



Equipment Rental & Revolving Fund

When Do I Replace It?

Guidance for Replacement Criteria

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ER&R Fund Replacement Criteria

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ER&R Fund Replacement Criteria

Background

A report on the general purposes and management of an Equipment Rental and Revolving Fund was completed May 2005, and is available on the CRAB web site, or by request. That report provides history, basic concepts and requirements for proper operation of an ER&R Fund. There remain however a number of more specific questions regarding the details of those operations. This brief document fills in one of those areas, when to replace a particular piece of equipment.

It seems as though there are as many methods to determine replacement as there are fleet managers. In practice however, the vast majority use something similar to what is outlined here. Managers should consider each of the elements, then design a system that matches their needs.

There are several items to consider in determining when to replace equipment. They can be read as independent, but ultimately all are dependent on the others. Read the entire document before you set up or revise your replacement criteria.

Replacement Basis

Annual Cash Needs Evaluation

The simplest method to begin to determine the replacements each year is to begin with an average fund balance requirement. Assume that the equipment fleet is valued at \$100 million, and across the entire fleet average life span is ten years. Obviously, the life span will typically be shorter for light duty, heavy use items, and longer for heavy duty, light use items. With that assumption however, the needed average annual funds will be \$10 million.

From this point, the determinations become somewhat more complex. Each class must be evaluated, and a balancing of replacement schedules and available cash (based on accumulated rental income) must be considered.

Annual Costs Evaluation

Fleet managers should evaluate their costs every year as they prepare the budget for the following year. Inflation, changes in fleet size, changes in equipment types, and even updated equipment can change each of the cost parameters, and all will affect not only the rates, but potentially the replacement schedule as well.

As a part of setting the rates, the replacement schedule must be evaluated. Adjustments may be necessary, allowing for either a longer or a shorter schedule on a particular class or piece of equipment. Elements to consider include:

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- *Fund balance*
If previous estimates and calculations are low, then there are automatic limitations built into the financial ability to meet the plan. That may be cause for adjustment in the equipment replaced as well as timing for some replacements.
- *Actual equipment condition*
If an equipment class has performed at a better or worse level than expected, then schedules may need adjustment for a longer or shorter life. Similarly, if a particular piece of equipment falls into the "lemon" category, or was significantly damaged in an accident, it may need major overhaul or replacement ahead of schedule.
- *Classes and levels of planned replacement*
If the anticipated fund balance changes substantially, and/or the reserve is less than anticipated, it may be necessary to adjust the replacement schedule.

For example, the plan is to replace eight ten-yard trucks, at \$150,000 each, for a subtotal of \$1,200,000; four graders at \$250,000, for a subtotal of \$1,000,000, and two loaders at \$225,000 for a subtotal of \$450,000. At the same time, the fund balance is \$250,000 short of the grand total required.

Trying to tackle the miscellaneous purchases for this much short fall will likely be unproductive. At the same time, in order to maintain fleet integrity and commonality of parts, it is undesirable to purchase less than the total number of each equipment type.

Let us assume that the loaders are marginal on the replacement assessment. It might be better then to delay the loaders by one year, and allow the reserve to rebuild after adjusting the rates. Of course, that would then affect the following year's plans as well.

Economic Life

Replacement of a piece of equipment is based on its "economic life". The concept is to replace the equipment when it becomes more expensive to operate than it would be to replace it. Life cycle costing and composite fleet classes are key elements in making this determination. The discussion on setting ER&R rates lays out the foundation for determining economic life. A number of cost elements must be included in that calculation. The ER&R Report covers this concept generally.

To recap, those elements include:

- *Replacement Costs*
 - *Capitalized cost of replacing with new*
- *Operational Costs*
 - *Fuel & Lubricants*
 - *Parts*
 - *Labor*
- *Overhead Costs*
 - *Administrative Costs*
 - *Shop Supplies & Small Tools*
 - *Buildings and Facilities*
- *Operational Life*
 - *Estimate of economic life*
 - *Adjust annually for operational experience*

Replacement, operational, and overhead costs are relatively easy to determine, provided accounting maintains appropriate breakouts. Determine replacement cost with a quick check with the several equipment dealers to determine current pricing of comparable equipment. Charge out operational costs to each piece of equipment as it is expended. Calculate overhead costs by determining the overall overhead costs of the total equipment fleet operation, and applying a percentage to the sum of the annual rates that will equal that cost.

Most problematic is the estimated operational life. Once a history is developed, that task is much easier, but until there is at least five to ten years experience with a particular class, it is educated guess work. That should be mitigated by discussions with other fleet operators to determine their experience. Calculate operational life for the entire class of equipment, not with individual equipment pieces.

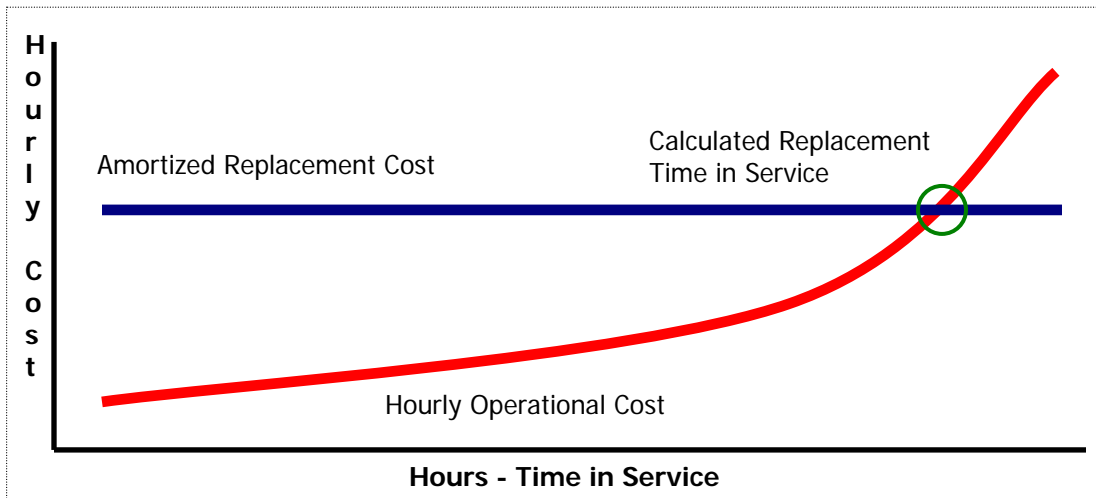
Replacement Time in Service

The time in service calculation, once these costs are captured, is a relatively simple function. Hourly (or mileage, depending on the measure appropriate to the equipment) replacement cost (purchase cost adjusted for inflation over the life of the equipment) is simply the total cost of replacement divided by the expected life of the equipment in hours. That cost will remain even throughout the life of the equipment.

As time in service increases and the equipment wears, periodic operational costs, including fuel, labor and parts, will rise. At some point, as major components wear, the parts and labor costs will rise steeply in comparison to earlier costs.

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When the hourly operational costs rise above the hourly replacement costs, it begins to cost more for every hour of operation to keep the equipment running than it does to replace it.



Replacement Cost vs. Operational Cost Chart

Equipment Condition Assessment

It is often difficult to make judgments on equipment condition with a high degree of certainty. By its nature and design, heavy equipment is built to last over time in high use tough conditions. Major component replacements may extend the life at an economic cost. Straight calculations with estimated life spans are weak in this situation. To aid in this assessment, the equipment manager may wish to use an assessment tool similar to the following.

Equipment Justification

First, each equipment user should be consulted to determine the ongoing viability of replacing the equipment in kind, or changing it in some manner. Again the example of the trucks. Six-yard dump trucks were the norm 25 years ago. As ten-yard trucks became more efficient, they began to replace the six-yard trucks so that today, most trucks are the larger ten-yard vehicles.

The same criteria that are used to determine if a vehicle should be in the fleet initially (see the ER&R Management Report) are reviewed to determine what the replacement vehicles should be. In most cases, the replacements will be quite similar to the previous vehicles in that needs and efficiencies typically change slowly.

Evaluation Survey

One tool that may be useful is a Vehicle Evaluation Survey. This survey may be quite formal (takes more time and effort to document), or may be informal. Most fleet managers use something like this evaluation, however the level of

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sophistication and documentation varies, generally with the size and complexity of the fleet.

This tool is typically the last one you use, after you've given consideration to the fund balance, the equipment condition, and the replacement vehicles.

By example, evaluation criteria could include 5 categories with scores of 1 to 5 including:

1. years of service,
2. mileage / hours,
3. service record,
4. utilization, and
5. overall vehicle condition.

Simply put, the highest scoring equipment gets replaced first. If an evaluation of this nature is formalized, it is suggested that the evaluation be accomplished by several different people do an evaluation, and the fleet manager arbitrate any discrepancies. The evaluators should represent both those who use the equipment daily and those who maintain it.