

A person wearing a blue and white checkered shirt is sitting at a desk. They are looking at a laptop on the left and have their hands on a stack of papers on the right. A red banner is overlaid on the image with white text.

What do I do with this data once I have it?

Using your fleet data to make better decisions

About the presenter: Alan Simpson

- ⚙️ **6 years as a Fleet Analyst (City and County of San Francisco)**
- ⚙️ **9+ years as a Fleet Manager (City of Palo Alto)**
- ⚙️ **18 years as a Senior Technical Consultant (AssetWorks)**
- ⚙️ **Expertise:**
 - Implement AssetWorks software for cities, counties and private fleets across the country
 - Promote best practices for industry professionals
 - Provide tune-up training to different clients across various industries

Today's Agenda

- ⚙️ Asset management and stages of life-cycle analysis
- ⚙️ Using MEAC life-cycle to determine optimal replacement
 - What is MEAC?
 - Why MEAC?
 - How do I calculate MEAC?
- ⚙️ Common challenges
- ⚙️ Introducing: our final power-webinar
- ⚙️ Questions

Where did we leave off?

⚙️ The 6 reports You Should Be Running to Get the Data You Need:

1. Maintenance and repairs
2. Downtime
3. Fuel
4. Depreciation
5. Resale Value
6. Usage

⚙️ How do these reports all fit together?

The Full Life Cycle Cost of Your Vehicles

Can help you decide when to repair versus replace



Can help you decide which vehicle to buy

Can help you understand how to dispose of your vehicles

Can help you optimize the size of your fleet



What is MEAC? (and why do I need it?)

What is MEAC?

⚙ Mean Equivalent Annual Cost (MEAC)

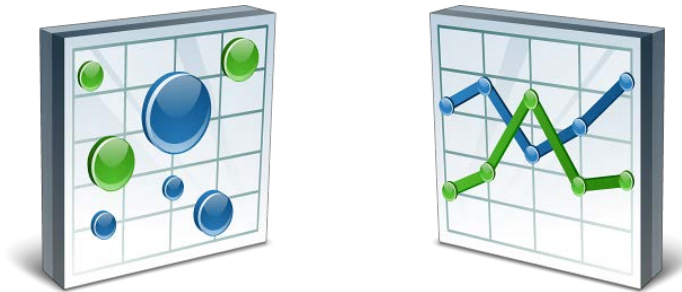
⚙ Commonly accepted methodology for determining an assets optimal replacement point and comparing assets with varying lives

⚙ MEAC:

- Averages capital and operating costs for the different life spans of an asset
- Identifies which life span has the least annual cost and represents the optimal replacement point

Why MEAC?

- ⚙️ Calculates the asset's total mean costs between varying life cycles
- ⚙️ Can determine assets' optimal replacement points – point with lowest mean annual cost
- ⚙️ Can use generated life-cycle costs to do additional analysis



Equivalent Annual Cost

- ⚙ The cost per year of owning and operating an asset over a specific lifespan
- ⚙ **Equivalent Annual Cost (EAC)** is the net present value of an annuity for that life-span

$$EAC = NPV/A_{t, r}$$

T = time, r = interest rate

- ⚙ For fleet life-cycle, the annuity measures life-to-date:
 - Cost of maintenance, downtime and fuel
 - Cost of ownership

How to calculate MEAC

Don't be intimidated!

$$\{EAC_R\} = \left[P - \frac{S_R}{(1+i)^R} + \sum_{t=1}^R \frac{X_t}{(1+i)^t} \right] \left[\frac{i(1+i)^R}{(1+i)^R - 1} \right]$$

What it means:

i=discount rate

t=year (0,1,2,3....)

R=year of replacement

P=purchase price at t=0

S=resale or salvage

X=sum of the year's costs

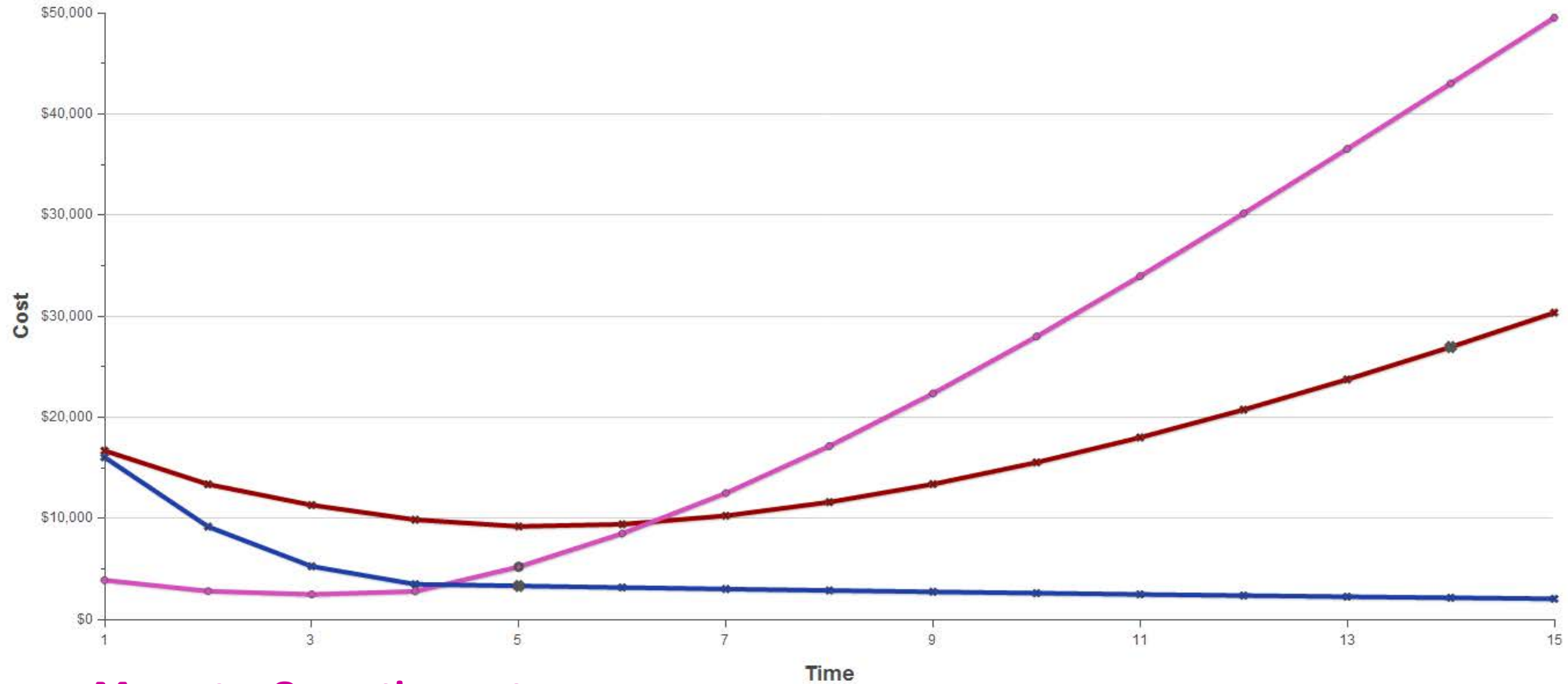
MEAC Optimal Replacement Calculation

6	12	13	14	15
Depreciation (Discounted)	Cumulative O&M Costs	Total Discounted Costs	Equivalency Factor	Mean Equivalent Annual Cost
$[2 - 5]$ $[P - SR / (1+i)R]$	$(\sum(11)t)$	$[6 + 12]$	$[i(1+i)R / (1+i)R - 1]$	$(13 * 14)$
\$ -	\$ -	\$ -	-	\$ -
\$ 12,857	\$ 8,596	\$ 21,453	1.0500	\$ 22,526
\$ 20,204	\$ 19,617	\$ 39,821	0.5378	\$ 21,416
\$ 24,402	\$ 32,464	\$ 56,866	0.3672	\$ 20,882
\$ 26,801	\$ 46,874	\$ 73,675	0.2820	\$ 20,777
\$ 28,172	\$ 62,425	\$ 90,597	0.2310	\$ 20,926
\$ 28,956	\$ 78,905	\$ 107,861	0.1970	\$ 21,250
\$ 29,403	\$ 96,106	\$ 125,509	0.1728	\$ 21,690
\$ 29,659	\$ 114,128	\$ 143,787	0.1547	\$ 22,247
\$ 29,805	\$ 132,446	\$ 162,251	0.1407	\$ 22,827
\$ 29,889	\$ 151,529	\$ 181,418	0.1295	\$ 23,494
\$ 29,936	\$ 170,674	\$ 200,611	0.1204	\$ 24,151
\$ 29,964	\$ 189,919	\$ 219,883	0.1128	\$ 24,808
\$ 29,979	\$ 209,944	\$ 239,923	0.1065	\$ 25,541
\$ 29,988	\$ 229,560	\$ 259,548	0.1010	\$ 26,221
\$ 29,993	\$ 249,379	\$ 279,372	0.0963	\$ 26,915

MEAC Life-Cycle Cost Curve

Life Cycle Graph: Life cycle by time

Saved models: DEMO BY YEAR



Magenta: Operating costs

Blue: Capital costs

Red: MEAC cost curve

Where do I find this information?

⚙ Maintenance costs

Parts, Labor, Comm'l

Annual Maintenance Reports
Labor Reports
Downtime Reports

⚙ Fuel

Gas and related taxes

Fuel Usage Reports
Fuel Management System

⚙ Depreciation

Capital or expense based

Capital Journal
Asset Management System

⚙ Usage

Miles or hours

Meter Journal
Fuel System
GPS/AVL System

⚙ Resale value

Market worth

Past Sales History – Salvage Reports
Industry Reference – KBB, Black Book
Estimated from Depreciation

A person wearing a pink long-sleeved shirt is sitting at a dark wooden desk. Their right hand is on a black laptop keyboard, and their left hand is holding a black pen over a white document. On the desk, there is a green notebook with a red pen on top, a colorful mesh pen holder, and several documents. One document in the foreground features a pie chart with five segments in blue, green, yellow, purple, and red, and another smaller pie chart with orange and blue segments. A red folder is also visible under the documents.

Common challenges

Common challenges

⚙️ **Generating asset cost profiles**


- A complete cradle-to-grave history must be available to calculate life-cycle
- They can be created from scratch, but historic data is needed to estimate mean cost by time and usage

⚙️ **Inflation impacts**

- Consistent increases in price levels require that historic costs and expenses be calculated in constant year dollar

⚙️ **Data quality and capture**

- Raw data alone can sometimes be misleading, as this does not account for nuances and specifics that should be factored into the data



Is there an easier way?

Tune in for our final power-webinar

⚙️ **“Is There an Easier Way? CAM Can Help.”**

⚙️ Host: Marc Knight, CAFM

⚙️ Date: Wednesday, June 8 at 2pm EDT (11am PDT)

⚙️ Covering:

- The many ways CAM improves decision-making
- How to streamline data-gathering and analysis
- Learn to optimize life-cycle costs of your assets with data

QUESTIONS?

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