

Understanding Equipment Costs: Finding the “Sweet Spot”

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Why Own Equipment?

- Be competitive
- ROI (return on investment)
- On Demand
- Self reliability
- Image



What makes up Equipment Costs?

All equipment costs are compiled into two categories

Ownership Costs

Operation Costs



DETAILED MAINTENANCE RECORDS GIVE YOU **DOCUMENTED PROOF** THAT YOUR MACHINERY HAS BEEN MAINTAINED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.



Ownership Costs

- *Price of unit delivered including taxes, transportation and all other charges to put machine in place*
- *Interest or cost of money*
- *Costs of insurance per Year*
- *Property Tax per year*



Price of unit delivered including taxes, transportation and all other charges to put machine in place

Capital Purchase – Lease - RPO

Sales Tax, FET tax, state, local, Special Motorized use, licensing

Disassembly, transport to first point of receiving, permits, reassembly, training, manuals, tooling

Interest or cost of money

Interest

Annual lease fees

Lease buy out penalties

Costs of insurance per Year

This can vary depending on deductibles, company risk rating, different insurance policies



Property Tax per year

Normally calculated by the location of the asset on Dec 31 each year.

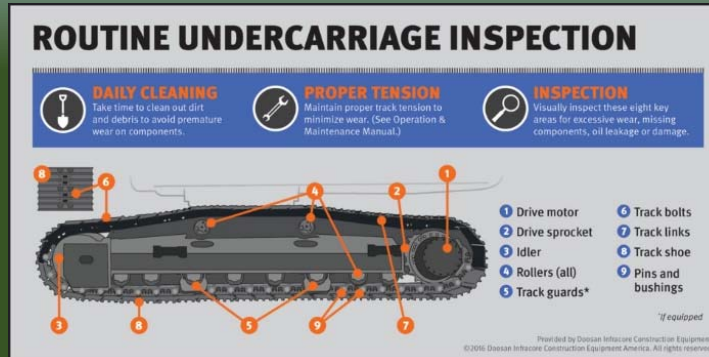


Ownership Costs example

Machine (model / make)	JD 470	JD 470	Machine Make & Model
Machine Designation		Excavation	Where will Machine Primary Use will be
Estimated Ownership Period in years	10	10	Number of Years estimated t be used
Estimated Usage (in hours or milage)	1200	1200	Number of cycle unit per year
Estimated total hours of Usage		12000	Estimated hour of life use
OWNING COST			
OWNING COSTS PER YEAR		\$58,500.00	Owning costs per year
OWNING COSTS PER HOUR		\$48.75	Owning costs per hour
Delivered Price	\$585,000.00	\$585,000.00	Price of unit delivered including taxes, transportation and all other charges to put machine in place
Less Tire Replcement	\$0.00	\$0.00	If applicable (less cost of tire (wear item))
Delivered Price Less Tires		\$585,000.00	Total delivered price
Less Depreciation	10.00%	\$58,500.00	
Depreciated value		\$526,500.00	
Costs per Hour	\$43.88		Estimated total costs per hour next year
Interest Costs per annum	3.50%	\$18,427.50	Interest or cost of money
Interest costs per life cycle		\$184,275.00	
Interest costs per hour (annually)		\$15.36	
Insurance per year	\$3,200.00	\$3,200.00	Costs of insurance per Year
Optional method when insurance cost per life cycle is known		\$32,000.00	Cost of insurance in known in advance
Insurance cost per hour (annually)		\$2.67	
Porperty Tax	3.70%	\$2,164.50	Property Tax per year
Optional method when Property Tax costs per life		\$21,645.00	Total property tax if known in advance
Total annual owning costs	\$526,509.00	\$76,442.00	
Total hourly owning Costs	\$764,420.00	\$63.70	Ownership costs per hour only

Operational Costs

- Total fuel usage per year
- Annual PM Parts Costs
- Annual PM Labor costs
- Total parts costs for non scheduled repairs
- Total costs for labor of non scheduled labor costs
- Total costs of GET (ground engagement tools)
- Total tire costs per year
- Total costs per life cycle of machine for under-carriage rebuild accrued annually



Ownership and Operational costs variables

- Expected annual hours of usage – average utilization
- Depreciation method\ lease
- Cost of Money (Credit rating)
- Insurance costs (Company risk rating)
- Fuel costs per gallon (use NFP index published to start with)
- Labor rate, full burdened
- In-house vs. Repair vendor
- Operator training / ability
- Average age of fleet
- Utilizing warranty, performance guarantees, maintenance guarantees

Typical Hours of Annual Use:

MACHINE TYPE	ANNUAL USE HOURS
Cranes	1252
Excavators	1396
Graders	929
Off Highway Trucks	1958
Paving Equipment	829
Skid Steer Loaders	834
Tractors/Loaders/Backhoes	942



Damages not considered Normal wear

Operator error, abuse, neglect should never be costed or charged to the asset. This should always be charged back to the project or overhead account that had the asset when damages occurred. Charging these damages back to the asset will grossly inflate the operational costs and makes it virtually impossible to get true life cycle costing for historical baseline data.

Clearly define in your equipment usage policy the difference between “Normal wear and tear” and “Operator error, abuse and neglect”. Leave no room for misinterpretation.



Damage calculator

Equipment monthly rate
 Quantity of equipment
 Total monthly rate 0

Variables	1 to 10	Variables description
<i>Environmental conditions</i>	4	Slope / grade
<i>Fixed hazard or working area</i>	2	material being handled
<i>Weather conditions</i>	5	weather conditions
<i>Operator ability</i>	5	operator experience
<i>Conscientious management</i>	7	Good or poor management control
<i>Maintenance</i>	2	Proactive or reactive
<i>Congestion</i>	7	buildings, trees, rocks, any fixed object
<i>GET</i>	5	Ground engagement tools (theeth, edges, hard facing, etc.)
<i>Visibility</i>	3	obsticles, light conditions
<i>Security</i>	5	is site secure from vandleism and or theft
<i>Total points</i>	40	

of 100 possible points

0 to 20 points would be 10%
 21 to 40 points would be 20% 500
 41 to 60 points would be 30%
 61 to 80 points would be 40%
 81 to 100 points would be 50%

Example

100 possible points.

Variable factor is 40 points.

Monthly rental is \$5000 per month.

0 to 20 points would be 10% or \$500 per month

21 to 40 points would be 20% or \$1000 per month.

41 to 60 points would be 30% or \$1500

61 to 80 points would be 40% or \$2000 per month

81 to 100 points would be 50% or \$2500 per month

Anything much over 40 points or 30% accrual would be considered high risk

Again the estimator must be honest in his risk assessment

Operational Costs example

OPERATING COSTS ESTIMATE			
Fuel unit price (\$/gal)	\$2.50	\$2.50	Current Fuel price(average for year)
Fuel consumption (gal/hr)	5.50	5.50	Fuel consumption (per hour / mile)
Annual Fuel Costs		\$1,650.00	Total fuel charges per year
Internal Labor rate	50		
	\$59.00		Internal labor rate including all compensation
PM cycle in Hours or Milage	250	250	Recommmeded PM interval
Annual PM cycles		4.80	PM's per Year
Cost per PM (parts)	\$500.00	\$500.00	Cost of parts per PM
Preventative Maintenance (PM) parts costs per service (annually)		\$2,400.00	Annual PM Parts Costs
PM Labor costs per service		\$283.20	Cost of Labor Per PM
PM Labor costs per service (annually)		\$1,359.36	Annual PM Labor costs
Scheduled repair costs parts (anually)	\$500.00	\$500.00	Brakes, wear shims, adjustments
Schedule laobor hours (annually)	5		Labor hour for the previous year
Scheduled hourly labor costs	\$59.00		Scheduled labor costs per hour
Scheduled Labor Costs (annually)		\$295.00	Scheduled total labor costs for previous year
Average Parts Cost per parts for Non Schedule repair	\$150.00		Previous years non scheduled repairs Parts (average per repair)
Non schedule costs parts (annually)		\$1,800.00	Total previous years non scheduled parts
Average Labor Cost per Non Schedule Repair	\$59.00		Total previous years labor costs for non scheduled repairs
Non schedue labor hours (annually)	1		Total previuos years labor hours for non scheduled repairs
Non-Scheduled labor costs (annually)		\$59.00	Total costs for labor of non scheduled labor costs
Tire replacement costs (total cost per change)	\$0.00	\$0.00	Tire costs per change
Average hours per tire cycle	1	1	Average hours / miles per change
Total Tire costs (annually)		\$0.00	Total tire costs per year
Undercarriage Costs per Rebuild	\$40,000.00	\$40,000.00	Average costs per under-carriage rebuild
Average undercarriage hours per cycle	10000	10000	Average hours per under-carraige life
Total undercarriage costs		\$4,800.00	Total costs per life cycle of machine for under-carriage rebuild accrued annually
Special wear item costs per cycle	\$400.00		cutting edges
Average hours per special item cycle	160		Igt use 60 hours / heavy use hours 30
Total special item cost (annually)		\$3,000.00	Total speciality item costs per year

Total Combined Costs

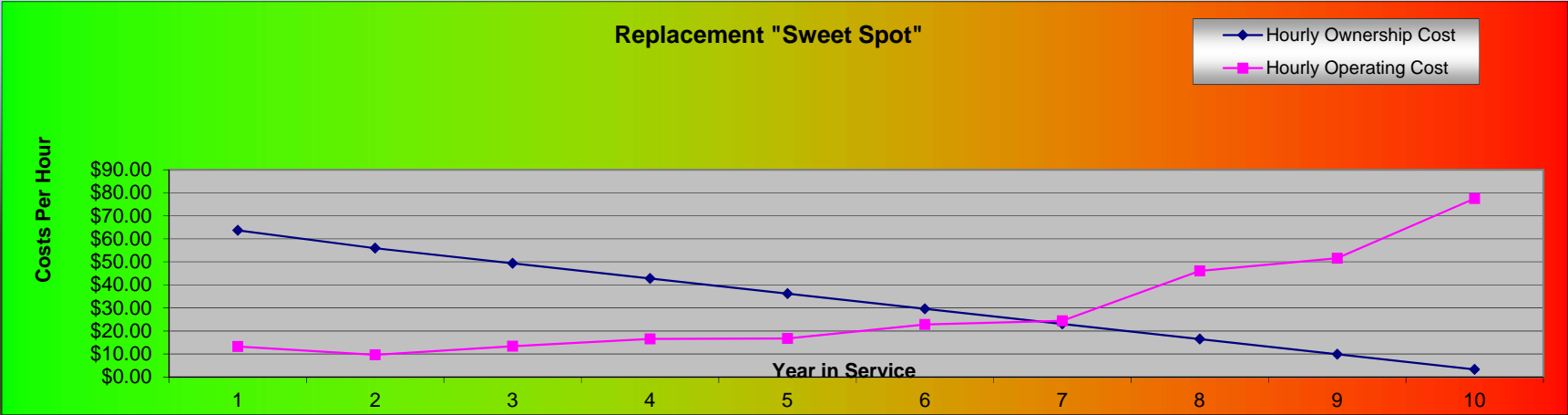
TOTAL OPERATING COSTS (annually)		\$15,863.36	<i>Total operating costs per year</i>
TOTAL OPERATING COSTS (per hour)		\$13.22	<i>Total operating costs per hour / mile</i>
MACHINE OWNING PLUS OPERATING COSTS			
Machine life		\$891,326.88	
Machine annually		\$89,132.69	
Machine hourly		\$74.28	
RESIDUAL VALUE AT REPLACEMENT			
Gross selling price	\$526,500.00	\$526,500.00	
Make ready costs	\$0.00		
Inflation during ownership	2.00%	\$537,030.00	

Break this out over the expected life (10 years)

MACHINE OWNING PLUS OPERATING COSTS		
Machine life		\$891,326.88
Machine annually		\$89,132.69
Machine hourly		\$74.28
RESIDUAL VALUE AT REPLACEMENT		
Gross selling price	\$526,500.00	\$526,500.00
Make ready costs	\$0.00	
Inflation during ownership	2.00%	\$537,030.00
Net residual Value		

Sweet Spot Workbook

Year in service	Total Ownership and Operating Cost	Hourly Ownership Cost	Hourly Operating Cost	Net residual value	reliability
Year 1	\$537,030.00	\$63.70	\$9.77	\$ (38,030.00)	100%
Year 2	\$468,000.00	\$55.95	\$8.91	\$ (32,360.00)	90%
Year 3	\$409,500.00	\$49.37	\$12.94	\$ (27,690.00)	85%
Year 4	\$351,000.00	\$42.79	\$15.93	\$ 1,980.00	80%
Year 5	\$292,500.00	\$36.21	\$16.06	\$ 56,650.00	80%
Year 6	\$234,000.00	\$29.63	\$22.06	\$ 71,320.00	75%
Year 7	\$175,500.00	\$23.05	\$23.62	\$ 120,990.00	70%
Year 8	\$117,000.00	\$16.47	\$44.78	\$ 130,660.00	60%
Year 9	\$58,500.00	\$9.89	\$25.18	\$ 140,330.00	50%
Year 10	\$0.00	\$3.30	\$39.86	\$ 150,000.00	50%



[Revised 11.2019 Life Cycle costing master sweetspot spread sheet\(2\).xlsx](#)

Using technology to master fleet management

Instant real time data

- Project costs controls
- Live maintenance information
- Real time diagnostics and alerts

<https://sso.online.tableau.com/public/idp/SSO>

Questions?