Establishing a Cost Effective Fleet Replacement Program

Regardless of what purpose your company's fleet serves, there are certain fundamentals to keep in mind when designing and implementing a cost-effective vehicle replacement program.

By Sal Bibona

Whether your company's fleet is serving as a means of transportation for the sales and service staff or is providing a mobile work platform, all fleet decision-makers will be in a better position to develop cost-effective replacement programs if they consider the following fundamentals.

Take a Comprehensive Approach

A comprehensive approach when developing a cost-effective fleet replacement program is more than just simply having replacement criteria such as age and miles guidelines in place. Instead, the approach should be multi-faceted and contain the following components:

- Systematic policies and procedures.
- Maintenance programs.
- Decision models.
- Lifecycle cost considerations.
- Funding mechanisms.
- Financial projections and analyses.

Develop Systematic Policies and Procedures

Best practice fleet operations have fully integrated and well thought out policies and procedures to guide them through each of the major phases of the lifecycle of their vehicles. These phases, illustrated in Chart 1, begin with evaluating the need for the vehicle and culminate with remarketing, disposing, or reassigning the vehicle.

Too often organizations give little consideration during the replacement planning process to whether a replacement vehicle is needed or not. When vehicles are due for replacement, management should ask the following questions:

- Is the vehicle being fully utilized?
- If the vehicle is not being used, why replace it?
- If it does need to be replaced, is the current specification of the vehicle appropriate?
- Would a different vehicle be better suited for the particular application?
- Are there any secondary uses for the vehicle?

By asking and answering these questions early in the replacement process, companies can avoid having too many or inappropriate units in their fleets. To answer such questions, fleet organizations need to have data on the utilization of their fleet units. These data can take several forms such as miles, engine hours, fuel consumption, percent of time used, and other parameters.

Fortunately, with modern fleet information technology, obtaining this information should not be too difficult. Maintenance management information systems, work force management systems, automated fuel systems, and external point-of-sale fuel transactions can automate much of the data collection process.

Similarly, best practice fleets have standards in place to guide the specification of the fleet units. These are particularly beneficial for those fleets that service their vehicles in-house. The familiarity of their technicians with the vehicles and equipment that they service, the amount of training needed, the levels of parts inventory required are all impacted by the diversity of the fleet in terms of makes, models, and types.

Plan and Execute a Preventive Maintenance Program

What does fleet maintenance have to do with fleet replacement? Plenty! Having a well-planned and executed preventive maintenance program is essential for an economically operated and reliable fleet. Otherwise, fleets would simply be capitalizing their maintenance.

A preventive maintenance program reduces the overall cost of

vehicle maintenance and repair, enables vehicles to reach their economic service life, increases the residual or salvage value of the vehicle, and enhances the professionalism and credibility of the fleet department.

Develop a Decision Process for Vehicle Replacement

Decision models represent the mechanisms that fleets will use to decide whether they should replace a particular vehicle or equipment unit. Most fleets use a combination of vehicle age, mile, and condition criteria. They may also review current and historical repair costs to see if they exceed a particular threshold like the original cost, replacement cost, or salvage value of the vehicle.

Sometimes fleets will use a weighted combination of these factors by computing the ratio of a replacement candidate's age, mileage, and lifecycle costs to the respective replacement guideline.

This approach is particularly helpful when setting replacement priorities based on alternative levels of funding or when funding under constraint.

Chart 2 illustrates the decision process used by one best practice fleet. This approach not only identifies the specific units for replacement, but also actively involves user groups in the process by enabling them to suggest additional units for replacement or changes in the types of units to be replaced.

Consider Your Fleet's Lifecycle Costs

One of the most important considerations in developing a fleet replacement program is understanding the concept of lifecycle costs. As vehicles age, certain costs, such as maintenance and repair, tend to increase while other costs, such as depreciation, tend to decrease. When the sum of these and all other ownership/leasing and operating costs reaches a minimum, the economic life is reached. Quantifying and analyzing these costs is known as economic lifecycle analysis.

This analysis can be applied in three ways as a management tool in fleet replacement. First, the analysis can be used to develop guidelines by vehicle class basis of age or mileage replacement criteria before vehicles go into service. Second, the analysis can be used to assess individual vehicles, after they have been in service, to determine whether they should continue in service for another year or be replaced. Third, the analysis can be applied to evaluate the economics of major rebuilding programs for larger trucks and equipment units to assess whether it is more cost-effective to rebuild the unit and extend its life or replace it with a new one.

The typical parameters included in these analyses include the following:

- Acquisition costs.
- Estimated salvage value.
- Cost of money.
- Maintenance costs.
- Operations costs.
- Fuel costs.
- Age or miles to date.
- Downtime cost.
- Obsolescence cost.

Quantifying downtime and obsolescence is not easy but can be the deciding factor on how long to keep vehicles. Downtime generally is costed between the loaded rate of the work crew and the cost of a spare vehicle. Quantifying obsolescence requires judgment and can involve age and experience factors, manufacturers input, and safety factors.

Also, as vehicles age they tend to be less reliable and their maintenance and repairs costs vary widely. Thus, the increase in variance or "volatility" in financial parlance can have a major impact on estimating repair workload and in turn staffing requirements.

Chart 3 represents a graphical illustration of an economic life cycle analysis for a fleet light truck. After the forecasted financial, maintenance, and other operating costs have been converted to their present worth values, they are amortized over different lives to see which life produces the lowest total cost.

It should also be noted that lifecycle analysis is as much of an art as it is a science. One of the major assumptions implicit in the approach is that future maintenance costs can be forecasted on the basis of historical maintenance costs.

Moreover, historical trending of vehicle maintenance costs versus age tends to understate the true maintenance costs of older vehicles, since highly problematic vehicles typically have been already culled from the fleet. Also, older vehicles tend to be reassigned to less intensive use and major repairs may be postponed or not done at all.

In addition, the total cost curve tends to be asymptotic or flattened and not like the "U" shaped curve often presented in textbooks. Therefore, judgment is needed in interpreting the results; and, sensitivity analyses should be made to evaluate the impact of changes in assumptions.

What is interesting to note is that lifecycle costs affect vehicle procurement preferences. These are most evident in the noticeable variation in preferences by fleet sector as surveyed by the National Association of Fleet Administrators (NAFA) in its *2002*

Model Year New Vehicle Acquisition Survey.

As illustrated in Chart 4, for commercial/industrial fleets depreciation is one of the highest rated factors in acquiring vehicles. This is to be expected since most commercial and industrial fleets consist primarily of light vehicles such as vans and sedans. In particular, passenger cars are driven from 18,000 to 20,000 miles per year and are remarketed after only three years in service. These vehicles may have a residual or salvage value of 45 percent or so of their original cost. Thus, the management of the commercial fleet will naturally focus more attention on the remarketing values of vehicles and the factors that will influence them. With light vehicles, these factors will include make, model, color, etc.

On the other hand for government and utility fleets, job suitability, initial costs, and serviceability are the highest weighted factors. This also is to be expected since government and utility fleets contain a broad mix of vehicles and equipment types, many of which are heavy units that are serviced in-house and have relatively long service lives of seven, 10, or more years. When removed from service, these vehicles may have residual or salvage values that are small percentages of original costs, say only five percent to 15 percent. For these fleets, initial costs, maintainability, and safety become primary factors.

These are broad generalizations and there are exceptions. Nevertheless, fleet operations from completely different sectors of the economy and supporting diverse applications are all impacted by lifecycle economics, knowingly or not.

Put in Place a Replacement Funding Mechanism

Ideally, best-practice fleets have mechanisms in place to fund their fleet replacements on an annual basis. They have what is referred to as "Asset Replacement Funds." These funds are set aside to meet asset replacement requirements, and thereby minimize the pressure on annual funding constraints and enable the smoothing out of cash flow.

Companies that lease their fleets have built-in replacement funding mechanism. Part of their lease payment includes an amortization of the vehicles' capitalized cost. In effect, the acquisition of the vehicle is amortized or divided over the life of the lease. When the lease is renewed for the replacement vehicle, the amortization process starts again. If the lease is open-ended, the differences between the book value and actual salvage or residual value can automatically be credited or debited to the account. In contrast, for purchased fleets salvage recovery values may not necessarily be credited back to the owning department.

While leasing may make these credits more transparent, leasing may not necessarily be the best option for a particular fleet operation. It may even be prohibited in some public service jurisdictions. In such cases, installment purchases may be used instead to finance fleet acquisitions over more than one year.

An organization's embedded, current, and perhaps incremental costs of capital are all relevant factors that can be taken into account in lease versus buy decisions. While the finance department usually has the final say, the fleet manager should still be an informed advisor in this process. The fleet manager should become familiar with the vocabulary of finance and have a basic understanding of financial concepts. This knowledge is particularly important when the fleet operation is being scrutinized to assess how competitive its costs are.

Those organizations without a dedicated source of funding their fleet units need to go through a more involved capital budgeting process when they are competing with other units in the organization for capital funds. Whether the eventual source of these funds is internal cash or external debt, equity, or other sources, this approach often results in inconsistent and insufficient funding of vehicle replacements from year-to-year.

Sometimes capital is so scarce; there is little choice but to retain costly, worn-out vehicles. Nevertheless, even under these challenging situations, the fleet replacement process should be managed as best possible.

For example, one fleet knew in advance that capital to replace the fleet was going to be short for several years. While its management at the time did not want to lease vehicles, it had to develop a strategy to keep its fleet rolling despite its advancement in age. So it conscientiously increased its preventive maintenance program to minimize the potential incidence of vehicle breakdowns.

Conversely, another fleet did not want to have too many resources tied up in maintaining the fleet. So it pursued a strategy of partnering with their major equipment supplier to replace units more frequently than in the past. It was able to receive high trade-in values from its equipment supplier, and at the same time downsize its fleet maintenance operation.

In both instances, management understood the implications of

lifecycle costs and how replacement funding and maintenance funding were integrally related.

Projecting Financial Requirements

In order to forecast future financial requirements to fund vehicle replacements, management first needs to have some basic information on the current inventory of the fleet. This may seem self-evident, but we have seen, on many occasions, clients who did not have a complete and full accounting of the number, location or condition of fleet units. An up-to-date inventory of the fleet for replacement planning should include at least the following elements:

- Vehicle identification number.
- Make and model.
- Location and assignment.
- Class.
- Acquisition cost.
- Model-year and age.
- Life-to-date usage.
- Life-to-date maintenance and repair costs.

From these data, management or consultants can forecast funding requirements over a planning horizon of five to 10 years. Often sensitivity analyses will be done to assess the impact of changes in assumptions on funding needs. These forecasts will be based on such parameters as:

- Expected service life.
- Replacement criteria.
- Future replacement costs.
- Expected salvage value.
- Backlog of replacements.
- Total replacement cost.

In addition, more sophisticated projections will go one-step further by also forecasting future operating costs like maintenance and downtime. From these projections, a discounted cash flow analysis can be made to compare the costs and benefits of alternative amounts of replacement funding and sources of funds.

These analyses may identify a large backlog of under-funded or deferred replacement. In these situations, it may be unrealistic to fund this entire backlog at once. Instead, the backlog may have to be funded over an extended period of time.

Review the Components of the Best Approach

In summary, the best approach in establishing a cost-effective fleet replacement program should:

- Account for specific organization's needs.
- Evaluate more than one factor.
- Review vehicle condition.
- Consider trade-offs of capital versus operating expenditures.
- Examine "whether" as well as "when" to replace.
- Consider alternative financing such as leasing.
- Apply good judgment.

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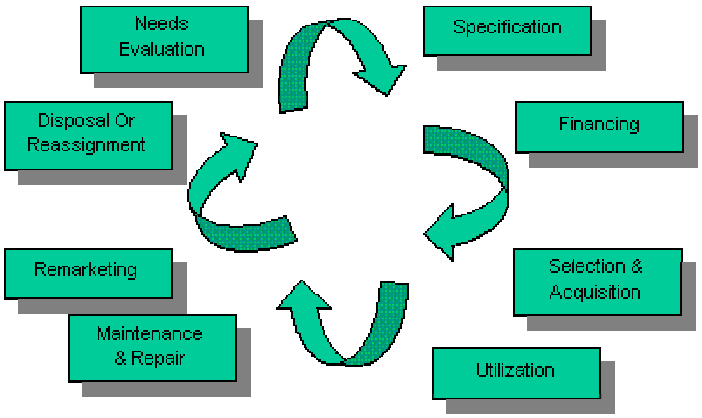
Exhibit 1: Fleet Vehicle Life Cycle



Phase one of the fleet vehicle lifecycle is a vehicle-needs evaluation, and the final phase is the remarketing, disposal, or reassignment of the vehicle.

Exhibit 2: Illustrative Decision Process For Vehicle Replacement by Public Service Fleet

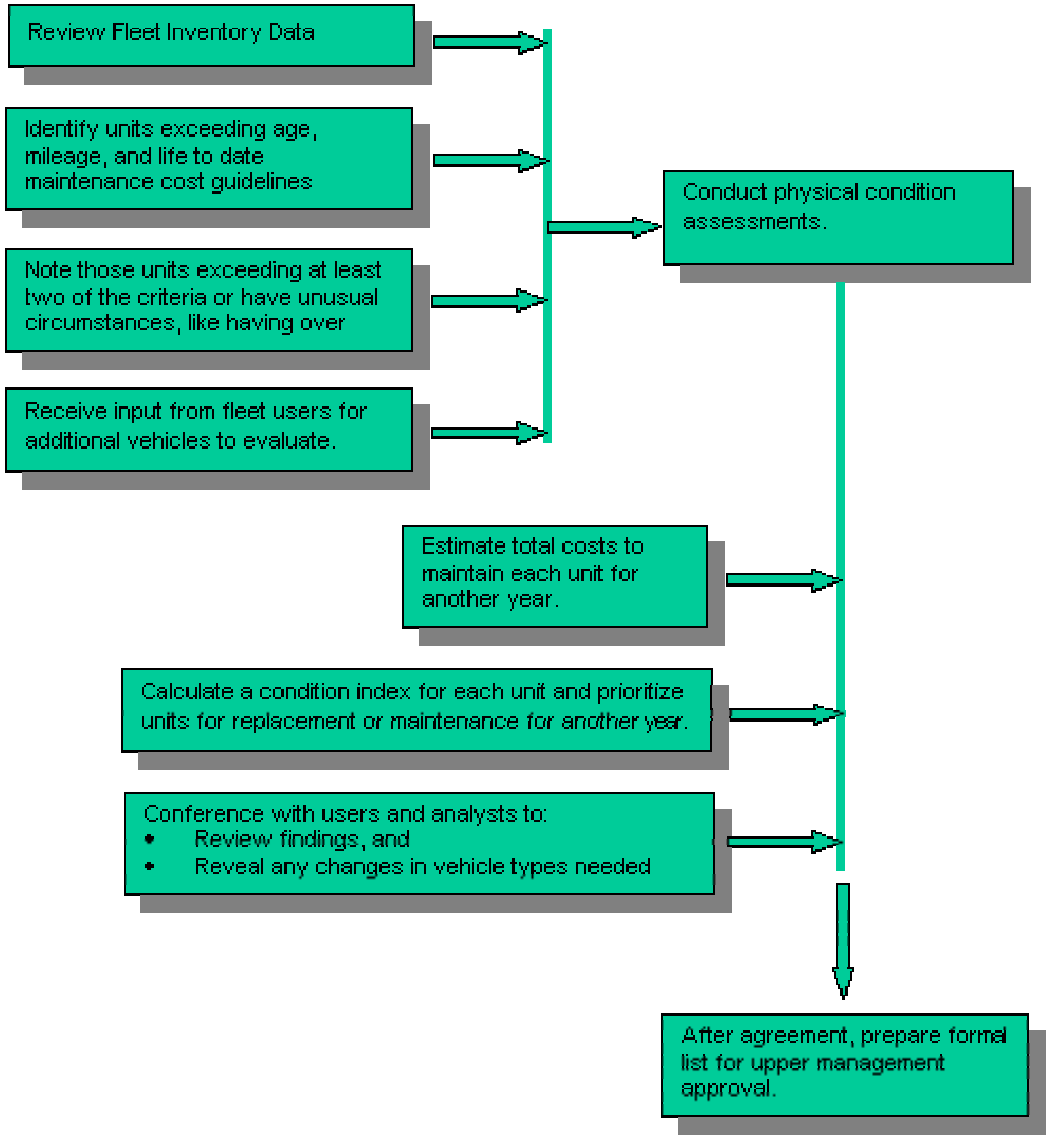
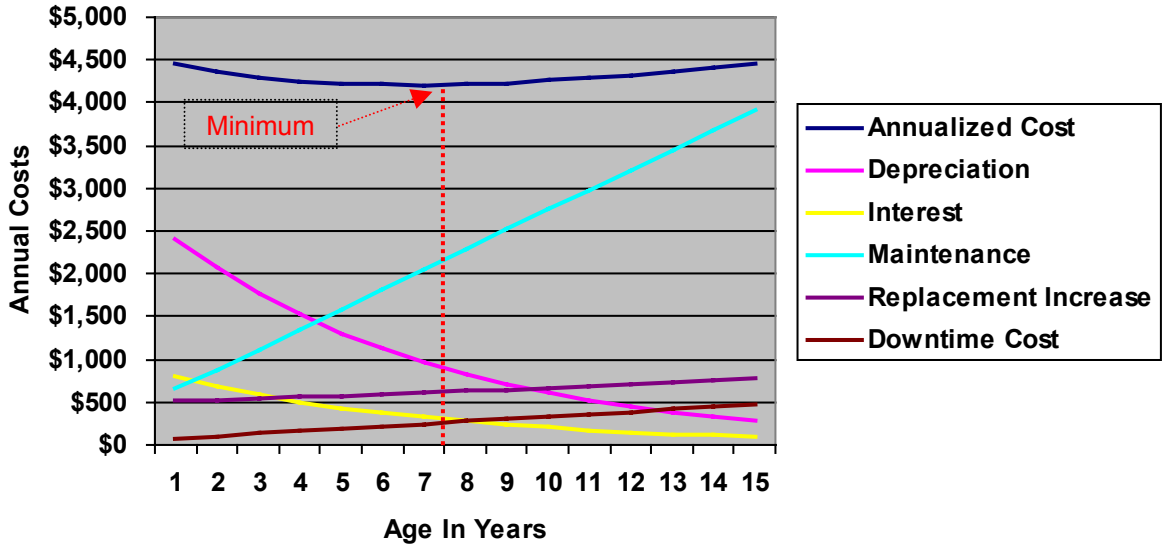


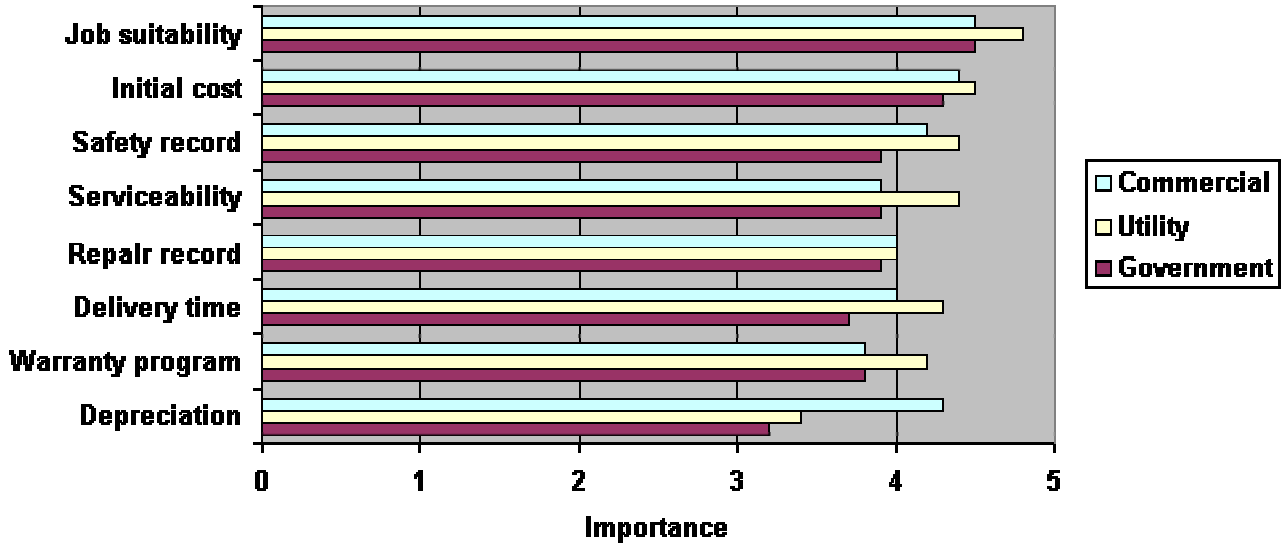
Chart 2 depicts the comprehensive decision-making process utilized by one fleet.

Exhibit 3: Sample Life Cycle Cost Analysis For Light Trucks



In the lifecycle cost analysis example in this chart, seven years was determined to be the life span that produces the lowest total cost.

Exhibit 4: Ranking of Vehicle Selection Factors
(Source NAFA: "2002 Model Year New Vehicle Acquisition Survey")



This chart shows that job suitability is the highest rated factor in acquiring vehicles for commercial, utility and government fleets.