



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 ₂ 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/CO₂ emissions per ton-mile = total CO₂ emissions

30,000/17.48 = 1,716.2 grams CO₂

CO₂ emissions grams/453.6 grams = CO₂ emissions per pound

1,716.2 grams/453.6 grams = 3.8 pounds of CO₂

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):

Ton-Miles: _____

Fuel Requirement: _____

Fuel Cost: _____

CO₂ Emissions: _____

Advantages and Challenges of this option:

Option 2

Transportation Mode: _____

Units required to carry cargo: _____

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

Ton-Miles: _____

Fuel Requirement: _____

Fuel Cost: _____

CO₂ Emissions: _____

Advantages and Challenges of this option:
