



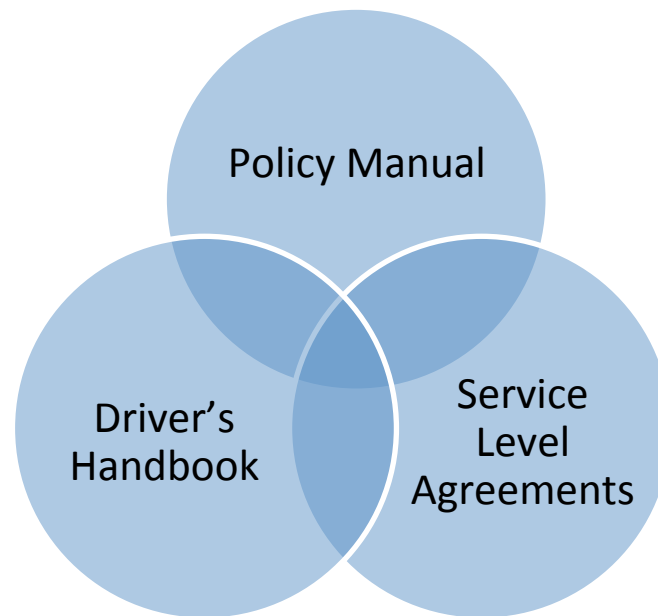
The Economics of Fleet

www.nafa.org

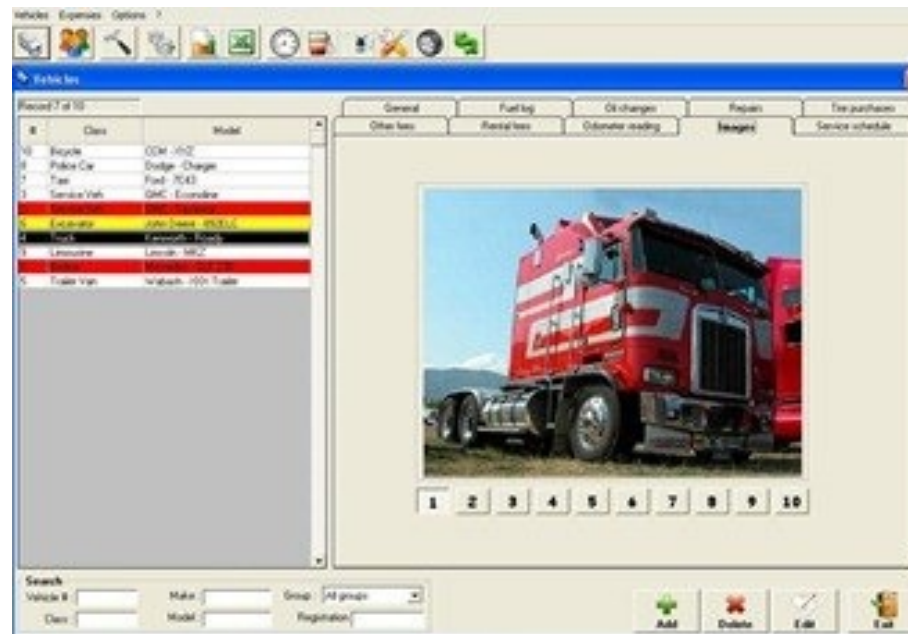
Agenda

- **11 Essentials of Fleet Management**
- **Lifecycle Cost Analysis**
- **Exercise 1 – Select the Best Vehicle**
- **Exercise 2 – Select the Optimal Replacement Point**

ELEVEN ESSENTIALS OF FLEET MANAGEMENT



The organization has a robust policy framework covering appropriate topics.



A FMIS tracks Key Performance Indicators that contribute to organizational goals.

Fixed	<ul style="list-style-type: none">• Depreciation• Cost of money• Insurance• Administration
Operating	<ul style="list-style-type: none">• Fuel and lubricants• Maintenance• Collision repair
Incidental	<ul style="list-style-type: none">• Parking• Tolls• Washing

The organization use's NAFA system along with the Total Cost of Ownership methodology to measure all costs of fleet operations.

#4



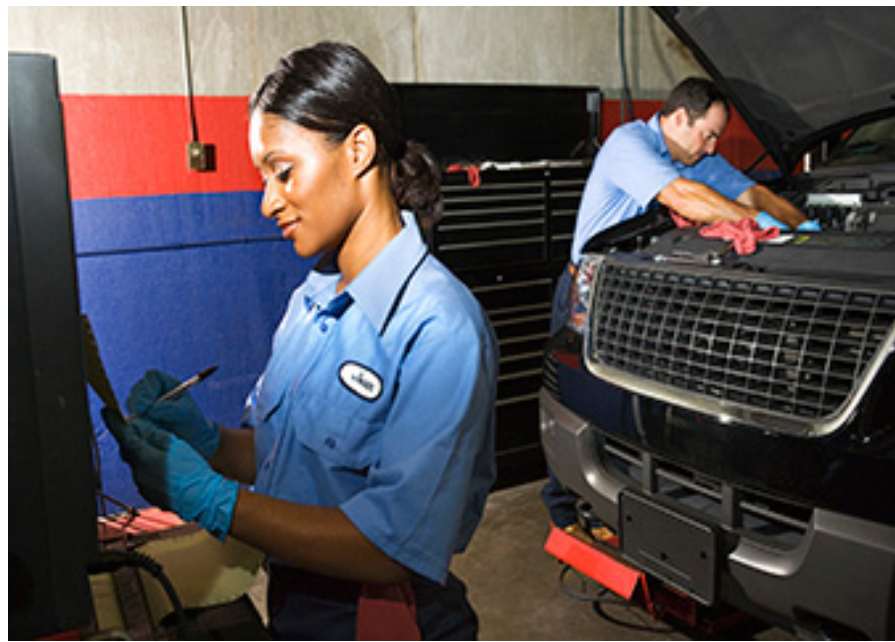
Vehicles are selected using a formal process that considers lifecycle costs, safety and the environment.



The organization is proactive in the selection of remarketing methods and tracks results.



The organization has a comprehensive safety policy which includes classifying crashes into preventable and non-preventable categories and tracking Crash Frequency Rates (CFR).



Vehicle Equivalency Units are used to calculate productivity and compare maintenance performance.



Key personnel are certified by industry associations that they are qualified for the jobs they perform.



The organization sets goals for fuel and emissions reductions in accordance with NAFA's sustainability standard.



The organization considers alternatives to ownership and conducts regular reviews to ensure the fleet is right-sized.

Variable Data		Description:
Model:	Vehicle A	Vehicle model being analyzed
Vehicles in Fleet:	300	Total number of vehicles of this type in fleet
Annual Miles Driven:	22,000	Expected miles to be driven each year
Annual Shifts:	256	The number of normal man-shifts the vehicle operates during a year
Maximum Replacement Years:	7	Upper limit for years to hold a vehicle based on policy decision
Maximum Replacement Miles:	175,000	Upper limit for mileage to hold a vehicle based on policy decision
Net Acquisition Cost:	\$ 22,500.00	Net purchase price including all make-ready expenses
Return on Investment:	5.300%	The annual percentage rate earned on cash investments
Fuel Miles-per-Gallon	12.0	Mileage of vehicle being analyzed
Fuel Cost-per-Gallon:	\$ 1.65	Fuel cost-per-gallon
Pool Loaner Cost-per-Mile:	\$ 0.35	Cost-per-Mile of providing a backup vehicle while the primary vehicle is being worked on

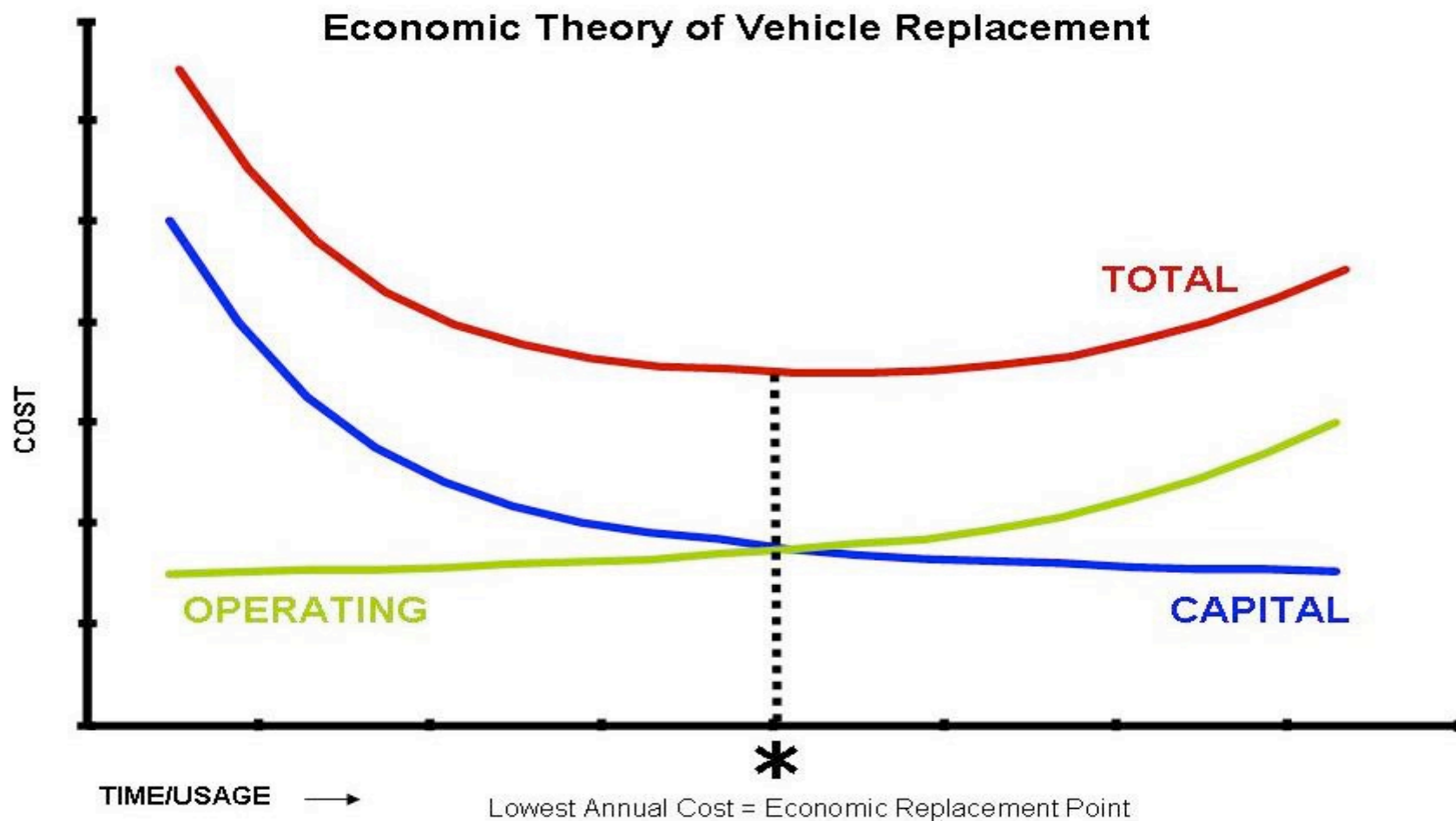
The organization uses NAFA's lifecycle spreadsheets and defines and observes optimal vehicle lifecycles.

11 Essentials – sound easy?

PRACTICAL TOOLS

Three Misconceptions

- I drive a car so I know how to buy a fleet.
- Least expensive = lowest acquisition cost.
- Delaying replacement will save me money.



Expense Categories

Fixed

Operating

Incidentals

Fixed Costs

- Administrative Overhead
- Fleet Management Overhead
- Make Ready/Refurbishment
- Cost of Money
- Licenses & Taxes
- Insurance
- Depreciation

Operating Costs



Incidentals



LCA Equation

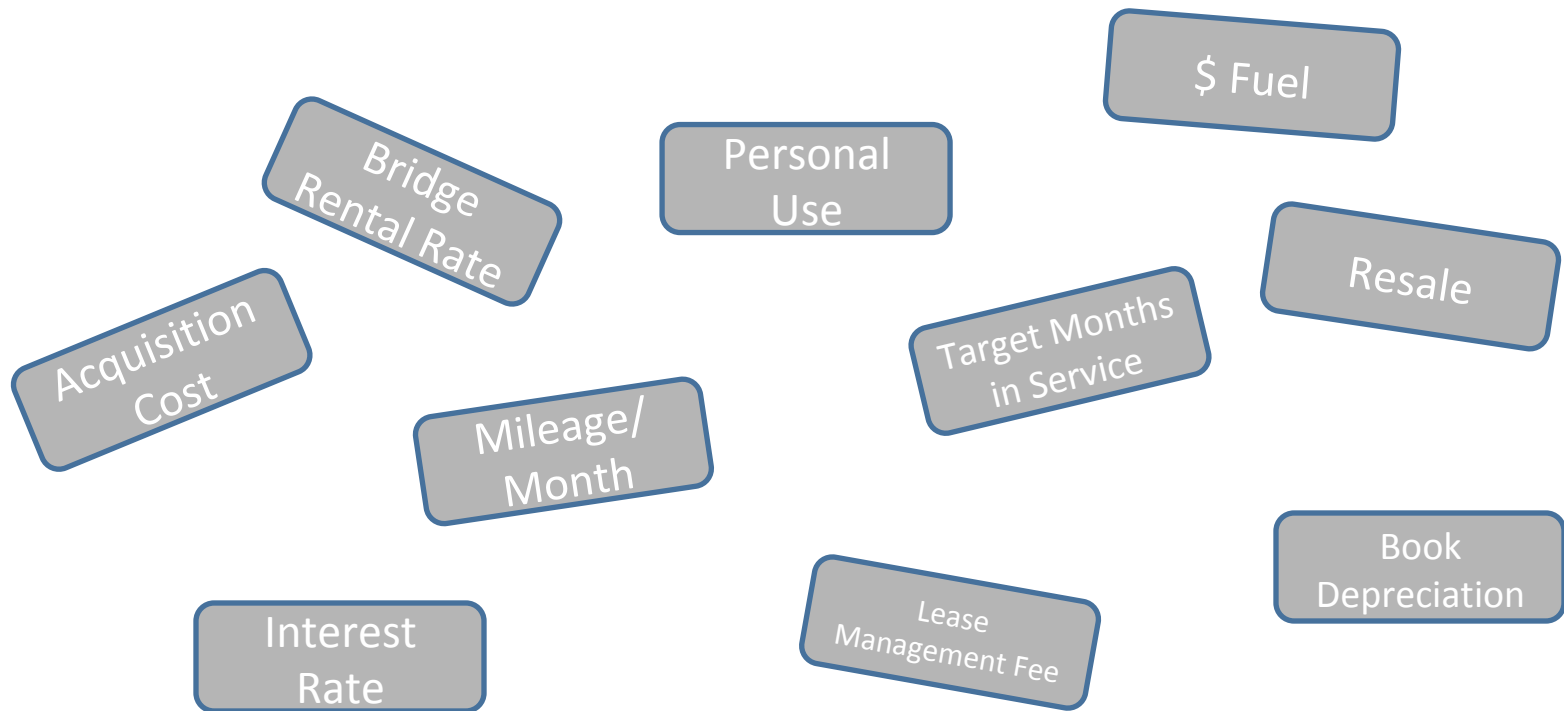
Acquisition costs
+ fixed costs
+ operating costs
- personal use payments

Lifecycle cost

LCA use #1

SELECTING THE RIGHT VEHICLE

Information Required



Tombstone Data

Universal Variable Data		Derived Values	
Target Months in Service:	48	Actual Months:	44
Target Replacement Mileage:	85,000	Actual Mileage:	85,000
Expected Mileage-per-Month:	1,900	Daily Mileage:	62.5
Lease Annual Interest Rate:	7.85%	Monthly Interest:	0.654%
Lease Management Fee (%):	0.05%		
Lease Management Fee (Flat Rate):	\$ -		
Book Depreciation Rate:	1.67%		
Fuel Cost-per-Gallon:	\$ 3.00		
Estimated Personal Use:	15%		
Daily Bridge Rental Rate:	\$ 60.00		

Acquisition Cost

	Vehicle A	Vehicle B	Vehicle C
Acquisition Cost			
Factory Invoice Price	19,228.00	\$ 21,851.00	\$ 19,475.00
Dealer Holdback Adjustment	\$ (200.00)	\$ (200.00)	\$ (280.00)
AFV Incentive/Credit	\$ -	\$ -	\$ -
Mfg. Additional Incentive	\$ (100.00)	\$ -	\$ -
Fleet Incentive	\$ (700.00)	\$ (1,200.00)	\$ (550.00)
Net Acquisition Cost	\$ 18,228.00	\$ 20,451.00	\$ 18,645.00

Invoice price is a common starting point
 Most deductions and incentives reduce the acquisition cost and can vary widely by make, model & time of year
 $\$19,228 - \$200 - \$100 - \$700 = \$18,228$

Resale

		Vehicle A	Vehicle B	Vehicle C
Fixed Costs				
Effective Depreciation		\$ 12,981.00	\$ 14,803.00	\$ 12,880.00
Projected Resale Price		5,247.00	\$ 5,648.00	\$ 5,765.00
Number of Months Past September		#####	#####	#####
Price by Month Adjustment		\$ -	\$ -	\$ -
Interest		\$ 3,330.96	\$ 3,737.19	\$ 3,407.17
Year 1		\$ 1,299.47	\$ 1,457.95	\$ 1,329.20
Year 2		\$ 1,012.72	\$ 1,136.22	\$ 1,035.89
Year 3		\$ 725.97	\$ 814.50	\$ 742.57
Year 4		\$ 292.81	\$ 328.52	\$ 299.51
Year 5		\$ -	\$ -	\$ -
Management Fee		\$ 401.02	\$ 449.92	\$ 410.19
Delivery Delay Cost		\$ 1,800.00	\$ 900.00	\$ -
Days Over Least Delivery Time		30	15	0
Delivery Days		75	60	45
AFV TAX CREDIT		\$ -	\$ -	\$ -
Mfg. Additional Incentive		\$ -	\$ (250.00)	\$ -
Total Fixed Cost:		\$ 18,512.98	\$ 19,640.11	\$ 16,697.36

Interest

	Vehicle A	Vehicle B	Vehicle C
Fixed Costs			
Effective Depreciation	\$ 12,981.00	\$ 14,803.00	\$ 12,880.00
Projected Resale Price	\$ 5,247.00	\$ 5,648.00	\$ 5,765.00
Number of Months Past September	0	0	0
Price by Month Adjustment	-	-	-
Interest	\$ 3,330.96	\$ 3,737.19	\$ 3,407.17
Year 1	\$ 1,299.47	\$ 1,457.95	\$ 1,329.20
Year 2	\$ 1,012.72	\$ 1,136.22	\$ 1,035.89
Year 3	\$ 725.97	\$ 814.50	\$ 742.57
Year 4	\$ 292.81	\$ 328.52	\$ 299.51
Year 5	\$ -	\$ -	\$ -
Management Fee	\$ 401.02	\$ 449.92	\$ 410.19
Delivery Delay Cost	\$ 1,800.00	\$ 900.00	\$ -
Days Over Least Delivery Time	30	15	0
Delivery Days	75	60	45
AFV TAX CREDIT	\$ -	\$ -	\$ -
Mfg. Additional Incentive	\$ -	\$ (250.00)	\$ -
Total Fixed Cost:	\$ 18,512.98	\$ 19,640.11	\$ 16,697.36

$$\$1,299.47 + \$1,012.72 + \$725.97 + \$292.81 = \$3,330.96$$

Other Fixed Costs

Fixed Costs			
Effective Depreciation	\$ 12,981.00	\$ 14,803.00	\$ 12,880.00
Projected Resale Price	\$ 5,247.00	\$ 5,648.00	\$ 5,765.00
Number of Months Past September	0	0	0
Price by Month Adjustment	\$ -	\$ -	\$ -
Interest	\$ 3,330.96	\$ 3,737.19	\$ 3,407.17
Year 1	\$ 1,299.47	\$ 1,457.95	\$ 1,329.20
Year 2	\$ 1,012.72	\$ 1,136.22	\$ 1,035.89
Year 3	\$ 725.97	\$ 814.50	\$ 742.57
Year 4	\$ 292.81	\$ 328.52	\$ 299.51
Year 5	\$ -	\$ -	\$ -
Management Fee	\$ 401.02	\$ 449.92	\$ 410.19
Insurance	\$ 4,400.00	\$ 4,400.00	\$ 4,400.00
Delivery Delay Cost	\$ 1,800.00	\$ 900.00	\$ -
Days Over Least Delivery Time	30	15	0
Delivery Days	75	60	45
AFV Tax Credit	\$ -	\$ -	\$ -
Mfg. Additional Incentive	\$ -	\$ (250.00)	\$ -
Total Fixed Cost:	\$ 22,912.98	\$ 24,040.11	\$ 21,097.36

Operating Costs

Operating Costs						
Total Fuel Cost	\$	7,942.00	\$	7,220.00	\$	7,563.81
<i>Estimated Miles-per-Gallon</i>		20		22		21
Total Maintenance Cost	\$	8,426.88	\$	7,590.88	\$	8,008.88
<i>Estimated Maintenance Cost-per-Mile</i>	\$	0.1008	\$	0.0908	\$	0.0958
Total Operating Cost:	\$	16,368.88	\$	14,810.88	\$	15,572.69

Personal Use

Universal Variable Data		Derived Values	
Target Months in Service:	48	Actual Months:	44
Target Replacement Mileage:	85,000	Actual Mileage:	85,000
Expected Mileage-per-Month:	1,900	Daily Mileage:	62.5
Lease Annual Interest Rate:	7.85%	Monthly Interest:	0.654%
Lease Management Fee (%):	0.05%		
Lease Management Fee (Flat Rate):	\$ -		
Book Depreciation Rate:	1.67%		
Fuel Cost-per-Gallon:	\$ 3.00		
Estimated Personal Use:	15%		
Daily Bridge Rental Rate:	\$ 60.00		

Percentage of total vehicle use that is not official business (including commuting) to collect from employee

Personal Use Costs

Fixed Cost for Personal Use	\$ 3,436.95	\$ 3,606.02	\$ 3,164.60
Operating Cost for Personal Use	\$ 2,455.33	\$ 2,221.63	\$ 2,335.90
Total Personal Use Cost	\$ 5,892.28	\$ 5,827.65	\$ 5,500.51

Costs per Mile

Total Lifecycle Cost:	\$ 33,389.58	\$ 33,023.34	\$ 31,169.54
Lifecycle Cost-per-Mile:	\$ 0.3994	\$ 0.3950	\$ 0.3728

LCA use #2

OPTIMIZING REPLACEMENT CYCLES

Extended Replacement

Advantages

- Lower cost of depreciation
- Temporarily avoid vehicle price increases
- Reduces money tied up in assets

Disadvantages

- Higher maintenance and downtime
- Longer to adopt new technologies
- Lower fuel efficiency, safety
- Impacts morale, organizational image

Optimal Replacement

Additional information required for optimum replacement analysis:

Annual shifts

Annual miles

Loaner vehicle costs

Max replacement

Tombstone Data

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Maximum Replacement Miles:	175,000	Upper limit for mileage to hold a vehicle based on policy decision
Net Acquisition Cost:	\$ 22,500.00	Net purchase price including all make-ready expenses
Return on Investment:	5.3%	The annual percentage rate earned on cash investments
Fuel Miles-per-Gallon	12.0	Mileage of vehicle being analyzed
Fuel Cost-per-Gallon:	\$ 1.65	Fuel cost-per-gallon
Pool Loaner Cost-per-Mile:	\$ 0.35	Cost-per-Mile of providing a backup vehicle while the primary vehicle is being worked on

Cost of Maintenance per Mile

		Vehicle A	Vehicle B	Vehicle C
Operating Costs				
Total Fuel Cost		\$ 12,750.00	\$ 11,590.91	\$ 12,142.86
Estimated Miles-per-Gallon		20	22	21
Total Maintenance Cost		\$ 8,568.00	\$ 7,718.00	\$ 8,143.00
Estimated Maintenance Cost-per-Mile		\$ 0.1008	\$ 0.0908	\$ 0.0958
Total Operating Cost:		\$ 21,318.00	\$ 19,308.91	\$ 20,285.86

Average cost of maintenance per mile

$$\$0.1008 \times 85,000 = \$8,568$$

Maintenance Cost-per-Mile × Actual Miles = Total Maintenance Cost

Maintenance Intervals

Service/Repair	Mileage Interval	Parts & Labor Cost	Shifts Down per Incident
PM A with safety inspection	3,000	\$ 60	0.0
PM B (A + transmission service)	21,000	\$ 70	0.5
PM C (A + tune up)	63,000	\$ 55	0.5
air conditioning	60,000	\$ 450	1.0
auxiliary - lights, siren, radio	40,000	\$ 150	0.5
battery	50,000	\$ 55	0.0
brake - pads, disc, drum	10,000	\$ 120	0.5
brakes - master cylinder, calipers, ABS	60,000	\$ 400	1.0
cooling system	50,000	\$ 140	1.0
engine	150,000	\$ 4,500	5.0
exhaust	75,000	\$ 70	0.5
front end/suspension	30,000	\$ 120	1.0
tires	15,000	\$ 280	0.3
transmission	130,000	\$ 1,100	1.0
miscellaneous	20,000	\$ 250	0.3

Maintenance Costs

1-Year			2-Years			3-Years			4-Years		
Freq.	Repair	Down	Freq.	Repair	Down	Freq.	Repair	Down	Freq.	Repair	Down
7	\$ 420	\$ -	14	\$ 840	\$ -	22	\$ 1,320	\$ -	29	\$ 1,740	\$ -
1	\$ 70	\$ 15	2	\$ 140	\$ 30	3	\$ 210	\$ 45	4	\$ 280	\$ 60
0	\$ -	\$ -	0	\$ -	\$ -	1	\$ 55	\$ 15	1	\$ 55	\$ 15
0	\$ -	\$ -	0	\$ -	\$ -	1	\$ 450	\$ 30	1	\$ 450	\$ 30
0	\$ -	\$ -	1	\$ 150	\$ 15	1	\$ 150	\$ 15	2	\$ 300	\$ 30
0	\$ -	\$ -	0	\$ -	\$ -	1	\$ 55	\$ -	1	\$ 55	\$ -
2	\$ 240	\$ 30	4	\$ 480	\$ 60	6	\$ 720	\$ 90	8	\$ 960	\$ 120
0	\$ -	\$ -	0	\$ -	\$ -	1	\$ 400	\$ 30	1	\$ 400	\$ 30
0	\$ -	\$ -	0	\$ -	\$ -	1	\$ 140	\$ 30	1	\$ 140	\$ 30
0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -	\$ -
0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -	\$ -	1	\$ 70	\$ 15
0	\$ -	\$ -	1	\$ 120	\$ 30	2	\$ 240	\$ 60	2	\$ 240	\$ 60
1	\$ 280	\$ 9	2	\$ 560	\$ 18	4	\$ 1,120	\$ 36	5	\$ 1,400	\$ 45
0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -	\$ -
1	\$ 250	\$ 9	2	\$ 500	\$ 18	3	\$ 750	\$ 27	4	\$ 1,000	\$ 36
	\$ 1,260	\$ 63		\$ 2,790	\$ 171		\$ 5,610	\$ 379		\$ 7,090	\$ 472

Lifecycle Costs

Years Held:	1	2	3	4
Fixed Cost				
Mileage at Replacement	22,000	44,000	66,000	88,000
Projected Resale Price	\$ 16,000	\$ 12,000	\$ 9,000	\$ 6,500
Total Fixed Cost	\$ 6,500	\$ 10,500	\$ 13,500	\$ 16,000
Annual Fixed Cost	\$ 6,500	\$ 5,250	\$ 4,500	\$ 4,000

Years Held:	1	2	3	4
Operating Costs				
Maintenance	\$ 1,323	\$ 2,961	\$ 5,989	\$ 7,562
Fuel	\$ 4,583	\$ 9,167	\$ 13,750	\$ 18,333
Total Operating Costs	\$ 5,906	\$ 12,128	\$ 19,739	\$ 25,896
Annual Operating Cost	\$ 5,906	\$ 6,064	\$ 6,580	\$ 6,474

Years Held:	1	2	3	4
Lifecycle Total Cost	\$ 12,406.50	\$ 22,628.11	\$ 33,238.98	\$ 41,895.56
Lifecycle Annual Cost	\$ 12,406.50	\$ 11,314.06	\$ 11,079.66	\$ 10,473.89
Lifecycle Cost-per-Mile	\$ 0.564	\$ 0.514	\$ 0.504	\$ 0.476

*See Spreadsheet

- LCA USB
<http://www.nafa.org/nafastore/index.php/nafa-publications/nafa-flashdrives.html>
- FM Discipline Certificate
<http://www.fleetcertification.org/individual-certification/certificate-program/>
- CAFM/CAFS Certification
<http://www.fleetcertification.org/individual-certification/certification-program-application/>



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