LD Bailey & Associates
Tangible Asset Management

Fleet Management – "A White Paper"

There are many people talking these days about fleet management, cost containment, cost reduction, and fleet sizing, but they tend to focus on only one or two aspects of the job. Frequently their attention is fixed on a specific area for which they have developed a controlling "system" or software application. In order to effectively manage an equipment fleet, a holistic view is required. This paper addresses the topic with that broader view to identify and describe some of the key issues involved.

There are at least **8 key issues** to consider when managing a fleet of tangible assets – **Application / Operating Environment** of the equipment, the **Inherent Useful Life** of the asset being managed, **Financing**, **Data Capture**, **Equipment Utilization**, **Maintenance Programs**, equipment **Damage / Operator Abuse**, and **Industry Volatility**. To illustrate these points, let's talk about material handling equipment (MHE) in a manufacturing and distribution environments.

Application / Operating Environment of the Equipment

This issue is usually pretty obvious to the manager of an equipment fleet and is frequently the focus of the manufacturer's sales effort. "Our unit can handle high lint situations better than the competition." "Our over-sized radiator…" "Our flammis is 10 times better than their floogie." You've heard the debate. However, there are situations that are not as obvious. Consider the situation where either an electric lift truck or an internal combustion (IC) unit will work. It's not just the sales price and the reliability of the unit that should be considered. For example, during the "energy crisis", electric units could have cost 10 times more for "fuel" (a battery is nothing more than a fuel cell) than a liquid propane unit. We had a client who recharged all of their electric units at the same time during each shift. It happened that their electric energy contract contained a clause that allowed the energy provider to set the rate for all energy based on the peak usage each day. Thousands of dollars were lost not because they chose electric lift trucks, but because they didn't consider the entire environment in which they were operating the fleet.

Case Study

Client:	Major Food Distributor
Fleet Size:	20 electric lift trucks in a single distribution center
Challenge:	The client had the habit of charging all units at the same time in the shift. The client's energy provider had inserted a clause allowing them to charge the peak usage rate to all Kilowatt-hours used. This increased rate resulted in an annual loss of $15,000 per year.
Solution:	Schedule recharging a various times throughout the shift.
Fees Charged:	**$1,600** for a one-day site audit
Net Savings:	Approximately **$15,000** in the first year

Inherent Useful Life

A common misconception is that "once an asset is purchased and fully depreciated, it costs nothing to own." As you may already know, there are actually two cost curves that must be considered when calculating the Useful Life of an asset – the Ownership cost, and the Maintenance Cost curve. Look at the chart in Fig 1.

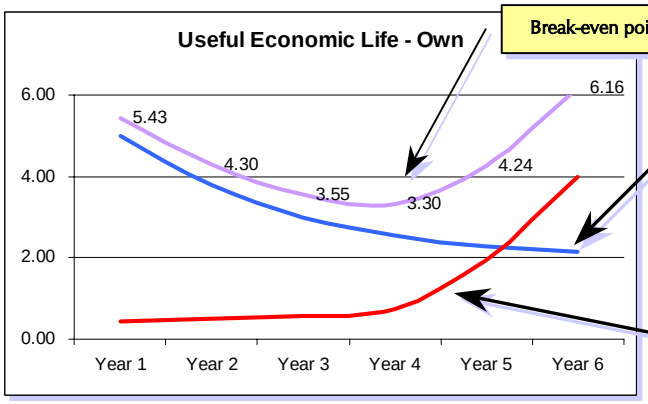

Fig 1 – Useful Economic Life

Sit-down, rider lift truck. 5,000 lbs capacity, LPG fuel in a warehouse distribution center.

	After	New Truck Cost	Residual or Trade-in value	Cost to Own	Total Hrs Operated		Cost to Own $/Hr
Cost of Ownership / Market Value Loss	Year 1	$ 25,000	16,000	$ 9,000	1,800	=	5.00
	Year 2	$ 25,000	12,000	$ 13,000	3,420	=	3.80
	Year 3	$ 25,000	10,000	$ 15,000	5,040	=	2.98
	Year 4	$ 25,000	8,000	$ 17,000	6,660	=	2.55
	Year 5	$ 25,000	6,000	$ 19,000	8,280	=	2.29
	Year 6	$ 25,000	4,000	$ 21,000	9,720	=	2.16

	After		Total Cost to Operate	Total Hrs Operated		Cost to Operate $/Hr	Total Cost $/Hr
Maintenance Cost After Purchase	Year 1		$ 774	1,800	=	0.43	5.43
	Year 2		$ 1,691	3,420	=	0.49	4.30
	Year 3		$ 2,916	5,040	=	0.58	3.55
	Year 4		$ 5,009	6,660	=	0.75	3.30
	Year 5		$ 16,130	8,280	=	1.95	4.24
	Year 6		$ 38,911	9,720	=	4.00	6.16

Fig 1a – Supporting Calculations

As you can see, there is a point where the diminishing cost of ownership is offset by the increasing cost of maintenance. It's the same principle at work when you trade in the family car because it's starting to cost too much for repairs.

Another consideration is the number of hours or miles the manufacturer will warrant or support. After requesting equipment quotes for a number of years and thousands of units, we've discovered that there is a practical limit for how long a manufacturer will take the risk in maintaining their equipment. It is our belief that manufacturers set a Useful Life limit of approximately 15,000 hours of operation for a typical fork truck (12,000 hours for a unit with a heavy-use attachment). If you try to retain approximately 20% of its value, that suggests a practical Useful Life of approximately 12,000 and 10,000 hours respectively. This also corresponds to the amount of life that a manufacturer's dealer will quote for a guaranteed maintenance contract. Typically the dealer will switch to time-and-material pricing after that point. Of course a mechanic's sole purpose in life is "to keep any machine running" so the mechanic's inability to get a unit back in service is too late to take appropriate action. When we see maintenance costs amounting to more than the price of a new unit in a two-year period, we ask, "why not acquire a new unit at an overall lower price instead?"

Case Study

Client: "Big Box" Home Repair Supplies Retailer

Fleet Size: 8 lift trucks with a variety of attachments per location, 11 representative locations

Challenge: The client had leased a number of units using an inappropriate lease term not knowing the Useful Economic Life of the units.

Solution: We recommended to the vendor that the lease terms be lengthened in order to help the client get the value out of their equipment and improving their relationship with the vendor.

Fees Charged: **$4,600** for an 18-hour analysis

Net Savings: Approximately **$264,000** over the remaining lease term

Financing

It is tough for the Treasury Department of a large corporation to keep up with all of the asset acquisition requests it receives. The IRS has set out specific guidelines for depreciating various assets and it has been a common practice to choose corresponding terms for leases. The problem with that approach is that by setting the term too short, you will not be able to get the value (Useful Life) out of the asset and by setting the term too long, the asset will be used up before it is returned to the Lessor. More on this in the Utilization section following.

Financing is not the simple "Lease vs. Buy" analysis performed by the typical asset manager. In fact, we have created a continuing education course on "The 7 Ways a Financial Institution Makes Money on a Lease". That's right – at least 7 ways to lose money in a lease. Let's look at just one way - the lease Interest Rate. The lease Interest Rate is one of the main elements on which the lessee focuses and it is frequently assumed that this is the way (maybe the only way) that the lessor makes their money. To be sure, it is the main profit generator for the lessor, but as long as the rate is competitive, it should not be the main focus of the lessee.

A new gimmick has been developed to deal with the rapidly changing financial markets - Rate Indexing. The goal of indexing is to tie the lease interest rate to the state of the financial markets at the time that the lease equipment schedule is closed. The "index" is usually an instrument like Treasury Notes as reported in a respected and easily accessible periodical like The Wall Street Journal. The language usually reads something like "for every rise or fall of 25 basis points of US Treasury Notes as reported in The Wall Street Journal for a period of 90 days following the lease acceptance / commencement date, your lease rate factor will rise or fall by 25 basis points." The catch in rate indexing is the phrase "for a period of 90 days following the lease acceptance / commencement date." The trick is to say "we will set the basis on today's rate (Treasuries)" which may be appealing to the financial manager since it is lower than the competition's rate. BUT the rate indexing language gives the lessor an additional 90 days (or more) to pick the highest index rate and therefore to set the highest possible Lease Rate Factor. If the schedule was open for 90 days and the language said "an additional 90 days", the lessor would have six months in which to find the highest rate. The initial rate is VERY attractive, but becomes non-competitive when it is finally set. By that time, the financial manager has usually moved on to more pressing matters.

There is an even harder-to-catch trick in indexing – the increase in rate is not always directly proportional to the rise and fall in basis points and it appears to be so infinitesimal as to be irrelevant. An increase of 0.05% (read that 0.0005) is actually the monthly adjustment rather than an annual adjustment. On a $1 M equipment schedule leased for 84 months that indexed increase would amount to around $22,000 the approximate value of a 5,000 lb lift truck.

Case Study

Client:	International Bathroom Fixture Manufacturer
Fleet Size:	97 tractor & straight truck units in three European locations
Challenge:	The client had leased a number of units not knowing that the vendor had capitalized the first two years of maintenance costs and set short lease terms.
Solution:	We renegotiated the leases cleaning up the overlooked details.
Fees Charged:	**$23,300** including European travel expenses for a project lasting approx. 4 months
Net Savings:	Approximately **$157,000** over the renegotiated lease term

Data Capture

Accurate fleet management data capture is so important that an entire industry has sprung up around the topic. Currently there are several hundred fleet data capture systems available commercially with countless proprietary in-house systems in use or in development as well. Process improvers have taken a quote from Tom Peters, author of *In Search of Excellence*, "If you don't measure it, you can't manage it" to the extreme that the measurement device has become the focus. It's interesting that in fact, the book was actually an attack on the numbers-based, scientific management approach prevalent in the 1980's. Nonetheless, not watching accurate numbers is like driving your automobile... with your eyes closed. Data capture systems must be appropriate for what you are trying to accomplish. They must track the kind of information that will help you make smart decisions about your equipment fleet.

And, it's not just the dollars and cents that need to be tracked. How about right-sizing your fleet based on "simultaneous use" information? We frequently run into fleet managers that have based their fleet size decisions on how many drivers are currently employed. The biggest cost in operating and maintaining material handling equipment is the operator's salary – not fuel, not parts, not capital investment. There are a number of economically priced, on-board "black box" systems available that provide the bigger picture data.

Besides the capture technology, you must consider the "unseen" costs. For example, consider a company with its own staff of mechanics. It's tempting to report only the cost of the actual hours spent on a specific piece of equipment. The "unseen" cost is the overhead of the shop space, parts inventory, and specialized equipment (presses, racking, fluid recovery systems, etc.) needed to perform the maintenance service. In fact, it is common for the company to report only the special parts cost (not the belts and hoses from inventory) for each unit. Unfortunately, that approach provides a very inaccurate view of the maintenance cost for each piece of equipment and clouds the "keep or replace" decision.

Case Study

Client:	Corrugated Box Manufacturer
Fleet Size:	249 forklifts with a variety of attachments in 15 locations nationwide
Challenge:	Data was presented showing a total of $1.2 M in maintenance costs for the year.
Solution:	We reviewed thousands of invoices and found that on average, 18% of maintenance costs were recorded as Miscellaneous Expense. While the actual total dollars were recorded, they were attributed to a specific unit for accurate analysis.
Fees Charged:	**$23,000** for a 4-month analysis project
Net Savings:	Over **$200,000** in "lost" cost was identified and systems were improved to accurately capture the data for future evaluation.

Equipment Utilization

To the user of the asset (Lessee or owner), proper utilization is crucial to "getting the value" out of the asset. Under lease conditions, the Lessee has a limited amount of time to get the value out of the asset. Think of it like squeezing toothpaste out of a tube with a time limit. In the case of owned assets, "getting the value" is less crucial since there is no time limit.

To put this into perspective, a 5,000 lb lift truck in the typical working environment (this varies by industry, environment, etc.) has a Useful Economic Life of approximately 12,000 hours of operation. Using **173** hours per month (one shift, 5 days a week) the equipment would have a Useful Economic Life of **69.4 months**. In order to get the optimum value from the lift truck under a lease, the Lessee would need to set the lease term for say 70 months and use it 100% of the available time to use up the Useful Economic Life. This isn't practical since no truck ever runs 100% of the time. It will lose at least 60 hours (60 PM's x 1 hour) or more over its life to normal service (forget about damage repair). The operator will take breaks totaling at least 758 hours (2 breaks x 15 minutes x 5 days x 52 weeks / 12 months / 60 minutes x 70 months). And so on…

Utilization is VERY IMPORTANT to the manager of the asset. However, setting utilization targets is not a "herd management" decision. Consider the fleet at an international airport. The fueling trucks would be in use something close to 6,500 hours a year while the fire trucks might be fully utilized at less than 100 hours a year. Another example might be a manufacturing facility that has a fleet of identical forklifts, but one is located down the street at a storage warehouse and is used only half the time of the others. It would be cost-prohibitive to rotate that unit through the other positions to balance its use. So, a different usage target would be set for that unit.

Case Study

Client:	Paper Manufacturer
Fleet Size:	100 forklifts with a variety of attachments in one plant
Challenge:	The plant manager leased a fleet of 53 new units and insisted on a short lease term due to heavy utilization.
Solution:	We installed "black box" telemetry and found that the maximum simultaneous use on any day of a thirty-day period was 29 of the 53. We also found that the short lease term would result in a loss of value of approximately 40%. We recommended that the leased fleet be purchased at the end of the lease in order to capture the lost Useful Life value.
Fees Charged:	**$19,000** for a 130-hour fleet data collection and analysis project
Net Savings:	Approximately **$425,000** in "lost" Useful Life

Maintenance Programs

Optimally, maintenance costs should only include preventative maintenance and normally expected wear-and-tear. Many Fleet Managers negotiate service contracts that typically exclude "consumables" like tires and seats and which adjust for abusive environments (heavy lifts, gritty air, etc.) or abusive work schedules. When accounting for maintenance costs though, most operators / owners / lessees lump all repair into the same maintenance cost total. Generally, controllable damage is the item that blows the maintenance cost budget, but the other budget-buster is operating equipment beyond its Useful Economic Life.

Our stance is "the older the equipment, the more it costs to operate it." We frequently show the "hockey stick" curve (below) of costs over the life of MHE equipment. Many maintenance cost estimating formulas graph as a straight line increasing at some set percentage each year. Our experience suggests the hockey stick is closer to reality. See **Fig. 2**.

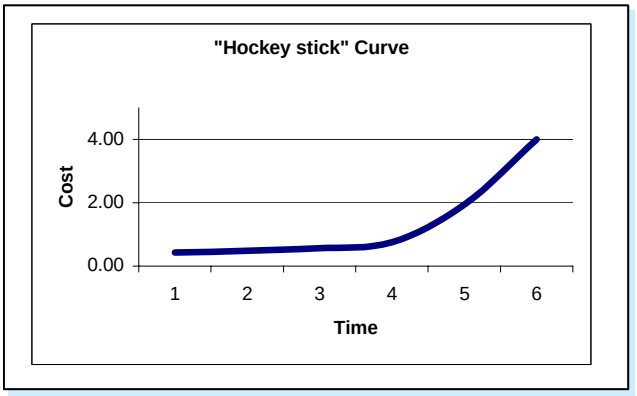

Fig. 2 – The Realistic Cost Curve

With an understanding of a unit's Useful Economic Life, its operating environment, and Target Utilization, it is possible to negotiate a cost-effective maintenance contract. Still, careful attention must be paid to the details. Frequently we find bid processes in progress that combine too many details into a single price. We have found that most MHE equipment manufactures are willing to take a very slim profit margin on the sale of equipment because they more than make up the difference on the "rolling vending machine" when they charge upwards of 40% mark-up for parts and service.

Case Study

Client:	Corrugated Box Manufacturer
Fleet Size:	227 forklifts with a variety of attachments in 18 locations
Challenge:	We were required to "right-size" the fleet and negotiate for replacement units.
Solution:	We handled the RFQ that covered at least 3 – 5 different configurations, 3 or 4 dealers and at least 3 different lease terms in each location. That resulted in approximately 1,500 different quotes.
Fees Charged:	**$35,900** for a 90-day fleet RFQ project
Net Savings:	**Fleet Reduction** from **227** to **166** units, **Cost Avoidance** ("savings") over 5 years approximately **$478,060**, and Capital Recovery of approximately **$244,000** for a total value of approximately **$722,060**

Damage / Operator Abuse

Damage / Operator Abuse is frequently the budget-buster of equipment fleets. The bigger problem is that equipment damage only represents between 5 and 10% of the total cost of operator accidents and abuse. Property, Plant and Product (inventory) suffer impact damage too. Those costs get hidden away in other cost categories like "plant upkeep", "inventory spoilage", "insurance expense", etc. **The facts are that damage is nearly 100% controllable**. Accidents are "unexpected and undesirable events" and are not what we're talking about. It's the damage caused by lazy operators or poorly implemented safety guidelines that will wipe out the budget.

Frequently damage is not recorded separately. **Fig. 3** shows the false readings that the fleet manager can get when damage and abuse is not recorded properly. The graph illustrates two lines - the red line shows maintenance AND damage, the blue line shows maintenance only.

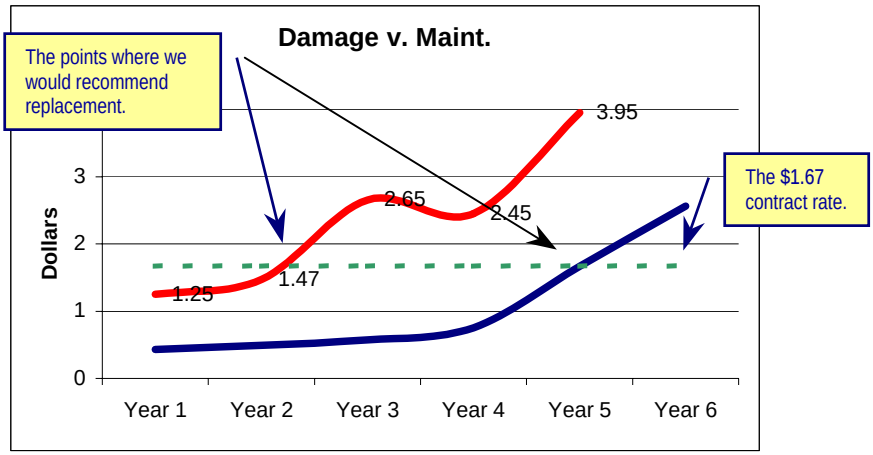

Fig. 3 – False Indicators

The manufacturer will contract for maintenance services for the first 12,000 hours at a rate of $1.67 per hour. We would normally try to replace the unit at the point in time when the maintenance cost exceeds the contract rate. Therefore, if we could not determine that the costs were actually damage, we might replace this unit three years early.

Case Study

Client:	Manufacturing Plant
Fleet Size:	54 forklifts in one plant
Challenge:	Equipment utilization was low yet maintenance costs appeared relatively high.
Solution:	We audited repair invoices and found that approximately 53% of all reported costs were for damage or operator abuse.
Fees Charged:	**$9,700** for a 43-hour invoice audit project
Net Savings:	We identified an average of **$309,000** in annual damage / abuse costs (for each of 4 years) and recommended an operator incentive program to reduce that "controllable" cost

Industry Volatility

Finally, industry volatility can have a dramatic impact on fleet management. Frequently the fleet manager will insist on having all of the units he will need (maximum number for the peak period or season) on hand. Depending on the situation and length of peak times or seasons, this can seriously diminish fleet utilization. Seasonal peaks should be handled with rental equipment OR lease contracts should be modified to correlate to a much longer Useful Life term.

Sometimes the volatility issue manifests itself as a calculation of the impact of downtime. For example, we have a manufacturing customer that loses $100,000 for each hour that the production line is down. There is a special purpose lift truck that takes finished product off the line and if that truck goes down, the line stops. It then takes a day to get the line back up to production speed. Others use a forklift to fill in a gap in a conveyor system. On several occasions, we have recommended that our client purchase a piece of custom-fit conveyor system rather than using a resource that was not really built for that purpose. Here's what happens with an under-used asset (see **Fig. 4** below) on lease.

A lease payment is a fixed cost. In this example, the target use is 208 hours per month and the lease payment is $196.60 per month. Graphing this data shows that the lower the use, the higher the cost per hour goes. On the other hand, at some point, the return for over-use diminishes to an immaterial amount.

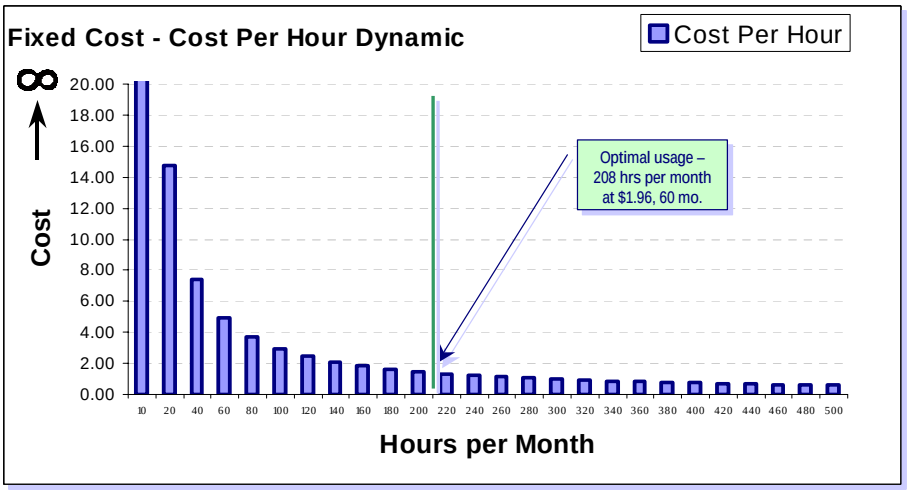

Fig. 4 – Asset Under-use Dynamics

Case Study

Client:	Major Mid-West Food Distributor
Fleet Size:	417 forklifts in 96 locations
Challenge:	Through acquisition a major food distributor accumulated hundreds of lift trucks and pallet jacks. The problem was deciding on how many and which ones to keep.
Solution:	We analyzed the fleet and utilization data to recommend the correct fleet size of **187 units**.
Fees Charged:	**$5,800** for a 41-hour fleet analysis project
Net Savings:	Approximately **$3.98 M** in total savings over the life of the leases.

Pulling it All Together

As you may have noticed, we use several concepts in each area – Utilization, Useful Economic Life, Lease Term and so on. It's difficult to completely separate these concepts and those systems and technologies that claim massive savings by focusing on the data capture and reporting area alone are missing the point. Fleet management is a holistic effort. Sure, the purchasing department could beat the vendor out of another percent or two on the purchase price, or keep a consigned inventory of replacement parts, or find the best interest rate for a financed purchase or lease, but so much more is gained when the **RIGHT NUMBER OF UNITS** is kept for the **RIGHT AMOUNT OF TIME**. Certainly there are tricks to negotiating financing and for managing Requests for Quotation for equipment along with some basic rules-of-thumb for Useful Economic Life, but the bottom line for fleet management is putting all the pieces together.

Case Study

Client:	$500 M Paper Products Manufacturer
Fleet Size:	356 forklifts with a variety of attachments in 19 locations
Challenge:	We were required to "right-size" the fleet and negotiate for replacement units.
Solution:	We analyzed over 4 years worth of data, visited all locations, managed 2 Request For Quotes efforts to cover the fleet, analyzed simultaneous use, reviewed thousands of invoices, wrote Standard Operating Procedures, and wrote the Purchasing Bible for lift trucks.
Fees Charged:	**$87,000** for a 12-month fleet analysis
Net Savings:	**Fleet Reduction** from **356** to **220** units, **Cost Avoidance** ("savings") over 5 years approximately **$1.06 M**, and Capital Recovery of approximately **$475,000** for a total value of approximately **$1.53 M**