of the shipment
- **Fastest under \$1500 method of transportation**
 - Air – 4 cartons – \$1,018.55
 - Sea – 4 cartons – \$479.92
 - Total cost: \$1,498.47
 - **Most cost effective method**
 - Sea – 8 cartons - \$489.84
 - Total cost: \$489.84



Learning Outcome



- Discuss basis for shipment rates
- Explain weight of shipment
 - Volumetric Weight
 - Revenue Ton
- Describe types of freight rates
 - Air Freight
 - Sea Freight

