

Problems UK Transport Multimodal

13.1 A company normally ships to a customer by rail at a cost of \$500 per load. The transit time is 14 days. The goods can be shipped by truck for \$700 per load and a transit time of four days. If transit inventory cost is \$35 per day, what does it cost to ship each way?

13.2 A company manufactures component parts for machine tools in North America and ships them to southeast Asia for assembly and sale in the local market. The components are shipped by sea, transit time averages six weeks, and the shipping costs \$1000 per shipment. The company is considering moving the parts by air at an estimated cost of \$7500, the shipment taking two days to get there. If inventory in transit for the shipment costs \$150 per day, should they ship by air?

It was said that forecasts are more accurate for nearer periods of time. Should this be considered? What activities are affected by the shorter lead time?

13.3 For a given commodity, the line-haul cost is \$13 per mile. For a trip of 200 miles and a shipment of 300 cwt., what is the cost per hundred weight? If the shipment is increased to 500 cwt., what is the saving in cost per hundred weight?

13.4 A company ships a particular product to a market located 1000 miles from the plant at a cost of \$4 per mile. Normally it ships 500 units at a time. What is the line-haul cost per unit?

13.5 In problem 13.4, if the company can ship the units unassembled, it can ship 800 units in a truck. What is the line-haul cost per unit now?

13.6 A company processes feathers and ships them loose in a covered truck. The line-haul cost for an average shipment is \$250, and the truck carries 2000 pounds of feathers. A bright new graduate has just been hired and has suggested that they should bale the feathers into 500-pound bales. This would make them easier to handle and also allow them to be compressed into about one-tenth of the space they now occupy. How many pounds of feathers can the truck now carry?

What is the present line-haul cost per pound?

What will it be if the proposal is adopted?

13.8 A company ships LTL to customers in a market in the Midwest at an average cost of \$40 per cwt. It proposes establishing a distribution center in this market. If TL shipment costs \$20 per cwt., the estimated inventory-carrying costs are \$5 per cwt., and the local cartage (LTL) cost is estimated at \$6 per cwt. If the annual shipped volume is 100,000 cwt., what will the annual savings be by establishing the distribution center?

13.9 A company has a central supply facility and a distribution center located 500 miles away. The central supply product cost is \$20, TL transportation rates from central supply to the DC are \$50 per unit, and inventory-carrying costs are \$4 per unit. Calculate the market boundary location and the laid-down cost at the market boundary. LTL rates are \$1 per unit per mile.

13.10 Suppose the company in problem 13.8 had another market area located between the parent plant and the proposed distribution center. The LTL costs from the plant to that market are \$35 per cwt. The company estimates that LTL shipments from the distribution center will cost \$4 per cwt. Should it supply this market from the distribution center or central supply?

13.11 A company can ship LTL direct to customers in city A or use a public warehouse located in city B. It has determined the following data.

Cost per cwt. for shipping LTL to city A is $\$0.70 + \0.30 per mile.

Cost per cwt. for shipping TL to warehouse is $\$0.40 + \0.15 per mile.

Warehouse handling costs are \$0.30 per cwt.

Distances: Plant to city A = 115 miles

Plant to city B 135 miles

From city B to city A = 30 miles

- a. What is the total cost per cwt. to ship from the plant direct to customers in city A?
- b. What is the total cost per cwt. to ship via the warehouse in city B?
- c. In this problem, the cost per cwt. has a fixed and a variable component. Why?