

# Predictive Analytics

## Optimizing Data To Get The Most Out Of Your Vehicles

By Bill Romba

**MANY ORGANIZATIONS USE MILEAGE** and/or months-in-service to determine when to cycle their assets. This method, however, doesn't take into account the great variation in vehicle usage that can occur across a fleet or how the vehicle may have been driven.

This is where predictive analytics and leveraging big data can give fleet managers a clearer picture of the condition of their vehicles by using a model that incorporates factors such as maintenance history, driver behavior, age, and mileage.

NAFA Regular Member Bob McElheney, CAFM®, Director, Vehicle and Equipment Services for the City of Newport News, Va., said his team bases many replacement decisions on a vehicle-by-vehicle basis by examining the type of asset and how it is used.

"For example," he explained, "a K-9 police vehicle's fuel throughput would be a better measure than mileage due to comparably higher idling."

McElheney also considers other factors before replacing a vehicle, such as mileage/hours, cost per mile/hour, lack of comparable vehicle safety technology, higher comparable emissions, lower comparable operational suitability, and "any recent significant, unavoidable spend that would justify keeping the vehicle longer."

Likewise, Matt Costolo, Assistant Manager, Business Intelligence and Analytics for ARI, a privately-held

global fleet management company, said that his company analyzes multiple key performance indicators (KPIs) when advising their clients on vehicle purchasing and replacement. These can include mileage, cost per mile, total cost of ownership, and downtime.

"Rather than looking at a singular maintenance transaction, we're leveraging data and historical tendencies to help predict trends over the entire lifecycle of a vehicle," Costolo explained.

"If the data indicates a likely spike in maintenance costs at 125,000 miles or six years in service, we'll work with our clients to get ahead of that curve and remove units from service prior to those anticipated spikes," said Costolo. "Additionally, if a fleet has a large number of vehicles on the same cycle, we'll work with them to replace those units in a manageable fashion. This can help avoid large jumps in operating expenses."

### Starting Point

Ryan Wilkinson, Chief Technology Officer at Vehicle Tracking Solutions, explained that most automakers are currently equipping their vehicles with technology that can collect low-level data from a vehicle's ECM that can be of great use to fleet managers.

"As of 2018, vehicle manufacturers are supplying key metrics needed (for fleet managers) such as fuel economy, fuel consumption, operating temperature, diagnostic trouble codes, and key vehicle

performance indicators," Wilkinson said. However, he also added that analyzing this data can prove more difficult for fleets with vehicles from multiple manufacturers.

### Lifecycle Cost Analysis

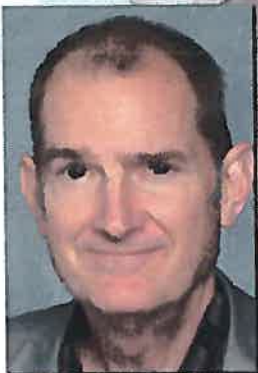
In addition to analyzing KPIs, another important task to perform regularly throughout a vehicle's time in your fleet is a lifecycle cost analysis (LCA). NAFA recommends this because the data collected can help to mitigate certain lifecycle cost issues, as well as help determine when to replace a vehicle.

Wilkinson said, "Fleet managers should have consistent access to real-time lifecycle cost analysis based on historical and real-time data. With the availability of this intelligence, lifecycle cost analysis should be an ongoing process that is part of normal business practices."

McElheney said that his team routinely collects data "which points out anomalies that result in a more thorough cost analysis. Annual utilization meetings with customer user groups also include lifecycle cost discussions."

Costolo said that ARI will perform an LCA when helping companies make selector decision, as well as when investigating the impact of adjusting replacement criteria.

"This practice enables us to ensure the vehicle specifications meet the needs of daily business operations while also minimizing total cost of ownership.



*Bob McElheney, CAFM®*



*Matt Costolo*

Some organizations elect to leverage this insight just before the ordering cycle, and others prefer to run the analysis at regular intervals throughout the year," he said.

It is important to analyze the data to predict any potential issues as best as possible. Normal wear-and-tear is not the only factor that can play into vehicle replacement. Vehicle downtime and operating costs can also play a role.

"In an effort to better control operating costs and smooth capital forecasts, we're transitioning a growing

number of clients to a consistent annual replacement methodology," said Costolo. "This approach examines several factors to help customers avoid replacing too many – or too few – vehicles during a particular cycle. By replacing a consistent number of vehicles on an annual basis, you're able to avoid the peaks and valleys often associated with replacing a large number of units simultaneously."

Additionally, Wilkinson said that it is important to take vehicle recalls into account when making any replacement decisions.

"If your business relies on a fleet to produce revenue, and your vehicles are at the dealer regularly for recalls, it will obviously hurt your business," said Wilkinson. "Taking recall information for specific vehicle manufacturers into account when off-boarding vehicles and purchasing new ones is a key metric that fleet operators should use to help make buying decisions."

So when it comes time to finally cycle certain vehicles out of your fleet, how should you go about the off-boarding process for those assets?





Wilkinson explained that there are baseline standards that fleets should adhere to when it comes to cycling out older vehicles. Chief among these is looking beyond the mileage on a vehicle's odometer.

"The cost to maintain a vehicle is typically a key factor in determining off-boarding. However, the baselines for off-boarding should be determined by the industry and the use of the vehicle," he said.

"For example, a vehicle that is used for deliveries has high annual mileage, and thus goes through tires at a much faster rate than that of a large utility truck. The utility truck travels drastically fewer miles per year but records more engine hours. This is because the engine is used to power the Power Take Off accessories, like the boom and bucket. Looking at engine hours and RPM ranges can help determine additional metrics for wear and tear on a vehicle that may

not be considered with a more narrow analysis that just looks at mileage."

### The Power of Visual Documentation

As far as the actual off-boarding process itself, McElheney explained that, in a centralized shop operation, the customer's new vehicle is made ready. The vehicle being replaced is then turned in and is processed through the shop.

"(This is where) any graphics are removed and any value-adding minor repairs are made in preparation for sale," he said. "State inspections are made current if it can be cost-justified. Then the vehicle is turned over to administration where it is prepared for a public, online auction. Pictures, text about recent work performed, tire tread depth, and video are used to provide potential buyers with enough information to make an informed decision."

McElheney added that "video is particularly useful when selling specialized equipment such as refuse, fire, or dump trucks. Seeing the vehicle operate improves buyer confidence, which can translate to higher sale prices."

While predictive analytics can help to make vehicle replacement easier, it can also help fleet managers keep up with routine maintenance and repair of their vehicles – and even lessen the costs associated with these responsibilities.

"We were experiencing cooling fan failures on police sedans," McElheney explained. "Using data analysis we were able to predict failure points by miles and grouped by 90, 80, and 70 percent statistical confidence levels. This gave us the ability to prioritize, manage supply timing, and avoid any subsequent failures."

It all comes down to utilizing the data. Knowing how to manage the information that is collected from your vehicles has the ability to make managing your assets much easier.

"For many of our clients, predictive analytics is the driving force behind key business decisions throughout the entire vehicle lifecycle. It certainly plays a critical role in the replacement process, which is a significant area of spend," said Costolo. "Effectively leveraging big data and predictive analytics empowered many of our clients to take greater control of various operating costs." ■



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