

Pickup and Trailer and Freight Cost Calculator*

Objective

The purpose of this decision aid is to facilitate the cost calculation of a ranch pickup and/or a livestock trailer. The decision aid user can choose which analysis to do by selecting the appropriate sheet in the decision aid. The decision aid calculates the per mile and annual costs of pickup or trailer, the cost of making a trip with livestock, and also allows for calculation of costs for enterprises by allocating the percent costs between forages, livestock, and crops. The program is useful for enterprise budgeting, estimating transportation costs and evaluating purchasing alternatives. Increased fuel cost calls for more efficient use of vehicles.

Input

There are a number of variables in blue used to describe the vehicle or pickup and trailer. These can be observed in the attached decision aid example. Current market value can be the purchased value on a new vehicle, pickup or trailer or the market value (net) for a used. Total miles used should equal remaining miles of use for a new vehicle, pickup or trailer. Remaining miles of use would reflect miles left for use for used vehicle or pickup or trailer. See the definition section for a description of other input items.

Output

There are three sections of output for the decision aid: per mile and annual costs, trip costs and allocated costs. The trip cost or allocated cost section can be ignored if they are not desired. The pickup cost can be calculated without the trailer; however, to calculate the combined pickup and trailer cost, the pickup must be included to generate these costs. Its best to use the vehicle cost sheet if only the pickup is under consideration. See the example for a clear illustration of outputs.

Definition of Terms used in this Analysis

Variable Cost - Variable costs are those costs that vary directly with the amount the vehicle is used. If the vehicle is not used, these costs are eliminated. Variable costs include fuel, tires, and maintenance costs.

Fixed Costs - Fixed costs are those costs that continue whether the vehicle is used or not. Fixed costs include depreciation, insurance, and interest costs.

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Interest Costs - Interest costs include actual financial charges on the loan required to purchase the vehicle or the interest that could be earned on the money in an income producing investment.

This is often referred to as the “opportunity cost of capital.” The input data requests annual loan payments to determine cash costs, but uses the interest rate specified to determine the interest opportunity cost of capital investment. This is a non-cash cost.

If the vehicle is being financed then the annual payment should be entered and this is used as cash cost which would be reflected in cash costs.

Depreciation - Depreciation is a measure of the actual loss of value in the pickup or trailer occurring in the current year. Thus, it may be different from depreciation used for tax purposes. The formula takes the fraction of remaining life used in the current year and multiplies it by the current market value of the auto or truck less salvage value. Depreciation is a non-cash cost of a depreciable asset with a life of more than one year.

Equations and Formulas

The key formulas used in the analysis are as follows:

$$\text{Interest Cost Per Mile} = \frac{(\text{Market Value} - \text{Depreciation}) * (\text{Interest Rate} * .01)}{\text{Annual Miles of Use}}$$

(Based on Average Investment)

Depreciation Cost per Mile

$$\frac{(\text{Annual Use (Mi)}) * (\text{Current Market Value} - \text{Salvage Value})}{\text{Remaining Life (Mi)}} \\ \text{Annual Miles of Use}$$

$$\text{Remaining Life} = (\text{Useful life} - \text{Current Mileage})$$

$$\text{Total Cost per Trip} = ((\text{Miles for Trip} * (\text{Total Costs} / \text{Mi})) + (\text{Drive Labor Hours} * \text{Drive Labor Cost per Hour}) + (\text{Additional Labor Hours} * \text{Additional Labor Cost per Hour}))$$

$$\text{Cost Per Unit Hauled} = (\text{Total Cost per Trip} / \text{Number of Units Hauled})$$

For the Vehicle trip motel and other trip costs can be included to calculate the total trip cost.

Appendix A: Trailer Capacity

BQA Recommended Maximum Number of Cattle for Trailers of Various Lengths

Trailer Size	Weight of cattle in pounds per Head							Total Weight*
	400	600	800	1,000	1,200	1,400	1,600	
Inside Dimensions in Feet	Number of Head							
16x6	18	12	9	7	6	5	5	<7,400
18x6	21	14	10	8	7	6	5	<8,400
20x6	23	15	12	9	8	7	6	<9,300
24x6	28	18	14	11	9	8	7	<11,100
20x7	27	18	13	11	9	8	7	<10,800
24x7	32	22	16	13	11	9	8	<13,000
32x7	43	29	22	17	14	12	11	<17,300

*Do not exceed the Gross Vehicle Weight Rating for the truck of trailer.
To estimate weight multiply length times width times 77.

Source: NCBA Beef Quality Assurance (BQA) 2008