FreightBestPractice

Department for Transport

Key Performance Indicators for Food and Drink Supply Chains

Benchmarking Guide

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Dairy Crest
Elddis Transport
Fox's Biscuits
GIST
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Tetley Tea
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United Biscuits
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Foreword

The role of Key Performance Indicators is well known and established throughout all sectors of industry. They provide a simple, focussed measure of performance, and so provide management with a short, concise picture of what is happening in their operation.

Over the past few years, the Department for Transport, through the Freight Best Practice programme, has supported a number of surveys that have developed a range of Key Performance Indicators (KPIs) in a variety of industry sectors.

The KPIs have provided those in the freight industry with a consistent measure of the levels of efficiency being achieved within their sector. Comparing, or benchmarking, their own performance against those KPIs provides the opportunity to focus on those aspects which are most likely to yield performance improvement.

This Benchmarking Guide aims to provide operators with those critical comparisons, and hence to help them improve efficiency, reduce operating costs and to reduce the impact of road transport on the environment.

1 Introduction

As far back as 1992 the Department of the Environment supported a project on improving vehicle aerodynamics through the Energy Efficiency Best Practice programme. This was followed by the establishment of a discrete transport efficiency programme in 1994, which by 2005 had evolved into the Freight Best Practice Programme.

The first substantial survey in the food sector was carried out in 1998, followed by a much larger survey in 2002. The results enabled participants to benchmark their individual performance against companies within their sector.

The 2007 Survey is a natural progression in a line of similar work all aimed at providing operators with accurate, reliable measures by which their own performance can be compared with the results achieved by others. For the first time the remit has been extended to include the drinks sector, and there is a commitment to carry out a further survey in 2009.

The overall aim of this Survey, and previous ones, was to:

- Provide measures of efficiency levels being achieved in the food and drinks sectors
- Enable companies to measure their own efficiency against that of the industry as a whole
- Stimulate and support existing efforts to improve efficiency in the operation and use of vehicles.

For the 2007 Survey the activities of almost 9,000 vehicles - tractors units, trailers, and rigids - were closely monitored and recorded. These vehicles were operating in the food and drinks sectors, and covered the movement of product from producers to the ultimate point of sale. The data gathered enabled the operational efficiency of those vehicles to be analysed, and measures of that efficiency, i.e. Key Performance Indicators were established.

Comparisons with previous surveys will show general trends and highlight the way that the supply process for food has changed in the last decade or so. However, there were differences in the fleet mix between 1998, 2002 and 2007, both at sector and sub-sector level, and so it is impossible to be sure that the results represent an absolute ‘like for like’ comparison.

The Survey gathered information in three broad categories:

- General information covering the details of the vehicles being surveyed – size, type, capacity, age, fuel consumption
- Detailed data on a leg by leg basis, for all journeys undertaken during the sample period
- An audit of vehicle activity during the sample period.

Previous Surveys have studied trailers, semi-trailers and rigids, i.e. the load carrying elements. For this Survey, activity information was also gathered on tractor units.

In order to make the results as reliable as possible, and, therefore, the most useful both to participants and subsequent users of the Guide, it is important that data gathering is carefully prescribed. Standard software was used as the medium to assemble the information and enable computer analysis.

Previous surveys had used a 48 hour sample period but for 2007 it was decided that 24 hours was perfectly adequate. The previous survey results – where they provide a picture of activity across the sample period - show that the first 24 hour period looked very similar to the second. A reduction to 24 hours therefore imposed less data gathering on participants without detracting from the value of the results. However, in addition data covering daily activity was also collected to demonstrate day to day variations plus the impact of 7 day trading.

2 The Key Performance Indicators

The main KPIs used in the 2007 Survey were the same as those used in the 2002 Survey. With due regard to the caution expressed above about like-for-like comparisons, this Survey does provide operational measures which can now be traced back for almost ten years.

The main KPIs were:

1. Vehicle Fill
This is the measure of load carried, compared with vehicle capacity, on each loaded leg.

For the food sector this was done by payload weight, load height and load unit numbers. In most loads in the food Survey product was carried in unit loads, i.e. a roll cage or wooden pallet. Where this was not the case conversion factors were used to enable the creation of a pallet-equivalent measure, and hence a deck fill measure.

For the drinks vehicles participants were offered the option of using tonnage – being the total weight of kegs/cask and bottles of beers, wines spirits and soft drinks, or a combination of the number of kegs/casks, plus the number of pallets used to load bottled product.

2. Empty Running
This is the distance which a vehicle runs empty, that is not carrying product, usually the final leg of a journey when the vehicle returns to depot or moves on to another point at which it collects a load.

3. Time Utilisation
This was the measure of what vehicles were doing during each hour throughout the sample period. The seven categories used were: running on the road, awaiting loading/unloading, being loaded/unloaded, pre-loaded and awaiting departure, driver daily ('overnight') rest period, vehicle idle (empty and stationary) and maintenance or repair.

Additionally, for tractor units only, there was 'running solo' (i.e. without a semi-trailer).

4. Deviation from Schedule (Delays)
This is the measure of the delays suffered by the vehicles in the Survey. Categories of delay were: lack of driver, delay at vehicle's own base/point of departure, delay at a collection point, traffic delay, vehicle breakdown.

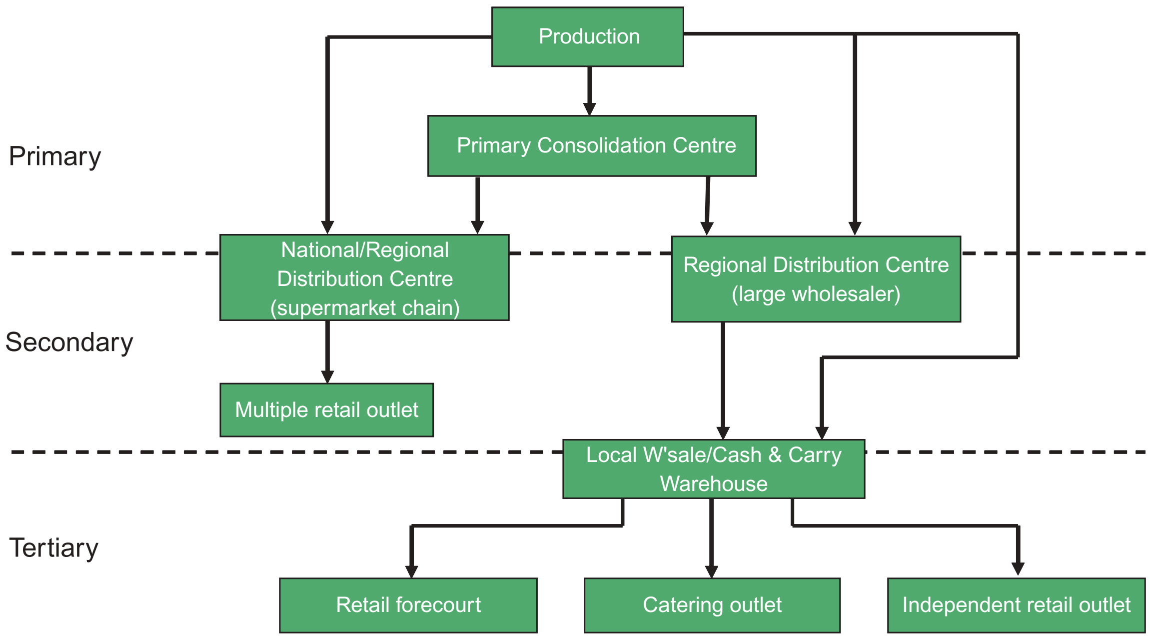
5. Fuel consumption
Data was requested for each vehicle type within the Survey. Performance over a sustained period was required and so data covering three winter months was requested.

The unit of measure used is miles per gallon, due to operator feedback suggesting that mpg was still the measure which people used most readily and could relate to.

The Survey covered all aspects of the movement of finished food, i.e. food that is ready for sale rather than raw materials. Activities were separated into:

- **Primary:** Movement of saleable product, raw material, work in progress, returns, packaging or handling equipment between a supplier and factory/factory and NDC/NDC and customer's RDC, Hub depot or Wholesale depot including C&Cs
- **Secondary:** Movement of saleable product from retailer RDC or Food Service Hub depot into retail outlet or picking depot. In addition, the return of equipment or goods from outlet to RDC or Hub.
- **Tertiary:** Movement of saleable goods from a factory, regional or picking depot, including wholesaler, into the final outlet where product is consumed i.e. home, pubs & clubs, small independent corner shops, retail forecourts or restaurants

Figure 1 Food Distribution Channels



2.1 Survey Statistics

A total of 113 fleets, from both food and drinks sectors, participated in the Survey, which now falls into the category of a 'devolved function' and so only covers fleets based in England, or operating mainly in England.

During the 24 hours the food sector vehicles delivered over 147 thousand pallet equivalents, and those in the drinks sector delivered 12,716 tonnes of product. Total distance run for both groups of vehicles was almost 1.4 million kilometres.

Tables 1 and 2 show the Survey Statistics.

NB It should be remembered that the 1998 and 2002 Surveys covered two days and the 2007 Survey covered only one.

Table 2 Survey Statistics - Drink

	2007
No. of fleets	22
Tractor Units	363
Trailers	644
Rigid vehicles	268
Journeys	956
Journey legs	5,435
Tonnes delivered	12,716
Kilometres travelled	172,028

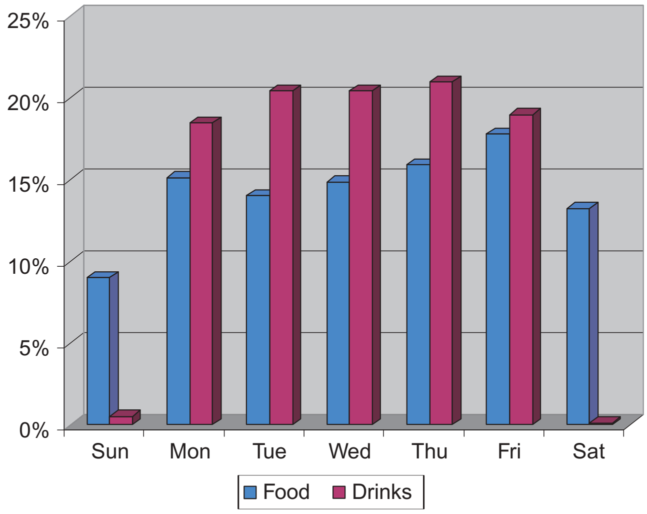
Table 1 Survey Statistics – Food

	1998	2002	2007
No. of fleets	36	53	91
Tractor Units	1,393	1,446	2,286
Trailers	1,952	3,088	4,052
Rigid vehicles	182	546	1,362
Journeys/24 hrs	2,012	3,034	7,064
Journey legs/24 hrs	5,937	12,222	23,044
Pallets delivered/24 hrs	103,101	110,329	147,645
Kilometres travelled/24hrs	580,956	727,111	1,226,408

2.2 The Survey Day

Unlike previous Surveys the 2007 covered only a single day. Activity on the sample day (Thursday) compared with the remainder of the week is shown in Figure 2.

Figure 2 Percentage of volume delivered across the week



2.3 Vehicle Fill

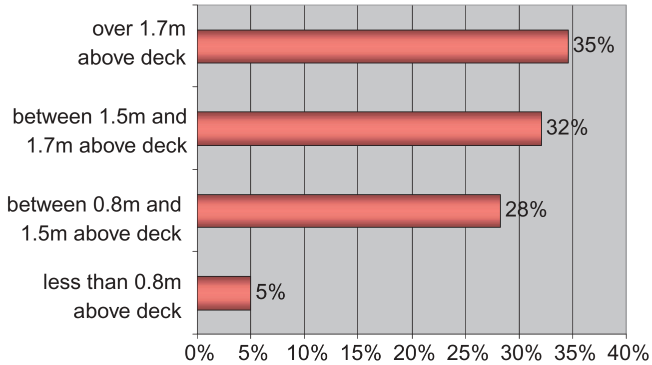
The measurement of vehicle capacity in the food sector is relatively complex. Vehicles will either ‘weight out’, i.e. the payload limit is reached, or, more usually, they will ‘cube out’ i.e. the vehicle is filled before reaching its allowed payload limit.

For this survey, as with the previous ones, the fundamental unit used was the pallet, being regarded as having dimensions of 1m by 1.2m. Where companies used different handling methods – roll cages, cartons, or dollies with tote boxes for instance – the number of these carried was converted into pallet equivalents, that is 1.2 square metres of vehicle deck space. The survey also asked for tonnage carried and for vehicle carrying capacity.

The second key measure was typical height of a load within the vehicle. Participants were asked to provide an estimate of the typical load height profile across their operation.

The average height used on laden trips is shown below in Figure 3

Figure 3 Distribution of heights on loaded vehicle trips (food)



The results show that many companies are unable to use the typical available height within a ‘standard’ vehicle of around 2.1 metres, which allows for air circulation in temperature controlled vehicles. Across all trips in the survey on the sample day, the mean height utilisation figure was 72%.

Table 3 Vehicle Height Utilisation (food) %age of trips by height utilised

	2002	2007
under 0.8m	9%	5%
0.8 – 1.5m	9%	28%
1.5m – 1.7m	67%	32%
Over 1.7m	15%	35%

Table 3 shows a considerable change in profile since the 2002 survey, but the overall effect is a marginal improvement in use of vehicle height of around 1%.

This appears to an opportunity for significant improvement but there are a number of obstacles which prevent using the cube. These include an inability to stack certain products due to fragility or instability, or a requirement to supply pallets of a particular height to customers, or a customer requirement for single stacking.

The average utilisation for each fleet is shown in Figures 4 and 5.

Taking all food trips within the survey the average deck utilisation, measured by use of deck space, was 74.8%, and by weight was 55.1%.

Figure 4 Average deck utilisation by fleet (food)

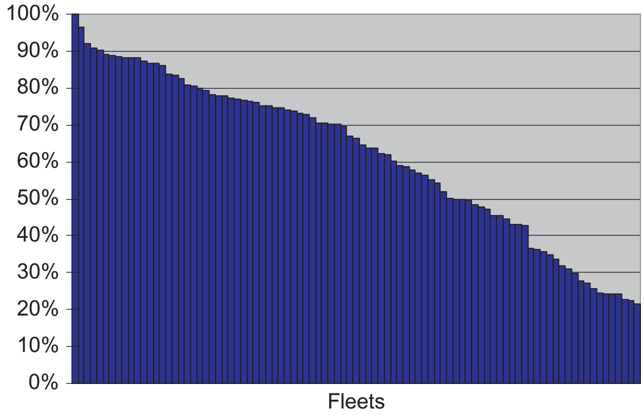
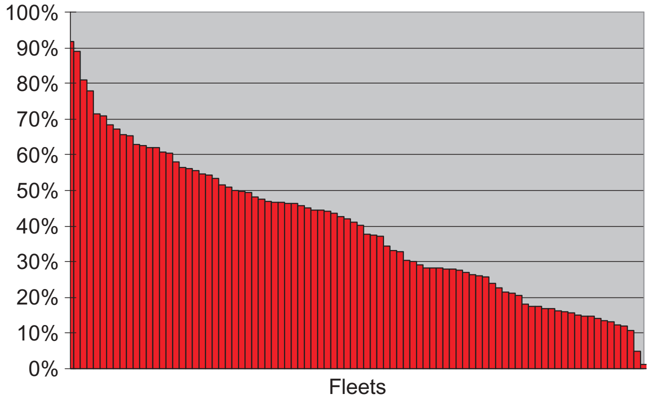
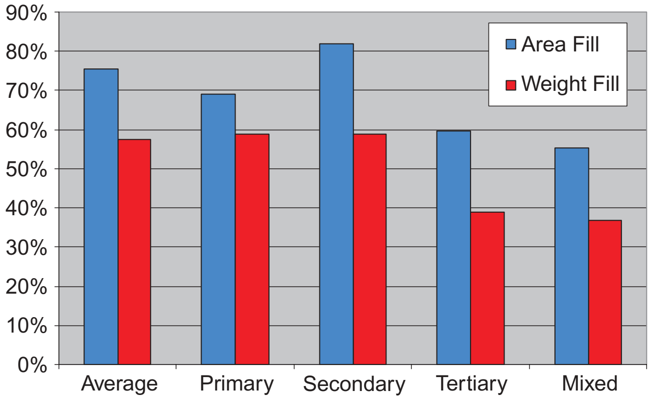


Figure 5 Average weight utilisation by fleet (food)



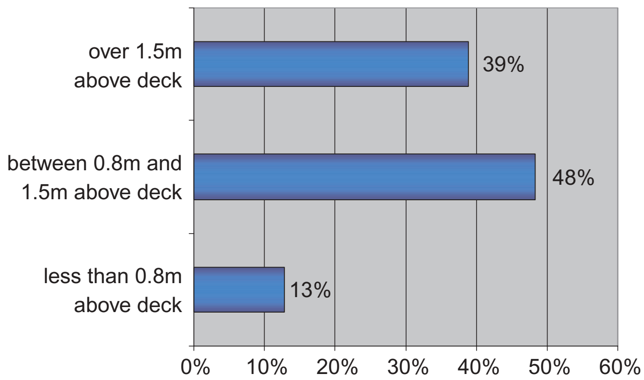
Across the three activity streams in food the levels of utilisation, measured by each individual trip, were as shown in Figure 6 below.

Figure 6 Vehicle Utilisation by activity (food)



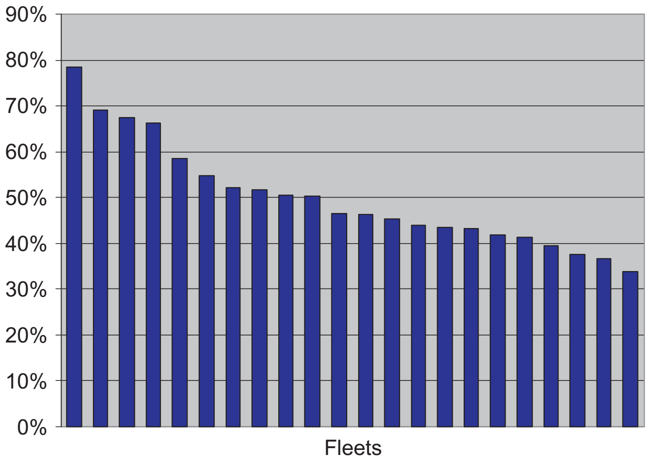
Utilisation of height within drinks fleets (Figure 7) is to a large extent governed by methodology used. Many dray operations carry kegs and casks loose within the load, and so stacking, to any great extent, is not practical. The primary fleets, delivering mainly into the food retail and wholesale sectors can stack pallets of canned or bottled drinks, and by the use of locator boards, can also stack kegs and casks.

Figure 7 Distribution of heights on loaded vehicle trips (drinks)



Within drinks the utilisation measure used is weight, and Figure 8 shows the average weight utilisation for each fleet.

Figure 8 Average weight utilisation by fleet (drinks)



In the case of drinks vehicles, particularly drays on pub/club deliveries, most operators use tonnage including keg/cask beer and bottled beers, wines, spirits and soft drinks) as a measure of vehicle fill. However, although kegs or casks are heavy, the vehicles rarely use their full weight carrying capability. Vehicle operators use a notional vehicle capacity, in tonnes, for load planning, based on their experience of what will fit onto vehicles. This notional capacity is rarely, if ever, the same as the vehicle's legal weight carrying capacity, and there is often a difference of several tonnes on a typical 17/18t vehicle. It is this notional capacity figure on which the utilisation calculations are made.

Due to the inherent difficulties of handling and securing, kegs and casks are rarely stacked on drays and so the load height is usually low.

2.4 Empty Running

Empty running is widely seen as the bane of commercial vehicle operation since it usually represents mileage which is being run without direct commercial benefit or purpose, at best returning or moving on to collect another load. There is a perception amongst the public that lorries run half empty most of the time, or completely empty for half of the time.

In fact, of the 1.39 million kilometres run by the vehicles during the Survey, just 24.1% of food vehicle kilometres were empty, while the corresponding number for drinks was 20.1%. These are higher than the 2002 figure of 19% but lower than the 27.4% quoted in the Department for Transport's Transport Statistics Bulletin Road Transport 2005.

The question of empty running is made more complicated in the food sector by the use by many retailers of roll-cages for the inbound supply to their stores. Having been delivered to stores with product they must of course be returned to Distribution Centres for re-filling. This return journey takes up a vehicle's load space, even when the roll-cage design allows the cages to be nested when empty.

Since the cage is empty it can be argued that the vehicle is also empty, since it carries no saleable product, and that the carriage of empty roll-cages is the result of the mode of delivery operation chosen by that retailer. The alternative view is that a vehicle loaded with empty roll-cages is full. Whatever the view, in practice the carriage of empty roll cages takes up space and prevents the carriage of other, usually palletised goods, such as new product from a supplier.

The proportion of empty kilometres run, i.e. those without any product, by each fleet carrying product in cages or other containers is shown in Figure 9.

For comparison, Figure 10 shows the proportion of empty running incurred by fleets which deliver on pallets rather than in cages.

In fact the proportion of empty running carried out by vehicles carrying product in cages is very similar to those carrying product on pallets. In the case of the cage carrying vehicles however there is less scope to carry backloads because of the volume taken up by cages.

Figure 9 Proportion of kilometres run empty, by cage carrying fleet (food)

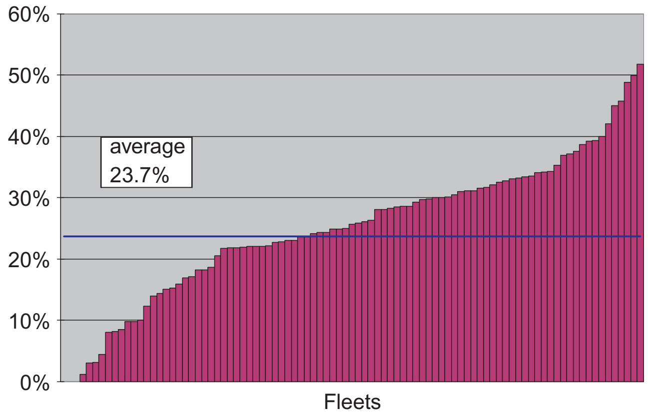
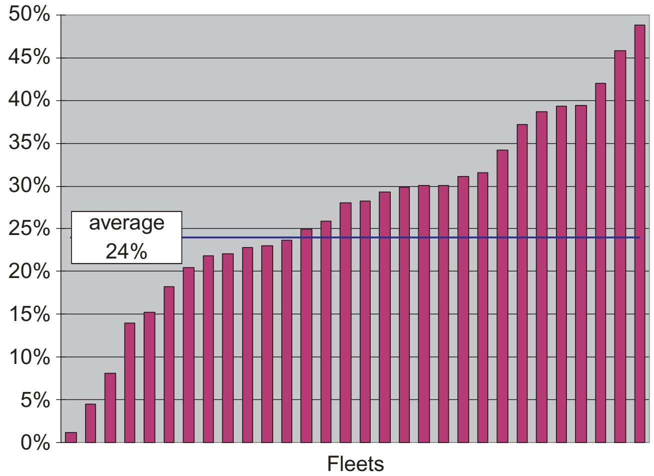


Figure 10 Proportion of empty running by pallet carrying fleets (food)



Empty running is an inevitable part of vehicle operation in the food sector and the extent of it is dependant on both the nature of the journey – primary, secondary or tertiary – and on the way that vehicle delivery routes are planned and executed.

A primary route may involve a full load delivery to a single point and then a return. If no arrangements for a backload are, or can be, made then 50% empty running will result.

A secondary or tertiary delivery route will usually run the last leg empty, but the length of that last leg, and hence the proportion of empty running can depend on the way that the journey is planned. If deliveries are done on the outbound part of the journey, up 50% (returning mileage) may be empty, whereas running out to the furthest point and offloading on the way back may leave only a short empty leg back to base after the last drop.

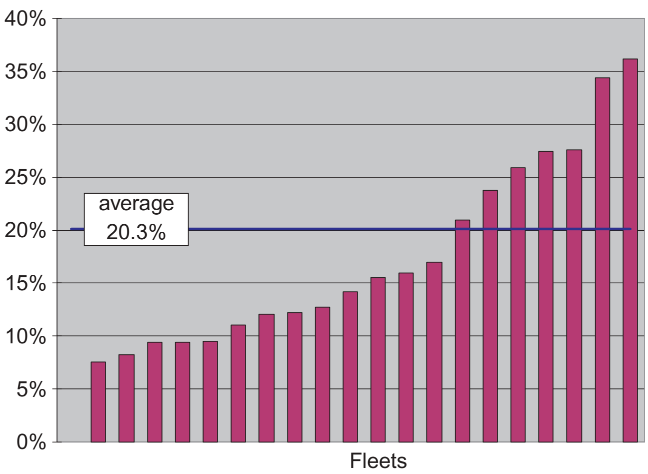
Table 4 gives the percentage of empty miles by activity for the food sector.

Table 4 Empty running by activity (food)

Activity	% of kms empty
Primary	23.9
Secondary	22.8
Tertiary	28.4

In the case of the drinks sector the return of empty kegs and casks is inevitable. They are the only means of supplying draft beers and lagers and far too expensive to be anything other than returnable. The amount of empty running within drinks is less than in food as shown below in Figure 11.

Figure 11 Proportion of kilometres run empty, by fleet (drinks)



2.5 Time Utilisation

Vehicle activity over the 24 hour period was measured by recording the main activity of each vehicle for each hour of the Survey. Trailers and rigids in the food sector spent 30% of the time running on the road (Figure 12). This includes 2% on overnight breaks and so is the same as the 2002 percentage.

Although vehicle operation is seen as being a substantial expense the Survey shows that, in the food sector, vehicles spend slightly less time (49%) active – on the road, loading/unloading, or delayed – than they do inactive.

Figure 12 Vehicle activities (trailers and rigids)(food)

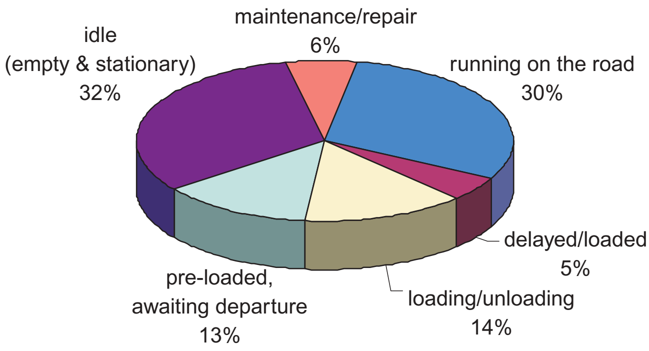
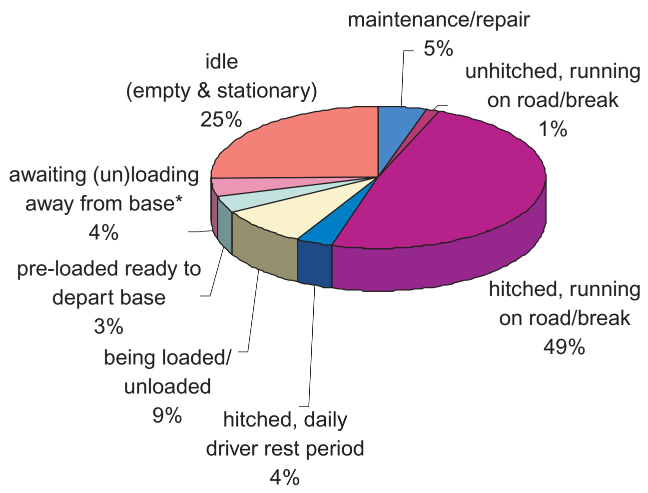


Figure 13 Tractor unit activities (food)



The comparisons above clearly show the benefit of using articulated combinations where the time spent on the road by tractor units was 49% compared with just 30% for the group of vehicles as whole.

The figures for trailer and rigid activities in the drinks sector are shown below.

Figure 14 Vehicle Activities (trailers and rigids)(drinks)

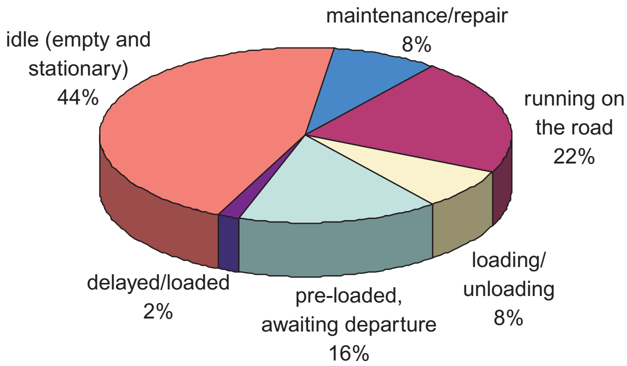


Figure 15 Tractor Unit Activities (drinks)

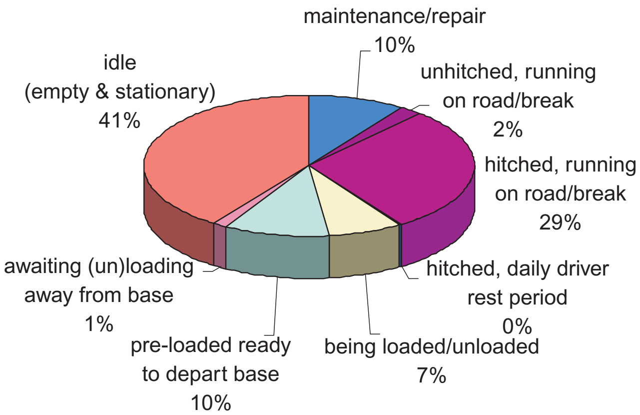
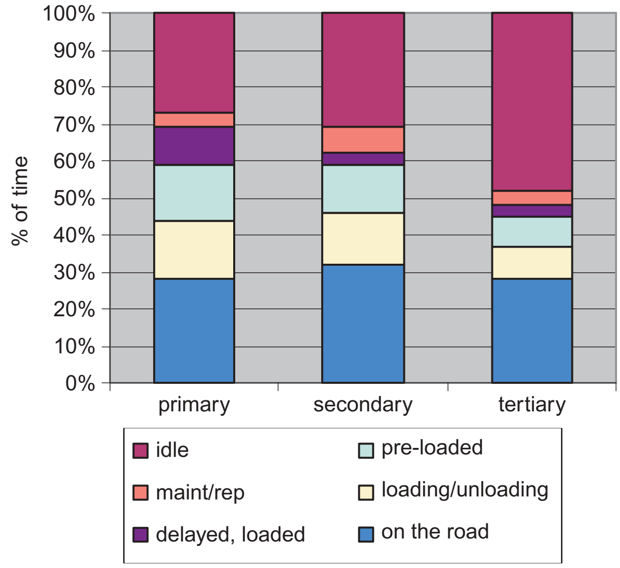


Figure 16 Vehicle utilisation by activity



Separation of vehicles into activities, i.e. primary, secondary and tertiary shows a number of marked differences. In primary operations vehicles spend 27% of their time 'idle and stationary', whereas in tertiary the corresponding figure is 48%. The comparisons shown below (Figure 16) suggest that tertiary is predominantly a day shift operation with vehicles loaded immediately prior to departure, making small, presumably largely un-assisted deliveries, and suffering relatively few delays. Primary vehicles spend a similar time on the road but seem to spend a larger proportion of their time (41%) loading, unloading or delayed.

The data also enables us to consider the spread of activities across the 24 hour period and the differences here are very marked.

Figures 17, 18, and 19 show marked differences in levels of activity over 24 hours across the primary, secondary and tertiary fleets. Primary operations are spread very evenly through the whole 24 hours.

Secondary fleets show substantial activity across the period but with a clear peak in the early morning, with start times between 4:00 and 6:00am in order to meet early required delivery windows.

Finally in tertiary activities the operation is very heavily concentrated into the early morning with the highest levels of activity taking place between 6:00 and 10:00 am, and hardly any movement taking place after 7:00pm.

Figure 17 Time Utilisation Primary Fleets

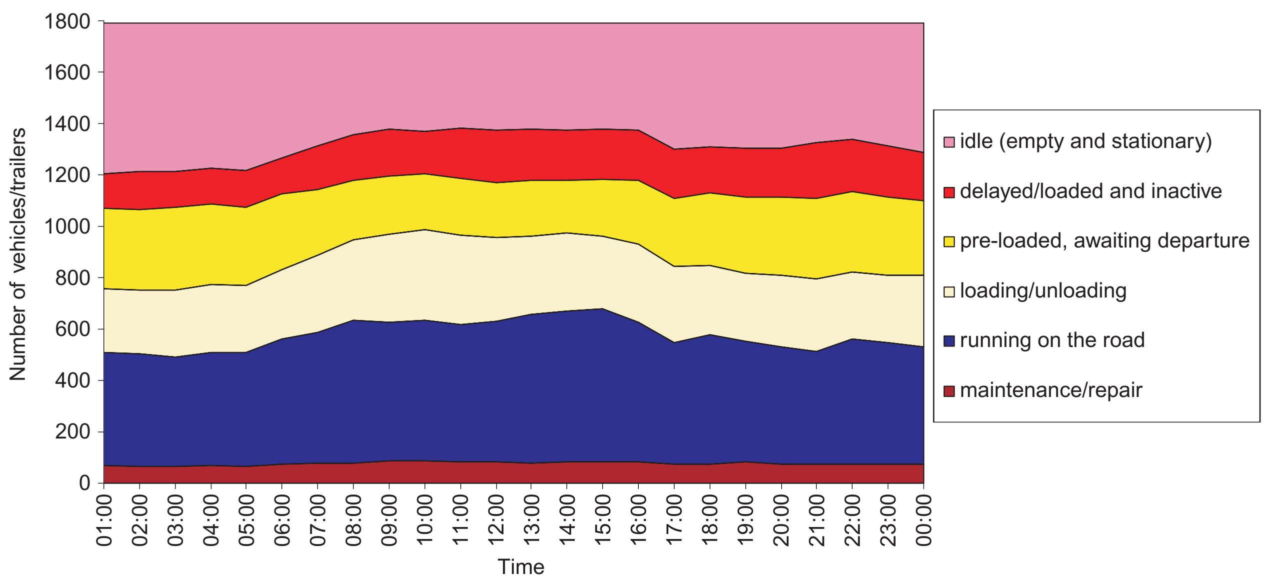


Figure 18 Time Utilisation Secondary Fleets

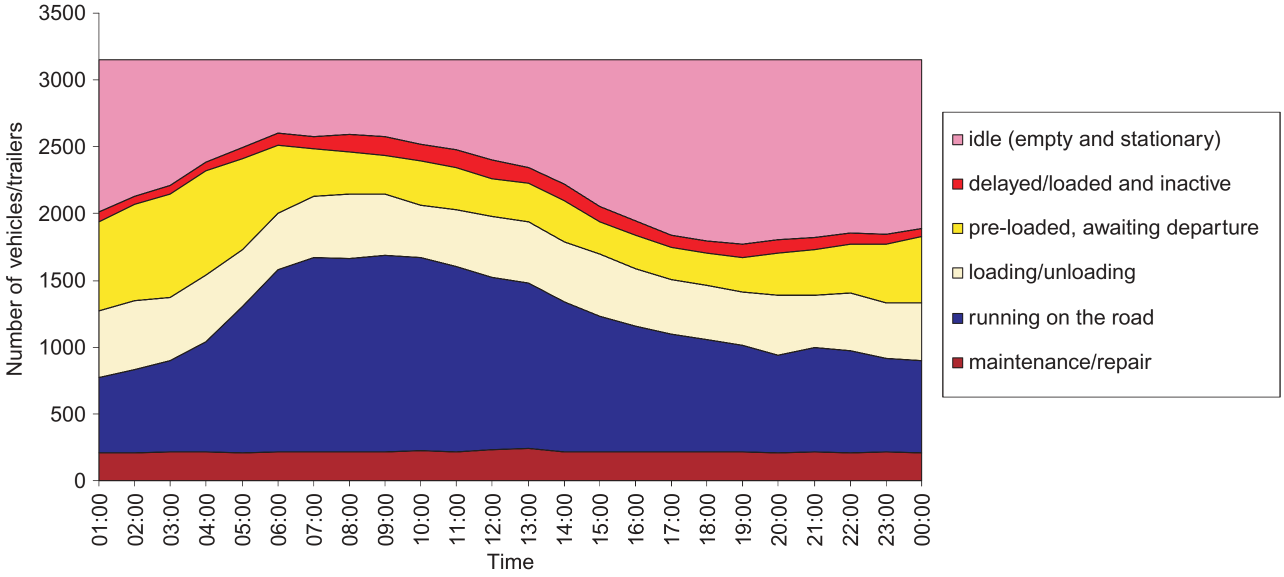


Figure 19 Time Utilisation Tertiary Fleets

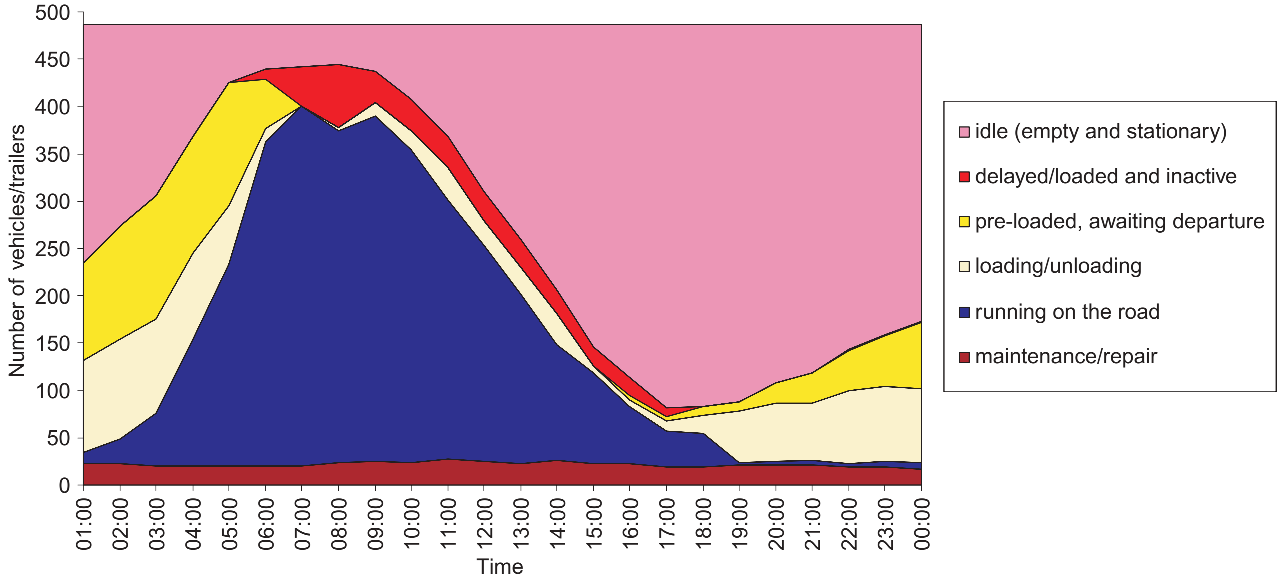
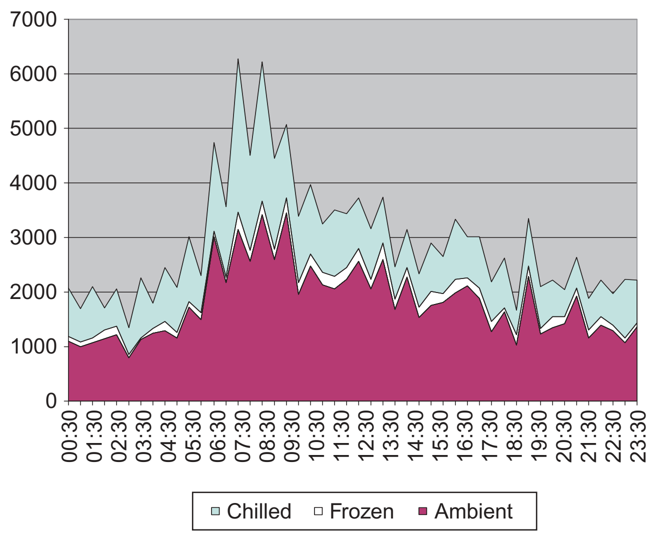


Figure 20 Standard pallets delivered in each half hour (food)



The survey also shows the patterns of activity within the different temperature regimes. All three regimes show a similar peak during the early part of the day, but within chilled produce this is more marked. This reflects the need for most retailers to have chilled and fresh produce into shops at or just after opening time.

Overall the four preceding figures show that although much activity does now take place ‘out of hours’ there are still marked peaks. Even allowing for the need for retailers to manage their stocks and staffing levels effectively, and for commercial vehicles to operate in harmony with local residents, the results suggest that a strong focus is required to spread vehicle activity across the whole of the 24 hour period.

Figures 21 and 22 show that the much of the drinks sector is operating on a day shift basis, driven, as with food tertiary, by the requirements of customers to take deliveries during something near to a normal working day. In the case of drinks it is clear that vehicles are extensively pre-loaded for the following day when they return from delivery routes. This at least ensures that they are all out delivering during the relatively narrow time window which is available to them.

Figure 21 Tonnes delivered in each half hour (drinks)

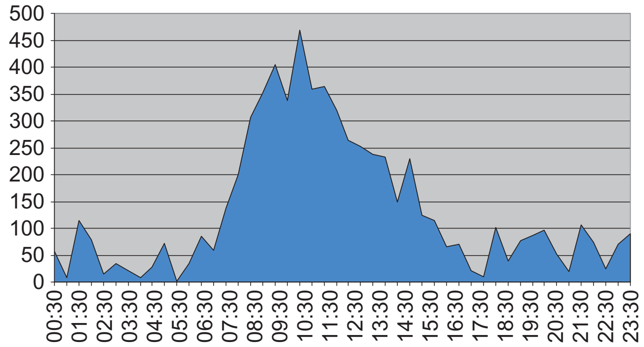
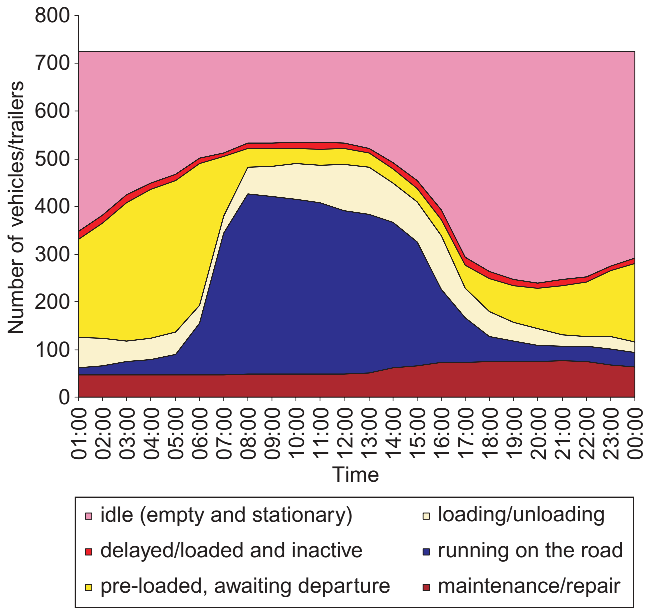


Figure 22 Time Utilisation (drinks)



2.6 Deviations from Schedule (Delays)

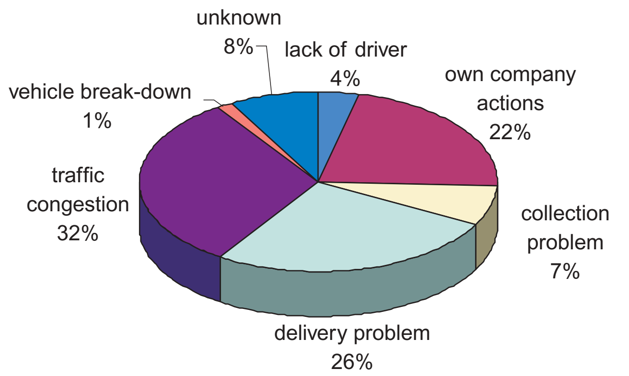
Delays in vehicle operations have been an integral part of transport planning for many years. Previous Food Surveys showed that in 1998, 25% of journey legs were subject to 'unscheduled delay', and the corresponding figure in 2002 was 29%. In 2007 the number had decreased to 24%. In the drinks sector it was 31%.

Direct comparisons across these three years are unsafe but the numbers show that delay remains a significant issue. There are a number of factors which will have affected these results including the amount of work done by the Survey vehicles at night, an option which is not available to most of the drinks sector operators. It is also important to remember that the Survey measures delay against schedule and we do not know how much delay is already factored into the planning process.

The most frequent reason for delay was traffic congestion at 32% of delays. This is an increase of only 1% since the last Survey, which is perhaps surprising, given the widespread perception that traffic congestion has worsened in the intervening years.

Of the remaining 68% of delays, 59% were incurred at the vehicle's 'own' premises, or in loading or unloading at delivery or collection points. This is an increase from 2002 when the corresponding figure was 50%. It is still the case, therefore, that congestion at loading and unloading points, factories, distribution centres and retail outlets still causes more delays than the traffic congestion, which generally has a higher profile.

Figure 23 Delay by number of occurrences (food)



On average, a delay lasted for 51 minutes compared to 43 minutes in 2002. The lengthiest delays were those caused by the lack of a driver. In 2002 the lengthiest delay were caused by equipment breakdown.

If we take the length of delay by cause and the number of delays it is possible to assess the overall impact of each type of delay. This shows that the largest impact from delays comes from those caused by 'own company actions' and delay at collection and delivery points.

Figure 24 Average length of delay by cause (food)

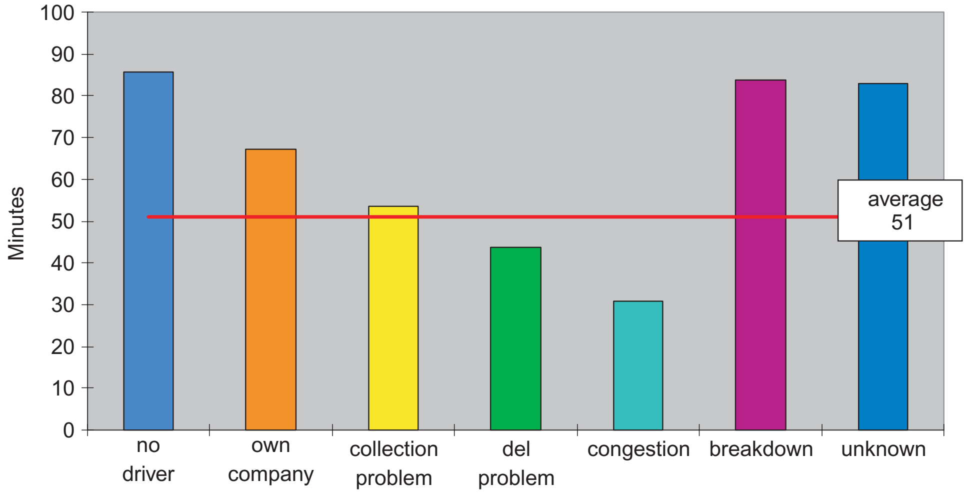
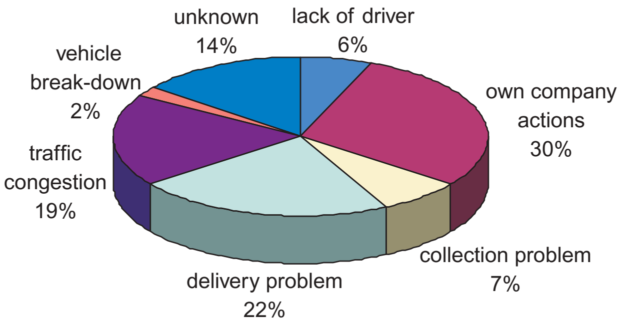


Figure 25 Total length of delay by cause (food)



Within the drinks sector the numbers look somewhat different, partly because of the nature of the work. In the case of drays the vehicles are subject to many of the same delays experienced by vehicles in the food sector. For many, however, there is the opportunity to minimise the effect of delays at offloading points by moving on to the next customer, and then returning to the one that was not ready to receive a delivery. This informality is not generally available within the food sector, but can be useful where consecutive deliveries are geographically close.

The other element of pub deliveries is that it is not unusual for dray crews to deliver ‘out of sequence’ where they believe that this will be beneficial. This may or may not bring benefits in efficiency but it invariably makes it difficult to assess delays, and to understand the effectiveness of planned routes and opportunities to improve them.

As with the food sector there is a marked discrepancy between the number of occurrences of delay and the delay time which they cause. The most extreme is delivery delays which account for 26% of all reported delays, but cause 45% of the time lost due to those delays.

Figure 26 Delay by number of occurrences (drinks)

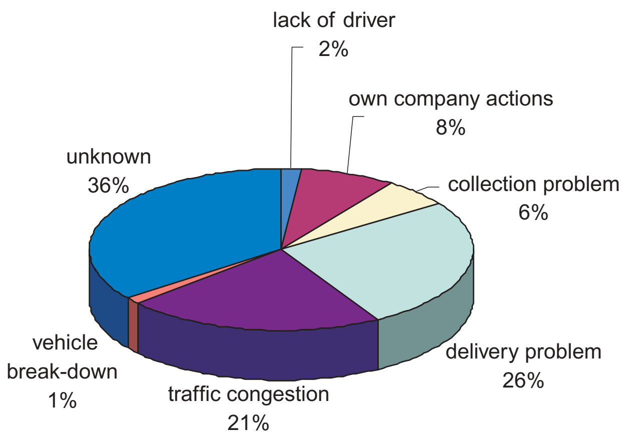


Figure 27 Total length of delays by cause (food)

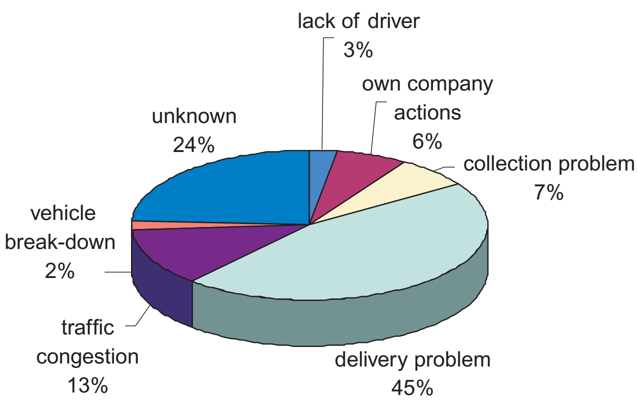
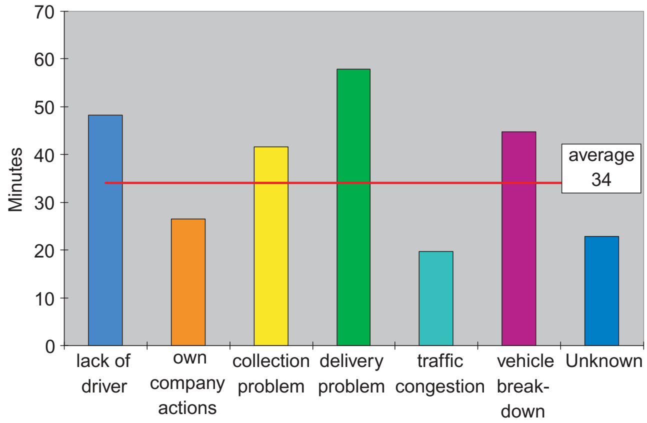


Figure 28 Average length of delay by cause (drinks)



2.7 Fuel Consumption and Energy Efficiency

Fuel Consumption

Fuel consumption data was requested for the period October 2006 – January 2007. It was considered worthwhile specifying a three month period to allow sufficient smoothing of company data to give a representative figure, but also to minimise the effect of vehicle replacement programmes had a longer period been requested.

The overall results were:

Table 5 Fuel Consumption by Vehicle Type (mpg)(food)

	1998	2002	2007
Small rigid		11.3 (4.0)	13.1 (4.7)
Medium rigid	10.4 (3.7)	10.2 (3.6)	9.8 (3.5)
Large rigid	10.4 (3.7)	8.8 (3.1)	10.4 (3.7)
Drawbar		8.8 (3.1)	7.2 (2.5)
City Artic	9.0 (3.2)	9.0 (3.2)	8.5 (3.0)
Medium artic	8.8 (3.1)	9.0 (3.2)	9.3 (3.3)
Large artic	8.2 (2.9)	8.2 (2.9)	8.6 (3.0)

(Table 5 shows kms/litre figures in brackets)

Although the composition of the sample group and the type of work and journeys is likely to be different it is interesting to note that there appears to have been relatively little improvement in fuel consumption over a period of 9 years.

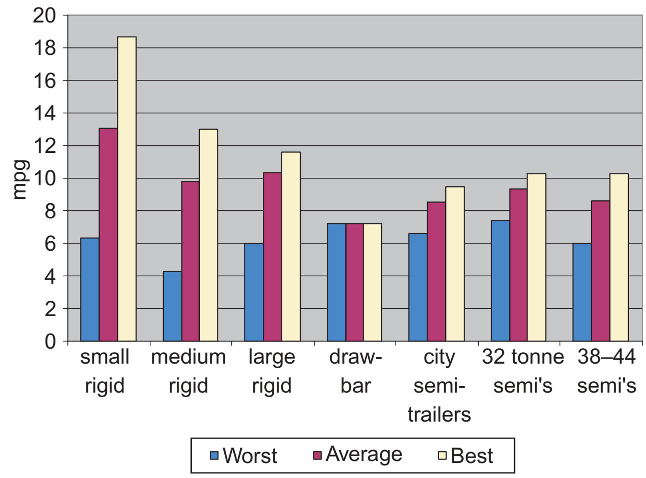
Table 6 Fuel Consumption by Vehicle Type (mpg)(drinks)

Small rigid	15.1 (5.3)
Medium rigid	8.0 (2.8)
Large rigid	8.2 (2.9)
Drawbar	7.4 (2.6)
City/urban artic	7.0 (2.5)
Medium artic	
Large artic	8.6 (3.0)

(Table 6 shows kms/litre figures in brackets)

Fuel consumption in the drinks sector was poorer than food in all vehicle categories, except small rigids. This may be due to the nature of the work, i.e. short journeys with large number of deliveries in predominantly urban areas. Alternatively it may be that it is an area which has not received a great deal of management attention, perhaps being seen, in a low mileage operation, as a relatively small area of expenditure, and one which is difficult to improve.

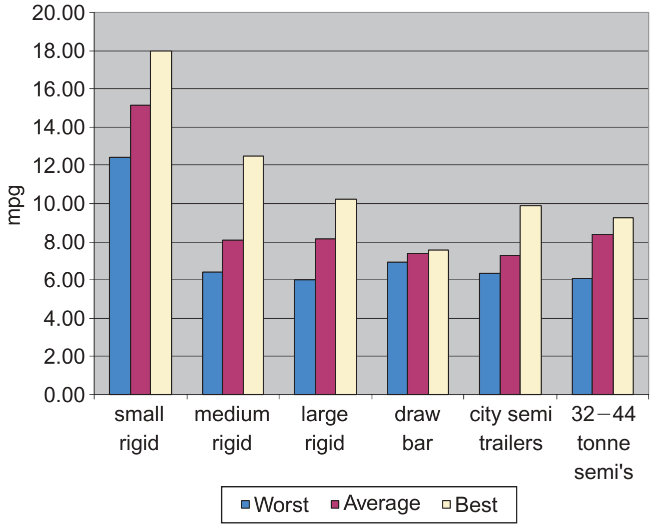
Figure 29 Fuel consumption by vehicle type (food)



Within each vehicle type there is a wide range of fuel consumption levels, especially in the case of the smaller vehicles. This may effect the range of journey type undertaken by rigid vehicles, some of which will be operating largely in urban environments, whereas the larger vehicles are more likely to be used on trunk roads and motorways. Perhaps the most extreme example of this is the small and medium rigids where the poorest numbers are generated by inner city delivery vehicles where the refrigeration equipment is driven off the vehicle engine.

Corresponding data for drinks is shown below.

Figure 30 Fuel consumption by vehicle type (drinks)



Energy Efficiency

It has always been difficult to make meaningful comparisons of transport efficiency between different operations. There are many variables which will effect any measure used, including:

- the nature and geographical range of the work undertaken
- efficiency of load planning - how is time utilised?
- the correct specification of vehicles - are they the right size and type? - it is very easy to fill vehicles which are smaller than they should be
- the fuel consumption achieved by those vehicles.

All of these factors effect efficiency, i.e. the amount of fuel used in moving one unit of load from origin to destination.

In the last survey a composite measure - pallet kms per litre - was derived in order to bring some of the variables together. This has been repeated in the current Survey and the results are shown below in Figure 31.

The chart shows clearly that primary operations tend to be most efficient, with the tertiary the least efficient. There are some operations which disrupt the pattern but broadly the results are consistent. They are also as we might expect, with the typical primary journey – large vehicle, full load – being the most efficient in terms of fuel used for product moved.

The numbers clearly show the benefit of moving product in bulk as far down the supply chain as possible, before breaking it down into smaller vehicles and smaller deliveries. The difficulty arises in trying to do this when most food supply chains have become increasingly centralised.

As thoughts turn to the environmental impact of the way that food supply chains are constructed, further measures will become important. There is an ongoing

Figure 31 Energy intensity, pallet kms/litre

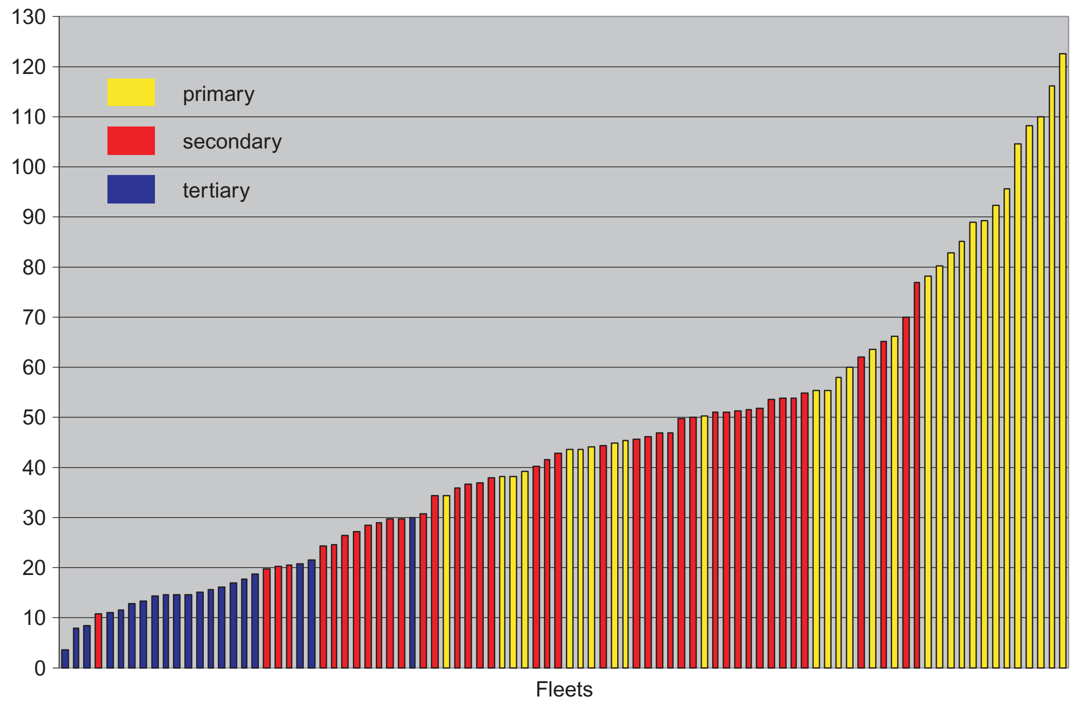
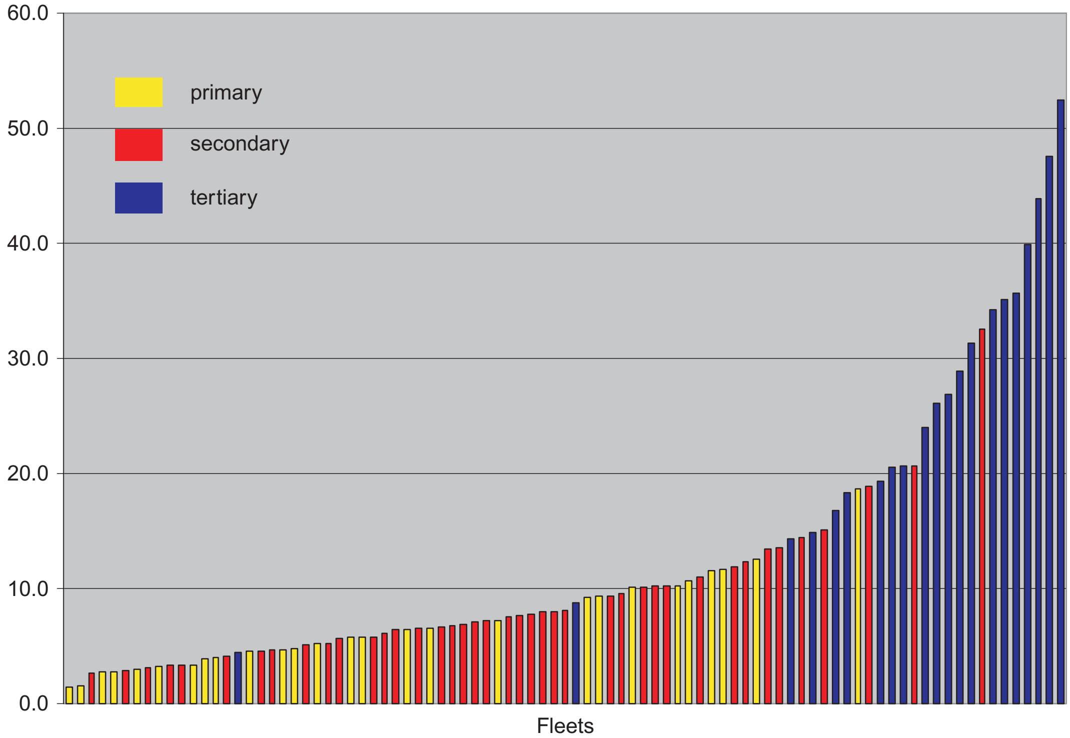


Figure 32 Distance travelled - kms/loaded pallet



debate about food miles, generally taken to mean the distance that food travels before it reaches the shelf in the shop or supermarket. This type of survey cannot readily identify food miles since it does not follow food throughout its entire supply chain. We do however have measures of the number of miles run in moving a quantity of goods within the supply chain.

Figure 32 shows the average figures for each fleet by activity, with tertiary operations, generating the most mileage per pallet moved.

2.8 Operating Restrictions

The Survey also covered, for the first time, the extent to which fleet operations were affected by local authority restrictions or by restrictions placed by customers. Although this area was thought to be of interest many fleets were unable to respond with sound data.

Only 4.5% of fleets reported local restrictions on the operation of their own depot, with just two saying that the restrictions affected both loading/unloading and vehicle movements.

Delivery restrictions have greater impact with 40% of food fleets and 59% of drinks fleets reporting customer delivery time restrictions. The impact was most severe in food with some fleets reporting that all customers placed delivery restrictions on them. The extent of the restrictions is shown in Figure 33 below.

Figure 33 % of customers with delivery restrictions (food)

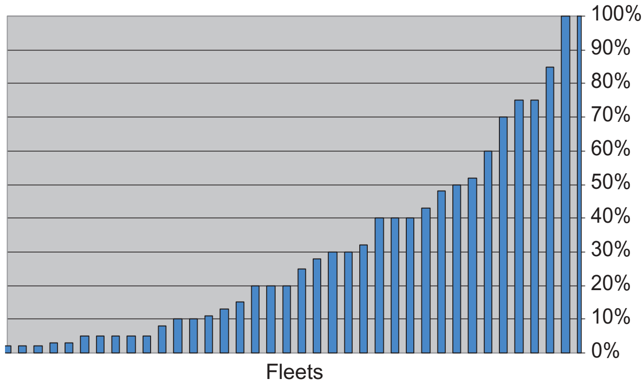
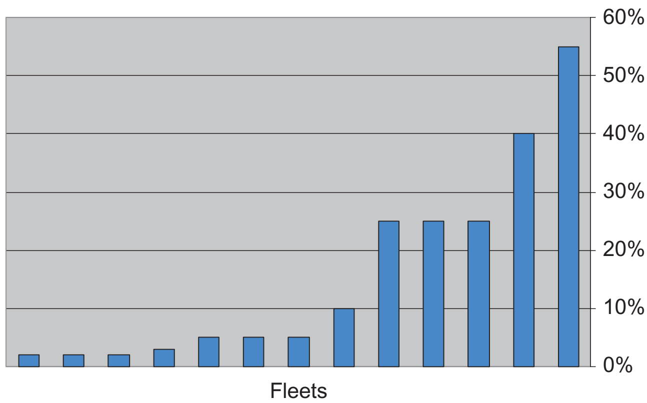


Figure 34 % of customers with delivery restrictions (drinks)



3 Conclusions

3.1 Levels of Efficiency

The 2007 Survey suggests that fuel consumption of vehicles within the food sector has not improved drastically since the first survey in 1998. Within the three groups of rigid vehicles one has improved, one has worsened and one has remained the same. Articulated vehicles have shown the best improvement with all but city artics becoming more fuel efficient over the 9 year period. Consumption has improved by 6% and 5% for the two heavier groups.

The reasons for these levels of change cannot be readily identified from the Survey. There will have been many changes in the nature of the food supply chains since 1998, and the mix of the fleets in the last three Surveys has changed. Nevertheless it is disappointing that the undoubted improvement in vehicle fuel efficiency produced by technical advances has not fed through to operational results. The alternative view is that, but for those technical and engineering changes, the changes in the nature of the food supply chain would have made the fuel consumption figures significantly worse.

The amount of product carried, or vehicle fill, is one of the most important measures of utilisation and hence efficiency. In most cases vehicles carrying food will reach their volume capacity the weight carrying capacity. Most food product is not particularly dense and the increased use of packaging reduces the density of cases and pallets still further.

Since 2002 the use of height within vehicles has changed. There are now fewer trips with less than 0.8m of the vehicle's height used, 5% compared with 9%, and 35 % of trips had product over 1.7m compared with 15%. Utilisation of vehicle deck space increased from an average of 69% to an average of 74.8%. Weight utilisation has increased slightly from 53% to 55.1%.

Empty running is a measure of vehicle inefficiency and most companies will try to eliminate it, since, by definition, vehicles cannot be earning revenue when running empty. In practice the level of empty running will often depend on the type of operation being considered, but also within operations, on the way in which vehicle routes are planned. Multi-drop loads tend to have the lowest empty running since only the last leg is empty. That last leg can, however, be a long one if deliveries are made on the outward journey, with the last drop at the furthest point.

In 2007 the levels of empty running averaged around 24% for the food fleets and 20% for the drinks fleets, with extremes ranging from virtually none to just less than 50%.

Time utilisation appears not to have changed significantly with approximately one third of vehicle time spent idle and one third spent on the road. The 2007 Survey asked about tractor unit utilisation and as expected these were much better with almost 50% of the time spent on the road. The drinks sector faired worse here with only 22% of time spent on the road (29% for tractor units).

Taken across the day it is clear that primary movements have become largely a 24 hour operation. Secondary operations are now spread across 24 hours with a clear peak during the period which might be regarded as a normal working day. Tertiary operations are substantially a 'day' operation.

The results for Deviations from Schedule (Delays) show that traffic congestion is the major reason for delays to occur, but with a small increase from 31% in 2002 to 32%. The proportion of time lost due to traffic congestion is, however, much lower at 19%. In the drinks sector congestion causes 21% of delays but 13% of time lost. The major cause of time lost through delays, in both food and drinks, is own company actions and delays at loading and unloading points.

3.2 Utilisation over 24 hours and 7 days

The results suggest that, for many operations, vehicles spend a considerable proportion of their time off the road, whether pre-loaded or simply idle. The Time Utilisation charts also show that many operations are still based around a 'normal working day'.

Two major problems need to be overcome if this 'available' time is to be used. The first is that in most cases transport operators are aware of the opportunity but are constrained by the effects of customer delivery requirements. The second is the likelihood that more out of hours operations are likely to lead to more objections from the public, usually because they live near to transport or warehousing sites, or the premises receiving deliveries or on the roads leading to them.

These are often seemingly intractable problems, but, given the size of opportunity they represent they cannot be allowed to stop all progress in this area.

3.3 Summary

In summary the results show:

- Opportunities exist for improvement in vehicle utilisation but the combination of the 75% already being achieved and the limitations imposed by customer service requirements will probably make further progress increasingly difficult.
- Empty running appears to have increased
- Time utilisation remains an issue with vehicles running on the road for just one third of their available time.
- In food tertiary and drink supply chains most of the activity takes place during the day, offering more opportunity for out of hours deliveries. This is much less the case in secondary operations. Primary activities are well spread across the whole 24 hours.

- Vehicles operations still experience delays but those with the biggest impact are generated within suppliers or customers premises rather than by traffic congestion.
- There have been changes in the levels of fuel consumption achieved but little improvement overall.
- With the advent of seven day trading transport activities have also become more evenly distributed across the week. Saturday and Sunday activities now equate to approximately 1.5 week days, representing a substantial shift of traffic away from Monday to Friday.

Glossary of Terms

This short glossary is included to clarify the definitions of those terms used in the report whose meaning may be open to interpretation.

Drink Sector

The sector moving alcoholic drinks from manufacturer or importer to the end user, via retailers, licensed or off-license premises. Soft drinks would be regarded as falling into the food sector although relatively small quantities will have been present on drinks deliveries to pubs, clubs and restaurants.

Primary

Movement of saleable product, raw material, work in progress, returns, packaging or handling equipment between a supplier and factory/factory and NDC/NDC and customer's RDC, Hub depot or Wholesale depot including 'Cash & Carry's.

Secondary

Movement of saleable product from retailer RDC or Food Service Hub depot into retail outlet or picking depot. In addition, the return of equipment or goods from outlet to RDC or Hub.

Tertiary

Movement of saleable goods from a factory, regional or picking depot, including wholesaler, into the final outlet where product is consumed i.e. home, pubs & clubs, small independent corner shops, retail forecourts or restaurants.

Urban Artic

A tractor and semi trailer combination which has been specified to operate specifically in an urban environment where access and manoeuvring space might be limited. The tractor will invariably have a single rear axle and usually have a gross combination weight of no more than around 26 tonnes. The semi-trailer will usually be single axle and probably 7-10 metres long.

Drawbar

A vehicle consisting of a combination of a rigid vehicle towing a trailer, that is a trailer which supports its own weight independently rather than imposing some of it on the drawing vehicle.

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