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LCV Scoping Study – Phase 1: Review of Published Literature

Report to DfT Logistics Policy Division
ED06135 Issue 1

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Executive summary

The Department for Transport defines light vans (also known as light commercial vehicles (LCVs) or light goods vehicles) as goods vehicles up to 3,500 kg gross vehicle weight. This definition includes all car-based vans and those of the next larger carrying capacity such as transit vans.

Within its Distribution White Paper, the DfT indicated that the growth of LCVs is likely to continue for the foreseeable future and will be faster than for both medium and large goods vehicles combined. The DfT recognises that 'over the last decade the van population has increased by a third and van traffic by 40%, compared with increases of 15% in car traffic and nearly 20% in large goods vehicle (LGV) traffic. There has been a need, therefore, to obtain information about vans to complement information available on cars and large goods vehicles to provide a complete picture, particularly in relation to road freight activity'.

Similarly, the Department recognises that while statistics and market composition data, vehicle profile trends and operational priorities remain broadly unavailable, the job of qualifying and quantifying LCV contributions to strategic objectives will remain a difficult task.

This study aimed to provide an overview of the UK LCV market by presenting key facts and information and will contribute to DfT's understanding of one of the most important, but probably least understood, elements of service and freight transport modes. It aimed to:

- Identify gaps in current knowledge of LCVs
- Identify policy-industry needs mismatch
- Provide key sector perspectives of LCV utilisation
- Consider future research needs relative to LCV operations and DfT freight policies
- Provide recommendations for subsequent DfT activities and policy considerations

It is anticipated that the recommended actions resulting from this research will assist DfT in developing the scope and objectives of subsequent research phases in order to lead to gaining long-term reductions in carbon dioxide and accidents from the light commercial vehicle sector.

For the purpose of this study, the main LCV types were subdivided into three core weight categories:

- Small car derived LCVs up to 1.8 tonnes
- Medium sized LCVs with a weight range of 1.8t – 2.6 tonnes
- Large sized LCVs with a weight range of 2.6t – 3.5 tonnes

Included in these categories are certain LCVs that are built as hybrids to transport both passengers and freight. These are known as crew cabs and include seating in addition to the driver and driver's passenger, and space for equipment.

Research shows that the LCV market has grown considerably from 2001 to 2005, reflected in the rise of total registrations and total new registrations. Within this, large sized and pick-up type LCVs have seen the biggest increase, while small car derived vans and medium sized LCVs tend to have stabilised. Registration of crew cab style LCVs remains small, indicating demand from a limited sector.

Diesel is the main source of power for LCVs, due to its superior fuel economy performance, robust design and ongoing improvements in engine technology, e.g. turbo charging. The use of petrol is of less importance with a low and static pattern of registrations. Alternative fuelled vehicles play a marginal role in the LCV sector, with around 1,000 vehicles registered in 2005.

Overall, vehicle purchasers consider LCVs as workhorses, with durability and carrying capacity being important considerations. Despite this, vehicle style and driver comfort has become an important purchase factor and manufacturers have increasingly adopted innovations from the car market, improving items such as aesthetics and additional driver comfort based equipment, e.g. air conditioning. This type of model specification 'creep' is most evident in the pick-up market.

The current sales regime within the LCV sector appears to be disjointed, with a range of different showrooms being employed by manufacturers for this purpose, from car dealers and LGV dealers to dedicated LCV dealers. The different sales techniques employed within each showroom are likely to have an impact on the type and specification of LCV sold to individual purchasers, with car dealers more likely to sell an LCV as if it is a car, e.g. based on power, speed and additional features, rather than user needs, e.g. loading space, cost of ownership etc.

The range of LCVs available in the UK is dominated by Ford, which produces a wide range of vehicles to suit a variety of operational requirements. Other manufacturers, such as Mercedes or Volkswagen appear to focus their attention on one or two specific model or range types, while LDV manufacture a single model. This shows that individual manufacturers focus on different markets within the LCV sector and have different approaches to model development. Despite this, there is a degree of manufacturer interaction and collaboration, especially with regards to design, platform and parts sharing, in order to minimise development costs.

The research indicates that the LCV user industry can be split into two generic sectors dependent on whether the van is used to deliver goods, or in connection with providing a service.

Of the industry sectors researched, the majority fit within the service sector, namely Construction, Utilities, Contract Hire, Public sector, Telecommunications and Breakdown services. Of the remainder, two can be classified into the delivery sector (i.e. Mail and Courier services), while the Pharmaceutical sector appears to overlap both sectors, being the provision of a service to the health sector but also used for the delivery of goods to local pharmacies.

In all cases, vehicle selection depends on the operation, for example, the majority of courier and mail deliveries are undertaken in vans under 3.5 tonnes, whereas grocery deliveries take place in highly customised vehicles having the loading space divided into three compartments - ambient, chilled and frozen. Within the utilities sector, the vans are more likely to be fitted with specialist racking and other additional equipment, whereas the construction sector is more likely to utilise the basic LCV body shape. It is therefore crucial for companies to operate the right vehicles in the operation.

The sophistication of the fleet management process is often related to the industry sector and the size of the company. However, this does not suggest that all large fleets are managed well and that all small fleets are managed badly. This study shows that some large LCV fleets could be managed better, especially in relation to fuel consumption and mileage reduction, while some small fleets could be described as practitioners of 'best practice' techniques.

There are a wide range of regulations that impact on the LCV sector. This itself may result in a degree of confusion for LCV operators, as they may be unaware of some of these regulations and how they impact on their business. The lack of specific regulation concerning the driving of LCVs could be seen as a benefit as it allows anyone to drive a van up to 3.5 tonnes, thus providing businesses with easy access to a driving related workforce. However, this could also be seen as a problem, as those drivers may not be at ease driving a van, which could result in vehicle damage, excessive fuel use and potentially lead to accidents.

The overall numbers of LCVs involved in accidents has decreased steadily since 2001 even though the total number of LCV registrations, and hence the total number of LCVs on the road, has increased during the same time period.

The number of large LCVs (2,600 to 3,500kg) involved in injury accidents in both 2003 and 2004 has increased compared to the numbers occurring in both 2000 and 2001. However, it should be noted that there has been a significant increase in the total number of large van registrations in recent years from approximately 1.2 million in 2001 to approximately 1.6 million in 2005.

There has been a significant reduction of more than 50% in the number of small vans involved in injury accidents in 2004 compared with the numbers occurring in 2000/2001, even though the number of small van registrations has remained fairly stable during this time period. Accident numbers for medium sized vans have also decreased, although the number of medium van registrations has also remained fairly stable.

In general the research carried out has shown the following:

- The most dangerous roads for LCVs are A class and unclassified (i.e. urban and country roads)
- The age group most likely to have an accident are the 40 – 49 age group
- The manoeuvre most likely to result in injury accidents is “going ahead other”

Similar to the regulatory regime, the health and safety regime does not appear to be specifically targeted at the LCV industry. However, it does impact upon the industry and there is the potential for LCV operators to misunderstand to what degree these regulations impact upon them and the likelihood of prosecution.

From an environmental perspective, there has been a major reduction in the carbon dioxide (CO_2) emissions originating from petrol fuelled LCVs since 1990 (from 57% of all van emissions in 1990, to around 10% in 2004) and a corresponding increase in the importance of diesel powered vans. It therefore appears unlikely that petrol fuelled vans will regain their once dominant position.

However, the intrinsically lower CO_2 emissions of diesel fuelled vehicles, relative to petrol fuelled equivalents, has, to some extent, offset the increases in the numbers of vans in the fleet, and the increases in vehicle-km being driven. However, with the move to virtually 100% diesel vans, this offsetting has reached its maximum and further increases in vehicle numbers and activity (vehicle-km) would produce a corresponding increase in CO_2 emissions.

As part of this study, Momenta were tasked with providing recommendations to the Department, which could enable them to develop LCV based sustainable distribution policies and possible best practice guidance and user information. These recommendations include:

- The Department for Transport, in combination with its executive agencies, could look to rationalise their data recording methods with respect to LCV registrations and accidents, e.g. based on weight categories. This would enable the Department to gain a clearer understanding of the LCV market and therefore would assist in the easier development of sustainable distribution policies.

- With the Large Sized Light commercial vehicle dominating the market place, it is essential that any future awareness raising focuses on influencing this sector first to gain significant market penetration. It is therefore recommended that any publications are developed with this market in mind, while still being useful for other van segments.

- It is recommended that DfT continues to maintain dialogue with LCV manufacturers to ensure that the Department is fully briefed on the next stages of LCV product development. This dialogue could take place through a specific manufacturer working group, or by a greater involvement in the SMMT Van Group.

- The Department could undertake a number of benchmarking, Key Performance Indicator or supply chain studies in specific sectors to gain a further understanding of the utilisation of LCVs. This would enable the Department to better target and influence certain industry sectors, to ensure greater market penetration of any best practice style information.

- The Department could develop a long-term strategy to influence and spread the uptake of best practice techniques within the LCV sector. Such a strategy would need to reflect the differences between large and small fleets and could include the development of guidance notes and specific management guides.

- The Department could look to research and produce simple documentation to clarify and reinforce those regulations that impact on the LCV industry, to ensure that van fleets are operated in a manner that is consistent with government policy.

Contents

1 INTRODUCTION

The Department for Transport defines light vans (also known as light commercial vehicles) as goods vehicles up to 3,500 kg gross vehicle weight. This definition includes all car-based vans and those of the next larger carrying capacity such as transit vans. Also included are ambulances, pick-ups, milk floats and pedestrian controlled motor vehicles.

Light commercial vehicles (LCVs) have an important role in meeting DfT safety, environment, economic and accessibility objectives. Suppliers, users and beneficiaries of these vehicles have control on vehicle design and their subsequent use, and in turn impact on these policy areas. However, little is known about these stakeholders and the specific influence they have on the LCV sector. While statistics and market composition data, trends, operational priorities and stakeholder information etc, remain broadly unavailable, qualifying and quantifying LCV contributions to strategic objectives will remain a difficult task.

Within its Distribution White Paper, the DfT indicated that the growth of LCVs is likely to continue for the foreseeable future and to be faster than both medium and large goods vehicles combined. The DfT recognises that 'over the last decade the van population has increased by a third and van traffic by 40%, compared with increases of 15% in car traffic and nearly 20% in LGV traffic. There has been a need, therefore, to obtain information about vans to complement information available on cars and large goods vehicles to provide a complete picture, particularly in relation to road freight activity' (DfT, 2005).

Recent statistics published in the DfT's 2005 annual report also indicate that Large Goods Vehicles (LGVs) are moving more goods over fewer total kilometres, reflecting greater efficiency in that part of the supply chain. Unfortunately, it is not known whether the same efficiencies are being delivered by those LCVs delivering freight consignments, especially in today's commercial supply chain climate of reduced inventories, lean production techniques, quick response and increasingly demanding customers.

The term light commercial vehicle (LCV) refers to all commercial vehicles (both car derived and panel van type vehicles) up to 7.5 tonnes. However, for the purpose of this study, it is proposed to focus on the lower weight limits, i.e. 1.8 – 3.5 tonnes. The main LCV types vary in size and can be subdivided into three core weight categories:

- Small car derived LCVs up to 1.8t
- Medium sized LCVs with a weight range of 1.8t - 2.6t
- Large sized LCVs from 2.6t to 3.5t

There are certain LCVs, which are built as hybrids to transport both passengers and freight. These are known as crew cabs and include seating in addition to the driver and driver's passenger, and space for equipment.

These types of LCV also vary in size and type and range from 'Mitsubishi Warrior' style pick-ups to Ford Transit style crew cabs. These types of LCV are common in the construction and service sector.

For this study, the term 'commercial' comprises all vehicles used to carry goods and/or equipment. This includes private and public users, individual and company owned vehicles. At present there are two main sub-sectors of the LCV market, which are described in detail below.

Freight transport is where the LCV's sole function is to carry goods. This could be the operators' own goods (own account) or another party's (hire and reward). This type of freight includes courier and home delivery operations.

This LCV operation occupies a niche position in two respects, typically providing the final or initial leg of the supply chain, where local restrictions or economics preclude a larger vehicle, and as a backup/time urgent function. The reduction in stock holding in line with just in time logistics and sophisticated inventory management is encouraging frequent low volume orders, which are ideal for LCVs. In addition, the apparent growth in the popularity of home delivery may also mean that home delivery companies require more LCVs. There is also significantly less regulation than with vehicles above 3.5 tonnes, making them more straightforward and cheaper to operate as opposed to large goods vehicles (LGVs).

Service Provision is where the LCV is used to carry equipment and personnel to remote premises.

A wide range of service activities take place that involve an engineer or service provider performing a vehicle trip to a premises in order to carry out some form of servicing. Many of these trips involve the carriage of goods (such as tools of the trade, equipment, spare parts etc). The goods moved as part of the service operations are different from other freight trips since they are not consignments that are shipped and received as part of a service activity.

The general improvement in communications, the road network, affluence and a growth in the service sector all play their part in encouraging the use of LCVs for this activity.

Although some initial DfT research and statistics have been published on the LCV sector, the data remains at a macro level. More useful to specific policies is to break this data down into sector specific and operational information, for example, by identifying how many vans are utilised in the pharmaceutical sector, determine what type of vehicles are used and how are they deployed. This sector breakdown can assist DfT policy makers in identifying methods of targeting resources more effectively to tackle core policy requirements.

The Department for Transport commissioned Momenta to undertake a literature based research study into the light commercial vehicle sector which took place during May – July 2006. To make the task practical and manageable, the study set some basic parameters to focus its attention:

This LCV study aimed to provide an overview of the UK LCV market by presenting key facts and information. The study will contribute to DfT's understanding of one of the most important, but probably least understood, elements of freight transport modes. It aimed to:

- Identify gaps in current knowledge of LCVs (e.g. best practice, supply, use, maintenance, etc)
- Identify policy-industry needs mismatch (e.g. health and safety, environment, etc)
- Provide key sector perspectives of LCV utilisation
- Consider future research needs relative to LCV operations and DfT freight policies (e.g. Key Performance Indicator research)
- Provide recommendations for subsequent DfT activities and policy considerations (e.g. LCV best practice programme)

It is anticipated that the recommended actions resulting from this phase will assist DfT in developing the scope and objectives of subsequent research phases in order to lead to gaining long-term reductions in carbon dioxide and accidents from the LCV sector.

This study was made up of the following key elements:

Identification and location of relevant information sources
This stage of the study aimed to identify and locate the information sources required to undertake the LCV market review. This included Internet searches, CD ROMs, media releases, company reports and research publications.

Critical analysis and policy review
The study then reviewed and summarised this information in relation to its impact on the LCV industry and its relevance to DfT objectives.

Identification of areas for further research
As one of its outputs, the review identified gaps in knowledge according to subject matter.

Research areas
The study utilised a mixture of desk based research employing Internet, published documents and telephone information gathering techniques, covering the following areas:

- LCV market sizing
- LCV manufacturer profiling
- LCV user profiling
- Fleet management techniques
- Driver numbers and training issues
- Maintenance and support networks
- Regulators and stakeholders
- LCV type approval processes
- LCV taxation issues
- The European LCV market
- UK LCV accident and safety review
- UK LCV licensing and registration
- Environmental considerations

2 LCV MARKET PROFILING

The basis for understanding the LCV market is the quality and availability of reliable data. This can be used to develop a picture of the market and assist with identifying trends and behaviour. In order to construct this picture, the project aimed to consider the following:

- The total number of LCVs registered for a period of 10 years
- The total number of new LCVs registered for a period of 10 years

These were then further segmented into:

- Region
- Type of propulsion
- Type of LCV

2.1 LCV categorisation

The types of LCV considered were based upon the project scope, namely:

- Small car-derived (up to 1.8 tonnes)
- Medium sized LCV (1.8 to 2.6 tonnes)
- Large sized LCV (2.6 to 3.5 tonnes)
- Pick-ups
- Crew cabs

A thorough analysis of the data indicated that the project would need to make several assumptions and pay particular attention to the process of cleaning the data. Much of the information was raw, did not necessarily fit the scope of the project and required some conversion.

Currently the Department for Transport (DfT) uses 35 headings to record LCV registrations (both total and new) and these are identified below.

Table 2.1: Department for Transport LCV categorisation

Type	Type continued
Panel van	Tipper
Box van	Low loader
Car derived van	Truck
Light goods	Breakdown Truck
Pick-up	Tanker
Motor home/caravan	Solid bulk carrier
Van/side window	Concrete mixer
Light van	Mobile plant
Pantechnicon	Car transporter
Luton van	Refuse disposal
Insulated van	Goods
Glass carrier	Front dumper
Specially fitted van	Skip loader
Van	Special mobile unit
Livestock carrier	Light 4x4 goods
Float	Airport support
Flat lorry	Skeletal vehicle
Dropside lorry	

This extensive list gives an indication of the wide variety of light commercial vehicles being operated within the UK. However, as the study aimed to focus on five specific LCV types, this list created a challenge to the project team, particularly in the areas identified below.

Vehicle groupings
In order to use the statistics for the project, the 35 headings provided by the DfT were broken down into the project's 5 types of LCV as follows:

- 'Small car-derived' (SCD) is made up solely of 'car-derived van'

- 'Medium sized LCVs' (MSL) comprises light goods, light van and van. As discussed later, there was no way of dividing panel vans into individual weight categories. However, if there were, many of the panel vans would probably fit into this category.

- 'Pick-ups' (PU) consist of pick-ups and light 4x4 utilities, which may also include other commercial vehicles based on, for example, the Land Rover platform. Similar to MSL, there is no method of rationalising this heading.

- 'Crew cabs' (CC) were assumed to be vans with side windows. There may be duplication with pick-ups, but there is no way of analysing this further as the information is currently unavailable.

- The remaining 28 headings were placed into the 'large sized' LCV (LSL) category, with the exception of motor homes/caravans, which are not considered to be LCVs for the purpose of this study.

Examples of LCVs:

Car Derived Van – Vauxhall Corsavan

Medium Sized LCV – Ford Transit Connect

Medium Sized LCV – Vauxhall Vivaro

Crew Cab LCV – Ford Transit Crew Cab

Large Sized LCV – Vauxhall Movano

4x4 LCV – Nissan Navara

Weight information
The LCV statistics provided by DfT did not include the weight of the vehicle. Therefore, for vehicles such as panel vans, there was no viable/appropriate method for dividing these between the MSL and LSL categories.

The data supplied by DfT details all LCV types up to 7.5 tonnes. However, for the purpose of this study, LCVs over 3.5 tonnes were classified as Large Goods Vehicles (LGV) and not considered. As can be seen from the categories supplied (Table 2.1), there are a number of categories that could cause confusion, for example truck, tanker, etc.

2.2 Licensed numbers and registration trends

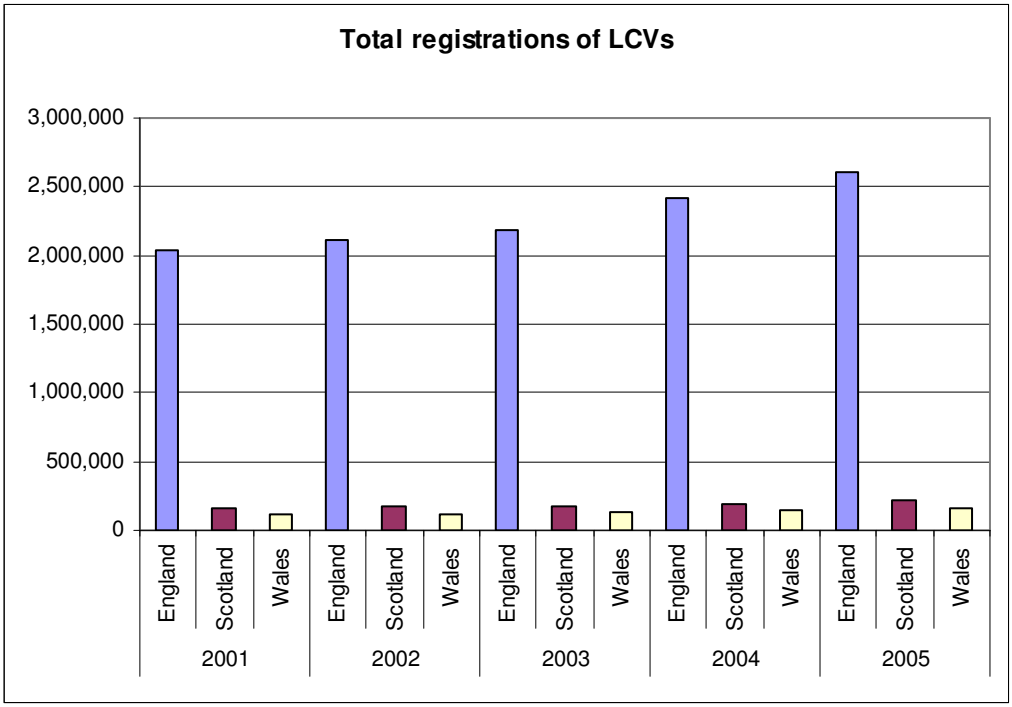
The following analysis was based on five year's licensing and registration information supplied by the DfT Vehicle Statistics division. This information was supplied in two main categories, which were:

- Total registrations (i.e. the total number of registered LCVs on the road)
- Total new LCV registrations.

Figures 2.1 to 2.10 show a diverse market with a number of interesting characteristics and from this a number of trends have been identified. The following sub-sections highlight these trends and offer some possible explanations for them.

The increase in total registrations
Total LCV registrations have grown rapidly between 2001 and 2005. For England this represents an increase from 2.04 million to 2.6 million (an increase of 27%), Scotland 162,853 to 274,510 (68%) and Wales from 112,624 to 163,259 (45%). This trend appears to coincide with a period of prolonged economic growth and activity, which has the potential to continue to increase demand for LCVs.

Figure 2.1



Source - DfT Vehicle statistics

Changes to urban freight activity, and restrictions on LGVs within urban areas, could also increase the registrations and use of LCVs. The pressure of operating LGVs within these urban areas (e.g. physical restrictions and congestion) could make the use of LCVs more attractive as an alternative –

this is especially true of the home delivery market. The trend for freight operators to use urban consolidation centres, may also increase the numbers of LCVs through the transfer of loads from LGV traffic to LCVs.

In addition, there has been a concerted effort to improve enforcement and raise standards of LGV operators. For example, since 2003/04 VOSA have provided new technology to traffic examiners to give them easier access to more information at the roadside. VOSA have also moved to a targeted enforcement framework to establish a uniform and common approach to targeting non-compliant operators. Since 1999, there have been tougher entry requirements to the industry e.g. the changes to admission to the occupation of road haulage operator requirements (good repute, professional competence, and financial standing) that hire or reward LGV operators must meet if they wish to hold an operator's licence. This may result in some transport activity moving from LGVs to LCVs. Forthcoming legislation to implement the Compulsory Training Directive (scheduled for launch in 2009), into domestic legislation will ensure that all LGV drivers undertake regular training. This may increase the trend of utilising LCVs to transport more goods.

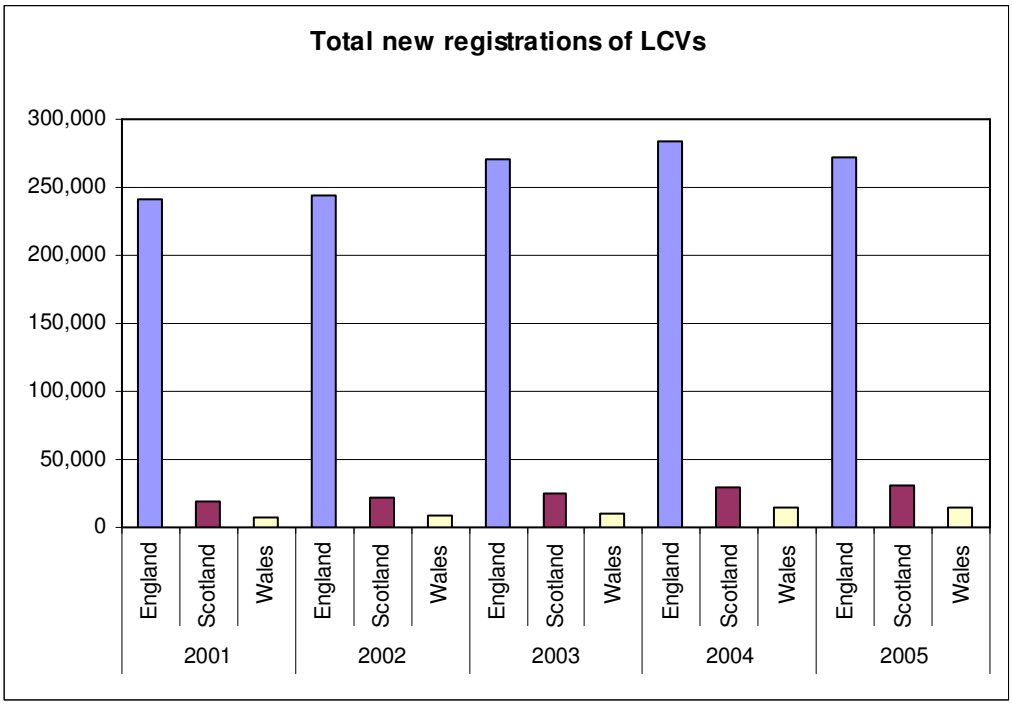
The increase in total new registrations

Figure 2.2 shows that there has been an increase in new registrations between 2001 and 2005. For England, this represents an increase from 247,197 to 284,344 (15%), for Scotland from 18,591 to 30,283 (63%) and Wales from 7,207 to 15,235 (111%). This indicates a healthy demand for light commercial vehicles, which in turn will increase the total UK LCV fleet.

There are several reasons for this growth in LCV registrations, including improvements to the strategic road network and improving the geographical area that LCV operators can serve. LCV users can now travel further to service a wider market than before. This is typified by the M25, where greater distances are now practical. This all assists the growth of the service and courier sectors, which in turn further increases the demand for LCVs.

The pattern of out-sourcing and sub-contracting is fragmenting the structure of the users market, for example the construction industry relies on a complex network of main contractors, sub-contractors and even sub-sub-contractors. This is changing the co-ordination of transport for these activities, with different actors in different locations all operating their own vehicles.

Figure 2.2



Source - DfT Vehicle statistics

Changes in the structure of the macro-economy are also affecting registrations. Manufacturing is in many cases moving to lower volume, higher value items, which are more suitable for LCVs. In addition, the increase in service activity, away from manufacturing means that there is higher demand for LCVs.

Supply chains are relying on less stock as manufacturing uses just-in time systems as standard. This means that there is an increased demand for regular, lower quantity movements of stock, which suit the LCV sector.

Finally, the increased use of the Internet and the popularity of home delivery mean that home delivery companies require more LCVs. For many home delivery companies, LGVs are not suitable for restricted residential areas. Similarly, the demand for lower quantities of product by domestic households are likely to increase the demand for LCVs.

Despite this overall growth in LCV registrations, there was a slight decrease in the number of new registrations in 2005. There are a number of possibilities for this trend. Within this total, SMMT statistics suggest that car derived van (up to 1.8t) registrations dropped by 5% whilst those in the 1.8 to 3.5t range dropped only 0.5%, indicating that the main impact was in the smaller vehicle segment. In a market dominated by one or two manufacturers, any change in their sales figures will therefore impact broadly on the whole market (see section 3 for further information). This decrease in new registrations may also indicate that the LCV market is reaching saturation point and the growth profile may not be sustainable. It also suggests that the number of older LCVs is increasing, which may have an impact on maintenance, servicing and accident levels.

Regional variations

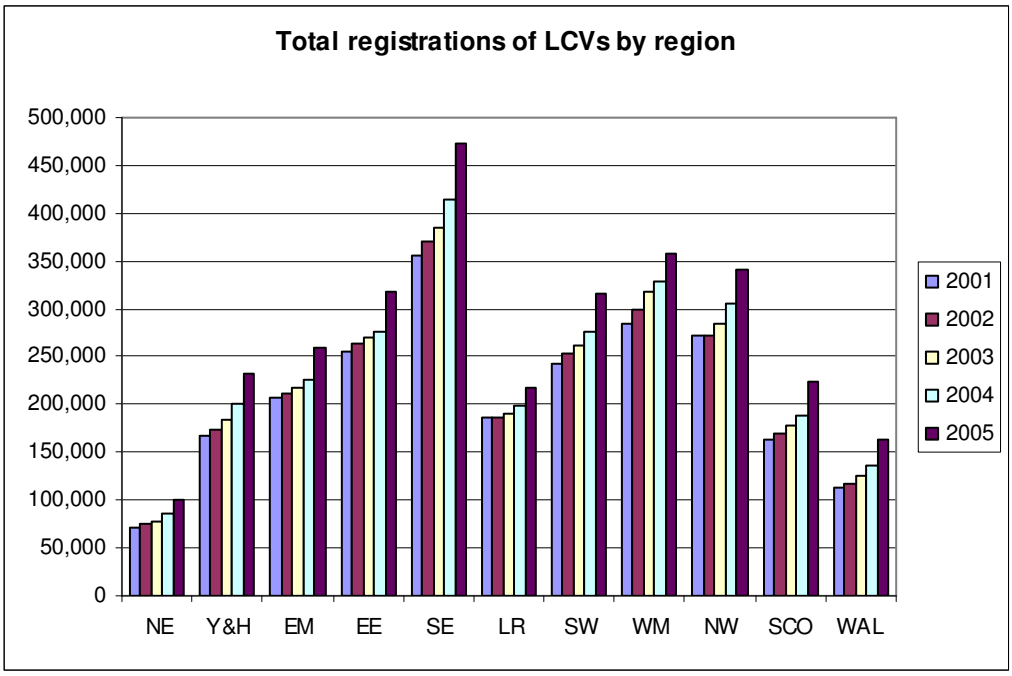
The regions used for this study are the 'English regions and Devolved Administrations'. This follows the method that the DfT uses to record the LCV statistics. These regions are defined in Table 2.2 below.

Table 2.2: Department for Transport regional split

Government region	Abbreviation
North East region	NE
Yorkshire and Humberside region	Y&H
East Midlands region	EM
East of England region	EE
London region	LR
South West region	SW
West Midlands region	WM
North West Region	NW
Scotland	SCO
Wales	WAL

There are several regional differences in LCV registrations. For total registrations all regions saw increases, for example the South East has seen numbers increase from 356,162 in 2001 to 471,795 registrations in 2005 (32%), whereas the East Midlands has grown from 207,738 to 258,456 (24%) in the same time period. This can be seen in Figure 2.3 and shows a picture of uniform increases in the total fleet, which suggests a comprehensive trend across the board.

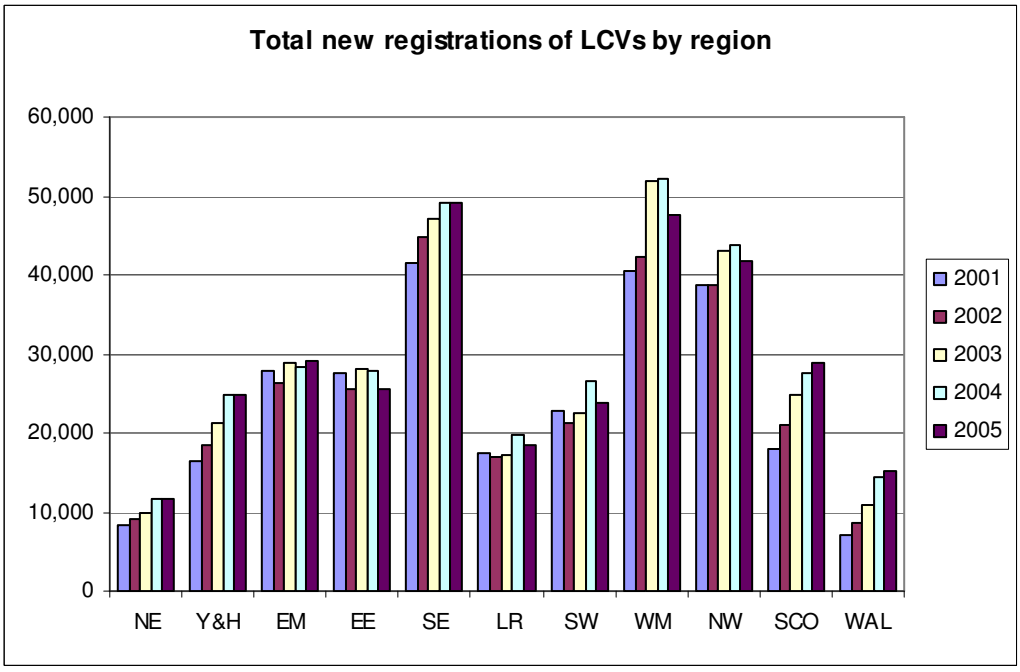
Figure 2.3



Source - DfT Vehicle statistics

The regional total new registrations provide a varied picture, as illustrated by Figure 2.4. Regions such as the North East, Yorkshire and Humberside, London, South East, South West, West Midlands, North West, Scotland and Wales have all experienced a growth in numbers from 2001 to 2004.

Figure 2.4



Source - DfT Vehicle statistics

The variation in regional new registrations demonstrates that certain regional markets have a changeable pattern of demand. It may be that certain markets are more cyclical in their demand for LCVs and this can create a pattern of peaks and troughs in registrations. However, other regions may be more consistent in their demand. The information supplied on regional new registrations indicates

that the largest growth in new registration markets from 2001 to 2004 appears to have occurred in the South East, West Midlands, Scotland and Wales. However, only Scotland and Wales have shown a continued increase in new LCV registrations in 2005.

2.3 LCV growth profiles

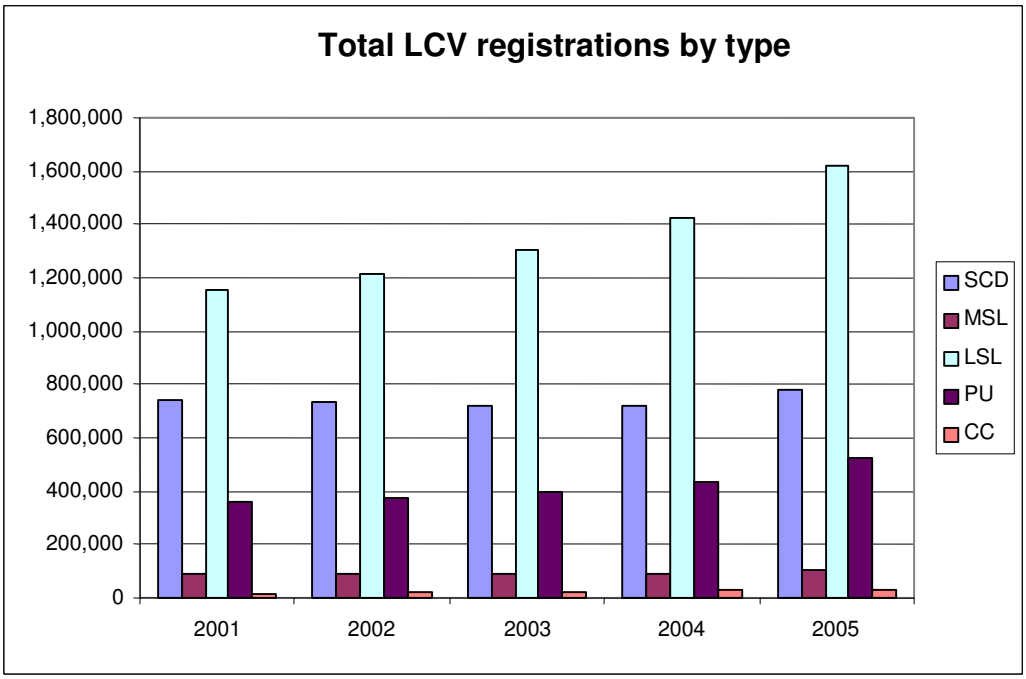
Small car-derived registrations
As can be seen from Figure 2.5, there has been little change in the total registrations of small car-derived (SCD) vans from 2001 to 2005. Similarly, Figure 2.6 shows that there has been little change in the total new SCD registrations from 2001 to 2005.

The number of SCD registrations continues to be stable in what is a growing market for LCVs, which would suggest that they are declining in importance. This may be due to users employing larger light commercial vehicles rather than small car derived vans. However this could not be confirmed, as there was insufficient vehicle weight information available.

Medium sized LCV registrations
The medium sized LCV total registrations have been relatively stable, increasing from 87,871 in 2001 to 101,599 in 2005 (approximately 16%). However, new registrations have declined from 11,387 in 2001 to 2,659 in 2005 (a decrease of 76%).

It is noted that the total numbers of new registrations for medium sized LCVs appears to be low which may be due to the way that vehicles have been categorised by weight category. This is identified by the analysis undertaken in the manufacturer market share analysis (section 3.3) in which medium sized LCVs are showing a healthy share of the overall LCV market. The difference in the information is most likely to be due to differences in the categorisation of data.

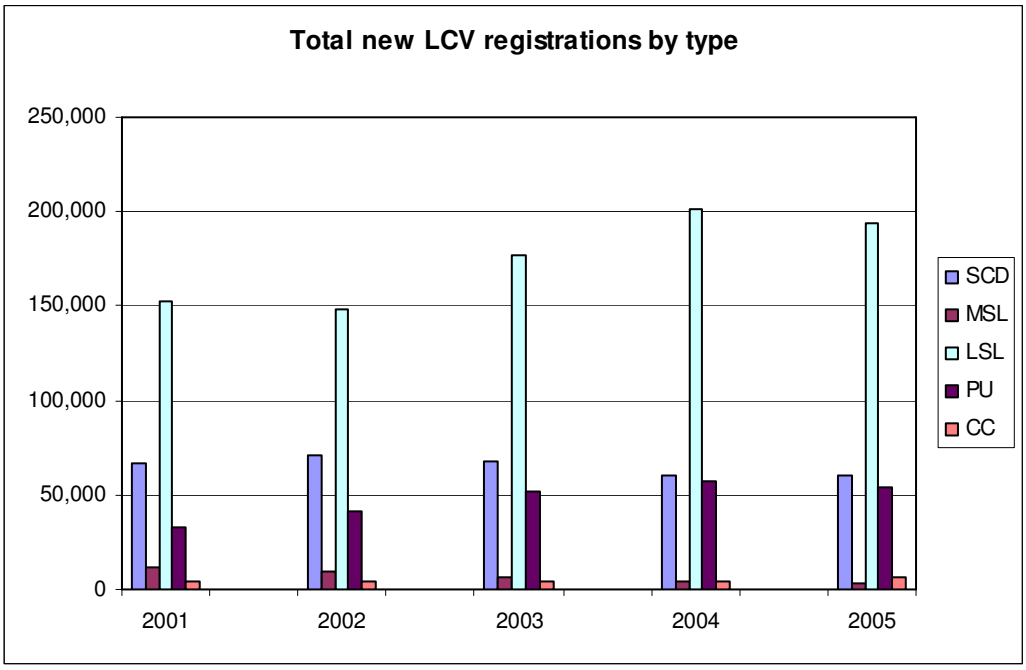
Figure 2.5



Source - DfT Vehicle statistics

Key for Figures 2.5 and 2.6:
SCD = Small car-derived
MSL = Medium sized LCV
LSL = Large sized LCVs
PU = Pick-up
CC = Crew cab

Figure 2.6



Source - DfT Vehicle statistics

Large sized LCV registrations
Total large sized LCV (LSL) registrations have increased rapidly from 1,155,286 in 2001 to 1,617,697 in 2005 (an increase of 40%). New registrations have followed a slightly different pattern with a slight overall increase from 152,626 registrations in 2001 to 193,781 in 2005 (27%). However, there has been a slight decrease in registrations from 2004 to 2005 which may have been due to buyers waiting for new model releases of vehicles such as the Ford Transit, Mercedes Benz Sprinter and VW Crafter to become available.

The LSL registrations broadly reflect the overall LCV market, showing considerable growth. This is representative of the entire market and suggests that LSLs are the dominant type of LCV. It also suggests that operators may be polarising their purchases to the bigger vehicles.

The dip in new registrations in 2005 (relative to 2004) demonstrates the importance of the LSL to the whole LCV market, as this is reflected in the total number of LCV registrations.

Pick-up registrations
Total pick-up (PU) registrations have grown from 356,955 in 2001 to 528,307 in 2005 (an increase of 48%). There has been a corresponding increase in new registrations from 32,386 in 2001 to 53,727 in 2005 (66%), despite a slight drop in registrations in 2005.

The PU registration growth has been considerable and may underline several important trends. Firstly, the growth in style and design within the LCV market has made pick-ups an attractive purchase as they cross over both work and leisure activities.

The construction sector is a large user of pick-up LCVs and a healthy construction market would increase the overall demand for these types of LCVs. Major construction projects such as the Thames Gateway, Channel Tunnel Rail Link, Heathrow Terminal 5 and Wembley Stadium as well as more regional renewal projects e.g. Manchester, Liverpool, and Birmingham are catalysts for growth.

Crew cab registrations
Total crew cab registrations increased from 17,473 in 2001 to 33,029 in 2005 (an increase of 89%). Despite this rapid growth in total registrations, the growth in new registrations appears to have remained stable, having grown from 4,471 in 2001, to 5,850 in 2005 (31%).

Crew cab total registrations appear to be increasing in line with a growing LCV market, although a lack of a similar increase in new registrations suggests that companies are keeping them on their fleet for longer than typical panel vans. The registration information also suggests that the use of crew cabs is a niche market.

Summary
Figures 2.7 and 2.8 below show the total new LCV registrations for 2001 and 2005 respectively. From these graphs it may be seen that there were fewer small car-derived and fewer medium sized new LCV registrations in 2005 than there were in 2001. In contrast, the number of new large sized LCV and pick-up registrations has increased in 2005 compared with those occurring in 2001.

Figure 2.7

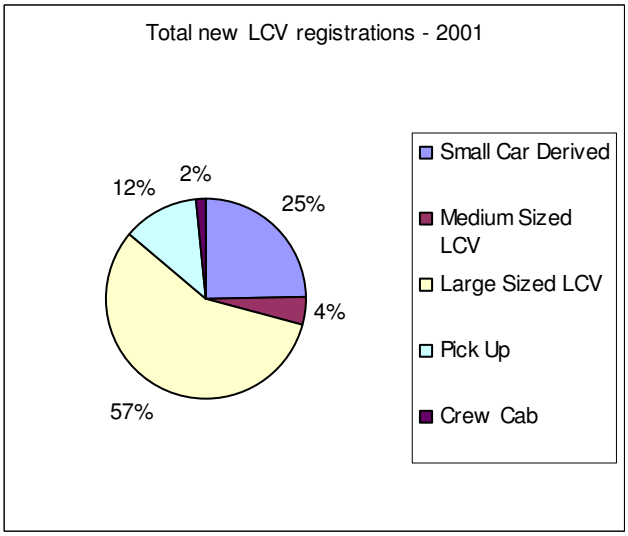
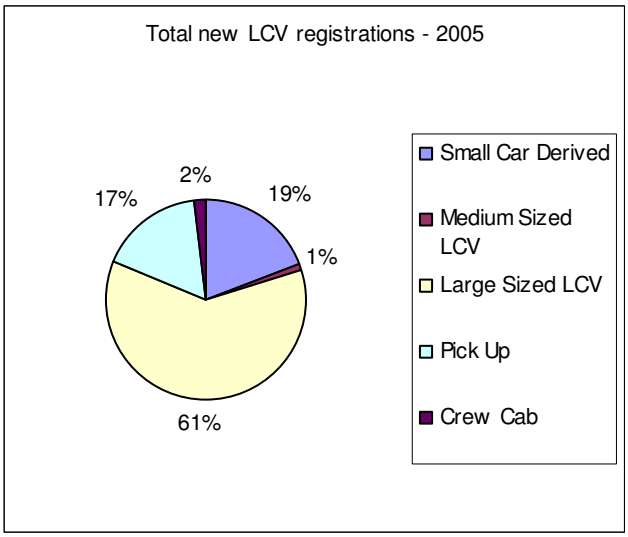


Figure 2.8

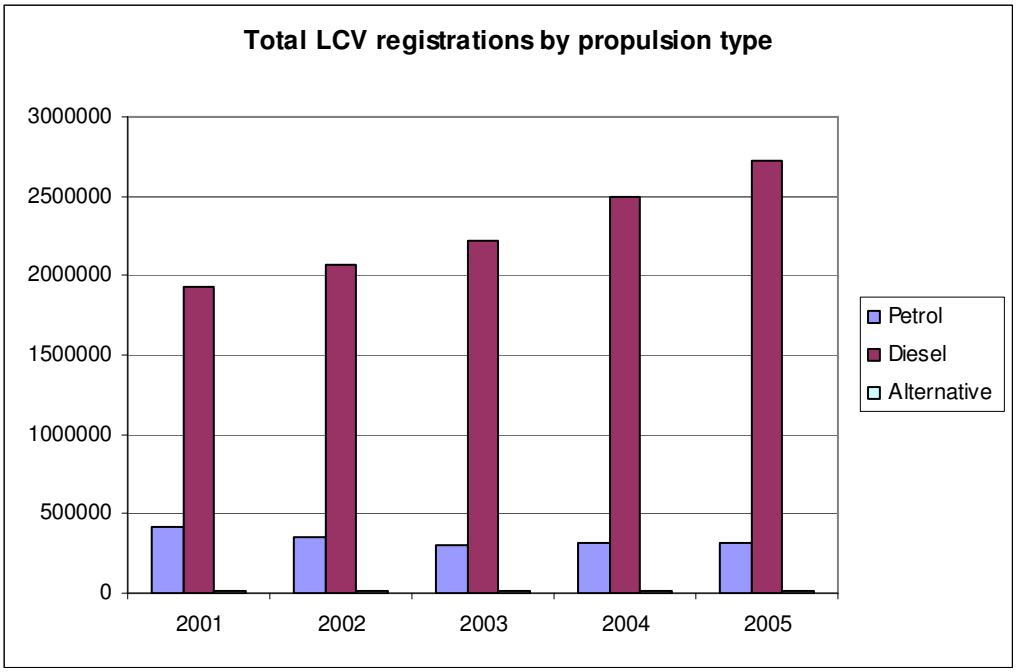


Overall, the information supplied from DfT vehicle statistics suggests that there has been a switch away from medium sized LCVs and small car derived vans to large sized and pick-up style LCVs.

2.4 Propulsion and fuel types

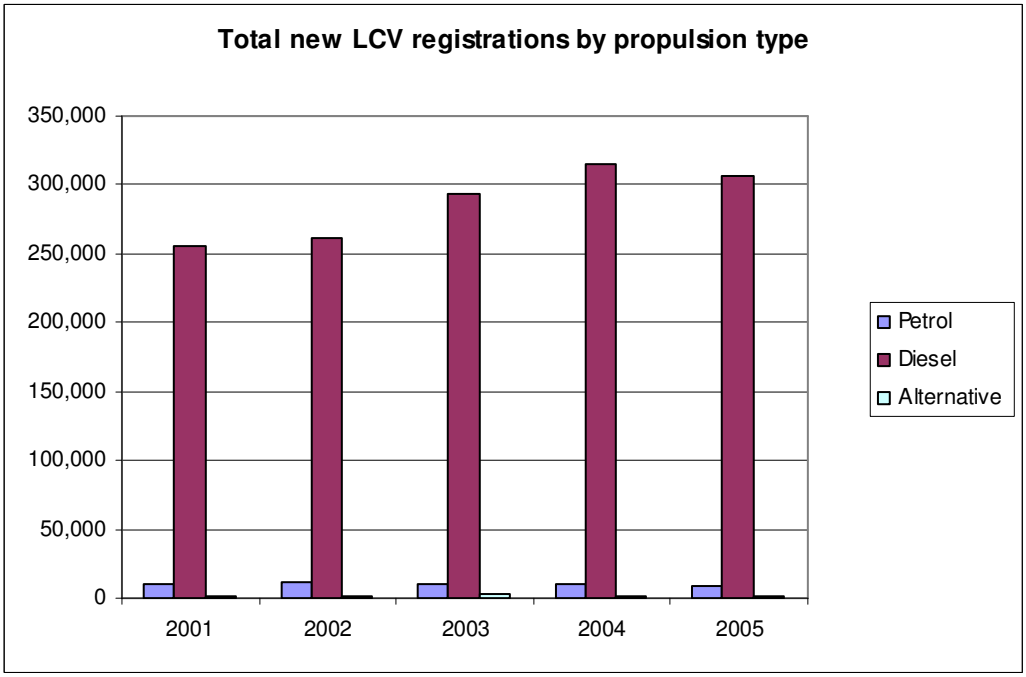
The propulsion types used for this study consisted of petrol, diesel and alternative fuels. Diesel is the most popular form of propulsion within the LCV market, accounting for some 2.7 million (84%) of the 3.2 million total LCVs registered in 2005. There has been an increase in new registrations from 2001 to 2004, although there has been a slight decline in numbers in 2005.

Figure 2.9



Source - DfT Vehicle statistics

Figure 2.10



Source - DfT Vehicle statistics

Traditionally diesel engines are popular within the LGV industry because of their hardwearing and robust design, which are essential requirements in this sector. In comparison, diesel engines for LCVs and cars were often slow and noisy. However, recent improvements in technology, particularly the turbo charging of diesel engines has made them a realistic option in smaller vehicles. As a result LCV buyers have considered diesel a viable option. In addition diesel offers important fuel economy benefits (if driven in an appropriate style), which maximises the efficiency of the vehicle. With the rising cost of fuel in recent years this has become an important factor.

Total petrol registrations have declined markedly from 419,809 in 2001 to 318,442 in 2005 (a reduction of 24%). Registrations of new petrol LCVs have remained around the 10,000 mark from 2001 to 2005. This suggests that the use of petrol power is limited to a number of niche markets.

It would appear that in recent years buyers have switched purchases away from petrol as diesel has become a practical alternative and petrol has become a relatively expensive source of power. However, information supplied by the UK Petroleum Industry Association (UKPIA) indicates that for a long period in the early 1990s the diesel pump price was significantly lower that petrol (UKPIA, 2006). This factor may have convinced a number of LCV manufacturers to produce more diesel variants of their models to take advantage of this fuel price differential.

Prior to the 1990s, petrol engines were more common and could produce the most suitable combination of torque and power for LCV users. However, recent advances in technology (e.g. fuel injection and turbo charging) mean that diesel engines can now produce sufficient power and torque for larger LCVs. If efficiencies with petrol engines were improved, it is possible that this trend may be reversed, particularly since the cost of diesel and petrol at the pumps is fairly similar at the present time.

In the period 2001 to 2005 the total alternative fuelled registrations increased from 9,636 to 16,831 LCVs (an increase of 75%). The pattern of new registrations for alternative fuels shows a different picture however, with registrations increasing by 170% from 1,160 (2001) to 3,136 (2003) and then subsequently decreasing by 50% from 3,136 (2003) to 1,586 in 2005.

It would appear that UK Government and local Government policy as well as operational needs could influence the alternative fuelled market. For example, the London congestion charge and Energy Saving Trust grant programmes may have contributed to the increase in alternative fuelled LCVs in the UK up to 2003. However, many operators have found that the use of alternative fuels such as Liquefied Petroleum Gas (LPG) and Compressed Natural Gas (CNG) has a number of difficulties, including loss of load space, reduced fuel economy and limited refuelling infrastructure. In addition these alternative fuels have faced competition from more efficient diesel engines, which may also be the reason for the decrease in registrations from 2003 onwards.

2.5 Summary

- There is a requirement for more accurate publicly collected information regarding weights and classification in order to improve the understanding of the LCV sector.
- The LCV market has grown during the period 2001 to 2005. This is reflected in the rise of total registrations and total new registrations. It is suggested that this is a reflection of increased economic activity, operational restrictions on larger vehicles e.g. 'O' licensing of LGVs, access constraints and important economic changes e.g. the sub-contracting phenomenon and the move to a more 'service' based economy.
- Large sized and pick-up type LCVs have seen the biggest increase in a growing market, whereas small car derived vans and medium sized LCVs tend to have stabilised. Crew cab registrations remain small showing the demand from a limited sector.
- Diesel is the main source of power for LCVs, due to robust engine design and improvements in fuel efficiency and advances in technology, e.g. fuel injection and turbo charging. However, the current market for petrol vehicles is of less importance with a fairly static pattern of registrations. Similarly, alternative fuelled vehicles only play a marginal role in the LCV sector.
- It should be noted that the price of diesel was lower than that of petrol during the early 1990s, which may have had an impact on sales of diesel powered vehicles.

3 LCV MANUFACTURERS

3.1 LCV manufacturer profiles

Ford
Ford is the market leader in the UK for LCVs, with a 26.95% share of new vehicle sales (What Van, 2006) and manufactures the Transit, often used as a generic term for an LCV. The company offers a full range including the car derived Fiesta, the Ranger pick-up truck, the Transit Connect light van and the Transit from 2.6 tonnes up to 3.5 tonnes and beyond.

Ford operates a substantial LCV factory at Southampton, where 50,000 Transits were produced in 2005. The Southampton plant concentrates on the short and medium wheel base Transit models, of which up to 50% are exported. Long wheel base and chassis cab models are sourced from a plant in Turkey. The Southampton Transit production also uses engines from Ford Dagenham and Transmissions from Ford Halewood. All other vehicles in Ford's range are sourced from outside the UK.

The company has recently changed its dealership network to include Backbone of Britain dealers, specially equipped to sell Transits. This builds on the success of the Transit Specialist Dealers, and aims to offer the same level of service to Transit operators as LGV operators would receive. Ford also offer the 'one-stop' shop where they offer bodies and additional equipment (Ford, 2006).

Until 2001, Ford was involved in a LGV joint venture with Iveco in the UK, although this did not involve the Transit product range. However, there were joint Iveco-Ford and Ford LCV dealers, some of which still operate e.g. CD Brammall, Hendy and Grays.

Ford works closely with Mazda sharing common components on its Range pick-up truck (Info from survey by Ford).

Vauxhall
Vauxhall is a subsidiary of the giant US General Motors (GM) and works closely in development and manufacturing with fellow GM company Opel of Germany. The product range offered by Vauxhall/Opel is identical, with the UK being exclusively marketed under the Vauxhall brand.

In recent years, Vauxhall has seen a substantial increase in its sales of LCVs in the UK, with an 8.15% growth in sales in 2004-2005 (What Van, 2005). This is partly due to a new product range, developed between GM and Renault to develop medium and large vans in Europe. The end result has been the medium sized Vivaro and the heavier Movano. There is extensive sharing of platforms and engines on this project across the GM and Renault group range. In addition, Vauxhall relies on components from Isuzu of Japan for certain applications e.g. diesel engines.

Another reason for this increase in sales is the investment made in a network of LCV retailers. 'We can apportion some of this success to our network of dedicated CV specialist retailers' (What Van, 2006).

The Vauxhall range begins with a car-derived model the Corsavan, then the Combo, which is a higher cube version of the Corsa. The next model is the Astravan, a small LCV based upon the Astra car model, then the medium Vivaro and heavy Movano, taking the range up to and over the 3.5 tonne threshold. At one stage, Vauxhall through its subsidiary Bedford was a major supplier of commercial vehicles both heavy and light, but this ended in 1986 when GM decided to cease the Bedford operation.

Vauxhall is the UK's largest producer of LCVs and through its subsidiary IBC vehicles Ltd it operates an LCV assembly plant in Luton, which produced 90,000 vehicles in 2005. The model produced is the Vivaro (for Vauxhall/Opel) which is also badged as the Traffic (for Renault) and as the Primastar (for Nissan). Shortly Vauxhall will introduce a new version of the Astravan to be built at its car plant in Ellesmere Port, Cheshire. Production will be 10,000 units per year, 90% for sale in the UK (Autoindustry, 2006).

LDV

LDV began life as the LCV part of British Leyland and in 1987 was sold along with Leyland Trucks to DAF of the Netherlands. In 1993 DAF went into receivership and Leyland DAF Vans was bought by its management team and renamed LDV. LDV worked with Daewoo of Korea on a new range of European based LCVs. However, Daewoo went into receivership before the new range was introduced. In December 2005, LDV became part of Sun Capital, a US financial company (LDV, 2006).

In 2005, LDV introduced the new range called the Maxus which starts with 2.8 tonne panel vans. It is anticipated that Chassis cabs will be introduced some time in 2006/7. Sales have increased considerably (50% up during 2006) (LDV article, Fleet news) and the range is regarded as a substantial improvement over the previous Pilot and Convoy models, which were a fairly old design. It is noted that LDV concentrate on large sized LCVs.

LDV operate an assembly plant in Birmingham, with current production of nearly 10,000 units per year. They regard themselves as a specialist value added supplier and do not sell on volume. The company does have some export markets including Denmark, Turkey and Malaysia.

LDV operate a specialist LCV network, the vast majority being LGV dealers which is a legacy of the Leyland DAF network, where many dealers sold LGVs and LCVs. LDV also operates Vanaid, a 24-hour roadside assistance service specifically for LCV operators.

Renault

Renault is the market leader in its home country of France for car, LCV and LGV sales. In the UK they offer a full range of LCVs from the Clio, (based upon the car of same name); a 'compact' van called the Kangoo; a medium sized van called the Traffic and a large model called the Master. The Traffic and Master are jointly developed and manufactured with GM as the Vivaro and Movano respectively. Renault's role in the partnership is to build the Master/Movano range, with GM concentrating on the Traffic/Vivaro which are built in the UK.

Renault also owns 40% of Nissan and its van range is similar to Nissan's. In fact, the GM-Renault range is re-badged as Nissan for sale in Europe, and Nissan produce some of these vehicles at a plant in Barcelona, Spain. Renault is also a substantial producer of LGVs, although the heaviest range is controlled by Volvo Trucks of Sweden.

Renault's dealership network is divided up between LCV specialists who sell the entire LCV range and the LGV dealers, which sell vehicles down to 2.8 tonnes e.g. the Master.

PSA Peugeot-Citroen

PSA is the holding company for the Peugeot and Citroen brands, both of which are jointly developed but sold separately. PSA is the second largest car maker in Europe. The brands have individual styling at the lower range of the car-derived and small LCV market, with both Peugeot's 206 and Citroen's C2 being car-derived. The medium vans include the Partner (Peugeot) and Berlingo (Citroen) and the large vans include the Boxer (Peugeot) and the Relay (Citroen), which are identical apart from minor styling and equipment.

The medium/large range of PSA is jointly developed with Fiat of Italy and goes back to the 1978 Sevel (The European society of Light weight vans) agreement. PSA build the lighter models whilst Fiat constructs the heavier ones.

Mitsubishi
Part of a large Japanese industrial group, which includes shipbuilding and industrial machinery, Mitsubishi's range in the UK, is focused on 4 wheel drive pick-up trucks. They are the largest supplier registering 27,000 units in 2005 with the L200 model accounting for 12,026 units (What Van, 2006). In the past they have sold panel vans, which is a practice that has now ceased.

Mitsubishi also make vehicles above 3.5 tonnes in weight that are sold under the Mitsubishi Fuso brand. In the UK they offer the Canter range. This range is owned by Daimler Chrysler and is separate to the pick-up truck business. The Canter range has more in common with conventional trucks than LCVs and is sold through Mercedes Benz Truck dealers in the UK.

Mercedes-Benz
Mercedes-Benz is part of Daimler Chrysler and manufacturers cars, LCVs, trucks and buses. The company has a reputation for a high build quality and has a significant presence across Europe.

The company sells just two LCV ranges, the medium Vito and the large Sprinter. The Sprinter has provided considerable competition to the Transit since its introduction in 1995, with the emphasis on safety and driver comfort. Mercedes have worked together on the larger LCVs with Volkswagen, where a re-badged version of the Sprinter is sold as an LT, sharing a similar range of components.

The company has reorganised its UK dealership network to separate the car and commercial brands. The commercial brands are sold through joint networks but with separate LCV and LGV specialist staff (Mercedes Benz, 2006).

Iveco
Iveco, (The Industrial Vehicle Corporation) is part of Fiat of Italy and produces a range of LCVs starting at 3.2 tonnes, in the shape of the Daily. These take the form of traditional LCV designs but Iveco concentrates on the heavier sector, leaving Fiat to focus on the smaller LCVs.

Iveco vans are sold through a network of LGV dealers, who can also hold Fiat LCV franchises. Iveco has a strong position in the light LGV sector in the UK through its connection with Ford Trucks in the 1980s.

Volkswagen
With three ranges, Volkswagen (VW) has a model in the light, medium and large sectors which are known as the Caddy, Transporter and LT respectively. As discussed above, the LT is a joint development with Mercedes Benz, and will be shortly replaced by the Crafter, also jointly developed with Mercedes Benz,

VW shares the same reputation with Mercedes for superior build quality, which makes their product reliable and durable. These are key requirements for this sector.

VW has a network of van centres, with dedicated staff focusing on LCVs.

Isuzu
Isuzu markets pick-up trucks in the UK through Isuzu (UK) Ltd, including one model marketed as the Rodeo. The company has a long history of producing these types of vehicles in its own right, but also in connection with one time part-owner GM. Both companies have shared designs and production.

Isuzu Trucks (UK) Ltd sell vehicles over 3.5 tonnes and Isuzu is a leading producer of LGVs in Japan and the US. This range is similar to the Mitsubishi Fuso range, but falls outside the scope of this LCV study.

3.2 LCV specification trends

During the research phase and subsequent discussions, a varied picture emerged regarding the LCV specification process. It became apparent that no LCV industry wide standard existed. On the contrary, there were significant variations in the approach taken to specification, with certain manufacturers and dealers building their product and service around specific customers' needs, whilst others provided a more generic product offering. However, it is possible that other specification processes exist within the LCV industry. Unfortunately, an unsatisfactory response from the LCV manufacturing industry prevented further examination of this.

There were also different levels of product and application knowledge from buyers. Certain fleet buyers, for example rental companies or public sector organisations, have a wide experience of specifying vehicles and will tend to order from an experienced LCV manufacturer/dealer. It was less certain whether independent buyers have the same attention to detail, with regard to the specification process.

The research identified a number of key stages in the LCV specification process. These were based upon discussions with dealers and manufacturers, including Ford, LDV and Mercedes Benz. The major items, in no particular order include:

- **Application.** Establishing a clear picture of what the buyer intends to use the LCV for. Their requirements may be basic including whether the vehicle requires a tipper body or crew cab, or could be more involved, e.g. is the vehicle for use on multi-drop courier activities or servicing activity?

- **Capacity/size**. Understanding the LCV's capacity and considering information about the potential loads e.g. the weight, height and length, people needs e.g. driver and number of crew, and the equipment requirements e.g. stowage capacity for tools and materials.

- **Type of use**. Providing an understanding of the type of environment that the LCV will be expected to operate in. For example, will it be an urban area with stop-start driving and access constraints or alternatively will it be a distance operation, where the LCV could be operating on inter-city routes at higher road speeds?

- **Driver comfort and safety**. Quantifying what is required to provide suitable workspaces for drivers; e.g. how the LCV is designed ensuring that comfort and protection of drivers and crew is maximised, to ensure sufficient productivity and risk management.

- **Additional equipment**. Investigating what additional equipment is required and available for the LCV. Such equipment is likely to be non-standard items and there are a vast array available e.g. satellite navigation, tail-lifts, roof racks, interior lighting etc. These needs are very specific to the buyer and dealers/manufacturers can increase their revenue if they can supply such items.

- **Mileage**. Enabling the supplier to provide the most suitable LCV for the buyer in terms of planned mileage.

- **Current LCV.** Understanding the buyer's present LCV to establish their preferences, which can be built into any new specification. This may include the identification of possible improvements to the existing LCV.

Workhorse
A vital aspect of understanding the LCV is its perception as a workhorse. In fact VW sells this attribute in their sales literature; 'The Crafter is a workhorse' (Volkswagen, 2006). It is seen as a tool used to achieve an outcome, which could involve activities such as carrying mail or servicing air-conditioning. The operator views the LCV as an incurred cost to pursue their activity.

The importance of this is that the LCV is subjected to tough operating conditions and is less likely to be cared for by its owner in the same way as a car or LGV. To some extent the LCV is regarded as a disposable item, which is worked hard and then replaced.

Durability
The reliability and toughness of the LCV is an important aspect of its use. Operators need an LCV that will cope with the tough operating conditions and last the length of its projected life. Therefore, manufacturers focus part of their marketing on build quality and this partially explains the success of Mercedes Benz and Volkswagen, who have acquired a reputation for class leading build quality. 'The fit and finish of the body is so good that the entire vehicle looks as though it has been painstakingly carved out of a single block of metal' (What Van, 2006). However, it is noted that most LCV manufacturers have adopted a similar approach.

Manufacturers select robust components, which are suitable for the operating conditions and have longer lead-times for replacement. However, there are vulnerable areas of design including latches, handles and levers, which can break and provide inconvenience to the operator. The VW Crafter for example is said to have a potential weak-point due to the location of the rear badge. 'The way it projects from the off-side door when it is opened makes it a natural handle and your hand automatically goes to it. You won't have to do that too often before it snaps off' (What Van, 2006).

Weight
LCV buyers consider payload to be an important specification because the more the LCV can carry, the higher the van's potential productivity (SLM, 2006). This is particularly true of freight carriers, but also applies to servicing activities where tools and equipment add to the Gross Vehicle Weight (GVW).

Payload is constrained by the 3.5 tonne GVW threshold, above which operators are subject to further regulation. Therefore, manufacturers must balance the buyers' need for higher payloads, with the requirement to keep the GVW of the LCV down.

The use of new technology, for example more powerful engines, lighter materials and manufacturers identifying gaps in their product offerings means that the LCV categories identified in this study are, in reality, inconsistent. An example of this trend is Ford's Transit Connect model, which was introduced to meet a requirement for a small LCV. The Transit Connect has a GVW of 2.3 tonnes and is in competition with small and medium LCVs. However, its design, appearance and components have more in common with larger LCVs. 'Also just like its bigger brother, Connect has been designed to be very durable and over-engineered for a van of its size and weight range' (What Van, 2006).

Similarly, Mercedes Benz Sprinter is regarded as a large sized LCV. However, its lowest GVW is 2.59 tonnes, which technically classes it as a medium-sized LCV. (What Van, 2006).

Engine type
Diesel power is the dominant source for LCV engines, particularly in the heavier sector. The successful use of turbo technology has ensured that diesel engines are more responsive and suitable for this application. Diesels are generally built to a tougher design and have greater suitability for commercial operations, where durability is a key requirement.

Petrol engines are generally not suitable for larger LCVs because the extra power requirements affect the fuel efficiency of the vehicle. Very few of the manufacturers now offer petrol as a specification option in medium and large vans. Car derived models tend to be available with a petrol engine model because of both the lower power requirement, and the availability of existing technology originally developed for the car sector.

The alternative fuels in use include gas or electric powered vehicles. For the gas option, Liquid Petroleum Gas (LPG) is the most commonly used. Ford offers an engine that can run on LPG or petrol (What Van, 2005). There are retrofit conversions available for most LCV models.

Electric vehicles are available from manufacturers such as Peugeot, which offers the small car derived Partner LCV (Green consumer guide, 2005). This is operated on battery technology, is electrically charged and can have a range of up to 100 miles. However, production of the electric Peugeot Partner has recently ceased, due to limited demand for the vehicle. The market for these LCVs tends to be within local authorities, airports and businesses located within urban areas. Specialist manufacturers such as Smith Electric Vehicles design purpose-built electric vehicles mainly for low volume markets (Smiths, 2006).

Limited information was found regarding biodiesel for LCVs, where biodiesel fuel is blended with conventional diesel. It would appear that there is some interest from organisations with an interest in sustainability and it is a sector that is in its infancy. Much of the promotion for these fuels is coming from the Department for Transport and biofuel and oil companies. The LCV manufacturers contacted made very little reference to biodiesel in any of their literature, although it is possible that this may fall under confidentiality issues at this early stage of development.

There is considerable interest in diesel hybrid technology, which is the combination of a diesel engine and an electric motor. Manufacturers such as Mercedes Benz and Ford have models in development (Daimler Chrysler, 2006), with much of this information being regarded as commercially sensitive.

The level of demand for alternative fuelled vehicles remains low and in 2005 Ford only sold 1,000 LPG vans (What Van, 2005). This low level of sales occurred despite the existence of several initiatives including Boost LPG, the Energy Saving Trust's Powershift programme and the exemption for alternative fuelled vehicles from the London congestion charging scheme.

There are a number of possible explanations for the slow take-up and these include poor information on the types of options available for buyers, a general lack of understanding of the alternative fuelled market or the promotion strategy from the manufacturers. It is however more likely that buyers prefer the dependability of existing technologies, over newer methods, particularly for the LCV's role as a workhorse.

Engine power
LCV buyers often use torque, as a measure of the power of the van as this gives an indication of what the LCV will 'pull' (SLM, 2006). Increasingly brake horsepower (bhp) is also in use demonstrating the overall power of the engine.

Torque ranges from 133 lb-feet (180 NM) at 1248 revs per minute (rpm) in a car derived LCV to 243 lb-feet (329 NM) at 1400 rpm for large LCVs. Total engine power ranges from 70 bhp to 156 bhp for a large LCV and engine size ranges from 1200 cc to 3500 cc. For pick-up trucks the additional power required for off-road applications raises torque to 167 lb-feet (226 NM) at 2000 rpm, total engine power to 130 bhp and engine sizes to 2999 cc (Ford, 2006).

Drive
The drive of the vehicle refers to the axle on which the power of the engine is transferred to the road. For LCVs there are three options:

- Front wheel drive
- Rear wheel drive
- Four wheel drive

Ford has identified that the sales split for their front and rear wheel drive LCVs is 50/50, although no exact breakdown of sales was available (What Van, 2005).

The four-wheel drive market is predominantly pick-up truck based, where the vehicles are designed to operate off-road and need drive through all four wheels to enable sufficient traction. A 2-wheel drive vehicle can have difficulty transferring the power of the engine to the ground in off-road applications. LCV manufacturers provided only limited information on the pick-up truck market and therefore this section requires further investigation.

Transmissions
Manual transmissions tend to be the preferred offering from the LCV manufacturers and commonly feature a 5-speed box. This is available in all LCV categories, the main reason being that 5-speed manual boxes are a proven technology. Recently, the higher engine power vehicles tend to be offered with a 6-speed box and this is more suitable for distance and motorway work (What Van, 2006).

Automatic transmissions are offered as an extra on some LCVs, for example VW provide it in the medium sized Caddy, at an additional £1000 (Volkswagen, 2006) and Mercedes offer this option on the Sprinter for £682 (What Van, 2006). The manufacturers point out that for certain markets e.g. urban driving, an automatic transmission assists in the reduction of wear and tear on the vehicle and driver fatigue.

Despite this, it is a fairly undeveloped market and possible reasons for this include a lack of understanding by customers as to the benefits of automatic transmissions, insufficient promotion by manufacturers/dealers, the extra cost and concerns over replacing proven technology.

Electronics
Electronics are playing a major part in LCV specification with electronic management systems (EMS) becoming almost standard across the sector. Certain manufacturers e.g. Mercedes Benz have introduced CAN (Computer Area Network) bus technology which creates a vehicle-wide system for transferring mechanical data. This data can be downloaded when the LCV is serviced.

Ford has introduced ‘drive by wire’ technology similar to aircraft where the driver’s input on the accelerator is transmitted electronically and not mechanically. In addition, some manufacturers have introduced rain sensitive wipers and light sensitive lights to the LCV range.

Telematics
The electronic information produced by the LCV can be useful for the operator, but it requires additional equipment to be fitted to the vehicle to enable it to be read. This equipment includes an interface box and a monitor to provide the driver with real time information. However, there was little evidence of a demand from buyers for this type of equipment, or of manufacturers promoting it heavily. Also, not all manufacturers have systems on the LCV that would be able to provide this information.

Vehicle navigation systems are an increasingly common option for LCVs. These systems utilise Global Positioning Satellite (GPS) technology, with a GPS receiver in the LCV receiving signals from satellites to enable the location to be determined. This location is transferred onto a digital mapping system and displayed on a monitor in the LCV. The user can instruct the system to provide directions for a journey and this is then displayed or verbally communicated to the driver.

These systems are popular and useful for LCV operators as they reduce empty mileage and can avoid congestion. They are available from manufacturers or retrofitted by specialist companies e.g. tomtom or Traffic*master*.

Type approval process
'Type approval is a way of making sure that goods vehicles are safe to use on the road, without having to inspect and test every single one' (VCA, 2006).

Any organisation looking to manufacturer or import an LCV must have type approval for that vehicle before it is permissible to sell it within the UK. 'A prototype vehicle must be submitted for testing. If it passes the tests and the production arrangements also pass inspection, then vehicles or components of the same type are approved for production and sale, without further testing' (VCA, 2006). The testing considers such issues as:

- Emissions
- Radio interference suppression (for petrol LCVs only)
- Brakes
- Noise

Broadly speaking, type approval is divided into two stages whereby firstly the components and systems must be approved and secondly the whole vehicle. The test will also consider the quality assurance process in place at the supplier and this may involve a review of the manufacturing process from design to final assembly. The testing is done at the suppliers' workshops and factories and on test tracks, for example the Millbrook proving ground in Bedfordshire.

The whole process can take up to 12 months, although this can vary depending upon the experience of the manufacturer/supplier. The activity is carried out by the Vehicle Certification Agency (VCA, 2006).

Once the LCV has been approved, it is issued with a Type Approval Certificate (TAC), (if it is manufactured within the EU), and can then be sold.

Design and styling
LCV buyers are now considering style, equipment and appearance alongside traditional requirements such as durability and reliability. Ideas from the car sector are broadening the appeal of LCVs away from a standard workhorse. Buyers are considering extra items e.g. air conditioning or audio systems as well as responsive engines e.g. turbo diesels to match car performance. Many LCV users are becoming more conscious about the appearance of the vehicle and consider it to be a statement about their company and driver; this is a trend largely adopted from the LGV sector.

This is perhaps most noticeable when the pick-up market is considered, where vehicles such as the Isuzu Rodeo look and feel like leisure vehicles, even though they may be used in the construction industry.

Vehicle access
Larger LCVs, of up to 3.5 tonnes have constraints if operated in certain environments, for example in urban conditions, where a lack of space hinders manoeuvring and parking. The market is reflecting these constraints and buyers are considering smaller LCVs to tackle these pressures.

Driver access
The access for the driver and crew is important to allow them ease of entry to and from the vehicle, and movement when in it. For example, rear doors need to allow clearance for people, tools and goods and front doors need to allow safe access to the cab. In addition, there is the internal layout, which needs to facilitate cross vehicle movement. The manufacturers have incorporated important design considerations such as the dash-mounted gear lever to aid access.

Working space
For certain applications, work space in the LCV is important, for example a multi-drop parcel LCV driver will need to have sufficient space in which to organise their schedule. Similarly, an engineer or technician will need space and lighting to work in the vehicle. Where customer interaction is involved, e.g. a builder, the driver will also need to be able to manage paperwork, meaning that protected stowage must be provided.

On-board storage within LCVs has become important as users often travel long distances and handle transactions at site level. Therefore, manufacturers have incorporated such things as larger glove compartments, in-door stowage areas, lockable cabinets and hooks.

Crew cabs
Crew cab vehicles provide additional seating behind the main driver's seat in the cab. The major benefit is that crew cabs can transport crew and equipment to a remote site using a single vehicle and they are therefore popular in the construction sector.

The LCV manufacturers offer a variety of crew cab options as standard features. VW for example provides a crew cab Transporter (Volkswagen, 2006), whilst Ford builds a Transit 'double cab' (Ford, 2006). The crew cab vehicle is seen as a 'specialist' item but it is sold and supported in the same way as other types of LCV.

Safety equipment
Manufacturers are offering safety items such as proximity sensors and additional mirrors which are becoming a popular method for reducing damage and injury, particularly in urban areas. Future developments from Mercedes Benz include rear view cameras, to aid vision. It is likely that increasing concern over the heath and safety obligations of operators to reduce risk will see increased interest in safety items. Electronic stability programme ESP is also available from certain manufacturers e.g. Mercedes Benz (What Van, 2006).

Security
Theft of an LCV or its contents is increasing the level of security devices fitted, with features including theft shield door locks, central locking and bonnet locks (What Van, 2006). The increase in the requirements for security devices might be explained by the trend to increase the specification of LCVs making them more attractive to steal, and also the popularity of the driver keeping the LCV at home, which is less secure then an operator's yard.

Noise
LCVs can suffer from excessive noise caused by the vibration and rattling from the vehicle's considerable exposed surface area. Manufacturers are working on solutions to this problem, one of which is to introduce a dash-mounted gear lever, which reduces the direct rattle noise of the transmission mechanism from the road.

Product development
The trends in product development (PD) ensure that each manufacturer tends to replace or revise a model every 5 years, which is largely a practice copied from the car or LGV sector (Mercedes Benz, 2006). Traditionally LCVs were at the low end of PD, however, with increased focus on styling and design in a competitive market, PD has become more important. It is worth noting that little PD information was available from the manufacturers due to commercial sensitivities.

Despite this, Ford has a number of product development areas, namely:

- Chassis engineering
- Body engineering
- Electrical
- Power train
- Product verification and test
- Vehicle engineering
- Design

Brand management
The manufacturers are also keen to promote brand strength and product differentiation. Ford appears to sell its importance to the UK and the popularity of the Transit, whereas LDV focuses on being a bespoke manufacturer offering the whole package, and VW offers the reliability of build and design.

Joint ventures
There is also widespread sharing of components and joint product ranges. The major reasons for these trends are reduced development costs, maximised production economies of scale, market consolidation through globalisation and reduced logistics costs. This is a trend that is used extensively in the car and truck market, where common components and platforms are used. The most visible joint ventures include GM-Renault, which sees the sharing of two products over 4 brands (Vauxhall, Opel, Renault and Nissan), the Sevel agreement where Fiat and PSA co-operate on medium and heavy LCVs and Mercedes Benz and VW's co-operation on the Sprinter/Crafter large LCVs.

Maintenance
Maintenance requirements are set by the manufacturers' guidelines and they typically range from 12,000 miles for a car-derived LCV or pick-up, to 20,000 miles for a medium LCV, and up to 25,000 miles for a large LCV.

Bodies
For LCV chassis, a special body is required and the main types include box vans, lutons, chilled compartments and tippers. There are three methods for supplying the LCV bodies:

- The manufacturer supplying the body, assembling directly at the factory or via a third party body-builder
- The buyer specifying a body and instructing the manufacturer to send the LCV to the bodybuilder
- The dealer taking delivery of the vehicle and arranging the body for the buyer.

Conversions
There are a variety of conversions available for standard LCVs including refrigeration and these are typically carried out at third party conversion specialists.

3.3 LCV sales profiles

Information gathered through Commercial Motor magazine (Commercial Motor, August 2005 and August 2006), gives an indication of annual and half-year sales performances of LCV manufacturers, both in terms of total market share and within individual LCV categories. The following is an analysis of the Commercial Motor data. It should be noted that the classifications quoted in Section 3.3 are different from those used in section 2 as, for the purposes of this report, we have utilised weight categories of:

- Small car derived LCVs up to 1.8t;
- Medium sized LCVs with a weight range of 1.8t - 2.6t; and
- Large sized LCVs from 2.6t to 3.5t;

whereas Commercial Motor have utilised SMMT derived information. A comparison of the total number of new registered vehicles over the reported time period is approximately the same and these discrepancies may be due to differences in the reporting period used. However, whilst the totals are similar, there are differences in the way that vehicles are categorised in this section, relative to the weight categories used in section 2.

Manufacturer market shares
In the first half of 2006, Ford dominated total LCV sales with 28.4% of the market (46,245 sales). However, this is actually a decrease in sales compared with the first six months of 2005 in which Ford sold 49,865 LCVs (29% of market). Ford's nearest competitor is Vauxhall who have 16.3% of the total LCV market (26,530 sales) in the first half of 2006, compared with a 16.9% share (28,416 sales) in the period January to June 2005. Whilst the overall LCV market is regarded as looking healthy, with total sales in the first half of 2006 running at 52.1% of the overall 2005 total, it is noticeable that all of the top six manufacturers have sold fewer LCVs in the first six months of 2006 than in the first six months of 2005.

The following charts (Figures 3.1 and 3.2) provide a comparative overview of market share by manufacturers for the first 6 months of sales in 2006 and also for the first half of 2005.

Figure 3.1: Top LCV manufacturers – market share (%) in Jan-Jun 2006

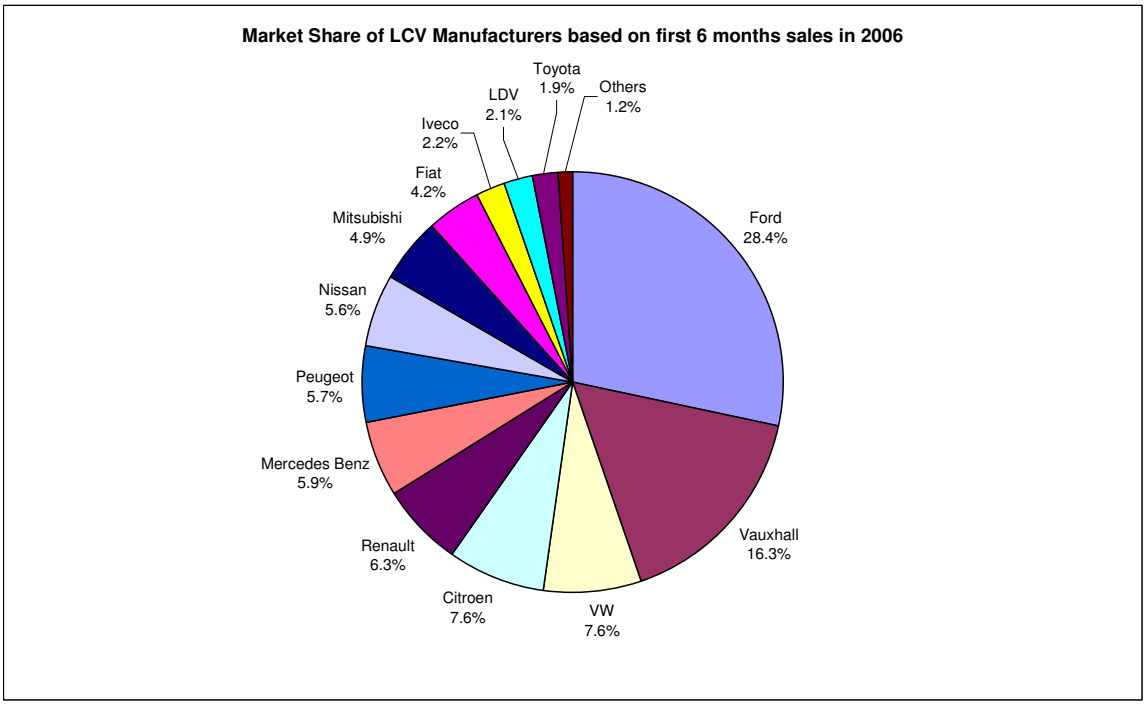
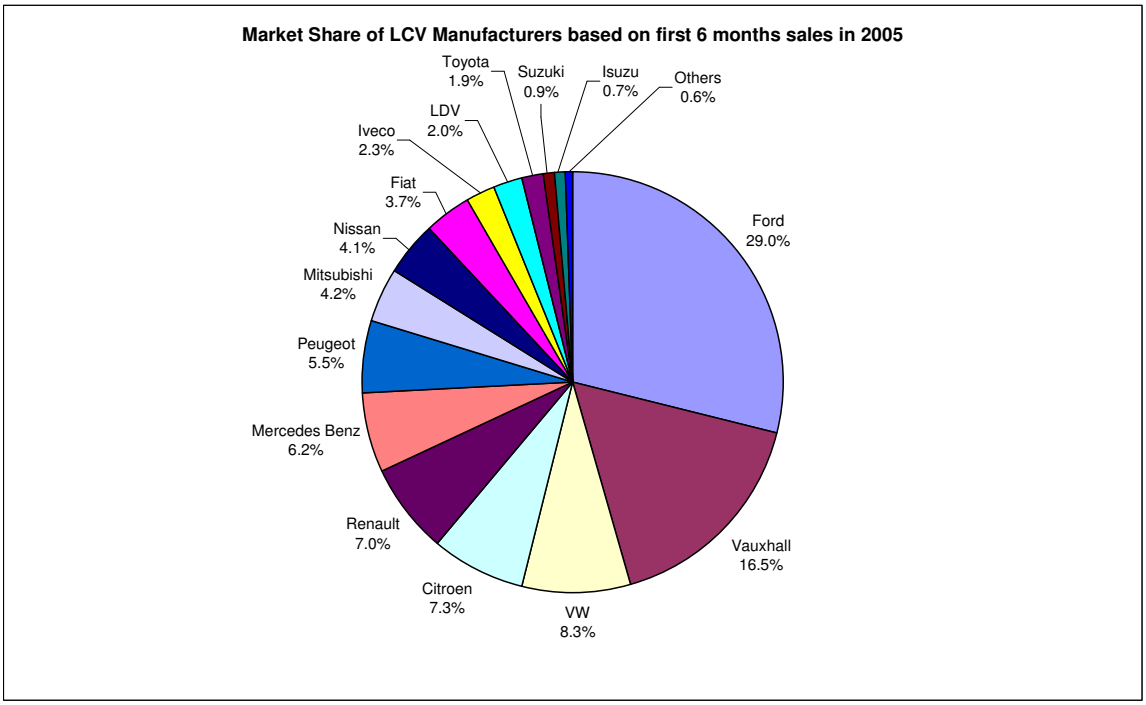


Figure 3.2: Top LCV manufacturers – market share (%) in Jan-Jun 2005



Vehicle segment analysis

Commercial Motor report utilising five vehicle segments, namely car-derived vans, high-cube vans, medium vans, large vans and pick-ups. Consequently, it is possible to provide simple market analyses on these segments.

Car-derived vans

In the car-derived van sector, the Vauxhall Astravan has dominated in the first six months of 2006 with 51.2% of sales. This is almost identical to the Astravan's percentage market share in the period January to June 2005, but in numerical terms Astravan sales have actually decreased from 5,251 (Jan-Jun 2005) to 4,335 in the first six months of this year. In the first half of 2006, the Ford Fiesta with a 16.0% share (1,358 sales) and the Vauxhall Corsavan with a 15.5% share (1,309 sales) are competing for second place in the rankings. These sales compare with Fiesta sales of 1,448 (14.1%) and Corsavan sales of 932 (9.1%) for the first six months of 2005, indicating that both models have increased their percentage market shares in 2006. The competition between the Vauxhall Corsavan and the Fiesta for second place in the car-derived van rankings in 2006 represents a considerable change from the first half of 2005 in which the Suzuki Carry held second place. Whilst it is noticeable that the Suzuki Carry has experienced a significant drop in sales figures, it is unknown at this time as to why this has occurred.

The sales figures indicate that although the Ford Fiesta has increased its market share from 14.1% (Jan to Jun 2005) to 16% (Jan to Jun 2006), its corresponding unit sales have actually decreased in this time period compared with the previous year. This trend is mirrored in the overall sales of car-derived vans, which for the first half of 2006, are lower than those which occurred in the equivalent time period in 2005.

Table 3.1: Market share – Car derived vans

Model	Jan – Jun Sales 2006	%	Total sales 2005
Vauxhall Astravan	4,335	51.2	8,946
Ford Fiesta	1,358	16.0	2,615
Vauxhall Corsavan	1,309	15.5	1,682
Peugeot 206	667	7.9	1,087
Daihatsu Extol/ HiJet	263	3.1	501
Suzuki Carry	192	2.3	2,963
Renault Clio	185	2.2	350
Citroen C2	117	1.4	185
Fiat Punto	36	0.4	201

High-cube vans

The Ford Transit Connect dominates the High-cube van sector with sales of 11,928 units in the first half of 2006, giving it a 30.7% market share. However, this is a decrease on its 33.9% share of this time last year during which 15,014 Ford Transit Connects were sold. The second and third highest sellers in the first six months of 2006 were the Vauxhall Combo with 8,769 (22.6%) and Citroen Berlingo with 7,206 (18.5%). A comparison with the sales for the first half of 2005 shows that Vauxhall Combo sales have decreased from 11,254 (Jan to June 2005) to 8,769 in the same period this year, resulting in a decrease in market share from 25.4% to 22.6%. In contrast, the Citroen Berlingo has increased its market share from 14.5% (6,434 sales) in the first half of 2005, to 18.5% (7,206) in the same time period this year. The Peugeot Partner and the VW Caddy have also both increased their unit sales in the first half of 2006 compared to this time last year, whilst Renault Kangoo sales have decreased in the same timeframe.

Overall, High-cube van sales for the top nine models in the first half of 2006 total 38,879, which is considerably lower than the 44,245 unit sales that occurred in the first six months of 2005.

The following table on High-cube vans has been created from the Commercial Motor data. For the purposes of this study, it appears likely that the majority of the vehicles in Commercial Motor's table for High-cube vans would fall under this report's small car derived vehicle category (up to 1.8t).

Table 3.2: Market share – High-cube vans

Model	Jan – Jun Sales 2006	%	Total sales 2005
Ford Transit Connect	11,928	30.7	23,097
Vauxhall Combo	8,769	22.6	20,887
Citroen Berlingo	7,206	18.5	12,304
Peugeot Partner	3,520	9.1	6,260
VW Caddy	2,946	7.6	4,873
Renault Kangoo	2,608	6.7	6,500
Fiat Doblo	1,495	3.8	2,508
Nissan Kubistar	280	0.7	1,201
Citroen C15	127	0.3	567

Medium Vans

In the medium van sector, the Vauxhall Vivaro has the highest market share (29%) with total sales of 9,951 in the first six months of this year. Second place is taken by the VW Transporter (20.3%) whilst the Renault Trafic, Mercedes Benz Vito, Peugeot Expert and Citroen Dispatch occupy the third to sixth places inclusive and have a 38.1% market share between them. A comparison with medium van sales in the first six months of 2005 shows that Vauxhall Vivaro sales have increased from 8,686 (Jan to Jun 2005) to 9,951 whereas VW Transporter sales have decreased from 9,522 (Jan to Jun 2005) to 6,958 in the same time period. In the first half of 2005, the Renault Trafic, Mercedes Benz Vito, Peugeot Expert and Citroen Dispatch also occupied the third, fourth, fifth and sixth places respectively and held a 37.4% share of the market between them which is very similar to the 38% occurring in the same time period in 2006. Overall, medium van sales for the top nine models in the first six months of 2006 total 34,272, compared with sales of 36,409 for the top nine in the same time period in 2005, which suggests that overall medium van sales have decreased compared to the same time period last year.

Table 3.3: Market share – Medium vans

Model	Jan – Jun Sales 2006	%	Total sales 2005
Vauxhall Vivaro	9,951	29.0	16,802
VW Transporter	6,958	20.3	12,702
Renault Trafic	4,953	14.5	9,120
Mercedes Benz Vito	3,421	10.0	7,827
Peugeot Expert	2,494	7.3	4,783
Citroen Dispatch	2,171	6.3	4,350
Fiat Scudo	1,555	4.5	3,047
Nissan Primastar	1,470	4.3	2,935
Toyota Hiace	1,299	3.8	2,559

For the purposes of this study, it appears likely that the majority of the vehicles in Commercial Motor's table for Medium vans have fallen either into the small car-derived and/or large sized LCV categories.

Large Vans

Ford dominates the large van sector, with the Transit accounting for almost 49% of total sales (29,674 units) in the first half of 2006, which is similar to its sales of 29,761 (50.4%) this time last year. The introduction of the new model Transit is likely to strengthen its position further. The Mercedes Benz Sprinter has remained in second place with sales of 5,768 (9.5% market share) in the first half of 2006. This is a decrease on its sales of 6,477 (11%) in the first six months of 2005. However, the introduction of the new Sprinter may assist increasing Mercedes Benz's market share.

In the large van sector, sales of the top eleven models totalled 59,672 in the first half of 2006 compared with sales of 60,655 in the corresponding time period last year, suggesting that sales in this sector have also decreased in the first half of this year.

Table 3.4: Market share – Large vans

Model	Jan – Jun Sales 2006	%	Total sales 2005
Ford Transit	29,674	48.9	52,314
Mercedes Benz Sprinter	5,768	9.5	14,436
Fiat Ducato	3,792	6.2	6,661
Iveco Daily	3,562	5.8	7,649
Renault Master	3,496	5.7	6,376

LDV Maxus	2,724	4.5	4,177
Citroen Relay	2,680	4.4	5,039
Peugeot Boxer	2,678	4.4	4,837
Volkswagen LT	2,414	3.9	4,870
Vauxhall Movano	2,166	3.5	4,164
LDV Convoy	718	1.2	3,883

Pick-up vans

The pick-up sector is lead by the Mitsubishi L200, with one model, the Warrior double-cab version accounting for over 50% of these L200 sales. In the first six months of 2006, Mitsubishi had a market share of 38.1% (8,021 units) in this sector compared to a 39.4% share, (7,233 sales) in the first half of 2005. The new Nissan Navara sold 6,510 units in the first half of 2006 giving it a 30.9% market share whilst sales of Nissan's old pickup model decreased to only 135 units (0.6%) from 3,855 (21.0%) this time last year.

Overall sales in the pick-up sector, totalled 21,026 for the top selling models in the first half of 2006, compared with sales of 17,828 in the corresponding time period last year, suggesting that sales in this sector are increasing.

Table 3.5: Market share – Pick-ups

Model	Jan – Jun Sales 2006	%	Total sales 2005
Mitsubishi L200	8,021	38.1	12,026
Nissan Navara	6,510	30.9	4,785
Ford Ranger	3,285	15.6	7,016
Toyota Hilux	1,657	7.9	2,518
Isuzu Rodeo	962	4.6	2,389
Mazda B-Series	333	1.6	1,098
Nissan Pickup	135	0.6	4,613
Proton	123	0.6	354

Routes to market

Light Commercial Vehicles can be sold directly from the factory to the customer, for example Royal Mail receives its new LCVs direct from manufacturers e.g. LDV (Royal Mail, 2006). The benefits of this system are that it can cope with large quantities of vehicles and they can be delivered straight to the operating site, at a time to suit the buyer. Consequently, this system is generally preferred for large fleet orders.

The more common sales profile is the franchised based dealership system. Under this system, the manufacturer will appoint a franchise dealer and these can be independent sites, part of a group, or owned by the manufacturers. Manufacturers aim to ensure complete coverage via the establishment of a nationwide network. The dealership also provides after sales functions like vehicle servicing and parts.

Traditionally, the dealership network was based upon the Selective and Exclusive Distribution (SED) system, under which dealers could determine to whom they sold (selective) and manufacturers could appoint a single dealer, in a particular area to sell their product (exclusive). This was a practice at the European level, but was amended to reflect the concerns of buyers and regulators over price, choice and competition (DTI, 2004).

The system still permits exclusive dealers, who are granted a geographical region in which to sell the manufacturer's LCVs, but these dealers are free to sell to anyone, including customers outside their region and third party traders.

For the LCV market there are three types of dealer:

- **Car dealer**
  Their main business is selling and supporting a car range, but this includes either pick-up trucks and/or car-derived LCVs. They are unlikely to have a 'van' specialist and will generally concentrate on volume sales, treating LCVs as a branch of the car market.

- **Car and LCV dealer**
  This type of dealer is more likely to have specialist knowledge of LCVs and may include a trained LCV specialist in both sales and support, plus specialist maintenance facilities e.g. a heavy workshop lift. The dealer will need to ensure that their staff are fully trained in the sector and can answer all appropriate technical queries. In some cases the dealer also has an agreement with the manufacturer on the standard expected. Market leader Ford has its 'Backbone of Britain' network of 150 specialist LCV dealers, who are knowledgeable on the LCV product range. Despite the efforts of the sector, it is worth noting that the standards in place can vary considerably. This is largely because the manufacturers have different requirements and the network is extensive which makes enforcement more difficult.

- **LGV Dealer**
  Finally there are LGV dealers, who also hold an LCV franchise. These dealers have extensive experience in specifying, selling and supporting LGVs. As LGV operation is a 24-hour activity and LGV dealers need to build their business around their customers, this results in dealers opening workshops outside 'normal' working hours and often involves night and weekend working to minimise LGV downtime.

In essence, LCVs sold through LGV dealers are purchased more like LGVs. For example, although LDV are an independent LCV manufacturer, it has historic links with LGV maker DAF and shares a number of joint dealers. Therefore, the LDV sales staff are used to handling experienced LGV buyers, who concentrate more on vehicle specification and running costs. There appears to be a similar pattern with Iveco and Mercedes Benz, where a strong exposure to the LGV market is reflected in their LCV sales and service network.

Although there are numerous LCV specialists within car dealerships, is it likely that these dealers do not fully understand the LCV products they sell, the operational needs of their customers and the peripheral support mechanisms.

Reasons for buying
From the research, two types of approach to buying were identified. The first type was the planned approach and involves a process of specifying a defined vehicle replacement. This can be undertaken through a number of different processes: a vehicle tender process, which public sector organisations often use to supply vehicles; a replacement cycle agreement between the company and a vehicle leaser, to a less formal process between the dealer and fleet manager.

The second type is a distressed purchase. This type of buying relates to the purchase of an LCV, which is required immediately to replace another LCV, e.g. to replace an LCV that has failed an MOT, needs extensive mechanical repairs or has been involved in an accident.

Overall price and availability were seen as the major influencing factors within the purchase decision (SLM, 2006).

Types of buyer
There are two types of buyers who purchase vehicles through the dealership network. Firstly there is the fleet buyer, who purchases a number of vehicles on a frequent basis. Fleet buyers will request that

the dealer visits them to discuss any buying decisions. These buyers may have varied requirements ranging from the cheapest available through to a detailed body specification process.

The other type of purchaser is the independent buyer, who will visit the dealer as a retail buyer. From research, this buyer tends to focus on LCV purchase cost and payload. The dealer must be able to manage the expectations of both type of customer (Ford, 2006).

Internet sales
Outside the franchised network there are a number of companies who specialise in providing new vehicles, and are independent of the manufacturer-dealer franchised system. These are largely internet based companies, who concentrate on achieving bulk purchases to reduce unit prices. Examples of such companies include:

www.vanman.com
www.thevanwebsite.co.uk
www.best4vans.co.uk

These internet companies are providing significant competition to the traditional dealer network, not only through direct sales, but also via downward pressure on prices. Limited information was found on the specification processes carried out by the independent sellers to market.

The manufacturers have also all established websites for their LCV business, and these are fairly comprehensive in what they cover. There is a breadth of information on range, product features, prices and dealership networks. Examples include:

www.fordvans.co.uk
www.ldv.com
www.volkswagen-vans.co.uk

Vehicle imports
In general there are two different types of vehicle imports. The first type are grey imports whereby vehicles are imported into the UK from outside of the authorised manufacturer-dealer networks. In general, these types of imports are from outside Europe and do not conform to EU type approval standards concerning safety and environmental aspects. Therefore, although there may be a cost saving over a similar model at a local dealer, the vehicle may not have a valid warranty.

The second type of vehicle imports are parallel imports, where the vehicle is imported from an EU member state. Unlike grey imports, such vehicle will have EU type approval and will thus have a valid warranty.

Second-hand sales
Authorised dealers have a stock of used vehicles that they sell alongside new models. The source tends to be a combination of vehicles originally supplied by the dealer, vehicles from other franchised dealers in the network, and trade-ins.

The other mechanism for selling second-hand vehicles is through used van centres. These are non-franchised sites, which tend to sell larger quantities of LCVs. The research undertaken as part of this study found little information on this sector.

Finance
In the main, light commercial vehicles are either bought outright or through a purchase agreement. The outright purchase of LCVs tends to be undertaken through the use of cash, bankers draft, electronic transfer or credit card. Alternatively, LCVs can be obtained through hire purchase agreements, where agreed fixed payments are made over a period of time, totalling the amount of the LCV plus interest charges. These two methods of either outright purchase, or hire purchase have been the traditional methods for acquiring an LCV.

In recent years, leasing has become more common, as this improves the flexibility of operation and reduces the financial risk for operators.

Essentially leasing removes the financial commitment of owning the vehicle and it can even be left off the balance sheet, thus reducing the amount of capital tied up in fixed assets. The length of the lease can be established to suit the operator and there are numerous specialist companies offering this service.

Market segmentation
The research has shown that the manufacturers have identified 5 main markets for LCVs (LDV, 2006).

- **Public sector**: Operators who are either publicly owned or working for publicly owned organisations e.g. local authorities, enforcement, health, defence etc. They tend to have extensive tender requirements for purchases and one of their main requirements is a comprehensive level of technical back up.
- **Fleets**: Large fleets of vehicles used for parcels, servicing, home delivery etc. The purchases may include a long specification process and could include specific requirements. The deals are generally fairly large and the unit price is lower to reflect this.
- **Rental and finance**: Bulk buyers of generally lower specification vans, designed to be used by a third party either infrequently through self drive hire, or longer term through a lease.
- **Independent:** Single or small fleet purchases, typically done at a dealer with a greater concern for items like value added e.g. air-conditioning, telematics or higher power. The buyers may also be more interested in the style of the LCV.
- **Work/leisure**: Focusing on buyers of pick-up trucks where the vehicle may be used privately as well as for work.

3.4 Summary

- The LCV specification process varies across the industry, between the different manufacturers and dealers. There is no industry-wide standard.
- LCVs are seen as workhorses, with durability and carrying capacity being important considerations when purchasing.
- Style has become an important purchase factor and the manufacturers have increasingly adopted innovations from the car market, improving items such as aesthetics and additional equipment. This is most evident in the PU market.
- Pick-ups and Crew Cabs are largely regarded as standard variants by manufacturers who cover the full range of LCVs.
- There are three types of LCV dealers i.e. Car dealers, Car and LCV dealers and LGV dealers and there are two types of buyers i.e. fleet buyers and independent or retail buyers.
- Market segmentation is a common tool used by manufacturers to understand the market and manufacturers use a variety of different methods to sell LCVs. Some manufacturers cover the entire LCV product range e.g. Ford, whereas others specialise in key sectors e.g. Mitsubishi with their pick-up range.
- The LCV sector is very competitive with numerous manufacturers, and operates on a global basis. It is also an important part of the UK automotive industry as a number of LCV models are built in the UK. LCV manufacturing also has numerous joint ventures e.g. GM and Renault.
- The level of co-operation from manufacturers is fairly low for this type of vehicle.

4 LCV USERS

Recent Department for Transport statistics indicate that light van traffic grew by around 8 per cent between Quarter 1 of 2005 and Quarter 1 of 2006 – more than for other types of motor vehicle. This growth maintains the trend seen over the past three years. The statistics also indicate that vans accounted for nearly 13 per cent of total traffic volumes.

Company van activity accounted for some 11 billion tonne kilometres during 2005, about 7 per cent of all freight activity on GB roads by GB-registered vehicles. Statistics also showed that a third of the distance travelled by company owned vans was in connection with the collection or delivery of goods, a third between home and work, and a fifth when travelling between jobs. Of these journeys, the transport of tools, machinery and equipment accounted for nearly a half of all travel. The peak periods for such travel occurred between 7am and 9am, and between 4pm and 6pm, when around 30 per cent of vans were in use (DfT, 2005).

Furthermore, DfT statistics show that only 14 per cent of the total distance travelled was by vans over three quarters full, whereas 38 per cent was travelled by vans less than one quarter full. Overall, vans were empty for some 15 per cent of total distance travelled.

Of the total distance travelled by company vans, 84 per cent was for journeys that started and ended in the same Government Office Region.

The construction industry accounted for around a third of vehicle kilometres and the wholesale and retail trade a fifth. There was therefore the need to gain a better understanding of those major industry sectors and companies that operate large van fleets, especially regarding the environmental impacts of such LCV use. Desk based research was undertaken to gather information on the top players within the following defined industry sectors:

- Construction
- Utilities
- Mail
- Courier services
- Contract hire and rental
- Pharmaceutical
- Public sector
- Home shopping
- Telecommunications
- Breakdown services

It is recognised that the above list is not exhaustive. The following sections give an overview of these industry sectors and provide a profile of the top players within each industry and, where possible, the environmental impacts of the van operations.

4.1 Construction

The construction industry is one of the largest UK sectors, employing some 1.5 million people and accounting for 10% of UK GDP. The sector comprises around 180,000 companies, of which 98% employ less than 3 people. The remaining split into around 25 (0.014%) large companies and 200 (0.1%) medium sized companies (DTI, 2005).

The construction industry can be seen as a series of distinct sub-sectors such as: house building; infrastructure building; industrial construction; commercial construction and building materials.

For the basis of this report, the construction industry has been taken as a whole, rather than the individual sub-sectors noted above.

Research carried out through the use of Keynote market reports (http://www.keynote.co.uk) has provided us with the following top players within the construction industry in 2003:

- Alfred McAlpine Plc
- AMEC Plc
- Balfour Beatty Plc
- Carillion Plc
- Costain Group Plc
- John Laing Plc
- Kier Group Plc
- Mowlem Plc
- Tarmac Ltd
- Taylor Woodrow Plc

A description of each of these businesses and an indication of the impacts created by their transport operations has been provided below.

Alfred McAlpine Plc
Alfred McAlpine is a construction support services business focused on the built environment. Their principal businesses are driven by the continuing business trend to outsource the maintenance and management of buildings and by the high levels of investment required to renew the UK's health, leisure and education facilities and its transport and utility infrastructure. With over 9,000 employees, building is around one third of their business with the rest made up from facilities management and infrastructure services.

One of the Alfred McAlpine Group Environmental Objectives for 2005 was to determine the extent and feasibility of setting carbon dioxide reduction targets. Part of this was to undertake research into CO_2 emissions and the baseline CO_2 data was collected and collated by businesses across the Group during 2005. The research aimed to include gathering information on current CO_2 emissions in order to establish where the focus for CO_2 target setting needed to be. This research was to include emissions from the company vehicle fleet and selected company offices.

This research was to be completed by April 2006 and following this, a specific CO_2 emissions reduction plan will be agreed for implementation over the remainder of 2006. The results of this research have been published in the Alfred McAlpine Corporate Responsibility Report 2005 (Alfred McAlpine, 2005).

The following table shows Alfred McAlpine's CO_2 emissions generated in 2005 by their vehicle fleet including commercial vehicles, company cars and fuel used by fuel card holders only. The data has been calculated from fuel card information.

Table 4.1: CO_2 emissions for Alfred McAlpine, 2005

Group company vehicle fleet data	CO_2 Emissions 2004	CO_2 Emissions 2005
Tonnes CO_2	22,480*	56,952**

* Data collected over a 6 month period
** Data collected over a 12 month period

From the CO_2 emissions data collected during 2005, Alfred McAlpine could determine that 60% of generated CO_2 emissions that they monitored could be attributed to their company vehicle fuel consumption.

During 2006 Alfred McAlpine intends to review and research various processes and schemes to address and reduce their CO_2 emissions, including the following initiatives: Green Travel Plan, Employee's Company Car tax advice and fuel efficient driving guidelines.

AMEC Plc
AMEC provides technical services and project management to the UK and World markets, employing around 45,000 people in some 40 countries around the world.

AMEC works in many different markets around the world and have a large customer base in the oil and gas, power and transport sectors and in process industries such as mining, food and pharmaceuticals. They also work across the public sector for national and local governments, providing facilities and services in the health, education and defence sectors, and have experience in urban regeneration projects. In addition, AMEC have customers in a range of light industrial and commercial sectors such as financial services, retail and leisure.

Although AMEC Plc has an active Environmental Management system and policy, it is unclear whether their transport operations are included.

Balfour Beatty Plc
Balfour Beatty serves the international markets for rail, road, utility systems, buildings and complex structures. Balfour Beatty's main customers include, the National Grid, BAA and the Highways Agency.

Within Balfour Beatty, environmental issues are monitored and reviewed by a Environmental Strategy Group, made up of representatives of the operating companies under the chairmanship of the Director Safety, Health and Environment.

The company have over 7,000 vehicles operating throughout the UK and consume around 20 million litres of diesel per annum. Therefore, Balfour Beatty have recognised that fuel consumption control offers an important opportunity to improve their environmental performance.

In 2005, four operating companies representing the largest users of vehicles within the Group – Balfour Beatty Power Networks, Balfour Beatty Rail, Balfour Beatty Utilities and RCS, (the road management and maintenance company), worked together to explore three key areas: technology, mileage reduction and culture change.

The Group takes every practical opportunity to adopt technology improvements developed by the motor industry and their fleet list has been expanded to include environmentally friendly options. As a result, the overall average CO_2 emission level per car on their company choice list has fallen from 184gms/km in 2004 to 175gms/km in 2006 (Balfour Beatty, 2005).

Balfour Beatty are currently undertaking trials in London where RCS are reducing fuel consumption by using 'G-wiz' electric cars in a joint venture with Westminster Transerv. These low energy, zero pollution cars are ideal for visiting and inspecting sites. Their fleet services division has also agreed to work with suppliers and customers to introduce heavy goods vehicles fitted with Euro 4 diesel engines as and when they are released for sale in the UK (expected June 2006).

Various options have also been explored with the aim of reducing the overall level of mileage. Satellite navigation and tracking systems have been found to have a major beneficial effect, enabling better planning and reducing the number of wasted journeys.

The greatest opportunity for improvement within Balfour Beatty is in the achievement of culture change. Driver effectiveness training and incentive schemes to encourage car-sharing have been promoted widely. The use of crew cab style vans has been trialled alongside a poster and advertising campaign promoting the benefits of lower fuel usage (Balfour Beatty, 2005).

The next step is for individual operating companies to set relevant targets to reduce CO_2 emissions and ensure increasing improvements to 2010.

Carillion Plc
Carillion is one the UK's leading infrastructure, building and business services companies, with 40,000 employees and an order book worth over £9bn. Their main areas of work include designing, building, and maintaining new environments for business and leisure, and safer, more reliable transport networks.

Carillion have been working to reduce the CO_2 emissions in their car fleet through changes in their company car choice list. They have also established a strategy for reducing business mileage by introducing video conferencing facilities and by questioning business mileage. The migration of their fleet from petrol to diesel and the addition of the Toyota Prius to their fleet have also helped to reduce CO_2 emissions.

During 2005, there was an increase in the Carillion fleet size, which was predominantly driven by the acquisition of PME. In line with this, their CO_2 emissions have grown from 8,959 kg in 2004 to 12,798 kg in 2005. However, CO_2 per unit has reduced to 4,121 kg in 2005 from 4,291 kg in 2004. The proportion of diesel vehicles has also increased from 63% in 2004 to 85% in 2005 with the introduction of some hybrid vehicles also in 2005. Carillion have seen continued reductions in CO_2 emissions per unit as their shift to diesel continues and manufacturers improve emission levels (Carillion, 2005).

The Carillion Fleet Management business have introduced the concept of 'smarter miles' to reduce the cost to the Carillion business whilst helping the environment. One of the key tools used is the Fleet Sustainability Model, developed to reduce environmental impacts whilst delivering improving cost benefits in excess of over £2.2m. This has been achieved through:

- Reduced reliance on daily rental vehicles by 25%
- Reduced CO_2 output by 17.2%
- Reduced corporate mileage by 7% (c.1.3 million miles)
- Reduced accidents by 18%
- £500,000 supply chain savings

(Carillion, 2005)

Costain Group Plc
The Costain Group are a civil engineering and building company and have worked on a number of significant infrastructure projects, including the Channel Tunnel and Channel Tunnel Rail Link. After nearly collapsing in the 1990s, Costain was rescued by Swedish giant Skanska, which has since sold its stake.

Although the Costain Group has an active environmental policy, it is unclear whether their transport operations are included.

John Laing Plc
John Laing is one of the UK's leading investors, developers and operators of privately financed, public sector infrastructure projects such as roads, railways, hospitals and schools.

The Laing Group continues to develop their quality and environmental management systems. In 2005 Laing Road's ISO 9001:2000 quality management system was approved and Equion successfully maintained its ISO 9001 registration for its quality management system and ISO 14001 for its environmental management system. Despite this, it is unclear whether the Group's transport operations are included.

Kier Group Plc
Kier Group plc is a leading UK building and civil engineering contractor also specialising in private house building, facilities management, property development and the PFI. The Group employs 8,300 people worldwide and has an annual turnover in excess of £1.62bn.

The Keir Group have an overarching environmental policy, in which it is noted that vehicle emissions are one of five key target areas that will be measured and monitored. Despite this no information on such emissions could be found.

Mowlem Plc
Mowlem Plc was established in 1822, since when it has become one of the UK's leading construction and support services groups with an annual turnover of nearly £2 billion and more than 25,000 employees worldwide. Since 23 February 2006, Mowlem has been a wholly owned subsidiary of Carillion plc.

No information on Mowlem Plc's environmental policy or transport impacts could be found on their corporate website.

Tarmac Ltd
Tarmac Ltd is a wholly owned subsidiary of Anglo American plc, and produces a range of construction materials including various types of concrete block. They are the UK's leading heavy building materials producer.

These products are split into the following areas: Tarmac Ltd supplies aggregates, asphalts, concretes, mortars and screeds; Tarmac's Tilcon Mortars is a range of natural and coloured mortars, screeds and renders whilst their Topmix range of ready-mixed concretes provides customers with self-compacting and foamed concrete solutions.

No information on Tarmac Ltd environmental policy or transport impacts could be found on their corporate website.

Taylor Woodrow Plc
Taylor Woodrow Plc are a leading housing development company. It is a focused homebuilder with additional expertise in mixed-use development and construction. The Group's principal activities are housing, construction and property development.

The table below provides an estimate of the CO_2 emissions relating to energy procured directly by Taylor Woodrow as part of their UK operations. This information has been gathered via their 2005 Corporate Social Responsibility report. Electricity and gas oil are used during the construction process whilst electricity and gas are used in their offices and show homes. The company vehicle fleet comprises 1,022 cars and 244 vans of which 800 are diesel and 466 are petrol (Taylor Woodrow, 2005).

Table 4.2: CO_2 emissions for Taylor Woodrow's UK operations

Estimated CO_2 emissions from Use of Energy (UK)	2005 CO_2 (tonnes)	2004 CO_2 (tonnes)	2003 CO_2 (tonnes)	2002 CO_2 (tonnes)
Electricity	7,927	14,957	13,250	13,673
Gas	2,876	3,866	3,739	2,929
Gas Oil/ Diesel Products	5,030	4,330	30,057	31,907
Company cars & vans	4,571	6,065	4,224	4,579
Total	20,204	29,218	51,270	53,088

4.1.1 Summary

- The construction sector appears to be dominated by a few large companies, with a larger quantity of smaller companies employed through subcontracts and this is especially true of the home building industry. This will have an impact on the use of light commercial vehicles within this sector, as it may be that the parent company operates a limited number of LCVs, while relying on those LCVs supplied through subcontracted companies. This in turn has the potential to limit the effectiveness of any fuel saving initiatives undertaken by individual construction companies, as they can only impact upon their own vehicle fleet, rather than those vehicles owned by subcontractors.
- Overall, the sector undertakes a range of construction style activities, from home building and industrial construction, to the supply of products and infrastructure maintenance. Similarly, this will have a direct impact on the use and impact of LCVs as those companies involved with major industrial construction projects are likely to undertake less mileage than those involved with infrastructure maintenance.
- Of the 10 companies researched, only 4 had any reference to their transport impacts within their company reports (mainly through Corporate Social Responsibility reports). Those companies undertaking such reporting appeared to be undertaking a range of initiatives, from fleet policy changes to alternative fuels and emission reduction targets. However, much of these appear to be aimed at company car fleets.

4.2 Utilities

The largest sector in terms of turnover is electricity, due to the expensive process of converting primary fuels such as coal or gas into electrical power. Gas forms the second largest sector with its major markets being direct use for heating and, increasingly, electricity generation, while water services are the smallest sector.

There has been a change in direction of the type of players in the UK utility market during the past few years. Following the opening of the electricity and gas markets from the mid-1990s, some of the major players adopted a broad position with activities in electricity, gas, telecommunications, water and waste management. However, there has been a general retreat from this position to the current one in which most players focus on either energy or water.

Research carried out through the use of Keynote market reports (http://www.keynote.co.uk) has provided us with the following top players within the Utilities sector in 2004:

- AWG Plc
- Centrica Plc
- EDF Energy Plc
- National Grid Transco Plc
- E.ON UK Plc
- RWE Power Plc
- Scottish Power UK Plc
- Severn Trent Plc
- Thames Water Utilities Ltd
- United Utilities Plc

A description of each of these businesses and an indication of the impacts created by their transport operations has been provided below.

AWG Plc
The Anglian Water Group's principal activities are supplying and distributing water, collecting and treating wastewater, building and maintaining infrastructure in the utility, social housing, highways and property markets.

Anglian Water has shown that managing transport in a more sustainable way brings financial, as well as environmental savings. By reducing fuel consumption, offering alternative schemes to company cars and encouraging drivers to reduce their mileage, the company saved nearly £1.4 million between May 2001 and 2002. In doing so, CO_2 emissions were reduced by 4,400 tonnes, greatly exceeding the company's 700 tonne target. The reduction in fuel consumption came largely as a result of more fuel-efficient vehicles, including the use of more liquid petroleum gas (LPG) vans and cars and replacing older vehicles with more efficient diesel vehicles (AWG, 2005).

Centrica Plc
The Group's principal activity is the provision of gas, electricity and energy related products and services. The Group also offers a range of services to residential customers which includes installation and servicing of home heating and security systems and the care of electrical wiring, kitchen appliances and plumbing and drains.

Centrica operates a fleet of around 9,500 vehicles, including British Gas vans and company cars. In 2005 their commercial vehicle fleet covered more than 100 million miles and used 13.8 million litres of diesel (Centrica, 2005).

Centrica are maximising the use of new vehicles equipped with the latest low-emission engines. They use whole-life costing for the choice of operational vehicles and company cars to ensure that the most appropriate vehicle and fuel type is chosen and that fuel-efficient vehicles are favoured. Regular maintenance on vehicles is carried out to ensure they meet emission standards and to ensure that the vehicles are in optimum condition.

Centrica are also developing a revised fuel strategy that will ensure maximum benefits are made of the latest vehicle technologies and are investigating the possibility of using biofuels to power their vehicles (Centrica, 2005).

They have improved their fleet management information to offer better quality data on the fleet, focusing on fuel used by each driver/vehicle. High-risk drivers are identified and provided with training to help them improve their driving style to reduce the risk of accidents. Centrica benchmark this performance data against that of other leading companies with similar vehicle fleets.

EDF Energy Plc
EDF Energy is part of EDF Group, one of the three largest energy companies in Europe, with key business interests in Germany and Italy as well as in France and the UK. Founded in 1946, EDF Group's activities include generation, trading, transmission, distribution, supply and other energy services. EDF Energy is one of the largest energy companies in the UK, employing over 11,000 people and supplies gas and electricity to over five million customer accounts.

Despite having an environmental policy, and Corporate Social Responsibility report, no information on transport related impacts or policies could be found on their corporate website.

National Grid Transco Plc
National Grid is one of the world's largest utilities, focused on delivering energy. They own and operate gas and electricity transmission and gas distribution networks in the UK and US. Their UK operations are split into National Grid, UK Electricity Transmission and UK Gas Transmission.

During 2004/05, National Grid Transco Plc used some 45 million litres of fuel within their commercial fleet, company cars and private cars used for business travel and some contractor movements, compared with some 62 million litres in 2003/04 (National Grid Transco, 2005).

E.ON UK Plc

E.ON UK is the UK's largest integrated energy company – generating and distributing electricity, and retailing electricity and gas – and is part of the E.ON group, the world's largest investor-owned energy services provider. They employ around 13,000 people in the UK.

The E.ON Central Networks and Energy Services fleet vehicles use a significant amount of fuel to carry out their operational activities. The quantities are provided in the table below.

Table 4.3: E.ON UK vehicle fleet fuel use

	2002	2003	2004	2005
Litres	598,379	549,490	4,213,301	3,146,976

The apparent reduction in fuel consumption in 2005 was a result of a number of factors, including the rationalisation of reporting systems and the removal of some company cars and pool vehicles from the monitoring systems. The increase in diesel fuel use since 2003 is due to the inclusion of Central Networks West (acquired in 2004). This region has much higher numbers of internal staff carrying out field operations and distances between sites of work tend to be greater because of the rural nature of the area. Furthermore, the data also include the metering business that was acquired at the same time, which has a large number of field staff (E.ON UK, 2005).

During 2005, E.ON UK Plc staff travelled almost 18 million miles on business. They are aiming to reduce this mileage by re-assessing the need for travel between locations and better scheduling of essential meetings. Among the solutions being employed are increased use of video and teleconferencing, and use of web-based virtual meeting applications.

RWE npower Plc
RWE npower Plc, a division of the RWE Group, is a leading UK energy company, supplying gas and electricity through their retail business npower.

Despite having an environmental management system and Corporate Social Responsibilty report, no information on transport related impacts or policies could be found on their corporate website.

ScottishPower UK Plc
ScottishPower is an international energy company, made up of four businesses: Energy Retail, Energy Wholesale and Energy Networks in the UK and PPM Energy in the US.

ScottishPower has operated a transport policy designed to minimise environmental impact for several years. This is kept under review to accommodate changes in legislation, technology and financial incentives. The Fleet Business in the UK has been offering cars with lower CO_2 emissions for the last three years, in particular encouraging employees to take advantage of the benefits in kind tax incentives for lower carbon emitting cars. Environmental factors, such as fuel consumption and vehicle emissions are taken into account during the tendering process for the supply of new vehicles (ScottishPower, 2005).

In the US, 90% of light-duty vehicles purchased after the 2000 model year by fleet operators, such as PacifiCorp, must be alternative-fuelled vehicles. This includes the use of a 20% biodiesel blend (ScottishPower, 2005).

Severn Trent Plc
Severn Trent Plc is a leading environmental services group providing water, waste and utility services. The group, which includes Severn Trent Water, Biffa, Severn Trent Laboratories and Severn Trent Services, generates revenues of £2.081 billion and employs more than 15,000 people across the UK, US and the rest of Europe.

During 2004/2005 Severn Trent Plc travelled almost 189 million kilometres by road, rail and air, an increase of 3% on the previous year. Biffa, who travelled almost 90 million kilometres in 2004/2005, compared to 80 million kilometres the previous year, undertakes almost half of this (Severn Trent, 2005).

Biffa operates approximately 1,650 vehicles throughout the UK, accounting for some 79% of Severn Trent's transport-related greenhouse gas emissions in 2004/2005. To mitigate the impact of its fleet on the environment, Biffa has a programme to manage and reduce its transport-related emissions, including:

- Replacing around 15% of its fleet each year. The entire fleet runs on ultra-low sulphur diesel, and all new vehicles meet the Euro IV emissions standard. Driver and vehicle fuel consumption is monitored using a nationally-networked fuel dispensing system.
- Fitting the majority of Biffa fleet workshops with smoke emissions meters, meaning that vehicles are now tested routinely throughout the year. Any anomalies can be identified quickly, and the vehicle's engine can be tuned to improve fuel efficiency and reduce emissions.
- Running trials on biodiesel, with the aim to utilise biodiesel in the fuel mix for 50% of its fleet vehicles by April 2006.

In the past gas-powered vehicles have not provided a viable alternative for the bulk of the fleet. However, Biffa is in discussions with a leading supplier over the use of new gas-power technology, and it aims to conduct new trials with gas power (Severn Trent, 2005).

Thames Water Utilities Ltd
Thames Water first came into existence in 1974, when ten regional water authorities were created for England and Wales. The company was privatised, along with the rest of the industry, in 1989.

With a fleet of over 2,500 vehicles and over 13 million miles travelled for business in 2004, Thames water recognise that they have a responsibility to reduce the environmental and social impacts of their transport use. An environmental policy for transport has been established which is being implemented through their green transport strategy (Thames Water, 2005).

Initiatives that form part of the green transport strategy and will help deliver future fleet fuel consumption and business mileage targets include:

- The installation of Automatic Vehicle Location (AVL) in their liveried vehicles. AVL provides a management tool to locate each of their vehicles, which assists in planning work, resulting in improved performance and efficiencies and will also help to reduce vehicle and fuel costs.
- E-conferencing has been promoted throughout Thames Water via their internal magazine and various employee-training sessions. In addition teleconferencing and video-conferencing facilities are available across the company.

The table below gives an indication of the carbon dioxide emissions from the Thames Water fleet.

Table 4.4: CO_2 emissions for the Thames Water fleet

	2001	2002	2003	2004
Tonnes CO_2	6211	7740	6783	6974

(Thames Water, 2005)

United Utilities Plc

United Utilities Plc was created from the merger of North West Water and Norweb in November 1995. Its principal activities are managing and operating the regulated electricity distribution, water and wastewater networks in North West England, a region with a population of around 7 million.

During 2004, United Utilities bought 30 LPG-powered vehicles for use in their Welsh operations. These are in addition to 26 bought in the previous year. They have also been trialling the use of biodiesel. The trial has given positive results in terms of efficiency and emissions, and a decision is pending on the next phase (United Utilities, 2005).

4.2.1 Summary

- The UK utilities sector undertakes a range of activities, from electricity, gas and water supply and maintenance, to building maintenance and waste management services. These differing roles will have an influence on the use and impact of LCVs.
- Of the 10 companies researched, 8 had references to transport impacts within their company Corporate Social Responsibility report. Within these, there were a wide range of initiatives being undertaken, from vehicle replacement policies and a switch to diesel, to the trialling of alternative fuels such as biodiesel and the implementation of vehicle tracking systems. Although many of these appeared to be aimed at their company car fleets, the use of vans was mentioned, giving the impression that the utilities sector understands the role and impact of these vehicles on their businesses.

4.3 Mail and courier express parcel services

Mail and courier express parcels services involve the delivery of letters and packages. Such deliveries are commonly undertaken by bicycle or motorcycle, but small vans and cars are also used for bulkier consignments.

Despatch or parcel delivery services tend to demand speed and reliability. These services typically involve a time specific constraint usually on a 24-hour, 48-hour, or 72-hour basis, and proof of delivery is also invariably required. They are most often used when the usual mail cannot be relied upon for speed and, in particular, for same day delivery.

The market as a whole has been affected in recent years by the growth in e-commerce. This has had a significant impact in stimulating effect on demand for home deliveries resulting from orders placed over the Internet. Also of significance has been the blurring of the boundaries between what were at one time considered separate activities, in particular between courier and express services on the one hand and national post and logistics activities on the other. A notable example of this has been provided by the conversion of Germany's national postal service into Deutsche Post World Net and that company's takeover of DHL. Overall, the courier and express services market has been growing at a faster rate than the UK freight transport market.

In general, there is likely to be a continuation of existing trends, including the exit of weaker players from the marketplace, the exploitation of niche markets by the more successful players and the impact of the Internet on the market, an influence that has both positive and negative effects.

Research carried out through the use of Keynote market reports (http://www.keynote.co.uk) has provided us with the following top players within the Courier and Express delivery sector in 2005:

- Home Delivery Network Ltd
- Business Post Group Plc
- DHL
- FedEx Corporation
- GeoPost UK Ltd
- Lynx Express Ltd
- Parcelnet Ltd
- Royal Mail Holdings PLC
- TNT Express Worldwide (UK) Ltd
- UPS Ltd

A description of each of these businesses and an indication of the impacts created by their transport operations has been provided below.

Home Delivery Network Ltd
Once called Business Express Network Limited, Home Delivery Network Limited is the UK's largest dedicated home delivery service. It is the result of the merger of Business Express Network Limited with Reality Group Limited in 2004 and is now part of the Littlewoods Group. Business Express Network Limited was the unit within the Littlewoods Group that provided parcel delivery services for the Littewoods home shopping business. It also provided parcel delivery services on behalf of some third parties.

No information on Home Delivery Network Limited's environmental policy or transport impacts could be found on their corporate website.

Business Post Group Plc
Business Post has grown to become one of the largest independent express delivery companies in the United Kingdom. Business Post has an estimated 8% share of the premium express delivery market, making it the fourth largest operator in the sector, operating through a UK network of over 140 locations and with key strategic alliances for deliveries world-wide. For example, a long-term agreement is in force with FedEx, the world's largest express transportation company, and alliances are in place with a number of leading European express companies for road deliveries across continental Europe.

In 2003, the business of BXT, a Birmingham based courier, was acquired and subsequently rebranded as Business Post Technical Couriers. Then in 2004, the Group entered the rapidly growing palletised freight delivery market by the acquisition of Weaver Pallet Express, now trading as UK Pallets.

The Business Post Subsidiary UK Mail was the first ever independent company to provide business mail services across the UK, following the deregulation of postal services. It has been operational since May 2004 and is now number two in the postal market after Royal Mail.

The Group recognises it has the potential to make a significant contribution towards improving the environment and is determined to realise this potential. Responsibility for communicating the Group's environmental policy and monitoring compliance rests with the Group's Transport Manager and National Health and Safety Manager.

Examples of actions taken by the Group to minimise its environmental impact include:

- Continued use of automated vehicle routing to eliminate unnecessary mileage
- Use of double-decked trailers, modified to be more fuel efficient and less harmful to the environment
- Continued use of fuel which is both low in sulphur and lead
- Trialling the use of biodiesel

(Business Post Group, 2005)

DHL

Part of the Deutsche Post Group, DHL provides a courier, parcel and express shipment service to international destinations by road, rail and air. Their network spans the globe and allows them to provide both standard products and tailored solutions to customers in over 220 countries and territories. Their portfolio also spans international air and ocean freight, contract logistics and value-added services along the customer's entire value chain. This enables them to help manufacturers and trading companies to manage their supply chains across the globe. They are the number one in the intercontinental freight business and, following the acquisition of Exel (UK), they are now one of the market leaders for contract logistics as well.

In 2004, the DHL Group used 50 million litres of diesel and petrol across their 124,000 worldwide vehicle fleet, releasing some 830,000 tonnes of carbon dioxide. As part of their commitment to tackling the causes of climate change, DHL aim to reduce their dependence on fossil fuels by promoting environmentally-friendly alternatives, by operating alternative fuel vehicles and by operating more efficiently (DHL, 2005).

One way of achieving this is by adopting an environmentally friendly driving style. DHL have dedicated in-house trainers to school their drivers in defensive driving and fuel-saving techniques. Their 'eco-driving schemes' can generate fuel savings of between 2 to 8%.

DHL also operates a growing fleet of alternative fuel vehicles in countries around the world as part of their efforts to tackle the causes of climate change and to reduce their emissions. They already operate 1 CNG and 126 LPG vehicles within their UK operations. Beyond this, DHL are also constantly improving the efficiency of their operations, thus reducing their consumption of fuel by:

- Purchasing vehicles with fuel efficient engines and streamlined bodywork
- Implementing a thorough and regular maintenance regime for their fleet
- Increasing loading factors - thereby avoiding the need for additional vehicles
- Route optimisation - in many cases on a daily basis

(DHL, 2005)

FedEx Corporation

FedEx Corporation provides transportation, e-commerce, and business services worldwide. The company operates in four segments: FedEx Express, FedEx Ground, FedEx Freight, and FedEx Kinko's.

Although information could be found on FedEx's USA based environmental policy, no information could be found on their UK operations.

GeoPost UK Ltd
GeoPost UK is wholly owned by La Poste, the second largest postal operation in Europe and is represented in the UK by the following brands: Interlink Express, Parceline and DPD.

No information on GeoPost's environmental policy or transport impacts could be found on their corporate website.

Lynx Express Ltd
LYNX Express, recently acquired by UPS, is now part of the world's largest package delivery company and leader in global supply chain services. LYNX Express employs over 3,500 people and operates a fleet of more than 2,000 vehicles. Activities centre on the group head office in Nuneaton, which is also the site of the two main hub operations. Their service provision is split into the following groups: Lynx Express, Lynx Partsflow, Lynx Solutions, Lynx@Home and Lynx International.

No information on Lynx Express's environmental policy or transport impacts could be found on their corporate website.

Parcelnet Ltd
A division of Otto UK, Parcelnet was formed in 2000 with the merger of Speedlink and Direct Line, the home delivery networks of two of the UK's home shopping companies, Freemans and Grattan.

As well as providing home delivery and return collection services to Otto UK in-house brands, Parcelnet supports a number of third party clients including Next Directory, Cotton Traders, Boden, Debenhams Direct, Tesco Home Shopping and Lakeland Limited. Performing 85 million handlings each year, across its 14 depots, Parcelnet manages home delivery fulfilment from client warehouse to customer, via its own courier network and complementary carriers. Their 5,000 strong courier network is managed by a team of 2 Divisional, 10 Regional and 75 Field Managers.

No information on Parcelnet's or OTTO UK's environmental policy or transport impacts could be found on their corporate websites.

Royal Mail Holdings Plc
This state-owned company delivers about 84 million letters and other items daily to some 27 million addresses in the UK through its main unit, Royal Mail. Royal Mail's Parcelforce Worldwide unit provides express delivery services, primarily in the UK but also, through alliances, elsewhere in Europe and around the world.

Royal Mail is their letters and packages business, covering the whole of the UK for a one-price-goes-anywhere universal service. Each working day Royal Mail collect items directly from some 113,000 post boxes, 14,500 Post Office branches and around 87,000 businesses. These items pass through a network of 70 mail centres, 8 regional distribution centres (for customer sorted mail) and 3,000 delivery offices. Then a fleet of over 30,000 red vehicles and 33,000 bicycles delivers them to their final destination (Royal Mail Holdings, 2005).

Parcelforce Worldwide is Royal Mail's express parcels business, delivering around 150,000 parcels a day. In the last few years Parcelforce Worldwide has successfully turned around its business and is now a key player in the competitive, unregulated, express parcels market.

General Logistics Systems (GLS), is Royal Mail's European parcels business. GLS handles over 1 million parcels a day, through its network of 667 depots, 29 central transhipment points, 16,000 delivery vehicles and 1,700 long distance trucks.

Royal Mail's transport and distribution operations have a significant impact on the environment, having one of the largest fleets in Europe with about 32,000 vehicles in their commercial fleet, including hire vehicles and around 2,600 company cars. In 2004-05 they implemented a fuel monitoring system across the whole business, which enables them to monitor the amount of fuel used through electronic measurement systems at all onsite fuel tanks (Royal Mail Holdings, 2005).

The trial and use of alternative fuels continues to play a role in their transport programme, with a range of alternative fuel vehicles throughout their operations, from 147 liquefied petroleum gas (LPG) vehicles based in London and Perth, through to the electric Bradshaw vehicles utilised in Oxford.

They are also trialling the use of biodiesel in their operational vehicles and are midway through a trial at their Normanton Office. They have two Volvo Bi-fuel (petrol and LPG) vehicles that are being used as pool cars in London. In addition, the Honda IMA Hybrid has proved very popular and Royal Mail are investigating options to increase the numbers available (Royal Mail Holdings, 2005).

TNT Express Worldwide (UK) Ltd

TNT Express Services is a leading business-to-business express delivery carrier in the UK & Ireland, employing 10,600 people and operating 3,500 vehicles out of 70 locations. The company delivers some 3.5 million parcels, documents and pieces of freight a week to more than 200 countries using its network of nearly 900 depots, hubs and sorting centres. TNT Express operates over 19,000 road vehicles and 43 aircraft and has the biggest door-to-door air and road express delivery infrastructure in Europe.

According to the TNT Social Responsibility Report 2005, around 23% of the CO_2 emissions produced by the TNT Express operations are associated with their automotive fleet, which amounts to some 152 kilo tonnes (TNT, 2005).

To reduce this impact, TNT Express are encouraging the introduction and use of on-board computers, which has resulted in around 3,229 vehicles using them. The on-board computers provide TNT Express with information that allows them to use less fuel.

UPS Ltd

Founded in 1907 as a messenger company in the United States, UPS has grown into a USD 36 billion corporation by clearly focusing on the goal of enabling commerce around the globe. Today UPS, or United Parcel Service Inc. is a global company with one of the most recognised brands in the world. As the largest express carrier and package delivery company in the world, UPS are also a leading provider of specialised transportation, logistics, capital, and e-commerce services. Every day UPS manage the flow of goods, funds and information in more than 200 countries and territories worldwide.

Although information on UPS Ltd's US based environmental policy and transport related impacts could be found, nothing could be found relating to UK based policies or emissions.

4.3.1 Summary

- The mail and courier express parcel delivery sector appears to be dominated by a limited number of very large companies who operate nationally, with a larger number of small companies operating more locally. Vehicle use within this sector is likely to be dominated by the LCV, as these vehicles provide a more flexible solution for the delivery of parcels and letters.
- Of the 10 companies researched, 4 made reference to transport impacts within their company Corporate Social Responsibility report. As part of this there were a wide range of initiatives being undertaken, from the trialling of alternative fuels such as biodiesel to driver training and the implementation of route optimisation and vehicle tracking systems.
- Although many of these appeared to be aimed at their company car and large goods vehicle fleet, the use of vans was mentioned, giving the impression that this sector understands the role and impact of these vehicles on their businesses.

4.4 Contract hire and rental

The vehicle leasing sector is made up of companies engaged in the hiring out of vehicles ranging from cars and vans to heavy goods vehicles. The sector is dominated by around 10 large leasing companies, who account for some 60% of all vehicles leased (FN50, 2005).

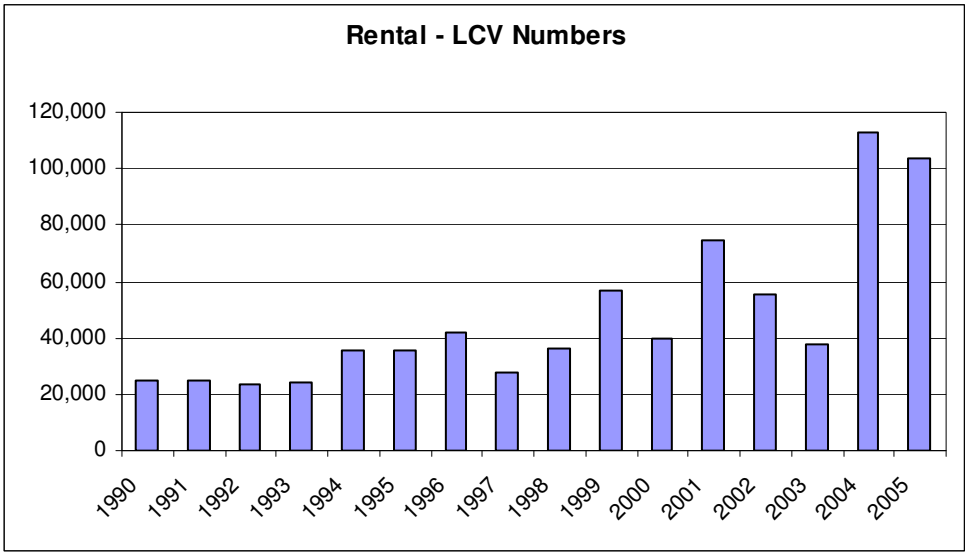
Research carried out by Datamonitor for Northgate Plc in 2000 has shown that the Light Commercial Vehicle leasing and rental market grew by around 17% between 1998 and 2000 and was forecast to grow by a further 32% by 2005 (Northgate, 2004).

LCV rental companies offer rental over different time periods and with differing degrees of flexibility, characterised as either daily rental (often called spot hire) or longer-term contract hire.

Daily rental sector
This sector is dominated by suppliers such as Enterprise, Sixt, Lombard and Avis which, while traditionally focusing on hiring out vehicles other than LCVs, have recently increased their LCV numbers significantly.

Information gathered through the British Vehicle Rental and Leasing Association (BVRLA) shows that the Light Commercial Vehicle rental market has seen strong growth since 1990, which can be attributed to the growth of the van industry. This information is shown in figure 4.1. Research carried out (detailed in following sections) as part of this study indicated that this growth might also be due to van users tending to rent rather than purchase their vehicles.

Figure 4.1: Growth in LCV rental market

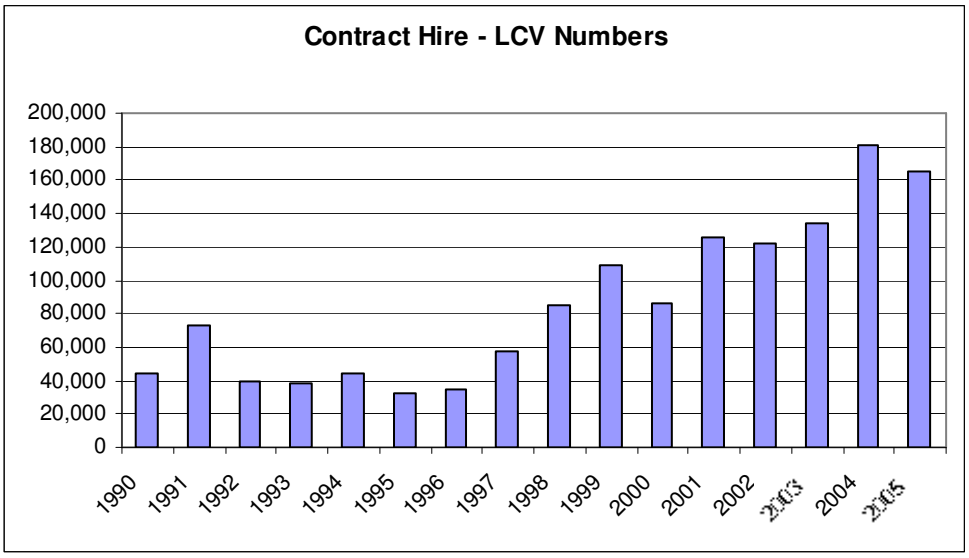


Contract hire
Contract hire, sometimes referred to as long-term rental, is technically an operating lease in which, the user (the hirer) simply hires the vehicle for a predetermined period and mileage at fixed monthly rentals from the owner (the contract hire company). Ownership, and all risks, rewards and associated responsibilities are retained by the owner or passed to a third party. The arrangement cannot embody any option to purchase the vehicle.

In its barest form, contract hire covers depreciation, funding and road fund licence, though more commonly the agreement incorporates at least a standard maintenance package. Beyond that, most contract hire companies offer a range of additional services which, depending on how many are written into the contract, can transfer varying degrees of the fleet administration burden and risk from the vehicle user to the owner. Examples of such services include relief vehicles to replace those off the road for repair, roadside assistance, insurance, accident management and fuel cards. Users are able to choose from a menu of options to meet their individual budgets and level of in-house fleet support resources.

Information gathered through the BVRLA shows that the numbers of Light Commercial Vehicles being funded through Contract Hire has been growing since 1990, which can be attributed to the growth of the van industry. Similar to the daily rental sector, research carried out (detailed in following sections) as part of this study indicated that this growth might also be due to van users tending to contract hire/ lease rather than purchase their vehicles.

Figure 4.2: Growth in LCV contract hire market

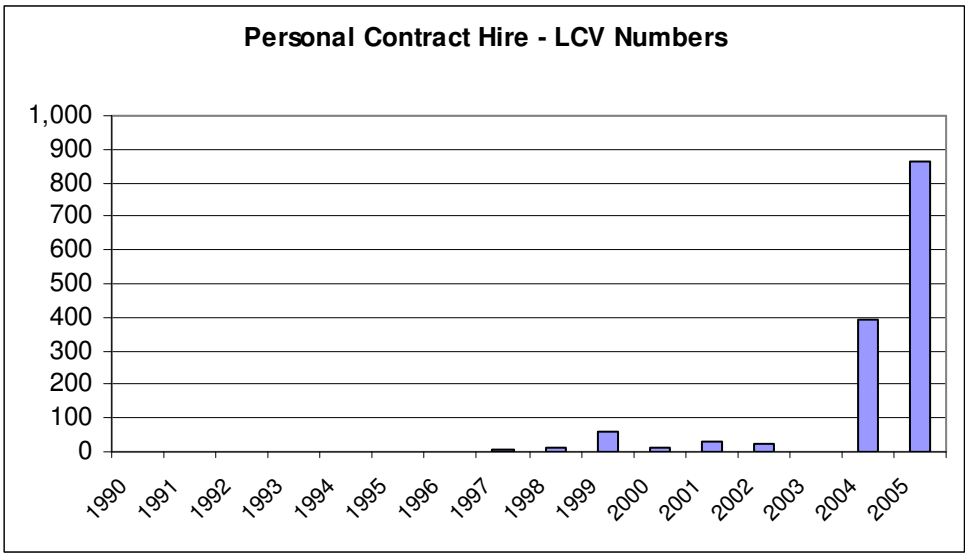


Personal contract hire

This type of finance package allows individual employees to drive new vehicles at a competitive price, while benefiting from monthly payments that will be lower than traditional finance arrangements. The employee chooses to finance the vehicle for a contract period to suit his or her needs, with the supplier guaranteeing the future value of the vehicle. The employee can also choose to take an optional maintenance package and roadside assistance for peace of mind. The scheme can be made available to all staff, regardless of whether the employee receives a cash allowance or not. The majority of vehicles leased under this package are cars.

Information gathered through the BVRLA shows that the numbers of Light Commercial Vehicles being operated through Personal Contract Hire has been slowly growing since 1999, with a large increase from 2004 onwards. This growth in personal contract hire may be due to the growth in alternative company car schemes called Employee Car Ownership Schemes (ECOS), which allow employees to select a wider variety of vehicles. However, further research would be required to provide further details into the reasons and specific LCV type behind this growth.

Figure 4.3: Growth in LCV personal contract hire market



Contract hire sector

This sector is dominated by suppliers such as Lex Vehicle Leasing and Lloyds TSB Autolease who have traditionally focused on leasing out cars to the company car sector. However, almost all contract hire organisations have a separate business that focuses on the light commercial vehicle sector, for example TLS within GE Commercial Finance.

The British Vehicle Rental and Leasing Association (BVRLA) represent nearly 800 Members who between them run more than two million vehicles and who buy 45% of all new vehicles sold in the UK. In doing so, they spend more than £14 billion each year on vehicles and around a further £4 billion on support services.

Led by contract hire, the BVRLA Members' fleets increased by more than 5% to a new record total of 2.639 million units. Car contract hire now forms more than 57% of the total fleet with light commercial vehicles (LCVs) and large goods vehicles (LGVs) adding a further 9.5%.

Contract hire for cars increased by 166,000 units to a new high of 1.507 million units while jointly, the commercial vehicle sectors also rose to a new combined total of 251,318 units.

The annual Fleet News report (FN50) on the contract hire sector shows that the top ten leasing companies in 2005 were as follows:

- Lex Vehicle Leasing
- Lloyds TSB autolease
- LeasePlan UK
- Lombard
- Masterlease
- Bank of Scotland Vehicle Finance
- Arval
- GE Commercial Finance Fleet Services
- ALD Automotive
- BT Fleet

Further information supplied by the FN50 report is provided in tables 4.5 and 4.6:

Table 4.5: FN50 market share

Table position	'05 Fleet Size	'05 % Market Share
1 – 5	364,765	44.3
6 – 10	306,452	21.4
11 – 20	277,462	19.4
21 – 30	120,088	8.4
31 – 40	61,693	4.3
41 – 50	32,888	2.3

Table 4.5 shows how the Contract Hire sector is dominated by a few suppliers. The top 20 players account for some 85% of the market covered by the FN50 report. To highlight this the bottom 25 suppliers hold less market share that the largest player, Lex Vehicle Leasing, who operate around 170,000 vehicles. In contrast, the bottom 25 players operate a total of 136,821.

Table 4.6: FN50 fleet size comparison

Year	Top 10	% FN50 Fleet Size	FN50 Fleet Size
1994	416,046	57.9	718,084
1995	446,446	58.4	763,838
1996	477,928	56.8	841,490
1997	570,315	59.5	958,266
1998	600,635	53.3	1,127,189
1999	573,497	51.0	1,125,533
2000	726,671	58.1	1,256,490
2001	779,391	60.2	1,294,643
2002	862,429	64.5	1,336,094
2003	908,000	66.8	1,359,210
2004	900,457	62.1	1,449,147
2005	941,217	65.7	1,433,348

From table 4.6, it can be seen that the largest companies have increased their domination of the market, despite the total size of the FN50 fleet decreasing slightly compared to 2004.

The growth of the top 10 companies has been due to acquisitions and takeovers, rather than an increase in customer orders.

4.4.1 Summary

- As with many industry sectors, the contract hire sector is dominated by a limited number of large companies. An indication of this is the fact that the top 20 companies control around 85% of the vehicles. Although the majority of these will be cars, each leasing company tends to have their own LCV rental section.
- The main business undertaken by contract hire organisations is the supply of specific vehicle to companies. Although it is unlikely that the rental company will have any direct influence over the vehicle chosen, many do offer fleet and fuel management packages to assist LCV users manage their operations more effectively.
- The continued growth of the LCV contact hire and daily rental sectors indicates that the flexible and cost effective packages offered by such organisations are becoming more attractive to those companies operating LCVs.

4.5 Pharmaceutical

The UK pharmaceutical market is a successful, research-driven, high-technology industry. The UK market is dynamic and increasingly competitive and, with a trade surplus of £2.44bn in 1998, it ranks third after Germany and Switzerland in the global pharmaceutical industry rankings in terms of trade balance. According to the Association of the British Pharmaceutical Industry (ABPI), the industry employs around 75,000 people, of whom over 25% are graduates.

Distribution of pharmaceuticals is highly complex and diffuse, as retail outlets are polarised between the enormous High Street retailers such as Boots the Chemists Ltd and small, community-based pharmacies. Pharmaceuticals are generally distributed via specialist wholesalers such as Alliance UniChem or AAH Pharmaceuticals.

Research carried out through the use of Keynote market reports (http://www.keynote.co.uk) has provided us with the following top players within the Pharmaceuticals sector in 2005:

- AstraZeneca Plc
- Celltech Group Plc
- GlaxoSmithKline Plc
- Novartis Consumer Health UK Ltd
- Pfizer Group Ltd
- Roche Products Ltd

The following pharmacies were chosen as representative of the pharmacy sector in the UK.

- Boots the Chemist
- Lloyds Pharmacy
- Superdrug Stores Plc
- Alliance Unichem Plc
- Numark Ltd

A description of each of these businesses and an indication of the impacts created by their transport operations has been provided below.

AstraZeneca Plc
In 1999, the British company Zeneca plc, and the Swedish company Astra, merged to form AstraZeneca, thus becoming one of the world leaders in the pharmaceutical industry. The British group finishes and sells various medicines to pharmacies and hospitals.

As noted in the AstraZeneca Corporate Responsibility report, the major sources of carbon dioxide are from the energy used at their sites and from travel and transport. AstraZeneca's total greenhouse gases from all sources in 2005 amounted to 1.43 million tonnes CO_2-equivalent, compared to 1.49 million tonnes CO_2-equivalent during 2004. Of these emissions around 23% could be attributed to travel and transport operations (AstraZeneca, 2005).

During 2005, CO_2 emissions from transport activities, including transport of products and business travel by road and air, totalled 0.32 million tonnes. The biggest single contribution to these emissions is associated with business travel for sales and marketing activities.

During 2005, the reported business travel by car amounted to 653 million kilometres. This is an increase on last year of 4% and is mainly attributable to an increase in sales and marketing activity and improved reporting. More than 90% of the miles driven are associated with sales and marketing. Nevertheless, the sales-related emission index for car travel has decreased by 7% from 2004.

To reduce their impact on the environment, AstraZeneca are developing partnerships with logistic and road haulage companies who have good procedures for SHE and quality management, modern trucks with efficient engines and drivers trained in eco- and safety driving.

Internally, efforts have been made to make transport more efficient by using more environmentally friendly packaging options. For example, a thin 'slip-sheet', instead of a wooden pallet, is used in air containers. This enables one additional cubic metre volume of goods to be transported in a main deck container of 17 cubic metres. Wherever possible, reusable blankets have replaced polystyrene boxes for temperature-controlled transport (AstraZeneca, 2005).

In 2005, all new cars purchased for the sales force in Brazil were 'Flex Fuel' cars (i.e. powered by either ethanol or petrol) and AstraZeneca now have 250 of these in their 400-strong Brazilian car fleet. In the US, they have ordered 20 hybrid cars to form a pilot scheme, while 10 SAAB Bio-power vehicles are being tested in Sweden, with engines adapted to run on a blend of 85% ethanol and 15% petrol.

Table 4.7: AstraZeneca transport emissions

Emissions from transport	2001	2002	2003	2004	2005	Change
Car travel (in million km)	467	536	592	630	653	+4%
CO_2 emissions (in million tonnes)	0.27	0.28	0.30	0.32	0.32	+2%

Celltech Group Plc
Following a takeover in 2004, Celltech is now fully integrated into UCB a global biopharmaceutical company.

The UCB corporate HSE charter states "We are committed to the efficient use of natural resources and to the minimisation of adverse environmental impacts of our activities and our products throughout their life cycles." Despite this, no information on policies or environmental impacts relating to transport could be found on their corporate website.

GlaxoSmithKline Plc
The Group's principal activity is creating, discovering, developing, manufacturing and marketing pharmaceutical products and consumer health-related products.

GSK estimate that transport accounts for around 9% of their total global warming impact. In 2005 they emitted approximately 232 million kg of CO_2 from transport. In 2005, their global sales fleet drove a total of over 850 million kilometres on business travel – resulting in 102 million kg of CO_2 (GlaxoSmithKline, 2005).

Novartis Consumer Health UK Ltd
Novartis is a world leader in the research and development of products to protect and improve health and well-being. Novartis is organised into three business divisions - Pharmaceuticals, Consumer Health and Sandoz, employing over 81,000 people across 140 countries worldwide.

The Novartis Global Reporting Initiative (GRI) is a multi-stakeholder process that aims to develop a common global framework for "sustainability reporting." The objective is to elevate sustainability reporting to the same level of rigour and credibility expected of financial reporting. Despite this, it fails to mention environmental impact relating to transport, or any transport related policies.

Pfizer Group Ltd
In June 2000, Pfizer Inc merged with Warner Lambert to create the 'new' Pfizer. This made Pfizer Limited a market leader in Consumer Healthcare. During April 2003, Pfizer and Pharmacia combined operations, bringing together two of the world's fastest-growing and most innovative companies. This made Pfizer Limited the largest pharmaceutical company in the UK and the number one supplier of medicines to the NHS.

The 'Pfizer in the Community' website highlights that the primary source for environmental impact relating to transport is from travel to work and business-related travel. In a year, Pfizer employees travel approximately 30 million business miles by road for all European operations. Pfizer estimates that their total travel-related carbon dioxide produced is around 30,000 tonnes per year. This is around 25% of that related to their energy use, making travel a key target for impact reduction (Pfizer, 2005).

Their primary focus on travel management has been the introduction of a Green Transport Scheme, however, no information has been provided in relation to business related travel and the impacts and policies thereof.

Roche Products Ltd
Roche produce a range of diagnostic and pharmaceutical products and employs around 1,800 people in the UK.

Despite having a sustainability report, no information on policies or environmental impacts relating to transport could be found.

Boots the Chemist
Boots are the United Kingdom's leading health and beauty retailer and one of the best-known names in the UK.

During the last two years they have seen considerable changes within their logistics operations. Various services, including commercial vehicle management and operation, have been outsourced to third party suppliers. Boots estimate that they are now delivering around 13% more stock, while at the same time improving the on-shelf availability of their products through more frequent deliveries to stores. Their transport efficiency (as measured by m^3 stock delivered per 1,000km travelled) has improved by 5.4% since 2002/03 through better scheduling and increased vehicle fill (Boots, 2005).

They have introduced 23 dual-fuel vehicles into their long distance LGV fleet, using a mixture of Liquefied Natural Gas and diesel, to reduce their carbon dioxide emissions. The rest of the Boots fleet is moving towards EURO IV compliance, allowing them to meet stringent standards for emissions such as particulates that have an impact on local air quality.

Boots are continuing their policy of 'backloading' (i.e. using their vehicles to deliver goods to stores, then picking up goods from their suppliers on the return journey) now saving the equivalent of around 1.8 million kilometres of travel on UK roads (and approximately 2,000 tonnes of carbon dioxide) each year (Boots, 2005).

Lloyds Pharmacy
Lloydspharmacy is the trading name of Lloyds Pharmacy Limited, which in turn is a wholly owned subsidiary of Celesio AG, one of the largest pharmaceutical wholesalers in Europe. Celesio AG purchased AAH Plc and also acquired Lloyds Chemists Plc, which at the time had 902 pharmacies. Together with AAH's 350 strong Hills Pharmacy network, this took the combined group to over 1,250 pharmacies. This has now grown to over 1,520 pharmacies within the UK.

No information on policies or environmental impacts relating to transport could be found on their corporate website.

Superdrug Stores Plc
Superdrug Stores Plc is a leading health and beauty retailer, operating over 700 stores in high street and shopping mall locations throughout the UK and employing 12,500 people.

No information on policies or environmental impacts relating to transport could be found on their corporate website.

Alliance Unichem Plc
Alliance Unichem Plc is one of the top three pharmacy groups in the UK with over 800 stores. They are a Europe-wide healthcare distribution group with 300 warehouses, each carrying up to 25,000 product lines for efficient delivery to the pharmacist. With more than 1,200 pharmacies in the UK, Norway, the Netherlands and Italy, Alliance UniChem operates the third largest pharmacy network in Europe.

The Alliance Unichem business manages the handling and distribution of pharmaceutical products in seven European countries. In the UK and the Netherlands, their own vehicle fleets carry out the majority of product delivery. In France, around half of their deliveries are conducted by third party contractors and in the Czech Republic, Norway, Italy and Spain, most of their product delivery is outsourced.

In 2005,they owned or leased approximately 1,400 product delivery vehicles, the majority being vans which deliver products from their wholesale depots to customers. Larger trucks and lorries make deliveries from their central distribution centres to their depots. Over 90% of Alliance Unichem vehicles meet the EURO III or higher standards on emissions (Alliance Unichem, 2005).

In 2005, the fleet produced around 25,200 tonnes of carbon dioxide (CO_2). In their wholesale businesses in the UK, France and the Netherlands, the fleet efficiency was 8.6 kilometres per litre of fuel and 31,700 units delivered per tonne of CO_2.

Fuel efficiency is a key consideration in their fleet purchasing decisions. Their UK wholesale business has selected a new standard van for its fleet that is 8% more fuel efficient than previous models.

They also seek to optimise efficiency through logistical planning such as increasing vehicle loads and plotting the most efficient routes. In the last 18 months, their UK wholesale business installed a telematics unit in all vans, which monitors vehicle movements and enables better route planning. In addition, the UK business re-evaluated all van routes using a new computer routing system. The initial results show some significant savings, with some depots achieving up to a 15% reduction in kilometres travelled (Alliance Unichem, 2005).

Table 4.8: Alliance Unichem transport data, 2005

Transport Issue	Quantity
Transport fuel (000 litres)	9,600
Distance travelled (000 km)	83,600
CO_2 from fuel use (tonnes)	25,200
Transport efficiency (km per litre)	8.6
Transport efficiency (units delivered per tonne of CO_2)	31,700

The above data covers Alliance Unichem's own product delivery fleet only. It does not include third party distribution or business travel.

Numark Ltd
Based in Tamworth, Staffs, Numark Ltd provides buying and marketing support under the Numark Brand to 1,720 membership pharmacies throughout the UK. It is the largest 'virtual chain' of independent pharmacists in the UK with outlets across England, Wales, Scotland and Northern Ireland.

No information on policies or environmental impacts relating to transport could be found on their corporate website.

4.5.1 Summary

- The UK pharmaceutical sector can be divided into two distinct areas i.e. the manufacture and production of health care products and medicines and the selling of such products over the counter. These distinct areas will have their own specific transport related impacts, with the manufacturing sector focusing on sales and product delivery to distribution centres, while the retail sector focuses on product delivery to individual stores.
- Of the 11 companies researched, 5 made reference to transport impacts within their company Corporate Social Responsibility report. As part of this there were a wide range of initiatives being undertaken, from the trialling of alternative fuels to the implementation of backloading and new vehicle emission standards. However, many of these initiatives were aimed at company LGV fleets rather than their vans. Similarly, many pharmaceutical companies had initiatives to reduce company car use and commuting to their business sites.
- Although many initiatives were aimed at company car and large goods vehicle fleets, the use and impact of vans was mentioned, specifically the use of telematics and routing and scheduling systems, giving the impression that this sector understands the role and impact of these vehicles on their businesses.

4.6 Public sector

The public sector is that part of economic and administrative life that deals with the delivery of goods and services by and for the government, whether national, regional or local. This includes:

- Central government departments, executive agencies and non-departmental public bodies
- County, city, borough and district councils and unitary authorities
- Emergency services, such as Police, Fire, Ambulance and Coast Guard
- National health services

Public sector vehicle fleets are required to deliver essential services, for example, refuse collection vehicles for cleansing services or ambulances for emergency services. These vehicles underpin the provision of public services, and more efficient operations mean the delivery of better services at a reduced cost.

The range of goods vehicles operated by the public sector is extremely broad and includes activities as diverse as local authority housing services to the delivery of medical supplies to NHS hospitals,

While they may not apply to all organisations, some of the key characteristics of many public sector fleets are that:

- Vehicles are often driven by staff not specifically employed as drivers
- Vehicles are often employed on specialised operations with limited opportunities for use on other activities
- Vehicles tend to have relatively low average annual mileages and are frequently confined to specific geographical areas
- Due to the specialised nature of some equipment, vehicles tend to be kept in service for a long time

Additionally, public sector fleets are often operated under a broad range of internal and external constraints, including financial, environmental and social policies.

In June 2006, the government unveiled new targets to reduce carbon emissions from its fleets of vehicles. In a set of measures published by the Sustainable Development Commission (SDC), the government is aiming to reduce the level of carbon dioxide emissions for all its road vehicles by 15% by 2010/11 (Fleet News, 22/06/06).

These new targets illustrate a shift in approach, as the SDC's previous targets aimed to ensure that 10% of government fleets were alternatively fuelled by the end of March 2006. However, a report in January 2006, from the Sustainable Development Commission, entitled 'Leading By Example? Not Exactly...' criticises the government for failing to meet those targets. The report said eight departments had already met the March deadline for alternatively fuelled cars, but two-thirds had failed to report accurately on the total amount of fuel consumed, and data on CO_2 emission reduction was 'sometimes poor' (SDC, 2006).

Instead, fleets will now have to monitor total emissions, requiring a more detailed and analytical approach than has previously occurred.

The Ministry of Defence was singled out for failing to provide data on fuel consumed. The report said the MoD 'has a long way to go on ensuring 10% of its massive fleet of cars (8,924) are alternatively fuelled'.

There were some good reports for the Department of Culture, Media and Sport, which already has 85% of its 40 cars powered alternatively and the Department for Work and Pensions which has 20% of its 2,704-strong fleet running on alternative fuel.

Beyond this, the Government Car and Dispatch Agency (GCDA), which runs the ministerial fleet, has shifted its policy on new vehicles meaning that Ministers will have the additional choice of a Toyota Prius hybrid or a larger, more powerful biodiesel fuelled Jaguar XJs when their current cars are defleeted (Fleet News, 23/02/06).

The choice of cars was reached through a combination of considerations, including value for money and environmental impact. Overall, a quarter of the current GCDA fleet is powered by greener means – operating 22 hybrid cars, 11 diesel cars capable of running on biodiesel and one Liquefied Petroleum Gas (LPG) vehicle.

4.7 e-Grocery shopping

More and more people are shopping online via either the Internet or interactive television services. Major retailers are now learning to utilise the Internet and Interactive television as an essential distribution channel. Many of the UK's largest firms are defining and enacting online strategies that are aimed towards a consumer who is becoming increasingly receptive to the idea of online shopping. Shopping from home no longer means poring over the glossy pages of a catalogue. It can be performed using the television, personal computer or even via mobile telephone.

Research carried out through the use of Keynote market reports (http://www.keynote.co.uk) has provided us with the following top players within the e-Grocery sector in 2004:

- Tesco
- J Sainsbury
- ASDA
- Waitrose
- Safeway/ Morrisons
- Iceland
- Somerfield
- Budgens
- Majestic Wine Plc
- Oddbins

A description of each of these businesses and an indication of the impacts created by their transport operations has been provided below.

Tesco
Tesco operates some 923 stores and employs 240,000 people. Over the past five years, they have expanded from their traditional UK supermarket base into new countries, products and services, including a major non-food business, personal finance and Internet shopping. Tesco is the largest food retailer in the UK with 702 stores and operates 4 store formats in the United Kingdom: Extras, Superstores, Metro and Express.

Tesco's non-food operation encompasses electrical, home entertainment, homeshop, cookshop and even white goods and furniture in their largest stores. Tesco have also established themselves as the number one internet business for grocery, with Tesco.com now reaching around 90% of the UK population and making 70,000 deliveries weekly.

To reduce emissions from their distribution fleet, Tesco aim to deliver more goods for each litre of fuel they use each year. In 2005, they exceeded their target of a 2.5% increase in the products delivered per litre of fuel by delivering 8% more products per litre of fuel used. To measure the environmental impact of their distribution fleet more accurately, their future vehicle efficiency Key Performance Indicator will be calculated according to the CO_2 produced per case delivered, instead of per litre of fuel consumed. Over the next three years they aim to reduce the amount of CO_2 they produce per case of goods delivered by 30% (Tesco, 2005).

The current initiatives undertaken by Tesco to reduce emissions from their distribution operation include:

- Working with suppliers to ensure that their vehicles do not travel empty after making a delivery. This partnership has resulted in over eight million fewer miles travelled
- Investing some £2.8 million in double deck trailers which carry 67% more products per load and encouraging suppliers to use these vehicles when they make deliveries
- Reducing the number of times they deliver to their Express stores each week and improving the way they fill their vehicles. This has resulted in a saving of over 54,000 deliveries each year, travelling 2.5 million fewer miles and delivering 25% more with each journey

(Tesco, 2005)

J Sainsbury
J Sainsbury plc is a leading UK food retailer with interests in financial services and employs 153,000 people.

Sainsbury's goal, noted in their 2005 Corporate Social Responsibility report, is to transport their products more efficiently, and reduce carbon dioxide emissions from employee and customer travel, by improving the efficiency of their distribution systems through improving engine efficiency, using alternative fuels and alternative modes of transport.

As part of this, Sainsbury's are gradually renewing their vehicle fleet and are using this opportunity to switch to more efficient engines. They have also tested LPG in the smaller vans used for Sainsbury's To You home delivery. However, they found that the fuel was not widely available. They also found that the mileage achieved was only about a third of what they could achieve with diesel, and maintenance costs were higher. This trial was disappointing for Sainsbury's as such gas vehicles have lower vehicle excise duty, are exempt from the London Congestion Charge and are quieter as well as cleaner (J Sainsbury, 2005).

Table 4.9: J Sainsbury, transport emissions

Key indicator	2003/04	2002/03	2001/02	2000/01
Carbon dioxide emissions from transport (tonnes)	125,367	117,337	125,100	124,032

In their 2005 Corporate Social Responsibility report, Sainsbury's have set themselves a number of targets to achieve in relation to their transport operations. These include:

Within the Sainsbury's fleet operation:
- Improve fuel consumption by 2%
- Reduce road miles by 3%
- Improve vehicle space utilisation by 5%

Within the Sainsbury's To You fleet operation:
- Increase vehicle utilisation by 20%
- Increase miles per gallon by 5%
- Reduce mileage per delivery by 10% compared to January 2005

(J Sainsbury, 2005)

ASDA

Owned by Wal-Mart Stores, ASDA is the UK's second-largest food retailer (behind Tesco). It operates about 280 large stores that primarily sell groceries and apparel.

ASDA recognises the importance of reducing fuel consumption and increasing the efficiency of their delivery operations. The following information on the initiatives they are introducing has been gathered from their corporate website:
- They have reduced road miles by 4.5 million in the last two years by moving freight to rail - this equates to a 5% overall reduction in road miles travelled
- In September 2005, ASDA unveiled a plan to build a new £20m logistics centre at Teesport near Middlesbrough. Once opened, the facility will enable them to save two million road miles a year and reduce their overall carbon tail pipe emissions
- They are running a biodiesel trial for all fleet transport at their Wakefield distribution centre. If successful this will be rolled out to the entire chain.
- None of the ASDA tractor fleet is over three years old – the units are therefore still operating at maximum efficiency.

(ASDA, 2005)

Waitrose

Waitrose, part of the John Lewis Partnership, was originally concentrated in the south of England. However, new store openings and acquisitions such as the conversion of 19 Safeway stores bought from Morrisons during 2005 has given Waitrose a presence throughout England and Wales. Two of the acquired Safeway stores are in Edinburgh. Their conversion, during 2006, will give Waitrose their first Scottish outlets. The Company has an annual turnover of £2,955 million, an increase of 10% over the previous year.

The Waitrose Corporate Social Responsibility report 2005 notes that delivering more goods while cutting down on miles travelled is one of the issues facing Waitrose's central distribution unit. The solutions initiated by Waitrose include:
- Centralising deliveries into larger loads across two regional distribution centres and ensuring that the lorries are better packed.
- Computerised route planning, enabling managers to match lorries with loads more efficiently.

The majority of Waitrose deliveries involve Waitrose owned vehicles, which enables the company to specify the vehicles, service them regularly and fit optional extras, which can help reduce their impact on the environment (Waitrose, 2005).

Waitrose recognise that good driving can save between 10 and 20% on the fuel bill – a major incentive when Waitrose's fleet covers more than 13 million miles a year. Skilled instructors offer advanced driving courses to all Waitrose commercial drivers.

Switching Waitrose distribution onto more environmentally friendly transport, such as rail, has proved to be economically and logistically unviable.

To date, it has proved impossible for Waitrose to find an alternative fuel suitable for its commercial fleet as trials with Liquid Petroleum Gas (LPG) and Compressed Natural Gas (CNG) have proved disappointing, both failing to meet the rigours of long-distance delivery.

Converting the business car fleet to alternative fuels has proved much more successful, with more than 70 of the Partnership's 850 cars running on LPG. Unfortunately, the future for LPG as a realistic alternative to petrol and diesel is in doubt because of its higher running costs. Waitrose has found that LPG cars depreciate faster than conventional fuel cars (Waitrose, 2005).

The results of the initiatives undertaken by Waitrose can be seen in table 4.10:

Table 4.10: Waitrose, transport impacts

Environmental Impact	2003/04	2002/03	CHANGE
Commercial mileage	13,967,166	12,509,464	+12%
Commercial miles per gallon	10.86	10.69	+2%
Avoided mileage from back and forward hauling	1,012,874	1,386,196	-27%
Car mileage	3,971,672	3,758,082	+6%
Car miles per gallon	38.4	36.9	+4%

Safeway/ Morrisons
Founded in 1899 by William Morrison, the company has become the UK's fourth largest supermarket chain. They currently employ more than 130,000 people working in stores, factories, distribution centres and head office functions.

The Morrisons 2006 Corporate Social Responsibility report notes that the on-going implementation of rigorous maintenance schedules, new engineering developments and fuel efficiency programmes will help reduce the environmental impact of their transport fleet (Morrisons, 2006).

Iceland
Iceland**,** owned by the Icelandic company Baugur, are a UK supermarket chain specialising in frozen foods such as frozen prepared meals and frozen vegetables. The chain now has over 760 stores throughout the UK. In 1999, Iceland launched what was claimed to be the first nationwide, free, online grocery shopping service.

No information on Iceland's environmental policy or transport impacts could be found on their corporate website.

Somerfield
Somerfield is a high street supermarket chain operating some 800 Somerfield and 500 Kwik Save stores. These stores are supported by a network of 16 distribution centres, serviced by a fleet of 743 delivery vehicles, with operational support provided by the support centre based in Bristol. In October 2004, Somerfield acquired 113 former Safeway stores from Morrisons as part of a packaged deal worth £260 million. Together, Somerfield and Kwik Save have more stores than any other full service food retailer in the UK.

Initiatives to improve fuel performance and emissions associated with the Somerfield delivery fleet operation include:

- The use of double decker trailers
- All new vehicles and trailers are specified with low energy tyres
- The Dynafleet fuel monitoring system has been fitted to the fleet

Somerfield are also evaluating the feasibility of introducing alternative fuelled delivery vehicles to their operations. An outline of the environmental impact of Somerfield transport operations is given below (Somerfield, 2005).

Table 4.11: Environmental impact of Somerfield's transport operations

Somerfield Transport Data 2004/2005	
Litres diesel consumption	28,752,697
Kms travelled by delivery fleet	89,487,553
Km/litre	3.11

Budgens
Founded in 1872, Budgens supermarket chain operates over 227 stores, employing in excess of 6,000 staff and providing a home delivery service. The Musgrave Group, Ireland's largest food and grocery distributor acquired Budgens in July 2002.

The Musgrave Group is the only wholesale and retail food distributor in Ireland to operate an environmental charter, committing to measure environmental impact and to report results for company divisions and the independent franchise stores. As part of this Charter, the Group aims to reduce their dependency on and consumption of fossil fuels; reduce emissions and expenditure on energy; instill best practice and reduce the lifecycle energy costs of their operations by improving efficiency through the monitoring and targeting of fuel and energy use (Musgrave, 2005).

Majestic Wine Plc
The Group's principal activity is the retailing of wines and beers through a UK wide warehouse chain. The Group operates 122 stores located in the United Kingdom and France and uses its own fleet of vans to offer free delivery throughout Britain.

No information on Majestic Wine Plc's environmental policy or transport impacts could be found on their corporate website.

Oddbins
Similar to Majestic Wine, Oddbins are a wine, beer and spirits retailer operating a UK wide warehouse chain.

No information on Oddbin's environmental policy or transport impacts could be found on their corporate website.

4.7.1 Summary

- The UK e-grocery sector focuses on the delivery of goods (usually food stuffs) to households. Due to the characteristics of this service and the, usually, perishable nature of the goods in transit, the vehicles used tend to be converted LCVs with separate chilled and frozen sections.
- Of the 10 companies researched, 5 made reference to transport impacts within their company Corporate Social Responsibility report. As part of this there were a wide range of initiatives being undertaken, from reducing empty running and improved fill, to the purchasing of vehicle with the latest Euro vehicle emission standards. However, many of these initiatives were aimed at company LGV fleets.
- For many companies the use and impact of vans was mentioned, specifically the trialling of alternative fuels (e.g. liquefied petroleum gas and biodiesel) and the use of driver training, giving the impression that this sector understands the role and impact of these vehicles on their businesses.

4.8 Telecommunications

The UK telecommunications market is very competitive, although the degree of consolidation varies across the main segments of the market. Whereas the mobile market is consolidated into the hands of five main operators, the fixed-line market is very fragmented — although, in terms of revenues and market position, BT Group PLC remains larger than most of its competitors put together. In terms of revenue, BT is the largest player in the market, followed by Vodafone, France Telecom and then O2. BT leads the fixed-line segment of the market (calls, access lines and leased lines), while Vodafone, France Telecom (i.e. Orange) and O2 lead the mobile segment of the market.

Research carried out through the use of Keynote market reports (http://www.keynote.co.uk) has provided us with the following top players within the Telecommunications sector in 2005:

- BT Group Plc
- Cable and Wireless Plc
- ntl Group Ltd
- O2 Plc
- T-Mobile (UK) Ltd
- Virgin Mobile Holdings (VMH)
- Vodafone Group Plc

A description of each of these businesses and an indication of the impacts created by their transport operations has been provided below.

BT Group Plc
The BT Group's principal activities include networked IT services, local, national and international telecommunications services, and higher-value broadband and internet products and services. In the UK, BT serves more than 20 million business and residential customers with more than 30 million exchange lines, as well as providing network services to other licensed operators.

BT operate a fleet of some 32,000 vehicles, mainly diesel powered medium and large vans, managed by their subsidiary BT Fleet, and use their purchasing power to ensure they achieve value for money and lowest costs for the full life of the vehicles. BT Fleet is responsible for the management of the BT transport environmental impacts, which is part of BT's UK certified ISO 14001 environmental management system (EMS) (BT, 2005).

In the financial year 2005, BT's commercial fleet was reduced by two per cent, which included the removal of 664 vans. This resulted in a corresponding reduction in fuel consumption of 3.5 per cent. The reductions to their commercial fleet were possible due to a number of initiatives and policies in place, such as:

- Operational policies, including optimising vehicle use
- Efficient vehicle replacement cycles, which ensure the fleet benefits from the latest technologies and emission standards, while delivering greater reliability and lower maintenance frequency and costs
- Utilising a pool of larger or specialist vehicles to help reduce the number of these vehicle types

(BT, 2005)

BT recognise that there is the potential to utilise alternative fuels, but are aware that there are drawbacks:

- They could replace diesel with petrol vehicles, but this would reduce fuel economy because petrol vehicles are less efficient than diesel equivalents
- They could use Liquid Petroleum Gas, but supplies are limited. Furthermore the additional space needed for LPG tanks on the vehicles would mean replacing existing vehicles with larger, less fuel efficient models

(BT, 2005)

Tests undertaken by BT on a fuel economy device found that it produced an average fuel saving of 12 per cent and reductions in diesel smoke emissions of 36 per cent. However, the device risked damaging the fuel injection system and was rejected.

In the 2006 financial year BT aim to:

- Reduce their commercial fleet by a further 500 vehicles
- Test potential fuel savings from a new speed limiter function on vans, report on driver feedback and make recommendations
- Review their approach to alternative fuels

(BT, 2005)

Cable and Wireless Plc

The Group's principal activity is providing voice, data and IP services to business and residential customers and wholesale services to carriers, mobile operators and content, application and internet providers.

No information on transport related impacts or policies could be found on their corporate website.

ntl Group Ltd

ntl Incorporated is one of the UK's largest cable operators and a leading provider of broadband, digital television, telephony, content and communications services to homes, businesses and public sector organisations.

No information on transport related impacts or policies could be found on their corporate website.

O2 Plc

O2, a wholly-owned subsidiary of Telefónica S.A., comprises mobile network operators in the UK and Ireland, along with integrated fixed/mobile businesses in Germany, the Czech Republic (Telefónica O2 Czech Republic) and the Isle of Man (Manx Telecom). O2 has headquarters in Slough, UK, and has more than 35 million customers across Europe.

The main areas of their transport emissions occur through network maintenance, retail distribution – both undertaken by contractors – and business travel. To understand the impact of their operations on the environment, O2 captured some of the energy consumption by their main contractors in 2004/05 (O2, 2005).

Table 4.12: Impact of O2 UK third-party contractors

Travel by contractors maintaining the network of base stations	Distance travelled (kms)	Estimated fuel consumption (litre)	Estimated CO_2 emissions (kgs)
Diesel vehicles	1,065,451	95,890	256,985
Dual fuel/LPG vehicles	70,566	6,350	10,477
Travel by contractors distributing products to shops			
Diesel heavy goods vehicles	1,193,790	326,023	873,741
TOTAL	2,329,807	428,263	1,141,203

O2 have conducted a green travel survey within their UK operations and the resultant recommendations led to the roll-out of an employee car-share scheme in Leeds. The scheme is now being considered in our other UK locations. They remain committed to using effective technologies – like audio and video conferencing – to cut down the amount of business travel for O2 employees.

T-Mobile (UK) Ltd
T-Mobile is the UK network of T-Mobile International.

T-Mobile UK has an existing Environmental Policy and an Environmental Management System consistent with the principles of ISO14001. However, no details of transport related impacts or policies could be found on their corporate website.

Virgin Mobile Holdings (VMH)
Virgin Mobile is a provider of mobile communications services within the UK, with more than four million customers. Virgin Mobile employs more than 1,400 staff on four sites, Trowbridge, London, Daventry and Middlesbrough.

Virgin Mobile use external courier services for the delivery of handsets to stores and customers. Advanced logistics systems help minimise the miles needed to travel in order to fulfil these deliveries – reducing costs and minimising the impact on the environment. The company have begun to monitor the mileage involved and will attempt to reduce delivery miles further over the coming years.

Vodafone Group Plc
The Group's principal activity is providing mobile telecommunications services.

Vodafone aim to reduce the impact of their business travel. Although they collect Group-wide data on transport, the issue is managed at an individual operating company level. In 2004/05, their transport use produced the equivalent of 55 thousand tonnes of carbon dioxide. This figure included company cars and network operations vehicles, but excluded air travel. The fuel consumption of company owned cars increased during 2004/05 as a result of increased activity due to expanding networks and the roll-out of 3G (Vodafone, 2005).

Table 4.13: Environmental impact of company owned vehicles

Year	Diesel (million litres)	Petrol (million litres)	Carbon dioxide emissions (million kg)
2002/03	10.0	11.1	52.441
2003/04	11.0	8.4	48.884
2004/05	13.3	8.7	55.741

4.8.1 Summary

- The UK telecommunications sector focuses on the provision and maintenance of 'landline' and mobile telephone services and infrastructure. Due to the characteristics of this service, the vehicles used tend to be converted LCVs with racking systems.
- Of the 7 companies researched, 4 made reference to transport impacts within their company Corporate Social Responsibility report. As part of this there were a wide range of initiatives being undertaken, from the purchasing of vehicle with the latest Euro emission standards to the monitoring of mileage and fuel and trialling of alternative fuels. Many companies also focused on the implementation of initiatives to reduce the impacts relating to company car use and commuting to their business sites.
- For many companies the impact of vans was mentioned, giving the impression that this sector understands the role of these vehicles within their businesses.

4.9 Breakdown services

The vehicle breakdown services market has four main sectors:

- The ad-hoc sector
- The private/retail sector
- The third-party sector
- The commercial sector

Motorists who do not have motoring organisation membership or insurance-backed cover for breakdowns rely on ad-hoc use of vehicle breakdown and recovery services, normally from local garages, and are charged at the time of use.

The private or retail sector is for individuals who belong to motoring organisations such as the Automobile Association (AA), the Royal Automobile Club (RAC), and who engage the recovery organisation in the event of a breakdown at no charge at the time.

Providers such as Green Flag and Mondial Assistance offer breakdown services to individual motorists at no charge at the time, but are predominantly contracted through a third party, such as an affinity group, insurance company or car manufacturer.

The commercial sector is for businesses with fleets of cars or commercial vehicles.

For most of the last century, the AA and the RAC have dominated the UK vehicle recovery industry. In the last 30 years, new entrants such as Green Flag and Mondial Assistance have increased competition in the market, particularly in the third-party sector.

RAC Plc
RAC Plc provides a comprehensive range of motoring and vehicle services to consumers and businesses. These range from BSM, RAC breakdown cover, automotive glass replacement, insurance, financial and legal services, to vehicle history checks. RAC is part of Aviva, the world's sixth-largest insurance group and the biggest in the UK, where it operates under the Norwich Union brand. The RAC operates in excess of 1,500 patrols (http://www.rac.co.uk/web/breakdowncover/).

No information on transport related impacts or policies could be found on their corporate website.

The AA
Owned by CVC Capital Partners, an independent buy-out group, the Automobile Association ("AA") is one of the UK's leading motoring organisations. It has 13.5 million members and comprises roadside recovery, insurance, personal loans, services centres, mobile tyre fitting, publishing and driving schools. Their main activity is roadside breakdown service, where the AA is the UK market leader.

A press release published on TNN website (http://www.tnn.co.uk/IndustryNews/plonearticle.2006-08-22.5895214864) states that the AA have 1,850 VW Transporter vehicles as part of the breakdown and recovery fleet, covering an average of 25,000 miles per annum.

No information on transport related impacts or policies could be found on their corporate website.

Green Flag
Since its launch in 1971, Green Flag Motoring Assistance has become one of the UK's major motoring assistance providers. It is now a multi-million pound business, providing vehicle rescue services to millions of drivers, 24 hours a day, all year round.

No information on transport related impacts or policies could be found on their corporate website.

4.10 LCV users - summary

- The research carried out into LCV users appears to complement other research carried out by Momenta and TRL (Momenta, 2005; TRL, 2006), such that the LCV user industry can be split into two generic sectors dependent on whether the van is used to deliver goods, or in connection with providing a service.
- Of the industry sectors researched, the majority fit within the service sector, namely Construction, Utilities, Contract Hire, Public sector, Telecommunications and Breakdown services. Of the remainder, two can be classified into the delivery sector (i.e. Mail and Courier services), while the Pharmaceutical sector appears to overlap both sectors, being the provision of a service to the health sector but also used for the delivery of goods to local pharmacies.
- In all cases, vehicle selection depends on the operation, for example, the majority of courier and mail deliveries are undertaken in vans under 3.5 tonnes, whereas grocery deliveries take place in highly customised vehicles having the loading space divided into three compartments - ambient, chilled and frozen. Within the utilities sector, the vans are more likely to be fitted with specialist racking and other additional equipment, whereas the construction sector is more likely to utilise the basic LCV body shape. It is therefore crucial for companies to operate the right vehicles in their operations.

5 FLEET MANAGEMENT TECHNIQUES

The term fleet management is used to encompass the management of all aspects relating to a company's vehicle fleet, including, but not restricted to:

- Vehicle specification and procurement
- Vehicle funding/ purchase methods
- Maintenance
- Taxation issues
- Disposal methods
- Accident management
- Fuel management
- Driver management (including licence checks)
- Breakdown cover
- Environmental considerations
- Health and safety considerations

In general, within large organisations the role of fleet management tends to be given to a single individual or team, while small organisations tend to view fleet management as an additional job function.

The role of fleet management within an organisation can have an impact on how the vehicle fleet is managed and therefore the potential efficiency savings that could be achieved. For large organisations, with an internal fleet manager or team, achieving efficiency gains will be easier than for small organisations as the fleet will be viewed with some importance and therefore the potential financial benefits of efficiency measures, such as fuel monitoring, will be easier to implement.

However, small organisations may have problems implementing efficiency measures as they are more likely to focus on the extra time that may be needed to manage the measure, rather than the financial savings that could be achieved.

5.1 Procurement

There are a number of funding methods available to companies wishing to purchase or lease a vehicle. Each method has its own advantages and disadvantages, but the emphasis placed on these will vary from company to company. Even within organisations, the arguments are not always clear-cut e.g. accounting pressures may dictate the application of one financing method, while operational objectives could be more effectively met by utilising another.

Once committed to acquiring a vehicle, or to changing the current means of acquisition, the company's funding decision will be governed by its current and forecast internal position with regard to:

- Balance sheet structure
- Funding strategy
- Cash flow
- Tax status
- VAT recovery
- Number of high value vehicles on the fleet
- Risk
- Availability of in-house fleet management expertise

The method used by LCV operators to procure their vehicles largely depends on company size, fleet size, operational requirements, company financial stability and buying power. In the main, most companies (irrespective of size) will tend to contract hire their LCVs as this provides them with a stable financial package that is unlikely to change over the life of the vehicle. Undertaking contract hire also means that they can request extra services such as maintenance and breakdown at an additional cost.

Companies with either a very small fleet, or with a high degree of buying power, will tend to purchase their vehicles outright. Although not as flexible as contract hire, outright purchase does benefit those organisations that are likely to keep vehicles on their fleet for an extended period.

Daily rental (or spot hire) is used by a wide variety of organisations (size and sector) as a method of ensuring that any unexpected peaks in service/delivery demand are met without an excessive drain on their resources. Those organisations that rely on daily rental can often develop a good working relationship with the rental company and therefore could gain financial benefits.

The selection and decision-making process for van procurement often differs depending on the needs and wants of the individual company, for example some companies directly compare their current van with a comparable alternative, while other focus on a price comparison. All companies contacted named three factors they took into account when considering the purchase of a new van:

- Fit for purpose
- Safety
- Price

5.2 Maintenance

In a similar way to procurement, the method that operators use to service and maintain their vehicles depends on a number of factors. For those companies who have a contract hire deal, an additional maintenance contract can be added at an extra cost. This provides the company with peace of mind, with a relatively small increase in monthly payments. However, some companies will have separate LCV contract hire and maintenance contracts. This decision tends to be made where the company has a fleet of cars that have a maintenance contract, thus allowing the LCVs to be added to this contract at minimal extra cost whereas other companies rely solely on reminders sent by their local dealer network.

By going through a maintenance contract, the operator can be sure that the vehicles are being serviced and maintained to the manufacturers' recommenced intervals, thus keeping the vehicle warranty valid.

One company contacted as part of this research indicated that they had a contract with their local garage, which ensured that their vehicles were serviced overnight. This means that at no time are their vehicles off the road.

5.3 Fuel management

Many LCV operators, both large and small companies, manage their fuel use through the provision of a fuel card. This offers them an easy to manage solution to the otherwise paper heavy system of managing fuel consumption.

Most fuel card providers offer additional reporting benefits through the use of exception reporting, which highlights to the company which drivers or vehicles are using the most fuel, or do not provide mileage details when presenting the card to the cashier.

5.4 Driver training

Driver development is concerned with the driver's performance once the licence has been gained. It incorporates defensive driver training, which focuses on road-risk and hazard perception, to a tailor-made programme specific to the operators needs i.e. urban driving or motorway driving skills.

Conversations with training providers have shown that influence from insurance companies and the HSE has created a demand for practical training to improve safety in the van market. This has been done to reduce insurance premiums and comply with duty of care and road related risk regulations.

Where operators have committed to a programme of training, the benefits are noticeable. For example one training company quotes:

- 37% of operators saw a reduction in insurance premiums after training.
- 51% reported other benefits, i.e. reduced staff downtime and improved staff recruitment and retention.

Although there are approximately three-million company owned vehicles on the road, it is estimated that as few as 10% drivers have undergone any formal training (Company Van, 2005). A survey undertaken by Lex plc found that only 17% of van drivers receive driver training as part of their job (Lex, 2001).

There are no published statistics to indicate the number of drivers currently receiving driver training. In 2004, DriveTech Ltd trained between 1,500-2,000 van drivers and DriveTech believe the overall number of drivers trained annually by external commercial providers is approximately 8,000.

The figure of 8,000 does not include internal training, although that would increase this figure.

5.5 Driver attitudes

A labour force survey commissioned in 2005 estimated that approximately 195,000 people have the profession of 'van driver' (Skills for Logistics, 2005). This figure is far short of the total number of vans registered in the UK and therefore it can be assumed that the majority of those who drive vans do not consider this to be their profession.

Given the number of vans, the total number of van drivers is likely to be considerably more than the labour force survey figure suggests. One training provider believes it could be in the order of 3 to 4 million (Momenta, 2005).

A study into LCV usage undertaken by TRL on behalf of the AA Motoring Trust (TRL, 2006), showed that:

- Employed dedicated van drivers (e.g. courier drivers) were likely to have a heavy workload and unrealistic schedules, with limited breaks for rest. This appeared to lead to dangerous behaviour, such as eating, drinking and map reading while driving.

- Employed tradesmen (e.g. electrical engineers) spend less time in their vans, and consequently reading maps or eating and drinking while driving appeared to occur less often. This is probably due to the task of driving being secondary to their actual job.

- Self-employed tradesmen (e.g. self employed furniture removals) were likely to work under pressure as their working day was built around their client's needs. This was likely to lead to them driving regardless of whether they felt tired or ill.

- Self-employed van drivers (e.g. builders), were unlikely to eat, drink, or read a map while driving. This is possibly because of the lack of time pressure, but also as a result of a lower exposure to driving.

None of the drivers questioned as part of this study felt up-to-date with driving-related legislation or felt that they were given this information by their management.

5.6 Telematics

Research undertaken as part of this project has shown that a variety of Telematics systems are used within the LCV industry (for example tomtom, Tracker and Siemens). The use of such systems largely depends on the vehicle operation.

For those companies undertaking a delivery type service, routing and scheduling software tends to be used to ensure that the required jobs are undertaken to the specified timescales. Those organisations undertaking a service type function tend to use a “daily job list” system.

Beside these systems, there are a number of other systems in use – from in van Telematics (e.g. vehicle tracking and satellite navigation), to PDAs used to communicate the next job to the drivers.

5.7 Disposal methods

For those companies not procuring their LCVs through contract hire, there are two options available for disposal i.e. private sale or auction.

The private sale option tends to be undertaken by smaller companies who will either sell the vehicle to a private individual or as a trade in for a different model.

The option of auction is open to all sizes of LCV operator. Research has shown that the Transit Connect, VW Caddy, Citroen Berlingo and Vauxhall Combo have helped revolutionise the small-van market due to their car-like qualities.

Demand for such second hand vehicles is currently exceeding supply, due to small businesses (e.g. photographers, florists, etc) being attracted by the light vans’ load carrying capacity, without the refinement compromises of running a heavier van.

Specification and power is much more important with the second user with in-van entertainment and air conditioning being highly prized. Buyers of de-fleeted small vans are likely to be self-employed or small businesses and therefore presentation and condition is vital to achieving a good sale. Ply lining can be a good investment (to keep the load bay in shape) and a side door is essential. (Fleet Management, June 2006).

5.8 Summary

The research undertaken as part of this study indicates the sophistication of the fleet management process is often related to the industry sector and the size of the company. However, this does not suggest that all large fleets are managed well and that all small fleets are managed badly.

Research and phone calls with practitioners have shown that some large LCV fleets could be managed better, especially in relation to fuel consumption and mileage reduction, while some small fleets could be described as practitioners of ‘best practice’ techniques.

6 MAINTENANCE AND SUPPORT NETWORKS

6.1 Cost of repair

Accidental damage will ensure that replacement parts are required. The parts will come from two sources, the first being manufacturers' parts supplied direct from the LCV manufacturer. These are available at the dealer and are offered alongside their sales and service functions. These parts can be specific to a model e.g. body parts, or more generic items, such as electrical controls. The parts are often marketed as 'genuine' because they are type approved for sale and the manufacturer controls distribution. There is no guarantee that manufacturers' parts supplied outside of this chain are to the manufacturers' specified standard.

The second source of parts are Express factors who include generic items, such as automotive paints. Express factors are independent companies who supply the LCV dealer direct.

The cost of the parts varies between manufacturers as there are a number of different processes and sources of parts available. Each manufacturer sets a list price for items and there may be some variation between dealers as their costs vary by location. The competitive nature of the sector means that there is downward pressure on parts prices so as not to lose custom due to higher parts costs.

The other aspect of damage costs is the repair process. Accidental damage can be rectified in a body repair centre. Certain dealers operate manufacturers' approved body shops, whilst others will rely on a specialist external repairer. The costs of this activity are calculated on an hourly charge, which covers the workshop space and the cost of labour. There is a wide variation in costs, often depending upon experience and local circumstances. Workshops with high expertise are likely to have higher charges whilst regions with lower living costs will tend to have lower charges.

Maintenance regimes
Each manufacturer defines ideal maintenance regimes for their range of vehicles and these are followed by the operator to ensure that they are within the conditions of the warranty. These are designed to ensure that the vehicle has a mechanical check-up to assess its condition. This may simply involve an inspection of the working parts, oils and lubricants.

The increasing use of electronics and computers in vehicle technology means that maintenance is often carried out using downloaded reports from the engine's on-board diagnostics computer to assess condition.

Each vehicle should be checked before it is allowed onto the road and this check should include the vehicle's basic condition and safety. This ensures the LCV complies with the requirements of the Construction and Use Regulations, which states that a vehicle must be in a fit and serviceable condition if on the public highway. There is no known data for the level of take-up of this practice.

Consequences of LCV Product development
The sales of LCVs are often judged on torque and/or power, e.g. the total power produced by the engine. This is because LCVs are often seen as workhorses and a simple measure of their effectiveness is that a higher power or torque figure means a better vehicle, and also more power is seen as a status symbol, which is very much borrowed from the car sector. Manufacturers have designed more effective power units e.g. turbo diesels as customers are requiring this but one consequence is that the LCV sector now features high power vans, which require more fuel if driven unsympathetically.

The styling of LCVs has changed to reflect the need for a more style conscious customer, especially within the pick-up sector, and these LCVs are not seen as the workhorses they once were. There is more emphasis on designing 'driver' friendly vehicles, with comfort and ergonomics considered. The impact of this is that LCV designers have to balance the needs of the driver, with the tough conditions that the LCV will operate in and LCVs which are too focused on the leisure needs of the driver may suffer more wear and tear.

Car derived LCVs appear to be very similar to their car based model. However, whilst they may use the same basic body/chassis, designers take a different approach to their conception. Car derived vans often use components designed for the conditions of an LCV, rather then a car e.g. suspension, steering, engines etc.

Anecdotal evidence suggests that the cost of repair for specific vehicle parts is increasing as these individual parts become more sophisticated. An example of this is the tendency for manufacturers to provide electric wing mirrors as standard, which will cost more to replace than a standard 'manual' version.

6.2 Manufacturer support networks

Manufacturers appoint authorised dealers to distribute their vehicles, parts and provide after sales service on a franchised basis. This gives a dealer exclusive rights for that manufacturer in a given area. Previously, the manufacturer was able to determine who the dealer could sell to and where, through a selection processes known as Selection and Exclusive Distribution (SED), although European wide legislation has now removed the selection practices. In essence a dealer is now free to take orders from outside their franchise area and supply vehicles to third party companies for re-sale.

The manufacturers work closely with their dealers on issues such as customer requirements, special offers, marketing etc. This is facilitated through a network of area managers and head office staff providing the support required for the products.

Each manufacturer has developed an assistance service for operators. This generally comes under the heading of breakdown and recovery, and is detailed below.

6.3 Breakdown services

The breakdown sector consists of both mobile assistance and recovery. Mobile assistance is where a technician is despatched to an LCV, with the aim of resolving whatever problem has disabled the vehicle. There is also recovery where a disabled vehicle is taken to a place of repair or to the owner's operating base.

The breakdown service can be provided by the manufacturer, as part of a package when an LCV is purchased e.g. Volkswagen provides assistance on all vehicles up to 3 years after first registration. It is worth noting that each manufacturer may have slightly different conditions in place, although due to competitive pressures they are broadly similar.

Vehicles over 3 years old, or those purchased as part of a fleet may be covered by membership of a breakdown service, for example the Automobile Association (AA). These are specialist organisations, which rely on the members' subscriptions to provide the service. The breakdown recovery service can be carried out directly by the service provider or through a specialist sub-contractor.

6.4 Fuel card companies

Fuel cards are a mechanism for paying for the fuel used in a transport operation and are very popular with car, LCV and LGV fleets. Essentially the user can pay for fuel at an approved filling station and the vehicle operator is sent regular bills for their fuel use, similar to a credit card system.

The fuel cards are provided by organisations such as the oil companies e.g. BP, Shell etc; specialist card companies e.g. CSC group and also support service companies who market a fuel card as part of their product range e.g. Husk and Arval. The supplier is often assessed by the price charged, which is based upon bulk diesel prices and the number of filling sites. Filling sites will agree to serve the customers of the fuel card provider with those who have a larger number of sites providing greater convenience to the user.

Fuel cards are designed to provide a more secure method of funding for fuel, which is harder to abuse and less liable to fraud than cash and also allows the user to plan their cashflow accordingly and avoid sudden losses of income in the business. There are additional security measures e.g. a pin protected card; the requirement to enter registration and mileage details; and the ability to restrict transactions to oil and fuel only.

The use of the card is provided with a regular statement on their use of fuel. The level of information and detail can vary, although comprehensive management reports on the behaviour of particular vehicles are available. Some of the cards do not have a minimum usage and others allow a pay-as you-go system.

Larger fuel users can install an on site bunker to store fuel stocks which has the benefit of reducing the unit price of the diesel as it is bought in bulk. However, there are accompanying regulations on storing and handling fuel to contend with and there are potential theft and fraud issues as it relies on the vehicle returning to base (based upon web-research on a number of fuel costs).

6.5 Insurance infrastructure

LCV insurance is provided as part of commercial vehicle insurance, which is a fairly concentrated market with a total value of £600 million a year. There is generally more skill and expertise in the commercial vehicle market as there are higher risks associated with commercial use of vehicles.

The market is served by leading insurers such as Zurich, Norwich Union, Summit insurance, Equity Red Star and Ensign. Each of these companies provides a broker service to supply the insurance and an underwriting function to assess and quantify the risk. This is all traded though an insurance where members accept the risks of profit and loss from insurance through market syndicates.

During the 1990s, the large general insurance companies looked to expand into the commercial sector, but this was reversed when large losses were experienced and it now tends to be a specialist sector.

The insurance products offered range from basic third party and theft cover to full comprehensive cover and the premium paid will reflect the level of risk identified by the insurance underwriter and the claims history. Therefore logically the insurance suppliers will offer reduced premiums to those who can demonstrate risk management and claim reduction.

6.6 Tyre management

Specialist suppliers have traditionally been the main source of tyres and exhausts. In fact until recently the motor manufacturers tended to avoid this sector, the exception being Ford through its acquisition of Kwik Fit (subsequently sold) and the establishment of Fast Fit.

The market is divided into garage-based supply and roadside supply and fit. A vehicle can be driven to a suppliers' workshop in order to have tyres or exhausts supplied. Larger LCV operators will have a national account with the supplier and any transaction is added to this, smaller may pay at the point of supply.

Alternatively, the disabled vehicle can be assisted at the road-side. In this case, the supplier operates a mobile LCV and fitter function to carry this out. This will largely be done on account, with the driver contacting the operator to arrange the despatch of a fitter.

Large suppliers tend to concentrate on providing this national coverage for their customers and there are broadly two main companies providing this service. The first, Kwik Fit has around 700 sites in the UK and through Kwik Fit mobile, provides roadside services. Secondly, ATS Euromaster has over 500 sites in the UK and also offers a mobile fitting service. The remainder of the market is with regional or SME suppliers, some of whom specialise e.g. to supply plant tyres.

There are tyres which are specially designed by the manufacturers for LCVs, for example Pirelli supplies Citynet designed for urban LCV operation, Citynet all weather and the Citynet winter plus, with extra grip . Michelin (owners of ATS) markets the Agilis, which is specified in use for car-derived and medium/large LCVs. Finally, Continental offers the Vanco range, which is offered for light, medium and large vans, minibuses and mobile homes. These come in winter and summer specification.

6.7 MOT enforcement

LCVs under 3.5 tonnes are subject to the requirements of an MOT test, carried out on the third anniversary of registration and subsequently each year. The process is regulated by VOSA and is carried out at an approved test centre by a nominated or certified MOT tester.

There is a MOT inspector's manual or testers manual, which has specified items that the LCV must comply with. Any non-compliance is a failure and the vehicle must be retested. The manual includes the following items:

- Registration plates
- VIN numbers
- Steering
- Horn
- Lights
- Bonnet catch
- Doors
- Vehicle structure
- Seats
- Brakes
- Windscreen
- Mirrors
- Suspension
- Seat belts
- Exhaust systems
- Fuel systems
- Tyres and road wheels
- Exhaust emissions

These items originate from the Construction and Use regulations (C&U), which determines minimum standards on road vehicles and that they are kept in a fit and serviceable condition.

Enforcement of these standards is not just limited to the annual MOT test; VOSA and the Police are able to issue prohibitions on LCVs, which do not meet these standards. Overall, the vehicle driver is still responsible for the condition of the vehicle on the road and any infringements are endorsed on their licence. It must be recognised that, unlike the LGV sector (through o-licensing), there are no minimum standards for the operator of LCVs.

6.8 Auction

LCVs are dealt with at auction in the same way as any other item. The Auctioneer will invite entries, publish a catalogue and hold an auction, which is open to members of the public and/or traders.

The main sources of auction vehicles include: LCVs from leasing companies where the LCVs are at the end of their lease; vehicles from fleets where the fleet is being replaced; LCVs from business liquidations. An auction is a very effective way of disposing of LCVs and offers potentially lower prices for customers. It is also a popular source of LCVs for independent traders.

The LCVs are bought as seen and this means that the buyer requires a good knowledge of the LCV product in order to purchase the right item.

6.9 Summary

- Repair costs are based upon part prices and workshop costs. Parts prices are kept competitive due to the parts supply industry having numerous companies within it. Workshops costs vary depending upon local conditions and skill level. Anecdotal evidence suggests that the price of some individual parts has increased, for example electric wing mirrors.
- LCVs have benefited from improved technology, which has boosted engine power output. However, this has the potential to increase fuel consumption and emissions, depending upon the style in which the vehicle is driven.
- LCV manufacturers balance the need for durability, with style aspects when designing their products.
- Manufacturers heavily influence the supply of LCVs through the franchised dealer system.
- Breakdown cover is a standard feature offered when new LCVs are sold.
- Commercial vehicle insurance is a niche market, where the providers must have sufficiently high skill and expertise to assess and manage risk.
- The MOT provides a minimum standard of road-worthiness, which the operator must comply with. The condition of the LCV on the road is the responsibility of the driver, and any penalties lay with the driver, not the operator/owner.

7 LCV REGULATIONS

There are a number of very important areas of legislation that apply to fleets running Light Commercial Vehicles. The following section provides an overview of the main legislative influencers on this vehicle sector.

The Road Traffic Act (1991)
Road Traffic Act provides a framework for safe road use and lays down clear standards for driver and rider behaviour.

The Road Traffic Act, states that the driver of an LCV has ultimate responsibility for the safety of their vehicle. This responsibility applies equally to the use of company owned, long term leased, short term hired and company pool vehicles. Under the Act the driver must, where practical, carry out a safety check on their vehicle covering lights, tyres, windscreen wipers and windscreen washers before starting their journey, followed by a check on the brakes and steering while at low speed. If the driver is not confident in the safety of the LCV they are entitled under this Act to refuse to drive the vehicle.

The Road Traffic Act requires that all drivers give due care and attention to the task of driving at all times. Evidence from accidents and studies under laboratory conditions indicate that the use of hand held mobile phones is distracting. Under the revised Road Traffic Act, the use of hand held mobile phones is illegal, punishable by a £30 fine. However, under the Road Safety Bill 2005, this will be amended to a £60 fine and 3 points on the driver's licence.

Provision and Use of Work Equipment Regulations (PUWER) (1998)
PUWER (1998) replaces the Provision and Use of Work Equipment Regulations 1992 and carries forward these existing requirements with a few changes and additions, for example the inspection of work equipment and specific new requirements for mobile work equipment. The Regulations require risks to people's health and safety, from equipment that they use at work, to be managed in such a way that they are either prevented or controlled. In addition to the requirements of PUWER, lifting equipment is also subject to the requirements of the Lifting Operations and Lifting Equipment Regulations 1998.

In general terms, the Regulations require that equipment provided for use at work is:

- Suitable for the intended use
- Safe for use, maintained in a safe condition and, in certain circumstances, inspected to ensure this remains the case
- Used only by people who have received adequate information, instruction and training
- Accompanied by suitable safety measures, e.g. protective devices, markings, warnings.

Generally, any equipment that is used by an employee at work is covered, for example hammers, knives, ladders, drilling machines, circular saws, photocopiers, lifting equipment, and motor vehicles. Similarly, if employees provide their own equipment, it too will be covered by PUWER and companies will need to make sure it complies with the regulations.

For many companies, the fact that many of their LCVs are classed as leased equipment may blur the extent of their employers' responsibilities. However, their lease contract should make it clear that the responsibility for the maintenance and provision of suitable and safe equipment resides with the lease-company. However, the company leasing the vehicle will need to verify that the arrangements are in place, the hire company is discharging this duty and the vehicles are safe at all times to use.

As noted above, vehicles provided for use by employees fall within the scope of Health and Safety legislation, in particular, PUWER. However, The Road Traffic Act and Highway Code requirements take precedence when the vehicle is being used on public roads.

The training requirement contained in the Provision and Use of Work Equipment Regulations and reinforced by the Management of Health and Safety Regulations goes beyond 'should'. The regulations use the words 'shall ensure' which shows that it is mandatory. Companies need to have in place firm arrangements to make sure this happens. Any training needs must be assessed against the company risk assessment, e.g. those at high risk (taking into consideration mileage driven, vehicle type, nature of the journey, experience of the driver, etc) must be given appropriate training.

Any training must go further than just checking driver's licences. It must be ascertained for example if employees can use ABS systems correctly, correct a skid, drive in snow, set head restraints etc. This should include testing their understanding of the Highway Code.

Health and Safety Regulations (1999)

The Health and Safety at Work Act 1974 requires companies to ensure, so far as is reasonably practicable, the health and safety of all employees while at work. Under this Act, companies also have a responsibility to ensure that others are not put at risk by their work-related driving activities (self-employed people have a similar responsibility to that of employers).

Under the Management of Health and Safety at Work Regulations 1999, employers also have a responsibility to manage health and safety effectively. They are required to carry out an assessment of the risks to the health and safety of their employees, while they are at work, and to other people who may be affected by their work activities. The Regulations also require companies to periodically review their risk assessment such that it remains appropriate.

Lifting Operations and Lifting Equipment regulations (1998)

These regulations cover the fitting, maintenance and operation of any lifting equipment. Under these regulations, lifting equipment is defined as any equipment that lifts or lowers a load and all the associated attachments. In the case of LCVs this includes cranes and tail lifts. These regulations are most likely to have an impact within the courier and express parcel sector.

The operator (i.e. the company owning the equipment) is liable for the training and correct operation of the equipment. However, the maintenance of such equipment is the responsibility of the company who have the maintenance contract for the equipment. Thus, if a vehicle with any piece of lifting equipment is leased from a third party supplier, with a maintenance contract, it is the leasing company's responsibility to carry out the maintenance work to the necessary standard. The leasing company would also be responsible for the maintenance and storage of the certificates of compliance, which have to be passed on when the vehicle is sold.

OTHER REGULATIONS

Speed Limiters

From 1st January 2005, all newly registered goods carrying vehicles weighing over 3.5 tonnes and employed on international operations, must be fitted with a speed limiter, restricting speeds to 56 mph.

The new EU rules also apply to all vehicles used for the carriage of passengers and which have more than 8 passenger seats, restricting speed to 62mph.

Ultimately most commercial vehicles over 3.5 tonnes and passenger carrying vehicles, regardless of whether they are used abroad, will have to be fitted with speed limiters under the rules introduced following European Union directive 2002/85/EC.

For vehicles used solely in the UK, all vehicles over 7.5 tonnes must be fitted with speed limiters, in accordance with the current legislation. However, for new vehicles in the range 3,501kg to 7,500kg the fitment date is not until January 1st, 2008.

There is also a requirement to retrofit limiters to existing vehicles first registered after October 1st, 2001. However, there is no requirement to fit limiters to vehicles first registered before that date.

As the rules will not apply to vehicles under 3.5 tonnes, most small vans and transit type vehicles will be exempt from the regulations.

Speed Limits
Under the Highway Code, the term 'goods vehicles' applies to all panel van type LCVs as well as the Ford Connect and the VW Caddy HiCube vans as they exceed 2.0t GVW.

Table 7.1: Vehicle Speed Limits

Type of Vehicle	Built Up Areas MPH	Single Carriageways MPH	Dual Carriageways MPH	Motorways MPH
Cars & Motorcycles (inc Car Derived Vans up to 2t GVW)	30	60	70	70
Cars towing trailers (inc CDV's)	30	50	60	60
Minibuses	30	50	60	70
Goods Vehicles (over 2.0t & under 7.5t)	30	50	60	70

Working Time Directive
This Directive outlines the working conditions for mobile workers, i.e. drivers. It is primarily aimed at the heavy goods sector (i.e. over 3.5t GVW) but there are a number of provisions for the drivers of LCVs, which also apply to the drivers of minibuses. However, drivers of LCVs can opt out of this Directive.

The main points are:
- An average 48 hour working week, typically averaged over a 4 month period
- Drivers can't exceed 60 hours of work in a single week
- A 10 hour limit for night drivers over a 24 hour period

Despite the option to opt out of this Directive, drivers of LCVs are covered by domestic regulations, which stipulate:
- A maximum daily driving time of 10 hours
- A maximum duty time of 11 hours
- The requirement for adequate rest

Seat Belts
The new law states that people making deliveries and who travel for more than 50 metres between stops, now have to wear seat belts. This applies to all drivers and passengers on public roads.

Operating weight limits
All vans are assigned a Gross Vehicle Weight (GVW) limit when they are certified for use on the roads. For example, a GVW of 3,500kg or 3.5t, means that that the total weight of the van including the driver, any passengers, fuel and the load itself must not exceed this weight. If the vehicle exceeds the Gross Vehicle Weight, then it is breaking the law.

Most van operators are aware of this legislation. However, there are two other factors that need to be taken into account:

- **Is the van going to be towing anything**? If this is the case, then the Gross Train Weight (GTW) has to be taken into account. This is the total permissible weight of the vehicle + the trailer. This figure will vary depending on whether the trailer is fitted with a braking system or not – a braked trailer has a total weight limit of approx 2,000kg (including the trailer itself) while an unbraked trailer is around 500kg. It is the GTW that is actually used to assess if the vehicle needs to covered by an 'O' licence. Therefore, if the vehicle and trailer exceeds 3.5t then the vehicle should be fitted with a tachograph.

- **Axle Weights**. This is a point that may be missed by some van operators, i.e. that each axle also has a weight limit. If the vehicle exceeds either the Front or Rear Axle Weights then it is breaking the law. It is perfectly possible for a van to be under the GVW weight limit but exceed the Rear Axle limit, thus being driven illegally. It is therefore important that the load is distributed correctly. Manufacturers, through their interaction with VOSA, set axle weight limits.

Public Service Vehicle Licence
The Public Service Vehicle (PSV) licence applies to any vehicle designed to carry 9 or more passengers as well as the driver (i.e. certain minibuses, buses and coaches.) It applies to these vehicles if they are used for Hire or Reward, i.e. where the company is paid for the use of the vehicle. This doesn't have to mean straight cash payments e.g. a free service bringing people from an airport to a hotel is still considered to be a reward to incentivise customers to use the company's service.

'O' or Operator Licence.
This is the licence that applies to practically all operators of vehicles over 3.5t Gross Vehicle Weight. This licence sets out a number of different criteria (e.g. the fitting of tachographs; minimum competency standards though the Certificate of Professional Competency; undertakings of maintenance, etc), which have to be met by both the driver and the operating company. Companies that have O licences are subject to enforcement by VOSA, such as random inspections, to ensure that they are operating their fleet to the correct standards.

Although not governed by the Operator Licensing, if a company operates both Large Goods Vehicles and Light Commercial Vehicles, then both these vehicle types will fall under the O licensing regime. Under this system, if an LGV operator is found to be running a van fleet that breaks the law, then they will be charged under the Operating Licence regime.

7.1 Driver licensing arrangements

For a van not exceeding 3.5 tonnes (i.e. an LCV) the current legislation states that any individual using a category B licence can drive it. This licence is granted after passing the practical and theory elements associated with a standard car test. At present there are no additional competency requirements for vehicles up to this threshold.

Until 31st December 1996, passing the B licence automatically entitled the bearer to drive a vehicle up to the weight of 7.5 tonnes. This means that the majority of B licence holders are able to drive vans up to 7.5 tonnes.

After 1st January 1997, anyone passing a B licence had to apply separately for a C1 or C licence, the B licence entitlement having been reduced to 3.5 tonnes. Those with licences before this date are not affected, through so-called 'grandfather rights'.

The C1 licence covers vehicles from 3.5 - 7.5 tonnes. This can only be obtained by completing additional practical and theory tests as well as a medical examination. A driver is only eligible to take the C1 licence if they already hold a B licence and are at least 18 years old.

A C licence applies to rigid vehicles over 7.5 tonnes. It can only be taken when the driver is 21. In practice many drivers will take the C licence for the greater entitlement, rather then the C1 which restricts them to 7.5 tonnes.

A driver acquires the B licence once they have passed their car test. Driving instructors, who focus on skills and competency based upon operating a car, provide this training.

C1 licences are acquired by using specialist driver training providers. The need for this licence will be mainly for vocational and career development purposes. The B licence is more generally acquired for private transport.

There are approximately 32.1 million B licence holders and 20,662 C1 licence holders (DVLA, 2005) in the UK. This suggests that the vast majority of van drivers (up to 3.5 tonnes) are likely to hold no more than a B licence as a result of passing their driving test for a car. Even for vehicles between 3.5 and 7.5 tonnes, the majority of drivers may have received no formal instruction other than during the driving test for a car and are entitled to drive these vehicles as a result of 'grandfather' rights.

7.2 LCV licensing arrangements

The tables in the following section contain the nomenclature used by the Driver and Vehicle Licensing Agency to classify Light Commercial Vehicles. Therefore, where Light Goods Vehicle is noted, this is the same as Light Commercial Vehicle.

Table 7.2: Private/Light Goods Vehicles (goods vehicles not over 3,500kg - registered before 1st March 2001)

	12 months	6 months
Not over 1549cc	£110.00	£60.50
Over 1549cc	£175.00	£96.25

Table 7.3: Light Goods Vehicles (vehicles not over 3,500kg) (registered on or after 1st March 2001)

Light Goods Vehicles TC39	12 m1onths	6 months
All Vehicles	£170.00	£93.50

Since 1st March 2003, light goods vans first registered in the UK, which meet Euro 4 emission standards, qualify for a lower rate of Vehicle Excise Duty (VED). This change reinforces the message to both the motor industry and the general motoring public that "the less you pollute, the less you pay".

The new tax class (TC 36) only applies to those light goods vehicles, weighing less than 3.5 tonnes, which meet the required Euro 4 standard as detailed in the EC Directives.

The rate of duty payable for the new tax class will be £110 for 12 months and £60.50 for 6 months, a saving of £55 and £30.25 respectively on the normal vans rate (TC 39).

The manufacturer needs to provide voluntary confirmation that the vehicle meets the Euro 4 standard at first registration in the UK. Without this, operators will be charged the higher rate of VED. The manufacturer will add this information at first registration either via the Automated First Registration and Licensing System (AFRL) or on the appropriate paper V55. If this information is not available, operators will need to contact the manufacturer to obtain evidence that the vehicle meets Euro 4 standards. This should be a signed declaration made by them on formal headed paper.

Table 7.4: Euro 4 Light Goods Vehicles (vehicles not over 3,500kg - Vehicles registered between 1st March 2003 and 31st December 2006)

Euro 4 Light Goods Vehicles TC36	12 months	6 months
All Vehicles	£110.00	£60.50

7.3 Enforcers and Regulators

The Police and the Vehicle and Operator Services Agency (VOSA) are responsible for enforcing quality and safety in road vehicle operations.

For vehicles less than 3.5 tonnes, there is a requirement to hold a valid MOT, insurance, category B licence and to comply with the health, safety and competency regulations. For vehicles over this weight, the operator must also comply with the operator licensing, EU regulations, RTD and more advanced driver licence entitlements.

Both organisations have the powers to investigate infringements and bring prosecutions where necessary.

Local authorities can also be classed as enforcers and regulators due to, for example, parking restrictions and in the case of London, congestion charging.

7.4 LCV taxation

Previously vans were taxed at a standard rate of £500 per annum. In the 2006 budget the Chancellor announced that there would be new tax laws, which would come into force on 6th April 2007.

From April 2007, the benefit-in-kind charge for private use of company vans will increase from £500 to £3,000. In addition, drivers receiving free private fuel will be liable for an additional £500 fuel scale charge (there is currently no additional charge for free fuel). Drivers will pay income tax on these benefit-in-kind charges at their applicable rate (basic rate or higher rate).

When introduced, these measures will mean a basic rate tax-paying company van driver, who has private use of the vehicle, will see a six-fold increase in their monthly tax bill.

However, employees who take their van home but incur no other private use will be exempted from paying any benefit-in-kind tax. The HM Revenue and Customs website states:

‘The charge is nil if both the following requirements are satisfied throughout the year (or part of the year which the van is available to the employee) – the van must only be available to the employee for business travel and commuting; it must not be used for any other private purpose except to an insignificant extent or the van must be available to the employee mainly for use for the employee’s business travel.

‘If both the requirements are not met, the charge is £500 if the van is less than four years old at the end of the tax year or £350 otherwise.

'From 2007/08, the age of the van is no longer taken into account and the charge is increased to £3,000'.

Private use would be considered insignificant if it is insignificant in quantity within a tax year, for example, employees who take rubbish to the tip once or twice a year; regularly make a slight detour to stop at a newsagent on the way to work; or call at the doctor on their way home. Private use would be considered significant if, for example, an employee uses the van to do their weekly shopping, uses the van for a week's holiday or uses the van outside of work for social activities.

The stipulation regarding private use does not apply to self-employed owner drivers.

7.5 Summary

- As can be seen from the above section, there are a wide range of regulations that impact on the LCV sector. This itself may result in a degree of confusion for LCV operators, as they may be unaware of some of these regulations and how they impact on their business.
- The lack of specific regulation concerning the driving of LCVs could be seen as a benefit as it allows anyone to drive a van up to 3.5 tonnes, thus providing businesses with easy access to a driving related workforce. However, this could also be seen as an problem, as those drivers may not be at ease driving a van, which could result in vehicle damage, excessive fuel use and potentially accidents.

8 EUROPEAN MARKET

8.1 Market structure

The United Kingdom was the 6th highest manufacturer of light commercial vehicles in 2004, the largest manufacturers being France, Turkey, Spain, Italy and Germany. The majority of LCV manufacturing occurs on mainland Europe by, for example, Peugeot, Citroen, Ford and DaimlerChrysler.

There is limited manufacturing of the Japanese brands of LCVs within Europe, these being mainly manufactured in Japan.

Table 8.1: Total LCV Production figures (Europe – 2004)

Country	Production
Belgium	9,038
Czech Republic	1,072
France	376,972
Germany	205,535
Italy	260,629
Poland	72,979
Portugal	53,507
Slovenia	15,037
Spain	279,492
Turkey	293,452
UK	177,136

Despite being only the 6th highest manufacturer of LCVs, the UK is the third largest user of LCVs in Europe, with the third highest number of LCV registrations after France and Spain.

Table 8.2: LCV Registration figures (Europe – 2005)

Country	2005
Austria	28,724
Belgium	61,722
Denmark	55,856
Finland	15,272
France	418,965
Germany	193,638
Greece	23,026
Ireland	35,877
Italy	206,136
Luxembourg	3,025
Netherlands	65,224
Portugal	66,332
Spain	386,250
Sweden	34,759
United Kingdom	317,519
EU (15)	**1,912,325**
Iceland	2,118
Norway	35,047
Switzerland	21,494
EFTA (3)	**58,659**
EU(15) + EFTA(3)	**1,970,984**
Czech Republic	15,926
Estonia	2,870
Hungary	20,479
Latvia	1,715
Lithuania	2,969
Poland	33,765
Slovakia	14,423
Slovenia	6,865
New EU Members	99,012
Total EU23	**2,011,337**
Total EU23+EFTA	**2,069,996**

Source: Association Auxiliaire de l'Automobile

9 LCV ACCIDENTS AND SAFETY

The following analysis was based on five year's worth of STATS 19 accident data supplied by the DfT Accidents Statistics department. An analysis of the data was undertaken and from this analysis a number of trends have been identified. The following section highlights these trends and offer some possible explanations for them.

It should be noted that all figures quoted in the data supplied relate to the number of LCVs involved in accidents. Whilst not the same as the number of accidents involving LCVs (since one accident can involve many vehicles), these figures avoid any "double counting" of accidents (e.g. an accident where a small LCV hit a large LCV would be counted in both small and large LCV accidents. By considering the number of vehicle involvements, this problem is avoided).

Data on crew cabs and chassis cabs in unavailable in the STATS19 accident database. For the purpose of this analysis, LCVs were defined as Goods vehicle <3.5 tonnes gross weight. "Small" LCVs were defined as goods vehicles with a gross weight up to and including 1,799 kg, "Medium" as those between and including 1,800 and 2,599 kg, and "Large" as those between and including 2,600 and 3,500kg.

Banding of driver age matches that currently used in the DfT publication "Road Casualties: Great Britain".

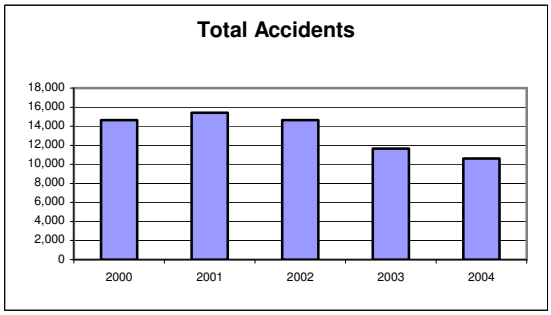
Contributory factor (CF) information is only available from a trial scheme run by 15 of the 51 police forces between 1999 and 2004. CFs were recorded for a small proportion of all GB accidents; LCV accidents form an even smaller sub-set of that data, and it is likely that further breakdowns would result in very small sample sizes. CF data from all police forces was collected from 2005, and is planned to be released later in 2006.

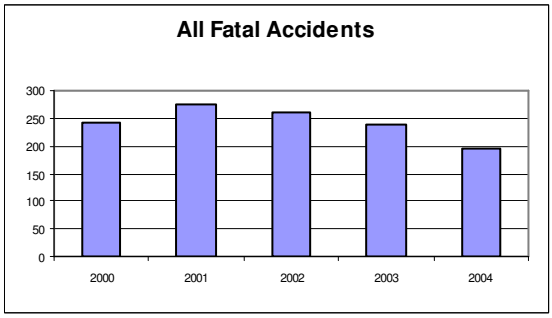
9.1 Analysis of DfT STATS19 data

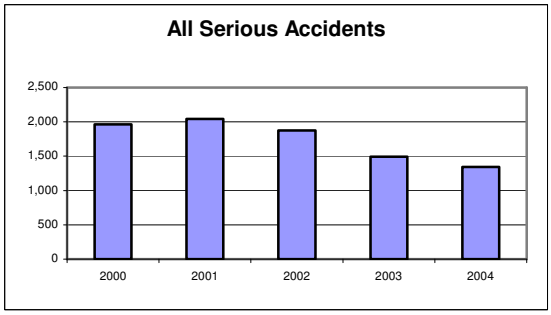
All Accidents

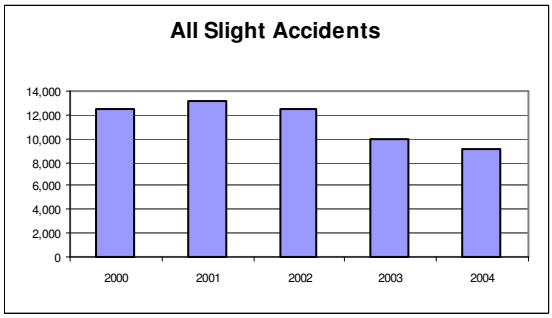
The total number of LCVs involved in accidents and the degree of severity of these accidents is shown in figures 9.1 to 9.4 inclusive. The data overall shows a general decrease in the total number of LCVs involved in accidents between 2000 and 2004. However, the exception is 2001 in which fatal, serious and slight accidents all rose, before declining again in 2002. Subsequent years suggest that the overall downward trend is continuing with a decrease in all severity categories observed in both 2003 and 2004.

Figures 9.1 to 9.4









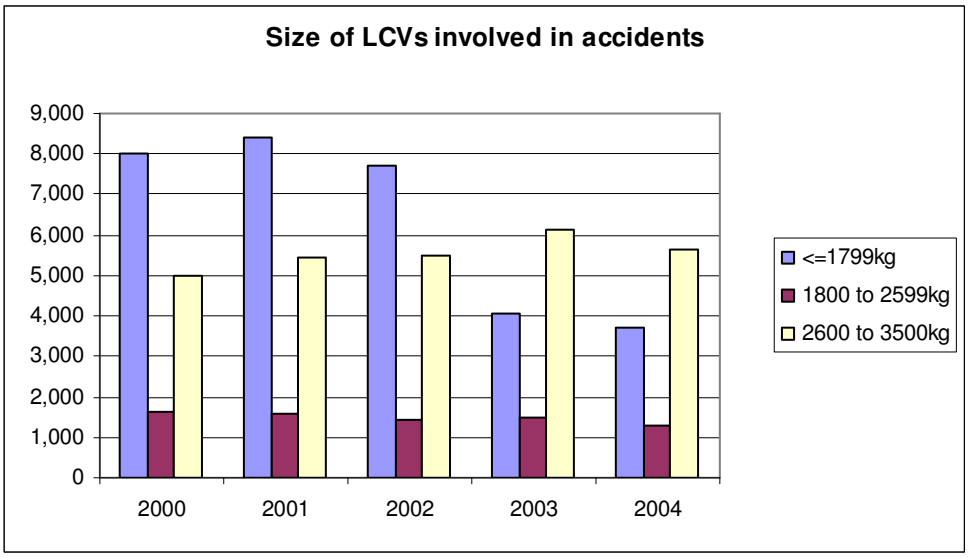
Sizes of LCVs involved in accidents

Figure 9.5 shows the number of LCVs involved in accidents versus the size of the vehicle. Whilst the overall trend shows a general decrease in the number of LCVs involved in injury accidents from 2000 to 2004, it is noticeable that this trend is not reflected in all of the different ranges of van sizes for which data was available. There has been a significant reduction of more than 50% in the number of small vans (i.e. those which are <=1,799kg) involved in injury accidents in 2004, compared with the numbers occurring in 2000/2001. However, whilst the general downward trend in accident numbers is repeated for medium sized vans (1,800 to 2,599kg), the reduction is less pronounced for this size category over the same time period. By contrast, the number of large LCVs (2,600 to 3,500kg) involved in injury accidents in both 2003 and 2004 is greater than the number that occurred in both 2000 and 2001.

It should be noted that there has been a significant increase in the total number of large van registrations in recent years from approximately 1.2 million in 2001 to approximately 1.6 million in 2005. This contrasts with the number of small and medium van registrations which have remained largely stable during the same time period. Therefore, overall it appears that the number of small and medium sized LCVs involved in accidents has decreased, even though the number of these vehicles on the roads has remained largely stable during this time period.

The number of large LCVs involved in accidents has increased in 2003/04 compared to 2000/01 but this increase appears to be due to there being a significantly greater number of large LCVs on the roads as total registrations have risen by over 30% between 2001 and 2005.

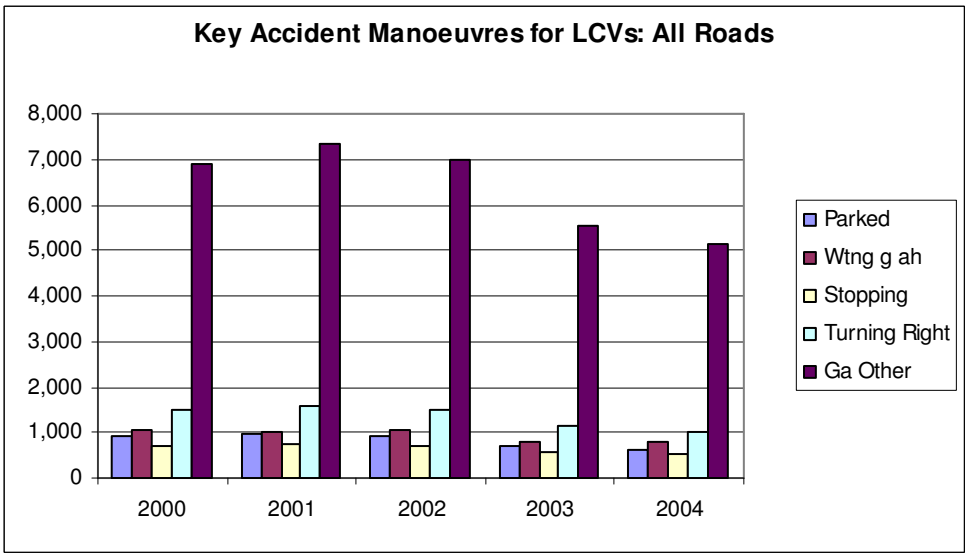
Figure 9.5



Key Accident Manoeuvres for LCVs: All Roads

From figure 9.6, it can be seen that by far the most commonly reported manoeuvre for accidents involving LCVs is 'going ahead other'. This manoeuvre has been reported for approximately 50% of all injury accidents involving LCVs each year from 2000 to 2004. Four other manoeuvres i.e. turning right, parked, waiting to go (held up) and stopping have each consistently accounted for at least 5% of injury accidents in each year for the reporting period.

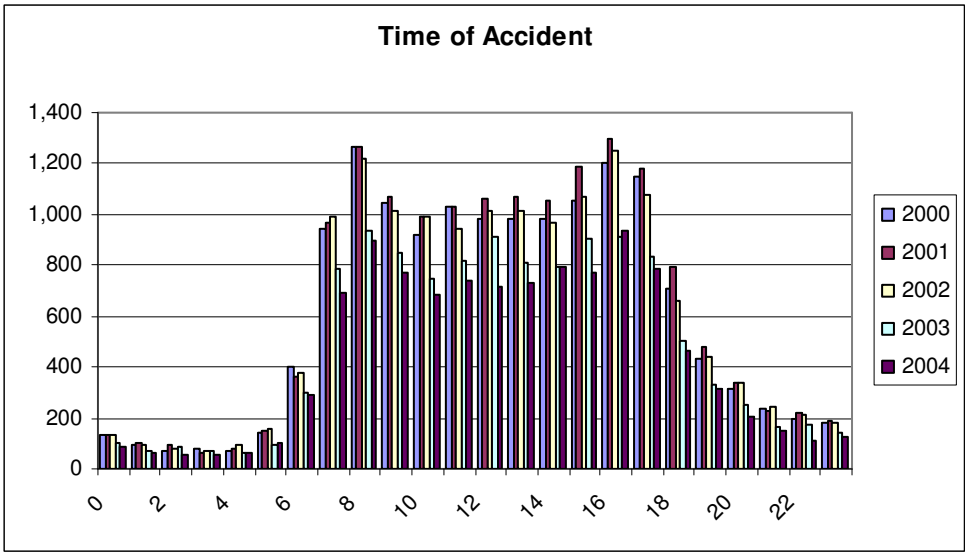
Figure 9.6



Time of Day at which Accident occurred

Whilst overall accident numbers have reduced in 2003 and 2004 compared to those occurring in 2000 and 2001, the general trend regarding the times of day at which most accidents take place has remained the same (figure 9.7). Over 84% of the LCVs that were involved in accidents in 2004, were involved in accidents that occurred between 07:00 and 18:59. This is a very similar in percentage terms to 2000 in which just under 84% of these accidents occurred between 07:00 and 18:59. Although there are a significantly lower number of LCVs involved in accidents outside of this timeframe, it is still noticeable that LCV accidents are occurring at all hours, and there is no particular time of day which could be regarded as being exceptionally 'quiet' in accident terms. The time period with the lowest number of vans involved in accidents seems to occur between approximately 02:00 and 04:00, but even between 03:00 and 03:59 there were still over 50 accidents per year (i.e. at least one van per week on average involved in an accident even in the small hours of the morning).

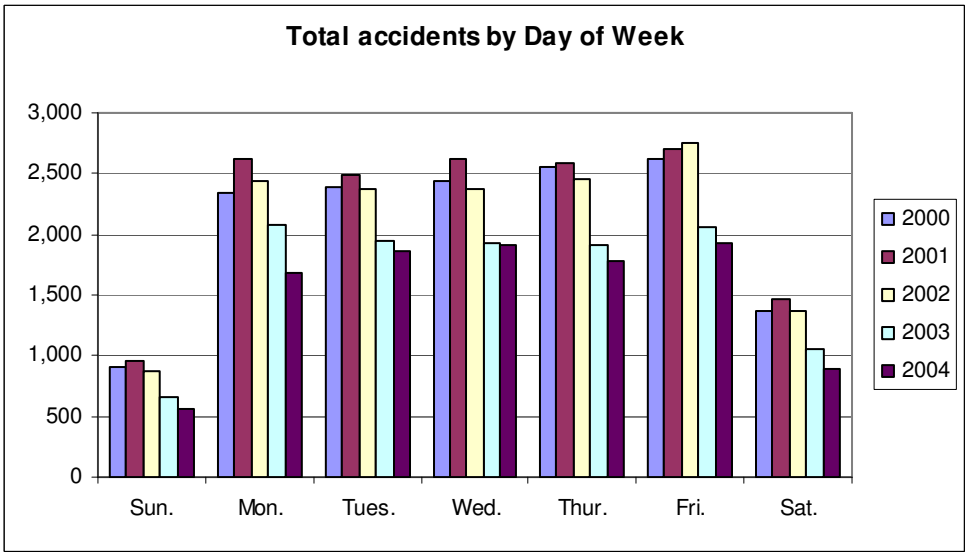
Figure 9.7



Day of week on which accidents occurred

As expected, there were fewer LCVs involved in accidents at weekends than on weekdays. However, even at weekends there were a considerable number of accidents involving LCVs e.g. in 2004 there were 1,450 LCVs involved in accidents at weekends, which equates to over 13% of the total. The total number of accidents involving LCVs that occurred on each day of the week is shown in figure 9.8.

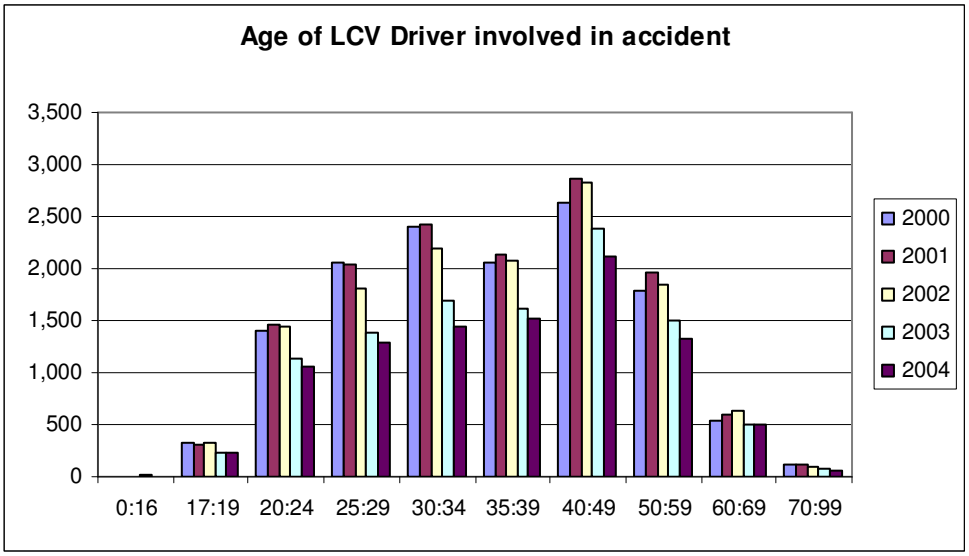
Figure 9.8



Age of Driver
LCV drivers aged between 40 and 49 were involved in the largest number of accidents every year from 2000 to 2004. This is equivalent to 22% of the accidents for which the age of the driver has been recorded. Further research (DfT, 2005) indicates that this age group contains the second highest number of driving licences holders. Despite this, no age group related breakdown of licence holders within the LCV sector could be found, thus no definitive reason for why licence holder within this age group should have the highest number of accidents could be found.

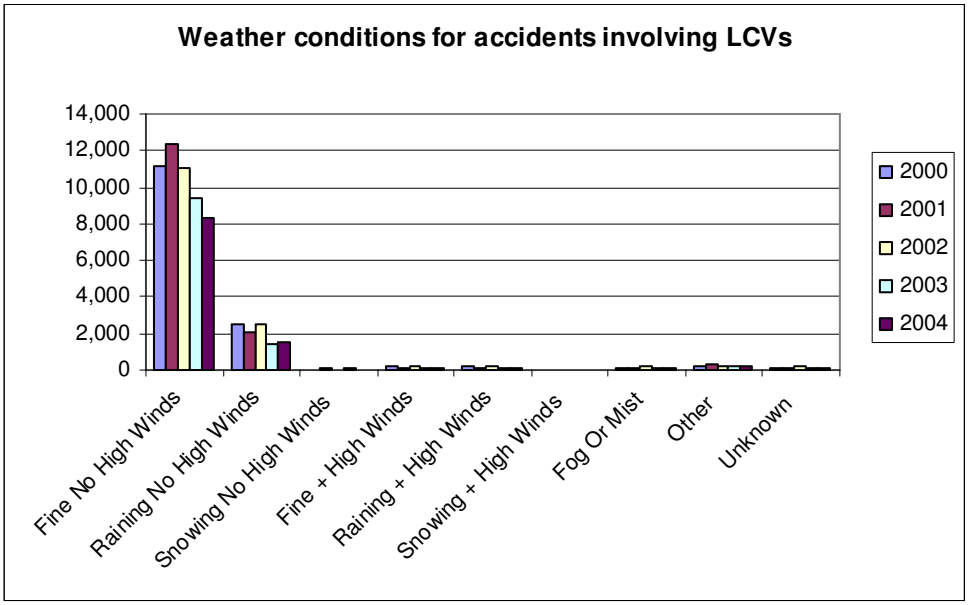
Less than 3% of these LCV accidents involved LCV drivers aged 17 to 19. It should however be noted that in 2004 there were 1,072 drivers involved in LCV accidents (10% of the total) for which no age data was recorded. Figure 9.9 shows the number of LCV drivers involved in accidents compared to the age range of the drivers.

Figure 9.9



Weather Conditions for accidents involving LCVs
The STATS19 data recorded for the prevailing weather conditions suggests that over 78% of the vans were involved in accidents in 2004 that occurred in fine weather with no high winds. In addition, a further 15% of these accidents in 2004 occurred when it was raining but without high winds. Therefore, the data indicates that in 2004, approximately 93% of these accidents took place under these two types of weather conditions, leaving only a comparatively small number of accidents occurring under the other types of weather conditions recorded. A similar trend was observed in the data for 2000 to 2003 inclusive. Figure 9.10 shows the overall trends for the weather conditions in which LCV accidents occurred.

Figure 9.10



Geographical Distribution of LCVs involved in injury accidents

From Table 9.1 below, it may be seen that the majority of LCVs were involved in accidents that occurred in England. A much more detailed breakdown by county showed that in 2004, a total of 1,391 of these accidents (13.1%) were in the Greater London area, with the next highest numbers occurring in West Midlands (477) and West Yorkshire (471).

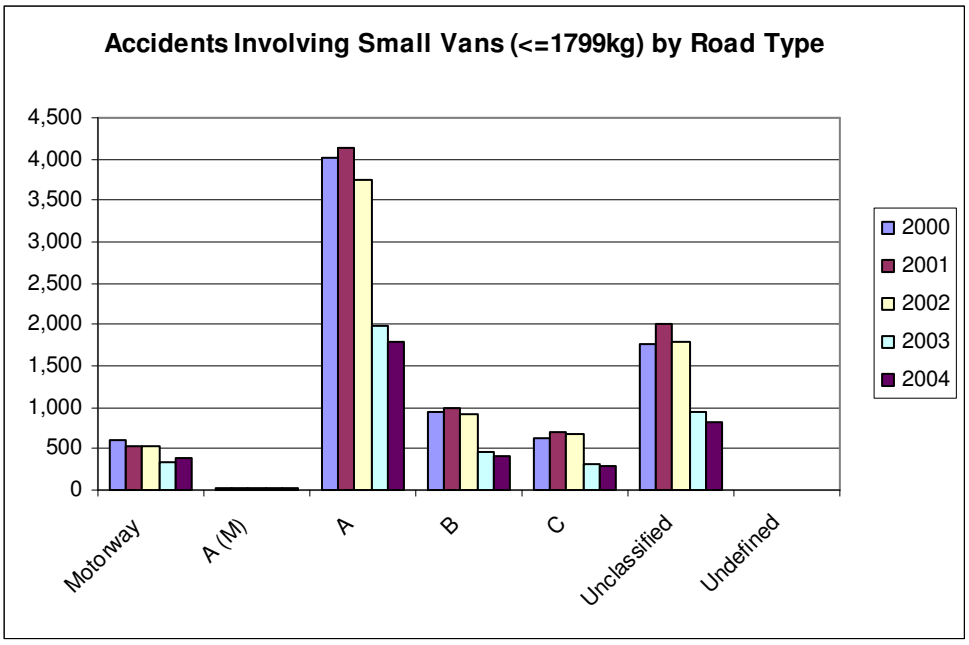
Table 9.1: Geographical distribution by country

	2000	2001	2002	2003	2004
England	13,864	14,305	13,460	10,518	9,634
Wales	381	511	473	450	363
Scotland	386	606	705	669	613
TOTAL	**14,631**	**15,422**	**14,638**	**11,637**	**10,610**

Road Class v LCV Type

In 2004 there were 3,726 small LCVs (<=1799kg) involved in injury accidents. Of these, just over 48% of the small LCVs were travelling on 'A' roads at the time, whilst a further 22% were driving on unclassified roads. Even though overall accident numbers have decreased from 2000 to 2004, the distribution of small LCV accidents versus road type has remained similar throughout this time period (figure 9.11). The total number of small car-derived van registrations has remained fairly stable in the last few years suggesting that this reduction in accident rates is not due to any significant change in the number of these vehicles on the road.

Figure 9.11



A total of 1,264 medium sized vans (1800 to 2599kg) were involved in injury accidents in 2004 compared to 1,617 in 2000. Just over 48% of these medium vans were travelling on 'A' roads at the time of the accident, with a further 22% of the accidents occurring on unclassified roads. Even though the total number of medium vans involved in accidents is considerably less than for small vans, the percentage distribution of accidents versus road type is virtually identical for both small and medium-sized vans. The number of accidents involving medium sized vans that occurred on each type of road are shown in figure 9.12. During this time period the number of medium van registrations has remained largely stable suggesting that the reduction in accident numbers is not a result of a decrease in vehicle numbers in this sector.

Figure 9.12

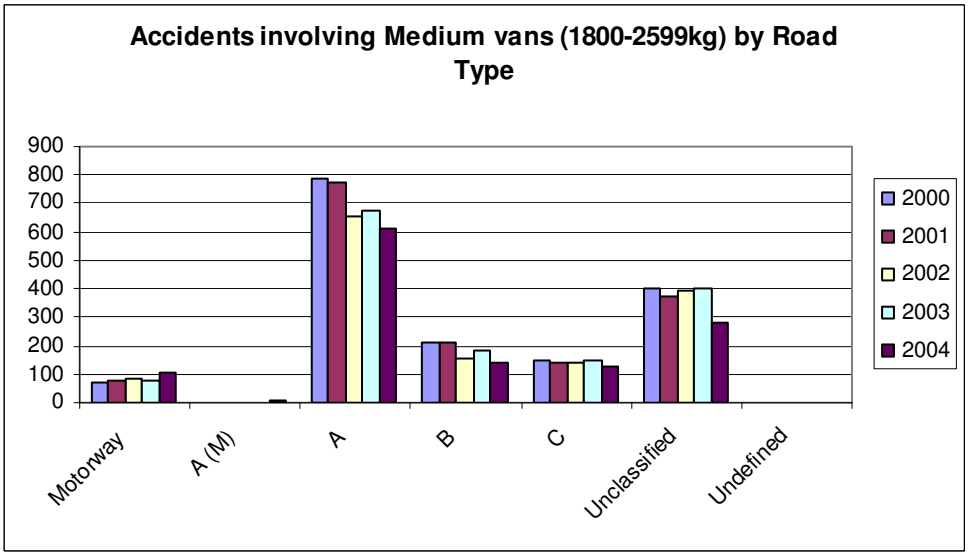
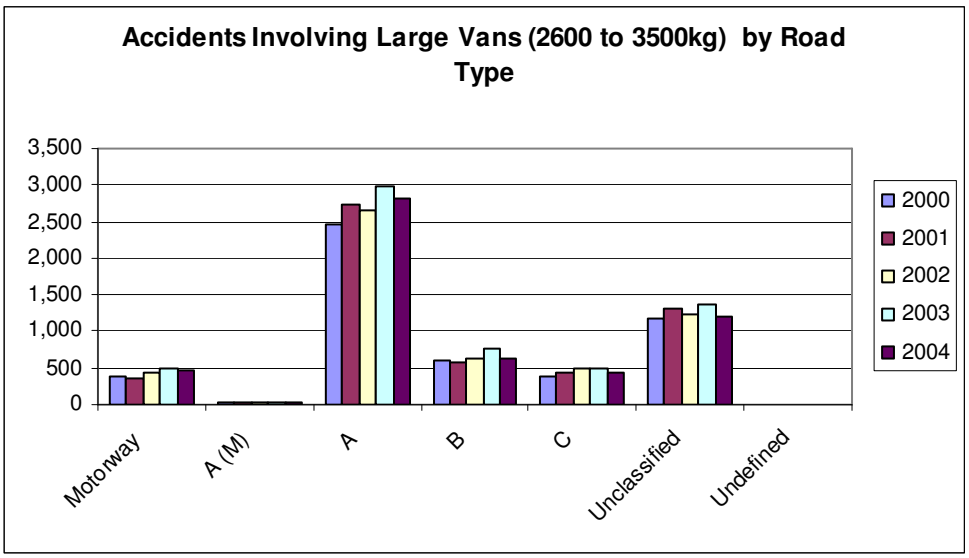


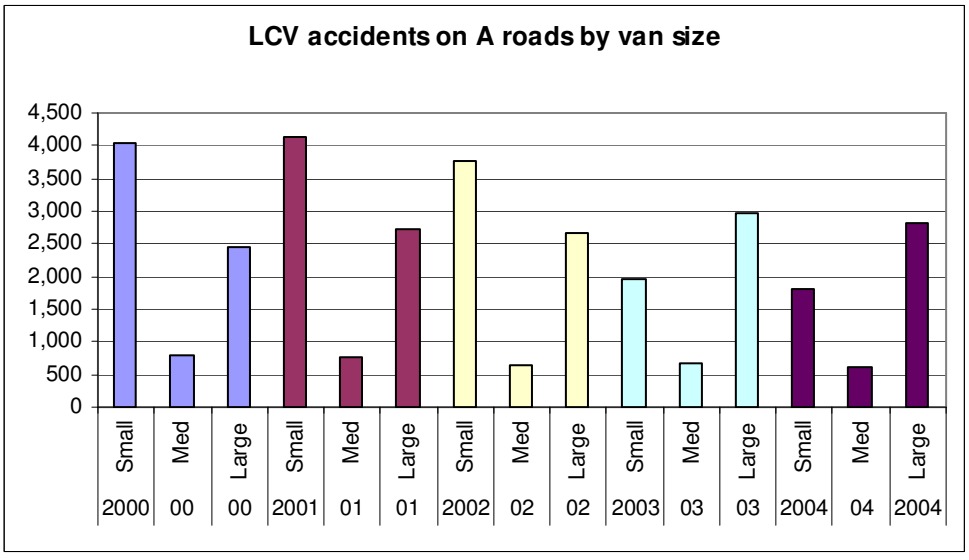
Figure 9.13 shows the number of accidents involving large vans that occurred on each type of road. Of the 5,620 large LCVs (2,600 to 3,500kg) involved in accidents in 2004, over 50% of these accidents occurred whilst travelling on 'A' roads, with a further approximately 22% taking place on unclassified roads. Once again, whilst the total vehicle numbers involved are different for each size category, there is a very similar distribution for the percentage of van accidents versus road type for each size category.

Figure 9.13



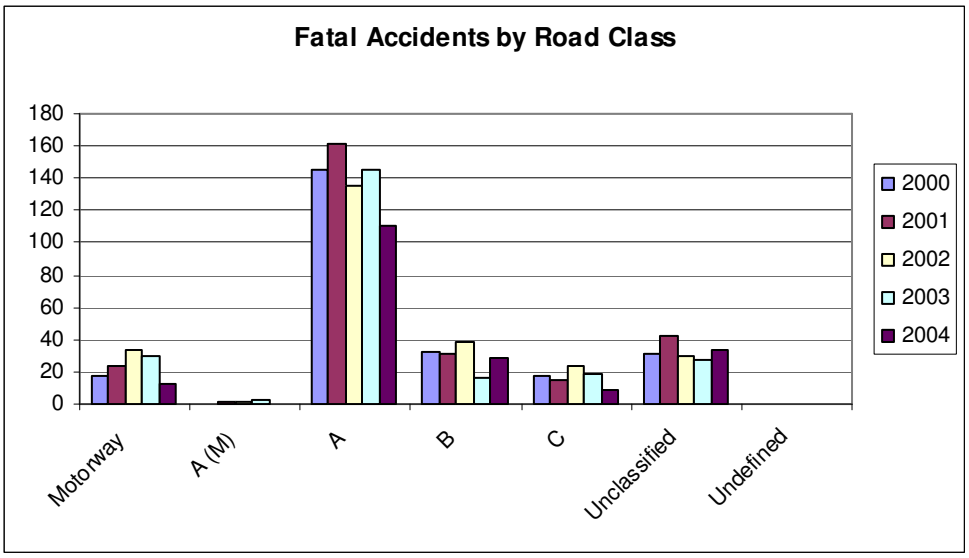
From figure 9.14 which shows the number of LCVs involved in accidents on 'A' roads versus size of van, it can be seen that the number of accidents involving large vans has remained fairly consistent between 2000 and 2004 even though there has been a significant increase in the total number of large van registrations from approximately 1.2 million in 2001 to approximately 1.6 million in 2005. This contrasts with the data for small vans which shows a significant reduction in accident numbers in 2003 and 2004 compared with that occurring in previous years. However, for small car-derived vans it should be noted that the total number of small car-derived van registrations has remained fairly stable over this time period, whereas the total number of large van registrations has increased significantly.

Figure 9.14



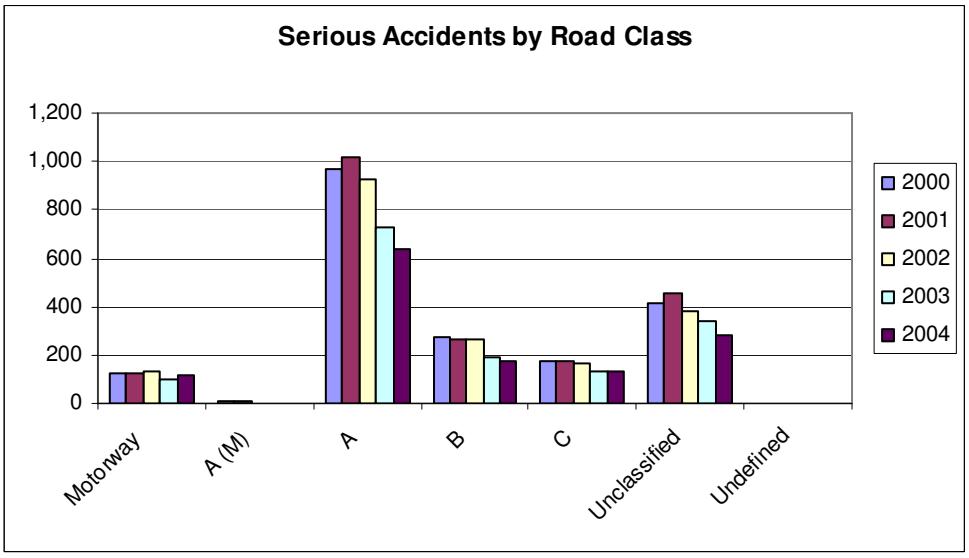
The data for accident severity versus road class was analysed to identify the number of LCVs involved in fatal accidents on each road type. From this analysis it can be seen that the majority of fatal accidents have occurred on 'A' roads for each year from 2000 to 2004 inclusive (figure 9.15). In 2004, 110 (nearly 57%) of the 194 fatal accidents were on 'A' roads, 29 (almost 15%) on 'B' roads and a further 34 (almost 18%) were on unclassified roads. Whilst the overall number of fatal accidents has declined from 2001 onwards, 'A' roads have consistently been the location of over 50% of the fatal accidents occurring in this time period.

Figure 9.15



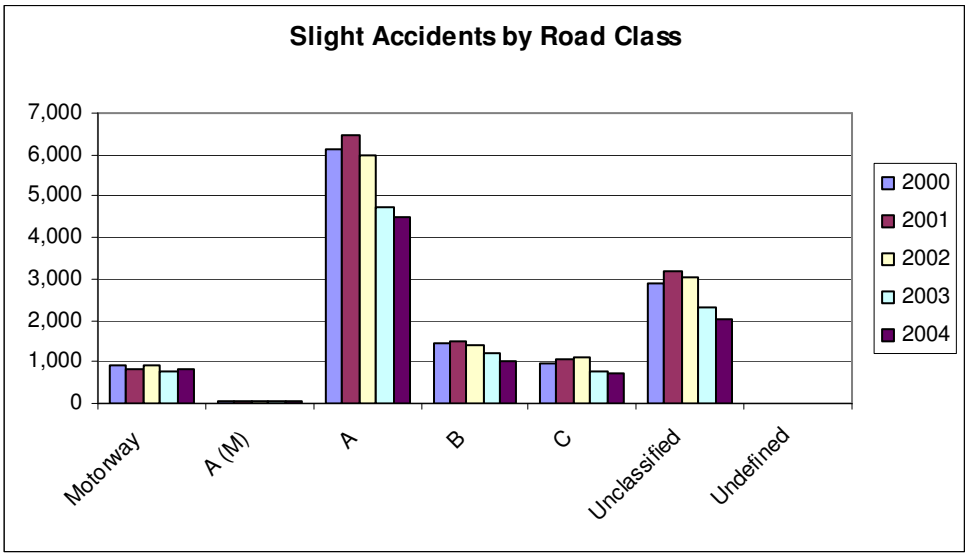
In 2004, there were 1,345 LCVs involved in accidents causing serious injury. A total of 640 (over 47%) of these serious injury accidents took place on 'A' roads, 285 (approximately 21%) on unclassified roads, and 171 (nearly 13%) on 'B' roads. The number of LCVs involved in serious accidents has reduced from 2,041 in 2001 to 1,345 in 2004 but throughout this time period, approximately 50% of these serious accidents have occurred on 'A' roads. These trends are shown in figure 9.16.

Figure 9.16



Of the 9,071 LCVs involved in slight injury accidents in 2004, 4,488 (almost 50%) of these accidents occurred on 'A' roads, 2,006 (over 22%) on unclassified roads and 990 (nearly 11%) on 'B' roads. Whilst the total number of LCVs involved in slight injury accidents has reduced from 13,107 in 2001 to 9,071 in 2004, approximately 50% of these accidents have occurred on 'A' roads throughout this time period. Figure 9.17 below, shows the number of slight accidents by road class.

Figure 9.17



9.2 LCV crash and pedestrian safety tests

A review of LCV crash and pedestrian safety tests was undertaken to assess the current systems and procedures. With regards to the crashworthiness requirements that apply to LCV, the situation is currently understood to be as follows:

- Frontal impact testing (EC Directive 96/79/EC) - no mandatory provisions for LCVs;
- Side impact testing (EC Directive 96/27/EC) - required to comply if the 'R' point of the lowest seating position does not exceed 700 mm [NOTE: the 'R' Point is a reference point that equates to the seat occupant hip position with the seat in a position defined by the vehicle manufacturer];
- Pedestrian protection (EC Directive 2003/102) - 'car-derived' LCVs not exceeding 2.5t required to comply (consideration is being given to extending the scope to include vehicles up to 3.5 t). Details of these directive can be found at the following website http://ec.europa.eu/enterprise/automotive/directives/index.htm
- Equivalent provision for frontal and side impact can also be found in UN-ECE Regulations 94 & 95 respectively.

Accident data on LCV tests is currently being collected under the Heavy Vehicle Crash Injury Study (HVCIS). The purpose of this study is to obtain detailed accident and injury data that can be linked to establish modes of injury and determine effective counter-measures.

It is also believed that some companies perform in-house tests, but this information is not available as commercial confidentiality prevails.

9.3 Status of health and safety within the LCV market

Current health and safety legislation appears to be largely generic, rather than specific to LCVs. Health and safety law requires both employers and the self-employed to ensure, so far as is reasonably practicable, the health, safety and welfare of all employees at all times. Employers also have a responsibility to ensure that others are not put at risk by the work activities of their employees. It should be noted that health and safety law applies to on-the-road work activities as well as to other work activities, and the risks need to be effectively managed within a health and safety management system. The requirements of health and safety law are additional to the responsibilities that employers have under road traffic law e.g. the Road Traffic Act and Road Vehicle (Construction and Use) Regulations which are administered by the police and other agencies such as VOSA.

Under the Management of Health and Safety at Work Regulations 1999, employers are required to carry out an assessment of the risks to the health and safety of their employees, or themselves, whilst they are at work, and to other people who may be affected by their work activities. This includes any driving activity on the road. The regulations also require companies to periodically review their risk assessment to ensure that it remains valid. The risks to employees on the road should be considered by employers in the same way as for the risks in a workplace.

HSE have published free guidance on work-related road safety aimed at any employer, manager or supervisor with staff who drive, or ride a motorcycle or bicycle at work, and in particular those with responsibility for fleet management. It also applies to self-employed people. The guidance leaflet "Driving at work: managing work-related road safety" (HSE, 2003) alerts employers and the self-employed to the fact that their responsibilities under current health and safety law extend to driving at work. The leaflet contains generic information on the effective management of work-related road safety and on integrating it into existing health and safety arrangements.

As part of the Government's Road Safety Strategy "Tomorrow's Roads: safer for everyone", work was undertaken to identify whether more could be done to reduce the number of work- related road traffic incidents. This was done by setting up an independent Work-Related Road Safety Task Group which investigated the issues and provided recommendations on the way forward. The findings of the independent Work-Related Road Safety Task Group are reported in "Reducing at-work road traffic incidents" (HSE, 2001). The key conclusion was that Government and the Health and Safety Commission should take measures to reduce at-work road traffic incidents by applying existing health and safety law to on-the-road work activities. The Task Group considered that employers should manage road risk in the same way as they manage other occupational health and safety risks.

Additional information on the management of work related road safety is published in "Management of work related road safety" (Lancaster et al, 2002a) which is available from the HSE website and also in "The contribution of individual factors to driving behaviour: Implications for managing work-related safety" (Lancaster and Ward, 2002b). These reports summarise the findings of a three part study (Entec UK Limited) commissioned by the HSE and the Scottish Executive, the aims of which included the identification and documentation of good practice case studies of occupational road safety policy and procedures and establishment of the contribution of individual factors to driving behaviour and the implications for managing work-related road safety. Whilst the findings reported are not van specific, they have implications for occupational road safety policies and procedures, in particular recruitment, training, safety culture, medical screening and stress management.

The HSE has also published 17 case studies on work-related road safety (HSE website, 2006) that may be useful to employers who are seeking to develop or review their own occupational road safety policies and procedures. The case studies include ones relating to companies who have van fleets.

HSC/E has also published guidance for directors, CEOs and others at an equivalent level to voluntarily provide leadership on health and safety (HSC, 2003). Whilst the guidance is generic, it sets out the roles and responsibilities of the board and its members with respect to health and safety risks arising from the organisation's activities.

The RoSPA website includes some free road safety resources (RoSPA, refs1-6) which contain generic information on work-related driving issues such as journey planning and mobile phone use. There is also a RoSPA guide available entitled "Managing Occupational Road Risk (MORR™): The RoSPA Guide" but this is only available if purchased i.e. it is not a free report. In addition, RoSPA also run seminars on the management of occupational road risk aimed at tackling work-related road safety.

Overall, there is a lack of van specific reports on issues such as work-related road safety, work-related road accidents etc although a few reports have been identified that contain generic material on these issues such as those identified above.

Searches of both university and research establishment websites for material on specialist safety studies have also produced little evidence of van specific studies but have again tended to produce more generic material. It is noted that both university and research establishments tend to undertake research on behalf of other organisations and therefore the resultant published material (if any) may well be published on the funder's website and not necessarily on the contractor's e.g. the Entec report on the Management of Work Related Road Safety is available from the HSE website.

Loughborough University have undertaken a study funded by HSE to review the key human factors involved in workplace transport accidents (Harley and Cheyne, 2005). This study examined literature on individual differences and personality, stress, fatigue and demands, training, competencies and selection, and safety culture and management processes, primarily in the context of workplace transport. The literature found relating to these areas suggested that human factors issues are likely to influence workplace transport accidents on a number of levels. Whilst again not van specific, it provides generic information that would also be applicable to LCV operations.

Loughborough have also carried out work to develop a protocol for the investigation of crashes involving M1 and N1 cars and vans (Morris et al, 1999). However, it appears that only the executive summary of the report is downloadable from http://magpie.lboro.ac.uk/dspace/handle/2134/539 so it is not possible to assess the extent to which information in the report may be applicable to vans.

The Vehicle Safety Research Centre (VSRC) and TRL have also undertaken joint studies such as the On The Spot (OTS) Accident data Collection study commissioned by DfT and the Highways Agency (HA) to enhance road safety and reduce road casualties through improved accident research. Although not van specific, the report (Hill & Cuerden, 2005) describes the research design and methodology to develop a collaborative approach that enables expert crash investigators to attend the scene of an incident within 15 minutes of it occurring, thus allowing the collection of accident data that would otherwise be quickly lost. The report on "Development and Implementation of the UK On The spot Accident Data Collection Study – Phase 1" can be downloaded via http://magpie.lboro.ac.uk/dspace/handle/2134/1050 .

The Loughborough University website also includes a summary of a study that presents data on light goods vehicle (LGV) crashes for which the data were derived from two main sources. The first source involves mass analysis of crashes involving LGVs recorded in the national British STATS19 accident database for 1994 to 2000. The second source involves analysis from an in-depth study of LGV accidents in Britain since the late 1980s. In total, in-depth data on almost 500 LGV crashes were considered. Three main issues were apparent. Firstly, there is an issue of crash compatibility between LGVs and passenger cars. The second issue involves restraint use among LGV occupants, since the in-depth data reveal that use is low compared with car occupants. The third issue is the implication of introducing a regulatory compliance crash test for LGVs. For the above study, it is assumed that the definition used by Loughborough is similar to that utilised for this research i.e. a light goods vehicle is similar to a light commercial vehicle.

The University College London Centre for Transport Studies website contains a long list of publications, conference papers and working papers up to April 2000 (http://www.cts.ucl.ac.ul/publications/publica/publscon.htm). However, although the list includes some safety related studies, there are no links provided to the documents listed so it was not possible to determine whether they contained any van related information. The library services part of the UCL site contained a list of more recent reports but did not appear to contain any van specific information.

There are a small number of free reports available on the TRL website which include reports on mobile phone use by drivers (TRL634 and TRL635) and also a report on work-related road accidents (TRL582).

TRL has carried out a series of surveys for the Department for Transport on mobile phone use by both car drivers and other road users. These surveys were undertaken as an extension to surveys of seat belt usage that had already been ongoing for a number of years. The results of each survey found that the level of phone use by van drivers was higher than for car drivers, although there were significant variations between survey areas. The highest level of use was recorded in North London in 2003, where almost 6% of van drivers were using a phone. The surveys also found that van drivers who were using a phone were more than twice as likely not to wear a seat belt as non-phone users. More recent survey results include information on the percentage of van and lorry drivers using mobile phones and these are shown in the table below. The survey findings are reported in TRL634, TRL635 and LF2097.

Table 9.2: Percentage of van and lorry drivers using mobile phones on weekdays

	September 2004			April 2005		
%	Hand-held	Hands-free	Overall	Hand-held	Hands-free	Overall
Van Drivers	2.4	1.3	3.7	2.6	0.7	3.3
Lorry Drivers	1.2	1.5	2.8	1.9	1.0	2.9

A study on work-related road accidents has also been undertaken by TRL for DfT (TRL582). The study findings suggested that it would not be possible for companies to attempt to deal with work-related road risk simply by improving driver training. Instead, the study suggested that companies needed to change the conditions under which their employees drive in order to reduce time pressure and fatigue. It also identified a need to strongly discourage attention-demanding in-car tasks such as mobile phone conversations.

In addition, there are also a large number of reports available on the TRL website that have to be purchased. These include reports that contain generic information that would also be applicable to LCVs e.g. the report TRL547 “How dangerous is driving with a mobile phone? Benchmarking the impairment to alcohol” (Burns et al, 2002) reports on the findings of a study designed to quantify the impairment from hands-free and hand-held phone conversations relative to the decline in driving performance caused by alcohol impairment. The study results showed significantly poorer driving performance when using a hand-held phone in comparison to the other conditions. Under the influence of alcohol, driving performance was significantly worse than for normal driving, but still better than driving while using a phone. The study concluded that driving behaviour was more impaired during a phone conversation than by having a blood alcohol level at the UK legal limit (80mg / 100ml).

The University of Nottingham have undertaken an in-depth study of work-related road traffic accidents for DfT (DfT, 2005). The study found that the drivers of company cars, vans/pick-ups or LGVs appeared to be more to blame in their accidents. Van and pick-up drivers had their peak number of accidents in the age band 21-25 years which was younger than for other drivers. It was also found that van and pick-up drivers who were at fault had a peak in their accidents between 07:00 and 08:00. Only a comparatively small number of accidents (approximately 1.5%) were found to result from vehicle defects. However, the two main categories of vehicles that were prevalent in this group were LGVs and vans/pick-ups.

The study also found that drivers of vans/pick-ups were significantly more likely to be involved in collisions with motorcyclists. In addition, van and pick-up drivers had more accidents where they failed to take account of a restricted view.

9.4 Corporate manslaughter

The laws relating to corporate manslaughter are currently being reformed and the draft Corporate Manslaughter Bill was published in March 2005. The draft bill sets out proposals for a new, specific offence of corporate manslaughter. This bill shifts responsibility for organisations and individuals who do not adhere to UK health and safety laws. It is expected that the Home Office will introduce its new bill before the close of the current parliamentary session in July.

9.5 Summary

- The overall numbers of LCVs involved in accidents has decreased steadily since 2001 even though the total number of LCV registrations, and hence the total number of LCVs on the road, has increased during the same time period.
- The number of large LCVs (2600 to 3500kg) involved in injury accidents in both 2003 and 2004 has increased compared to the numbers occurring in both 2000 and 2001. However, it should be noted that there has been a significant increase in the total number of large van registrations in recent years from approximately 1.2 million in 2001 to approximately 1.6 million in 2006.
- There has been a significant reduction of more than 50% in the number of small vans involved in injury accidents in 2004 compared with the numbers occurring in 2000/2001 even though the number of small van registrations has remained fairly stable during this time period. Accident numbers for medium sized vans have also decreased, although the number of medium van registrations has also remained fairly stable.
- The manoeuvre most likely to result in injury accidents for LCVs is “going ahead other”.
- Although the majority (approximately 84%) of accidents involving LCVs occurred between 07:00 and 18:59, there is still at least one van per week on average involved in an accident even in the small hours of the morning.
- The majority of the accidents involving vans occurred in weather that was classified as fine, with no high winds.
- There were fewer LCVs involved in accidents at weekends than on weekdays.
- The age group most likely to have an accident are the 40 – 49 age group.
- The most dangerous roads for LCVs are A class and unclassified (i.e. urban and country roads).
- The research found that the health and safety regime was not specifically targeted at the LCV industry as the health and safety legislation is largely generic. However, it does however impact upon the industry, as LCV operators are required to comply with the legislation.
- Overall, it appears that a large amount of health and safety related research has been undertaken, but very little of it is van specific.

10 ENVIRONMENTAL CONSIDERATIONS

This section summarises the current understanding of and calculations of, carbon dioxide emissions from light goods vans. It discusses:

- The regulatory framework whereby vans are approved for sale
- Developments in engine technology and its impact on CO_2 emissions
- The current methodology for estimating the CO_2 emissions from light goods vans in the UK
- The results from these calculations
- New data that has recently become available, and
- Systematic differences between estimates of CO_2 from vans and passenger cars

The section concludes by predicting trends in CO_2 emissions from vans in the short and medium term, the potential for abatement and some caveats on the current calculations caused by gaps in the information available.

10.1 Overview of light-duty vehicle emissions testing

Before light-duty vehicles can be sold within the EU, the manufacturer has to demonstrate that they meet certain emission standards, known as Euro standards. These specify maximum emissions of four pollutant species, carbon monoxide (CO), oxides of nitrogen[1] (NO_X), hydrocarbons (HC) and particulate matter[2] (PM), for a vehicle when started from cold over a well-defined drive cycle. The drive cycle used is the New European drive cycle (NEDC). This cycle actually comprises two components, the ECE (urban) and EUDC (extra urban) cycles and is the test cycle used as the basis of the vehicle fuel consumption data published by the VCA.

The first standard, Euro I, came into force in 1993, whilst the most recent, Euro IV, was implemented from 1/1/2005. The differences between Euro III and Euro IV standards is approximately a halving of the allowed emission limit of all four pollutant species (or three for petrol fuelled vehicles). These emission standards, and the test procedure, apply equally to passenger cars and light goods vehicles less than 3.5 tonnes gross vehicle weight (although the exact emission limit is in three bands for the three different light goods vehicle weight classes).

These standards have been the dominant driving force behind most changes in engine technology. For petrol fuelled vehicles, this has been the introduction of firstly single point and then multipoint fuel injection systems, controlled by a computer (the engine control unit, ECU), monitored with a range of sensors (including mass air-flow, oxygen and lambda sensors) and with a three-way catalyst to convert CO and HC to carbon dioxide, and NO_X to nitrogen. For diesel vehicles, the challenge has been to reduce PM and NO_X emissions to the required levels. (It is much easier to meet CO and HC standards because of the fundamentals of combustion in internal combustion engines). The fuel systems of diesel vehicles have undergone major changes in the last few years, with vehicles going from mechanical systems operating at modest injection pressures, to electronically controlled systems injecting fuel at higher pressures from a common high-pressure rail. These changes have been augmented by the addition of post combustion emission abatement systems including diesel oxidation catalysts, and in some cases diesel particulate filters to control PM (and HC and CO) and also exhaust gas recirculation (EGR) systems to control NO_X. In addition, the more recent EU directives have specified on-board diagnostic (OBD) systems that must be fitted to new vehicles, irrespective of their fuel, to monitor that the emission control technology continues to function correctly.

All these changes in vehicle engine technology and after treatment have been driven by regulatory limits concerning the key pollutant species. Any changes in fuel efficiency, and consequently CO_2 emissions, and in the emissions of other unregulated pollutants have been secondary. The improved fuel systems have generally improved fuel efficiency, but the addition of catalysts or EGR often causes a small reduction in fuel efficiency.

[1] This is the sum of the concentrations of nitrogen dioxide (NO_2) and nitric oxide (NO)

[2] PM is only regulated for diesel fuelled vehicles, not petrol fuelled vehicles

10.2 Calculation of CO_2 emission inventory for vans

The preceding discussion describes the regulatory framework that determines which vehicles are approved for sale and use on our roads. However, the NEDC (or ECE + EUDC components) are acknowledged not to be typical of "normal" driving behaviour. Moreover, the NEDC starts with the vehicle cold. The emission inventory for vans is calculated from:

$$E_{\text{Pollutant i}} = \sum_{\text{Vehicle Types}} \text{Distance driven(km)} \times \text{Emission Factor(for pollutant i)} \qquad \text{Equation 1}$$

Where:

- The vans are categorised according to their fuel, weight class and the Euro standard to which they were manufactured
- The distance driven by each van type is found/estimated from road traffic statistics, and
- The emission factor (in grams emitted per km driven is for vehicles at their normal operating temperature.

This basic equation is modified to include:

- Additional emissions due to cold starting – This is much more significant for petrol fuelled vehicles than diesels because of the amount of over-fuelling required for even running when cold and the time taken for catalysts to reach their normal operating temperature.
- Hydrocarbon emissions from evaporation – Again significant for petrol fuelled vehicles but taken as zero for diesel vehicles.
- PM emissions caused by brake, tyre and road wear, and atmospheric resuspension caused by road traffic.

The final total CO_2 emissions figures are then "normalised" or made consistent with, the fuel usage statistics provided by DTI in the Digest of UK Energy Statistics (DUKES).

Emission factors, including those for CO_2, are found by testing a number of vehicles of each vehicle type on a chassis dynamometer when driven over a range of cycles (simulating journeys ranging from driving in a congested city to motorway driving). The average speeds for these cycles vary from around 7 kph to 140 kph. The emissions of species, e.g. CO_2, for each vehicle over each drive cycle are then plotted against the average speed of the drive cycle. This correlation is analysed using an established statistical procedure (see Barlow et al, 2001 and Norris et al, 2005) to generate a speed related emission factor. This gives the average emissions (g/km driven) over a wide range of speeds, expressed as a polynomial. The traffic census data not only provides vehicle-km data but also the average speed of vehicles for different types of roads. For the UK National inventory, Equation 1 is subdivided into three different road types – urban, rural and motorway. Using the polynomial and the average speeds for each type of road, an average emission factor can be calculated for each type of road.

10.3 Key differences between cars and vans

A detailed analysis of the total emissions and fuel efficiency of the passenger car and light goods vehicles components of the light-duty fleet reveals some systematic differences. These include:

Fuel type. Whilst there has been an increase in the ratio of diesel cars to the whole passenger car fleet, this is more marked for vans, with recent sales of petrol fuelled vans being limited. These differences are taken into account when calculating the inventory.

Trip length. It is probable that the average trip length of vans differs significantly from that for cars. The NAEI does not have sufficient input data to take this into account and presumes that the average trip length for passenger cars and vans is the same. Further, because the influence of this is in estimating the emissions contributions from cold starting and because the excess CO_2 emissions from the cold starting of diesel vehicles is small, overall this is thought to lead to only a minor variation to the inventory.

Duty cycle. For passenger cars, the ratio of the maximum load to gross vehicle weight is much smaller than the equivalent ratio for vans because of the greater load carrying capacity of the latter. Whilst this is the case, the emission factors currently used in the NAEI are those for only lightly loaded vans.

10.4 Emission factors for vans

The emission factors used in the current road transport model within the NAEI were, for the most part, calculated by TRL and reported in 2001 (Barlow et al, 2001). The number of test results were 121 for Euro I petrol LCVs, 60 for Euro I diesel LCVs and only 4 for post Euro I vans. For post-Euro 1 vans in the UK fleet, emission factors have been estimated taking into account several influences and information sources: There is a voluntary agreement among European car manufacturers to reduce the average of CO_2 emissions from new cars to around 140 gCO_2/km, around 25% less than the average emissions from new cars in 1996. Emissions of CO_2 from new light-duty vehicles have been improving over the last decade as manufacturers have aimed at improving vehicle fuel economy. In addition, emissions of CO_2 have also been influenced by vehicle engine design and abatement technologies, as discussed earlier. There are also values of CO_2 emissions and fuel consumption for new light-duty vehicles reported by manufacturers and made available to consumers, as required under EU Directives. All these sources of information have been used to produce the estimated CO_2 emission factors and average fuel efficiencies for post-Euro 1 vans in the UK fleet that are used in the NAEI. These are the foundation of the calculations whose results are shown in Figure 10.1, which shows the UK CO_2 emissions by vehicle type between 1990 and 2004. Figure 10.2 shows the same van data on a different vertical scale to illustrate the contribution of vans in the overall road transport inventory.

Figure 10.1

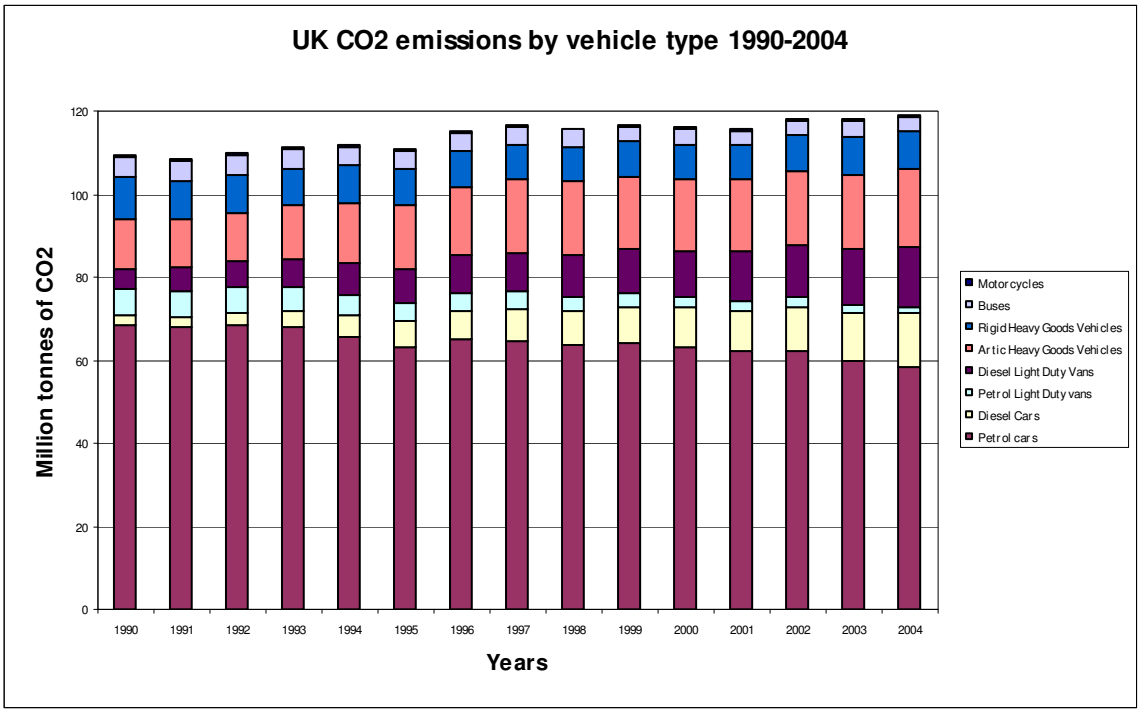
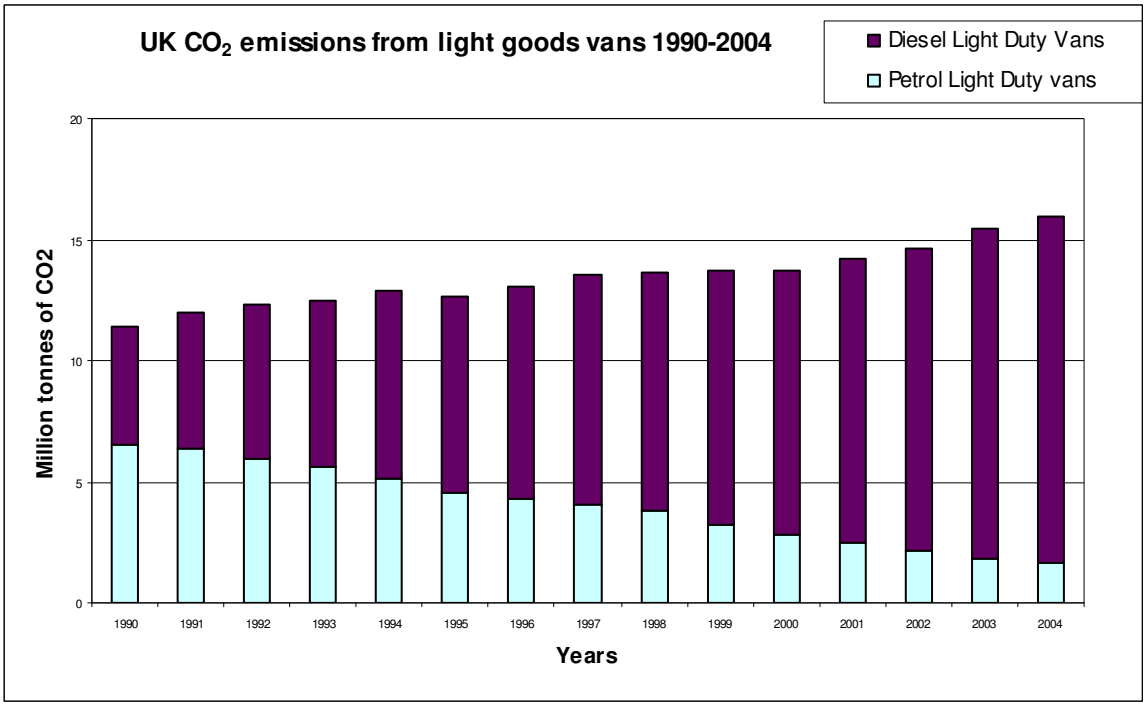


Figure 10.2



The Cleaner Fuels and Vehicles (CFV) division of DfT commissioned two projects to address the shortcomings of the current van emission factors database. Shell Global Solutions collected data from 10 Euro II and 10 Euro III diesel vans. This data set was delivered to DfT in July 2005 and DfT then commissioned AEA Technology to analyse this data. The report (Norris et al, 2005) concluded that the measured CO_2 emissions from diesel powered LCVs were lower than those predicted from the Euro I technology by, on average, around 20%. Table 10.1 reproduces the summary CO_2 emission factor data from the report.

A further research project being funded by DfT is a "Review of emissions modelling methodology", project reference number PPRO/4/009/003. This 6 month duration contract was awarded in December 2005, and should be nearing completion.

Table 10.1 CO_2 Emission factors for average diesel LCVs (in gCO_2/km) on Ultra Low Sulphur Diesel (ULSD)

	g CO_2/km		
Euro Standard	**Urban**	**Rural**	**Motorway**
Current Euro II	299	258	417
Current Euro III	275	237	384
Current Euro IV	256	221	358
New Euro II	223	217	330
New Euro III	221	210	319
Recommended Euro IV	221	210	319

One of its aims is to review the current methodologies used (the speed related emission factors described earlier) for modelling road transport emissions in the national inventory and to identify where new methodologies could improve the quality of the inventory. This review may lead to a change in methodology, and a resulting change in inventory calculations and predictions.

Beyond the UK, there is a pan-European project entitled “Assessment and Reliability of Transport Emission Model and Inventory Systems, ARTEMIS” whose objective is to develop a harmonised emission model for road, rail and ship transport. Work Package 300 is the “establishment of reliable emission factors for passenger cars and light-duty commercial vehicles”. The ARTEMIS project may generate a new emission factor database.

10.5 Trends in emissions from vans

Figure 10.2 shows quite clearly that, within the assumptions used in the NAEI, since 1990 there has been a major reduction in the CO_2 emissions originating from petrol fuelled light goods vehicles (from 57% of all van emissions in 1990, to around 10% in 2004) and a corresponding increase in the importance of diesel vans. This change cannot continue beyond there being no petrol fuelled vans left. Also, because of a number of factors, it appears unlikely that the petrol fuelled vans will regain their once dominant position.

The intrinsically lower CO_2 emissions of diesel fuelled vehicles, relative to petrol fuelled equivalents, has, to some extent, offset the increases in the numbers of vans in the fleet, and the increases in vehicle-km being driven. However, with the move to virtually 100% diesel vans, this offsetting has reached its maximum and further increases in vehicle numbers and activity (vehicle-km) would produce a corresponding increase in CO_2 emissions.

It must be recognised that fuel prices will have had an impact on the market penetration of diesel. Information supplied by the UK Petroleum Industry Association (UKPIA) indicates that for a long period in the early 1990s the diesel pump price was significantly lower that petrol (UKPIA 2006). This factor may have convinced a number of LCV manufacturers to produce more diesel variants of their models to take advantage of this fuel price differential.

In terms of vehicle technology, the potential pollutant limits being discussed for the future Euro V and VI standards, are likely to require further reductions in PM and NO_X emissions, and will probably lead to very little change in fuel efficiency.

10.6 Potential abatement

This is an interesting and challenging area. It would be equally wrong to believe either than nothing can be done, or that a simple solution exists. There are a variety of technical and non-technical measures that could be taken, including:

- The introduction, and uptake of, hybrid vans
- The uptake of biofuels
- The accelerated removal of old technology vehicles (including petrol fuelled vehicles)
- Schemes to reduce congestion
- Changes in aerodynamics
- Changes in driving styles

An example of an initiative addressing the last item on this list is AEA Technology, through its Momenta management unit, working with DfT providing a programme entitled “Safe and Fuel Efficient Driving (SAFED) for Vans”.

10.7 LCV fuel efficiency trends

Unlike cars, there is currently no standard test for quantifying the miles per gallon (MPG) or carbon dioxide (CO_2) emissions from LCVs. Therefore, data on MPG and CO_2 performance of LCVs is unreliable and not comparable.

Some data is available though, mainly through DfT estimates for the CO_2 emissions from new small and large vans in 2003. Despite this dataset being based on limited data and coming from specific vehicle manufacturers, it does show that there are wide variations in the CO_2 emissions and that emission levels vary widely between different models of small and large vans.

Small vans appear to have CO_2 emissions similar to those for a car, while the larger vans can be up to 40 per cent higher.

Table 10.2: Examples of CO_2 Emissions for Light Commercial Vehicles (measured in grams per kilometre of CO_2)

		Engine cc	Fuel Type	Euro Standard	CO_2 emissions (g/km)
Small Vans					
Citroen	Berlingo Multispace 1.9D	1868	Diesel	III	181
Peugeot	New Partner Combi 2.0 Hdi (90 bhp)	1997	Diesel	III	152
Volkswagen	Caddy Kombi 1.9 TDI (90PS)	1896	Diesel	III	154
Fiat	Doblo 1.9 JTD	1910	Diesel	III	176
Large Vans					
Ford	Transit 2.0 Turbo Diesel (100PS) 4.54 FDR	1998	Diesel	III	209
Volkswagen	LT Kombi 2.5 (83PS) Axel Ratio 4.111	2461	Diesel	III	257
	LT 4.6 Kombi 2.8 (158PS) TDI Axel Ratio 3.727	2799	Diesel	III	289

(Source: Estimates by the DfT, based on information supplied by vehicle manufacturers for new LCVs in 2003)

For light vans based on the same technology as cars, some crossover effect from the fuel economy improvements of cars can be expected. However, this may be reduced by differences in gear ratios, engine sizes, secondary equipment and patterns of use.

The dieselisation of the UK LCV fleet is virtually complete with over 80 per cent of the light van fleet running on diesel in 2002 (DfT, 2003) and virtually all new vans purchased today running on diesel. As a result, an increased use of conventional diesel is unlikely to deliver further improvements in the overall fuel efficiency of the LCV fleet.

10.8 Alternative fuels

In the period 2001 to 2005, the total number of alternative fuelled registrations increased from 9,636 to 16,831 LCVs. However, the number of new registrations varied during this time period with 1,160 in 2001, which increased to 3,136 in 2003, before subsequently decreasing to 1,586 in 2005.

The alternative fuelled market may be influenced by government policy e.g. the London congestion charge in 2003 may have increased sales of these LCVs as they were exempt. The Energy Saving Trust's grant programme may also have affected sales.

Many LCV operators have investigated the cost effectiveness of using alternative fuels (especially liquefied petroleum gas and compressed natural gas) through undertaking local trials. For many the use of such alternative fuels is not cost effective due to the cost of the additional equipment required, the limited refuelling infrastructure, the loss of loading space and the lower fuel efficiency compared to diesel.

Many manufacturers are currently developing a range of diesel hybrids that, when available, will produce fuel efficiencies in the high 60 – 70 miles per gallon. Although initially at an extra cost, the development of hybrids is seen by many as the next step in fuel efficiency.

A DTI-commissioned study (Selwood & Seymour, 2001) that examined the appropriateness of fuel cells technology in vans found that urban delivery is the operation that would most benefit from such technology. In many cases home delivery vehicles return to base – which is helpful for overnight refuelling. The study also showed that reduced running costs could offset the higher capital cost of fuel cell powered vans.

Currently fuel cell technology is being tested in a number of applications, with Transport for London taking delivery of the UK's first hydrogen fuel cell buses in 2005. Similarly, Hermes courier service in Germany has been using fuel cell powered Mercedes Sprinter vans since 2001. More recently, UPS began trialling a fuel cell powered Mercedes Sprinter in Stuttgart, Germany.

Future developments in alternative fuels and vehicle drivetrains are likely to be initiated through the DTI sponsored Foresight Vehicle Initiative. This programme, now administered by The Society of Motor Manufacturers and Traders Limited (SMMT), is the UK's prime knowledge transfer network for the automotive industry.

The Foresight Vehicle Group was set up by the SMMT Transport Panel and the DTI to define the detailed objectives of a programme designed to develop, demonstrate and exploit technology to stimulate the UK automotive supplier base to develop products and systems which satisfy increasingly stringent environmental requirements while meeting mass expectations for safety, performance, cost and desirability.

It consists of representatives of vehicle builders and their suppliers, independent research consultancies and university departments, government departments and user representatives such as motoring organisations.

10.9 'Green' fleet management trends

Green fleet management is not a term that tends to be used within the LCV industry. In general, the sector is more likely to undertake policy and procurement changes for operational efficiency, rather than environmental benefits. However, despite this, a number of companies are utilising techniques that could be described as 'green' for example:

- Mileage reduction through satellite navigation and vehicle tracking systems
- Fuel management through fuel cards
- Driver management techniques such a training and reward schemes
- Fuel reduction targeting
- Maintenance regimes
- Optimal loading
- Trialling alternative fuels

Through the research carried out as part of this study, it would appear that the environmental impacts of individual company's LCV fleets are rarely recorded. A number of companies do record overall transport impacts, however, those that do tend to focus on those impacts relating to company car use rather than their LCV fleet. In many cases the focus is on health and safety, rather than environmental management.

10.10 Media awareness of Government programmes

Research carried out though industry journals and magazines (e.g. Commercial Motor, Fleet Van, Fleet News, Professional Light Truck and Van Magazine), indicates that media promotion of Government backed programmes is relatively low.

The exception to this is when the Government launches a new programme or scheme, or the individual programme issues a press release, launches a new publication, undertakes an event or purchases advertising space. There appears to be very little proactive promotion of Government programmes by individual industry journals.

11 CONCLUSIONS

Research carried out as part of this Department for Transport funded study has shown that although the majority of Light Commercial Vehicles (LCV) registered in the UK can be categorised as Large Sized LCVs (LSLs), there are a number of specialist variations that suit a wide variety of niche markets and applications (e.g. livestock carriers, glass carriers, low loaders, etc). With such a wide variety of LCVs available within the UK market place, it is likely that the usage and market driver applying to each individual sector will differ significantly.

As noted, the growth of the LSL sector has been rapid over the past 3 years (mirroring the national growth profile) and this type of light commercial vehicle now dominates the market place. The increase in numbers may be due to the increase in home delivery through the advent of home shopping and Internet based sales.

The growth in pick-up style (PU) light commercials has also increased rapidly over the past 3 years. The research carried out could not ascertain the reasons behind this growth, but it may be due to a number of factors including personal choice, fashion, tax advantages and the growth of personal contract leasing/ self-employment.

Further research has indicated that although the overall LCV market has been growing rapidly since 2002, the numbers of new registrations appears to be stabilising. This may indicate that the LCV market is reaching saturation point and the growth profile may not be sustainable. It also suggests that the numbers of older LCVs is increasing, which may have an impact on maintenance, servicing and accident levels.

The LCV statistics provided by DfT did not include the weight of the vehicle. This made it difficult to gain an accurate picture of the LCV sector as there is no appropriate method of dividing certain types of vehicles e.g. panel vans, between the MSL and LSL categories. In order to improve the understanding of the LCV sector, it appears that more accurate publicly collected information regarding weights and classification would be required. This could take the form of a common industry and statistical reporting standard.

Research indicates that any potential environmental benefits in carbon dioxide emissions and MPG through the use of diesel have been outweighed by the growth in van numbers and use. Therefore, any further improvements in fuel economy and carbon dioxide emissions are likely to be offset, as the use of LCVs increases. Moreover, due to the operational requirements of these vehicles, it is likely that improvements in conventional diesel technology, combined with the efficient management of fuel and vehicle operations will have a long-term impact on the overall fuel economy and emissions of the LCV sector. The contribution of vans to overall CO_2 production is growing. Therefore, greater effort is likely to be required to ensure that the van sector does as much as possible to minimise its environmental impact.

Alternative fuels such and Liquefied Petroleum Gas (LPG) and Compressed Natural Gas (CNG) have had limited impact on the LCV market, again due to the operational requirements of the vehicles such as torque, loading space and range.

It is anticipated that the next step change in LCV propulsion is likely to be achieved through non-conventional diesel power sources, such as biodiesel or diesel hybrid technology.

The range of LCVs available in the UK is dominated by Ford, who produce a wide range of vehicles to suit a variety of operational requirements. Other manufacturers, such as Mercedes or Volkswagen appear to focus their attention on one or two specific model or range types, while LDV currently manufacture a single model. This suggests that individual manufacturers focus on different markets within the LCV sector and have different approaches to model development. Despite this, there is a degree of manufacturer interaction and collaboration especially with regards to design, platform and parts sharing.

Many of the changes in LCV design have been around driver comfort, with the inclusion of air conditioning, satellite navigation and CD players being the most common outcome. This indicates that both the manufacturers and LCV users are beginning to view these vehicles as more than just the traditional workhorse. Therefore, there is a trend towards higher specified vehicles, which may result in higher costs for maintenance and repair. Similarly, there is likely to be a hidden cost to running a van fleet, i.e. that of accident, repair and maintenance costs.

The current sales regime within the LCV sector appears to be disjointed with a range of differing showrooms being employed for this purpose from car dealers and LGV dealers to dedicated LCV dealers. The different sales techniques employed within each showroom are likely to have an impact on the type and specification of LCV sold to individual purchasers, with car dealers more likely to sell an LCV as if it is a car, e.g. based on power, speed and additional features, rather than user needs and loading space.

The operational use of LCVs within UK industry can be broadly categorised into two different roles:

- The service role, where the vehicle is used to transport tools, equipment and personnel to a specific site. In the case of the construction industry this would generally be a single trip, while for telecommunications it may be a number of trips in a day.
- The delivery role, where the vehicles are used to transport goods to and from a number of different sites.

The exception to this rule is the contract hire and leasing sector, where the main role is to supply vehicles to individual companies for a specified length of time. In this case they are acting as an intermediary.

The research carried out through this study indicates that there are a number of large companies within specific sectors, (e.g. construction, contract hire, courier, etc) which can influence the purchase of LCVs through their buying power or other supply chain influences. Furthermore, research has indicated that, within each industry sector selected, a number of companies (irrespective of fleet or organisation size) could be described as practitioners of best practice in relation to fuel consumption and mileage reduction. Such best practice techniques include the use of fuel cards and fuel management systems to effectively monitor and manage fuel consumption; utilising satellite navigation and routing technology to minimise excessive mileage; undertaking effective maintenance scheduling to reduce costs; and using driver training to decrease the risks associated with driving.

The manufacturer and aftermarket support networks do not appear to differ between cars and vans, with numerous opt in/out contracts available through, for example, fuel card and tyre management companies.

The regulatory regime covering Light Commercial Vehicles (including the MOT test) appears to be narrow, with very few regulations specifically targeted at the LCV industry. Although the regime is similar to that of cars, there are a number of subtle differences, for example, operation of lifting equipment, speed limits, seat belts etc. It is possible that a number of van operators and drivers are unaware of these differences.

With reference to accident levels, it can be seen that the overall levels of LCV accidents has been decreasing steadily since 2001. This is encouraging, however the rapid growth of the LCV sector since 2003 suggests that this level of reduction may not be sustainable. Although the overall numbers of larger vans in the UK has grown rapidly, the current growth in accident rates has been slower than could be expected. This may be due to the emergence of safety equipment such as ABS, road safety campaigns and safety cameras. The rapid reduction in accidents involving small LCVs suggests that this may be due to their car-like qualities being a factor. However, the statistics suggest that with growing numbers of large LCVs, there is a potential for an increase in accidents for this group of vehicles.

In general the research carried out has shown the following:

- The most dangerous roads for LCVs are A class and unclassified (i.e. urban and country roads)
- The age group most likely to have an accident are the 40 – 49 age group
- The manoeuvre most likely to result in injury accidents is “going ahead other”

Similar to the regulatory regime, the health and safety regime is not specifically targeted at the LCV industry. However, it does impact upon the industry and there is the potential for LCV operators to misunderstand to what degree these regulations impact upon them and therefore the likelihood of prosecution.

12 RECOMMENDATIONS

The following areas have been identified as future areas of research or opportunity and have been assessed according to their relevance to a number of DfT policy objectives, namely environment, safety, research and best practice.

12.1 Data collection

The Department for Transport, in combination with its executive agencies, could review their data capture methods with respect to vehicle registrations as a minimum. This could extend to maintaining a database on fleet operators' (freight and service) vehicles, mileages and drivers.

The rationalisation of the data collected, could enable the Department to gain a clearer understanding of the LCV market and therefore would assist in the easier development of sustainable distribution policies. Such rationalisation could include weight categories.

Environment		**Safety**		**Research**	✓✓✓	**Best Practice**	

12.2 Manufacturer dialogue

With a variety of manufacturers producing a wide range of LCVs it is recommended that, in order to influence these manufacturers, the DfT continues to enter into dialogue with LCV manufacturers to ensure that the Department is fully briefed on the next stages of LCV product development. This dialogue could take place through a specific manufacturer working group, or by a greater involvement in the SMMT Van Group or the Low Carbon Vehicle Partnership (Low CVP) van sub group.

This may assist with the development of policies to encourage the uptake of certain equipment as standard specification to help key DfT policies, for example MPG monitoring equipment.

Environment	✓	**Safety**		**Research**	✓✓	**Best Practice**	✓✓

12.3 LCV user workshops

The range of fleet management techniques and sophistication suggests that the development of a strategy to influence and spread the uptake of best practice techniques within the LCV sector could prove successful. Such a strategy would need to reflect the differences between large and small fleets and could include the development of guidance notes and specific management guides.

It is recommended that any such strategy should begin with undertaking a number of LCV user workshops to fully ascertain the information and advice that would be most applicable for LCV fleet, with the focus being on large fleets as they would provide the best return on investment.

Environment	✓	**Safety**	✓	**Research**	✓✓	**Best Practice**	✓✓

12.4 LCV running costs

Very little information could be gathered through this research into the true cost of running an LCV fleet – especially with regards to fuel management, accident and maintenance costs. It is recommended that a study be carried out to investigate this further and to gain an understanding of how these costs influence the behaviour of companies and drivers.

It is anticipated that this activity would result in a series of official guidance documentation to advise operators of vans of best practice and methods of achieving high standards in vehicle operation.

Environment		**Safety**		**Research**	✓✓	**Best Practice**	✓✓

12.5 LCV key performance indicators

With the UK industry, there is very little information available on the specific uses and impacts of van use. It is recommended that the Department undertake a number of benchmarking, Key Performance Indicator or supply chain studies in specific sectors to gain a further understanding of the utilisation of LCVs.

This would enable the Department to better target and influence certain industry sectors to ensure greater market penetration of any best practice style information. Continuation and further development of the van user surveys will be an essential continuing activity.

Environment	✓	**Safety**	✓	**Research**	✓✓	**Best Practice**	✓✓✓

12.6 Accident statistics

There are a number of accident statistics that may require further investigation to gain a better understanding of the influences behind these. These include:

- The key accident manoeuvre of “going ahead other”. Gaining an understanding of the reasons behind this type of manoeuvre being the largest contributing factor in LCV accidents could enable the Department to develop road design or training policies to help reduce this factor. An investigation of user data would assist in determining own records of incidents and the causation attributed to the accident.
- The age of driver involved in LCV accidents. Gaining an understanding of the reasons behind why the 40-49 age group have the largest number of accidents could enable the Department understand the driver attitudes that most influence LCV driving and behaviour.
- The weather conditions. It is surprising that the weather involved in most LCV accidents is classified as “Fine, No High Winds”. Further investigation may lead to an appreciation of the reasons behind this statistic.
- The road type. The second largest number of accidents occurs on unclassified roads, which include urban and country roads. This is a significant number and may require further investigation to gain an appreciation of the reasons behind this statistic.

Environment		**Safety**	✓✓	**Research**	✓✓✓	**Best Practice**	

12.7 Health and safety

The number of accidents within the LCV industry suggests that there may be the need to undertake further research to understand how the recently amended Health and Safety regulations are being implemented within LCV operating companies. Such research could enable the department to gain a better understanding of the health and safety priorities for the LCV industry.

An additional activity developing guidance for loading and load security for LCVs would also be advisable. The DfT have already produced a code of practice on load safety for LGVs, which could be adapted for use within the LCV sector.

Environment		**Safety**	✓✓✓	**Research**	✓✓	**Best Practice**	

12.8 LCV insurance infrastructure

The limited information on the insurance infrastructure for the LCV industry suggests that there may be the need to undertake further research into this area to gain a better understanding on what influences this sector and what information could be developed to influence behaviour change within users and the insurance industry.

By working with the sector through the Driver & Vehicle Operator (DVO) group, DfT may be able to gain access to valuable data sources held by insurance companies.

Environment		**Safety**		**Research**	✓✓	**Best Practice**	✓

12.9 Publication development

With the Large Sized Light commercial vehicle dominating the market place it is essential that any future awareness raising scheme (such as a Van Best Practice programme) should focus its attention on influencing this sector first to gain significant market penetration.

It is therefore recommended that any publications are developed with this market in mind, whilst remaining useful to other van types.

Environment	✓	**Safety**	✓	**Research**		**Best Practice**	✓✓

12.10 Alternative fuels

With diesel dominating the LCV market place, and alternative fuels having limited penetration within the LCV sector (due to the operational requirements of the vehicles such as torque, loading space and range, etc) it is therefore recommended that vans be treated differently from cars and trucks with respect to alternative fuels and technologies.

Environment	✓	**Safety**		**Research**		**Best Practice**	✓

12.11 LCV sales route

To help DfT ascertain the main sales route to market, it is recommended that further research be carried out into this area, such that the Department can gain an understanding of how LCVs are sold and therefore develop policies to influence both the purchaser and the retailer.

Environment		**Safety**		**Research**	✓	**Best Practice**	

12.12 Regulations

The number of regulations that have an influence on LCVs suggests that there may be a need to research and produce simple documentation to clarify and reinforce these regulations. This would help to ensure that van fleets are operated in a manner that is consistent with legal requirements.

An additional consideration would be to review the current regulations governing vehicles based on a weight category alone – vehicles below the 3.5t limit are pushing technical boundaries by increasing vehicle size and load volume, without necessarily exceeding plated weight limitations. LCV users therefore, are able to transport greater load volumes that would traditionally be transported by medium and large goods vehicles. The added clear benefit that these new generation LCVs offer their users is the avoidance of having to comply with operator licensing regulations and associated costs.

Environment		**Safety**	✓✓	**Research**	✓✓	**Best Practice**	✓✓

12.13 EU reliance

Research carried out into the European LCV market has shown that the UK is likely to be a net importer of light commercial vehicles. There may be the need to investigate the ways of influencing the UK LCV manufacturing industry to ensure that this reliance is reduced.							
Environment		**Safety**		**Research**	✓	**Best Practice**	

12.14 Intermediary relationships

Closer working relationships with professional bodies representing the industry (such as ACFO, ICFM and BVRLA), and the trade media (Fleet News) would assist in not only disseminating and endorsing industry advisory schemes, but also for identifying methods of mainstreaming van fleet management and professional qualifications into the market place. Similarly, with the LCV leasing industry being dominated by a few large players, it is recommended that the Department continue its dialogue through the BVRLA membership to ensure that they gain acceptance and support from these important intermediaries.							
Environment	✓✓	**Safety**	✓✓	**Research**	✓	**Best Practice**	✓✓

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14 GLOSSARY

ACFO	Association of Car Fleet Operators
AFRL	Automated First Registration and Licensing System
BIK	Benefit in Kind
BVRLA	British Vehicle Rental and Leasing Association
CAN	Computer Area Network
CC	Crew Cab style light commercial vehicles
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CPC	Certificate of Professional Competency
CSR	Corporate and Social Responsibility
DfT	Department for Transport
DTI	Department of Trade and Industry
DVLA	Driver and Vehicle Licensing Agency
EGR	Exhaust Gas Recirculation
EMS	Engine Management System
EU	European Union
GM	General Motors
GPS	Global Positioning Satellite
GTW	Gross Train Weight
GVW	Gross Vehicle Weight
HC	Hydrocarbons
HSE	Health and Safety Executive
ICFM	Institute of Car Fleet Management
LCV	Light Commercial Vehicle
LGV	Large Goods Vehicle
LPG	Liquefied Petroleum Gas
LSL	Large Sized Light Commercial Vehicle
MPG	Miles Per Gallon
MSL	Medium Sized Light Commercial Vehicle
NAEI	National Atmospheric Emissions Inventory
NO_X	Oxides of Nitrogen
PM	Particulate Matter
PU	Pick-up style light commercial vehicle
PUWER	Provision and Use of Work Equipment Regulations
SCD	Small Car Derived light commercial vehicle
SDC	Sustainable Development Commission
VED	Vehicle Excise Duty
VOSA	Vehicle and Operator Services Agency
WTD	Working Time Directive

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Manufacturers

DaimlerChrysler
Ford
LDV
Vauxhall

Companies

AGA Limited
Alkens Limited
Avery Weigh-Tronix
Baxi Heating
Benham Office Supplies
Bradley Environmental
Brayleino Events
BT
BSkyB
Bunzl Vending
DC Couriers
DHL
DPD Priority Freight
Epwin Group
Excel Special Products
Farm Fresh Express Limited
Harlow District Council
Martin Dawes Limited
Medway Maritime Hospital
Newmarket Open Door
Royal Mail
Speedy Couriers
TNT Logistics
SGBE Field Engineering
Shooters Limited
Southampton City Council
VW Heritage Parts Centre