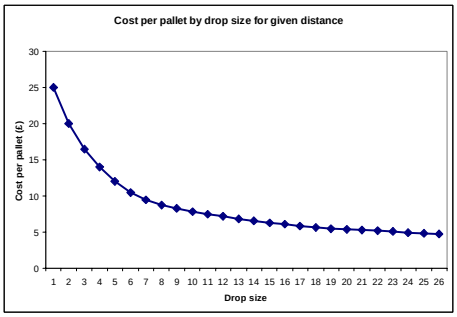
How much does a delivery cost?

By Phil Gibbs, Logistech Limited

It is simple to establish the average cost of a delivery, but what about the cost to a particular customer, trade sector, drop size or region? While it is easy to establish the cost of operating an entire vehicle fleet or a particular route, the cost of serving an individual delivery will depend on the size of the delivery and the distance and time the delivery is from its depot and from other deliveries. The problem of establishing individual delivery costs can face many different businesses, such as:

- manufacturers wishing to establish the cost of serving particular customers or sectors to identify whether they are profitable or not
- retailers wanting to quantify inbound or outbound delivery costs according to drop size and location
- shared user transport companies wanting to establish contract profitability
- hauliers wanting to build rates tables to ensure pricing disciplines
- any company wanting to pass on the cost of delivery, either to their customers or to other operating companies



Cost apportionment can be used to determine the cost of serving each delivery, but must be used with caution. The process that we follow at Logistech to derive costs is:

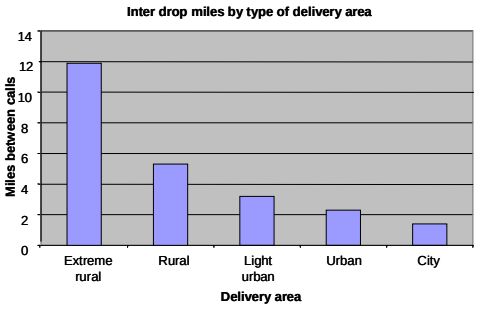
- use a routing and scheduling package to produce a base case of the current operation
- extract the key operating statistics, such as inter-drop distances by post code area
- use a spreadsheet model to apportion the costs to individual deliveries
- carry out an analysis of the delivery costs by customer or sector

Transport professionals are rightly wary of cost apportionment. The problem with delivery costs is that removing some deliveries will affect the cost of those that remain. If the analysis points to a change in the delivery task, such as removing an unprofitable customer or sector, the cost implications need to be properly assessed using a routing package.

Routing and scheduling

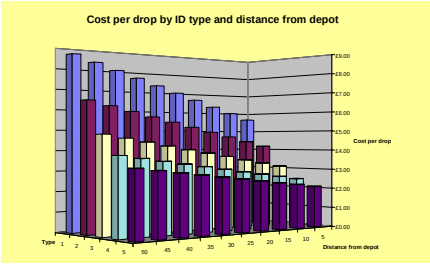
We use the Paragon routing and scheduling system for this stage of the work. When we build a base case, we take a sample week and use settings such as unloading rates, vehicle capacities and running speeds that are a reflection of the current operation. The base case will produce a fleet size, operating statistics and overall cost that can be validated against the existing operation and management accounts. A number of runs may have to be undertaken, with discrepancies investigated, to produce a reasonable match. We will then generate spreadsheet reports on customer locations, drop sizes, stem and inter-drop speeds and distances. These statistics may be summarised by postal area or geographic characteristics, depending on the project.

Cost apportionment model



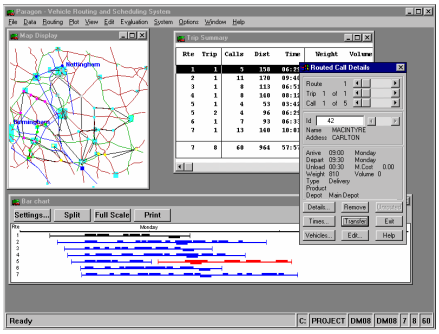
Our spreadsheet model is then used to cost a delivery at time, assuming that a vehicle carries deliveries that all have the same characteristics as the one being costed. General inputs include the vehicle cost per day and mile and the vehicle capacity and unloading rate. As each delivery is costed the model considers the drop size, stem and inter-drop speed and distance that apply to that particular delivery. It tests whether the vehicle will run out of driving time, shift time or capacity, and then calculates the cost per drop for the most constrained. An additional test is carried out to evaluate whether the cost would be lower if the vehicle did two trips per day. With mixed fleets, multi day runs and double manned vehicles, a delivery can be costed several times and the lowest cost selected.

Calibration and analysis



When all deliveries have been individually costed, the total cost can be calculated and compared back to the cost of the fleet identified in the base case. We can then tabulate and analyse the delivery costs in any way we desire: by combinations of trade sector, customer, drop size band, postcode area, country and so on.

Profitability studies

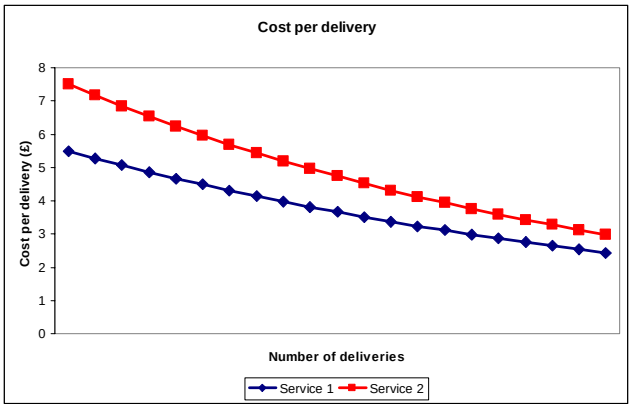


One of the uses of this technique is in customer account profitability studies. Care should be taken if the analysis points towards withdrawing from an unprofitable sector, as not all the apportioned costs will be saved. Removing the unprofitable deliveries will affect the costs of the remaining ones, possibly making them unprofitable. If you are not careful, you will start a vicious circle that will end with the closure of the business. Decisions should be tested with a routing and scheduling package, which will establish the new fleet requirement, before they are finalised.

In one recent project we carried out this process for an international groupage operator. Unprofitable customers and regions were identified, resulting in a major restructuring of rates and changes in the customer base. Commercial staff were given clearly structured rates tables that truly reflected the underlying transport costs. Within a year, an unprofitable operation was turned into a profitable one.

Home delivery costs

Rather than analysing individual delivery costs, a company may want to establish how costs change with different levels of activity and different levels of service. This is particularly important when establishing a new home delivery service. The cost per delivery will fall dramatically as volumes increase, but charging the full cost of the delivery at low volumes will be the best way of ensuring that volumes never increase! Also, the service offered will dramatically affect the cost: a delivery with a three day lead time with no specified delivery window will have a very different cost to a same day delivery with a specified time. An additional complication is the size of delivery area: basing delivery vehicles at stores may give compact delivery areas with lower costs but the operation may not have a critical mass and could present management issues. Operating from depots over a larger territory may give control benefits and reduce management costs, but will put up transport costs and may limit the service that can be offered.



The final decision on the delivery charge and service offer will be a commercial one, but should be taken with full visibility of how the underlying costs vary according to volumes and service. The different scenarios should be modelled with a routing

package, using a combination of actual and synthesised data, to allow an informed decision.

Phil Gibbs is the Managing Director of Logistech, a supply chain consulting company that specialises in computer modelling and the analysis of supply chain economics. Services include: deciding on the number and locations of production and distribution facilities, determining how and where products should be sourced, manufactured and stored, establishing vehicle requirements, transport mode and method.