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Calculating Asset Lifecycles

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Legacy Method

- Relies on the experience and testimony of managers, mechanics and operators to determine when a vehicle should be replaced.

- Pros
  - Easy to obtain
  - Developed directly by user-group

- Cons
  - Brain-drain
  - Hard to defend

Weighted Score Method

- Each vehicles is given a score based on a variety of variables that are weighted based on importance to the department.
- Age, LTD Maintenance Cost, LTD Mileage, Class Priority, etc.

- Pros
  - Flexible
  - Easier to defend

- Cons
  - Time-consuming
  - Arbitrary weights
  - Reactionary

MACE Method

- Mean Annual Cost Equivalent is calculated by projecting the average annual cost to own and maintain an asset for each potential lifecycle.

- Pros
  - Extremely Defendable
  - Cost-effective by design

- Cons
  - Time-consuming
  - Knowledge Barrier
  - Data Barrier

MACE Method: Example Data

Class	Annual Mileage	Purchase Price	Age at Sale	Residual Value
Light Duty Pickup	14,000	$24,000	14	$1,000

MACE Method: MACE Equation

$$\text{MACE} = \frac{Total\ Lifetime\ Cost\ of\ Asset}{Number\ of\ Years\ in\ Service}$$

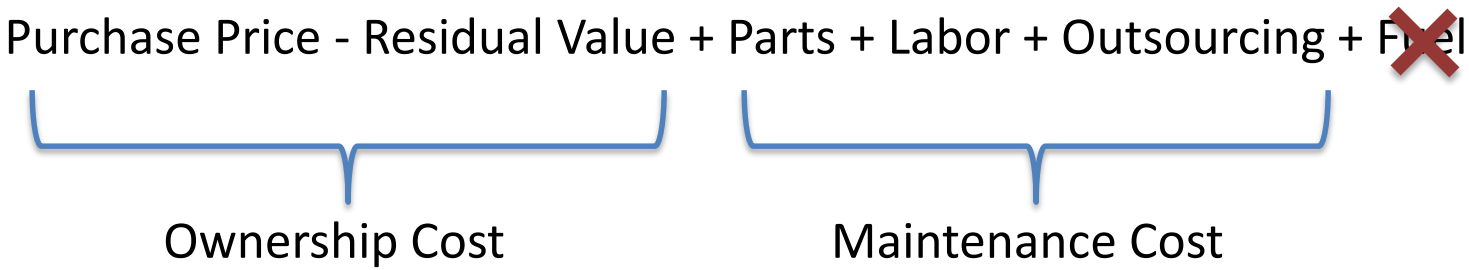
MACE Method: Total Cost

Purchase Price + Parts + Labor + Outsourcing + Fuel - Residual Value

MACE Method: Total Cost

Purchase Price + Parts + Labor + Outsourcing + Fuel - Residual Value

MACE Method: Total Cost



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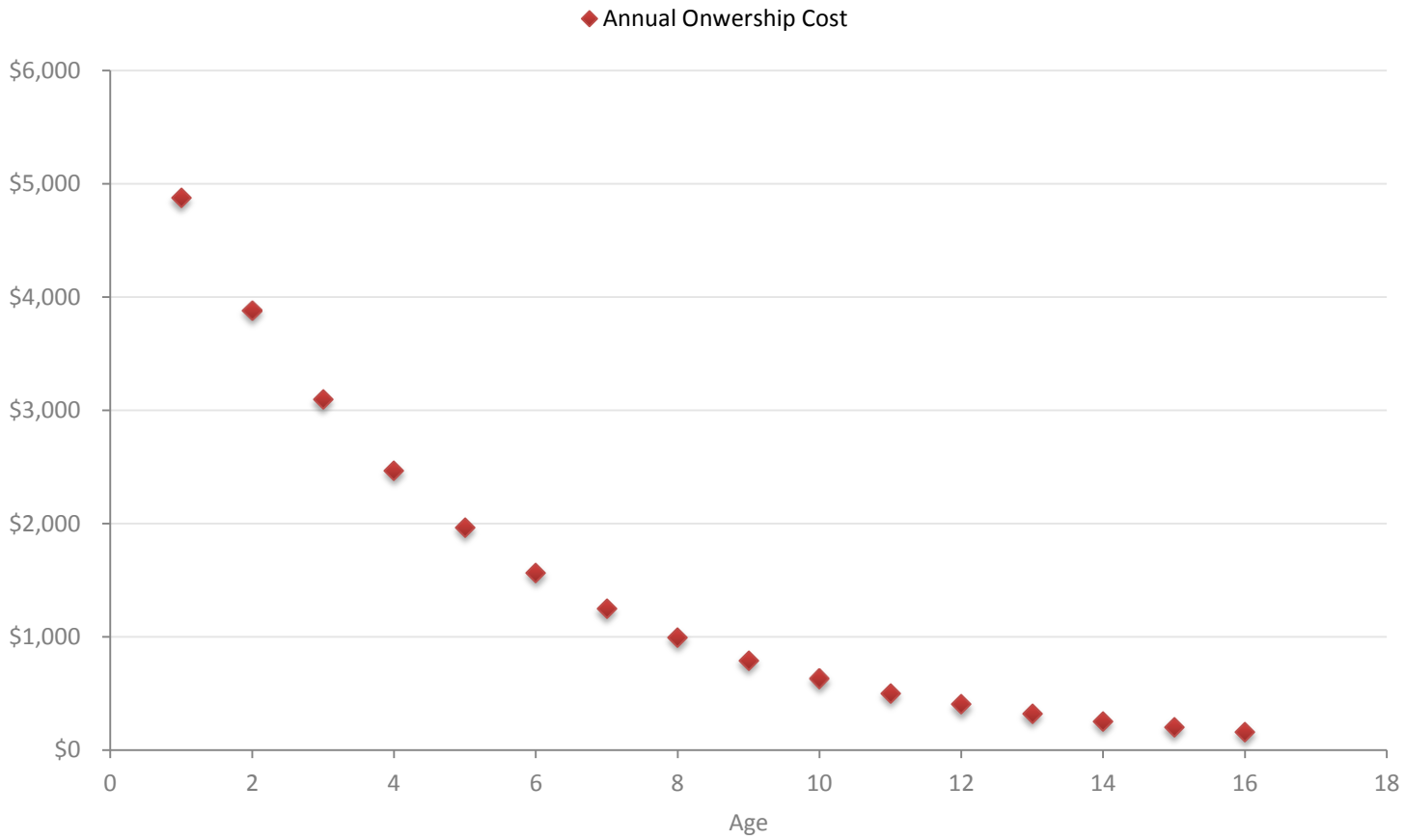
MACE By Lifecycle

Lifecycle	Total Own. Cost	Total Maint. Cost	Total Cost	MACE
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Ownership Cost Projection

Light Duty Pickup Truck | Avg. Ann. Mileage 14K | Purchase Price $24K | Age At Sale 14 | Residual $1K



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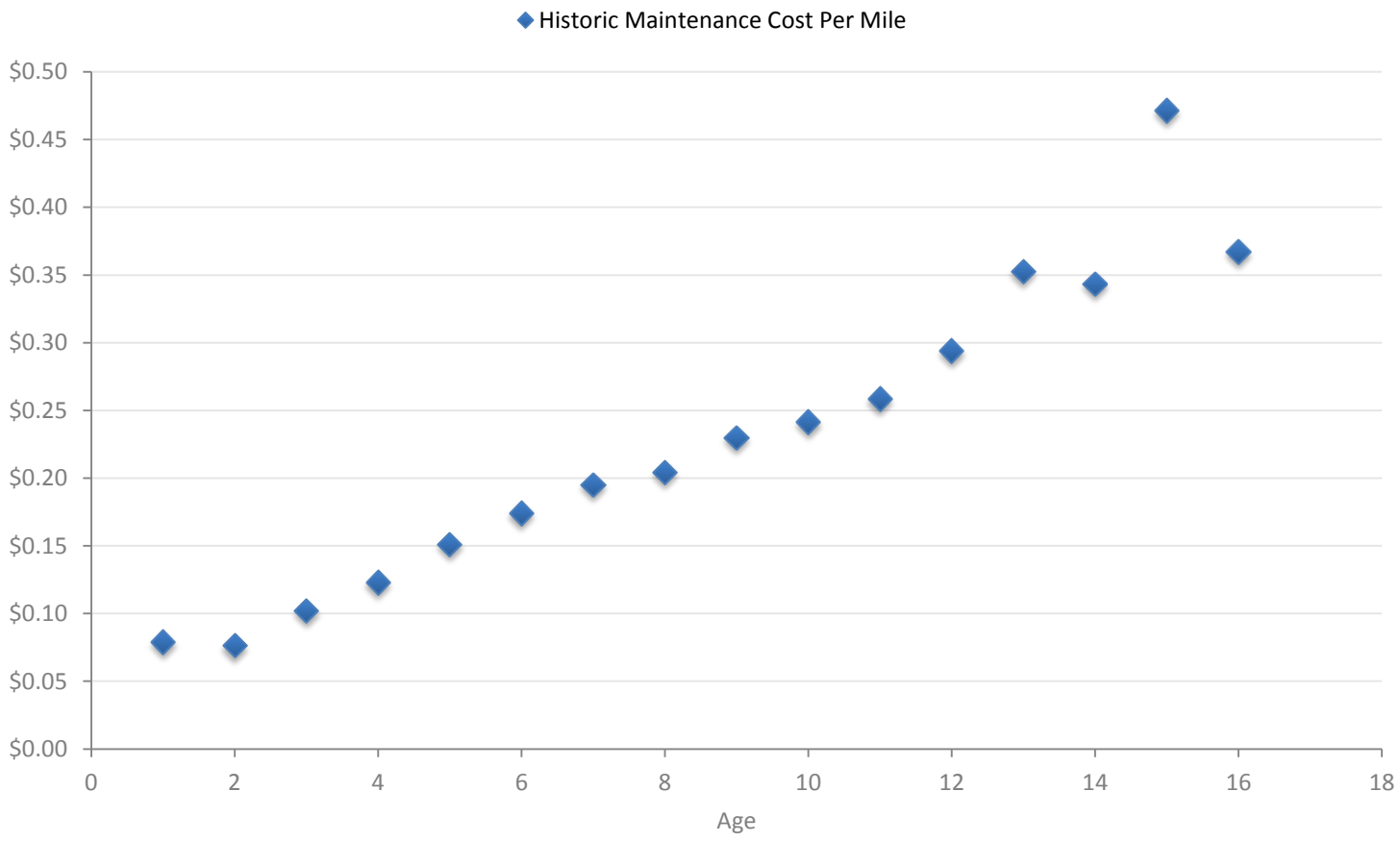
MACE By Lifecycle

Lifecycle	Total Own. Cost	Total Maint. Cost	Total Cost	MACE
1	$4,874			
2	$8,758			
3	$11,853			
4	$14,320			
5	$16,286			
6	$17,853			
7	$19,101			
8	$20,096			
9	$20,889			
10	$21,521			
11	$22,024			
12	$22,425			
13	$22,745			
14	$23,000			
15	$23,203			
16	$23,365			

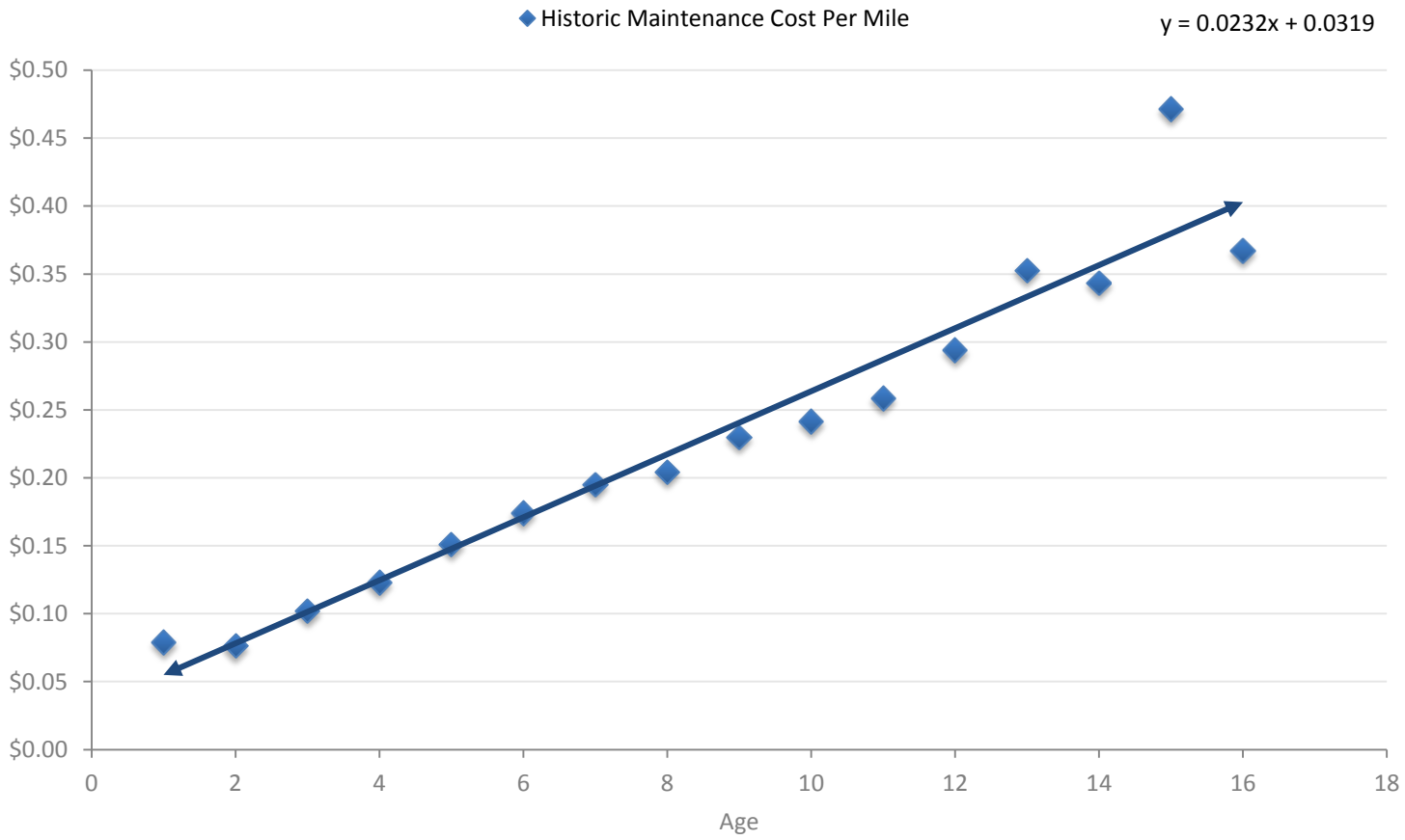
Maintenance Cost Projection

Light Duty Pickup Truck | Avg. Ann. Mileage 14K | Purchase Price $24K | Age At Sale 14 | Residual $1K



Maintenance Cost Projection

Light Duty Pickup Truck | Avg. Ann. Mileage 14K | Purchase Price $24K | Age At Sale 14 | Residual $1K



MACE By Lifecycle

Lifecycle	Total Own. Cost	Total Maint. Cost	Total Cost	MACE
1	$4,874	$771		
2	$8,758	$1,900		
3	$11,853	$3,408		
4	$14,320	$5,312		
5	$16,286	$7,644		
6	$17,853	$10,419		
7	$19,101	$13,666		
8	$20,096	$17,408		
9	$20,889	$21,672		
10	$21,521	$26,489		
11	$22,024	$31,887		
12	$22,425	$37,899		
13	$22,745	$44,556		
14	$23,000	$51,886		
15	$23,203	$59,927		
16	$23,365	$68,715		

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MACE By Lifecycle

Lifecycle	Total Own. Cost	Total Maint. Cost	Total Cost	MACE
1	$4,874	$771	$5,645	
2	$8,758	$1,900	$10,658	
3	$11,853	$3,408	$15,261	
4	$14,320	$5,312	$19,632	
5	$16,286	$7,644	$23,930	
6	$17,853	$10,419	$28,272	
7	$19,101	$13,666	$32,767	
8	$20,096	$17,408	$37,504	
9	$20,889	$21,672	$42,561	
10	$21,521	$26,489	$48,010	
11	$22,024	$31,887	$53,911	
12	$22,425	$37,899	$60,324	
13	$22,745	$44,556	$67,301	
14	$23,000	$51,886	$74,886	
15	$23,203	$59,927	$83,130	
16	$23,365	$68,715	$92,080	

MACE By Lifecycle

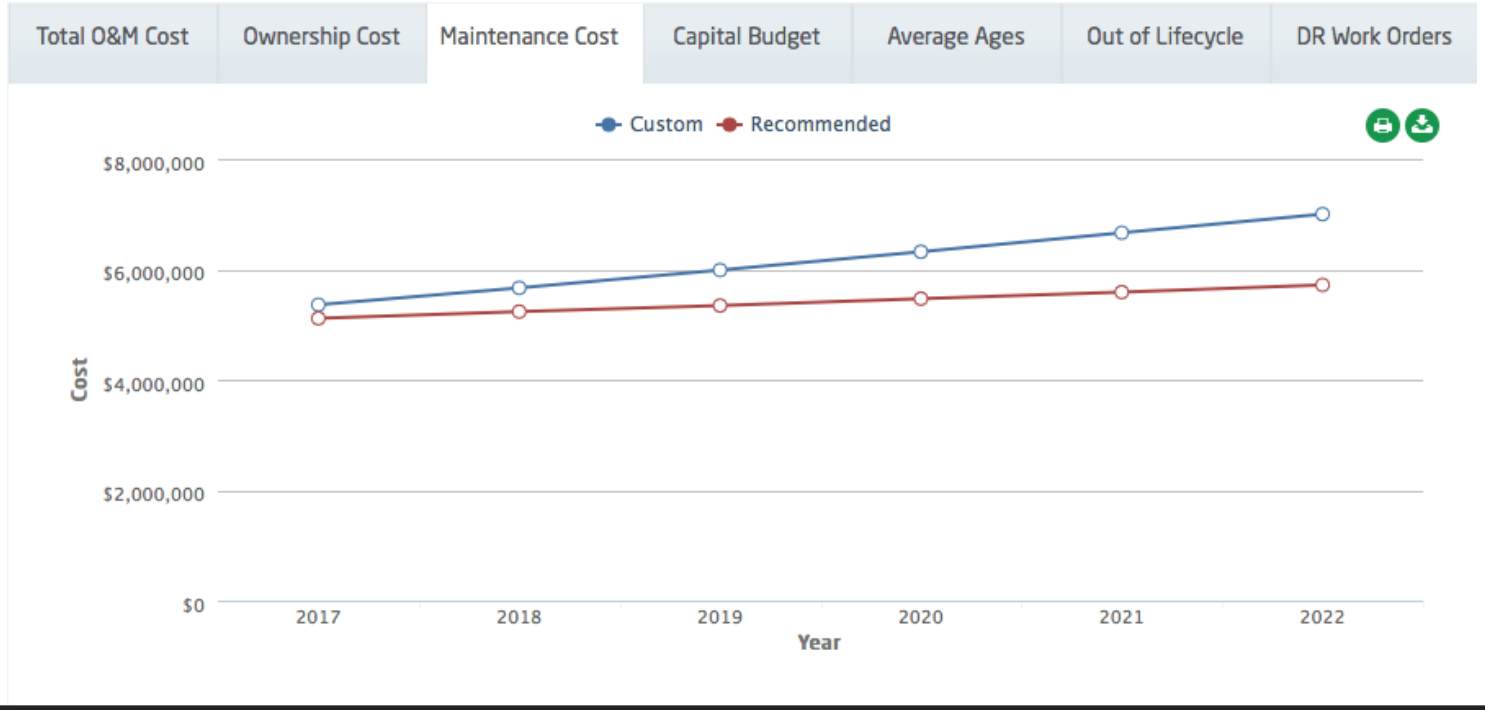
Lifecycle	Total Own. Cost	Total Maint. Cost	Total Cost	MACE
1	$4,874	$771	$5,645	$5,645
2	$8,758	$1,900	$10,658	$5,329
3	$11,853	$3,408	$15,261	$5,087
4	$14,320	$5,312	$19,632	$4,908
5	$16,286	$7,644	$23,930	$4,786
6	$17,853	$10,419	$28,272	$4,712
7	$19,101	$13,666	$32,767	$4,681
8	$20,096	$17,408	$37,504	$4,688
9	$20,889	$21,672	$42,561	$4,729
10	$21,521	$26,489	$48,010	$4,801
11	$22,024	$31,887	$53,911	$4,901
12	$22,425	$37,899	$60,324	$5,027
13	$22,745	$44,556	$67,301	$5,177
14	$23,000	$51,886	$74,886	$5,349
15	$23,203	$59,927	$83,130	$5,542
16	$23,365	$68,715	$92,080	$5,755

Why Minimize MACE?

Replacement Plan	Years	Number of Vehicles	Annualized Cost	Total Cost
1 Year Lifecycle	14	14	$5,645	$79,031
7 Year Lifecycle	14	2	$4,681	$65,530
14 Year Lifecycle	14	1	$5,349	$74,881

MACE and Modeling

- MACE Method requires building models to predict ownership and maintenance cost.
- These models can be used to predict future costs, or compare the effectiveness of different replacement plans.



Which Method Should You Choose?

- Combining Aspects of each Method
  - Incorporate mechanic/customer/user feedback into MACE Model
  - Use MACE as a variable for a Weighted Score.

Questions