

## **Estimated Trucking Costs Idaho and Montana**

**Steve Hayes, Michael Niccolucci and Todd Morgan**  
**Bureau of Business and Economic Research**  
**The University of Montana - Missoula**  
**December 14, 2022**

### **Goal**

The goal of this project was to develop updated estimates of USDA, Forest Service, Northern Region (R-1) log hauling costs and better understanding of key variables and factors impacting hauling costs. The objective was to develop a simple method for estimating the cost of hauling logs various distances. This paper provides results of the 2022 log hauling cost survey in Montana and North Idaho.

### **Methods and Procedures**

The Bureau of Business and Economic Research (BBER) has collected log hauling costs in Montana and North Idaho since 2010. The early surveys were fairly complex. Following discussion with several individuals knowledgeable in the trucking and logging industry, BBER researchers developed a postcard approach to collect the basic information needed to estimate log hauling costs over a range of distances and cost of diesel fuel. We also collected information that helped describe their longevity in the industry, the size of operation and the number of loads hauled in 2021. A copy of the postcard is displayed in Appendix 1.

The postcard was designed to provide the information needed to calculate the average cost per ton and the average cost per ton per mile. The survey provided the truck cost per hour (or per day), tons per load, miles per gallon consumed and number of hours worked per day. We used this information and the following assumptions: a total of 60 minutes for loading and unloading, 10 miles unpaved haul miles and varied the paved haul distance from 20 miles to 240 miles. The haul distances were converted to round trip haul minutes assuming an average speed over various types of road systems (e.g., gravel roads, paved county roads, state highways and interstate road systems, etc.). We assumed the combined per mile rate avoids the thorny cost accounting problem of allocating loading and unloading costs and fixed costs arbitrarily to paved versus unpaved mile costs. Based on the survey data and the assumptions described above, the cost per ton and cost per ton per mile were calculated.

We used our survey results and various diesel fuel prices to understand the impact of diesel fuel on haul costs. We calculated costs for the 1) 2022 average diesel fuel price, 2) \$4 per gallon diesel fuel price, and 3) \$6 per gallon diesel fuel price. Appendix 2 shows the composition of the cost per gallon of diesel fuel (US Energy Information Administration, 2022). Forty percent of the cost per gallon is tied to the crude oil price and sixty percent is tied to the cost of refining, distribution, marketing and state and local taxes.

Responses were received from truckers and loggers and mills contracting log hauling with truckers. Responses were received from entities that have hauled logs for an average of 26 years. The estimates presented below are based on the cost of operations including depreciation. A number of the respondents indicated there is currently a large difference between what the truckers feel they need to operate in the long run and what they are currently being paid in the current market.

Table 1 below displays averages, minimum and maximums for some of the information collected. The bolded items are the data used to estimate costs per ton and costs per ton per mile.

Table 1. Descriptive statistics for information collected.

Variable	Average	Minimum	Maximum
<b>Miles per Gallon</b>	<b>5.2</b>	<b>4.8</b>	<b>6.0</b>
Number of Days Worked per Year (#)	162	100	200
Hours Worked per Day (#)	12	8	15
<b>Tons per Load (tons)</b>	<b>27.5</b>	<b>26.5</b>	<b>29</b>
<b>Loads per Day (#)</b>	<b>2.3</b>	<b>1.0</b>	<b>4.0</b>
<b>Hourly Rate (\$ / day)</b>	<b>\$138.00</b>	<b>\$125.00</b>	<b>\$155.00</b>
<b>Daily Rate (\$)</b>	<b>\$1,300.00</b>	<b>\$900.00</b>	<b>\$1,800.00</b>
<b>One Way Haul Distance (miles)</b>	<b>75.1</b>	<b>40</b>	<b>150</b>

The average miles per gallon was 5.2 miles per gallon and ranged from 4.8 to 6.0 miles per gallon. The average tons per load was 27.5 tons and ranged from 26.5 to 29 tons per load. The hourly rate averaged \$138 per hour and ranged from \$125 to \$155 per hour. The daily rate averaged \$1,300 per day and ranged from \$900 to \$1,800 per day. The average one-way haul distance was 75 miles and ranged from 40 to 150 miles. The range (a measure of variability) in several of these variables is quite small especially for the important factors in estimating haul costs per ton and mile, such as tons / load, hourly rate and miles per gallon. These narrow ranges should lead to estimated cost per ton and cost per ton per mile that are fairly consistent over the range of haul distances data.

### Estimated Costs

We estimated cost per ton and cost per ton per mile using the 2022 haul cost survey results. We used the average 2022 retail diesel fuel price to generate the average presented in Tables 1 and 2 (US Energy Information Administration 2022). To understand the impact of rising and falling diesel fuel prices we present results for the diesel fuel prices of \$4 per gallon (Low in Tables 1 and 2) and \$6 per gallon (High in Tables 1 and 2). Tables 1 and 2 also present the cost per ton and cost per ton per mile over various haul distances (10 miles unpaved and various paved haul miles).

Table 2 displays the cost per delivered ton for retail diesel prices ranging from \$4 to \$6 per gallon over haul distances from 30 to 250 total haul miles. The average retail diesel fuel price for January 2022 through December 5, 2022 was \$4.98 per gallon; this includes all local and state taxes and distribution and marketing costs (see Appendix 2).

Table 2 displays that the estimated cost per ton for the average retail diesel price ranged from approximately \$12.50 per ton to \$58.40 per ton (see Average row). If diesel fuel prices increase to \$6 per gallon (holding all other factors constant) the cost per ton range from approximately \$13 per ton to \$62 per ton. If diesel fuel prices decrease to \$4 per gallon (holding all other factors constant) the cost per ton range from approximately \$12 per ton to \$55 per ton.

The log hauling cost per ton is driven by many factors some of which are fixed (e.g., truck insurance, truck payment, etc.) and some of which are variable (e.g., fuel, labor, tires, etc.). The volatility of diesel fuel prices draws a lot of attention in the cost discussion. At diesel fuel price of \$4.98 per gallon and average haul distance of 75 miles, diesel fuel was 24 percent of the total cost per ton. If diesel fuel prices increase to \$6 per gallon, holding constant all other factors, diesel fuel as a percentage of the total cost per ton increases to 29 percent. If diesel fuel prices decrease to \$4 per gallon, holding constant all other factors, diesel fuel as a percentage of the total hourly cost decreases to 19 percent of the total cost per ton. The average truck cost per hour ranges from \$131 per hour to \$145 per hour for diesel prices ranging from \$4 per gallon to \$6 per gallon at an average haul distance of 75 miles.

<b>Table 2</b>						
<b>Conventional Truck</b>						
<b>Cost per delivered ton</b>						
<b>Haul Distance*</b>	<b>30</b>	<b>50</b>	<b>75</b>	<b>110</b>	<b>160</b>	<b>250</b>
<b>High (\$6/gallon)</b>	\$12.94	\$17.40	\$22.97	\$30.77	\$41.91	\$61.97
<b>Average (\$4.98/gallon)</b>	\$12.51	\$16.67	\$21.90	\$29.20	\$39.63	\$58.40
<b>Low (\$4/gallon)</b>	\$12.10	\$16.00	\$20.87	\$27.69	\$37.44	\$54.98
* Haul distance assumes 10 miles on gravel and the remainder on pavement.						

Table 3 displays the cost per delivered ton per mile for retail diesel prices ranging from \$4 to \$6 per gallon over haul distances from 30 to 250 total haul miles. At the average 2022 diesel fuel price of \$4.98 per gallon the cost per ton per mile ranged from \$0.42 to \$0.23 per ton per mile. The range of cost per ton per mile increases to \$0.43 per ton per mile to \$0.25 per ton per mile when diesel fuel prices increase to \$6 per gallon. At \$4 per gallon the range decreases to \$0.40 per ton per mile to \$0.22 per ton per mile.

<b>Table 3</b>						
<b>Conventional Truck</b>						
<b>Cost per delivered ton per mile</b>						
<b>Haul Distance*</b>	<b>30</b>	<b>50</b>	<b>75</b>	<b>110</b>	<b>160</b>	<b>250</b>
<b>High (\$6/gallon)</b>	\$0.43	\$0.35	\$0.31	\$0.28	\$0.26	\$0.25
<b>Average (\$4.98/gallon)</b>	\$0.42	\$0.33	\$0.29	\$0.27	\$0.25	\$0.23
<b>Low (\$4/gallon)</b>	\$0.40	\$0.32	\$0.28	\$0.25	\$0.23	\$0.22
* Haul distance assumes 10 miles on gravel and the remainder on pavement.						

## General Comments

The 2022 log hauling survey saw very different economic conditions than the pandemic year of 2020. The following are several important observations from the 2022 survey:

- 2022 saw the highest rates of inflation since the early 1980s. The high inflation was recorded in all sectors of the economy.
- The diesel fuel prices were approximately \$2.50 per gallon in 2020. The average diesel fuel price in 2022 was approximately \$5 per gallon, a doubling of diesel fuel prices. In our analysis we estimated the fuel cost holding constant all other cost factors and found that at the average haul distance of 75 miles diesel fuel is approximately 24 percent of the total truck cost per hour in 2022. This proportion falls to approximately 19 percent when fuel costs drop to \$4 per gallon and increase to 29 percent when fuel costs increase to \$6 per gallon.
- Important factors, such as miles per gallon, hourly truck cost per hour, tons per load were fairly stable across the survey respondents. This suggests that the estimated cost per ton and cost per ton per mile should be relatively constant over the range of data reported.
- The variability in the 2020 to 2022 economy supports the sampling design of collecting haul cost data every other year.
- Based on these results the Region should have the information to modify the haul costs in the appraisal systems if large changes in fuel costs occur before 2024. However, the Region should not be modifying the haul costs if only minor changes in fuel costs occur.

**Literature Cited**

US Energy Information Administration, 2022. Rocky Mountain Retail Gasoline and Diesel Prices.  
[https://www.eia.gov/dnav/pet/pet\\_pri\\_gnd\\_dcus\\_r40\\_w.htm](https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_r40_w.htm)

APPENDIX 1: Haul Cost Postcard

Business name: \_\_\_\_\_

Were you active in 2021? Yes  No

Montana  or Idaho

How long have you been in business ? \_\_\_\_\_ years

Number of logging trucks operated \_\_\_\_\_

Number of Employees \_\_\_\_\_

How many days did you operate in 2021? \_\_\_\_\_

Typical number of hours worked in a day \_\_\_\_\_

Average number of loads hauled in a day \_\_\_\_\_

Total loads hauled in 2021? \_\_\_\_\_

Average volume per load \_\_\_\_\_ MBF or \_\_\_\_\_ tons

What does it cost to operate your truck including driver;

daily rate \$ \_\_\_\_\_, hourly rate \$ \_\_\_\_\_

Average miles per gallon of your truck(s) \_\_\_\_\_

Do you use an electronic log book ? Yes  No

----- Fold here -----

For new jobs how do you calculate rates ? formula  negotiated rate

based on similar past hauls  Other (describe) \_\_\_\_\_

In 2021 , what was your average one-way haul distance ? \_\_\_\_\_

What was your maximum one-way haul distance ? \_\_\_\_\_

How are new trucking regulations impacting your business? Fuel rates? Other comments.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Address or contact correction:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Thank you for your time.**



**BUREAU OF BUSINESS AND ECONOMIC RESEARCH**  
UNIVERSITY OF MONTANA

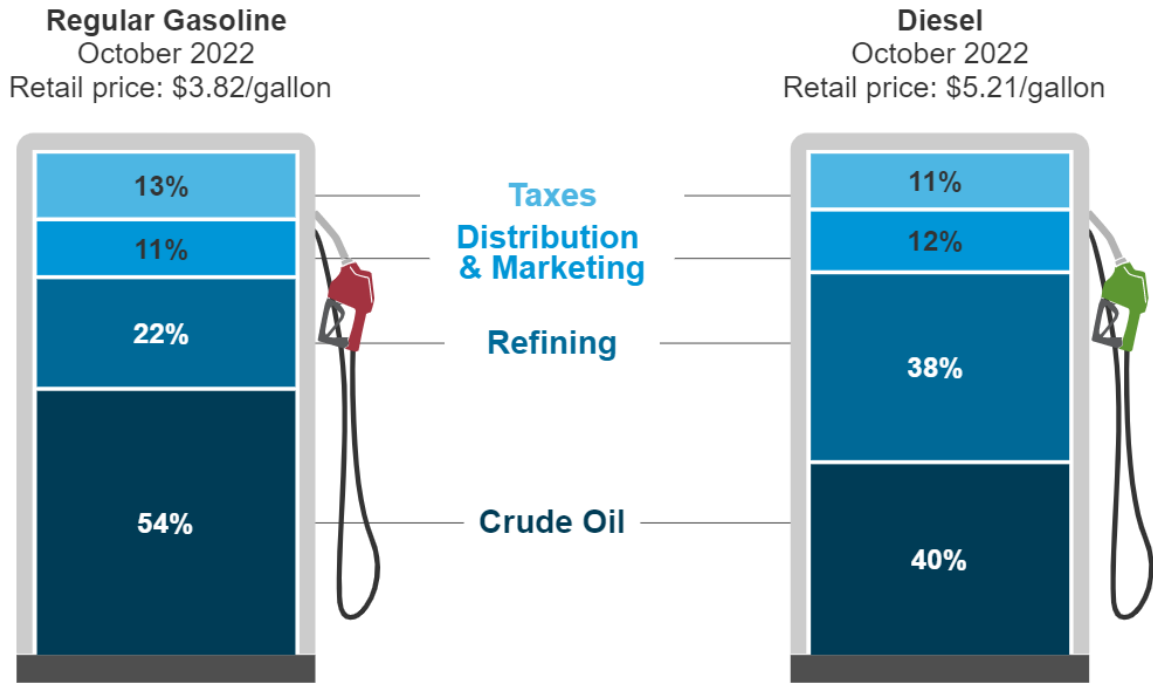


**MONTANA LOGGING ASSOCIATION**



### Appendix 2: Composition of Diesel Price:

What we pay for in a gallon of:



Data source: U.S. Energy Information Administration, Gasoline and Diesel Fuel Update