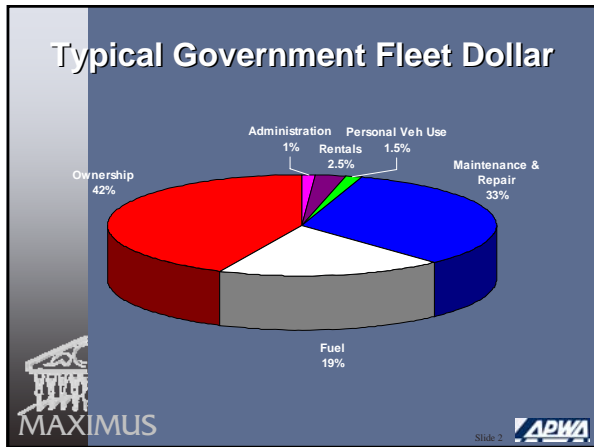


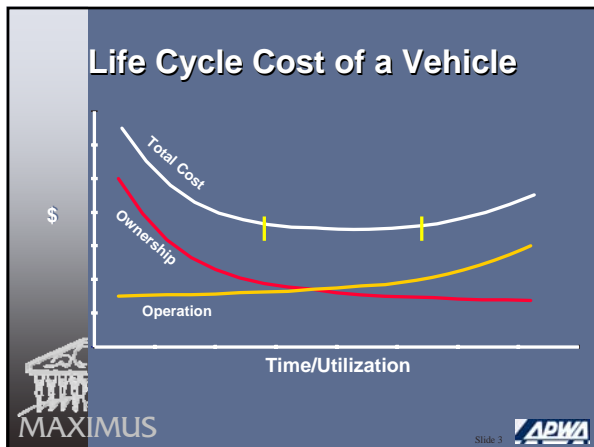
MAXIMUS
FLEET MANAGEMENT CONSULTING PRACTICE

Understanding and Managing Your Fleet Dollar

Les Rucker
National Director
Fleet Management Consulting

APWA APWA 2008 Congress
New Orleans, LA
August 17, 2008







Economic Life

- ▲ **30 Years**
 - ▲ 1-year life-cycle – 30 vehicles
 - ▲ 2-year life-cycle – 15 vehicles
 - ▲ 3-year life-cycle – 10 vehicles
 - ▲ 4-year life-cycle – 7.5 vehicles
 - ▲ 5-year life-cycle – 6 vehicles
 - ▲ 6-year life-cycle – 5 vehicles



Etc.

Slide 4

Economic Life 1-Year Vehicle

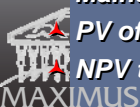

▲ Purchase price (w/upfitting)	-\$24,000
▲ Resale	+\$17,760
▲ Discount rate (1 year)	3.420%
▲ PV of resale	+\$17,173
▲ NPV of vehicle	-\$6,827
▲ Maintenance	-\$1,898
▲ PV of maintenance	-\$1,861
▲ NPV total	-\$8,688

Slide 5

Economic Life 2-Year Vehicle



▲ Purchase price (w/upfitting)	-\$24,000
▲ Resale	+\$14,400
▲ Discount rate (1 year)	3.860%
▲ PV of resale	+\$13,350
▲ NPV of vehicle	-\$10,650
▲ Maintenance	-\$3,268
▲ PV of maintenance	-\$3,126
▲ NPV total	-\$13,776

Slide 6

Economic Life (contd.)

	NPV	NPV/Per Year
▲ 1-year	-\$8,688	-\$8,688
▲ 2-year	-\$13,776	-\$6,888
▲ 3-year	-\$17,314	-\$5,771
▲ 4-year	-\$20,897	-\$5,224
▲ 5-year	-\$23,292	-\$4,658



Slide 7

Economic Life (contd.)

Equivalent Annual Cost (EAC)

$$EAC = NPV \times \frac{r(1+r)^n}{(1+r)^n - 1}$$



(Where *r* is the discount rate less inflation and *n* is the period of time)

Slide 8

Economic Life (contd.)

	EAC
▲ 1-year	\$8,768
▲ 2-year	\$7,029
▲ 3-year	\$5,974
▲ 4-year	\$5,475
▲ 5-year	\$4,963

Slide 9

Economic Life (contd.)

EAC is often used as a decision making tool in capital budgeting when comparing investment opportunities of unequal lifespans.

A practical example where the cost of capital is 5%:

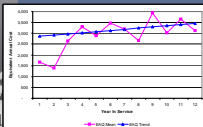
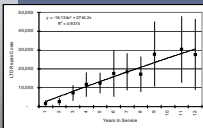
Machine	A	B
Investment cost	\$50,000	\$150,000
Expected lifetime	3 years	8 years
Annual maintenance	\$13,000	\$7,500
EAC	\$31,360	\$30,780



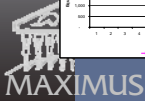
Slide 10

So When Should Vehicles be Replaced?

Dump Trucks



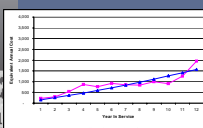
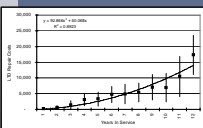
- ▲ 1473 units in sample
- ▲ $R^2 = 0.9374$
- ▲ Significant cost increase in year 9
 - ▲ Cost deviation increases \$15,000
- ▲ EAC declines years 6 to 8
- ▲ Life Cycle:
 - ▲ 8 Years



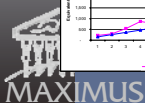
Slide 11

So When Should Vehicles be Replaced?

Administrative Sedans





- ▲ 1484 units in sample
- ▲ $R^2 = 0.8923$
- ▲ Initial jump in cost years 3 to 4 and 5 to 6
 - ▲ EAQ costs level years 4 to 10.
- ▲ Costs begin to rise again in year 9 and increase significantly in years 11 and 12.
- ▲ Life-Cycle:
 - ▲ 8 years



Slide 12

Types of Lives

- *Economic life*
- *Technological life*
- *Service life*

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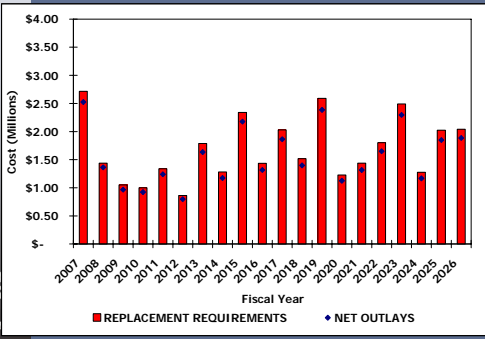
Replacement Planning

- ▲ *Tactical*
- ▲ *Strategic*






Slide 14

Baseline Strategic Replacement Plan



Fiscal Year	REPLACEMENT REQUIREMENTS (Millions)	NET OUTLAYS (Millions)
2007	2.7	2.7
2008	1.4	1.4
2009	1.0	1.0
2010	1.0	1.0
2011	1.3	1.3
2012	0.8	0.8
2013	1.7	1.7
2014	1.2	1.2
2015	2.3	2.3
2016	1.4	1.4
2017	2.0	2.0
2018	1.5	1.5
2019	2.6	2.6
2020	1.2	1.2
2021	1.4	1.4
2022	1.8	1.8
2023	2.5	2.5
2024	1.2	1.2
2025	2.0	2.0
2026	2.0	2.0

Slide 15

Key Statistics

▲ Original Purchase Price	\$6.5 M
▲ Estimated Book Value	\$2.3 M
▲ Average Vehicle Age	6.6 yrs
▲ Number of Units	255
▲ Avg. Vehicle Life-to-Date Miles	42,540
▲ Avg. Recommended Replacement Cycle	7.7 yrs
▲ Estimated Replacement Cost	\$10.8M
▲ Avg. Annual Replacement Cost	\$1.5 M
▲ Avg. Investment per Year for Last Five Yrs	\$1.0 M



Slide 16

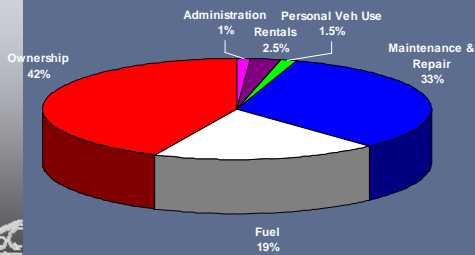
Reduced Replacement Spending

- ▲ Increase in total cost
- ▲ Increase in turn-around time
- ▲ Decrease in vehicle availability
- ▲ Increase in breakdowns
- ▲ Decrease in salvage value
- ▲ Customer dissatisfaction
- ▲ Fleet creep



Slide 17

Typical Government Fleet Dollar



Slide 18



Fuel




Slide 19

Typical Government Fleet Dollar



The Maintenance & Repair Piece

Slide 20

Useful Labor Measurements

Total Paid Hours = 2,080

Slide 21

Useful Labor Measurements

- Percent Productive

■	Charged to Work Orders (1,480 hrs.)	71%
■	Pd - Not Worked (400 hrs.)	19%
□	Worked - Not Charged (200 hrs.)	10%

Total Paid Hours = 2,080

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Useful Labor Measurements

- Percent Productive
- Percent Billable hours to productive hours (Efficiency)

■	Charged to Work Orders (1,480 hrs.)	71%
■	Pd - Not Worked (400 hrs.)	19%
□	Worked - Not Charged (200 hrs.)	10%

Total Paid Hours = 2,080

Slide 23

Useful Parts Measurements

- ▲ Dollar value of inventory at end of each FY for last five years
- ▲ Total dollar value of parts placed on vehicles in last 12 months
- ▲ Total \$ value of issues from inventory in last 12 months
- ▲ Percent fill from inventory
- ▲ Average inventory turns per year
- ▲ Number of inventory lines (current)
- ▲ Number of inventory lines with "0" on hand (current)
- ▲ Average value of line item with stock
- ▲ Lines with inventory on hand and no issues in the last year
- ▲ Lines with inventory on hand and no issues in the last six months
- ▲ Lines with inventory on hand and no issues in the last three months
- ▲ Percent stale inventory

Slide 24

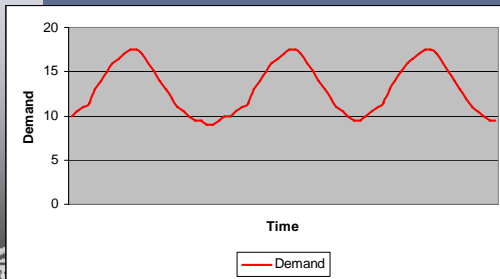
Sublet Considerations

- ▲ Size of maintenance facility
- ▲ Size of authorized technician force
- ▲ Training of technician force
- ▲ Specialized tools needed for function
- ▲ Regulatory & legal requirements
- ▲ Frequency of need to perform work
- ▲ Safety issues
- ▲ Balancing supply with demand



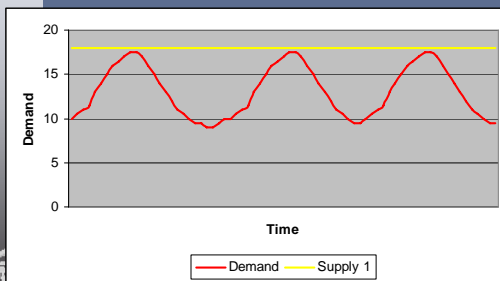
Slide 25

Optimization Theory

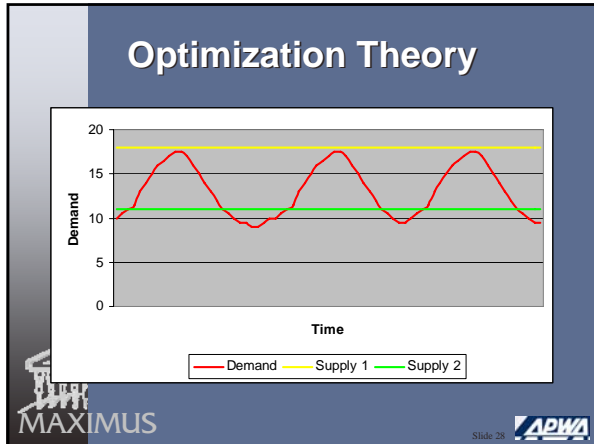


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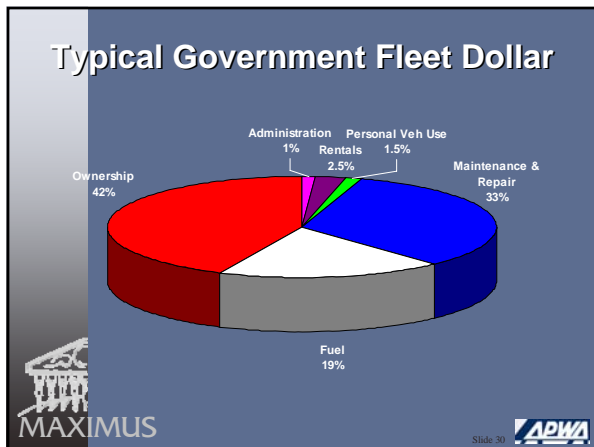
Optimization Theory

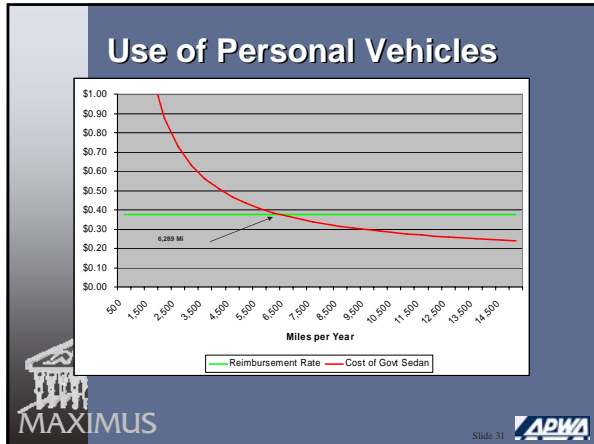


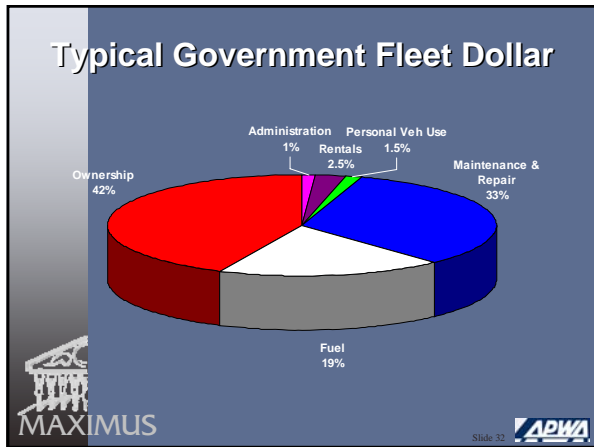
Slide 27



- ### Directives
- ▲ *Our fleet is too large . . . (How large is our fleet?) – reduce our fleet by 10%*
 - ▲ *Our fleet costs too much . . . (How much does our fleet cost us?) – reduce our cost by 10%*
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