One of Steve Johnson’s customers has presented him with an opportunity to move a significant amount of freight into a new market for Nomadic Trucking. The new move would be a weekly run between Greensboro, NC and Minneapolis, MN. Nomadic has hubs in both Greensboro and Minneapolis but has avoided hauling between the two cities because of the lack of backhaul opportunities from Minneapolis. This new move offers a significant increase in volume for Nomadic and Mr. Johnson wants to consider it. As part of the move Nomadic will perform sorting and segregation at its dispatch center in Greensboro. Each shipment will consist of straight (one product) pallet loads of various types of consumer goods freight destined for a retailer’s distribution center in Minneapolis. Sorting and segregation at Nomadic’s locations would consist of breaking the pallets and sorting the freight by the retailer’s store locations, then repalletizing into rainbow (mixed products) pallets for each store.

Mr. Johnson knows he needs to determine the operating cost for the move to make sure that the contract for the haul would be profitable. Because of the large volume involved, not covering Nomadic’s costs in pricing could result in losses that might cripple the company. The relevant information for costing this move is as follows:

**Operating Cost Data:**

Equipment Purchase Price

1. Line-haul tractors = $85,000
2. Line-haul trailers = $26,000

Depreciation

1. Tractors = 5 years straight line
2. Trailers = 8 years straight line

Interest

1. Tractors 5.5% APR for 5 years
2. Trailers 5.5% APR for 8 years

Fuel

1. $3.80 per gallon for diesel
2. Line-haul tractors = 6.5 miles per gallon

Labor

1. Line haul drivers = $0.34 per mile
2. Pick-up and delivery (PUD) drivers = $18 per hour
3. Dock workers = $14 per hour

Administrative Costs 8%

Dock Costs (The cost of having the merchandise at the distribution center) $10/hour

**Truck Route Information**

1. PUD

The shipment (40,000 pounds) originates at a customer location in Greensboro, located 15 miles from Nomadic’s dispatch center. A PUD driver is dispatched from the Nomadic location at 8:30 a.m. on Monday and arrives at the customer location at 9:00 a.m. The shipment is loaded from 9:00 a.m. – 12:00 p.m. and arrives back at the Nomadic dispatch center at 12:30 p.m.

1. Dispatch Center

The sort process at the dispatch center starts at 12:30 p.m. and ends at 8:30 p.m. It requires unloading the trailer, sorting, and repalletizing the load. This operation requires two dock workers, each working the same trailer for 8 hours in the dispatch center.

1. Line-haul

The line-haul portion begins with the vehicle being dispatched from Greensboro at 8:30 p.m. Monday evening and traveling to Dayton, Ohio a distance of 438 miles, and arriving at 6:15 a.m. on Tuesday. The driver rests for a mandatory 8 hours until 2:15 p.m. then continues driving to Rockford, Illinois, a distance of 376 miles and arrives in Jacksonville at 10:45 p.m. on Wednesday. The driver rests until 8:45 a.m. then continues driving to Minneapolis, a distance of 328 miles and arrives at the distribution center at 4:15 p.m. on Wednesday.

1. PUD

After getting to the distribution center at 6:18 p.m. the driver stays with the vehicle while it is being unloaded (2 hour unload time). The driver then travels to the Minneapolis dispatch center which is located 18 miles away from the distribution center. The driver arrives at the dispatch center at 8:48 p.m.

1. Equipment Costs

If Nomadic Trucking accepts this job, they will need to purchase a truck and trailer that is used exclusively for this job and the backhaul job. The cost of the truck and the trailer, including interest, need to be determined for the life of each. Then that cost needs to be determined for each run.

1. Administrative Costs

The administrative costs, the salaries of Nomadic Trucking’s office staff, are calculated at 8% of every job.

1. Profit

Nomadic Trucking is going to evaluate this job at a profit margin of 10% and 15% to give them 2 options for making their bid on this job.

**Determining Operating Costs: Use the information given in the “Operating Cost Data” and “Truck Route Information”**

1. PUD

|  |  |  |  |
| --- | --- | --- | --- |
| Pickup | Hours | Pay per hour | Total |
|  |  |  |  |

1. Dispatch Center

|  |  |  |  |
| --- | --- | --- | --- |
| Dispatch Center | Hours | Pay per hour | Total |
| Wages worker 1 |  |  |  |
| Wages worker 2 |  |  |  |
| Dock cost |  |  |  |

1. Line Haul

|  |  |  |  |
| --- | --- | --- | --- |
| Line Haul Driver | Miles | Pay per mile | Total |
|  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mileage | Miles | mpg | Gas Price | Total |
| Pick up |  |  |  |  |
| Line Haul |  |  |  |  |
| Delivery |  |  |  |  |

\*Note that the pickup and delivery mileage is also determined in this section for convenience.

1. Delivery

|  |  |  |  |
| --- | --- | --- | --- |
| Delivery | Hours | Pay per hour | Total |
|  |  |  |  |

1. Equipment Costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Equipment Cost | Total Cost | # of years | runs per year | Cost per run | Divide by 2 for headhaul only |
| Tractor: 85,000 + interest = |  |  |  |  |  |
| Trailer: 26,000 + interest = |  |  |  |  |  |

\*\*To determine the total cost we are going to use a separate worksheet

1. Administrative Costs

|  |  |  |  |
| --- | --- | --- | --- |
| Administrative Costs | Total Job Cost | 8% | Total Cost w/ Admin |
|  |  |  |  |

1. Profit

|  |  |  |  |
| --- | --- | --- | --- |
| Profit | Total Job Cost | Profit | Final Quote |
| 10% Profit |  |  |  |
| 15% Profit |  |  |  |

1. What are the operating costs if we assume that Nomadic Trucking can find freight to move back to Pittsburgh?

10% Profit 15% Profit

1. What is the profit margin for this job?

10% Profit 15% Profit

1. In this scenario, we assumed that we could find a return freight. If a truck runs without a return freight it is called deadheading. When a truck has to deadhead, all of the costs of the deadhead return trip have to be calculated into the cost of the job. Which costs would change if we had to add the costs of the return trip into of operating costs calculation?

End of Class Questions for Day 1:

1. The workers union has successfully passed requirements to increase dock worker wages. What would the cost of the dispatch center be if the dock worker’s wages went up to $22.00 an hour?
2. Instead of driving to Minnesota, the company you are creating this cost analysis for changed their shipping plans and wants to ship to Los Angeles California, a trip of 2472 miles. What would the line haul costs be for this new trip?

Can you think of any problems that you would run into if the materials shipped all the way to Los Angeles instead of to Minneapolis?

1. Let’s say that you find a better truck that gets 8.4 miles per gallon; however, the fuel prices have gone up to $4.05 per gallon. How much is it going to cost you to make this run?

Why did the cost increase of decrease from the amount in the activity?

1. What do you find interesting or challenging about the math of logistics?
2. What difficulties have you run into during this logistics activity