

VEHICLE COSTING IN A TRUCKING COMPANY

L.E. BROWNE

ABSTRACT: *A common view of trucking company operators is that prices are quoted and vehicles operated by a series of "seat of the pants" decisions with an annual review of profitability by an outside accountant employed to minimise the amount of income tax to be paid. Unfortunately, this is true of many operators, but increasingly the larger trucking companies recognise the need to maintain accurate cost records if they hope to enjoy long-term viability. This paper outlines the costing systems used by the Transport Group within B.M.I. and endeavours to explain both the reasons for the adoption of each system and the use made of the data which is produced.*

VEHICLE COSTING IN A TRUCKING COMPANY

Both within Australia and overseas the trucking industry is generally regarded as being made up of a multitude of small businesses each with little or no knowledge of day to day running costs. Popular opinion regards the "truckie" as either a short term candidate for bankruptcy or an economic rapist making a vast fortune. That these two extremes are incompatible doesn't appear to be generally recognised.

From my contact with other trucking company managers I can assure you of the following unfortunate realities of my industry:

1. Some truck operators are short term candidates for bankruptcy.
2. Because some operators will accept prices which establish them as candidates for insolvency there are no trucking operators making vast fortunes.

The economic fact of life for a vehicle operator is that there are substantial and unavoidable costs associated with running a fleet of vehicles. It is true that there are many operators who enter the industry without adequate knowledge of the cost of running vehicles. Some newcomers to the industry make the mistake of assuming that having paid for their registration and insurance, their fuel and a grease and oil change, the cash they have remaining is profit. These people quickly learn the facts of life:

1. Customers might not pay for 4/5 weeks but the insurance company, the petrol company and employee drivers expect to be paid much more quickly.

L.E. Browne

2. The new tyres wear out and have to be replaced - this could take 3 months and involve anything from \$1,000 to \$2,500.
3. Department of Motor Transport inspectors make enquiries about payment of road maintenance taxes, anything up to 6¢ per kilometre run by each vehicle - this might take 6 to 8 weeks to become evident.
4. Parts start to wear out on the vehicle, the expense involved could range from a few cents for a globe to thousands of dollars for a motor. Although the actual expense is incurred only after a breakdown the wearing out process begins the minute the wheels first turn.

Later on, if he is still in business, the owner finds his vehicle requires replacement. If he has consistently regarded his cash surplus as profit and used these funds to drive impressive private vehicles, to live in a big house or to take overseas holidays, he finds he has an old vehicle and no money for replacement. Even if he has listened to his accountant, who was probably employed primarily to ensure that income tax was as low as possible, and has taken account of depreciation; i.e., the decline in value of vehicle with increased age or utilisation, he is still in for a shock. At a rate of inflation of 10% p.a., (somewhat lower than both recent and projected experience) he would find that the vehicle which may have cost \$25,000 four to five years before will require expenditure of \$36,600 at the level of prices applying.

If he has lasted this long he might suddenly come to the conclusion that maybe he has not been making any money

VEHICLE COSTING IN A TRUCKING COMPANY

at all! He asks for a rate increase and loses the contract to another newcomer - a super optimist, another short term candidate for bankruptcy. His reaction will be one of: "These newcomers do not know their costs." "How can I compete with them?" He'll go broke" "What we need is control over unqualified people." Each of these comments has been made many times.

My company began operating vehicles in 1952 and still does so. The reason for our comparatively long life is that from its inception our truck running operation has been conscious of the need to assess all costs and to accept work only when expected earnings will cover expected costs and provide a surplus sufficient to meet corporate profit guidelines. The operation was initially established by an experienced executive with an accounting background and had relatively few trucks. Each month profit statements were prepared on an historical cost basis according to standard accounting practice.

The operation has grown and now covers eleven truck depots spread throughout New South Wales and includes specialised tipping trucks, fuel tankers, bitumen tankers, pneumatic powder tankers, used for fly ash, possoment, cement, stock food, catalyst powder, flour, etc., as well as a number of general freight flat top semi-trailers. Each of these operations perform a substantially different task with different operating conditions and because of the spread of activities often experience different prices for raw materials.

This means that for each operation cost structures may differ and while a monthly profit or loss statement for the whole operation is required for Board reporting purposes, such a document represents an averaging of a range of different performances and has only limited use for identifying problem

L.E. Browne

areas and seeking solutions.

To manage a transport operation I believe that a whole range of financial and operating data is required. We all know that profit emerges as the difference between revenue and costs. Our Management structure has been established so that each operations manager and each depot supervisor reporting to an operations manager has a defined area of revenue and cost responsibilities.

As much of our cartage income is earned from haulage of company produced products for which sales are made on a delivered basis, most of our operating managers or supervisors concerned with company product haulage makes his greatest contribution to profitability through close attention to cost control.

B.M.I. VEHICLE COSTING SYSTEMS

Cost data is compiled in a number of ways and for different purposes. We believe that the systems we have adopted, while not perfect, highlight the necessity of cost identification and control and direct attention to the areas of cost which are either under the direct control of the executive concerned or which must be accepted by him as a fact of life to be used in determination of appropriate cartage rates.

The following systems are employed:

1. Daily, weekly and monthly estimates of depot operating costs;
2. Monthly management accounts for each depot, each separate section and the division as a whole;

VEHICLE COSTING IN A TRUCKING COMPANY

3. Individual truck costs;
4. Ad hoc job costing.

Daily, Weekly and Monthly Estimates

On a daily, weekly and then monthly basis the depot manager prepares estimates of his costs from his knowledge of hours worked, fuel and tyres issued, repair work performed, kilometres run (for road tax) and the fixed costs of his depot and vehicles. These estimates are prepared to a set format (see Table 1, 2 and 3) and normally achieve in excess of 95% accuracy. This estimating procedure serves three basic functions:

1. The depot supervisor is forced to become conscious of his costs and can take early corrective action.
2. The Operation Manager has up to date information to make control decisions.
3. The sum of each depot's estimates improves divisional control by directing attention to potential problem areas well in advance of final accounting data; i.e., response time is much faster than if nothing is done until the 99% accurate accounting data is available.

Targets are determined by the manager using his overall budget as a reference point. Estimates on a daily basis are based on recent experience while weekly and monthly estimates take into account invoices known to have been received and costs known to have been incurred (e.g., maintenance) but not yet invoiced. In each case the paper work prepared for the individual truck costing system provides basic data

TABLE 1

DAILY OPERATIONS SUMMARY

FORM "A"

| | |
|---------------------------------|---|
| 1) _____ (Operating Company) | 2) _____ (day) (date) |
| 3) _____ (Depot) | |
| 4) _____ (Fleet Strength) | 5) _____ (Actual) |
| 6) _____ (No. of Drivers) | 7) _____ (Actual) |
| 8) _____ (No. of Mechanics) | 9) _____ (Actual) |
| 10) _____ (Other Employees) | 11) _____ (Actual) |
| 12) _____ (Paid Kilometres) | 13) _____ (Speedometer Kilometres) |

| 14) INCOME: a) Target b) Actual c) Variance | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">TOTAL</th> <th style="width: 50%;">PER TRUCK</th> </tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table> | TOTAL | PER TRUCK | | | | | | |
|--|--|-------|-----------|--|--|--|--|--|--|
| TOTAL | PER TRUCK | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| | | | | | | | | |
|--------------|----------------------------|--|--|--|--|--|--|--|
| 15) \$ _____ | (Cumulative Actual Income) | | | | | | | |
|--------------|----------------------------|--|--|--|--|--|--|--|

| | | | | | |
|------------------------|----------------------|------------|---------------------|----------------|----------|
| 16) COSTS: | i) Labour | CUMULATIVE | ORDINARY TIME HOURS | OVERTIME HOURS | TOTAL \$ |
| | a) Drivers' Labour | Ord. | 1½ | 2 | \$ |
| | b) Mechanics' Labour | | | | |
| | c) Other Labour | | | | |
| Total Labour: \$ _____ | | | | | |

| | | | |
|--------------------|------------------------------------|------------------------|----|
| ii) Parts, etc. | a) Standard Fuel _____ gallons @ | Cumulative Parts, etc. | \$ |
| | b) Distillate Fuel _____ gallons @ | | |
| | c) Oils _____ pints/gallons @ | | |
| | d) Parts | | |
| | e) Tyres | | |
| | f) Road Tax | | |
| | g) Other | | |
| Total Parts, etc.. | | \$ | |
| Total All Costs: | | \$ | |

| | |
|--------------|--------------------|
| 17) \$ _____ | (Cumulative Costs) |
|--------------|--------------------|

| | |
|--|--------------|
| 18) Operating Surplus (Income less costs) \$ _____ | \$ _____ |
| (Daily) | (Cumulative) |

| | |
|-------------------------------------|--|
| 19) General Comments: Wet/Dry _____ | |
|-------------------------------------|--|

DEPOT:

REPORT FOR MONTH ENDING:

| | |
|--------------|--|
| Income/Truck | |
| Speedo kms | |
| Paid kms | |
| Cents/km | |
| Income | |
| Costs | |
| Profit | |

| | | |
|--------------------|---------|--------------------|
| Vehicles Strength: | Actual: | Actual last month: |
|--------------------|---------|--------------------|

Employees Strength: _____ Total No. _____ Total No. _____
This Month _____ Last Month _____

Details of Changes:

Accidents or Breakdowns:

Details of Fines or Offences:

General Comments & Suggestions:

(Signature)

VEHICLE COSTING IN A TRUCKING COMPANY

for the depot supervisor.

Depot Costs - Monthly Management Accounts

On a monthly basis each manager and depot supervisor is presented with a detailed summary for the areas of his responsibility. The detailed depot summary includes all costs directly attributable to the particular depot and is prepared by the accounting staff as the basis of the reports prepared for presentation to the Chief Executive and the Board. Ultimately it forms part of the six monthly financial accounts.

The accounting data includes all costs and is compiled independently of the operating personnel's own estimates.

Table 4 outlines the detailed provided.

The data provides the Depot Manager with the total and cost per kilometre for the month, the year to date, and compares these with both his budget and the previous year's cost. In the past "last year" comparisons were more valuable than they have been during our recent inflationary burst but can nevertheless be employed to give a useful guide to the effectiveness of attempts to absorb unit price increases through greater productivity.

The classification of costs into direct labour, direct material, fixed overhead and variable overhead is intended to simplify preparation of reports to the Chief Executive who requires analysis of budget variations under these headings for presentation to the Board. The direct cost categories are those which in theory vary directly with kilometres worked and as such are directly under the control of the depot management. Overhead expenses whether variable or fixed generally result

[illegible]

VEHICLE COSTING IN A TRUCKING COMPANY

from the decisions of more senior management although to some extent the degree to which variable overheads diverge from budget reflects decisions taken within the depot itself.

This cost information is based on depots and fleets and is used primarily for assessing the overall performance of the depot, the depot supervisor or a number of depots making up a particular operation. As such the data is an amalgam of the individual results of a range of vehicles and does not provide any detail on the relative performance of individual vehicles.

Satisfactory depot performance may mask unsatisfactory performance by certain vehicles because of above average performance by others.

Individual Truck Costs

To assess individual truck costs we use a computer based system provided by one of the oil companies. The system we currently employ is the Mobil Mi/Dac System (Management Information for Decision and Control). This provides us monthly with separate reports covering:

1. Maintenance (as an example a sample page from one report is appended);
2. Operating costs (as an example a page which includes the sample maintenance report vehicles is also appended).

L.E. Browne

The maintenance report lists each item of maintenance carried out in the fleet or plant, during the month and can be used to provide the following data:

| | |
|-----------------------------------|---|
| Job Number | Cost of services performed outside the depot |
| Date | |
| Down hours | The Repair Code (repairs are categorised under various codes) |
| Labour hours | |
| Labour cost | Down cause |
| Parts cost | Total maintenance cost |
| Outside maintenance cost | Cents per kilometre |
| Kilometres travelled by the truck | Other maintenance costs (we use this for tyres) |
| Work performed | Total cents per kilometre |

This data is provided for each vehicle. The report is subdivided by depot and within each depot report each particular vehicle type is grouped.

This report provides monthly, year to date and life to date maintenance cost for each vehicle and permits comparison of maintenance costs of:

1. Individual vehicles at different ages
2. Types of vehicles
3. Similar vehicles in different depots
4. Different vehicle types engaged on the same work.

Trends in maintenance cost can be determined and the data made available has been used to determine:

1. Variations in cost with age
2. Variations in cost between basically similar vehicles, the equipment for which varies; e.g.,

VEHICLE COSTING IN A TRUCKING COMPANY

costs for automatic transmission vehicles can be compared with the costs of manual vehicles.

In addition to the maintenance report, periodically a Repair Code Analysis report is produced and this summarises the same data according to the nature of the repairs performed. This report can be used for detailed analysis where a suspicion that certain vehicles are subject to unusually high costs of repairs within certain areas; e.g., transmissions.

The operating report lists cost details for each piece of equipment for the current month, year to date and life to date under the column headings:

| | |
|-----------------------|---|
| Kilometres run | Maintenance costs (the total from the maintenance report) |
| Fuel - gallons used | Maintenance cost per kilometre |
| Fuel - cost | Down hours |
| Kilometres per gallon | Total direct operating cost |
| Oil - pints used | Operating cost per kilometre |
| Oil - \$ cost | Vehicle fixed charges; i.e. depreciation, insurance, etc. |
| Kilometres per pint | Total operating costs \$ |
| Road Tax | Total operating cost in ¢ per km. |
| Driver's wages | |
| Other charges | |

After all pieces of equipment are listed as above the current month and year to date totals are listed for each vehicle type, and after this for each separate location and finally after all locations have been listed the current month and year to date totals are listed for the user.

These two reports are naturally used for different purposes and are aimed at different management functions.

L.E. Browne

The maintenance report is too detailed for the general use of senior management but is used on an exception basis when vehicles are identified on the operating report as having excessive maintenance costs. Within the maintenance planning and supervision functions the details of the maintenance report have been exceedingly useful in identifying failure trends, repeating failures, faulty maintenance, number and types of breakdowns.

The individual truck system was originally designed for purely operational purposes and not for accurate accounting. Over time a degree of accuracy has developed which permits use of the aggregate data in management account preparation.

Using the maintenance and operation reports as a data base we have been able to determine the relative operating costs of the different types of vehicles in our fleet, the averages; i.e., fuel cost, maintenance cost, etc., are applicable to the operating conditions experienced by the particular vehicle concerned but provide an excellent base for estimating costs on proposed new work even when conditions are expected to be substantially different to those so far experienced.

Job Costing

The day to day operation of any fleet is made up of a series of individual jobs. To determine cartage rates to be quoted for new work or to assess the desirability of continuing established work separate analyses are prepared. These are best described as job costing exercises.

For relatively small jobs; i.e., those which are performed with only part of the fleet based at any one depot, assessment of performance is based on the individual truck costs for the trucks concerned. The procedure is the same

VEHICLE COSTING IN A TRUCKING COMPANY

whether we are assessing prospective work or carrying out an operational "audit" of established work. For the established work we have the advantage of knowing the actual costs relating to the vehicles used and to some extent this exercise has a greater degree of accuracy than one in which we are attempting to determine future costs for prospective work.

Assessing prospective costs, and therefore the cartage rate which will be quoted, we base projections on:

1. Historical individual truck costs adjusted for known and expected price increases which will have to be absorbed over the life of the job.
2. An operational assessment of conditions which permits -
 - (i) Fairly accurate estimation of delivery times (the factor which determines loads per day and daily wage costs),
 - (ii) Less accurate, but at least considered, extra or lower costs of fuel use, tyre use, maintenance, etc., because of the conditions specific to the particular contract.

We use a relatively set format for determining the costs of any particular operation and because it is a basically mathematical exercise computer programs can be written to simplify the mathematics involved. Given the operator's assessment of the individual cost factors; e.g., expected fuel usage, maintenance costs, delivery times, possible waiting times, etc. trip costs can be determined. From trip cost, the cost per tonne, the cost per hour or the cost per day, depending on the nature of the rate requested by the customer can be quickly

determined.

Where a job involves a large number of vehicles we would endeavour to establish it as a separate cost centre for accounting purposes so that ad hoc job costing studies would not be necessary after the commencement of the work. The monthly cost statement would in fact serve a dual purpose; i.e., a job cost and a depot cost.

THE COSTS OF COSTING

We believe the value of the data we derive is well worth the cost.

You might reasonably ask....."What is the cost?" Ultimately the cost of not having reasonably accurate data on vehicle costs is an insolvent operation. When costs are not known managers will pursue revenue earnings as a target basing their desired targets on either financial accounting data previously prepared for the tax gatherer or rule of thumb guidelines arrived at in discussions with other vehicle operators.

Mechanics, drivers, spare parts suppliers, fuel suppliers, tyre suppliers, State Government Tax Collection Agencies, all expect payment for their services. All businesses have to maintain some sort of records of these expenses so that these payments are made, so that checks can be made against accounts presented for payment and so that profit can be calculated for payment of tax and dividends. What we have endeavoured to achieve is a situation where the pieces of paper normally filled out in any company; e.g., drivers' work-sheets, fuel issues, mechanics' time sheets, etc., are also the source documents for the system.

VEHICLE COSTING IN A TRUCKING COMPANY

For the individual truck costing system the basic document used in the system is a Maintenance Work Order. The information on this order combines:

1. The instruction as to the work to be performed
2. Provision for inclusion of hours of work and the charge per hour
3. A listing of parts used in any repair.

All this information has to be compiled whether a computer system is used or not, the only real difference is that only one sheet of paper is used for each vehicle.

For the operating report the extra data required is only labour hours and fuel and oil issues. As this information is necessary in any case, no additional work is required. Having ensured that this data is compiled for the individual truck costing system the depot operator then uses the data in his estimates.

The data submitted for computer processing each month is summarised and any changes to standard data such as fuel prices, road tax rates, driver wage rates, vehicle locations, etc., are made at that time. By comparison with a manual system we believe that there is in fact no additional preparation costs and the computer processing costs are considerably less than the expense which would be involved in manual compilation, classification and printing required in a manual system offering only part of the degree of accuracy achieved by use of computer facilities.

For a vehicle operator with only a small fleet a manual system may be cheaper, but when a large fleet is operated the only people sufficiently close to the vehicles

L.E. Browne

to know which are performing well and which leave something to be desired are those directly concerned with day to day operations. Normally these are not the people who quote new work, who decide replacement policies, who plan the future of the business. The data required can only be available to the senior management when it is recorded. Moreover even in a small business where the senior management and owner has very close day to day contact with the business recorded data is virtually essential for major decisions otherwise decisions will not be made on the basis of trends over time, rather they will be made on the basis of the impact on the decision on the decision maker of the most recent events.

The costs which are really relevant in determining whether our effort is worthwhile are "incremental" costs. It is not a question of the strict accounting cost of getting the information but rather the additional costs above what would be required merely to meet legislative requirements and to maintain normal records for payment of invoices, stock control and wages compilation. Frankly, we don't know what the cost would be, we have never done the exercise because we know the inevitable result of not having appropriate costing systems. Whatever the figure actually is it cannot be significant in relation to our total costs. The systems spread over the total of our transport operations and provide data used not only in day to day operations but for management decisions involving vehicle replacement, determination of maintenance policies, determination of depot size, even fleet composition.

Unit cost information has led to decisions to withdraw from certain activities even when the depots in which the operations were based continued to produce satisfactory results.

VEHICLE COSTING IN A TRUCKING COMPANY

The best indication I can give of the importance of cost data and the value of systems which give accurate information for control is the level of costs which my Division expects to experience. In the period July 1975 to June 1976 our budget for costs directly associated with my Division; i.e., excluding any share of group central administrative costs, exceeds \$17m. If our costing data permits us to save costs by 1% or allows us to avoid costs rising by 1% then the difference in our contribution to the Group's overall performance is \$170,000. Even though I don't know the exact cost of producing the data we use I believe that a variation of 1% is relatively small (I don't want to run a controlled experiment to find out how much costs rise if emphasis on cost control is reduced) and I know that there is no way the extra costs we bear to generate the data can add up to \$170,000 per annum.

PLANNED DEVELOPMENTS

From my discussions with other vehicle operators I know that few equal B.M.I.'s emphasis on cost determination. This partly reflects the size of the company in that smaller organisations often do not have access to trained staff who can design and implement the systems. I'm sure that most of the larger organisations use systems which produce similar results to ours.

Varying conditions of vehicle operation, different customer needs and differing organisational requirements will naturally result in variations in the systems used but this does not mean that ours are better than the others, it simply means that ours are designed for our requirements. Our requirements are determined by the tasks our managers are expected to perform and the information is produced to facilitate their decision making.

L.E. Browne

As a result the cost data collected and used within a company is not always available in the form other people might require. For research projects such as might be performed by a public servant in the Department of Transport our data would require modification. Even for our own purposes it sometimes requires modification, the requirements of the Prices Justification Tribunal for example, were not part of our considerations when our systems were designed. For Prices Justification Tribunal submissions we have to prepare cost data in a form of very little use or value for anything other than the submissions.

Over time operating environments change and with the change comes a need to revise information flow. While our cost systems generally met our needs at the time they were adopted we have identified desirable changes. In my opinion the major stimulus to change has been the increased understanding among business executives of the benefits to be derived from increased use of computer facilities. Computers have always been capable of the work required for costing systems, as far as I'm aware programmers and systems designers have always been capable of producing the systems necessary to exploit the computers potential but it is only after some experience with the products of computer processing that middle and senior management acquires the skills necessary to communicate their needs to the experts.

Largely through the experience we have so far gained in the use of the computer we have become aware of the potential benefits to be derived from the use of systems designed according to our own needs and capacities rather than for general consumption. The individual vehicle cost system we currently use is also available to other truck operators and was designed as a general purpose system.

VEHICLE COSTING IN A TRUCKING COMPANY

With our increased experience and having the advantage of a recently installed in house computer service we are now pursuing the design and implementation of our own individual truck, depot, section and divisional costing system. Our intention is to design our system based on the concept of individual truck contribution to overheads and profit.

With the active involvement of transport executives the B.M.I. Group E.D.P. Dept., is well advanced in the design of a computer based system of management information which will progressively develop, over what seems to me to be an unfortunately lengthy period, a virtually real time information and operating control system. Costing data will form only part, albeit a major part, of the data base and I expect to have access to information which will be more accurate, more timely and in terms of reports generated, more specifically orientated to the particular decision to be made. For example, instead of manual derivation of figures from a generalised maintenance report I can expect to be able to get data specific to a vehicle type irrespective of location, even to the extent of having the data classified by vehicle age.

The long term aim is development of a continuously updated data bank accessed by visual display terminal. Before this ultimate goal is attained a large number of subsidiary systems have to be developed.

The first stage is almost completed. This involves development of a B.M.I. system to replace the Mi/Dac maintenance and operating report. As part of this process our stores control will be computerised and the operating cost report revamped to become a unit contribution report. The data compiled will be used in the same way as our present costing reports but each executive will receive as printed reports only the

L.E. Browne

data relating to the decisions he must make. For example, each depot supervisor will receive on a regular basis the unit contribution for the vehicles under his control while the manager of an operation will receive an exception report containing the same data but only for the vehicles with either unusually bad or unusually good performance.

The second stage depends on another development in the Quarrying Division of the company. As part of a major modernisation of production facilities a computerised load, weigh and despatch system is being installed. Our E.D.P. Department is confident that with relatively minor difficulty they can set up a communication link with the mini-computer operating the load, weigh and despatch system so that some of the inputs for the operations report will be produced automatically when the truck is loaded.

Ultimately the data generated is expected to be the basis not only for production of information for our operating managers but also for the preparation of divisional accounting and administration records.