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FLEET MANAGEMENT - THE MANUAL AND THE PROCESS

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FLEET MANAGEMENT - THE MANUAL AND THE PROCESS

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This paper highlights the six most critical measurement tools that need to be addressed and regularly analysed to comply with Vehicle and Plant Management best practice.

(1) Utilisation
(2) Optimum replacement points
(3) Whole of life costs
(4) Downtime costs
(5) Maintenance Failure records
(6) Flat rate repair times

The issues discussed are sometimes not well understood and even ignored by some fleet managers but correctly controlled these measurement tools will improve the efficiency of the business of plant and vehicle management and can result in significant savings. At the same time operational business units will benefit from reduced down time and lower repair costs.

The provision of plant & vehicle management services within public works requires managers to operate substantial and varied fleets of both vehicles and plant. Therefore the manager will require broad experience and probably more so than in any other industry.

The principles discussed in this paper can be applied to a broad range of plant and vehicles alike and are not restricted to any particular elements.

(1) Utilisation

Utilisation refers to the annual usage of a particular item of fleet and is generally measured in terms of either kilometres travelled or engine hours.

Base utilisation data is the level of utilisation set to generally justify ownership of any item of fleet. In order to gather base utilisation data a Microsoft XL or Lotus 123 spreadsheet is required and the following steps are recommended:

1. Record - Item, plant number, description, purchase date, current odometer or hour meter reading, date of the odometer reading, and last 12 months timesheet hours.

2. Calculate the actual annual utilisation based on
Current mileage / (current date – purchase date in days) * 365
3. Compare the actual utilisation with the recorded timesheet hours to identify any anomalies.
4. Establish the ratio between plant timesheet hours and actual utilisation. The ratio should be constant and can be used for determining changes in activity. For example:- where the timesheet hours allocated to a vehicle increase without a corresponding increase in the kilometres of the same vehicle, the operator needs to explain the change in activity.

Some internal management structures particularly business unit structures, make it very difficult to review the activity based timesheet hours. Managers of business units need to develop a suitable cross reference to review work crew activity along with the vehicle/plant activity.

The results of this survey will establish baseline utilisation for each item of fleet against which future performance can be measured.

Low utilisation results in high depreciation costs and low productivity. Good fleet management requires high utilisation.

Low utilisation needs to be investigated as it may reach the point where it becomes less than economical to own the vehicle or plant item. This decision is very dependent on geographic location, and access to hire plant and fleet. As a guide for most urban councils the following would be considered low utilisation and requiring investigation: -

Loader – <700 engine hours
Skid steer loader – <500 engine hours
Ride on front deck mower – <500 engine hours
Parks truck – <10,000km
Works truck – <25,000km
Rubbish collection – <1300hrs

i.e. number of hours/km utilisation must be investigated, and analysed to determine if the cost of continued ownership can be justified and the item provided through hire. The decision to own or hire will be influenced by issues such as:

Is the item essential to provide a service?
Is a suitable dry hire machine available for short-term hire?
Are contractors able to provide the service at a competitive cost?
Is there an opportunity to increase the utilisation through smarter management?

Knowledge of actual utilisation in kilometres or engine hours (levels and usage patterns) enables the fleet manager to:

- Service vehicles based on manufacturers recommended service intervals (programmed maintenance)
- Track actual use versus timesheet allocations to optimise operational requirements

- Develop a floating replacement program to reduce costs in periods of lower activity, and change our plant at the optimum replacement point.
- Develop accurate budget forecasts by using actual utilisation in their whole of life costing.

(2) Optimum Replacement Points

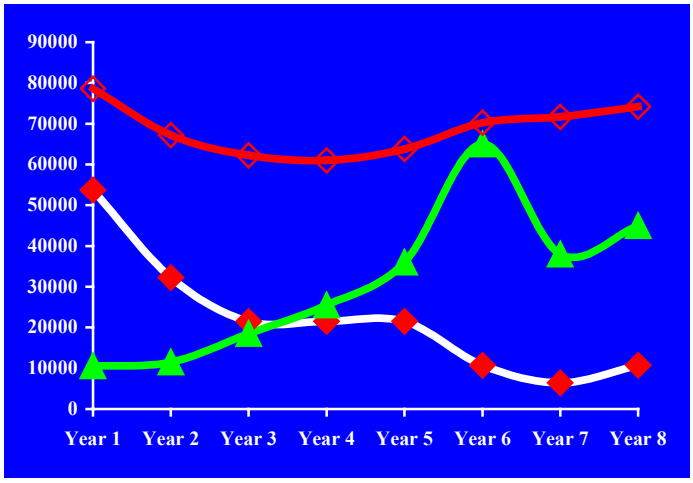
Optimum replacement points are calculated to best estimate the optimum timing in both kilometres (or engine hours) and time to achieve the lowest average annual cost.

In order to correctly manage optimum replacement data the following information is required:-

Purchase price of the equipment
Projected resale values over the next 10 years
Projected finance costs over the next 10 years
Projected repairs and maintenance costs over the next 10 years
Current operational downtime costs for your plant (these must include displaced operators and other works held up, standing costs for the plant item concerned)

The optimum replacement point in the life of the plant item can be depicted graphically when the decreasing line of deprecation intersects with the increasing cost of repairs and maintenance costs.

Actual depreciation figures will show two distinct steep drops in depreciation. The first significant drop is immediately post purchase. The second depreciation drop is prior a major component overhaul where second hand buyers are aware of a large impending maintenance bill.



In this example year five sees a substantial drop in value entering year six and a corresponding increase in maintenance at the same time. The net result is optimum replacements is year 4

By calculating the ideal optimum replacement points for equipment the fleet manager is achieving the lowest cost alternative available during the life of the machine. For example many managers are currently changing their car fleet at 9 months and 15000km for $2363 thinking they are achieving an excellent result. However if the vehicle is held to 60,000 or 3 years from the author's experience the change over is

very rarely more than $9000 - a saving of $454 in direct costs let alone the cost of staff down time and administration for the frequent change over of vehicles.

(3) Whole of Life Costs

Having established the optimum point at which to replace the vehicle/equipment the next management tool is knowing whole of life costs.

Whole of life costs include:

Straight line annual depreciation, to an anticipated residual.
Finance or opportunity costs
Operating costs, tyres, fuel, repairs and maintenance.
Fixed costs, overhead recovery, insurance, wages, licence.

For more complex calculations productivity on payload with trucks can be included. For example if a breakdown of whole of life cost is required down to a cost per bin for a rubbish truck all that is needed is to include the number of bins collected (load capacity) per trip and the number of trips expected to be made per day.

Whole of life costs will reflect how much of the equipment's annual costs will be based on annual utilisation and an optimum replacement point that has already been established. The annual costs calculated will provide a projected (budget) annual cost for the life of the equipment.

MAKE:	Grader	VARIABLE COSTS:	CENTS P.HR	$$$$ PER ANNUM	%
USE:	Road Maintenance				
MODEL .(WHEELBASE mm):	Grader	Operational-Depreciation:	0.00	0.00	0.00
LOAD CAPACITY:	1.00	Fuel:	1,600.00	16,000.00	22.49
UTILIZATION IN % :	1.00	Oil:	0.80	8.00	0.01
SERVICE DAYS P.YEAR:	260.00	Tyres:	400.00	4,000.00	5.62
TRIPS PER DAY:	1.00	Repair & Maintenance:	989.00	9,890.00	13.90
ANNUAL WORKING HOURS:	1,000.00	TOTAL VARIABLE COST:	2,989.80	29,898.00	42.03
NO.YEARS IN USE:	8.00				
PURCHASE PRICE VEHICLE:	266,000.00	FIXED COSTS:			
PURCHASE PRICE TYRES:	7,200.00				
TYRE LIFE IN HR:	1,800.00	Time-Deprecition:	———	23,940.00	33.66
FUEL CONS LTR./100 HRs:	1,600.00	Notional Interest:	———	17,290.00	24.31
FUEL PRICE CENTS/LTR:	100.00	Rego & Insurance:	———		0.00
OIL CONS LTR./1000 HRs:	2.00				
OIL PRICE CENTS/LTR:	400.00	T O T A L S :	p.Serv.Day		
M & R PER YEAR:	9,890.00				
REGO & INS. PER YEAR:		Variable Costs:	114.99	29,898.00	42.03
PERSONNEL COST P. YEAR:		Personnel Costs:	0.00		0.00
NOTIONAL INTEREST:	6.50%	Administraion Costs:	0.00	0.00	0.00
DEPRECIATION-OPERATIONAL	0.00%	Total Fixed Costs:	158.58	41,230.00	57.97
-TIME:	72.00%	TOTAL COSTS:	273.57	71,128.00	100.00
ADMINISTRATION COST:					
		Total HRs p. Year:	1,000.00	Qty.carried p. Year:	260.00
		HRs p. Service Day:	3.85	Qty. carried p. Day:	1.00
		HRs p. Trip:	3.85	Qty.carried p. Trip:	1.00
Employee Timesheet Hours:	1,400				

A simple spreadsheet (as above) can be used to develop whole of life costs and provide an estimate of the total annual cost of an item of plant.

By dividing annual cost by the operational timesheet hours used to recover the cost of operating plant, internal charge out rates can be determined. These rates when applied will provide the appropriate recovery of costs to a plant replacement reserve to fund plant replacement at the optimum time.

From knowing whole of life costs the fleet manager can provide:

- Annual maintenance budget
- Annual replacement provision

- Annual operational costs
- Internal recharge rates

(4) Downtime Costs

This is often called the hidden cost of fleet management. In many cases downtime costs are substantial and owner/operators need to be aware of how machine downtime can affect their productivity.

Downtime costs have two major components:-

1. Hire of a replacement machine. This also incorporates the cost of holding additional machines in order to compensate for the mechanical downtime on other machines. Dry hire of an externally supplied machine may involve on-site and off-site charges and these to need to be incorporated into the hire charges. Including the cost of providing an alternative machine to carry out the service within the optimum replacement calculation will ensure the real cost of downtime is captured.

2. Fixed costs related to the loss of an operational machine on a specific task. The fixed costs of a machine are the costs incurred irrespective of ownership. These include licence, insurance, finance costs, and depreciation. In addition to the fixed costs related to the plant one needs to establish a cost related to the operator's downtime, subject to whether or not the operator is allocated another chargeable job while his machine is down. If the task allocated is menial there is a net loss of productivity which costs money. Rearranging tasks for crews due to plant downtime also costs management time in addition to employees with travel to and from equipment breakdowns. All these items need to be assessed and allocated as a fixed cost associated with downtime for every item of plant and fleet.

By continually monitoring and recording downtime and its cause the fleet manager will establish a reasonable cost associated with that downtime. Once the cost of downtime is accurately established preventative maintenance planning, operator training and optimum replacement of plant can be accurately calculated to obtain the lowest operational cost.

(5) Maintenance Failure Records

Maintenance failure records are critical to the efficient management of fleet and plant.

Operational managers have a tendency to be accepting of failures on plant and vehicles as part of their business operations. However considering the cost of failures through downtime and repair costs they should investigate and record the reason for all failures.

Being aware of the cause of the failures will enable the operational manager to become proactive in his approach to staff training, and correct equipment application. By improving these areas he will reduce his costs and make the equipment available for use more often.

Vehicle and plant managers also need to record the failures of plant & fleet and allocate the cost of these failures to each category. Categories include failure due to:-

1. Lack of daily maintenance, no greasing, no daily checks carried out or tyre damage caused by incorrect tyre pressure.
2. The age of the machine
3. The operational requirement of the machine. An example of this is where a skid steer loader is used to remove kerb without an excavator/backhoe loosening the kerb prior to removal. This will normally cause premature failure of the drive components.
4. Design fault. This normally appears during the warranty period.
5. Operator inattention or experience on the machine.

By recording the cost of these failures managers will be able to action planned maintenance, training, or simply procedures to reduce the impact on operations of these failures.

(6) Flat Rate Repair Times

Flat rate repair times refer to an adopted industry standard for the expected repair time for a maintenance task. The term is applied by the vehicle repair industry to every task undertaken in the repair and maintenance of machinery.

Many mechanics do not appreciate being asked to work to flat rate times. Their argument including that the rates are set on new machinery, often without bodies or protection guards fitted and that manufacturers establish the labour flat rates, for a workshop fully equipped with special tools to undertake the task required.

Despite all the negatives established by repair staff, maintenance flat rates are an excellent benchmark for the establishment of labour flat rates.

Experience has shown that without flat rates and audit procedures to control repair labour, fleet managers are likely to find maintenance costs are excessive.

All service books supplied by manufacturers normally have flat rates supplied for every service. Automobile associations also normally have excellent guidelines of flat rate establishment.

Conclusion

Through proactive management of plant and vehicles, fleet managers can substantially lower the cost fleet and plant operations. The six basic measurement tools presented in this paper can be easily established and without sophisticated software. However they do need to be managed on a daily basis to ensure costs are kept to a minimum.

Good fleet management is about high utilisation, optimum replacement, and accurate whole of life costs, minimum downtime, proactive failure management, and adherence to labour flat rates by service and repair providers.

Managers can use these simple measurement tools to both reduce costs and optimise operational availability of plant, vehicles and equipment.