



# Analyzing Transportation Options

You have been hired to arrange the transportation of 5,000 tons of coal from the mine to the power plant. You need to present transportation options to your client that include different mode and route choices, and explain the economic and environmental costs associated with each option. Remember that your transportation modes can be singular (barge, rail, or truck) or multimode (a combination of two or more modes).

The following statistics will help you as you calculate costs for your presentation.

	UNITS TO CARRY 1,750 TONS OF DRY CARGO	TON-MILES PER GALLON OF FUEL	CO <sub>2</sub> EMISSIONS GRAMS*/TON-MILE	FUEL TYPE AND COST PER GALLON (AS OF APRIL 2010)
Barge	1	576	17.48	Diesel
Rail Car	16	413	24.39	\$3.02
Truck	70	155	64.96	

\* There are 453.6 grams/pound

Source: Texas Transportation Institute and Energy Information Administration

## Sample

Cargo: 100 tons of coal

Distance from Mine to Plant: 300 miles

Transportation Mode: Rail Car

Cost of Diesel Fuel: \$2.96/gallon

### **Cargo in tons x distance = ton-miles**

100 tons x 300 miles = 30,000 ton-miles

### **Ton-miles/ton-miles per gallon = total gallons required**

30,000/413 = 72.6 gallons

### **Total gallons x fuel price per gallon = total cost for fuel**

72 x \$2.96 = \$213.12 for fuel

### **Ton-miles/CO<sub>2</sub> emissions per ton-mile = total CO<sub>2</sub> emissions**

30,000/17.48 = 1,716.2 grams CO<sub>2</sub>

### **CO<sub>2</sub> emissions grams/453.6 grams = CO<sub>2</sub> emissions per pound**

1,716.2 grams/453.6 grams = 3.8 pounds of CO<sub>2</sub>

### **Cargo in tons/units = units needed to transport cargo**

100 tons/16 rail cars = 6.25 rail cars

Starting Destination: \_\_\_\_\_ Ending Destination: \_\_\_\_\_

Cargo: 5,000 tons of coal

### Option 1

Transportation Mode: \_\_\_\_\_

Units required to carry cargo: \_\_\_\_\_

Transportation Route (indicate major cities, roads, and/or rivers):

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Ton-Miles: \_\_\_\_\_

Fuel Requirement: \_\_\_\_\_

Fuel Cost: \_\_\_\_\_

CO<sub>2</sub> Emissions: \_\_\_\_\_

Advantages and Challenges of this option:

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### Option 2

Transportation Mode: \_\_\_\_\_

Units required to carry cargo: \_\_\_\_\_

Transportation Route (indicate major cities, roads, and/or rivers):

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Ton-Miles: \_\_\_\_\_

Fuel Requirement: \_\_\_\_\_

Fuel Cost: \_\_\_\_\_

CO<sub>2</sub> Emissions: \_\_\_\_\_

Advantages and Challenges of this option:

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