THE INSTITUTE OF THE MOTOR INDUSTRY

Automotive Retail Sector

Scenario Analysis of Potential Skill Requirements

In 2020

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Introduction and Aims of the Project

As a sector skills council, The Institute of the Motor Industry (IMI) is required by the UK Commission for Employment and Skills (UKCES) to adhere to a common framework of labour market intelligence which includes an annual sector skills assessment. This in turn requires an "anticipation of what lies ahead".

This report sets out the findings of the Automotive Retail Sector 2020 Scenarios Project, commissioned by The Institute of the Motor Industry from SAMI Consulting to address this question.

In particular, the report analyses the general and industry specific issues, trends and drivers which may have a significant bearing on the size and shape of the UK automotive retail sector over the coming decade. (Chapter Two)

Within the general economic and political framework provided by the UK Foresight Futures Vision 2020 scenarios - developed by SPRU-Science and Technology Policy Research, University of Sussex, for the Department of Trade & Industry - the report then develops four alternative scenarios or visions of how the UK automotive retail industry may look in 2020. (Chapter Three)

Finally, the potential implications for the industry's long-term workforce, skill and training requirements are reviewed and discussed. (Chapter Four)

Key Trends and Issues facing the Automotive Retail Industry

Factors which may have a significant impact upon the future size and shape of the UK automotive retail industry include the following.

Developments in the Global Environment

- ***Global GDP growth****.* A key factor influencing the future level of demand for the UK automotive retail sector will be UK GDP growth which will in part hinge on the future performance and stability of the global economy, both of which currently remain very uncertain in the wake of the 2008 global financial crisis.

- ***The rise of the BRICS****.* There is, however, a widespread expectation that the long-term growth in the BRIC economies will outstrip that of the highly indebted western economies, and that the global centre of economic gravity will shift towards Asia. Countries such as China and India can be expected to move up the economic value-added chain and may thus become increasingly formidable competitors for the west. Eventually, Chinese and Indian design and technology is also likely to have an impact on global automotive markets. The timing and extent of such changes, whether they will be smooth or turbulent, and whether they will be successfully 'managed' within an open global trading environment or will lead to an upsurge in trade disputes and protectionism, are all uncertain.

- ***The cost and availability of capital****.* The current fragility of many western bank balance sheets and the accompanying levels of personal and government indebtedness are such that under most scenarios, the cost of capital is likely to be higher, and the availability of credit more restricted, than was been the case prior to the 2008 financial crisis. This seems likely to constrain the level of infrastructure investment in countries such as the UK, certainly during the earlier years of the coming decade. It may also have an impact on the sources and ways in which both individuals and businesses finance their future asset purchases.

- ***Demographics and human resources***. Increases in total global population predominantly reflect rates of population growth in the developing countries, notably in Asia. Countries such as India and China are investing heavily in education, leading to a rapidly expanding and well trained workforce. In contrast, the population of most western countries is growing only slowly and is ageing, posing challenges for employers who will be faced with a declining pool of school leavers from which to recruit. The rapidly expanding younger generations of the BRIC economies coupled with the greying populations of the west together seem likely to bring with them significant changes in customer expectations, patterns of consumer behaviour and demand for specific products and services.

- ***Political and security issues***. The bi-polar world formerly dominated by the USA and Soviet Union has been replaced by a more fragmented world order. National relationships and interests are now more numerous and more complex, and the international institutions may no longer function efficiently. There is a significant risk that conflicts and tensions between the rich and poor countries, between energy and raw material producers and importers, and between developing nations themselves in their competition for markets and resources, may well increase.

- ***Regulation and governance.*** Systems of regulation and governance may change as a consequence. New systems may either prove to be internationally agreed and coordinated, be nationally instigated and driven, or possibly, be a combination of the two.

- ***Natural resources, energy and environmental concerns***. Competition for natural resources has intensified as a result of the rapid growth of countries such as China. Energy is a particular case in point, with mounting concern over the ability of future supply to respond to demand, the extent to which prices may be driven higher, and whether for political or other reasons, security of supplies may be threatened. In moves to ensure that its own natural resource needs are met, China has recently taken steps to acquire long-term sources of natural resources in both Africa and Latin America. The potential for future resource wars cannot be dismissed. The possibility of future energy shortages together with concerns over climate change, carbon emissions and more general issues of sustainability may also result in substantial regulation and charges, either at an international, supra-national or national level, aimed at curbing carbon emissions.

- ***Technological change.*** Global technological change is accelerating. Over the coming decade, information and communication technology (ICT) is expected to become far more pervasive, while the application of biotechnology is likely to grow. Beyond the decade, nanotechnology is expected to become increasingly significant. All three technologies have the potential to contribute towards changes in car design and specification and in particular in any drive towards a low carbon economy.

UK Economic, Political and Social Trends and Policies

- ***GDP growth and investment***. The size of UK public sector deficit, high levels of indebtedness and the continuing fragility of the financial system are likely to limit the rate of UK economic growth over the next few years. How successful the UK economy will be at working through current difficulties and regaining its historic trend rate of growth over the longer term remains to be seen.

- ***Demographics and human resources.*** The UK’s ageing population suggests that employers will have to compete harder for competent new recruits. The availability of skilled workers is also likely to hinge on government’s future stance towards immigration and on the international perception of the UK as an attractive location in which to live, work and do business. None of this is guaranteed.

- ***Role and philosophy of government.*** Current government finances and political preferences point to imminent and substantial cuts in public spending and bureaucracy.

Whether such preferences prevail over the longer-term, or whether shifts in public mood result in the election of a future government which is more inclined towards heavier taxation and public spending, remains uncertain.

- ***Transport investment and government and public attitudes towards the automotive industry**.* Substantial cutbacks in spending on transport infrastructure are to be expected during the early years of the coming decade. In the longer term, economic conditions may continue to pose a severe constraint on such investment. Alternatively, an underlying improvement in economic performance and public sector finances might lead to an eventual resurgence in transport investment, driven either by the public or private sectors or by a combination of the two. Such investment may possibly acquire a distinct ‘green’ hue, with the emphasis firmly on sustainable, smart infrastructure and public transport. This is particularly likely, should public concern over climate change mount and lead to coordinated global action to curb carbon emissions.

- ***Regulation, taxation, congestion charging and road pricing.*** A shift in this direction can be expected to be accompanied by a combination of additional regulations, targets, taxes, road pricing and other charges designed to curb unnecessary travel, particularly that by the private motorist, while at the same time securing a marked improvement in vehicle fuel consumption and carbon emissions.

- ***Health and safety*.** Under most scenarios, although the extent may vary, health and safety can be expected to figure in any further regulatory measures. High rates of innovation in particular are likely to lead to imposition of additional safeguards with respect to vehicle repair and maintenance.

UK Automotive Industry

- ***Size and age of vehicle parc.*** The size and age of the vehicle parc will both affect the size and composition of activity in the automotive retail industry, both with respect to the volume of work and its nature. A more rapid rate of vehicle replacement can be expected to hasten the introduction of new technologies and vice versa.

- ***Motorists’ behaviours and expectations.*** Consumers are likely to be better informed, and many are likely to demand higher levels of customer service. Changed economic and household circumstances may change attitudes to car purchase and required specifications, while shifts in public awareness and attitudes towards sustainability issues may also affect choice and use of vehicle. Preferences with respect to car ownership versus leasing and rental may also change, particularly among Generation Y. There may be greater emphasis on selling ‘mobility’ rather than vehicles.

- ***Warranties and servicing.*** The length of vehicle warranties and servicing intervals have been extended in recent years, while the service content on new vehicles has been reduced. These trends are likely to continue, driven by competitive pressures to reduce lifetime vehicle costs as well as increasing cost certainty.

- ***Self regulation and accreditation.*** Reference has been made to the philosophy of the government of the day with respect to the stance and level of state participation in the economy. This will influence the balance of emphasis between legislative control and self regulation and accreditation. Significant parts of the automotive retail industry currently suffer from poor image, and the customer may well be confused by the current array of accreditation schemes. Improvements and consolidation of the latter may have the potential to offer industry participants various benefits in terms of ease of recruitment and profitability.

Automotive Technology and Innovation

- ***Innovation and technology.*** The pace of technological change in the retail automotive sector is likely to be determined largely by the manufacturing sector and the type of vehicles produced. Demands on the retail sector will be progressive as new vehicle types enter the parc and as new technologies become standard, requiring new knowledge and skills on the part of the workforce. Most new technologies likely to have a significant impact on the automotive retail sector over the coming decade are already available, partly due to slow gestation in implementing the technology and partly due to slow take-up. In particular there is likely to be a further increase in vehicle electronics, as well as a further shift towards replacement of parts, rather than repair, in the event of failure or accident damage.

- ***Low carbon emissions.*** Under most plausible scenarios, there is likely to be continued pressure to enhance fuel efficiency and reduce carbon emissions, achieved by a combination of factors including better design, new materials, weight reduction and more fuel efficient engines. It is the pace of change that is likely to vary between scenarios.

- ***Electric and hybrid vehicles.*** Most commentators expect hybrid vehicles to make greater inroads than electric vehicles into the UK market over the coming decade. The rate of take-up of electric vehicles is likely to be particularly dependant upon a combination of advances in battery technology, government subsidies to reduce purchase cost to the consumer, and investment in supporting infrastructure. Market penetration by electric vehicles is consequently likely to be most rapid in scenarios where significantly greater emphasis is placed by government on cutting carbon emissions.

- ***Hydrogen.*** Hydrogen, as a clean source of energy, can be used directly to power conventional engines or as a fuel with which to generate electricity from fuel cells. The state of the associated technology is such that hydrogen powered vehicles are to remain predominantly at the experimental stage during the coming decade.

- ***Information and communication technology.*** The current trend towards greater use of ICT is likely to continue, but much more quickly in scenarios that are innovative and dynamic. An increasingly IT literate population and greater use of the internet have the potential to result in significant changes in vehicle distribution channels. The level of electronics embedded in vehicles is likely to increase with advances in on-board entertainment and information systems, collision avoidance and other safety systems, security, and traffic and fleet management. Electronics is likely to figure even more strongly in fault diagnostics as the complexity of vehicle systems increases, while the internet is likely to become an increasingly important source of technical knowledge transfer between vehicle manufacturers, distributors and repairers. The wider application of ICT by the industry generally has the potential to lead to changes in the supply chain and support improvements in productivity and profitability.

Scenarios for the UK Automotive Retail Industry in 2020

The project uses scenarios to investigate the future. Scenarios are not forecasts but alternative views of the world, or different possible outcomes. These provide a context within which to explore the implications of possible future events, thereby making organizations better prepared to cope with change and uncertainty.

The scenarios in this report do not represent all possible outcomes and are not necessarily equally probable or exclusive. Indeed, the actual outcome may comprise of a combination of events from different scenarios.

The four visions of the automotive retail industry in 2020 outlined below follow the framework of the UK Foresight Futures Vision 2020 Scenarios, updated in certain respects as part of this project and named: ***World Markets***, ***National Enterprise***, ***Global Sustainability***, and ***Local Stewardship***. The scenarios are based on a combination of assumptions regarding the level of international cooperation and trade, the degree of state intervention in the economy, and public and government attitudes towards social equality and sustainability. They also incorporate the various industry specific factors discussed above, such as UK transport policy, energy costs, regulation and taxation, road charging, and advances in vehicle and information technologies.

Scenario One - World Markets

World Markets in 2020 is a world driven by aspirations of personal independence, wealth and mobility. There is high-level international policy co-ordination, free trade and a philosophy of "limited government".

- GDP growth is strong: taxation and public expenditure are relatively low.
- Regulation is light touch, with an emphasis on self certification.
- Strong global competition drives a high rate of innovation and spread of best practice.
- Real energy prices increase steadily rather than rapidly, with some modest increase in fuel taxes and carbon pricing in response to "the green agenda".
- Road transport demand grows and congestion increases leading to some increase in tolling and telematics-based road charging. There is greater emphasis on fuel efficiency.
- Competition between motor manufacturers drives a rapid rate of innovation and higher vehicle specification.
- However, the penetration of the new vehicle market by hybrids and electric vehicles is steady rather than rapid due in part to lack of strong government support.

Scenario Two National Enterprise

National Enterprise in 2020 is a market-driven, but more fragmented and regionally unstable, world. People aspire to personal independence and material wealth, but with a greater degree of national autonomy, self-reliance and security, and with greater state protection of key industries.

- The rate of UK GDP growth is medium to low, as is the level of tax and public expenditure. Government sets the strategic framework and many public services are outsourced.
- Regulation is mainly limited to setting minimum standards on key areas such as health, safety and consumer protection, with the emphasis on self certification.
- Oil prices are substantially higher and volatile with periodic supply disruptions. There are higher fuel and vehicle taxes and carbon pricing.
- Government financial constraints and subdued growth result in low levels of public or private investment in major new transport infrastructure.
- Sales of new vehicle are subdued. There is excess capacity in vehicle manufacturing. Financial pressures on manufacturers slow the pace of innovation and the introduction of new models. The increase in level of vehicle specification slows.
- Take-up of hybrid and electric vehicles is low.

Scenario Three Global Sustainability

In the 2020 world of ***Global Sustainability***, people aspire to greater equality and high levels of welfare within communities with shared values. There is much greater emphasis on sustainability.

- UK GDP growth is medium to high.
- Global competition is fostered, within an internationally co-ordinated and regulated environment.
- Levels of taxation and other charges are much higher, with the aim of supporting higher levels of public service provision and achieving a sustainable economic environment with a marked reduction in carbon emissions.
- There is heavy investment in renewable energy and resource efficiency, and in new eco-efficient, low carbon and high-tech business opportunities.
- Innovation is rapid, both generally and within the motor industry, with a strong "green focus" and with emphasis on whole-life thinking, design and recycling.
- Advances and applications of ICT are widely pervasive.
- There is heavy public and private investment in new energy efficient and 'smart' infrastructure.
- Growth in demand for road and other transport is constrained by substantial increases in taxes and charges, including widespread tolls and congestion charging.

- Consumers are encouraged to use public transport.
- There is rapid take-up of hybrid and electric cars, supported by investment in the required infrastructure.

Scenario Four   Local Stewardship

Under ***Local Stewardship*** in 2020, people aspire to sustainable levels of welfare in federal and networked communities. There is greater local democracy and decision-making. Public policy promotes small-scale regionally based economic activity and self-sufficiency, rather than large-scale business and technologies.

- Although taxation is high, public finances are tight, limiting provision of pubic services to relatively basic levels.
- GDP growth and investment are both low, as is the rate of innovation.
- Markets are subject to substantial regulation with emphasis on equality and a sustainable local environment.
- Global energy supply constraints and security concerns result in high energy prices and a drive for alternative energy technologies and local sources of energy supply.
- There are high fuel taxes and other charges on the motorist. The public are encouraged to use public transport, although the latter is constrained by low levels of investment. Travel demand falls.
- People generally economise and make do, placing greater emphasis on repair and recycling, including of vehicles. The vehicle parc ages.
- Purchasers of new vehicles focus very heavily of fuel efficiency, lifetime sustainability of vehicle, and more basic equipment specifications. Hybrid and electric vehicles make limited market inroads.

Cross Scenario Analysis

There are both similarities and differences across the scenarios, both in terms of substance and in degree of impact. In particular:

- All four scenarios assume that by 2020, real UK GDP will be at a higher level than that prevailing in 2007 before the recent recession struck. However, the cumulative increase varies and by 2020, there is a significant difference between the scenarios in terms of underlying annual growth rates which then range between 1% and 2.5%.

- During the 2010 decade, the path of GDP growth has been more volatile under *National Enterprise* and *Local Stewardship* than under *World Markets* and *Global Sustainability*. Unemployment is highest under *National Enterprise,* with DIY and black market activity being particularly pronounced.

- Under all scenarios, crude oil prices increase, most markedly under *National Enterprise* and *Local Stewardship* which also suffer from much greater price volatility. The real cost of fuel at the pump after taxation has also been driven significantly higher under *the National Enterprise*, *Global Sustainability* and *Local Stewardship* scenarios.

- Regulation is much stronger under the *Global Sustainability* and *Local Stewardship.*

- Vehicle technology continues to advance under all scenarios, but change is most rapid under the higher economic growth and innovation scenarios of *World Markets* and *Global Sustainability*.

- In all scenarios the trend towards smaller internal combustion engines continues due to issues of cost and environmental awareness. People are much more aware of lifetime vehicle costs under *Global Sustainability* and *Local Stewardship.*

- The use of the internet in car purchase increases in all scenarios, but is particularly marked under *World Markets* and *Global Sustainability* where dealers are participating in development of the internet as a sales channel of growing importance.

- Under *National Enterprise* and *Local Stewardship*, the internet is central to increased private sales of second hand cars, as people seek the less expensive option of buying older vehicles through private rather than trade channels.

- Health and safety regulation continues in all scenarios but is much more marked under *Global Sustainability* and *Local Stewardship*. The impetus for most new regulation under *World Markets* comes from the EU.

- In both *World Markets* and *Global Sustainability*, there is an increase in leasing and rental of vehicles and in car clubs, whereas the traditional model of car ownership by the individual prevails to a greater degree under *National Enterprise* and *World Markets*.

- Demand for private mobility is higher under *World Markets* and *National Enterprise* where much less emphasis is placed by government and society on environmental considerations and investment in public transport. In contrast, demand for private mobility is significantly constrained by government policy and greater public awareness of environmental issues under *Global Sustainability* and *Local Stewardship.*

- Unlike other scenarios, there is substantial investment in transport infrastructure, both public and private, under *Global Sustainability*, with an emphasis on developing smart, sustainable transport networks.

- *World Markets, Global Sustainability* and *National Enterprise* all point to greater penetration of the new car market by new sales channels, particularly on-line and, for budget vehicles, supermarkets. The exception is *Local Stewardship* where markets remain local.

- Other key changes in sales networks and methods include, under *World Markets,* increased dealer focus on enhanced customer service as a competitive means of differentiation; under *National Enterprise*, a marked difference in levels of customer service and support offered on luxury as against budget models; and under *Global Sustainability*, the sale of electric vehicles by manufacturers direct to the customer.

Future Workforce Implications

Key assumptions underlying each of the scenarios, together with their potential workforce implications, are summarized in the following table. However, it must be stressed that the figures shown are scenario assumptions, not forecasts, and intended to be no more than indicative of the magnitude of changes that might be encountered by 2020 under each of the scenario storylines.

Overall, the total number of employees working in the automotive retail industry in 2020 would range between an estimated 464,000 under *Global Sustainability* up to a figure of 573,000 under both *World Markets* and *Local Stewardship*, compared with a total of 644,000 in 2007. Under *Local Stewardship* compared with *World Markets*, the effect of lower underlying levels of vehicle sales and a smaller vehicle the parc on total employment are offset by lower rates of productivity growth and an older average parc age. The cumulative percentage decline ranges from just over 10% to nearly 30%.

Assumed level in 2020 compared with pre-recession position in 2007	World Markets	National Enterprise	Global Sustainability	Local Stewardship
Annual new car sales	+10%	-10%	No change	-30%
Annual second hand car sales	+13%	No change	-12%	-13%
Annual total car sales	+12%	-4%	-9%	-17%
Size of vehicle parc	+15%	+5%	-5%	No change
Average age of parc	No change	+6%	-3%	+10%
Percentage of electric or hybrid vehicles in parc	5%	3%	10%	4%
Number of annual service and repair transactions	-8%	-15%	-23%	-16%
Number of sales personnel	+15%	-19%	-15%	-26%
Number of technicians	-27%	-27%	-40%	-20%
Number of master technicians	+5%	-10%	-14%	-11%
Number of fast fitters	+17%	-3%	-4%	-3%
Number of administrative personnel	-11%	-22%	-28%	-18%
Total employees dependant upon the Automotive Retail Industry in 2020	573,000	502,000	464,000	573,000
Number compared with 2007 level	-11%	-22%	-28%	-11%

The mix of occupations varies between scenarios, and although the 2020 total employment level under *World Markets* and *Local Stewardship* is similar, the occupational mix is rather different, with the number of sales employees increasing under *World Markets* while the number of technicians falls, and with sales employees declining more rapidly than technicians under *Local Stewardship.*

Implications for Skills

Generic Skills

- Generic skills are increasingly essential for any successful business in the twenty-first century. Customer handling (sales and customer service), improved literacy and numeracy, problem-solving, communications, and team working have all been identified as key generic skills. Current deficiencies in these areas are likely to be accentuated under at least two of the scenarios, *World Markets* and *Global Sustainability,* as technology moves forward, as competition in the labour market intensifies and as demands for improved customer service increase.

Management skills

- *World Markets* and *Global Sustainability* envisage rapid changes in technology and probably market structure as new market entrants emerge providing specialist services, selling cars supermarket style, or using high-powered marketing to sell mobility without vehicle ownership. Responding to such changes effectively will require a higher quality of management, particularly with respect to leadership and strategic planning. Increased competitive pressures under all four scenarios seem likely to place a growing premium on competent business management. Indeed, organisations able to respond effectively to change and improve their productivity are those most likely to survive and prosper over the coming decade and beyond.

- It is generally accepted that high quality management skills are in short supply in the automotive retail sector. This is probably largely due to lack of relevant training, especially in smaller businesses where managers have often moved from technical roles to management with no formal training. The benefits now to be derived from enhanced management skills consequently need to be "sold" to businesses in the industry.

Sales skills

- The ever changing landscape of new vehicle makes, models and technology creates a constant need for sales training. Increased market penetration of electric vehicles and hybrids will require sales personnel to understand and sell the advantages of the different systems and types of vehicle and their suitability for different customer lifestyles and vehicle usage patterns. Under scenarios such as *Global Sustainability* and *Local Stewardship,* customers are likely to place greater emphasis on the lifetime cost of vehicles.

- The internet will offer new opportunities and challenges. Selling vehicles to the ICT savvy Generation Y will require different skills, attitudes and products to those needed to sell to the growing "grey" market. Indeed differentiation of sub-sector markets may become increasingly important in all scenarios.

- Finally, in a highly regulated society such as that prevailing under *Global Sustainability*, there is greater probability of regulation requiring certification of employees involved with financial services, including insurance. This could be particularly significant for the training commitments of rental companies, leasing companies and car clubs.

Technical skills

- Technical skills will be in constant demand under all four scenarios and are perhaps the most widely recognised current industry skills gap, largely due to the pace at which new technology is being launched. IT hardware and software is being put into vehicles in the form of complex electrical systems. High-level problem solving and technical diagnostic skills are becoming increasingly important, and indeed essential, in servicing the latest generation of models, and keeping abreast of technological advances will become even more important as electric vehicles and hybrids penetrate further into the market.

- With ongoing changes in technology, vehicle types, vehicle models and model updates, there has been an increasingly extensive array of vehicle components, requiring greater levels of care in ensuring the correct replacement part. Such changes seem likely to continue.

- These changes are likely to result in a requirement for higher levels of literacy, numeracy and IT skills. Recruiting and retaining employees of the requisite calibre is likely to raise issues over the industry's image, employment terms and conditions, particularly under the *World Markets* and *Global Sustainability* scenarios where competition for skilled employees is likely to intensify across the economy as a whole.

- Technicians themselves may need to develop their customer-facing skills as well as their administrative skills, the latter to ensure that access codes and passwords used in electronic systems are safely and properly stored. Proper storage and retrieval of the wide range of software could also be an issue.

- In some industries where technology has advanced rapidly, an hourglass effect has been observed with a growing demand for certain high-level skills, such as master technicians; a decline in demand for middle range skills such as technicians; and an increase in the demand for more routine skills, such as fast-fit operatives.

- Such an effect could occur in the vehicle repair industry, especially under the *World Markets* and *Global Sustainability* scenarios, given greater use of electronic diagnosis, plug-in electronics, replacement rather than repair of defective components, and reduced service intervals. While certain work will become more routine, some problems may be more difficult to identify, diagnose and repair, requiring proportionately greater demand for the skills held by master technicians. Demand for master technicians may consequently increase at a time when fewer employees have the capabilities necessary to move from technician to master technician.

Administrative Skills

- One key impact on administrative skill requirements will be enhanced ICT and the use of the internet for more communication.

- In the higher growth scenarios, customer service skills will be particularly important since the most successful organisations are likely to be those that have the right customer attitude and can provide good service across their business.

- There also appears to be greater opportunity to use ICT and the internet in parts identification, sourcing and supply.

- The internet and all forms of mobile communication are likely to be deployed increasingly to allow the easiest access to rental vehicles and car club schemes. The overall administration of such rental schemes (renting, maintenance, vehicle locating and retrieval) is likely to be highly automated for speed and security, but the human backup will need to match the level of ICT with expertise and customer care.

Other skills

- The recycling of increasingly complex materials and components, some of which may contain more hazardous materials and fluids, will require continual retraining to ensure accurate and complete recycling and the safety of the environment and the operators involved. Tighter controls can be expected, particularly under the *Global Sustainability* and *Local Stewardship* scenarios.

- Recycling can be expected to grow to some degree under all scenarios, and workshop technicians in general will need to keep up to date with requirements regarding recycling of materials, replaced components and packaging.

Key Training Implications

Speed of Innovation

- The speed of innovation will have impact on required levels of training, how it is delivered, by whom and to whom. It will be important for trainers and training courses to stay ahead of the game in order to ensure that students are not taught out-of-date technology.

- Technological change will continue and will be most rapid under the *World Markets* and *Global Sustainability* scenarios. Frequent retraining will be needed by those dealing with the newest technologies. This will not necessarily apply to the majority of technicians, and much of the initial training is likely be provided by manufacturers or their agents. However, specific up-skilling training modules will need to be made available at sensible price, not just for the larger dealerships but for the independents as the vehicles with the latest technology get older and move from being serviced by manufacturers or their dealers to the independents.

- The penetration of new drive-trains, electric or hybrid, will be progressive, and training will be required for a limited number of experienced technicians to deal with the new technology under all scenarios. There may even be an interim period of market growth during which small independents specialise in and service the new technologies, much as occurred with ABS when it was first introduced. However, whether the demand is met by specialist organisations, or by small teams or individuals within an organisation, the net effect will be a steady demand for up-skilling in the new drive trains, probably faster than demand requires as most workshops will eventually want to have the ability to undertake the work as it arrives, even if the available capacity is not fully utilized.

- The rate of change in technology will require better methods of training delivery. Given the likely increase in average levels of training per employee, particularly under the high innovation scenarios. Cheaper methods of training delivery are likely to be required to persuade employers to provide training which adequately matches needs. Modular training on-line has frequently been proposed but is likely to become more commonplace, particularly under *World Markets* and *Global Sustainability*.

Delivery of training

- Trainers will need to liaise closely with their customers to ensure that training content keeps abreast of technological and other change, that training methods are acceptable to employers and employees, and that they meet the needs of individuals and the industry as a whole. It has been suggested that some training organisations are currently failing to keep in touch with developments in the industry and its future skill needs, and are “falling behind the curve”. This can lead to frustration and disillusion, not only on the part of the individuals who have undergone training but also by their employers, especially if they have sponsored the training in question.

- More thought consequently needs to be given to the ways in which trainers themselves can keep up-to-date, not only with respect to the industry’s immediate skills needs but the way in which these may evolve. This should aid the development of a continuous training and development culture in the industry, supported by initial training programmes and refresher courses.

- A proliferation of training organisations and courses can also make it difficult for those seeking training to identify the relevant and distinguish the good from the bad. While this appears to be an issue for the automotive retail sector, and one that needs to be addressed, the industry is by no means alone in this respect.

Apprenticeships

- The apprenticeship route has served the technical side of the industry relatively well for decades. Key issues historically have been finding the best applicants for training and obtaining the funding for that training. Such issues are likely to remain.

- Even though some decline in total industry workforce requirements is expected under all four scenarios, an ageing workforce coupled with step changes between particular age cohorts, may mean that reductions in required workforce numbers is more than matched under some scenarios by loss of employees with technical and other expertise due to retirement and other factors. Even under the scenarios of relatively low workforce demand, recruitment of new employees with good basic skills will be required, and this will be from a diminishing pool of school leavers in what may be an increasingly competitive national marketplace for such people. Furthermore, future school leavers are likely to have different, and possibly more demanding, employment expectations, as well as greater familiarity with, and use of, ICT.

- Given the rapid rate of change of technology anticipated in most scenarios, the question of what to teach and how to teach new entrants to the sector will be a continuing issue. The question of what *not* to teach new entrants as old technologies wane will also be an issue.

- Given the new technologies arriving continually, courses will need to be modular, flexible and up to date, ideally tailored to each individual’s needs. All stages should be certificated, both as evidence of competence and as a means of improving the image of the industry.

- Identification of the best new entrants, at recruitment and thereafter, will be important as levels of technology increase and as higher skill levels are demanded. Those less competent will still need continual training to keep abreast of technological change. There perhaps needs to be greater recognition that many skills in a technology-based industry are transient.

Recruitment and staff retention

- Recruitment of new entrants generally has been an issue. This has been partly due to the poor image of some parts of the sector, an image perpetuated by the popular media and one which has contributed to the problems faced by employers in attracting staff of sufficient calibre. Other challenges to recruitment include a perception of unattractive pay levels, a lack of flexible working opportunities, poor working conditions and a lack of opportunities for graduates.

- The future offers particular challenges and opportunities with respect to technicians. In the *World Markets* and *Global Sustainability* scenarios which bring a high level of technological, probably largely electronic, change, the industry is likely to have significant difficulty in attracting good recruits unless it changes its image from one of “greasy hands” to “high tech”.

- New technology will demand a new type of recruit, comfortable with electronics, and new selection criteria will be needed. However, even in the high technology scenarios, it seems likely that most recruits will need to be technicians with electronic capabilities rather than electronic experts. Indeed, the rate of integration of technology and the relatively simple diagnosis and replacement of components, excepting a few “difficult” problems, is unlikely to justify having a purely electronics specialist sitting around in any but the very largest of workshops. Rather, there is likely to be greater reliance on on-line semi-automated diagnostic help lines, manned by experts and specialists, some of whom may be ICT specialists rather than technicians expert in ICT.

- In conclusion, the general picture under all four scenarios is one of a decade and beyond in which new recruits with a higher level of basic, generic skills are required and where the importance of training will shift from training new entrants for a lifetime in the industry to continuous retraining of employees throughout their working life so as to maintain their expertise as technology evolves. Flexibility of employment and training, use of individually-tailored training methods and careful selection of recruits all seem likely to be central to success.

Regional Considerations

Finally, the detailed report considers differences in likely regional development patterns between the four scenarios together with variations in potential skill and training implications between regions. It seems most likely that:

- the greatest impact of new technologies and other factors driving change on the automotive retail industry’s skill requirements over the coming decade will be in the southern and eastern regions of the UK and in the other major conurbations and cities of England, Wales and Scotland;
- the least impact on future skill requirements is likely to be in the rural and other thinly populated areas of the nation.

1 Introduction and methodology

1.1 Introduction and Aims of the Project

This report sets out the overall findings of the 2020 Scenarios for the Automotive Retail Sector Project, commissioned by The Institute of the Motor Industry (IMI) from SAMI Consulting Limited.

As a sector skills council, The Institute of the Motor Industry (IMI) is required by the UK Commission for Employment and Skills (UKCES) to adhere to a common framework of labour market intelligence (LMI). As part of this framework, the IMI is required to produce an annual sector skills assessment which includes, as one of its key elements, an *“anticipation of what lies ahead”*.

Using a scenario-based approach, this report seeks to:

- identify the key issues, drivers and changes which the UK automotive retail industry may encounter over the longer-term;

- assess their potential implications for the industry’s employment, skill and training requirements.

The report’s focus is firmly on future skill requirements, i.e. the demand side of the equation. Its remit does not include an investigation into the current and future supply availability of particular skills.

Furthermore, due to the limited availability of data on historic employment:output ratios for individual occupational sub-groups, the analysis of future skill requirements in the report is primarily qualitative.

The year 2020 has been chosen, in discussion with the IMI, as an appropriate time line for analysis. 2020 is considered to be sufficiently far ahead in time to explore some potentially significant changes which could occur within the overall environment in which the UK automotive retail industry operates and in the industry’s technology, products, services, processes and skill-base, yet not too far ahead to result in purely blue-sky thinking.

It is to be hoped that the report and its conclusions will stimulate wider debate and appropriate action among all those having an interest in ensuring a successful future for the UK automotive retail industry - including customers, dealers, service agents and repairers, manufacturers, parts suppliers, vehicle rental and leasing companies, training organisations, regulatory authorities and other public and private sector bodies.

1.2 Structure of the Report

Following the Executive Summary, this introductory chapter sets out the approach and methodology adopted for the 2020 Scenarios for the Automotive Retail Sector Project.

Chapter Two then provides an overview of the issues, trends and forces for change which may have a significant bearing on the industry’s future activity levels, its composition and structure, the technology deployed, its methods of working and labour productivity, and hence on its future skill and training requirements.

Drawing on this analysis, and placed within a broader economic, political and social framework, Chapter Three the sets out and develops four alternative scenarios or visions of how the UK automotive retail industry may look in 2020. The varying outturns are compared and contrasted together with industry views on what may constitute a preferred, plausible future.

In Chapter Four, the potential implications of the scenarios for the industry's long-term labour skill and training requirements are discussed and key conclusions drawn. Recognising the uncertainties which inevitably persist, the chapter also flags some possible early warning indicators, or areas to be monitored, which may assist the industry in taking timely action to meet future skill requirements as they evolve.

1.3 Industry Background and Structure

For the purposes of the current project, the automotive retail industry has been defined as comprising the following activities, which are covered by the IMI Sector Skills Council:

- Light vehicle maintenance and repair
- Heavy vehicle maintenance and repair
- Motorcycle maintenance and repair
- Fast-fit operations (tyres, exhausts, batteries etc)
- Accident repair
- Body building
- Parts distribution and supply
- Vehicle sales
- Vehicle rental and leasing (self drive or with driver)
- Roadside assistance and recovery
- Lift truck maintenance and repair
- Motor sport maintenance and repair

The scope and scale of these various activities are discussed in Chapter Two.

1.4 Detailed Approach and Project Methodology

Reference has already been made to the scenario-based approach adopted for this project.

Professor Michael Porter of Harvard University defines a scenario as *"an internally consistent view of what the future might be .... not a forecast but one possible future outcome."*

Scenarios, as defined by Porter and used in this report, are based on four underlying assumptions, namely that:

- the future is unlike the past, and is shaped by human choice and action;
- the future cannot be foreseen, but exploring the future can inform present decisions;
- there are many possible futures - each scenario maps one 'possibility space' that is in itself consistent and plausible;
- development of scenarios involves rational analysis and subjective judgement.

Scenarios are thus possible alternative views of the world. They can illuminate significant forces for change, including those that may not necessarily have a high probability of occurrence. They must have internal logic and consistency, incorporating both areas of critical uncertainty and predetermined elements or trends. By seeing a range of possible worlds and understanding what is driving potential change, organisations are given a clearer context in which to think about the future, decisions will be better informed, and a strategy or actions based on this knowledge and insight will be more likely to succeed.

1.4.1 The Overall Framework for the IMI Vision 2020 Scenarios

While the emphasis of this report is firmly on the future of the UK automotive retail industry, it was felt strongly that in creating alternative visions of the industry's possible future development path, the wider political, economic and social environment, both internationally and within the UK, could not be ignored. This is because a number of the key forces driving change in the industry lie within, and will be fashioned by, the broader environment.

More specifically, the future size, composition and structure of the UK automotive retail industry and its employment and skill requirements will be determined by a series of variously inter-related external factors which include, but are by no means limited to:

- levels of international and national security and political stability;
- whether international collaboration, competition and globalization of markets prevails, or whether national or regional protectionist forces emerge and predominate;
- the future stability, rates and patterns of global and UK economic growth, trade, development and income distribution;
- demographic trends, including rates of population growth, age structure, household size and migration;
- future attitudes and approaches towards the role and the size of the UK state, both absolutely and in relation to the private sector; and towards issues of social welfare, political and corporate governance, legislation and regulation;
- economic, social and spatial development patterns;
- resource availability and security, including energy;
- environmental sustainability and climate change;
- rates and levels of innovation with respect to new technologies and materials;
- unforeseen events and shocks.

It was not considered to be a sensible use of available resources to create an original set of macro economic and political scenarios within which the required UK automotive retail industry scenarios could then be set.

Rather, it was decided to adopt the Foresight Futures Vision 2020 scenarios, with some updating amendments, as the macro framework. This has the added advantage of aligning the current sector skills analysis with the scenarios adopted in the broader future skills requirements analysis recently undertaken and published by the UK Commission for Skills and Employment (UKCES) as part of its 2010 National Strategic Skills Audit for England.

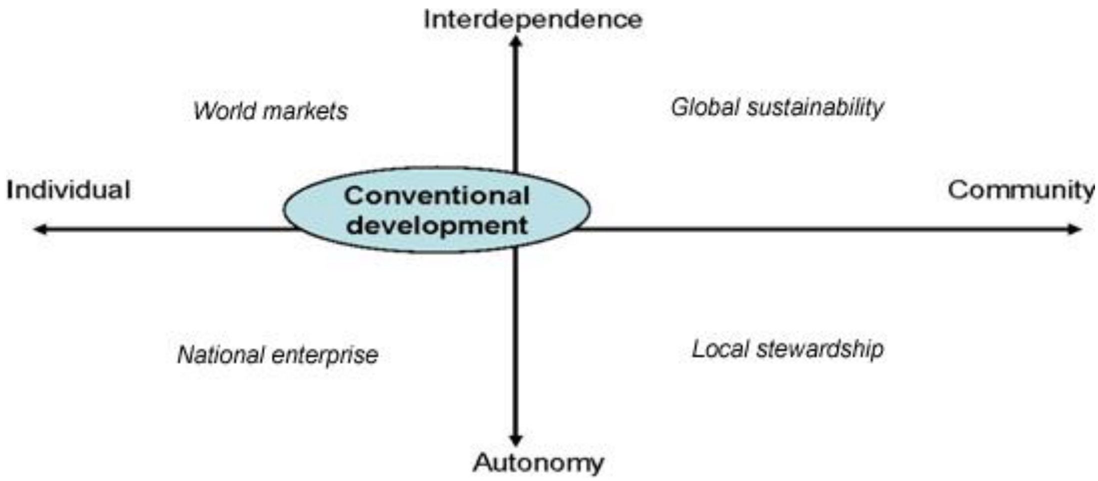
The original Foresight Futures Vision 2020 scenarios were developed for the then Department of Trade & Industry by a team of researchers at SPRU - Science and Technology Policy Research, University of Sussex, in consultation with stakeholders from business, government and academia. The Vision 2020 scenarios built on an extensive review of other national and global futures scenarios, and have the advantage of being widely used. They incorporate a broad spread and combination of key, macro drivers of change. The scenario storylines draw on an analysis of socio-economic trends, but also introduce elements of novelty and change.

The scenarios are framed within the context of two key variables - social values and systems of governance - the direction of which is uncertain yet likely to have a major impact on shaping the future course of events. Social values (horizontal axis in Figure 1 below) range from individualistic values to more community orientated values. Systems of governance (vertical axis in Figure 1 below) deal with the structure of government and the decision making process, ranging from autonomy where power remains at a national level or becomes more regional, to interdependence where power increasingly moves to other institutions, such as up to the EU or other international bodies, or to multi-national corporations.

For the purposes of the current project, the original Foresight Futures scenario storylines have been updated by SAMI Consulting to reflect global developments since the scenarios were originally produced, and indicate the possible paths of economic development over the coming decade. While the invaluable contribution made by the original Foresight Futures Scenarios to the current project and report is fully acknowledged, responsibility for the content of the amended scenarios lies entirely with the authors of this report.

The resulting scenarios describe what the UK could be like in 2020. The accompanying chart (Figure 1) positions each of the scenarios, named here as *World Markets, Global Sustainability, National Enterprise and Local Stewardship*. The scenario 'space' in relation to the two axes labelled in Figure 1 as 'conventional development' represents a common view of the general environment which prevailed during the latter half of the 1990s and early years of the current millennium.

Figure 1 Foresight Futures Vision 2020 Scenarios



The *World Markets* scenario reflects a world in which individual aspirations can thrive in a global economy sustained by international cooperation. Key features of this scenario include the following.

- High growth.
- People aspire to personal independence, material wealth and mobility to the exclusion of wider social goals.
- Integrated global markets are presumed to be the best way to deliver this.
- Internationally co-ordinated policy sets framework for the efficient functioning of markets.
- The provision of goods and services is privatised wherever possible under a principle of 'minimal government'.

Under *National Enterprise* both individuals and governments seek autonomy and independence. Key features of this scenario include the following.

- Medium-low growth.
- People aspire to personal independence and material wealth within a nationally-rooted cultural identity.
- Liberalised national markets, with a commitment to build capabilities and resources to secure a high degree of national self-reliance and security, are believed to be the best way to deliver these goals.
- International cooperation is minimal. Political and cultural institutions are strengthened to buttress national autonomy in a more fragmented world.

The world of *Global Sustainability* is a caring world where individuals value the community and look to government to implement policies for welfare and sustainability. Key features of this scenario include the following.

- Medium–high growth.

- People aspire to high levels of welfare within communities with shared values, more equally distributed opportunities and a sound environment.
- These objectives are believed to be best achieved through active public policy and international co-operation within the EU and at a global level.
- Social objectives are met through public provision, increasingly at an international level.
- Competition is fostered within a regulated framework.
- There is reconciliation of growth and sustainability, seen from a global perspective and undertaken with global cooperation.

Under *Local Stewardship* individuals seek sustainable levels of welfare within federal and networked regional and local communities and a high quality local environment. Key features of this scenario include the following.

- Low growth.
- Social and other regulation ensures more equally distributed opportunities with the emphasis on social welfare & equality, higher tax rates & public provision.
- The level of state provision is, however, limited by constraints on overall government finances. Community self-support and charity consequently play a major role.
- Public policy promotes small-scale regionally-based economic activity, resourcing and trade, rather than large-scale business and technologies. There are fewer large-scale, multinational companies and proportionately lower levels of international trade. Competitive pressures are less.
- Reduced employment opportunities result in low net inward migration & population growth.
- A heightened awareness of environmental issues leads to strong local planning controls, environmental regulations & taxes.
- The pace of innovation and take-up of new technologies, including ICT, is slow, but significant investment in small-scale and local renewable energy sources occurs.

Each of these macro or framework scenarios is described in more detail in Chapter Three of the report.

1.4.2 The Approach to Developing the Detailed Automotive Retail Industry Scenarios

Based on each of these four scenarios, a more detailed sector picture of how the automotive retail industry might look in 2020 - with respect to its size, structure and composition – was then developed.

This particular part of the scenario building process involved several steps including desk research, horizon scanning, interviews and a skills workshop.

Horizon Scanning

The first key project task was to carry out an horizon scan in order to identify the issues, trends and forces for change that may potentially affect the long-term employment and skill requirements of the automotive retail industry. This involved a comprehensive scan of both global and national PEST (Political, Economic, Social, and Technological) as well as legal, regulatory and environmental factors, using a wide variety of published reports and other information sources. Information obtained during the accompanying interview programme (see below) was used to inform and expand the horizon scanning process.

The scan included search and identification of issues that will stretch thinking about the future. To encourage such stretch, the project team scanned for issues that may have an impact over the coming two decades, significantly beyond the chosen 2020 time-line adopted for the development of the project's scenarios.

A bibliography of key sources of information used in the current project is given in Appendix One.

Industry Interviews

In addition, a number of structured interviews were undertaken with a cross section of automotive industry experts in order to gain further insight into areas for scanning and analysis. The interviews were conducted around the project's focal question of: *"what will be the drivers and impact of change on the automotive retail industry's employment and skills landscape in the UK by 2020 and what will be the challenges and opportunities facing the industry?"* The interviews also sought to elicit relevant detail on specific areas such as the direction and pace of take-up of new technologies and their potential impact on skill requirements and workforce productivity.

The interviews were all undertaken on a strictly non-attributable basis, and therefore the names of those interviewed are not being published. The organisations to which they belonged are included in the list of acknowledgements shown in Appendix Two. It should, however, be emphasised that the views expressed, some of which are noted in Chapter Two on a non-attributable basis, are those of the individual and may not necessarily represent those of the organisation to which the individual is attached.

Analysis of Output from the Horizon Scan and Interviews

The interview findings were then combined with those generated from the horizon scan, and coded and sorted by topic into a 'natural agenda' of issues, trends and forces for change. These various factors were then reviewed by the project team and assessed against the scenarios with respect to their relevance, likelihood and impact within each scenario. The factors seen as having a key potential impact on skills and which appear as predictable trends over the next ten years were overlaid onto all four scenarios. Those factors which are uncertain over this timescale (such as the rate of take-up of new technologies, the future regulatory environment, or UK economic performance) were assigned in different degrees to the individual scenarios to reflect that uncertainty. This process converts the set of framework or macro scenarios into one tuned to explore the future employment and skill requirements of the UK automotive retail industry. The resulting industry scenarios were then assessed for consistency, plausibility and accuracy

Project Workshop

A workshop was then held at which the resulting scenarios were presented to a group of industry participants with the aim of stimulating structured debate around the opportunities and challenges for the industry and the potential impact on its long-term skill and training requirements. In particular, attention was given to exploring delegates' views and reactions towards alternative future outcomes, together with the actions that may advantageously be taken under all scenarios to ensure that the industry is best placed to meet its potential long-term skill needs.

1.4.3 Probability of Alternative Scenario Outcomes

In conclusion, it must be stressed that the alternative scenario outcomes generated as one of the key outcomes from this project do not necessarily represent all possible outcomes and are not equally likely or exclusive. Indeed, the eventual outcome may in practice comprise of a combination of events from the various scenarios, or be completely different. This is not of great consequence since the key benefit of the scenario approach is that uncertainty inherent in the future is made more explicit when considering that future.

1.5 Acknowledgements

As will be apparent from the preceding description of the project's methodology, we have received considerable help and information from a number of individuals and organisations. We wish to acknowledge the generosity that they have all shown in giving freely of their time, for agreeing to be interviewed, for attending the project workshop and for their enthusiastic, constructive and creative response to our many questions.

We also acknowledge the work done by many in the industry in providing valuable research, comment and insight in the many documents listed in the bibliography.

This project would not have been possible without the considerable support and information which we received from the Institute for the Motor Industry and in particular, from their research manager, Alison Rhodes who gave invaluable assistance in arranging interviews and in providing a venue for, and managing invitations to, the project workshop.

We would also like to acknowledge the co-operation of the U.K. Commission for Skills and Employment in allowing us to draw on the analysis of skill drivers and scenarios undertaken by SAMI Consulting as part of the Commission's recent annual Strategic Skills Audit for England.

Finally, we would like to thank the individuals from the following organisations, who variously participated in the interview programme and scenario workshop. It must again be emphasised that the views expressed by the individuals do not necessarily represent those of their organisation.

Adrian Smith Saab
BMW UK
Bosch
British Vehicle Rental and Leasing Association (BVRLA)
City and Guilds
Delphi
Independent Automotive Aftermarket Federation (IAAF)
IMI
IMI Awards
Kilburn Autocentre Ltd
Lifestyle Europe Ltd
MAN Truck and Bus UK Ltd
Mercedes-Benz
Pendragon plc
Sector Skills Council for Science, Engineering and Manufacturing Technologies (SEMTA)
Society of Motor Manufacturers and Traders (SMMT)
Toyota Motor Europe

2 Key Trends, Issues and Drivers

2.1 Introduction

This chapter examines a number of the automotive retail industry's trends, issues, uncertainties and 'drivers' or forces for change, identified during the project's literature review, horizon scan and interviews with industry participants. Certain of the currently identified trends and drivers seem likely to endure over the coming decade. The impact and nature of others is less certain, both in terms of pace and direction as indicated in the text.

The key areas of uncertainty have been combined with the more predictable elements of the future business environment to create alternative scenarios or visions of the UK automotive retail sector in 2020. These are presented in Chapter Three.

The analysis which follows has been structured around a number of topics or themes, each containing several sub-topics. There are a number of linkages and interdependencies between the individual topics which are noted in the text. The main themes, some of which are inter-related, are as follows:

- the global framework;
- UK government influence and intervention;
- the industry's size, structure and business models;
- motorists' behaviours and expectations;
- technology and innovation.

2.2 The Global Economic and Political Framework

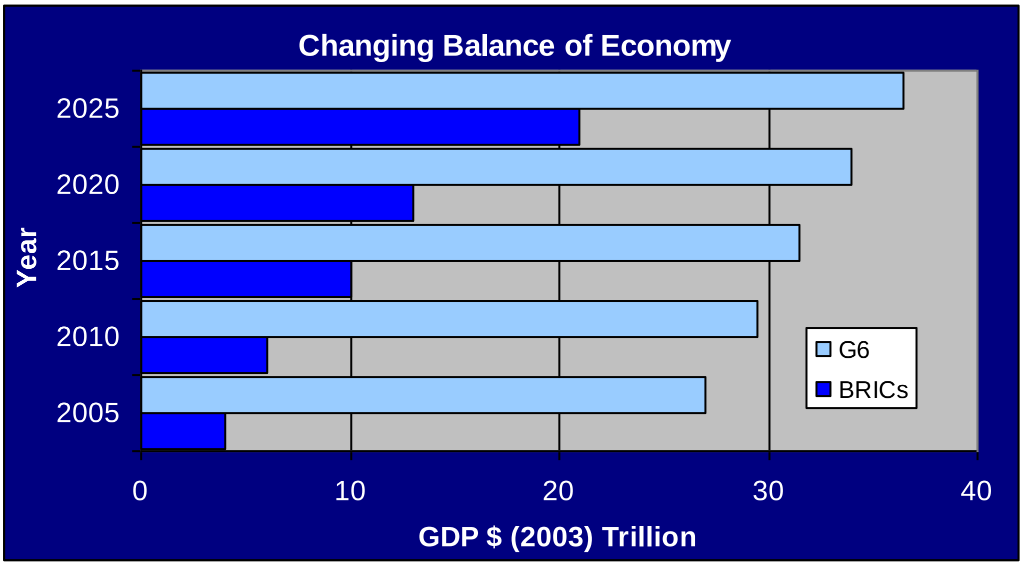
2.2.1 Changes in the Global Balance of Population and Economy Activity

A major force for change is the shift in the centre of gravity of the global economy. It is widely expected that the combined GDPs of the BRIC countries (Brazil, Russia, India, China) will exceed that of the G6 industrialised nations by 2050 (see Figure2), and by 2025 the gap will have narrowed such that the 20th century international institutions will need to reform or lose legitimacy. The power of the dollar and euro may consequently decline, while an Asian trading block may emerge using the Chinese currency (renimbi).

However, it is uncertain how quickly the regional balance of activity will shift, whether the transition will prove to be smooth or turbulent, and what will happen to absolute and relative levels of income and wealth.

The recent financial and economic crisis, which followed the massive global financial and trading imbalances of the past decade, coupled with the resulting surge in government and personal indebtedness in a number developed nations, can be expected to have a critical impact on global, regional and national growth prospects over the coming decade. However, just how the current global imbalances are resolved, how the excessive levels of indebtedness are reduced, and consequently how economic developments play out still remains very uncertain.

Figure 2



In particular it is by no means certain:

- how far the fortunes of the BRICs and other emerging economies have decoupled from those of the major OECD economies;
- whether the western economies will suffer renewed financial crises;
- whether it will prove possible to reduce excessive public sector deficits in the EU southern fringe economies and elsewhere while retaining political stability and social cohesion;
- whether China can maintain the economic and price stability together with the level of employment growth necessary to avoid the risk of popular discontent and social unrest;
- how long China's reliance on exports and infrastructure spending to achieve these ends is sustainable, and whether it can stimulate sufficient increases in domestic consumer spending among its expanding middle class population to provide a new impetus for economic growth.

Implications for the UK

The answers to these questions can be expected to have a significant impact on the UK's own economic performance over the coming decade and hence on the demand for domestic travel, vehicle sales and related automotive sector services. The uncertainty of economic outlook is reflected in the alternative scenarios presented in Chapter Three.

2.2.2 The Cost and Availability of Capital

A consequence of the collapse in financial markets in 2008 has been the damage inflicted on the balance sheets of western banks, with the resulting contraction in availability of credit. While some progress has been made, particularly in the US and UK, in rebuilding the capital base of the major banks, it is generally acknowledged that much has yet to be done. There are concerns that not all potential losses and write-downs have yet been recognised in the accounts of the banks and that more problems could yet emerge.

In particular, the position of various European banks is causing concern given the problems faced by various southern European economies, the risks of a sovereign debt default and the impact that might have on the Euro area and beyond. Even if such downside risks are averted, there will still be a very substantial private sector refinancing requirement over the next two to three years at a time when credit is tight. This, coupled with high levels of public sector borrowing, may place further strains on financial markets.

Barring any unexpectedly strong short- to medium-term economic recovery, it thus seems likely that the supply of business and personal credit within Europe and the UK will remain fairly tight over the next few years at least, and that the resulting cost of capital will also be relatively high, certainly in comparison with the level prevailing during much of the previous decade.

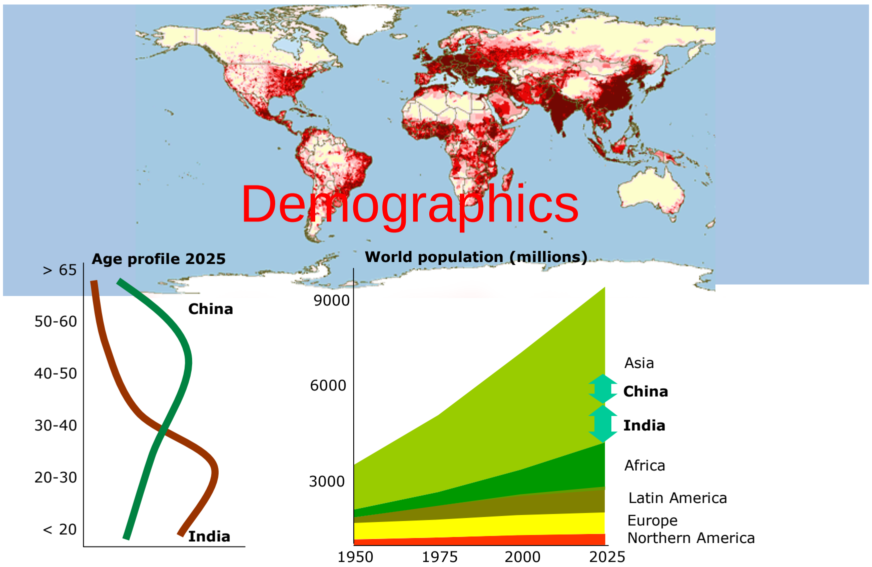
Implications for the UK

Unless, therefore, new sources of international investment capital become available, perhaps from countries such as China which have been running substantial trade surpluses and levels of domestic saving, attractively priced capital to support UK business investment and major capital purchases by individual consumers may be in relatively short supply, certainly during the early years of the coming decade.

2.2.3 Demographics and Market Dynamics

Successful long-term growth among the BRIC and other emerging economies is likely to mean that global consumer markets are increasingly conditioned by developments in these countries, and by the aspirations and demands of their populations, particularly the younger generations.

Figure 3



Market dynamics within individual regions and countries also seem likely to shift. By 2025, more than half of the world's population will be in Asia. While the population age profile of India is similar to that of many other developing countries, with a peak in the number of people entering the workforce in about 2025, China, Japan, America and Europe already have an ageing population with fewer people entering the workforce (see Figure 3 above).

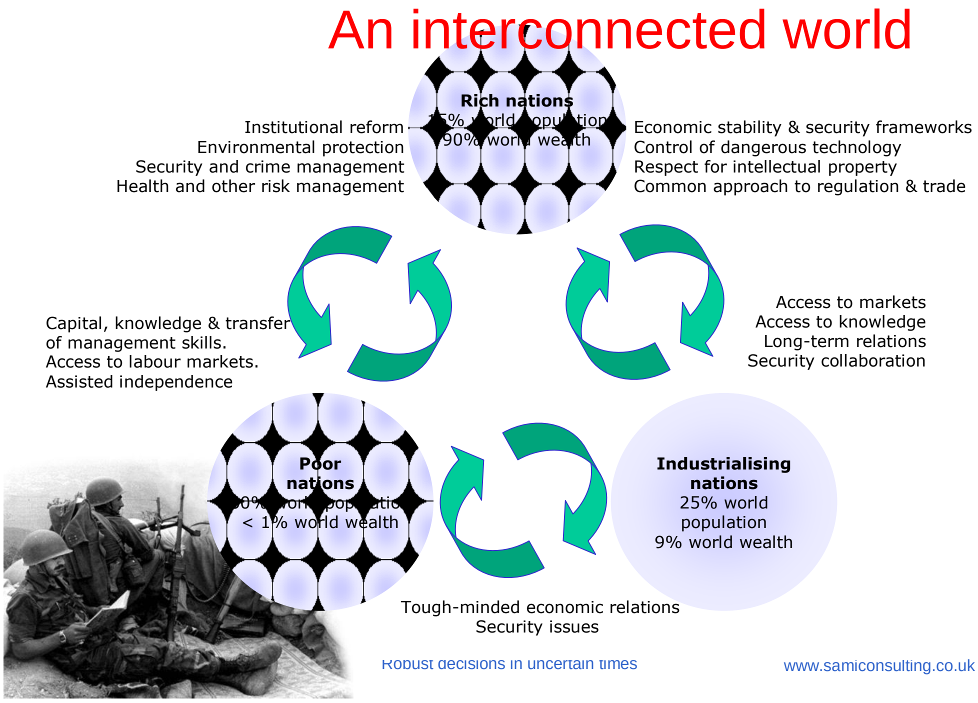
The new car announced by Tata of India, the Nano, selling for about £1,000, is symbolic of these changes and the potential developments that may affect European and North American companies and markets.

2.2.4 Political and security issues

The world is interconnected by links of trade, capital, and the many global systemic issues such as resources and security. Many of these links are managed by institutions based in the US or Europe. Global economic tensions caused by the shift of the balance of power seem likely to strain, and in the long term may break, the international institutions that have maintained the global economy in its growth over the last decades.

The demise of the bi-polar world dominated by the United States and the Soviet Union could lead to the emergence of a more fragmented world order in which national relationships and interests are both more numerous and complex (see Figure 4). Even in the medium term, the world can expect to face conflicting interests and continuing tensions in the relationships between rich and poor countries; between energy and raw material importers and producers; and between the developing nations themselves, in competition for resources and markets.

Figure 4



2.2.5 Regulation, Governance and the Role of Government

Many parts of the world, most notably the developed economies, have seen increasing regulation, sometimes with overlapping jurisdictions. This has been apparent most recently in the response to the turbulence in financial markets.

Implications for the UK

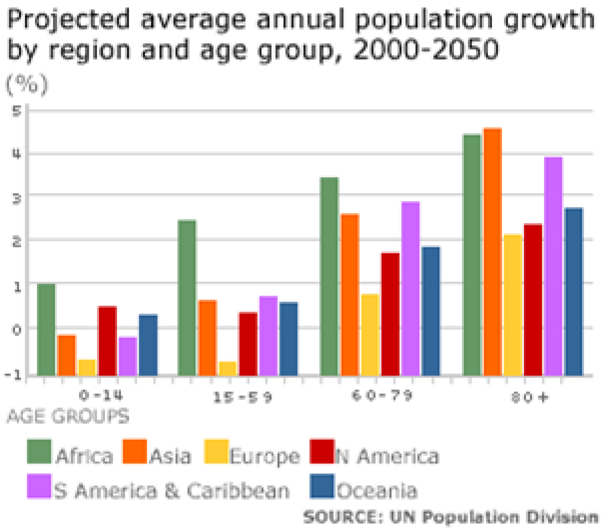
Issues of regulation and governance in the UK as they affect the UK automotive industry are discussed in detail later in this chapter. The UK, however, is not immune from global trends and international agreements. In the wake of recent developments, it consequently remains to be seen whether, over the coming decade, the world becomes one of high or low regulation, internationally directed and coordinated or uncoordinated; and whether it is a world of heavy state intervention and high levels of provision of public services, or one of light touch government and more limited direct participation in the provision of services to the public.

2.2.6 Demographics, Education and Human Resources

One of the biggest demographic changes facing the West in the next 20 years is the rise in the number of elderly people. Figure 5 shows Europe as having falling numbers of people under the age of 60, posing questions about workforce availability with potential implications for future immigration policy.

Figure 5 also shows that the average growth rate of the 60-75 and 80+ groups is relatively high, world wide.

Figure 5



Education is also a major force for change. By 2025 current trends and policies suggest that nearly half of the world's population will be educated to secondary level and that there will be a billion graduates. High school graduates are likely to be more prosperous than uneducated people. Both China and India are among the emerging economies that are focussing heavily on improved education to create a well-educated labour force with highly trained graduates. They will become a potential competitive threat to the West as the two countries move up the value chain and, in the case of the automotive sector, seek to develop their own indigenous vehicle manufacturing industries, progressively moving upstream from assembly into research and development.

People also become more mobile once they are literate. In recent years, there has been mass inward migration into Europe as well as between Asian countries, with both regions experiencing migration from the poorer to the more prosperous centres of activity as people seek employment and improvements in their living standards. Much of the migration has been to the major urban conurbations, and it is now estimated that half the world's population live in cities. These population movements have created growing congestion as well as some political and social strains, and it remains to be seen whether and how particular countries alter their future immigration and planning policies.

Implications for the UK

There is diverse opinion on whether and to what extent the BRICs, and in particular China and India, will have a long-term impact on UK automotive retail markets through increased penetration of the UK new car market and possibly by exerting influence over global standards as their domestic car markets and production burgeon. In the more immediate future, however, any impact seems likely to be modest, certainly until such time as their vehicles meet European environmental and safety standards.

What may be more relevant over the next few years is the continued ability and willingness of multinational manufacturers to locate production facilities in, and source components from, the BRICs and other low cost centres of production as part of their overall cost reduction strategies. This may in turn depend on supply chain issues such as:

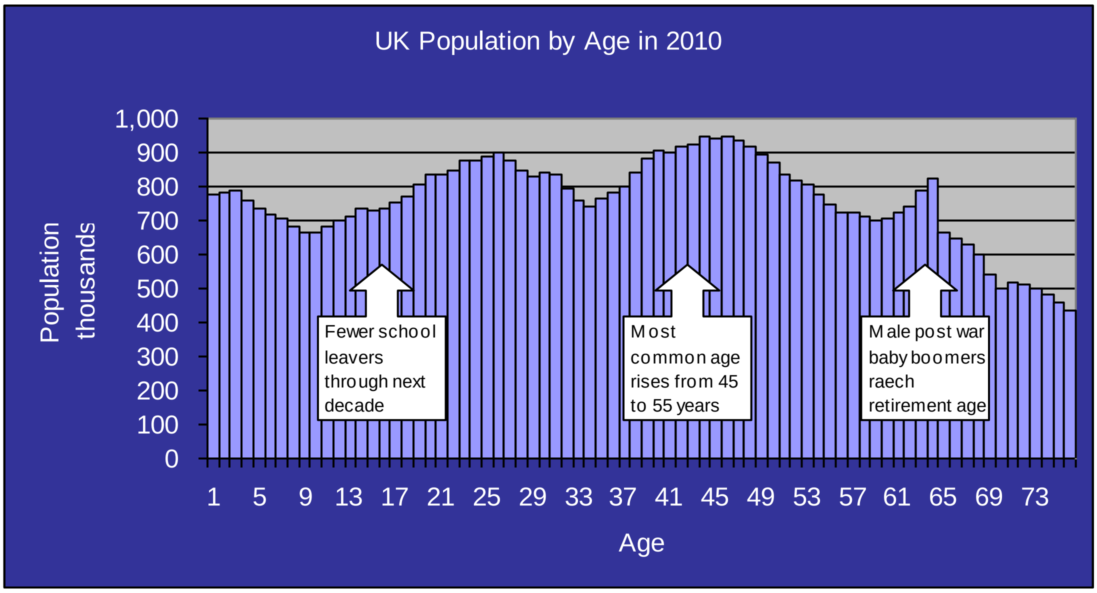
- logistics costs, which may be driven upwards by higher energy costs;
- political and security issues;
- whether there continues to be an open global trading environment, or whether there is a shift towards trade protectionism and imposition of trade barriers.

Demographic trends point to the likelihood of continued population growth in the UK, although the rate of increase may be uncertain and will in part be contingent on the level of net inward migration which most forecasts suggest will continue, even with the currently expected tightening of UK government immigration policy.

Migration can impact upon the economy and labour market in various ways. Immigration can improve labour supply and keep down pay rates, particularly for lower skilled jobs; it can help to resolve skill shortages; it can also act as a relief valve in a downturn, as more recent immigrants return home; however, outward migration, perhaps due to lack of attractive employment opportunities, can lead to a "brain drain".

Demographic trends also point to an ageing workforce in the UK under all likely scenarios and, possibly more importantly, to a reduction in the number of school leavers. The current age profile of the UK population is shown in Figure 6 which shows the changes that lie ahead.

Figure 6



Source ONS UK population projections 2008

Over the coming decade, employers will find it increasingly difficult to maintain their workforce as baby-boomers retire and fewer school leavers and graduates become available to enter work. Some older employees may stay on in work beyond the current retirement age and will need retraining, but currently in the retail automotive sector the trend seems to be to leave the industry earlier, especially amongst technicians, so the shortage of young intake is likely to be even more significant. There are also likely to be some sudden and significant step changes in the number of school leavers and retirees as the baby-boomer generations pass through the system.

The number of British pensioners now exceeds the number of under-16s for the first time ever; due in significant part to the reducing mortality of the old and very old. This will lead potentially to a growing number of older drivers, if they can afford it and meet prescribed health requirements, with an accompanying reduction in younger drivers.

Overall, the age profile of the population is likely to be broadly similar under most scenarios, but its impact will vary between scenarios depending on the future level of growth and composition of employment in the economy as well as the wealth and income of various age cohorts, including those of pensionable age. Migration, in comparison, may be a more pronounced differentiator between alternative futures as it will be linked to other factors such as economic performance and nationalistic attitudes.

2.2.7 Natural resources, energy availability and environmental issues

Another major force for change is the shift in balance between demand and supply of raw materials. For most of the last century, food was in abundance, supplies of oil were generally sufficient although subject to periodic price peaks, and water shortages were localised. Mining for metals was not very profitable, but output generally kept pace with underlying demand.

Much has changed since the turn of the Millennium. The demand for commodities and in particular energy from the emerging economies has been very significant. China has been active in acquiring minerals and agricultural resources in Africa and Latin America in an attempt to secure scarce long-term supply sources. The world faces challenges in meeting demand for food from the world's growing population and increasing standards of living. Water too is increasingly in short supply due to changing rainfall patterns, population increases and higher living standards. General issues of resource sustainability are being reinforced by concerns over climate change. These trends all have the potential to increase global political tensions and uncertainty, particularly over the longer-term.

With respect to energy, a key factor that is likely to have a major bearing on change in the automotive industry is the timing of 'peak oil'. The term peak oil relates to the date on which global oil production reaches its maximum and thereafter starts to decline.

In reality, the issue is not just one of maximum output but also one of price, as clearly the latter will act to balance absolute levels of both supply and demand and the rate at which they change. However, the sooner substantial supply constraints are met and the more rapid and marked the resulting price increases prove to be, the greater is likely to be the drive for greater fuel efficiency and with it the impetus away from the conventional internal combustion engine.

The exact timing of peak oil has so far proved difficult to predict, moving forward for decades. However, it now appears to be in prospect. A peak in conventional oil production before 2030 is considered likely by many analysts. Some suggest that there is a significant risk of a peak before 2020, while some argue that it may already have arrived. The latter view may have been rendered valid, should the BP oil spill in the Gulf of Mexico lead to a major political clamp-down on deep-water offshore exploration and production or significantly increase the costs of the latter through introduction of much tighter safety regimes.

One Russian analysis points to the need for a technology breakthrough by 2030 if energy supplies are to be maintained, while some commentators are suggesting that new technologies for exploiting shale in the US, Europe and China may help to alleviate any energy supply shortages in the coming decades.

On the demand side, although the Copenhagen Climate Change summit failed to reach agreement on targets to reduce greenhouse gas emissions, a number of individual countries are taking unilateral action; the EU is considering a further tightening of its own carbon reduction targets; while many major companies are becoming greener, driven by the bottom line and concern over cost and security of future energy supplies and other resources.

Oil shortages may not necessarily be imminent, as market prices are likely to move in a way that helps to balance available supply with demand. However, political factors coupled with current oil industry estimates of future oil production suggest that over the coming decade, barring any major economic downturn, real oil prices are likely to trend upwards, albeit possibly in an irregular and volatile fashion. Cyclical swings and real long-term increases in oil prices are both likely to have significant impact in all areas of the automotive industry.

Some signification climatic disaster, possibly associated in people's minds with global warming, could also have a sudden and immediate impact on oil supplies and prices as well as on government responses with respect to taxation, carbon pricing and regulation. Any future market-driven increases in energy prices may of course be compounded by heavier government taxation for environmental or other reasons. The development of alternative drive trains by manufacturers is not just altruistic.

Implications for the UK

For vehicle drivers, high fuel costs may be expected to have a significant effect on car usage, and consequently on both the level of car sales and that of servicing and repairs. Recent research also suggests that for every one pence rise in fuel prices, total new car demand falls by roughly 7,500 units.

The wider and growing global concern over climate change also appears to be having some impact on attitudes to vehicle ownership and usage, but this is by no means universal. In the UK, efforts to reduce carbon emissions are increasing, and there are signs that the public are beginning to believe that they should limit their own personal carbon footprint to benefit the environment by reducing car use. Carbon reduction measures already in place include greater use of green fuels such as bio-fuels, switching to hybrid and electrical vehicles, and increasing fuel and other taxation to reduce demand for oil based fuel. These changes are all discussed in greater detail later in this chapter.

Other resource shortages and wider ecological and commercial concerns are also forcing changes on business and consumers. Waste reduction, recycling and making products recyclable are all being driven by government regulation around the world, particularly in Europe.

2.2.8 Technological change

There are hopes that technology can help to resolve some of the resource and environmental issues facing the world by, for example, developing new alternative energy sources and low carbon technologies, new materials that reduce need for traditional metals, and new food strains with increased yields or lower irrigation requirements. We can but watch for early signs of breakthroughs in such areas. They could have a substantial longer-term global impact.

More immediately, there are two existing technologies that are likely to have a further significant impact in the short-to medium term – information and communications technology, and bio technology – and one that may be felt later in the decade, nano technology. The latter may well lead to long-term changes in the materials and fluids used by the automotive industry, and in technologies designed to increase durability and reduce cost and service frequency. However, by their very nature, nano particles can penetrate human and other cells, potentially giving rise to the need for a number of tighter health and safety regulations with respect to activities such as maintenance and servicing.

The implications of technological innovation and development in the automotive sector are considered at length later in this chapter.

2.3 UK Government Influence and Intervention

Intervention by governments in their automotive industries is commonplace. Those with a national automotive manufacturing base have generally provided at least some measure of support within the limits imposed by international trade and other agreements, not necessarily for sound economic reasons.

Taken in its entirety, the automotive industry has a significant impact on many facets of life, including resource utilisation and the environment, lifestyles, commerce, and health and safety, so that some degree of regulation and control is usually regarded as being in the interests of the public at large. However, governments have also variously used the industry as a tool in achieving their broader policy objectives, for example as a convenient general tax raising tool.

In the paragraphs which follow, the nature and implications of the EU and UK government's interface with the UK automotive industry are reviewed in relation to key areas such as overall transport policy, regulation, taxation and road pricing, and health and safety.

2.3.1 Transport Policy

Government transport policy sets the broad framework for a significant part of government's detailed interaction with the automobile industry. Transport policy encompasses many facets, not least issues of carbon dioxide emission reduction, sustainability, land use, health and safety, and economic efficiency. The balance of these factors may well vary over time depending upon public attitudes and the political colour of the government of the day, as well as by way of response to wider and evolving global and national economic, financial and social issues such as concerns over climate change or cost and security of energy supplies.

Over the next ten to twenty years, some degree of continuing government intervention and regulation with respect to transport policy appears almost certain. However, the degree of intervention, the extent to which road transport may or may not be favoured over other forms of transport, and the future the level of investment and provision of transport services by the public sector are all uncertain. They are consequently among the key variables incorporated in the alternative scenarios presented in Chapter Three.

Other government interventions that will impact on the automotive industry are business policies and the promotion of indigenous research, development and manufacturing capacity; and in particular, the extent to which the UK industry is encouraged and supported in any initiatives to capitalise on the economic opportunities and job creation offered by the shift to a low carbon world.

Within the overall framework of government transport policy, the specific issues that are most likely to affect the retail automotive industry include:

- attempts to reduce high carbon vehicle-kilometres;
- subsidies to particular sub-sectors or transport modes, and taxation on others;
- subsidies or taxation to alter the balance between public and private transport;
- support for commuting against long distance travel;
- balancing the demands of freight, passenger, business and leisure travel;
- promoting healthy forms of travel such as walking and cycling etc.;
- attempts to reduce travel mileage or fuel efficiency through:
    - ICT and teleconferencing;
    - facilitating car sharing and car clubs;
    - helping people to drive more efficiently;
    - adherence to speed limits - with the use of intelligent speed adaptation;
    - improvements in transport network efficiency and road pricing.
- reducing congestion in cities and on major routes;
- better integration of transport and new transport providers;
- accident reduction, emission reduction and other health and safety initiatives.

There are strong views that personal mobility is vital to modern life and will not be relinquished easily. This may well fashion and govern the shape, degree and impact of any future government policy changes on the automotive retail industry. As one interviewee observed, *"road is vital to 92% of trips. I don't see this changing. Government overdoes the pariahhood of vehicle ownership and driving. There should be a right to use road vehicles in a responsible, sustainable and safe manner"*. Another noted that *"cars have been part of massive social change in the last century. Communications are so much better today and we can't go back."*

However, a new study by University College London, based on DfT travel survey data, concludes that the miles travelled by the average person each year in the UK has not risen for about 15 years, which may suggest that individual demand for travel is reaching a peak, possibly because for most people, travel requirements have largely been met. If this is indeed the case, population growth rather than greater per capita travel mileage will be the main driver of any future growth in total travel mileage. However, it must also be noted that the figures do not include international air travel, and were that to be constrained significantly in future, perhaps due increased taxation and other costs, it is conceivable that some individuals could decide to substitute increased leisure travel at home.

2.3.2 Government and public attitudes towards the automotive industry

In recent decades, the policies of all UK governments have, to varying degrees, been viewed by some individuals and organisations as being *"anti car"*. Government has also been accused of being disingenuous in its attitude towards, and dealings with, the automotive industry, in that it has set parameters and an infrastructure which have facilitated the growth of the car, only then to blame the car for congestion and other ills.

Direct government support for the automotive industry has been largely directed towards manufacturing, rather than to the retail automotive sector. Downstream automotive is a very large industry with important contributions in facilitating overall trade, commerce and industry, employment generation and transport safety and sustainability. Interviewees flagged the need for greater recognition of the automotive retail sector's contribution, not least in its role of facilitating the smooth functioning of the wider economy.

Indeed, if the automotive retail industry is to prosper, there seems to be a fairly broad-based view that it needs to up its game and improve its image in the minds of both the public and government. History shows that failure to engender such support can lead to sudden and damaging policy shifts which can have a seriously detrimental impact on the industry in question.

The automotive retail industry needs to attract the right people to work within it, elevating itself in the minds of potential apprentices and their parents, and offering good training and career progression, rather than being viewed in the minds of some careers advisors as a last port of call; or worse, by being characterised in the words of one interviewee as "*Jimmy, you like nicking cars, why not become a car mechanic or a car salesman?"*

A major impediment to change is perhaps the existing culture of significant parts of the industry which are populated by individuals who have an interest and even passion in fixing cars rather than running a business. The industry is starting to launch accreditation schemes and other training products aimed at enhancing the competences of those in the industry and getting youngsters to understand why efficient business management is important. However, such initiatives will not fix the problem overnight. Another view, expressed by one interviewee, is that enthusiasts are needed to fill mechanic positions because *"no one but an enthusiast would work at the rates which some businesses are able to offer"*. The underlying problem in many parts of the industry may thus be a combination of training, career progression and rewards, and it may be that this can only be fully addressed through change in industry practices, organisation and productivity, factors which are again discussed later in this chapter.

2.3.3 Regulation

Legislation and regulation have been prime drivers of the whole automotive industry's competitive shape and technology, a situation which can be expected to continue, to varying degrees, under most future scenarios.

There appear to be seven main strands of legislation bearing upon the industry, namely:

- Competition
- Consumer protection
- Security
- Driving behaviours
- Environment
- Financial
- Health and safety

Each is considered below. Issues of self-regulation and self-accreditation are considered subsequently.

Competition

The main regulatory measure currently governing competition in the automotive retail industry is the European Union's Motor Vehicle Block Exemption Regulation (BER). The BER applies to distribution agreements relating to new car sales, servicing, repairs and parts distribution in the EU which have been exempted from the European law on anti-competitive agreements. It permits exclusive franchised dealerships, but in mitigation guarantees other rights for consumers to choose where to have their cars serviced.

The current motor vehicle BER (1400/2002) expired in May 2010, but it has recently been extended by Commission until 2013, largely unchanged in deference to the difficulties currently facing the automotive manufacturers as a result of the impact of the 2008/09 recession. However with effect from June 1st 2010, car manufacturers are no longer be able to refuse to supply independent repair shops with technical information and spare parts; nor are they able to make their warranty conditional on having the oil changed or other car services undertaken only by authorised garages. Nevertheless, service agreements struck with individual dealers are still valid where specific work is provided free under the warranty.

The protagonists in the motor industry - manufacturers, franchised dealers, other dealers, independent repair shops and the end user - all have different positions on BER. There is some concern over elements of the new regulations in that dealers are not allowed to multi-franchise or open new locations without manufacturer approval – power lies with the latter. The EU, however, says that the end user is most important, and hence the ability of independent repair shops to repair older vehicles to ensure that they remain safe to drive and meet emissions standards is seen to be highly important. The EU also believes that while new car sales are good for the economy, they are not necessarily as good for the environment.

Consumer protection

In addition to industry specific regulation, the automotive industry is subject to general consumer protection legislation.

Following a sector specific investigation into the effectiveness of such legislation, the Office of Fair Trading (OFT) published a report early in 2010 into second hand car sales by franchised and independent dealers which concluded that the automotive retail sector market is often not working well for consumers. The market study was prompted by consistently high numbers of consumer complaints. While the OFT concluded that existing legislation is sufficient, it recognised that more needs to be done to ensure dealers are aware of the law, that consumers are aware of their rights, and that dealers who fail to comply face effective enforcement. The OFT has listed a number of priority areas for further action if matters do not improve. These include;

- illegal clocking;
- dealers' responsibility to rectify problems;
- car dealers' reliance on illegal disclaimers;
- failure by dealers to disclose the mechanical and other pre-sale checks which have been carried out.

Two other potential OFT investigations into consumer protection issues remain in prospect.

First, the threat of a super-complaint was raised against the motor industry by the National Consumer Council (NCC) in March 2006, and could result in mandatory legislation to ensure quality and standards.

The complaint has continued to be delayed, as the NCC has recognised the significant investment in skills based initiatives taking place in the sector. However, the NCC has highlighted a number of areas in which it would like to see improvement, and thus the super-complaint remains a threat to the sector.

Secondly, some manufacturers are offering a period of free servicing within a new car's purchase price. However in 2004, the Office of Fair Trading suggested that it might instigate investigations if the use of such offers reduced the transparency of new car pricing.

Security

Government legislation on vehicle security has had a significant impact over recent years, not least in making maintenance more difficult. A large number of vehicles are stolen each year, although figures have been falling recently. Nevertheless, in certain scenarios, the drive for greater vehicle security could further increase.

Driving Behaviours

Further regulation on driving behaviours is likely to be aimed at energy conservation, CO2 emissions, safety and reduction of congestion. One prime aspect of any regulation may be to try to reduce vehicle-kms driven in Britain.

One initiative already started is the inclusion of eco-driving techniques in the car driving test. This is being extended to bus drivers and van drivers on a voluntary basis, and in future could conceivably be made compulsory or at least tightened further.

Extension of HGV tests and regulations to smaller vehicles under 3.5 tonnes has been suggested. While not all HGV regulatory measures are likely to be applicable to, and imposed on, smaller commercial vehicles, some specific measures could be adopted. These might include eco-driving training and regular retesting, as well as introduction of tachometers etc. Another option might simply be the introduction of another category on the driving licence for commercial vehicles involving an additional test.

Other possible regulations with respect to driving behaviours mooted for the future are:

- greater use of average speed camera technology to enforce urban speed limits;
- the introduction of Intelligent Speed Adaptation technology (linking the vehicle speed to the local speed limit using GPS and telematics);
- deployment and enforcement of high occupancy vehicle lanes.

Environment

UK, EU and other foreign government legislation on the environment have all already played a very significant part in the development of the industry. Controls on emissions of lead (Pb), NOx, SOx, and particulates have been followed by regulations relating to CO2. The tools used by government to achieve the required objectives have included taxation, subsidies, regulation and coercion, the levels of each being determined by public and government attitudes. The future balance of such measures is likely to vary under different scenarios.

Although there are some signs of improvement in attitude, the UK general public does still not appear very receptive to green driving. However the business sector appears to be more responsive, and there are already emerging pressures on and by businesses to cut the average CO2 emissions from company cars and light commercial vehicles, a trend which seems likely to continue. Business fleets may use smaller vehicles, use greener fuels, or simply reduce mileage.

The DfT has stated that vehicles will be required to be vastly more fuel efficient by 2022. This objective is expected to be achieved primarily through advances in the efficiency of the internal combustion engine. However, new ultra-low emission vehicles are also likely to have made at least some inroads into the mass-market.

The EU's New Car CO2 Regulation, agreed in 2008, establishes a clear, long-term framework for action by the automotive industry to develop lower emission vehicles. The EU is looking at an ambitious performance framework for CO2 reduction from vans throughout the EU out to

2020. It also aims to achieve significant reductions in emissions from HGV operations and wants low emission buses to play a growing role in the transport system.

The current EU targets for average car emissions are 130g CO_2/km from 2012, with full compliance by 2015, and 95g CO_2/ km by 2020. The DfT will work to influence the European Commission's review of the 2020 target, which must be complete by 2013, to ensure that the regulation delivers the maximum CO_2 savings possible. They will also promote measures that help drivers make CO_2 reductions, such as gear shift indicators and tyre-pressure monitoring systems.

It is reported that the EU is now considering a further possible tightening of overall CO_2 emission targets.

Financial

Financial services play a key role in financing new vehicle purchases.

There appear to be several possible financial regulatory measures which could affect future practices. These include:

- stricter regulation of the provision of financial services in relation to giving or finding credit for vehicle purchase;
- the European Insurance Mediation Directive which could have a very significant impact on the rental sector, as rental involves insurance.
- future changes to business accounting principles which might make leasing and vehicle hire less attractive to business users.

Health and Safety

Apart from additions to the safety equipment demanded in new cars, the MoT test on older cars has played a major part in maintaining safety on the road and has had a significant impact on the repair, maintenance and servicing (RMS) sector, particularly with respect to the industry's independents. According to Trend Tracker, in 2007/08, independent garages accounted for a 70% share of all paid-for MoT tests, while franchised dealerships accounted for 23% and fast-fit for 3%.

Recent suggestions that the UK MoT test should become biennial seem to have been averted, at least for the time being, but since most of the rest of Europe has biennial tests, the threat remains. While a biennial test would save motorists a significant annual expense - over 30% of vehicles tested annually in the UK fail their test and require corrective repair work - it could lead to a deterioration in the level of road safety, resulting in more accidents due to an increase in the number of defective vehicles on the road. The net socio-economic benefit of a switch to a biennial test may thus be much less than some estimates suggest.

Regulations to ensure that manufacturers continue to add safety features to cars are also likely to continue and could be tightened under certain scenarios. Regulations increasingly add to the complexity of repair, maintenance and servicing of vehicles as safety frequently conflicts with other demands on the manufacturer.

There are calls within and outside the industry for mandatory servicing and repair regulations in order to eliminate the 'cowboys' and improve the industry's professionalism. In the past, it has been a case of self regulation, and somehow the industry has managed to avoid tougher controls. Franchised dealers tend sign up to voluntary codes to a greater extent than do the independents.

The quality of franchised dealers' servicing facilities is in principle checked by the manufacturers. Independent garages are intermittently checked by local Trading Standards Officers. The current approach can thus probably best be described as patchy, and as noted earlier, the sector has long attracted a high number of consumer complaints.

To the extent that the future may be one of tighter regulation on vehicle use, potential beneficiaries within the industry may be vehicle rental organisations as they can provide mobility without the inconvenience and cost to the private individual or business of car ownership, particularly in cities with their often additional parking and other costs. There may thus be opportunities to work with government, local or national, in developing alternative and integrated transport and mobility systems. Losers may be the dealers and independent service garages facing a possible reduction in the number of vehicles to buy, sell and maintain. Clearly, such factors could have a very significant effect on the automotive retail industry's future business models.

2.3.4 Taxation, congestion and road pricing

As noted earlier, the level of taxation gathered by UK government from the road user has long exceeded the level of expenditure on enhancing and maintaining the country's road network. Taxation on the luxury of mobility to pay for other public services has been long standing and seems likely to continue, albeit to varying degrees, under most plausible scenarios. Perhaps, at least in part, in an attempt to make such taxation more palatable to motorists, government is now claiming that increases in road user taxes are aimed at promoting the efficient use of fossil fuels, minimising carbon emissions, and reducing congestion which, alongside other environmental considerations, are growing economic and political issues, closely related to increasing levels of traffic.

Indeed, road congestion is now estimated to cost the UK annually the equivalent of some £8 billion of GDP. Congestion can be alleviated by building more physical infrastructure; using infrastructure more efficiently; preventing or deterring road users and rationing road space by brute pricing and regulation; or more futuristically, by greater use of telematics technology that is rapidly becoming ubiquitous.

In recent years, the vehicle taxation system, with vehicle excise duty and company car tax both becoming CO2 emissions-based, has further helped favour diesel and small cars. Tax changes, rising fuel costs and the London congestion charge have boosted the market for alternatively fuelled vehicles, although at 0.7% of the total market in 2008, the numbers of such vehicles remain low for now. Future changes in taxation and other road charges, however, clearly have the capacity to influence further changes in travel patterns and choice of mode and vehicle.

The major taxes and charges currently imposed on the UK road user are discussed in the following paragraphs.

Vehicle excise duty and company car tax

In 2001, the UK was the first country in the EU to place vehicle excise duty (VED) on a CO2 basis. In 2002, the Government also placed company car tax (CCT) on a CO2 related basis, and further reforms were announced in the 2009 Budget to align vehicle excise duty more closely with CO2 emissions. (BIS/2) The latter changes are in principle quite significant but while they may appear painful to the motorist, in practice even the largest increases only amount to the equivalent of a few tanks of fuel at today's prices. Nevertheless, there are views that the latest change will both lower retail interest in new cars with an engine capacity above the current Band D and will depress residual values of these cars when they are due for resale, typically after 3 to 4 years. There remain issues with the taxation of company vans, particularly in relation to CO2 emissions.

VAT and Fuel Tax

Fuel tax, although steadily increasing, has on occasions been used by government to smooth the underlying increase in fuel prices. Apart from the recent temporary reduction to 15%, the current rate of VAT has in comparison remained unchanged at 17½% for a number of years. In its June 2010 Emergency Budget, the new UK Coalition Government announced an increase in the standard rate of VAT to 20% from 4th January 2010. It also declared its intention to consider possible future measures to smooth fluctuations in fuel prices and provide a degree of assistance to those living in remote rural areas.

Congestion charges and road pricing

The terms congestion charging and road pricing are in practice largely synonymous. Given enabling developments in ICT, congestion charges and tolls seem likely to be rolled out more widely in future, including on motorways and under most scenarios, albeit perhaps for differing reasons. The speed and extent of the roll out of such charges may, however, vary between scenarios depending on factors such as the underlying rate of economic and traffic growth, the political persuasion and policies of the government of the day, and public attitudes towards issues of sustainability.

Telematics will be required for efficient operation of widespread traffic charging schemes, and it will take a while before sufficient vehicles are equipped to make such schemes practicable. Once the latter is achieved, however, there could be very substantial opportunities to tax and influence driving behaviours, given the necessary political will and public acceptability.

Possible future taxation measures

It is also being mooted that with the further development of telematics and associated technologies, individuals and businesses might in future be taxed on their overall personal or company carbon footprint. Carbon trading with respect to an individual's fuel consumption or overall carbon footprint might create new opportunities for business.

There is also an issue regarding the absolute and relative future pricing of various types and sources of fuel consumed by vehicles and other transport modes, and whether differential charges and taxes might be introduced as a means of securing changes in the balance of usage between different transport modes or to signal to the consumer the degree of sustainability of specific energy sources with the aim of influencing their relative consumption.

Clearly while uncertainty prevails over future government policy on issues of taxation and regulation, the pace of innovation and introduction of new motor technologies may be held back as manufacturers and others remain reluctant to commit the substantial investment funds *"to back what may prove to be the wrong horse"*. It has been suggested by one interviewee that such concerns may in part lie behind doubts expressed by some manufacturers over the future of electric vehicles.

Others have raised the issue of when, in future, electricity supplied to transport will be taxed.

2.3.5 Health and Safety

Health and safety is important to government, both economically and from the point of view of public opinion in the case of road accidents. There is also pressure from insurance companies and other organisations to improve vehicle safety.

The general public also appears to be becoming increasingly intolerant of injuries and deaths that are not due to old age. Some countries have launched a *"Vision Zero"* programme, aimed at gradually improving road safety until, in an ideal world, it would achieve standards of safety and driving practices whereby nobody is killed or even injured.

Both the EU and UK governments have imposed health and safety regulations that affect the UK market, and it seems likely that regulation will continue to increase, or at least adapt to change, under most plausible scenarios.

There appear to be four main aspects of health and safety regulation which affect the retail automotive sector; namely those relating to:

- the workplace
- drivers and passengers
- pedestrians, cyclists and other road users
- emissions affecting public health

The Workplace

There is extensive regulation governing workplace accidents. New technology in the automotive industry can be expected to invoke more regulations, dealing with issues such as handling and servicing of batteries for electric cars, particularly as modern batteries contain non traditional risks and poisons. The precautions to be taken with respect to high voltages in electric vehicles when servicing and repairing the latter will also need to be addressed.

Regulation or advice to drivers is used to reduce accidents while driving at work. These include driving technique, hours and vehicle related matters such as overloading of vans. The latter may be especially relevant to rental and leasing operations as well as the distribution of parts and vehicles.

As noted earlier, there is the possibility of future increased regulation on commercial vehicles, probably not as intensive as with HGVs, but conceivably involving speed limiters, limits on driver hours, and roadside spot-checks.

Drivers and passengers

Technology will continue to improve safety for vehicle occupants and pedestrians. More equipment is likely to be installed in new cars in the name of safety. This may, for example, include:

- head up instrumentation, which needs special instruments and special glass;
- motorised seatbelts, which apply tension before, not during, vehicle impact;
- accident avoidance systems, anti-lock braking systems, electronic stability control and onboard radar to detect other cars and obstacles, all of which are becoming more sophisticated and, apart from being more effective, could take over vehicle control from drivers in case of emergency. However, there are issues over whether and to what extent drivers would be happy to cede control to such systems, or even to higher levels of drive-by-wire, to ensure their safety;
- telematics, leading to the generation of ad hoc networks between vehicles, and between vehicles and the infrastructure, with particular emphasis on road safety;
- lighting, which is also being improved with better lamps, automatic main beam dipping, long-life bulbs and even infrared vision systems that increase the range of night vision.

The need to increase passenger protection often conflicts with other objectives such as the reduction of fuel consumption, pollutants and CO_2 emissions. The development of passive safety has added a lot of weight to today's cars. Vehicle manufacturers are therefore adapting vehicle designs and using materials with better strength-weight ratios, like high-yield steel, aluminium, magnesium and hi-tech plastics. There are now said to be up to 50 different steels used in bodies with varying and often material specific repair processes. Some cannot be repaired. Indeed, the vehicle body is becoming as complex as the engine and power-train, and incorporates increasing amounts of electronics related to safety.

The use of more specialist materials together with more complex vehicle systems may require more repair work or replacement parts than hitherto, thus adding to the cost of repair and possibly the frequency of vehicle write-off in the event of an accident. However, there may be an offsetting reduction in the number of accidents due to enhanced vehicle safety design and safety systems.

Pedestrian, cyclists and other road users

A pedestrian protection standard was introduced by the EU in October 2005 which requires new vehicles to be designed to offer greater pedestrian protection in the event of an impact. An extension of this standard is planned for 2012, with a greater number of more stringent tests.

Pedestrian protection technologies include pedestrian friendly front-end designs, softer bonnets and collapsible mirrors. Some of these protection systems are active and require maintenance; others are purely passive but use new materials.

Detecting pedestrians in the path of the vehicle will also help to improve pedestrian protection. Even if it is too late to avoid a collision, the detection system can automatically reduce the speed of the impact, or deploy active systems in the vehicle such as front-end absorbers, lifting hoods, or external airbags to reduce potential injury to the pedestrian. Pedestrian detection, however, requires particularly sophisticated technology, including on-board computer analysis of images taken by a camera mounted on the vehicle.

Emissions affecting public health

Emissions from (new) vehicles, except for carbon dioxide, are now practically minimised, although there is still some work to be done on diesels. Maintenance of emission control systems will continue and will grow as more of the vehicle parc reaches best standards. There is unlikely to be any relaxation of these standards now that they have been achieved.

General conclusions with respect to health and safety

In conclusion, the growing influence of health and safety legislation on the automotive industry looks set to remain, and its impact on industry practices, skill and training requirements, vehicle design, and repair and servicing procedures will probably increase under most future industry scenarios. It is perhaps the pace and source of such regulation rather than its general direction that remains most uncertain.

2.4 The UK Automotive Industry: Size, Structure and Business Model

2.4.1 The Size and Shape of the UK Vehicle Parc

At the end of 2009, there were 34.3 million vehicles registered in Great Britain. The total vehicle parc has increased by an average of 1.9% per annum over the previous decade compared with an average annual real GDP growth rate of 1.7%. Furthermore over the past 20 years, only once, in 1991 during the early 1990s recession, was there a decline in the number of vehicles in the parc, although the increase in 2009 during the recent recession only amounted to 0.1%.

The growth in the total vehicle parc has been almost entirely due to increases in the number of cars and light goods vehicles; other categories, except electric vehicles, remained constant. The lack of increase in the number of HGVs possibly reflects the use of larger vehicles, growth in hub and spoke distribution systems and the reduction in UK manufacturing as a share of GDP.

At the end of 2009 the vehicle parc in Great Britain comprised:

- cars 27.1 million (78.7% of the total)
- light goods vehicles 3.3 million (9.5%)
- goods vehicles 0.42 million (1.2%)
- motorcycles 1.2 million (3.4%)
- buses 0.1 million (0.3%)
- electric and tax exempt vehicles 2.1 million (6.2%) - these should not be mistaken for electric cars.

Figure 7 below shows the proportions of vehicles by propulsion type. The rapid increase in diesels and, latterly, hybrids is apparent, although absolutely the number of hybrids is still very small. Penetration of the market by electric cars is growing but in absolute terms, is also still negligible.

Figure 7 Cars Licensed by Propulsion Type 2000-2009 (thousands)

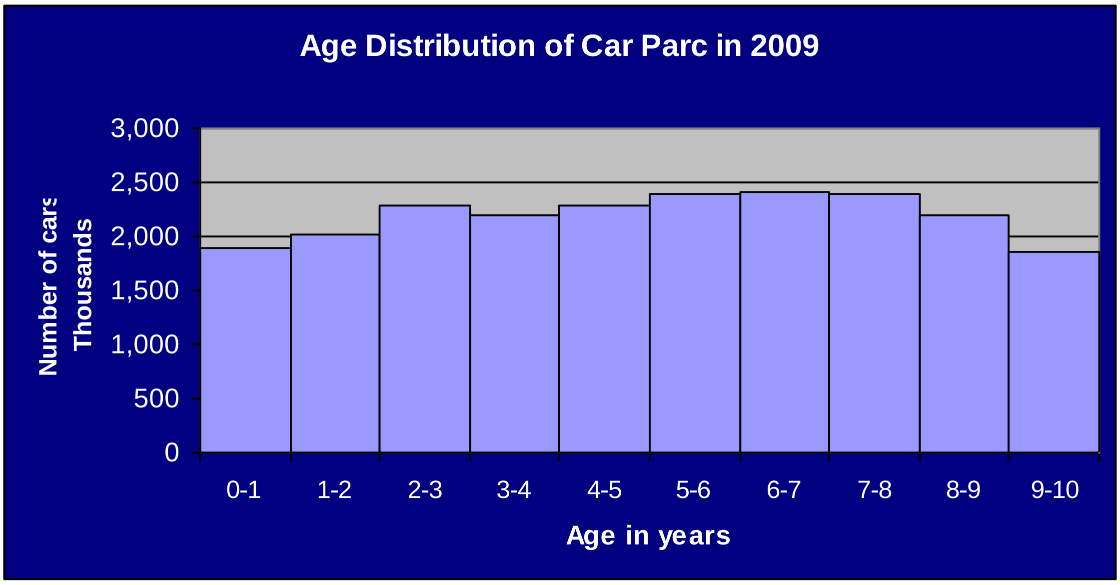
	Petrol		Diesel		Petrol/Gas		Gas*		Electric		Hybrid Electric		Total
Year	'000	%	'000	%	'000	%	'000	%	'000	%	'000	%	'000
2000	21,233	87	3,153	13	19	-	1	-	-	-	-	-	24,406
2001	21,641	86	3,460	14	21	-	3	-	-	-	1	-	25,126
2002	21,839	85	3,912	15	23	-	6	-	-	-	1	-	25,782
2003	21,805	83	4,400	17	24	-	10	-	-	-	1	-	26,240
2004	21,977	81	5,011	19	25	-	13	-	-	-	3	-	27,028
2005	21,876	79	5,596	20	26	-	14	-	1	-	8	-	27,520
2006	21,635	78	6,135	22	27	-	16	-	1	-	17	-	27,830
2007	21,432	76	6,716	24	27	-	18	-	1	-	32	-	28,228
2008	21,064	74	7,227	25	27	-	23	-	1	-	47	-	28,390
2009	20,651	73	7,694	27	26	-	26	-	1	-	61	-	28,459

- Includes gas, gas bi-fuel and gas-diesel

Source: Table 13: Vehicle Licensing Statistics 2009

The age distribution of the car park in 2009 is shown in Figure 8, while changes in the age of the parc over the past decade are shown in Figure 9.

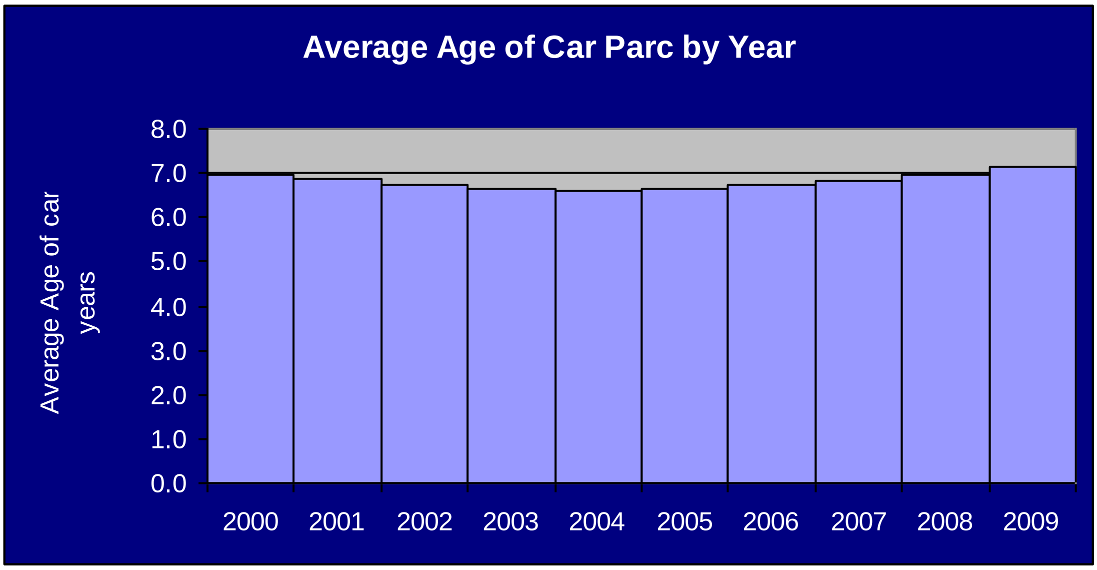
Figure 8



Source: Table 19: Vehicle Licensing Statistics 2009

Unless sales of new cars increase rapidly over the next couple of years, the dealers who tend to service and repair newer cars face a few lean years as the dip in the number of newer vehicles moves along the age profile.

Figure 9



Source: Table 19: Vehicle Licensing Statistics 2009

The rate at which the average age of the parc can change is constrained by the size of the parc and its existing age profile. There have been small but significant changes in the average age of the car park over the past decade, reflecting the high levels of purchase of new cars during the boom years around 2004, and the sudden decline in new car sales and the retention of older cars, from 2007 onwards as recession hit.

Over the past decade, registrations of commercial vehicles have shown exceptional growth, despite a 10½% fall in 2008. Total commercial vehicle registrations grew by 22% between 1999 and 2008, with light commercial vehicle demand up 25%, truck and articulated vehicle demand up by 11%, but with bus and coach registrations almost unchanged.

2.4.2 Overall industry structure

The automotive industry's structure has developed over the decades, largely as a result of the relative market and financial strength of the manufacturers and their franchised dealers compared with that of the independents. But regulation and government intervention have also played a part, recently and most significantly due to legislation surrounding the Block Exemption Regulation discussed earlier.

The standard industry business model currently has vehicle manufacturers selling through franchised or authorised dealers, occasionally arranging sales directly to large fleet buyers, but with after-sales activities arranged by the dealers and other industry participants.

After-sales servicing and warranty repairs are undertaken by a mix of franchised and authorised dealers, other authorised service agents and independent garages. The independents tend to undertake a relatively larger proportion of work on older vehicles, typically following the expiry of the warranty (when the vehicle is around 4 years old) or after a change of ownership.

Body repairs are undertaken by a variety of manufacturer franchised dealers, manufacturer accredited body repair shops and specialist independents. Because of the growing complexity of vehicles and methods required to repair specialist materials, manufacturer franchised dealers and other accredited workshops seem likely to take a growing share of this market, certainly on newer vehicles.

2.4.3 Manufacturing

The shape of manufacturing has been influenced by the special status attached by the respective host governments to being a car manufacturing nation. UK governments have variously believed in the strategic national importance of the UK motor industry, most recently by the previous Labour Government through its Automotive Assistance Programme, the Car Scrappage Incentive Scheme and the financial support offered to potential new electric vehicle manufacturing plants in the UK. However, the new coalition government's Business Secretary has indicated that government support may in future be less readily forthcoming and that policy is currently under review.

In 2008 more than 40 companies, large and small, manufactured vehicles in the UK, generating around £50 billion turnover, £10 billion of value added and 180,000 jobs. The UK automotive manufacturing industry is also characterised by significant foreign direct investment and a high level of exports. In 2008 1.6 million vehicles, of which 1.4 million were cars, were manufactured in the UK. Of these, more than 1.1 million were exported. However a greater number of vehicles, around 1.7 million, were imported. Over the years, there has been a steady increase in the proportion of both imported and exported cars, with imports' share of the UK market rising from 71.6% in 1999 to 86.4% in 2008.

Over the past decade the automotive manufacturing industry has faced global overcapacity, resulting in generally low and irregular profitability. While consolidation among manufacturers has been ongoing for several decades, new manufacturers have entered the market from Eastern Europe and the Far East. Despite some further consolidation during the recession, excess capacity still persists; while at the same time countries such as India and China have plans to develop their own indigenous automotive manufacturing companies. This raises the question of what the scale and form any further industry consolidation may take over the coming decade, whether in the extreme the UK could find itself entirely dependent upon imports, and whether any future changes in the structure and location of vehicle manufacturing will be such as to affect the UK automotive retail sector's business model and skill requirements significantly.

Furthermore, in a more cooperative or more competitive world, national manufacturers could lose the support of governments. As one interviewee observed, *"should global governments progressively allow the industry to be exposed to the full forces of global competition? No big bang deregulation or sudden dismantling of barriers, but a protected industry is a doomed industry."*

However it is not clear whether or not having an indigenous manufacturing sector will have any substantial impact on the retail automotive sector.

Nevertheless, indigenous or not, it is conceivable that in an attempt to enhance overall profitability in a competitive world, manufacturers could seek to achieve a greater share of the overall automotive industry's value added by trying to regain control of after-sales activities. Indeed, it has been suggested that the advent of electric or hydrogen vehicles could be an incentive and aid towards achieving this, a move that would clearly have an impact on franchised and independent dealers, repairers and their staff. The counter argument, however, is that competition might force manufacturers to focus even more on their existing core activities.

2.4.4 The Automotive Retail Industry

In 2008, the automotive retail sector generated turnover of £154 billion, nearly three quarters of which was from vehicle sales businesses, and £29 billion gross value added. The sector accounted for 2% of the UK workforce, some 570,990 staff, working across nearly 81,000 business units. The majority of these units, 85%, were businesses employing less than ten people. In addition, nearly two thirds of staff work in SMEs.

The main characteristics of the automotive retail industry's principal sub-sectors or activities are outlined below together with comment on key trends, issues and uncertainties.

Dealers and franchisees

The BCA Used Car Report 2008, estimated that new car sales and second hand sales each generated turnover of £33 billion in 2007, although the number of second hand vehicles sold was some three times the number of new cars. The value of both sectors of the market has been quite similar for the past decade. Used car dealers accounted for about three quarters of the value of second hand sales, the remainder being private sales.

Dealers margins are low, having been squeezed by factors such as the general level of competition in the sector, better informed and more price conscious customers (in part due to the advent of the internet), and overproduction of vehicles by manufacturers with strong competition for market share. The future balance between manufacturing supply and demand will clearly have a major impact on future industry margins.

The number of dealers in the UK has been in long term decline at a time when the level of new vehicle registrations and the size of the vehicle parc have shown a trend increase. Indeed, according to Glassock and Associates, the UK now has the lowest dealer density in Western Europe. Various factors have been implicated, but the most likely causes seem to be manufacturers' franchising policies and dealer cost structures.

Thin margins on new car sales have meant that dealers have needed to retain servicing and second hand car sales to survive. Looking ahead, potential threats to the competitive position of traditional dealerships and their margins include:

- growth of car supermarkets;
- direct sales by manufacturers;
- regulation to enhance competition further;
- success by independents in taking a greater share of a declining servicing market, perhaps due to the impact of regulatory changes.

Repair, maintenance and servicing (RMS)

The 2008 Trend Tracker Report estimates the total number of mechanical service and repair workshops to be around 21,000 in 2008, having fallen from 30,000 in 1998. Independent garages account for marginally over half the current total. The report suggests that the market for RMS, excluding MoT tests, was then around £8 billion. The extent to which individuals undertake DIY maintenance and repairs on their own cars is said to have fallen substantially over the decade.

The market for both servicing and mechanical repairs has also been experiencing a trend decline in volume. In terms of cyclicality, it is partially insulated from the worst extremes of the economic cycle as vehicles are subject to annual MoT tests which in turn generate a high proportion of repair work on older cars. Furthermore, cars up to three years old tend to be serviced regularly to avoid problems with warranty claims which could result from failure to meet the manufacturer's specified service schedule.

Franchised dealers' servicing turnover grew prior to the recession as a result of the number of new car sales and the impact of longer warranties. The recent decline in sales, however, has had the opposite impact on franchised dealers, and there has been a further decline in the number of franchised dealer outlets.

The independent workshops are typically owned and operated by self employed proprietors, or are occasionally limited companies, mostly fairly small. In 2008, according to Trend Tracker, there were only three companies operating more than six sites: Nationwide Autocentres with 224 sites; Formula One Autocentres with 50 sites; and Mr Clutch Autocentres with 28 sites. In early 2010, Halfords acquired Nationwide and plans to open a further 200 centres, creating 1,000 new jobs. In a world of certification and consumers demanding high quality, service and surety, coupled with reasonable prices, this could be an indication of future trends and increased competition for the small independents.

The vast majority of independents are currently single outlet operations. The proprietors have often been trained as mechanics at franchised dealerships or at other independent garages, and have often previously had little management or general business training. However, past concerns that the independents would not survive increased competitive pressures, the demands of advances in vehicle technology, and the need and ability to invest in new equipment, have not as yet generally come to pass.

Finally, a recently reported trend in large cities has been for an increase in DIY work undertaken by friends, particularly amongst immigrant communities. Presumably much of any such work is on older vehicles.

Fast fit

Another element of the repair, maintenance and servicing sector comprises the fast-fit operators such as Kwik-Fit which together have turnover, estimated by Trend tracker, of some £1.4 billion.

It has been suggested that the fast-fit sector is limited by its low penetration of the general service market and the decline in the number of mechanical repairs. Some of the fast-fit companies have opened MoT test centres in an attempt to bring in some repair work. However quality improvements by the assemblers and component manufacturers may reduce the demand for many fast-fit operations. On the other hand increased modularisation of components may increase the potential for fast fit replacement on a range of components.

Body shops

Trend Tracker's recent report, "*The Future of the Car Body Repair Market in the UK 2010-2015"*, shows that the recession has hit body-shops, accelerating the gradual shrinkage of the crash repair market that has occurred in recent years. Indeed the report also states that over the past decade, there has been a reduction of over 2,000 in the number of primary body-shops.

As noted earlier, incorporation of new materials and technologies within vehicles have required new and specialist repair techniques, leading to more manufacturer accredited workshops. There has also been pressure to reduce repair costs (parts and labour) by making it easier to undertake repair work, often by replacing rather than repairing body parts. In part this pressure on cost reduction has stemmed from insurers which are striving to contain their own costs and insurance premiums as competition in the sector has mounted with the arrival of new entrants such as Direct Line and price comparison websites.

Fleets, leasing and rental

Rental and other fleet sales of new cars totalled 1.1 million in 2008, representing a little over half new car sales. Sales to other business users accounted for a further 6% of the total. The current fleet parc totals over 2.5m cars, vans and trucks. Some 10 million people rent a vehicle each year.

There has been steady consolidation in the rental and leasing sector over the past 20 years. Views differ as to whether this trend will continue.

The economics of fleet operators and the size of their fleets will be sensitive to various factors, not least:

- the future cost and availability of capital. Securing capital at advantageous rates is an important component of leasing economics, as can be the prevailing tax structure and rules. Particularly under certain scenarios, capital could be costly and availability of credit tight over the coming decade.

- the residual value of vehicles when they come to the end of their lease. The unpredictability of resale prices is a serious risk to the sector, given that depreciation can represent some 40% of leasing costs, although the risk can go either way.

Among possible developments in the sub-sector, captive finance houses could re-emerge, branded and operated by the manufacturers and aimed at businesses, including employee owned “company cars”.

Attitudes on the part of the individual consumer towards car ownership are also likely to play a part in the future of the sub-sector. Members of the younger generation, for example, may opt to lease or rent rather than own a car, perhaps on account of the comparative cost certainty and financial convenience which leasing and rental can offer.

Roadside assistance and recovery

The improved reliability of vehicles has resulted in a trend reduction in the frequency of vehicle breakdowns over time. Latterly, the sector has also suffered from the effects of recession.

During the recession, larger employers have reported a slight negative impact, with business to business sales having decreased in line with the reduction in new car sales. This has been partially offset by an increased number of breakdowns occurring among individuals who have opted to continue to run rather than replace their ageing vehicles. Medium and smaller employers, however, have reported large decreases in work which they attribute mainly to decreased road traffic due not only to the recession but to higher fuel prices. Other reports suggest that commercial vehicle and truck breakdowns have reduced dramatically as a result of a decrease in deliveries and therefore road traffic.

Cyclical variations in the fortunes of the road assistance and recovery sub-sector seem likely to continue, the extent depending on the future degree of economic volatility which is likely to vary across alternative future scenarios. The longer term underlying trends faced by the sub-sector are likely to hinge on a combination of variables including the pace of economic growth and demand for transport, the relative cost and demand for road transport, the age of the vehicle fleet, and changes in vehicle technology and reliability.

Component manufacture and spare parts supply and distribution

The automotive component manufacturers play a very significant role in developing new vehicle technology and in the supply of spare parts, both of which clearly affect the automotive retail sector. There are some who believe that over time, the scale of investment in technological research and development by the major component manufacturers could strengthen their competitive position vis-à-vis the vehicle manufacturers.

A government survey conducted in 2006 indicates that there were more than 2,600 component manufacturers in the UK, contributing over £4.8 billion added value and employing around 132,000 people. Within the component manufacturing sub-sector, the UK has hitherto been an important force in power-train design and production, with a particular strength in internal combustion engines.

Looking to the future, there are a number of questions regarding the manufacture, supply and distribution of parts to manufacturers, dealers and repairers. They include, in particular:

- the effect of the new Block Exemption Regulations upon both the supply of spare parts to existing parts distribution channels and the competitive balance between the workshops of franchised dealers and those of the independents;
- the consequences of a possible strengthening of the competitive position of the component manufacturers vis-à-vis vehicle manufacturers;
- the way in which UK engine manufacturers respond to the introduction of electric vehicles;
- the impact of such changes on the automotive retail sector.

2.4.5 Business models

The preceding analysis has flagged various trends and stresses in the industry and its structure, and there appears to be a fairly widespread feeling in the industry that changes in its business models, if not in the structure itself, are necessary and likely. The nature of any changes that actually materialise will depend on the outcome of a range of separate trends and forces for change.

Some industry participants and observers argue that the industry lacks adequate strategic thinking and direction, and that this needs to be addressed. This in turn is likely to require stronger leadership, management skills, and coordination between businesses and their representative organisations, including the larger customers and business owners.

Among other factors which may affect future industry business models, and which may vary in scope and degree under different scenarios, are:

- the impact of the knowledge economy, ICT, the internet and commercial electronics;
- possible changes in how and where profit and value added is generated in the supply chain;
- changes in productivity of labour and other inputs;
- whether the concept of selling mobility rather than a vehicle (a service, rather than a product) takes hold;
- the future cost and availability of capital;
- the extent to which there is a significant shift away from the internal combustion engine;
- legislation and regulation;
- taxation and road charging.

Changes in the business model could include:

- more car dealer supermarkets, selling new and second-hand cars;
- increased penetration of downstream markets by manufacturers;
- more vehicle rental, leasing, and car-clubs;
- more, or less, specialisation in what any member of the supply chain offers;
- more highly professional garages, involving more regulation and a reduction both in DIY and the so-called cowboy operators.

With respect to the foregoing list of factors, the following specific comments are to be noted.

The internet and commercial electronics

Although few car sales transactions are yet completed on line in the UK, the web has rapidly become a major research tool for car buyers. It is suggested that if the internet makes deeper in-roads into the market, there could be a substantial change in the business model of dealers, and no doubt that of manufacturers who could also seek to exploit its potential. Already one of the major US dealers is said to sell 30% of its cars over the internet without ever seeing the customer. However, even before such a step change in the sales model were to occur in the UK, the internet could provide significant cost savings for dealers if much of the decision making by purchasers is done before ever they visit the dealership and if purchasers are simply seeking a test drive prior to making their final purchase decision. Dealers faced with much more knowledgeable customers may, however, equally be faced with the prospect of either having to sell entirely on price or provide the customer with a much enhanced level of service and value added.

Pre-informed and more knowledgeable customers are also more likely to be prepared to travel further to a dealer to secure a test drive and conclude their purchase, thereby allowing dealer sales outlets to operate over wider catchment areas. Greater distance from the dealer, however, is likely to be seen as a drawback by the customer when it comes to service and repair and, particularly given the new block exemption rules, the dealer may consequently lose after-sales income, particularly on older vehicles. The answer for larger dealerships may be a combination of fewer sales outlets coupled with an unchanged or greater number of local service centres. It may be that smaller, independent service and repair workshops benefit from a reduction in the number of large dealer outlets and increase their share of the after-sales market, particularly given better access to manufacturer branded parts and technical information on how to service the increasingly widespread and complex electronic systems on the modern vehicle.

Whatever the outturn, sales and service personnel are likely to have to adopt different attitudes and skills to sell to an internet-based clientele and cope with the technology embedded in new vehicles.

Profit and value added in the supply chain and potential efficiency gains

Over a vehicle's lifetime, it can generate turnover and margin for a range of businesses in the automotive sector. Manufacturers are believed to secure less than half of this margin.

Profits attributable to new car sales are generally not the major contributor to dealers' overall operating profits; used car margins, finance, insurance and service, repair and other after-sales income are usually more important. As already noted, the profitability of vehicle dealerships is generally low. Dealers may be able to survive by increasing value added through enhancing the value of their service offering, but it seems likely that many will also have to tackle underlying structural and operational inefficiencies in their business.

Possible collaboration between dealerships on sharing stock and logistics may be among the future options that allow dealers to operate with less vehicle storage space and relatively less capital. Only larger dealers will be able to take advantage of efficiencies such as single call centres, centralised administration, CRM, marketing, wholesale parts and vehicle preparation areas – although it is always possible that a new market entrant could in future establish itself as a central outsourcing operator, providing shared services to independent dealerships.

Repair activities are not immune from the general competitive pressures on margins. Indeed, average labour charge-out rates are likely to rise due to higher levels of skills, tighter legislation and a shortage of quality labour. It has been suggested that in many instances, workshop capacity and resources are poorly managed and that utilisation rates could be significantly increased, perhaps by differential charging or by introducing off-peak rates for services such as MoTs carried out during normally quieter times of the day or week when workshop facilities may be underutilised. Some franchised dealers are now offering discounted rates and charges for work on older vehicles in a drive to retain customer loyalty.

Vehicle manufacturers have also developed fast-fit programmes to try to maintain vehicle servicing at franchised dealers, particularly of older cars.

The concept of selling mobility rather than a vehicle

The idea that the automobile sector should be selling mobility rather than cars or vans has been around some time. One industry observer wrote in 2000 that *"a revolution in contract hire, leasing and fleet management company services will see them transformed into mobility traders within three years"*. There are now signs that the concept may be taking hold, albeit slowly.

There is, however, a strong perception that British consumers like to own their cars. In particular the variable cost of rental appears significantly higher than owning a vehicle once the capital sum is paid. However, regulation and the cost of car use in cities, together with the convenience of rental and the potential cost to the individual of owning several cars to meet different needs, could lead to changed consumer attitudes.

New forms of rental are developing beyond van hire and the airport car rental and appear increasingly attractive, particularly to urban drivers faced with high parking and congestion charges. Car-clubs such as Hertz's "Connect" appear to be a growing success, especially in cities. Instead of owning a car (or two cars), drivers may hire cars suitable for a specific purpose as and when required, for short or long periods. Several private companies are reported to be investigating the market, and among manufacturers, Peugeot is said to be showing an interest.

Whipcar has recently launched a web initiative whereby car owners are offered the opportunity to rent their car to their neighbours. Greatly improved methods of reservation and payment based on mobile devices for car clubs are also now established.

While there are sections of the market that, according to a Trend Tracker “White Paper”, believe that *“the concept of using rather than owning cars remains alien to the majority of private motorists”*, and there seems to be general agreement that the concept of widespread private car-share is currently a non-runner, a significant future change in attitudes and prospects, driven by a combination of cost and regulatory changes, cannot be discounted.

Cost and availability of capital

Comment has already been made with respect to the future cost, availability and sources of capital, and how these may vary under alternative macro economic scenarios. Cost and availability of capital will clearly be a significant factor in determining the future fortunes of the UK automotive retail industry, both with respect to providing working capital for businesses in the sector as well as financing the purchase of cars and other vehicles by business users and private individuals.

The use of capital by the automotive retail sector largely revolves around the financing of dealer stocks of vehicles for sale and of vehicles for leasing or rental to individuals or companies.

Beyond the financing of the vehicle stock, much of the automotive retail sector has relatively low capital requirements; this applies particularly to repair, maintenance and servicing activities where financial barriers to market entry are relatively modest. The principal exception is perhaps the cost of land and premises, even in the current property market. Dealers’ margins are frequently too low to justify new premises, and there is a temptation for some smaller garages to sell up in central London (and maybe other cities) and cash in or move to cheaper premises out of the centre. Indeed one interviewee commented that it was unlikely that general supermarkets would move into the field of selling cars as the achievable income per sq metre is too low.

As previously noted, company cars have comprised a very important component of the new car sales market in recent decades. Indeed, the proportion of company cars sales in the UK is believed to be the highest in Europe.

However a major factor in the popularity of company cars in both employee and employer eyes appears to be the availability and cost of capital alongside other considerations such as taxation, company accounting principles, relative costs of maintenance, reliability and the perceived benefits of ease of use. Clearly, changes in the attractiveness of company cars and in the balance between private car ownership and company cars could have a significant impact on virtually all automotive retail sub-sectors.

In the case of vehicle leasing, the availability and the post-tax cost of capital have also been instrumental in the development of the sub-sector. Leasing is often closely tied to company car packages, and both will be important in sustaining activity in the sector. Currently the position is reported to be difficult due to general constraints on availability of finance in the wake of the recession.

Investors in the rental and leasing sector have come and gone. A variety of organisations have invested, such as original equipment manufacturers (OEMs) which wanted rental companies to show-case their cars, and others who simply saw a good potential return. However, leasing is a high risk business, sensitive to the cost of capital and heavily dependant on residual value at lease end. Consequently, future investment is likely to appeal particularly to private equity and venture capital unless capital becomes more freely available, less expensive and the car market as a whole exhibits a greater degree of stability, particularly with respect to new vehicle prices and second-hand values.

Leasing to individuals has been growing in recent years and now represents around 10% of BVRLA members’ cars. As noted earlier, younger people may be more inclined towards leasing and rental deals which give more certainty of cost, and while the current overproduction of cars persists, leasing companies may be capable of securing substantial discounts on volume purchases, thereby lowering the overall cost of leasing to the consumer. Even with constraints on availability of finance, leasing companies may be able to secure funding more easily than individuals if they are perceived by lenders to be a more predictable credit risk.

Finally, with respect to dealer finance, it has been claimed that the credit arm of some automotive business portfolios is often the most profitable part. Unless credit becomes more readily available, the ability of the sector to achieve satisfactory levels of future profitability could be adversely affected.

A significant shift away from the internal combustion engine

A move away from internal combustion (IC) engines could be a significant force for business change in the automotive industry.

At present, all new cars are distributed through dealers (even if the deal is arranged by the manufacturer). However manufacturers may look for additional value added as a means of enhancing overall margins, and there may be opportunities for them to do this with the advent of electric vehicles, perhaps by securing lock-in on electric vehicles through leasing batteries to the purchaser of the vehicle. Such a move might be extended to leasing the vehicle, effectively cutting out the dealer, a move that could possibly be facilitated by the lower maintenance needs of electric cars.

Under some scenarios, it is thus conceivable that the industry could eventually end up with a split between businesses which focus on the legacy IC product and those which serve the new technologies, each possibly requiring its own particular skill set.

Regulation

Regulation has been discussed at some length earlier in this chapter, but its effect on the industry's potential future business models needs to be re-iterated.

The impact of high and expensive levels of certification to improve the average quality of the parc, through scrappage or by criminalising DIY work, could have a significant effect on smaller independent garages and drive many out of business, providing greater opportunities for the larger independent chains and franchised dealers.

On the other hand, stronger EU regulation aimed at improving competitiveness could further reduce the ability of dealers to retain after sales business such as warranty repairs and in-warranty maintenance.

2.5 Motorist Behaviours and Expectations

2.5.1 A new driving public and Generation Y

The demographic mix of UK motorists is changing. Glassock and Associates suggest that over the past two decades, two clear changes have occurred:

- women have become an important group of motorists, frequently being a vehicle's prime driver;
- older drivers (55+) are also of increasing importance in both new and used car markets, and are now estimated to account for over half the number of new car buyers.

The participation of 17 to 20 year olds has fallen sharply, possibly due to the high cost of driver education, the very high cost of insurance and the increasing numbers in full-time education. Glassock also suggests that the 25 to 34 age group has diminished as new car buyers, probably due to increasing vehicle reliability and the durability of older cars.

Conversely, the older age groups are also becoming more active and will expect to continue driving until a later age as life expectancy increases. Automation of driving, discussed later in this chapter under technical developments, may eventually help to keep older drivers mobile beyond the stage permitted by current health requirements.

Members of the so-called new *"Generation Y"* group, typified by younger, more ICT literate and sustainably aware individuals, are likely to seek high levels of technology in their vehicles, including improved green features and safety features, particularly those that protect other road users, as well as in car communication and entertainment. It is also suggested that the younger generation will not be as tied to vehicle brands as the older generation, and that sales teams will need to work harder to retain these customers.

The alternative scenarios presented in Chapter Three implicitly assume differences in consumer attitudes, but such changes seem most likely to occur gradually rather than rapidly, and consumer behaviour over the next ten years may be influenced as much, if not more, by short term political, economic and cost factors.

Mobility and distance travelled

Since 1970, the annual number of vehicle kilometres in the UK has roughly tripled for both cars and vans. A government report shows that the total distance travelled by UK vehicles in 2006 was 506.4 billion km of which cars represented 79% of the total and LCVs 13%. By type of road, motorway journeys represented 20% of vehicle kilometres, rural journeys 42% and urban journeys 38%. The average car journey was 13.6km and 93% of all car journeys were less than 40km.

Looking ahead, there is a general expectation that people will still want private personal mobility, even acknowledging the green factor, and that they will resist excessive restrictions on their travel, notwithstanding the cost and irritation of congestion. As one interviewee observed, *"the British public won't lose their love affair with the motor car, but may want a smaller, more environmentally friendly vehicle in future. But...the public is fickle....hatred of the 4x4 evaporated during the recent severe winter weather, and waiting lists for new vehicles extended; second-hand prices rose."*

The previous UK government implemented measures such as the *"Smarter Choices"* programme, designed to support and encourage cycling, walking, and public transport use, ease congestion, increase physical activity and reduce emissions of greenhouse gases and air pollutants in major urban areas. Initially aimed at urban and rural areas, it was accepted that it would only have an impact in urban areas because of the fewer alternatives to the use of the car in rural areas.

The reduction in vehicle kilometres in urban areas as a result of *"Smarter Choices"* is forecast to be a modest 3.7% by 2020. Other measures such as road pricing and congestion zones are being more widely considered, but it is uncertain if, when and on what scale such measures may be implemented and whether they will result in a significant reduction in vehicle kilometres.

2.5.2 Type of car

Notwithstanding current pressures to reduce the amount of car ownership, there has been a growing diversity of cars available in the UK market over the past decade.

Consumers have an increased array of models, body styles and power trains from which to choose. The increased choice of models follows the arrival and growth of niche products such as MPVs and 4x4 dual purpose vehicles, reflecting changing affluence and lifestyle. A household may have a conventional vehicle for routine use but also have less conventional vehicles for weekends, holidays or special purposes. This may be accentuated in larger household sizes, where children of driving age are still living at home.

As noted earlier, there has been a significant shift to diesel-powered vehicles, driven largely by reduced fuel costs but buoyed by the improved refinement and performance of diesel engines.

Small cars have benefitted from improved space and performance, along with the desire for more economical motoring. Up-market manufacturers are increasingly looking at smaller cars, but will need to secure significant mass market share to ensure viability.

Consumers will in future require greater help in understanding which is the most appropriate vehicle or vehicles to suit their individual needs. Current electric vehicle models for example are not for motorway driving.

2.5.3 Warranties and servicing

As a result of higher levels of quality in assembly and components, the major vehicle manufacturers are now able to give a three-year warranty on new cars. Pressure from the fleet and business market is likely to force vehicle manufacturers to continue reducing lifetime vehicle ownership costs, reliability is likely to improve further, and as a result, warranty periods may well be progressively extended, with five years perhaps becoming standard. Indeed, Toyota has just announced a five year warranty on all its models. Service intervals may also lengthen further, perhaps not substantially due to safety considerations, with service content continuing to decline.

The increase in reliability and longer warranties may lead some owners, who used to change their vehicles every 2 to 3 years, to keep them longer. Hyundai and Kia offer 7 year warranties. This has really caught on in some customers' minds and has boosted the market share of those two companies, although each still only has a UK market share of some 3%. In particular, UK silver £ buyers, who may now keep their vehicle for 7 years or more, seem particularly attracted to these long warranty periods – possibly because of the greater certainty which they provide regarding the long-term operational cost of their vehicle. This may be very significant to franchised dealers who often lose the servicing on a vehicle when it changes owner for the first time.

There are also some new marketing packages in which the selling price of the new vehicle not only covers longer warranties but also inclusive service. For example, the BMW Mini offers an inclusive five year service & warranty, albeit at a price. This too gives the buyer greater certainty over running cost and captures value for the manufacturer, while any service and repair work is retained by the franchised dealer rather than leaking out to the independent sector.

These trends seem fairly likely to continue, although they may be more pronounced in some scenarios than others, particularly reflecting prevailing levels of affluence and the extent to which a strong culture of service develops. The technology to improve reliability certainly seems to be well established.

2.5.4 Quality of service

Repair, maintenance and servicing (RMS)

As noted earlier, there seems to be a fairly widespread acknowledgement that the RMS sector does not have a particularly good reputation with consumers and steps are being taken to try to remediate this. However, in some scenarios the levels of improvement demanded by consumers will be very much higher than present measures appear likely to achieve, and further steps will need to be taken. Accreditation of the industry would surely help to improve its image and its output. No statutory accreditation has yet been implemented, but some progress has been made in self accreditation, as discussed below.

Rental

A poor reputation also applies, possibly with less justification, to the rental sector. The sector is trying to provide a highly efficient service at budget prices and is not always succeeding. Particular issues relate to disagreements on damage assessment, cost and liability in the event of an accident. There appears to be scope for better education of the public and employees.

New Car Sales

UK consumers are increasingly buying new cars on merit and demanding better quality and value. Unlike the UK, the retail network in the rest of Europe tends to place significant emphasis on national brand loyalty. Europe also has a much higher concentration of small family-run dealerships. The UK in comparison has seen the growth of a number of large quoted plcs, such as Pendragon and Inchcape, which operate successful multi-marque networks. However, with vehicles becoming more homogenous, brand differentiation increasingly hinges on customer service. This applies to the manufacturers, their franchisees and the independent dealers. Some manufacturers are taking this seriously. A recent report by the Institute of Customer Service had Mercedes and BMW ranking as 15th and 16th respectively in terms of quality of customer service among all companies in the UK. The top four positions were incidentally taken by Waitrose, John Lewis, M&S Food and M&S.

2.5.5 Self regulation and accreditation

There are currently significant concerns within the industry that regulation is needed to allay the poor image held by many consumers. Self-regulation generally appears to be the preferred route, although some would be content to see government regulation in the event that self regulation were to fail.

One of the first moves proposed is accreditation of more people in the industry, coupled with accreditation of organisations. Whether this will go far enough to persuade the public to use only those with accreditation, or whether (self) regulation will be necessary to ensure that only those with the proper procedures can operate, remains uncertain.

There have already been significant moves to increase the amount of accreditation within the industry, largely designed to rid the motor trade of its dubious reputation and initially aimed at vehicle technicians. Over 13,000 individuals have achieved Automotive Technician Accreditation (ATA), and schemes are now being extended to parts distributors, technical advisors and other technical and customer facing staff either using ATA or by developing parallel qualifications.

In May 2010, the IMI launched the Automotive Management Accreditation (AMA) scheme which will work on a similar basis to the successful ATA scheme but which is designed to address managerial needs specific to the sector. It measures the competence of automotive managers, and signposts their development needs, benefitting both individuals and the businesses for which they work.

Accreditation is primarily used by the franchise and authorised repairer sector, which, to meet the standards set by vehicle manufacturers, has in the past spent substantially more on technician training than the independent sector. The training to certification involves considerable investment, but it is reported by Trend Tracker that the content related to administration and customer service has been effective. It remains to be seen whether future accreditation and training will become more or less manufacturer specific.

Accreditation also brings funds and attracts apprentices, can be demanded by insurance companies paying for repairs, and is a sign of increased professionalism in the industry. It is, however, very important to stress that effective accreditation is a moving target and one where the content and standards embodied in specific accreditation schemes must keep abreast of developments in vehicle technology and specifications in order to ensure that those receiving accreditation keep their levels of competence up-to-date with respect to the tasks which they undertake.

Industry Recognised Standards

In addition to accreditation of individuals and organisations in the industry, the view has been expressed that a "*consumer code of practice, which ensures a minimum standard of customer* *care and a commitment to the consumer, has to be a starting point for a successful future, although getting such a code recognised and enforced more widely will be an issue*."

At present a number of separate codes of practice and standards exist within the automotive retail sector.

Among the codes, the Motor Industry Codes of Practice went live on 29th August 2008.

The Garage Code is a voluntary scheme with more than 6,200 garages signed up by 2010 (for just £75 a year). The scheme has the backing of the Society for Motor Manufacturers and Traders (SMMT) and the Retail Motor Industry Federation (RMIF). A range of methods including mystery shopping is used to monitor the performance of member garages. The code requires members to give a cost breakdown in any quotes and to gain customer approval before starting any work. Member garages must not ask for up-front deposits

The BSI's Publicly Available Standard (PAS 80) Kitemark scheme for Light Vehicle Servicing sets higher technical standards than the Garage Code. It defines standards for customer service which ensure that technical and service standards are maintained; and provides a quality framework for garages, including fast-fit outlets, which service and repair vehicles. A garage's mechanics must be trained to at least Level 3 NVQ standard to win the Kitemark. It is believed that between 1,000 and 2,000 garages have PAS 80.

The Kwik-Fit fast-fit chain, the largest UK service and repair chain by size, adopted the BSI standard in 2007, effectively doubling the number of PAS 80 certified garages with all its 663 centres and mobile units across the UK. Kwik-Fit's HQ and centres had been accredited with ISO 9001, the quality management standard, since 1992.

The PAS 125 standard was created for the accident repair industry in order to improve the quality of vehicle repairs. It sets minimum standards for accident repair centres around personnel, equipment, repair methods and quality of materials etc. The majority of accident repair work is driven into the sector by insurers who are increasingly stipulating that repair centres adhere to the PAS 125 standard.

The Good Garage Scheme, run by Forte, informs its customers that in using its member garages "*you'll find local independent garages you can trust to complete your car service competently. Be assured that every car repair garage listed performs services to a strict code of conduct and will always have your best interests at heart.*
Good Garage Scheme members can carry out all your car servicing and car repairs during a vehicle's warranty period without invalidating warranty conditions. For more information, go to our Car Service page..... We're run by Forte and are dedicated to driving up standards in the car service and car repair market."

Finally, the Finance & Leasing Association (FLA), the main representative body for the motor finance, consumer credit and asset finance sectors in the UK, established its own certification, the Specialist Automotive Finance (SAF), in 2007. This scheme assesses the knowledge of finance products sold in dealerships, as well as motor finance regulation. In August 2009, the FLA extended SAF certification for individuals (SAF Expert) to companies. FLA member companies financed around 50% of all new car registrations in the UK in 2006.

It has been suggested that there should be less competition between industry bodies and trade associations in certain areas of the industry such as accreditation, where greater standardisation and recognition of others' accreditation schemes might instil greater consumer confidence in the industry as a whole.

2.6 Automotive Technology & Innovation

2.6.1 The speed of innovation within the sector

The pace of technological change in the retail automotive sector is likely to be largely determined by the manufacturing sector and the type of vehicles produced. Demands on the retail sector will be progressive as new vehicle types enter the parc and as new technologies become standard.

The rate of change in the manufacturing sector is driven by regulation, consumer demands and competition. There are differing views on the strength with which manufacturers resist or drive change. Some argue that manufacturers drive change to maintain a competitive edge. Others argue that rapid change brings a cost penalty to manufacturers who have to write-off tooling and other investment over a shorter time-frame, and that to a degree, change may be forced on manufacturers by government regulation and other external factors. It is noteworthy that some component designs have been around 20 years or more – and nobody is claiming that this is because there here have been no design or manufacturing improvements since. Some manufacturers claim that the industry is moving very rapidly, to the point where consumers can have problems keeping up with the technology. Indeed, there is also a view that too rapid a rate of change in technology in high value items such as cars may actually be a disincentive to buyers.

Whatever the catalyst for specific innovations and changes in vehicle technologies and specifications, it does seem clear that most technologies exist a long time before they become widely adopted by vehicle manufacturers, partly due to slow gestation in implementing the technology and partly due to slow take-up.

In today's environment, with pressures to increase sustainability, it is probably irrelevant who is forcing the pace. It is difficult for the UK, or any participant in the market, to act alone in trying to influence the development of transport technology. Standards are generally defined at European or wider international levels, and international transport networks serve global markets. Manufacturers of components and original equipment manufacturers (OEMs) are largely international and designs have to meet the demands of world markets, not just an individual nation's markets.

Although regulation is a major driver of change, government equally needs to be careful that conflicting regulations do not inhibit or penalise desired change, Furthermore, installation of the right infrastructure will be necessary before the take-up of the more structural technological changes, such as plug-in electric cars, can accelerate.

Manufacturers' caution in committing to a new technology will normally mean a greater diversity of types of car on the market in times of rapid change as, initially, individual manufacturers are likely to be experimenting with different technical solutions and prototypes until it becomes clear which solutions are likely to prove commercially viable. Currently manufacturers seem reticent, probably correctly, to jump in any particular direction in the development of the new low carbon drive trains.

It appears likely that the future will see both advanced internal combustion engines and the development of new vehicle technologies over the decade to 2020, with the possibility of more rapid growth of the latter and possibly a significant shift to electrification over the longer term.

2.6.2 Low carbon internal combustion engine vehicles

The internal combustion (IC) engine is thus likely to be with us for some considerable time, as the engineering know-how and infrastructure are as yet insufficient to support widespread replacement of the IC engine by alternatively fuelled cars.

Pressure from government, industry and consumers coupled with fears over a potential shortage of petroleum and rising fuel costs, are now increasingly forcing the car manufacturing industry to reduce carbon emissions and fuel consumption in conventional IC engines. Indeed, the industry has already made considerable progress in reducing fuel consumption and emissions, and most future improvements will probably follow similar lines to those already adopted. It seems unlikely that any methods for reducing carbon emissions by 2020 are not at least already recognised, needing only relatively minor technological improvements and cost reduction to allow and promote their adoption.

Figure 10 below lists a number of currently recognised means of improving fuel efficiency. All appear likely to be deployed over the coming decade, the precise rate of implementation depending upon the strengths of prevailing green attitudes, the cost and availability of fuel and the cost of the new technologies.

There may also be greater marque differentiation, assuming that the OEMs rather than the parts manufacturers lead the changes. Indeed, faced with doubts over resale values, servicing charges and the fuel costs of the newer technologies, most vehicle owners may stick to more fuel efficient conventional technologies or reduce their car mileage, rather than spend what are currently significant additional sums of money on buying a new technology greener vehicle.

Figure 10 Technology and Methods for Increasing the Fuel Efficiency of Vehicles

Main Component	Details	Impact/ Comment
Components	High efficiency alternator.	
	High efficiency heating ventilation & air conditioning and system cooling	
	Human Machine Interface Engineering	
	Reduce extras	
	Electric power steering	
Fuel	Bio-fuels	5% or 10%
Improving driving efficiency	Auto Stop Start	
	Engine/vehicle electronic management systems	
	Vehicle Dynamics & Traction Control	
	Tyre pressure monitoring systems	
	Intelligent cruise control	
	More gears in automatic gear boxes	
Improving engine efficiency	Improved fuel injection systems	Modern turbocharged engines entering cost from 5–30% more than a baseline engine.
	Low friction oil	
	Turbocharged gasoline engines, diesel engines	
	Direct injection, homogeneous charge compression ignition	
	Variable valve timing (cams and camless)	
Recycling	Energy Storage	
	Waste Energy retrieval	
	Energy recovering brakes	
Reducing drag	Aerodynamics	
	Better surface materials and coatings	
Reducing drive train friction	Low rolling resistance tyres	
	Tyre pressure monitoring system	
Reducing weight	Reducing average vehicle size	A 10% reduction in weight increases fuel efficiency by 7%
	Engine downsizing - reduces weight and CO2	
	Lightweight body structures	
	New materials: plastics offer high performance and durability, and lighter weight compared to steel, aluminium and glass	
	Smaller/lighter components	

Finally, it seems likely that the complexity of vehicles and their maintenance will increase further as components will have to meet conflicting targets such as increased safety at the same time as reduced weight and size to improve fuel efficiency.

2.6.3 Bio-fuels

The use of bio-fuels to reduce carbon emissions is based on the premise of sustainability. Bio-fuels have been regarded as sustainable because they are not a fossil fuel, and when the biomass is grown for making the fuel, it extracts carbon from the atmosphere. The benefit in terms of reduced net CO2 emissions when used in existing vehicles is immediate, since bio-fuels can be utilised to at least a certain degree by most vehicles in the existing parc

Bio-fuels are already used as additives to many brands of petrol, and the EU has legislated to ensure that the bio-fuel content in European petroleum is raised to 10%. Fuel with 30% bio content is available in the UK, but there are reservations about its effect on engines due to its viscosity and moisture content. It also requires engines to be highly tuned.

However, there is now growing concern over the actual sustainability of growing bio-fuel crops, as the biomass required to produce the fuel can displace other valuable and necessary farming products and can also encourage deforestation. According to Friends of the Earth, if the global level of bio-fuel content in petroleum rises above 5.6%, there will be damage to rainforests. In addition, the cost and carbon intensity of the farming and conversion of bio-fuel products is such that some doubt its very effectiveness in reducing carbon emissions “well to wheel”. Nevertheless, a number of companies are already developing the next generation of bio-fuels, such as those based on algae or using cellulose, and these may overcome the short-comings of the current generation and prove to be genuinely sustainable. However, it seems unlikely that there will be much progress on this front before 2020.

In conclusion, sustainable bio-fuels have the potential to provide a low carbon alternative to fossil fuels, and promotion of such fuels is currently an important part of the DfT’s long-term emission reduction strategy. However, while the contribution of bio-fuels is expected to continue to grow over the coming decade and beyond, their use is unlikely to have a significant impact on the automotive retail sector.

2.6.4 Electric and hybrid vehicles

Over the last decade, alternatively fuelled and advanced propulsion vehicles have grown to account for almost 1% of new UK vehicle sales. The adoption of electrically powered cars appears to be a strong potential long-term contender to provide the population with continued freedom of travel and mobility coupled with a reduction in petrochemical fuel use.

The EU has called upon European governments and EU institutions to promote electric cars actively. It has recently issued plans that include a push for a standardised charger, seen as an important step in making electric vehicles viable as part of an accelerated strategy to promote their take-up. The Commission paper, however, also acknowledges that the internal combustion (IC) engine will dominate for years to come, and that to supplant them, makers of electric cars will have to find ways to reduce prices, improve range and deploy a network of charging stations, challenges that will be expensive and technically difficult.

The British Government also has electric vehicles as a central plank in its carbon reduction policy, and most major car manufacturers are now developing some type of electric vehicle.

“Electric” vehicles comprise fully electric (plug-in) vehicles, hybrid vehicles and hybrid plug-ins. Hybrids have IC engines and electric motors and batteries. The batteries are charged by the recovery of kinetic energy and from the IC engine. They are significantly more efficient than IC engines alone because of energy recovery and because their IC engine is always running at efficient speeds, not idling wastefully. Hybrid plug-ins have the added advantage of being able to charge the battery with low carbon electricity, if available, when the vehicle is parked.

Fully electric vehicles can effectively be zero carbon if they are charged with zero-carbon electricity. Current impediments to their use are their relatively short range and long recharge time, the cost of batteries, and the need for improved electrical infrastructure to provide charging points. The electric car presents some substantially different technologies for the automotive industry, with significant implications for consumer sales, vehicle usage and aftercare, particularly with respect to electric drive motors, the associated control gear, regenerative equipment and batteries.

Technically, there is little difference between hybrids and hybrid plug-ins, the main difference being the capacity, and hence size, cost and weight of the batteries.

The industry is currently tooling up to increase the number of hybrid and electric vehicles it will produce. Nissan and Renault are installing capacity to build 150,000 electric cars a year in Japan, 200,000 in Europe and 200,000 in the US, despite widespread views among their competitors and industry analysts that they will be little more than a niche product. The previous UK Government announced financial support for the installation of recharging points in several urban areas together with grants to consumers for the purchase of electric vehicles and to certain manufacturers planning to establish new production plants in the UK. How far that support is maintained under the new government, given the pressures on public finances, remains to be seen. There will almost certainly be growth in the number of electric and hybrid-electric vehicles, but the speed at which they are introduced and the resulting impact on the after-sales market is harder to predict.

Largely due to the high cost of batteries, the consensus is that electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) will cost more to produce than comparable existing vehicles for the foreseeable future. Over the medium term, the whole-life running costs of EVs and PHEVs are expected to be lower than conventionally-fuelled alternatives, primarily due to differences in fuel prices. However private consumers currently tend to buy on capital cost rather than running cost, so that education of potential customers will be required to raise awareness of the potential savings with respect to the latter.

The move to electric cars will probably be the biggest change facing the automotive sector since its inception. In the short to medium term, given the likely scale of market penetration, there is considered to be adequate power generating capacity to support the switch. The existing national transmission network will also be sufficient to cope with the power demands of electric vehicles, but there may possibly be distribution issues where local networks are already close to capacity. In such circumstances, this can be overcome with local system reinforcement, but until well after 2020, UK electricity generation as a whole will not be significantly green for electric cars to contribute substantially towards reducing carbon emissions. Indeed, a Cambridge Econometrics study predicts that on the basis of current policy, renewables will only account for around 15% of UK electricity generation by 2020, compared with the previous Government's aspiration of a 30% share. The study suggests that some changes in policy might be capable of achieving a further modest increase in this share to around 16.5%.

Longer-term, a wholesale switch to electric cars could have substantial implications for the country’s power generation and distribution system. One source has claimed that ten additional nuclear power stations would be required to convert Britain’s entire car parc from petrol to electricity although such a situation is clearly a very long way off. Indeed, current predictions suggest that worldwide electric and hybrid car sales will only amount to between 10% and 20% of overall car sales by 2020, with about a third of them being all electric. Adopting the 20% assumption would imply that the UK car parc in 2020 would contain around 300,000 electric cars and 1.3 million hybrids representing, respectively, some 1% and 5% of the total parc. It must, however, be noted that there is considerable uncertainty attaching to these projections, and it is not inconceivable to envisage scenarios that would support levels of market penetration well above or well below this range.

The global electric and hybrid market is thus still currently in its infancy and early stages of technological development. As a result, there is little firm data on vehicle reliability and vehicle life, and with technology continuing to develop, there is a concern that early vehicles may quickly become obsolete. Both of these factors will affect the confidence of consumers in purchasing such vehicles and in the ability of leasing organisations’ to predict residual values, consequently increasing the perceived risk of investing in such vehicles for leasing and rental purposes. A widespread roll-out and uptake of electric and hybrid vehicles over the coming decade and beyond would also thus require increased consumer confidence and education.

Figure 11 Some Characteristics of Electric and Hybrid Vehicles

Impact	Electric	Hybrid	Plug-in hybrid
Involves unaccustomed technology	Yes	Yes	Yes
Can reduce carbon impact	Yes	Yes a bit	Yes , more
Can meet zero carbon	Yes	No	Nearly
Servicing costs	Probably down	Probably up/same	Probably up/same
Servicing intervals	Probably longer	Same as IC	Same as IC

Servicing costs are lower for an electric car because the electric motor and its drive-train are simpler and have less maintenance requirements than the IC engine. Even other mechanical parts such as brakes require less maintenance because the use of regenerative braking itself will reduce wear. The latter also applies to hybrids.

Electric cars using lead-acid batteries require their regular replacement, while with routine maintenance, internal combustion engines can last the lifetime of the vehicle. Modern NiMH batteries would typically last the life of the vehicle. Some hybrid battery warranties are for 10 years/240,000 km.

Should service frequencies on electric and hybrid vehicles also reduce, there could be a reduction in the number of service establishments as workloads fall.

There will be regional disparities in demand for maintenance skills for fully electric cars as, certainly in the short to medium term, these are likely to be confined principally to urban localities. Market penetration by all-electric vehicles will depend on the necessary infrastructure being available, and currently only some limited trial areas are being subsidised by government for the provision of recharging stations. These areas currently include London, Milton Keynes and the North East. Use of hybrids will consequently be more ubiquitous.

2.6.5 Hydrogen power

Hydrogen as a fuel produces zero carbon emissions on the road. There are two principle methods for using hydrogen as a fuel, in fuel cells or in internal combustion.

Fuel cells are a relatively new technology in which fuels other than hydrogen, including petrochemicals, can also be used. A fuel cell uses the hydrogen to generate electricity on board the vehicle inside the fuel cell and then uses that electricity to drive an electric motor. The system is therefore more complex than a plug-in electric vehicle, although it should be able to match its efficiency and cleanliness of emissions, and will remove the major drawback of electric vehicles, namely their limited range. However, considerable further technological development will be required to make fuel cells efficient in a vehicle.

Internal combustion of hydrogen is very similar to internal combustion of vaporised liquid fuels or other gaseous fuels. The same engine with some modifications can be used, and many of the few vehicles that use hydrogen carry two types of fuel, although not normally using them at the same time. The main drawback to use of hydrogen for internal combustion is the difficulty of storage and supply, and at present, manufacturing hydrogen is also likely to involve significant carbon emissions.

The problems associated with producing, transporting and storing hydrogen for use as a vehicle fuel suggest that it is unlikely that any significant number of hydrogen fuelled cars will be seen before 2020. There may be some fleets of heavier vehicles making local journeys, such as buses, where hydrogen can be used efficiently, but the numbers are likely to remain relatively few and localised over the next few years, as is now the case.

It is also not yet clear whether fuel cell vehicles will offer the reliability and longevity that is commonly expected of general purpose vehicles. The more daunting long-term challenge will arise from the need to develop marketable vehicles in parallel with deploying new low-carbon hydrogen generation and distribution infrastructure. The current high cost of hydrogen vehicles is such that some observers believe that their impact on fuel use and emissions is unlikely to be significant until well beyond the end of the current decade, and even then there is no certainty that they will prove to be a widely viable solution. However, it must also be added that in spite of the challenges facing hydrogen, there are manufacturers who believe that electric cars will act as only a stopgap and that ultimately, hydrogen will become the long-term preferred fuel for vehicles.

Whatever the eventual outcome, the state of development of hydrogen vehicle technology and supporting infrastructure is such that there it is likely to have little impact on the automotive retail sector before 2020 or even possibly 2030.

2.6.6 Components and component manufacture

Bought-in manufactured components represent around 50% of a new vehicle’s retail price but are also important in that they can permit new technologies to penetrate the whole market more quickly. The component manufacturers also have a potentially larger effective market into which to sell their new technology than would be the case for any individual vehicle assembler. There may in future be a further shift towards more common platforms and standardised parts, as vehicle assemblers seek cost savings and the ability to switch between component manufacturers more easily.

This, together with the expansion of emerging markets, may provide opportunities for component manufacturers to strengthen their market position further.

In recent years, there has been a loss of UK component manufacture to other European nations which could make future access to parts supplies in the UK more complicated for independent repairers.

The continuing move towards more electronic components, with increasing electronic diagnostics and replacement rather than repair, will have an impact on the after-sales market. The increased complexity of such components will also demand greater attention to ordering and installing the right components. Embedded software is also likely to become more complex with the potential problem of periodic malfunctions due to hard-to-find bugs. This may in turn necessitate a greater level of manufacturer support with respect to diagnostics and fault reporting, while greater regulation and accreditation may be required of technicians where electronic components and associated software are an integral part of vehicle safety systems.

The use and implications of composites in components is discussed below. There is also the likelihood of increasing use of other new materials, including ceramics which will require training and understanding on the part of service and repair technicians.

2.6.7 Impact of technology on the RMS sector

There is very little doubt that the build quality of cars has improved, and one of the major effects of this has been the reduction in service frequency and the increasing simplicity of services. It is probable that only the increasing size of the car parc has saved the repair and maintenance sector from a more pronounced decline from that experienced.

The trend towards reduced service content on new vehicles is likely to continue. Manufacturers are under pressure from the fleet operators to continue to reduce whole life costs. However, while improved build quality may permit reduced routine servicing expenditure through extended mileage intervals, the financial risk presented by eventual component failure or accident damage is magnified by the number of complex, interconnected component systems present in each vehicle. Also there may need to be a limit to the reduction in the number of services per year for safety reasons.

Existing hybrid vehicles are claimed to have no extra maintenance requirements over internal combustion-engine vehicles, and it is generally accepted that plug-in electric vehicles will need less maintenance. The impact of hydrogen powered vehicles or of fuel cells on maintenance is not yet clear.

Warranty periods are likely to extend to five years and perhaps beyond as standard, matching the confidence of manufacturers in their vehicles. This and inclusion of “free” service periods in the sales price of vehicles will, as noted earlier, help to retain a proportion of maintenance income with the manufacturers’ franchisees or authorised agents at the expense of the independents.

The increasing level of technology in vehicles may make it more difficult for smaller independents who work on a range of vehicle marques to compete with the franchised and authorised agents as they will not have the franchised dealers’ strength of relationship with the technical departments of the manufacturers and will have the added burden of dealing with the technical departments of multiple manufacturers.

Furthermore, without proper training, electric hybrid, fuel cell and hydrogen powered vehicles could present significant dangers to motor repairers as well as potential danger and expense to their owners. One interviewee observed that there is already a growth in repair shops specialising in single marques, and this may well be a trend for the future. A future increase or decrease in the number of marques could be significant here.

Twenty five years ago, workshops were principally based around mechanical fitters, and electricians were separate beings. Now, however, all technicians have some knowledge of electrics. They spend as much time programming or diagnosing as changing parts. Hybrids and electrics vehicles will demand extra training but not different people. New technologies will be more about component replacement, less about repair.

Tools will be an issue. Access to the correct new tools is vital for a service technician, but for the independent garages they can be difficult to obtain and are expensive. This problem can only get worse unless there is a step change in the standardisation of manufacture of vehicles. The new tools including diagnostics are also not necessarily straightforward to use and technicians will need to be trained accordingly. The generic diagnostic equipment does not provide all the answers, manufacturer specific ones are expensive, and there are a lot of them. Diagnostic results still need interpretation. Wiring diagrams don’t look like real life.

Overall, there is likely to be scope for workshops to increase efficiency in their allocation of jobs to technicians and in administration of parts purchase and delivery.

2.6.8 Body shop repair work

The advances in car technology facing service technicians will also pose problems for non-specialist, all-makes body-shops who cannot afford to invest in new repair techniques and training.

There is likely to be growth in the use of new materials, probably composites, in body panels as manufacturers try to achieve new targets on weight and strength. Components will be built from composites very specifically to perform their particular function, so will normally require replacement rather than repair if damaged.

Other factors and trends which may further squeeze the business of traditional body-shops include:

- complex body structures, designed to absorb impact, which are likely to increase the rate of un-repairable total losses;
- increased use by insurers and used car dealers of SMART (Small to Medium Area Repair Techniques) rather than body-shops for small repairs;
- a reduction in accident repairs due to introduction of car radar detection systems.

Trend Tracker forecasts that the number of primary body-shops will decline by 18 per cent between 2009 and 2015, to a little over 3,000 outlets. Those who invest in specialised repair capabilities or particular makes of car may benefit at the expense of the weaker generalist majority. However, further decline of the sector may ultimately disadvantage consumers and insurance companies, and may erode the skills base needed to repair tomorrow's cars and assure their continued safety. Nevertheless, such factors do not necessarily signal the total demise of the man under the arches. Insurers are interested in cost rather than quality of repair. They may favour the cheaper repairer offering the customer a cash sum to go (or not go) where he likes and at his risk, even if not dealing with such repairers direct.

2.6.9 Improvements in servicing

Thirty years ago, the man-hours required to maintain a vehicle were probably of the order of ten times the current level. Further productivity gains are likely.

The current levels of reliability and quality of most vehicles should permit 30,000-mile service intervals on new vehicles in the very near future. Some believe that further improvements in technology could allow service intervals of up to 100,000 miles and, even eventually, the possibility of sealed-for-life engines. The main constraints on substantially longer service intervals are the need to change oil, spark plugs and brake linings. These factors and the need for periodic safety checks may mean that even if much longer mileages between services are possible, service frequency may not extend significantly. Others argue against the technical possibility of 100,000 mile services, ever.

More likely, development of new technology could lead to the removal of *routine* servicing altogether, as vehicle management systems will be able to monitor all the important variables such as the quality and volume of oil and water, component wear, performance and emissions and would inform the driver and probably the local dealer or authorised garage, when servicing is needed

The attitude of legislators and ever increasing concern about safety suggests that manufacturer recalls may become more frequent even though manufacturers and assemblers will be increasingly concerned to avoid them because of the cost and potential damage to their reputation. The quality performance of the component manufacturer is, of course, as crucial as the design and assembly skill of the manufacturer. The issues are made more complex when, as in the recent Toyota case, the same components are used by different manufacturers.

2.6.10 Vehicle scrappage and recycling technology

Scrapping cars and other vehicles has been a target for increased recycling and waste reduction and disposal, particularly with respect to toxic materials. High levels of recycling are now possible and an associated industry is being developed. Scrapping and recycling cars currently pays for itself, although the future situation will depend on the prevailing market value of recycled materials. In the UK several substantial breaking specialists are now well established, such as Autogen and Cartakeback. A regulatory framework is in place but implementation may increasingly be tightened, squeezing the smaller cheaper operations and their clients, small garages and the public.

There currently seems to be less activity with respect to recycling and reconditioning of individual components during the vehicle’s lifetime, even though there is a tendency for fewer repairs of components and greater removal and replacement, particularly with respect to the growing number of electronic units and complex body parts. As already noted, higher levels of technology and complexity of body parts to meet safety and weight regulation may actually result in a higher rate of scrappage of whole vehicles in the event of accident damage or major component failure on older vehicles, rather than replacement or repair of expensive components. Conversely the reduction in the number of mechanical components in vehicles and the greater reliability of modern components in general are already going a long way to reduce the replacement of parts.

The recent UK Car Scrappage Scheme, designed as a subsidy to the manufacturers but cloaked in green camouflage of scrapping high carbon emission vehicles, accelerated the disposal and recycling of some 400,000 vehicles.

The long term rate of scrappage will be dependent on a number of factors, not least the sales or purchase value of the vehicle relative to the cost of repairs. In periods when residual or resale values are low, scrappage rates can increase.

Scrapping and recycling may become even bigger business if electric cars become widespread, as batteries have special needs and regulations governing recycling (Waste Batteries Directive), as indeed does all electrical and electronic equipment (Waste Electric and Electronic Equipment Directive – WEEE). Clearly, buyers of newer vehicles will be less concerned than those of older vehicles about the potential scrappage costs.

2.6.11 Information and communications technology (ICT)

Internet

The internet offers a wide range of opportunities to the industry, although it also raises fears in some sectors concerning the relationships of dealers with their customers and customer retention. Indeed, some say that it has already partially severed the link between dealership and customer. With an increasing number of car buyers carrying out the majority of their research online, the opportunity for dealerships to capture customers at an early stage in their purchase decision process has been reduced.

A Which? survey, conducted in November 2009 among those who were looking at car information online, showed that the majority of people use the internet to look for reviews and car specifications rather than to make an actual vehicle purchases. The reasons why people were reluctant to buy online was their inability to physically see and check the car prior to purchase, potential problem resolution post-sale and concerns over the security of the financial transaction. On the other hand, it has been claimed that one of the major US dealers sells 30% of its cars over the internet without ever seeing the customer. This suggests that under certain scenarios, the internet has the potential to become a significant future vehicle purchase channel. Indeed, the UK automotive retail industry is believed to be way behind the general retail sector with respect to internet applications and usage. It seems likely that improved imagery and virtual reality will strengthen the internet's position as a sales tool.

Internet purchasing of all goods and services currently continues to grow. Deliveries of groceries are becoming ubiquitous, and this has already led to increases in the number of light commercial vehicles.

The internet and e-communications now seem likely to play an increasing role in the automotive retail industry's procurement, stock control and supply chain management, as well as providing a vital conduit for access to manufacturers' technical know-how, diagnostics, maintenance manuals and the online download and update of embedded software in vehicle electronic systems. Online software platforms with daily updates providing vehicle parts cataloguing, billing services and dealer services etc (e.g. AUTHORIS) are already available. As vehicle systems become more complex, dealers and repairers may increasingly resort to on-line diagnostic databanks to assist with identifying and repairing the unfamiliar and perhaps infrequent defect.

The internet is also a useful tool for customers finding local automobile services through networks such as goodgaragescheme.com. This together with on-line feedback should help customers assess the reliability and quality of smaller independent garages.

The other side of internet is a possible reduction in travel as electronic communication becomes better and replaces face to face meetings.

Over the next ten years, there are likely to be further moves towards exploiting the potential of the internet as a tool with which to increase the efficiency and productivity of the sector, and the sector as a whole needs to stay abreast of the changes.

On-board electronics and vehicle control systems

On-board electronics in vehicles have increased hugely over the past decade and have become very sophisticated. The growth in electrical equipment for labour saving, safety or environmental reasons has increased the potential amount of wiring in vehicles; this could have substantially increased the overall vehicle weight but for the advent of electronics which has slashed the weight of wiring while increasing flexibility.

The amount of electronics in cars is generally expected to continue to increase to meet further demands for comfort, safety and sustainability. Many systems that already exist in higher-priced marques will filter down to cheaper cars. New systems may be adopted depending on a number of factors. For instance:

- We can expect to see more electronic driver aids such as collision avoidance and proximity sensors, adaptive cruise control and safety systems involving cameras to identify cyclists and pedestrians.

- In the longer term, artificial control systems, with control algorithms tuned over millions of hours of simulated and real driving, will have the advantage over humans. Eventually we may come to prefer automated rather than human control. Such systems will inevitably face acceptability issues, but these might be less severe if they bring added benefits, such as the ability to maintain the mobility, and the ability to drive, of an ageing population.

- Toyota is to fit aircraft style black box data recorders into more of its cars, designed to show, after an accident, what has happened.

- Further integration of personal mobile electronics and car electronics is likely, as is further interaction between car electronics and roadside or GPS networks for hazard, congestion and speed-limit warnings.

- Information and communications technology will also play a prominent role in shaping transport demand and in enabling advances in the management and operation of transport systems.

More prosaically, one necessary adjustment to electronics in almost all but the most modern vehicles over the next five years will be the replacement of FM radios with digital radios. This is apparently not as straightforward as it might appear to be, and will certainly not be as cheap as the public may hope.

The potential implications of these developments in electronic technology and its application on the automotive retail sector may include:

- an increase in the complexity of vehicles and their electronics, accompanied by a reduction in mechanical repairs;

- added administration and complexity for independent service garages, and indeed franchised ones, in dealing with security codes and using the right software while working on vehicles;

- greater sensitivity to the consequences of mistreatment of delicate parts;

- higher levels of security and the ability to record “illicit” treatment, use, adaptation, or even maintenance, by “unauthorised” people;

- a possibly significant extension to the DVLA records of MoT tests, insurance and vehicles’ chassis numbers etc;

- the risk of an accelerated rate of change which is already probably running ahead of most drivers’ capability or interest; vehicle owners and vehicle salesmen alike will need education in the use of these new electronic gadgets and systems; and

- possibly well before 2020, the government may have to take steps to ensure that in-car entertainment, business communication and other systems do not become a driver distraction.

Traffic, fleet and network management

Road transport by road is being transformed by a communications revolution, enabling new forms of telematics services.

The advantages of these systems, which use GPS and possibly RFID (Radio Frequency Identification Devices) to allow communication between vehicle and roadside, vehicle and base, and between vehicles, include:

- efficient operation of private vehicles through avoidance of congestion;
- an effective increase in capacity of the road network:
- micro management of fleet vehicles and employee operations;
- the possibility that road-trains may become reality within a decade.

Wider use of telematics by Tesco is claimed to have reduced the company’s fuel costs by 12% and vehicle damage by 6%. Two other surveys show similar benefits. DigiCore’s 2010 Vehicle Tracking Survey found that improved productivity (41%) was still the main reason for adopting vehicle tracking, but other benefits included reduced costs, added security, and enhanced fleet and employee performance.

Buses and coaches increasingly carry global positioning systems (GPS) for real-time tracking. Originally installed for fleet management, GPS can provide information for traffic control, to give buses priority at traffic lights, and to display arrival times at bus stops.

There are understandably a number of issues surrounding the extension of the available technology.

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- There are fears that electronics may make it too easy for government to impose fines for minor offences like parking.

- Systems used to reduce congestion could be used to charge for road use; technologies intended to allow drivers to maintain high speeds in heavy traffic could be used for the controlled reduction of speeds.

- Technologies developed to maximise traffic volumes could be adapted to give priority to some road users.

- Civil liberties and privacy campaigners are concerned that RFID (radio frequency identification) will allow more than the tracking of goods.

Although probably important in the context of managing the efficient use of road infrastructure, these systems are not likely to add significantly to the impact of the changes in on-board vehicle electronics as described in the preceding sub-section of this chapter. However, regulation and congestion charging could increase the speed of traffic management system take-up and retrofit, but this should be a relatively simple task, similar to fitting a GPS.

3 Scenarios for the Automotive Retail Industry 2020

3.1 Introduction

As noted earlier, the Foresight Futures 2020 scenarios have been used in this project as an initial basis for providing alternative visions of how the international and UK economic and political environments might have evolved by 2020, in order to assess the potential implications of different futures for the long-term UK automotive retail industry's skill requirements. The scenario names adopted in the report are consequently similar to those used in the Foresight Futures 2020 report.

However, several, albeit relatively limited, changes have been made to the scenarios as originally presented in the Foresight Futures 2020 report. In part, these changes comprise points of emphasis to highlight the factors which the project's horizon scan and interviews suggest will be especially relevant in shaping future automotive retail industry skill requirements; in part, they reflect key global developments since the original Foresight Future 2020 scenario storylines were crafted and the way in which events may consequently evolve over the coming decade.

3.2 Scenario One – World Markets in 2020

The *World Markets* scenario can be summarised as reflecting a world which is driven by aspirations of personal independence, wealth and mobility to the exclusion of wider social goals; a belief in the efficacy of integrated global markets; and internationally co-ordinated policy, light regulation and a philosophy of minimal government.

3.2.1 Economic and Political Framework

Following the financial crisis and recession in 2008/2009, massive international fiscal and monetary stimuli eventually succeeded in stabilising the global economy.

While the economic and financial environment of the first few years of the 2010 decade remained somewhat volatile and uncertain, growth remained more or less in positive territory, subsequently gathering momentum in the latter half of the decade. This in turn led to increased demand and upward price pressure on commodities, many of which had suffered from reduced investment in new supply capacity in the wake of the 2008 financial crisis. The out-workings of the latter also included a shift in relative GDP growth rates and economic and political influence away from heavily indebted economies such as the US and UK towards the Asian continent, and in particular China.

Immediately following the financial crisis, there was the threat of a retreat from unfettered capitalism, and greater government intervention and regulation of markets, but this receded somewhat as growth resumed. However, the need for better global policy co-ordination and regulation, notably with respect to financial markets, was generally acknowledged and acted upon.

3.2.2 Developments in the UK

During the early 2010s, the growth of the UK economy remained sluggish and uneven under the impact of increases in taxation and cuts in public spending, as the government of the day grappled with the need to reduce the public sector budget deficit and maintain the confidence of financial markets. While tax increases inevitably figured in the equation, public expenditure cuts bore the brunt of the burden.

UK GDP, however, has since recovered to an underlying trend rate of around 2½%, close to its earlier historic norm. GDP now stands some 20% up on its 2007 pre-recession level. Real household disposable income has increased broadly in line with GDP.

The Role of the State and the Individual

Harking back to what are seen as better times, individuals wish to improve their own lives and are less concerned about equality and the effects that inequality may have on society as a whole. Economic and income growth eventually strengthen as stability and balance is progressively restored to the economy. However, the gap between rich and poor countries, and between rich and poor individuals within the UK, continues to widen.

In the UK, public expenditure cuts enacted to tackle the level of public indebtedness and poor state of public finances, coupled with pressure to limit the burden of personal and corporate taxation, have resulted in a sharp pull-back in the activities of the state, including provision of welfare payments and services where charitable and voluntary organisations have been increasingly been relied upon to take up some of the slack. Despite their best endeavours, inequality and social tensions have increased.

Various aspects of economic and financial management, commerce and trade pass to, and are co-ordinated by, global institutions, while nationally there is some further devolution of power to regions. Following the ratification of the Lisbon Treaty by all EU member states in 2009, Europe has assumed a greater role in defence and economic and social policy.

While in certain respects, the influence of Europe becomes stronger, there has also been recognition of the costs of excessive bureaucracy and its negative consequences for European competitiveness. Consequently, self-regulation has asserted its importance in a number of market areas, with a belief that corporate social responsibility can be relied upon to deliver desirable outcomes.

Consumerism is to the fore; business is focussed on developing global markets; global competition intensifies; fewer firms and brands, many multinational, come to dominate many sectors. Global standards emerge for many products and services.

Business and Consumer Services

In the UK, the main engine of growth is the business and consumer services sector, particularly healthcare, leisure and travel, financial services, media and entertainment, education and information services.

Growing national and personal income inequalities; an increase in social tensions; the increased intensity of international competition; and the increased prevalence of the digital economy and potential for cyber-crime all combine to heighten personal, business and government security concerns, thereby spawning growth of related products and services.

Manufacturing

UK manufacturing is further marginalised as traditional activities in primary industries decline, a result of business failures stemming from the 2008/2009 recession, increased competition from the BRICs, most notably China, in higher value-added manufacturing activities, and more generally from other lower cost centres of production in Europe, Asia and Latin America.

Driven by the growth of global competition and multinationals, centres of world-class specialisation expand, linked into interconnected clusters of expertise in areas such as science and engineering. A number of UK high-tech manufacturing centres, notably in the area of ICT and biotechnology, experience continued growth on the back of strong established clusters of expertise and technologically driven change. However, this is insufficient to offset decline in weaker centres of activity and more traditional manufacturing. The successful assembly industries that remain tend to be linked to complex global supply chains. They are generally small scale, agile and innovative, refashioned in part by developments in ICT and other advanced manufacturing techniques.

Construction

After a depressed period following the recession and public sector cutbacks, demand for construction has recovered, driven by innovation in technologies for the built-environment and the need for infrastructure renewal. Planning controls have been relaxed.

Agriculture

Agriculture becomes increasingly concentrated, industrialised and global in scale.

The Provision of Public Services

A much smaller public sector is mirrored in a reduced level of direct government involvement in the delivery of healthcare, education and other social services. More public services are privatised or become privately managed. There is greater focus of public resources on the poor and disadvantaged accompanied by more widespread user charges and fees on those who are deemed to have the ability to pay.

In education, individuals and their employers have assumed a greater level of responsibility for financing tertiary education and vocational training.

Innovation and Technological Change

Driven by international competitive forces and the spread of best practice, UK productivity improves strongly and accelerates structural change.

New technologies are adopted rapidly. Much technical change is consumer-focussed and dominated by the wide use of information and communication technology (ICT). This has a profound effect on how products and services are developed, produced and delivered. ICT also plays a key role in establishing strong consumer relationships, for example through new methods of online market research, customised marketing and design on demand. The application of biotechnology increases and nanotechnology starts to have an increasing effect in a number of sectors.

Labour Markets

The labour force is highly mobile, reflecting increased globalisation, economic growth, a weakening of labour market regulation, and heightened international competition for skilled workers. Tele-working and flexible employment arrangements become more commonplace. Individuals with professional and other marketable skills flourish.

There continues to be some growth in low skill, low pay service jobs in local markets. However, the long-term unemployed and unskilled workers tend to be further marginalised as benefit systems are squeezed. The digitalisation of the economy and society also acts to deepen social exclusion as internet access is required to use many public and private services and as many low-skilled, low-income workers lack the requisite internet and computing skills.

The potential impact of an ageing UK population has continued to be mitigated through immigration. However, unfettered in-migration of unskilled labour has increasingly been viewed as a threat by many in the more developed countries resulting in greater political pressure and action to stem the flow and pursue selective immigration policies.

Regional Development

Most UK regions are now benefitting from renewed economic growth, but London and the Greater South East, with their financial and service base and clusters of high tech industry, have attracted the bulk of new business investment, and areas of high unemployment persist elsewhere in the UK.

Environment and Sustainability

Energy prices, although increasing somewhat in real terms, have remained relatively stable due to greater international collaboration to develop available oil and gas reserves and lack of supply disruptions. This has acted to moderate concerns over the longer-term cost and security of energy supplies.

Difficulties in achieving an international consensus over how the cost of reducing carbon emissions is to be met and shared between developed and developing nations, has resulted in only modest progress towards reaching legally binding international accords on climate change. Minimum standards of social and environmental policy are achieved through the international legal framework and further enhanced through using a market-based approach of pricing, traded permits and incentives.

Such action has proved insufficient to cut greenhouse gas emissions, although there has been some limited success in constraining their overall rate of growth. However, increased consumer awareness and focus on corporate social responsibility, coupled with business recognition of the competitive and cost benefits of reduced energy consumption and carbon emissions, is driving international research and innovation in carbon efficient technologies, design, production, products and services.

Energy and Transport Infrastructure

Within the UK, the electricity market continues to be dominated by fossil fuels, increasingly natural gas from Russia and Central Asia. European shale gas is also making a significant contribution. A new programme of UK nuclear power station construction has been initiated to replace ageing stations and increase the future share of nuclear. Planning and technological constraints coupled with their relative cost have so far limited the contribution made by alternative generation technologies such wind and tidal power. Other emerging energy generation and fuel technologies remain largely at the research and development stage.

High levels of mobility, increased leisure and business travel, further residential and urban development into the green-belt and continued growth in international trade together create a demand for additional investment in UK transport systems including road, rail, air and ports.

With the aid of private finance, the road network is enhanced; the inter-city rail network is modernised, with more routes being electrified; and in the latter half of the decade, a start is made on construction of new high speed rail links.

3.2.3 The UK Automotive Retail Industry in 2020 under World Markets

Under *World Markets,* renewed and reasonably robust economic growth has meant that new vehicle sales have recovered. New car sales in 2020 at around 2.5m a year are now some 10% above their 2007 pre-recession levels while the total car parc is some 15% larger; the average parc age is little changed.

The effect of higher fuel and other vehicle taxes related to engine capacity in various national markets has sustained a steady shift towards the production and purchase of more fuel efficient vehicles. This has been achieved by improvements in the fuel efficiency of conventional vehicle designs, smaller engines and increases in the market share of diesel, hybrid and electric vehicles.

Conventional petrol engines now account for around 40% of new vehicle sales, diesel 40%, hybrids 15% and electric vehicles 5%. The increase in market penetration by the latter has been constrained by limited investment in the required supporting infrastructure, while the higher cost of hybrids has held back their sales growth. Take-up of electric vehicles in particular has largely been confined to a few localities within the major conurbations, where they are frequently a household's second or third car, purchased for convenience for short city journeys. Cars have generally become better equipped and appointed, even the smaller models.

As a percentage of the total vehicle parc, hybrid and electric vehicles still only account for some 4% and 1% respectively.

Under the open global trading environment that prevails in the *World Markets* scenario, competition between vehicle manufacturers remains intense. Asian producers, including those from India and China, are making greater inroads into western car markets, and some further consolidation has taken place within the global vehicle manufacturing sector as economic forces have proved to be stronger than nationalistic tendencies. In the UK, the number of manufacturers has reduced as production facilities have been relocated overseas to lower cost locations. UK centres of expertise remain, particularly in areas such as in research, technology and design.

Strong global competition and cross-border investment have stimulated the spread of international best practice in the automotive manufacturing industry. Manufacturers have, where possible, standardised components and vehicle platforms across their model ranges. To increase the consumer appeal of their models, they have added extras, such as entertainment and navigation systems, to the basic specification, as well as increasing optional extras. This, together with additional safety equipment such as collision warning systems, has further increased the electronic content of vehicles.

The real competition, however, is in customer service. Wherever possible, the stronger manufacturers have imposed stricter franchising conditions on their dealers to ensure a consistent brand image and a high level of service delivery. Manufacturers' direct sales to fleet owners have increased. An increase in the number of authorised service garages permits closer manufacturer control over after-sales service, particularly during the earlier years of the vehicle's life, a move reinforced by inclusion of service packages and extended warranties with the sale of the new vehicle. Self regulation is also successfully used to differentiate strong brands.

Sales by manufacturers with weaker brands, often from the emerging economies, increasingly go through efficient, but cheap, car supermarkets, with after-sales activities being undertaken by independents. New budget-priced electric cars are sold in car supermarkets with specialist repair garages springing up to service them, albeit a limited market at present. Hybrids are largely the preserve of authorised garages when it comes to servicing.

Servicing intervals on new vehicles have grown slightly while the length of warranty has also increased. With respect to vehicle maintenance, the trend towards greater emphasis on replacement rather than repair of components (and body parts in the event of collision damage) has continued.

The spread and application of ICT have moved forward apace, driven by the roll-out of superfast broadband and an increasingly computer literate population for whom on-line purchase of major durables as well as consumables has become commonplace. A growing number of younger car-buyers are now making all but their final selection of new vehicle on-line. The final step is the test drive, an increasing proportion of which are delivered to the customer's front door.

These changes, together with the competitive pressures that exist in the vehicle manufacturing sector and the greater emphasis being placed by manufacturers on quality of service, have resulted in some further decline in the total number of both franchised vehicle sales outlets and other sales dealerships which in total now stand 20% below their pre-recession level. The main casualties have primarily comprised the smaller dealerships and those in the areas of lower new car demand density. A greater proportion of the total are authorised and supported by the main manufacturers in return for high quality standards.

Business travel has increased with economic recovery. The corporate vehicle fleet has consequently expanded, although less than proportionately. Demand for vehicle leasing has also grown as companies have directed available capital towards core business activities. The desire for cost certainty and reduced residual value risk has also attracted more companies to adopt leasing solutions. A greater number of busy entrepreneurs and wealthier individuals also use the simplicity and efficiency of both leasing and rental, the latter particularly for specialist vehicles required for holidays or style. There is strong growth in the number of car clubs based in cities, thereby providing easy access to convenient small cars.

Progressively greater use is made of ICT in managing traffic flows and volumes on major arterial road routes.

The success of the M6 toll motorway has led to some further private development of the motorway network and of tolled de-bottlenecking schemes with national telematic toll cards allowing uninterrupted access. More schemes are in the pipeline.

Congestion has grown, particularly on smaller roads, the secondary network, and in urban areas. This has lead to differential road pricing in some cities with expensive access at peak periods where the market will bear it. Construction of some urban expressways is in the development pipeline, although planning issues have slowed their progress. Public investment in major new transport schemes has been limited over the past decade and despite a recent pick-up in rail investment, the car remains the preferred mode of travel.

The number of vans has increased to cope with economic growth, the rapidly expanding level of internet shopping and the resulting growth in home deliveries. However, the number of HGVs has only increased slightly as larger vehicles are now permitted on UK roads.

3.3 Scenario Two – National Enterprise in 2020

Under *National Enterprise*, people aspire to personal independence and material wealth, embracing liberalised markets as an effective means by which they can achieve their personal goals within a nationally-rooted cultural identity and with a high degree of self-reliance and security. Political and cultural institutions are strengthened to buttress national autonomy in what is a more fragmented and regionally unstable world.

3.3.1 The Economic and Political Framework

The international financial crisis and recession of 2008/2009 left serious scars on the global economy, and particularly on the most heavily indebted developed nations. The resulting government fiscal and monetary policy response temporarily succeeded in stabilising activity and engineering a weak global upturn in activity, in part reinforced by restocking. However, growth stalled, as the initial and substantial monetary and fiscal stimuli faded and as the scale of public sector deficits and pressure from financial markets forced a combination of tighter monetary policy, tax increases and public expenditure cuts.

The longer-term global economic recovery proved to be modest, highly uneven and sluggish, oscillating between short periods of upturn and downturn with a relatively anaemic underlying upward trend, particularly among the major developed economies.

The loss of jobs and level of unemployment in the heavily indebted developed economies resulted in an upsurge in international and domestic tensions, culminating in a series of protectionist moves, both between individual countries and regional trading blocks. As a result, global trade is now at a lower level and more regionally focussed; while the level of international competition and spread of best practice has also reduced.

Belief in the efficacy of international institutions has waned, marginalising their role and influence. Growing disparities between rich and poor, leading to greater social and political instability in certain of the less prosperous areas of the world, coupled with competition between countries to secure scarce natural resources, have all acted to heighten global and regional security concerns, leading to a greater focus on achieving national self-sufficiency.

3.3.2 Developments in the UK

Burdened with excessive personal and public sector indebtedness and against a continued background of tight credit and a sluggish global economy, the UK has experienced a decade of low and fitful economic growth accompanied by only a very modest increase in real disposable incomes. Investment is low, constrained by the availability and cost of capital. Achieved rates of managerial and technical innovation and productivity growth are also consequently lower.

Real UK GDP is now increasing at around 1½% a year, below its previous long-term historic trend and is only some 5% above its 2007 pre-recession peak. Real household disposable income has increased broadly in line with GDP.

Cutbacks in public expenditure have been swingeing, with the state withdrawing from, or reducing to a minimum, direct provision of various services to the public. Whilst recognising the need for cuts in public spending, public dissatisfaction with the intervention and efficacy of both international and national government and state institutions has increased.

The Role of the State and the Individual

People consequently value the freedom to do as they choose with the minimum of government interference, within the context of a more independent United Kingdom, less fettered by regulation emanating from the EU. Political power now resides primarily at national level, while further regional devolution within the UK has been limited. However, reflecting past inefficient and wasteful expenditure by big government, the view has also taken hold that government should set overall policy objectives, strategy and basic minimum standards in areas such as health and safety and consumer protectionism, and that execution and delivery of services should occur through smaller, more locally accountable units.

National interests and identities within Europe came more to the fore in the wake of the tensions created in the wake the 2008 financial crisis, the problems of the southern euro member countries, and a growing realisation that one policy does not fit all. The UK’s relationship with the EU has become arm’s length, with a range of selective opt-outs as the EU has divided into a ‘two-speed’ club.

More widely, international collaboration has become mainly limited to traditional areas such as security and defence, trade and immigration; but even here progress on reaching agreements is difficult because of many and varied vested interests that prevail within a difficult economic and political climate.

While market values still dominate, issues of national interest result in greater government protectionism and support for key national industries (such as utilities, infrastructure, pharmaceuticals, aerospace, finance, media), thereby constraining the full force of international competition.

UK-based business focuses predominantly on UK and European markets against a background of greater instability and barriers in various other parts of the world. Reflecting international barriers, security concerns and heightened awareness of transport costs and CO2 emissions, many hitherto international supply chains become more regionally structured and focussed.

Business and Consumer Services

The service sector grows moderately, particularly in the areas of finance, healthcare, tourism, and retailing. New markets develop for specialised personal services for high-income groups, while services for low-income consumers tend to decline. Technology becomes a less important driver of growth in the service sector. The informal service economy flourishes, providing work for the increasing numbers of people excluded from the mainstream job market.

Manufacturing

Manufacturing is less exposed to international competition, moderating the pace of decline in more traditional and lower-skilled areas of activity. However, levels of innovation and investment in the higher tech sub-sectors are also correspondingly lower as is outward and inward foreign direct investment, despite government attempts to attract the latter. Innovative and fleet-footed small and medium-sized enterprises serving niche domestic markets fare relatively well.

Construction

The construction sector struggles under a low rate of economic growth, cuts in public expenditure and a low level of investment in both housing and infrastructure.

Agriculture

Demand and climatic pressures on global food supplies result in the growing importance of UK agriculture in contributing towards long-term security of national food supplies.

The Provision of Public Services

The overwhelming need to reduce the public sector budget deficit, a desire for lower taxation, a belief in private enterprise as a means of revitalising the UK economy, and a relatively low level of public concern about social inequality and exclusion have lead to swingeing cuts in public expenditure.

Greater private sector delivery of publicly financed health and education services is consequently encouraged. Public provision of welfare services has declined and the role of the third sector has become increasingly important.

Innovation and Technological Developments

The pace of innovation and technological change has moderated due to constraints on availability of capital, the reduced intensity of international competition and the consequentially lower rate of spread of international best practice.

The application of developments in ICT continues to flourish, particularly in areas such home entertainment and logistics; but its impact is less pervasive and does not provide the same overall impetus to innovation and structural change. Biotechnology is the other main driver of technological innovation.

Labour Markets

Labour markets have been further deregulated, in part in an effort to attract inward investment and discourage international relocation of exiting activities. However, the positive effects on job creation, in terms of improved labour flexibility and cost, are insufficient to offset areas of decline.

Pay differentials between skilled and unskilled workers increase with the latter turning increasingly to the informal economy to supplement their incomes. There is consequently higher unemployment, increased wealth disparities, longer working hours, particularly for the lower-skilled, and an increase in social tensions. Government has taken steps to limit immigration, particularly with respect to unskilled workers.

Regional Development

Current regional disparities continue, with such growth as there is being strongest in London and the South East. Other regions rely predominantly upon existing economic activities, with an absence of investment in new industries. Those areas that have historically relied upon international trade in traditional sectors of industry or where public sector employment has been comparatively high are particularly disadvantaged, resulting in some further weakening of national social cohesion.

Environment and Sustainability

Regulation of the environment resides at national, rather than international, level with relatively little institutional or policy change. Policy implementation is largely market driven, aimed primarily at maintaining energy and environmental security. The focus is on adaptation rather than on mitigation.

Energy and Transport Infrastructure

Cost and security of energy supplies are primary concerns. There is consequently a drive by government to encourage energy efficiency and exploit domestic sources of energy including coal, gas, nuclear power and renewables, but progress with respect to developing nuclear power and renewables is slow. Market mechanisms, including pricing, are primarily relied upon to achieve a desired increase in energy efficiency.

The transport and communications sectors suffer from low levels of investment, reflecting the cost and availability of capital and a lower rate of growth in demand.

There is continuing reliance on privately-financed transport with little additional provision of public transport services. Sluggish GDP growth limits the growth in car ownership. Nevertheless, many roads operate at full capacity and congestion increases. Investment in the rail network stagnates, with the result that freight continues to move primarily by road. Slower growth in international trade and business coupled with limited growth in real disposable incomes reduces the pressure for additional airport and harbour facilities.

3.3.3 The UK Automotive Retail Industry in 2020 under National Enterprise

Under *National Enterprise*, by 2020 new vehicle sales have recovered somewhat, but new car sales at around 2.2m are still nearly 10% below their 2007 pre-recession level. The total car parc, however, is nearly 10% above its pre-recession level, its average age having increased a little as vehicle owners have deferred expenditure on replacement vehicles.

Purchasers of new vehicles place greater emphasis on fuel efficiency and price, and smaller-engine petrol vehicles have been the main beneficiaries of this trend. Despite running cost advantages, sales of hybrids have been constrained by their higher capital cost, electric vehicles both by their cost and lack of investment in supporting infrastructure.

By 2020, conventional petrol engines account for around 47% of total new car sales, diesels 40%, hybrids 10% and electric vehicles 3%. Hybrid and electric vehicles still only account for some 3% and 1% respectively of the total vehicle parc.

The relatively modest recovery in the global economy and in demand for new vehicles, coupled with competition from newer manufacturers in the BRIC economies, has perpetuated excess global vehicle production capacity. Further consolidation and plant closures have been held back as nations fight to retain indigenous car manufacturing in the face of economic reason. In the UK, nationalistic ideals are helping to support some of the “British” brands, and UK-based manufacturers are producing “British styled” cars, although this is only superficial dressing of internationally standard components.

Pressure on manufacturers’ margins and capital constraints have slowed the pace of new model launches. Manufacturers have instead tended to focus on facelifts and on incorporating additional equipment in ageing models in an attempt to remain competitive. Manufacturers have also modestly extended warranties and service mileage intervals on many new vehicles.

The level of new vehicle sales coupled with less frequent exchange of vehicles by owners has reduced second-hand sales. The resulting pressures on dealer margins have led to a further decline in the number of dealerships. Closures have affected large, medium and small dealerships, franchised outlets and independents alike. Cutbacks have been sharper in northerly and rural areas of the country than in the south where economic growth has been stronger. Staff levels have been cut among dealers that remain in business, and there is a distinct differentiation in service received by the buyers of expensive and budget cars, the latter being significantly in the majority. Car supermarkets for new and second-hand vehicles are found in every major town.

Consumer attempts to reduce motoring costs by extending service intervals, or by omitting non-essential service and repair work altogether, has led to some reduction in the number of service transactions to their pre-recession level, despite growth in the car parc and an increase in its average age. The “informal” sector and DIY activities have increased their market share, causing an increase in the number of MoT re-tests, thus giving some small respite to MoT registered garages. Regulation of garages is relatively lax. With repair charges having been driven down, there is little enthusiasm for self regulation, particularly at the bottom end of the market.

A number of entrepreneurial garages specialise in the hybrid and electric sector, independent of the main manufacturers, in part to meet the needs of small specialist electric car manufacturers which have emerged in an attempt to seize what is still seen as a niche in the market.

In a drive to cut costs, businesses have cut back on their company car fleets and non-essential travel. However, pressure on capital has led to more corporate owners favouring leasing rather than direct ownership. Consequently, the size of the vehicle leasing market is little changed from that which prevailed prior to the recession.

Vehicle rental levels have also stayed static as reduced company fleets are supplemented by renting.

Slow economic growth and higher fuel and other costs have constrained overall demand for travel. Households have retained their vehicles but have reduced average mileages driven.

Freight has increased broadly in line with the growth in GDP, as have HGV and light van fleets, there having been only a very limited shift towards larger HGVs.

The very limited investment in new transport infrastructure has resulted in increased levels of congestion. Pressure on the domestic purse and the higher fuel prices facing the motorist have also increased the market for bus and coach operators within and between cities.

3.4 Scenario Three – Global Sustainability in 2020

3.4.1 The International Economic and Political Backdrop

International action to shore up the global economy following the 2008 financial crisis proved to be successful in stabilising activity, and in securing a recovery in business and consumer confidence. Robust and credible plans to reduce public sector deficits to sustainable levels over an acceptable time-frame instilled confidence in financial markets and allowed a phased, rather than precipitate, withdrawal of monetary and fiscal stimuli. Underlying inflation has remained subdued and capital constraints have eased. Government policy action in China and certain other Asian countries, aimed at rebalancing their economies away from reliance on export driven growth through supporting expansion in domestic consumer demand, has helped to underpin the global economic recovery.

The policy and regulatory failures of the early years of the current millennium have been recognised and accepted. A consensus has emerged on the need for greater international collaboration and co-ordination of policies aimed at avoiding past excesses and ensuring a greater degree of economic and financial stability. Despite a greater degree of international regulation and policy intervention, stable economic conditions coupled with a commitment to open markets, trade and international competition in most sectors, results in the resumption of a fairly robust rate of global economic growth, albeit one that does not fully return to pre-recession levels. Investment has picked up strongly.

Substantial progress is made internationally in agreeing targets and other actions to reduce carbon emissions. The need to achieve a more sustainable approach to using finite natural resources in general is recognised, and eco-efficiency is placed high on the international agenda. Although the overall rate of inflation remains subdued, carbon pricing and taxation result in a shift in relative prices in favour of energy-efficient processes, products and services.

Despite a recovery in growth in the previously indebted developed nations such as the US and UK, it has continued to lag that of the BRICs and a number of other less indebted nations. The global balance of economic power has consequently shifted further towards the east. Some of the greatest commercial opportunities arise in fast-growing developing countries experiencing catch-up.

3.4.2 Developments in the UK

In the wake of debt reduction and shifting public attitudes towards the type of society in which people wish to live, the UK economy experiences fairly rapid structural change. While energy and resource-intensive sectors decline, there is strong growth of services and high-tech industries offering low environmental impact and high social value.

By 2020, UK GDP is growing steadily at around 2% a year and is some 15% up on its 2007 pre-recession peak. Increased personal taxation, imposed to sustain public services and fund investment in economic renewal and a sustainable environment, has however meant that the increase in real household disposable income over the past decade has been about half that of GDP.

The Role of the State and the Individual

People wish to be part of a wider national and international community. Reflecting public attitudes, business strives to balance the pursuit of profit with social responsibilities, working where possible in partnership with government and consumers.

The level of bureaucracy has been significantly reduced as part of the earlier drive to cut the public sector deficit, and the structure of government has been streamlined. However, government still plays a prominent role in the provision of education, healthcare and other social services. The welfare state functions increasingly at an international level where governments co-operate to make business and the rest of society work together to achieve social improvement.

Following the financial crises encountered around the turn of the decade, a revitalised and more accountable EU takes on a greater co-ordinating role across many areas of policy, providing a comprehensive health, education and welfare safety net for disadvantaged groups. Across the EU, regional government gains greater power at the expense of government at national level.

International collaboration and co-ordination cover areas such as security, economic development, trade, resource management and environmental protection, and involve networks of governmental, non-governmental and private sector organisations. Global communications systems drive cultural and political systems closer together. Equal access to high quality public education reinforces social and environmental values. There is North-South collaboration, helping a catch-up by many developing countries.

Business and Consumer Services

Intangible goods and services together generate the largest element in UK national economic value. The service sector becomes increasingly integrated with other areas of the economy as more goods are supplied as part of wider service packages, many aimed at ensuring whole-life thinking, efficient resource utilisation and recycling. Service sectors experiencing rapid growth include software and ICT support, communications and media, education, leisure and finance.

The development and widespread application of ICT also heavily influences the design, shape and delivery of many other goods and services.

Manufacturing

UK manufacturing, and its processes and products, are transformed by high levels of investment and a drive towards the global provision of resource efficient goods and services. Heavy industry tends to migrate abroad, while new high tech manufacturing sectors requiring a strong knowledge base establish themselves successfully in the UK. The strength of the UK professional, scientific and engineering skill-base is internationally recognised, leading to greater investment by multinationals in UK research, design and development centres. New clusters of activity are built around internationally recognised UK universities and other centres of scientific and engineering expertise, with a particular focus on exploiting newly emerging eco-markets at home and abroad.

Construction

The built environment is transformed through substantial investment in the rapid replacement of old and low-quality buildings and infrastructure. Due to strict planning controls, development is primarily concentrated in existing urban centres.

Agriculture

In agriculture, the focus is on achieving high agricultural yields and sustainable economically healthy farming communities with high levels of biodiversity and low environmental impact. Policy is driven by an approach that values the services provided by ecosystems.

The Provision of Public Services

Increasingly, Europeanised education, welfare and health care systems provide a comprehensive safety net for disadvantaged groups, financed by higher taxes. Equality of access to high quality public education reinforces social and environmental values throughout the curriculum.

Innovation and Technological Change

Relatively strong growth, open international markets and structural change support innovation and technological development. Technology is driven by user needs and geared towards eco-efficiency including further research and development of biotechnologies and nano-technologies. The development of ICT continues to accelerate and its application becomes widely pervasive.

Labour Markets

The demands of the economy for a dynamic labour force are limited to a degree by regulation, for example on working hours, conditions and fixed-term contracts, although a streamlined bureaucracy limits any negative impacts. There is a relatively high level of managed global mobility of labour, both nationally and internationally.

Systems of education and training are increasingly internationalised, particularly at a European level, with growing international recognition of professional qualifications. Education and training policy aims to encourage equal opportunities in a job market with rapidly changing qualification requirements. ICT plays a prominent role in the provision of education and training.

In the UK, the return of stable economic conditions combine with UK training and labour market policies to support a regulated high-skill, high wage labour force accompanied by greater income and social equality.

Resource and labour productivity both show significant improvements, and unemployment and working hours decline. Public sector employment is significant and recognised for the services it provides.

Regional Development

While London and the South East remains a major centre of growth, regional development is more evenly distributed under this scenario as a result of planning controls and transfer payments. These recognise the environmental consequences of environmental sprawl in the South East; the social consequences of under-employment elsewhere; quality of life issues; and the capability of advanced communication and transport infrastructure to support extended knowledge and supply networks and clusters. Nevertheless, in regions heavily dependant upon traditional manufacturing, the management of the economic transition remains a challenge for both national and regional policy.

Environment and Sustainability

Reconciling growth and sustainability is one of the guiding principles of this scenario. Ideological concerns about the environment are translated into practical action. Sustainability is seen from a global perspective, including fair access to environmental resources. Policy is increasingly co-ordinated at EU and international levels.

Energy and Transport Infrastructure

Public and private sectors together produce high levels of investment in areas such as public transport, new and renewable energy, water and information infrastructures.

Under mounting pressure to replace existing ageing generating capacity and reduce carbon emissions, work has commenced on a new generation of UK nuclear power stations. This programme is mirrored elsewhere around the globe.

Research, development and investment in renewable energy sources and in carbon capture and storage technologies accelerate. By 2020, dominant renewable sources include onshore and offshore wind, second generation biomass and solar, together with an emerging contribution from tidal energy.

Encouraged by regulatory incentives, energy suppliers also move towards the provision of integrated energy services. Together with smart infrastructure and high energy prices, these greatly enhance the take-up of energy efficiency measures.

The cost of private car transport and air travel rises substantially through a combination of pricing, tax and regulatory measures. Their use is consequently constrained. Modernisation and restructuring of freight and passenger transport infrastructure occurs with the long-term goal of building an eco-efficient, integrated system. There is an increasing use of heavily subsidised public transport.

3.4.3 The UK Automotive Retail Industry in 2020 under Global Sustainability

Under *Global Sustainability*, despite renewed growth in the overall economy, new vehicle sales have only recovered to their 2007 pre-recession level, constrained by taxes and legislation designed to reduce energy consumption and encourage greener transport of individuals and businesses. The vehicle parc is now slightly smaller than it was pre-recession, also with a reduction in average age, reflecting incentives and regulations to scrap older cars earlier so as to remove high emission vehicles from the parc and maintain high levels of safety. Legislation and regulations covering environmental and health and safety issues linked to vehicle scrappage and recycling and disposal of materials and fluids have also been tightened.

An increase in vehicle fuel efficiency has been achieved through improvements in the fuel efficiency of conventional vehicles, smaller engine sizes and increases in the market share of diesels, hybrid and electric vehicles. Hybrid and electric vehicles now account for some 7% and

3% respectively of the total vehicle parc. The number of plug-in hybrids is increasing rapidly as a standardised recharging infrastructure develops.

Conventional petrol engines now account for around 30% of new vehicle sales, diesels 35%, hybrids 25% and electric vehicles 10%. Sales of electric vehicles have received a boost from public investment in supporting infrastructure in a number of major towns and conurbations, although the purchase subsidy on electric vehicles is now being reduced as costs and purchase prices have started to fall. Petrol companies are calling for taxation on transport electricity.

In several conurbations, a number of public transport service and freight delivery companies have introduced experimental hydrogen powered fleets, while similar experiments are being conducted on selected national arterial routes. Manufacturers are closely involved in these trials, closely supervising necessary servicing. Servicing of fuel cells and hydrogen tanks is strictly regulated.

Global competition between vehicle manufacturers remains intense. This, coupled with co-ordination of government policies and accompanying tax and legislative changes designed to achieve greater sustainability, has led to increased research and technological innovation by vehicle manufacturers, accelerating the introduction of new low carbon emission models, many of which incorporate enhanced safety features and systems including collision avoidance technology. Standardised components and vehicle platforms are being increasingly shared across model ranges. To increase the consumer appeal of smaller models, popular on account of their fuel efficiency, manufacturers have added more extras to the specification, such as comfort, entertainment and navigation systems, thus providing a greater sense of luxury and appeal for higher income purchasers. These developments have substantially increased the electronic content of vehicles. As a result, specialist companies have grown up to service, repair and replace the many different electronic components, along the lines of tyre of auto-glass specialists.

Servicing intervals and warranties on new vehicles have been further extended. Service packages offered with new vehicles have also increased as consumers and manufacturers focus increasingly on the lifetime cost of vehicles and as potential owners seek greater operational cost certainty. Electric vehicle running costs are setting new standards for the rest of the industry.

There have also been significant changes in vehicle sales channels. The spread of ICT has moved forward apace, driven by superfast broadband and an increasingly computer literate population. An increasing proportion of younger car-buyers are now making all but their final selection of new vehicle on-line, such has become the sophistication of computer graphics and richness of customer information systems.

New budget electric cars are sold in car supermarkets with specialist repair garages springing up to service them. Manufacturers are also establishing their own branded supermarkets, like IKEA, taking the opportunity offered by the new market in electric cars to establish closer customer contact and squeezing traditional dealers in this sector. Hybrids are still serviced by franchised dealerships or authorised repairers due the vehicles' higher complexity.

The result has been a substantial decline in the total number of dealership outlets. The reduction has been particularly pronounced in the less densely populated areas of the country where purchasers wishing to visit sales dealerships to view alternative models have to travel further than has historically been the case. It has also affected the independent and smaller dealerships which have been less able to adapt and have only a small number of outlets across which to spread overhead costs.

The high proportion and quality of new vehicles, the decreasing car parc and the growth in specialised repairers have squeezed the market for general service and repair garages, despite regulations effectively banning DIY. The trend towards greater replacement rather than repair of components (and body parts in the event of collision damage) has accelerated. This has encouraged and supported the expansion of manufacturer-franchised vehicle service and bodywork repair outlets as well that of fast-fit chains covering a greater range of service and repair activities including electric vehicle battery maintenance and replacement. Garages servicing all but the older vehicles in the parc have had to invest in new technologies to survive.

Business travel has increased with renewed economic growth, although less than proportionately due to government tax and legislation. While capital has become more readily available, its cost has increased somewhat from the levels that prevailed during the previous decade. Together with competitive pressures and a desire for greater cost certainty on the part of businesses, this has led to the development of a variety of leasing options, aimed primarily at fleet owners.

The rental market is strong because the cost of vehicle ownership is high, and infrequent vehicle users find it advantageous to rent rather than incur high standing costs. Congestion charging policy has provided a significant impetus towards rental, car clubs and other similar schemes.

Regulation on the design and operation of HGVs is strict.

3.5 Scenario Four – Local Stewardship in 2020

In the world of *Local Stewardship*, individuals seek sustainable levels of welfare within federal and networked communities. Social and other regulation ensures more equally distributed opportunities within a high quality local environment. Public policy promotes small-scale regionally based economic activity rather than large-scale business and technologies.

3.5.1 The Economic and Political Framework

The international financial crisis and recession of 2008/2009, coupled with the recurrent financial turbulence of the early years of the 2010 decade, have left serious scars on the global economy, particularly with respect to the most heavily indebted developed nations which have progressively lost ground to the major economies of Asia.

Rising unemployment in the heavily indebted developed economies and increased competition with emerging economies for available raw materials has culminated in a series of protectionist moves as well as heightened global and regional security concerns.

The goal of international co-operation is now to secure local and regional economic and political autonomy. This is mainly through international coalitions of regions and “city states” with mutual interests. Some of these alliances prove to be stable and persistent, while others become undermined by conflict and tension. There is much greater focus on achieving national self-sufficiency, a trend reinforced by growing ethical considerations and global concerns over sustainability.

Global trade is consequently at a lower level and much more regionally focussed; while international competition, spread of best practice and the pace of technological innovation are all reduced.

Within Europe, the EU evolves into a loose association of European regions, with financial, economic and political strains having led to a progressive devolution of powers back to national and then sub-national levels.

3.5.2 Developments in the UK

A continued background of tight credit, a high cost of capital, sluggish global growth and international political and trade tensions have resulted in a decade of minimal and fitful UK economic growth as public and private sectors have struggled to pay down debt.

Real UK GDP growth, while now increasing at a trend rate of around 1%, is only some 5% up on its pre-recession peak. Real household disposable income has shown a small percentage decline, squeezed by increases in taxation and a reduction in public services and welfare benefits.

Indeed, cutbacks in public expenditure have been substantial, with the state withdrawing from, or reducing to a minimum, direct provision of many services to the public.

Investment by both public and private sectors has been limited, constrained by the limited availability and high cost of capital. Achieved rates of managerial and technical innovation are low as are productivity improvements.

The Role of the State and the Individual

Decision-making powers within the UK have been further devolved to regional government, and people identify strongly with their local community. This has encouraged development of business infrastructure and services which are focussed primarily upon serving local and regional needs and, where possible, utilise local resources. In turn this has resulted in fragmentation of many business sectors. Being small, local and agile becomes a competitive asset, but in general companies face less competitive pressures than in the other three scenarios. Reflecting differing local priorities and characteristics, regional outcomes across the UK vary significantly.

Protection of the environment and resource conservation are key political and popular objectives, reinforced by tight local regulation. Although economic growth is low, in certain respects quality of life is improved.

Business and Consumer Services

Services are the most important sector of economic activity, but with constrained household incomes and a less materialistic society, demand is primarily for services which meet basic needs. Services targeted towards high income earners and the business sector tend to suffer, while personal services such as healthcare, retailing, catering, leisure and tourism become increasingly localised.

Manufacturing

There are generally low rates of investment and innovation in manufacturing. Major changes occur in industrial structure. High tech sectors and international services decline, becoming increasingly located in limited UK regional clusters. There is a relative decline in very large multinational companies, with small and medium-sized enterprises and technologies adapted to small-scale sustainable production being favoured. There is emphasis on eco-efficiency, quality and durability in consumer and other manufactured goods with long-term service support and locally-based maintenance and recycling systems.

Construction

The construction industry continues to be dominated by small firms focussed increasingly on refurbishing, adapting and upgrading the existing building stock to meet current needs and improve its environmental footprint, rather than on building new.

Agriculture

The downward trend in agricultural production is reversed, and farming continues to receive subsidies in order to protect food security and local communities. Agricultural and food supply chains become much more local.

The Provision of Public Services

Health, education and social services, although reduced in scope, are publicly funded through high levels of taxation, with emphasis on more basic levels of provision and fairness and access for all, again with more regionalised control and accountability. The reduced scope of public sector service provision is partially compensated for by families, members of local communities and charities who all take a more active role in providing mutual social self-support in their local area.

Innovation and Technological Change

Economic and technological developments are constrained by limitations on available levels of local resources (knowledge, capital and materials) as well as the size of local markets, density of demand and level of transportation costs which together inhibit capital investment in large-scale production facilities. Overall levels of private investment decrease, and rates of innovation and technical change decline.

Labour Markets

Despite low income growth, the relative increase in labour-intensive activities, coupled with an increase in informal employment and publicly-funded employment schemes, limits the level of unemployment. Working hours stabilise but do not fall due to low levels of productivity growth. Income differentials narrow. There is strong emphasis on education and training to preserve heritage and other traditional skills. International migration of labour becomes limited primarily to those with specialist professional skills.

Regional Development

The demand for new housing declines as lower incomes and the revival of more collective social values lead to larger household sizes. Reflecting changing economic development patterns and job creation, the population drift to the south of the country slows. There is migration away from the larger cities and a corresponding growth of small and medium-sized towns. The urbanisation of the countryside comes to a halt as planning controls are tightened and development primarily takes place within existing urban boundaries.

Environment and Sustainability

Sustainable development is an underlying objective of this scenario, which profoundly shapes changes in economic activity, social behaviour and institutional development. Social values and political processes encourage individuals and organisations to integrate environmental concerns into all their activities. A key focus is on using technology and ingenuity to maximise the use of local and regional resources.

Energy and Transport Infrastructure

Energy supply becomes diverse, being restructured around local energy resources. A wide range of energy efficient and small-scale renewable energy technologies is exploited, in many cases subsidised through funds raised by substantial energy taxes. Coupled with low growth, the latter constrain overall demand for energy.

Demand for transport is adversely affected by the major slowdown in growth of trade, reduced labour mobility and the effect of environmental taxes and high energy prices on the cost of transport. These factors are reinforced by political and social pressure to reduce unnecessary travel. Passenger transport is still dominated by the private car, but public bus and rail services are extended particularly in urban areas. Alternatives such as car sharing, cycling and walking become more commonplace.

3.5.3 The UK Automotive Retail Industry in 2020 under Local Stewardship

Under *Local Stewardship,* new vehicle sales have declined further due to tight household budgets, higher taxes and increased fuel costs, and they are now 30% below their 2007 pre-recession level. The average age of the parc has increased.

Where new vehicles are being purchased, consumers place great emphasis on fuel efficiency in making their choice. Smaller engine vehicles and diesels have been the main beneficiaries.

Sales of hybrids have been constrained by their relative capital cost, electric vehicles by the lack of investment in supporting infrastructure. Pressure on household budgets has also led consumers to favour more utilitarian models with basic equipment specifications.

Conventional petrol engines account for around 43% of new vehicle sales, diesels 43%, hybrids 12% and electric vehicles 2%. In terms of the total vehicle parc, hybrid and electric vehicles still only account for some 3% and 1% respectively.

The difficult global economic environment, coupled with the continued growth of national motor manufacturing industries within the Asian region, have led to further consolidation, plant closures and rationalisation of product ranges among western manufacturers, although this has proved insufficient to resolve the financial problems of the latter. Nationalistic tendencies have conspired to retain a small manufacturing base in the UK although there have still been plant closures.

Many owners are now changing their vehicles much less frequently, reducing mileages travelled and scrapping vehicles at a later age than hitherto. Vehicle manufacturers have extended service intervals on new vehicles together with the length of warranty offered, in an attempt to contain the lifetime cost of new vehicles to the consumer; while in a further effort to contain motoring costs, vehicle owners, notably those with older vehicles, are frequently choosing to extend service intervals beyond those recommended by manufacturers, in part due to the lower mileages being driven, or even omit non-essential body and other repair work altogether.

Coupled with reduced levels of new and second-hand vehicle sales and the associated pressure on dealer margins, this has led to a further substantial decline in the total number of dealerships. Closures have affected large, medium and small dealerships and independents alike.

The number of vehicle service and repair outlets has changed little, largely due to an ageing car parc. Small low-cost independents have benefitted at the expense of the larger organisations with their higher overhead costs and charges, particularly in the more rural areas and with respect to maintenance of older vehicles.

The relatively slow rate of adoption of new technology by manufacturers has helped smaller workshops to survive. The economic situation has also encouraged many mechanics, which might otherwise have left the sector, to stay on, particularly as the technical demands of the job are getting lighter, with limited need to cope with a proliferation of new technology.

The very slow growth in electric vehicles has meant that a small niche sector of specialist repairers has grown in certain, usually congested, cities where local authorities have chosen to invest in limited recharging infrastructure and where the size of electric vehicles gives them an advantage. Other garages tend to ignore electric vehicles.

With greater emphasis on local self-sufficiency, local sourcing, shorter supply chains and a lower level of international trade, freight transport mileages have shown a significant decline on pre-recession levels. Coupled with pressure to reduce costs, this has led businesses to cut back on their company car and freight transport vehicle fleets and on non-essential travel costs in general. The average tonnage of freight transport vehicles has reduced, and with it the number of HGVs, as the demand for longer distance haulage has reduced relative to that for more local distribution and delivery. The average age of commercial vehicles has increased.

Vehicle rental has decreased as the demand for mobility is not so high, and there is a large car parc to satisfy most users. The cost of rental is also high relative to the cost of keeping an old, little used vehicle.

Transport infrastructure is poor due to a lack of investment. Despite lower traffic volumes, there is congestion in some towns, and on bank holiday weekends the motorway network comes to a standstill as everyone gets out their little used vehicles. Roadside repair services are kept busy.

Congestion charging has been introduced in a number of larger towns, both for environmental reasons and as a tax raising measure to help fund road maintenance and minor improvements.

Bus usage in towns and cities has increased due to increased parking costs, traffic regulation and other charges, but in rural areas, the lack of sufficient demand coupled with lack of public subsidy have led to a decline in bus services. In many rural and urban areas alike, the preponderant personal travel pattern has become one of short local journeys which have favoured use of minicars, motorcycles and cycles.

3.6 Comparisons and Contrasts between Scenarios

Appendix Two provides a cross-scenario summary of the principal characteristics and assumptions behind the four scenarios, particularly with respect to the issues and other factors affecting the automotive retail industry.

There are certain similarities across all scenarios, but there are also some significant differences, both in terms of substance and degree of impact.

The following points in particular are to be noted.

- All four scenarios assume that by 2020, real UK GDP will be at a higher level that that prevailing in 2007 before the recent recession struck. However, the cumulative increase varies and by 2020, there is a significant difference between the scenarios in assumed underlying annual growth rates which range between 1% and 2.5%, the latter being close to the rate of growth which prevailed in the UK in the decade which preceded the recession.

- During the 2010 decade, the path of GDP growth has varied under the scenarios, being more volatile and fitful under *National Enterprise* and *Local Stewardship* than under *World Markets* and *Global Sustainability*. Unemployment is highest under *National Enterprise,* with DIY and black market activity being particularly pronounced under this scenario.

- Under all scenarios, real oil prices are assumed to increase, less so under *World Markets* and *Global Sustainability* than under *National Enterprise* and *Local Stewardship* where prices have also been much more volatile. The real cost of fuel at the pump has also been driven higher particularly under *the National Enterprise*, *Global Sustainability* and *Local Stewardship* scenarios, primarily due to fears over security of energy supplies under *National Enterprise*, to mounting concern over the environment and issues of sustainability under *Global Sustainability*, and as a result of both these factors under *Local Stewardship*.

- Government is relatively light touch under *World Markets* and *National Enterprise* when it comes to regulation and direct provision of services to the public. It is much more interventionist and takes a more proactive and tougher line with respect to regulation under the *Global Sustainability* and *Local Stewardship* scenarios, especially at the local level under the latter.

- The technology of vehicles continues to advance under all scenarios, but change is most rapid under the higher economic growth and innovation scenarios of *World Markets* and *Global Sustainability*. This is reflected in the extended length of warranties offered with new vehicles.

- In all scenarios there is a continuing tendency towards smaller internal combustion engines on grounds of cost or increased environmental awareness. People are much more aware of lifetime costs under the *Global Sustainability* and *Local Stewardship* scenarios

- The use of the internet in car purchase increases in all scenarios, but is particularly marked under *World Markets* and *Global Sustainability* where dealers are participating in development of the internet as a sales channel of growing importance.

- Under *National Enterprise* and *Local Stewardship*, the use of the internet is central to the increase in private sales of second hand cars as a greater number of people seek the less expensive motoring option of buying older vehicles through private rather than trade channels.

- Health and safety regulation continues in all scenarios but is much more marked under *Global Sustainability* and, particularly at the local level, under *Local Stewardship*. The impetus for most new regulation under *World Markets* comes from the EU.

- In both *World Markets* and *Global Sustainability*, there is an increase in the use of leased and rental vehicles and car clubs of all types, whereas the more traditional model of car ownership by the individual prevails to a greater degree under *National Enterprise* and *World Markets*, particularly with respect to older cheaper vehicles.

- Relative demand for private mobility is higher in *World Markets* and *National Enterprise* where much less emphasis is placed by government and the community as a whole on environmental considerations and investment in public transport infrastructure. In comparison, demand for private mobility is significantly constrained by government policy and a greater public conscience with respect to environmental issues under *Global Sustainability* and *Local Stewardship,* affordability issues also being much more acute under the latter.

- *Global Sustainability* has substantial levels of investment in transport infrastructure, both public and private, in comparison with the other scenarios. The emphasis under *Global Sustainability* is on developing smart, sustainable transport networks.

- *World Markets, Global Sustainability* and *National Enterprise* all point to greater penetration of the new car market by new sales channels, particularly on-line and, for budget vehicles, car supermarkets. The exception is *Local Stewardship* where markets remain local.

- Other key changes in sales networks and methods include under *World Markets,* the increased focus placed by many dealers on enhanced customer service as a competitive means of differentiation; under *National Enterprise*, the marked difference in levels of customer service and support offered on the luxury and budget models; and under *Global Sustainability*, the selling of electric vehicles by manufacturers direct to the individual customer.

4 Implications for Skills and Training

4.1 Introduction

This chapter considers the principal implications of the four scenarios for the future size of the automotive retail sector's overall workforce; the potential changes in the level and mix of skills required; and the key training and recruitment issues.

4.2 Overall Workforce Requirements

The size of the industry's future workforce will predominantly hinge on a combination of changes in the volume of new and used vehicle sales; the size, age and composition of the vehicle parc; mileages driven; the ensuing levels of repair, maintenance and servicing required; and changes in workforce productivity.

4.2.1 Vehicle Sales Activity

The four scenarios presented in Chapter Three contain different assumptions regarding the rate of recovery in *new* car sales post the 2008/2009 recession and their subsequent growth over the remainder of the decade. Reflecting a combination of underlying assumptions regarding factors such as economic growth rates, cost of fuel and government policy and regulation, only one scenario, *World Markets*, shows an annual level of new sales in 2020 higher than that prevailing in 2007 prior to the recession. One scenario, *Global Sustainability*, shows a level broadly similar to that of 2007, while under *National Enterprise* and *Local Stewardship*, new vehicle sales never regain their annual pre-recession levels, being 10% and 30% lower respectively by 2020. These changes will clearly have significant impact on the numbers of sales staff required under different scenarios.

The level of *second hand* sales is dependent on a number of variables, primarily economic activity and the size of the parc. Dealers (franchised and independent) sold 54% of second-hand cars in 2008; private individuals 49%; while other routes, including auctions, accounted for 6%.

The assumed changes in sales' levels built into the four scenarios are summarised in Figure 12 below.

Figure 12 Percentage Changes in Car Sales under Each Scenario 2020 compared with 2007

Scenario Assumption	World Markets	National Enterprise	Global Sustainability	Local Stewardship
Total new car sales	+10%	-10%	No change	-30%
Total second hand sales	+13%	No change	-12%	-13%
All car sales	+12%	-4%	-9%	-17%
Dealer sales (new and second hand) relative to 2007	+12%	-12%	-4%	-30%

It is assumed that under National Enterprise and Local Stewardship that there is a resurgence in private second-hand sales (reducing the overall sales share of dealers), while under Global

Sustainability, government attitudes and the structure of the market weigh against private sales so that the level of dealers' sales suffers less erosion.

Compared with their 2007 level, overall sales volumes for new and second–hand cars combined in 2020 range from an increase of 12 % under *World Markets* to a fall of 17% under *Local Stewardship*. As noted, the line for dealer sales shows the number going through dealerships (including car supermarkets); it excludes auction and private used car sales. The percentage of *second hand* sales by the dealers, and hence the changes in dealers' second hand sales volumes relative to 2007, varies under the various scenarios according to their relative strength in the market and the number of private sales.

4.2.2 Rental and Leasing Activity

A significant proportion of new vehicle sales comprise fleet sales for leasing and rental. Two scenarios point to the potential for substantial increases in leasing and rental activity, as new business models based on the sale of mobility rather than car ownership take hold: *Global Sustainability*, under the influence of government measures to increase the cost of motoring, and *World Markets*, through consumer demand for new vehicle experiences, cost certainty and convenience.

The increase in leasing and rental activity under these two scenarios seems likely to have a minimal impact on the overall market for maintenance and repair, but there will be a shift in sales style and associated skill requirements with any move from the car ownership model to the mobility model being accompanied by substantially different management and marketing styles. However, even with respect to sales and marketing, the changes seem only likely to apply to a relatively small percentage of sales personnel; nevertheless, those that remain in the traditional model will need to be aware of the growth in competition from the mobility model.

4.2.3 The Vehicle Parc, and the Demand for Servicing and Repairs

The *size* of the vehicle parc will clearly have a major bearing on the total demand for servicing and repairs and hence on the overall requirement for technicians, master technicians, service managers, parts distributors and fast-fit operatives.

The *age* of the parc and its *composition* will also have substantial impact on the amount of maintenance needed. As the park ages, the need for repairs and the proportion of cars taking and failing the MoT test will increase, thus boosting demand. However, there is likely to be some compensating reduction in the number and frequency of services and repairs actually undertaken, particularly under the *National Enterprise* and *Local Stewardship* scenarios, as vehicles come out of warranty and ownership moves to a less affluent part of society. The number of electric and hybrid cars in use will affect the average frequency of servicing and the length of warranties, as well as demanding new skills.

The assumed size, age and composition and shape of the vehicle parc under the four scenarios take into account a range of variables including:

- changes in GDP, personal disposable income, fuel prices and other motoring costs, and hence in the demand for road travel and vehicles;

- government policies, particularly with respect to imposition of regulations and provision of subsidies and other incentives to switch to low-carbon vehicles and scrap older high-emission vehicles.

The resulting parc sizes and average vehicle ages under each of the four scenarios are summarised in Figure 13 below together with estimated changes in the volume of transactions such as servicing, repairs and MoT tests. The figures also include an allowance for a progressive reduction in the recommended service frequency in new cars. It must be emphasised that the figures are not forecasts, and should be regarded as no more than indicative of the possible scale and direction of changes under different scenarios.

Figure 13 Parc Size and Service Transactions in 2020 as a Percentage of those in prevailing in 2007 under Each Scenario

Scenario Assumption	World Markets	National Enterprise	Global Sustainability	Local Stewardship
Change in size of parc	+15%	+5%	-5%	No change
Change in average age of parc	No change	+6%	-3%	+10%
Percentage of electric or hybrid in parc	5%	3%	10%	4%
Change in number of transactions	-8%	-15%	-23%	-16%

It is significant that all four scenarios point to a reduction in the number of service and repair transactions. The reduction is greatest under *Global Sustainability* followed by *Local Stewardship*. The impact of the reduction in transactions on the number of technicians and hence training requirements depends on a number of other variables, most notably changes in productivity. These are discussed below.

4.2.4 Changes in Workforce Productivity and Numbers

Potential changes in productivity are considered under four main occupational categories: management, sales, technical and administrative.

Management

The number of managers has been assumed to be primarily a function of the total number of staff employed with a reduction if the average size of organisation grows. Thus, under *Local Stewardship* where the number of workshops and small dealerships is expected to increase, there has been a relative increase in the number of managers. However, caution needs to be exercised in linking such numbers with demand for training as the quality of managers, their skill requirements and their inclination to undergo training is probably inversely correlated to their numbers.

Nevertheless, the scenario assumptions suggest that there will be a small increase in the number of managers and proprietors under *Local Stewardship*, a small fall in numbers under *World Markets* (although training demand may be higher) and a significant fall in numbers under both *National Enterprise* and *Global Sustainability*.

Sales Staff

Sales productivity, in terms of the volume and value of vehicles sold per employee, can be improved by the use of efficient management, staff rosters and training; by greater use of technology, mostly ICT; or by increases or reductions in the level of service provided to the customer. The assumed outworking of these factors under each of the scenarios is shown in the table below as “Net Productivity”. In each scenario, the productivity increase due to technology is offset by an increase in sales effort. The result is that the number of sales staff is primarily driven by the level of new and second-hand sales by dealers.

Only under *World Markets* is there an increase in the number of sales people between 2007 and 2020. The decline under the other scenarios, which ranges from around 15% to nearly 25%, reflects their weaker vehicle sales markets.

Figure 14 Assumed Annual Changes in Productivity of Sales Staff and Numbers of Sales Staff in 2020 relative to the Levels prevailing in 2007

Scenario Assumption	World Markets	National Enterprise	Global Sustainability	Local Stewardship
Net productivity: assumed annual increase	-1.0%	no change	no change	-0.5%
Number of sales personnel relative to 2007 levels	+15%	-19%	-15%	-26%

Technical Staff

Alongside changes in vehicle drive chains, many other technological changes are possible, as discussed at length in Chapter Two. Some of these technological changes will add to complexity of vehicles and that of their repair and maintenance; some will remove or reduce maintenance complexity.

Electronics and modular components, whose use is expected to increase under all scenarios, albeit at varying rates, are likely to reduce the time spent on servicing and repair. Thus, it is generally assumed under the various scenarios that the general increase in technology will at least be matched by increases in productivity of technicians, thereby reducing the average time taken to service a vehicle, as has occurred over the past two decades. The impact of electric vehicles, which have lower service requirements, will accelerate this change, albeit probably on only a very small percentage of the parc over the time horizon under review. The scenarios have assumed a range of productivity improvements varying from a maximum annual 2% under *Global Sustainability* down to one of ½% under *Local Stewardship*, assumptions which compare with the average annual increase of around 2½% achieved over the past two decades. Over a ten year period, a 2% annual productivity improvement will reduce required technician hours by nearly 20%; while an annual productivity improvement of ½% will reduce them by some 5%. Productivity increases under *Global Stewardship* are driven by the push towards a rapid take-up of newer low emission vehicles which incorporate the newer technologies, while the low rate of productivity growth under *Local Stewardship* reflects low rates of growth and vehicle replacement and the ageing vehicle parc.

The net effect of changes in the volume of transactions coupled with the varying rates of productivity increase under the four scenarios leads to significantly different outturns with respect to the future number of technicians required by the automotive retail industry. However, under all scenarios the number of technicians required declines between 2007 and 2020 as shown in Figure 15, ranging from a reduction of around 20% under *Local Stewardship* to one of 40% under *Global Leadership*.

Figure 15 Assumed Annual Changes in Productivity of Technicians and Numbers of Technicians required in 2020 relative to the levels prevailing in 2007s

Scenario Assumption	World Markets	National Enterprise	Global Sustainability	Local Stewardship
Technical productivity: assumed annual increase	2.0%	1.0%	2.0%	0.5%
Number of technicians relative to 2007 level	-27%	-27%	-40%	-20%
Number of master technicians relative to 2007 level	+5%	-10%	-14%	-11%
Number of fast-fit fitters relative to 2007 level	+17%	-3%	-4%	-3%

The decline in master technicians is likely to be less marked, particularly under the two higher innovation/technology scenarios of *World Markets* and *Global Leadership*, and could actually show a small increase under *World Markets* reflecting an increase in average skill requirements.

Administrative staff

Demand for administrative staff has been assumed to be largely dependent upon the number of other staff employed, a measure of activity. Productivity has been assumed to change little. The net effect on the number of administrative staff consequently shows a reduction under all four scenarios. Under such assumptions, the percentage decline by 2020 compared with 2007 levels would range from just over 10% under *World Markets* to one of nearly 30% under *Global Sustainability*.

Figure 16 Numbers of Administrative Personnel required in 2020 relative to the levels prevailing in 2007

Scenario Assumption	World Markets	National Enterprise	Global Sustainability	Local Stewardship
Number of administrative personnel relative to 2007 level	-11%	-21%	-28%	-18%

4.2.5 Overall Size of Workforce

Overall, the total number of employees working in the automotive retail industry in 2020 would range between an estimated 464,000 under Global Sustainability up to a figure of 573,000 under both *World Markets* and *Local Stewardship*. Under *Local Stewardship* compared with *World Markets*, the effect of lower underlying levels of vehicle sales and a smaller vehicle the parc on total employment are offset by lower rates of productivity growth and an older average parc age. (See Figure 17)

The range in total employment of up to 573,000 in 2020 compares with an automotive retail industry workforce of 644,000 in 2007 (as quoted in the UKCES Working Futures 2007 report). The cumulative percentage declines range from just over 10% to nearly 30%.

It should also be noted that the mix of occupations varies between scenarios, and although the 2020 total employment level under *World Markets* and *Local Stewardship* is similar, the occupational mix is rather different, with the number of sales employees increasing under *World Markets* while the number of technicians falls, and with sales employees declining more rapidly than technicians under *Local Stewardship.*

Figure 17 Numbers of Total Employees directly dependant upon the Automotive Retail Industry in 2020 compared to the Levels prevailing in 2007

Scenario Assumption	World Markets	National Enterprise	Global Sustainability	Local Stewardship
Total Number of Employees in 2020 ('000's)	573,000	502,000	464,000	573,000
Percentage Change 2007-2020	-11%	-22%	-28%	-11%

Finally, it must again be stressed that the preceding figures are not forecasts. Rather, they are intended to be purely indicative of what may occur under each of the four scenarios as a consequence of the chosen scenario storylines and their underlying assumptions.

4.3 Changing Skill Requirements

The preceding analysis has examined the nature of changes that may occur under each of the scenarios in terms of industry employment levels and broad occupational mix.

Within broad occupational categories, there are likely to be changes within and between sub-occupations and in the particular skills required by a given occupational category. These changes are discussed in the following sections of the report.

In Chapter Two, the report discussed at length a number of the key factors or forces that can be expected to drive change in the industry and in its future skill and training requirements. Three factors in particular are likely to have a significant and varying impact on skill and training requirements under the four scenarios: information, communication and other technologies; health and safety; and regulation and certification. Each are considered again briefly before examining their implications, and those of other change factors discussed in Chapter Two, on the specific future skill needs of particular occupational groups.

4.3.1 Technology

Two points in particular should be re-iterated with respect to technological change.

First, there is a significant lead time between the initial research and development of a new innovation or technology and its widespread take-up and application to standard vehicle production models. Most of the technological advances and innovations that are likely to achieve significant levels of up-take and market penetration over the coming decade are already well-known within the industry, particularly by the parts manufacturers and vehicle assemblers. It is only in the latter part of the coming decade and beyond that as yet emerging technologies, may have a significant impact on the automotive retail industry. However, the impact of the new technologies already available, but not yet widely applied, may still surprise. There may also be ideas not yet recognised that will have a big impact by 2020.

With respect to the new technologies identified, the rate of take-up and degree of impact on the industry can be expected to be greatest under the two high innovation scenarios, *World Markets* and *Global Sustainability*.

Secondly, extensive reference has been made to the various effects that ICT and in particular the internet are likely to have on vehicle specification and electronic equipment levels, on marketing and sales channels, on customer service and relationship management, on service and repair information and diagnostics support, and on supply chain and general business management within the automotive retail sector.

The benefits which greater use of ICT can offer in each of these areas are generally recognised and they are already being exploited to varying degrees by many industry participants. However, there is the potential for the application of these technologies to accelerate and become much more widespread and pervasive. The extent to which this is likely to happen is once again likely to be greatest under, but by no means limited to, the two high innovation scenarios, *World Markets* and *Global Sustainability*.

4.3.2 Health and Safety

It is probable that the drive to reduce the level of both road accidents and accidents in the workplace will continue to some degree under all four scenarios as a result of pressure from government, insurance companies and the public.

Safety on the road will involve increased complexity of vehicle design, parts, materials and systems. This in turn will require new skills on the part of those selling, servicing and repairing the vehicles in question, especially in the case of the maintenance of safety or hands-off driving components of vehicles where high levels of competence will be required to ensure that the necessary work is responsibly and safely completed. Maintenance of active safety devices could be a growing part of car maintenance schedules. Under certain scenarios, the possibility of regulation, certification and hence training of technicians working on these new technologies seems likely and indeed desirable.

Within workshops, safety will continue to be an issue. Apart from pressure to reduce existing mechanical and chemical risks, there will be an increase in electrical and chemical risk from the growing percentage of high voltage battery packs in hybrid and electric vehicles (EVs). Other components are also likely to present new risks, possibly as yet unidentified, but the risks that air bags present to technicians are an example of how a new safety technology can pose dangers as well. Again greater health and safety regulation and training is a distinct a possibility, particularly under certain scenarios and should any serious road traffic or workplace accidents occur as a result of poorly handled, serviced or maintained new vehicle technologies and equipment.

Training will also be vital in increasing the understanding and competence of technicians in dealing with ever changing safety issues. With regulation, better access to training for the smaller independents will be necessary, and should probably be improved under all scenarios.

4.3.3 Regulation and certification

The likelihood and extent of further certification and regulation varies significantly across the four scenarios. However, the perceived benefits and impact of certification appear more closely aligned across the scenarios than perhaps is the case with outright regulation.

There are widely held views that the industry currently needs more regulation or at least self certification to improve the image of the industry in the eyes of customers, government and potential employees, let alone insurance companies.

The scenarios point to the potential additional value to be derived from further certification, particularly with respect to improving the image of vehicle servicing and second hand car sales activities. The advent of EVs and hybrids with 400v battery packs and accompanying toxic materials provides scope for significant problems if technicians are not properly trained. It is significant that the scenario in which the opportunity to accelerate regulatory change appears most likely, *Global Sustainability* which embodies high levels of government intervention, is the one with the highest penetration of hybrids and EVs. Should it appear that the UK is going down that route, action should be taken to lobby government for help in promoting certification.

Certification will increase demand for training, but it is likely that the first targets will be the “new” specialist skills for working on the dangerous components of EVs and hybrids, and later, possibly, hydrogen. To be allowed to work on certain components in vehicles, technicians might have to be certificated to an agreed national standard.

Other pressure for certification could arise in the event of more drive-by-wire and semi autonomous driving products, such as cars designed for road trains, where an electronic failure could be fatal. The public is generally likely to support certification for technicians in such circumstances, and given that manufacturers are constrained by law in defining who may service their cars, government intervention seems plausible in all but the lightest government touch scenarios.

4.3.4 Implications for Skills

Generic Skills

Generic skills are increasingly essential for any successful business in the twenty-first century. Sector employers have identified customer handling (sales and customer service), improved literacy and numeracy, problem-solving, communications, and team working as key. Many in the sector consider that current cohorts show failings in this area. These failings are likely to be accentuated under at least two of the scenarios, *World Markets* and *Global Sustainability,* as technology moves forward, competition in the labour market intensifies and demands for improved customer service increase.

Management skills

The two highest growth scenarios, *World Markets* and *Global Sustainability*, involve rapid changes in technology and probably market structure as new entrants to the sector emerge providing specialist services, selling cars supermarket style, or using high-powered marketing to sell mobility without vehicle ownership, for example through rental, leasing, car clubs or other routes. Dealing with these changes effectively will require a generally higher quality of management, particularly with respect to leadership and strategic planning. Increased competitive pressures under all four scenarios seem likely to place a growing premium on competent business management, since those organisations most able to anticipate and respond to change, and secure meaningful efficiency and productivity gains across their operations, can also be expected to be among those most likely to survive and prosper over the coming decade and beyond.

The balance of strength between the manufacturers and the dealers and independents will throw up new challenges for all sectors. The significant difference in size and style of market across the four scenarios also underlines the need for successful companies to be observant and proactive.

However, it is generally recognised that high quality management skills are in short supply in the industry. This is probably largely due to lack of relevant training, especially in smaller businesses where managers have often moved from technical roles to management with no formal training. The benefits now to be derived from enhanced management skills consequently need to be “sold” to businesses in the industry. Training in leadership, strategic planning and just 'running a business effectively’ needs to be seen as commercially advantageous, desirable, available and accessible to busy managers

Sales skills

Vehicle sales currently account for around three quarters of industry turnover. The ever changing landscape of new makes, models and technology currently creates a constant need for new sales training. The wider penetration and acceptability of EVs and hybrids will impose the need for salespeople to understand and sell the advantages of the different systems and types of vehicle. Scenarios such as *Global Sustainability* and *Local Stewardship* are likely to place far greater emphasis in customers’ minds on lifetime vehicle costs, and salespeople will require a much greater understanding of the corresponding merits of particular vehicle types and models with respect to different customer lifestyles and vehicle usage patterns.

Opportunities for specialised marketing and sales will also occur in developing sectors such as car clubs, car rental and mass selling supermarket style.

The internet will offer new opportunities and challenges to sales people in all fields. Selling vehicles to the ICT savvy Generation Y will require different skills, attitudes and products to those needed to sell to the growing grey market. Indeed it seems likely that differentiation of sub-sector markets may become increasing important in all scenarios, and each scenario will have different sub-sectors with their own size, shape and characteristics.

Finally, in a highly regulated society such as that prevailing under *Global Sustainability*, there is greater probability of regulation requiring certification of employees involved with financial services, including insurance. This could be particularly significant for the training commitments of rental companies, leasing companies and car clubs.

Technical skills

Technical skills will be in constant demand under all four scenarios and are perhaps the most widely recognised current industry skills gap, largely due to the pace at which new technology is being launched. IT hardware and software is being put into vehicles in the form of complex electrical systems, and high-level problem solving and technical diagnostic skills are becoming increasingly important and indeed essential in servicing the latest generation of models. Alongside the rapid changes in technology, vehicle types, vehicle models and model updates, has come an increasingly extensive and perhaps bewildering array of vehicle parts, requiring increased levels of care in ensuring choice of the correct replacement.

Much greater use of bio-fuels could have significant impacts on the servicing of older cars.

Keeping abreast of technological advances will become even more important when the significantly new technologies of EVs and hybrids penetrate further into the market.

All these changes can again be expected to lead progressively to an industry requirement for higher levels of literacy, numeracy and IT skills among its workforce. In turn, when it comes to employee recruitment and retention, this will have implications with respect to the industry's image and employment terms and conditions. This seems likely to be especially important under the *World Markets* and *Global Sustainability* scenarios where competition for skilled employees is likely to intensify across the economy as a whole.

As technology further removes the greasy side of technician's skills, such employees too may need to develop more customer-facing skills. Technicians' administrative skills must also improve to ensure that access codes and passwords used in electronic systems are safely and properly stored. Proper storage and retrieval of the wide range of software could also be an issue.

In some other industries where technology has advanced rapidly, an hourglass effect has been observed with respect to workforce skill requirements as a growing demand for certain high-level skills, such as master technicians, and an increase in the demand for more routine skills, such as fast-fit operatives, has been accompanied by a decline in demand for middle range skills such as basic technicians.

It is possible that such an effect could occur in the vehicle repair industry, given the greater use of electronic diagnosis, more plug-in electronics, replacement rather than repair of defective components, and reduced service intervals, which results in certain service and repair work becoming more routine while some faults could become more difficult to diagnose and harder to repair, requiring proportionately greater demand for the skills held by master technicians. A significant outcome of such changes may be that demand for master technician levels increases at a time when the number of technicians in the industry capable of making the move from technician to master technician is falling. The growth of fast–fit will be instrumental in this shift. Again, it seems most likely to become apparent under the *World Markets* and *Global Sustainability* scenarios.

Administrative Skills

One key impact on administrative skills will be enhanced ICT and the use of the internet for more communication. In the high growth scenarios, customer service skills will be important as all parts of the organisation will need to have the right customer attitudes and provide good customer service.

There also appears to be greater opportunity to use ICT and the internet in parts identification, sourcing and supply.

In the scenarios where increased numbers of car clubs and specialist rental companies are expected to emerge, more participants can be expected to follow the current leaders in the market and use internet and all forms of mobile communication to allow the easiest possible access to rental vehicles. The overall administration of rental schemes (renting, maintenance, vehicle locating and retrieval) is likely to be highly automated for speed and security, but the human backup will need to match the level of ICT with expertise and customer concern.

Other skills

Only under *Global Sustainability* does the rate of scrappage increase noticeably, so that little additional training in scrappage is likely to be needed under certain conditions.

However the recycling of increasingly complex materials and components, some of which may contain more hazardous materials and fluids, will require continual retraining to ensure accurate and complete recycling as well as the safety of the environment and the operators involved. Tighter controls can be expected particularly under the *Global Sustainability* and *Local Stewardship* scenarios where government intervention and regulation is expected to be greater and where there is a much increased emphasis on environmental protection and sustainability.

Under all scenarios, however, recycling can be expected to grow to some degree in importance, and workshop technicians in general will need to keep up to date with respect to current requirements for recycling materials, replaced components and packaging.

4.4 Key Training Implications

4.4.1 Speed of innovation and up-skilling

The speed of innovation will have an impact on required levels of training, how it is delivered, by whom and to whom.

It seems likely that a significant rate of change in vehicle technology will continue over the next ten years. It is likely to be particularly marked in the high growth, high innovation scenarios of *World Markets* and *Global Sustainability*. It will consequently be important for trainers and training courses to keep in touch with new developments and stay ahead of the game in order to ensure that students are not taught out-of-date technology.

Indeed the speed of change may be such that frequent retraining will be needed by those dealing with the newest technologies. This will not necessarily apply to the majority of technicians, and much of the initial training is likely be provided by manufacturers or their agents. However, specific up-skilling training modules will need to be made available at a sensible cost, not just for the larger dealerships but for the independents as the vehicles with the latest technology get older and move from being serviced by manufacturers or their dealers to the independents.

The penetration of new drive-trains into vehicles, EV or hybrid, will be progressive under all scenarios. It seems likely that under all four scenarios, training will be required for a limited number of experienced technicians to deal with the new technology, although there will be no economic reason to train all technicians to meet a limited market. There may even be a period of interim growth in small independents that specialise in the new technologies, much as occurred with ABS when it was first introduced. However, whether the demand is met by separate specialist organisations or by small teams or individuals within an organisation, the net effect will be a steady demand for up-skilling in the new drive trains, probably faster than actual demand requires as most workshops will eventually want to have the ability to undertake the work as it arrives, even if the new skills are not used to full capacity.

Careful employee selection will be required on the part of employers to choose those most suitable for up-skilling and re-training.

4.4.2 Delivery of training

The rate of change of technology will require better methods of training delivery. Given the likely increase in average levels of training per employee, particularly under the scenarios involving rapid change, cheaper methods of training delivery are likely to be required to persuade employers to provide levels of training adequate to meet demand. Technology should be able to provide solutions to assist in this need. Modularised training on-line, at the learner's own speed, with suitable personal support has been frequently proposed, but it can be expected to become much more commonplace, particularly under the *World Markets* and *Global Sustainability* scenarios, as the applications of ICT increase.

Trainers will need to maintain close liaison with their customers to ensure that the training content is kept abreast of technological and other change, and that training methods are acceptable both to employers and employees and meet the needs of individuals and the industry as a whole. As already noted, it has been suggested that this is often currently not the case and that a number of organisations which currently offer technical training and other courses are failing to keep in touch with developments in the industry and its future skill needs. This can lead to frustration and disillusion, not only on the part of the individuals who have undergone training but also by their employers, especially if they have sponsored the training in question. A proliferation of training organisations and courses can also make it difficult for those seeking the training to identify the relevant and distinguish the good from the bad.

The UK automotive retail sector is by no means alone among UK industries in needing to address this issue. In particular, more thought needs to be given as to how trainers themselves can be kept up-to-date, not only with respect to the industry's immediate skills needs but how may evolve over the medium to longer-term. Success in this respect should hopefully aid the development of a continuous training and development culture in the industry with associated linked programmes of initial training and refresher courses, and rather than what have perhaps in the past been attempts to deliver a one-off fix.

There are also likely to be issues over the cost of training the trainers and providing the equipment and other resources needed for training, and how this cost is met, especially under the less economically prosperous scenarios of *National Enterprise* and *Local Stewardship*.

4.4.3 Apprenticeships

The apprenticeship route has served the technical side of the industry relatively well for decades. Historically, key issues have included those of attracting the best applicants for training and in funding that training.

The difficulties with respect to recruitment in general appear to result from the industry's image problems noted above, but pay, conditions and career prospects have also been mentioned.

An additional factor facing the automotive retail industry, and indeed all other industries, over the coming decade will be the declining number of school leavers. Future school leavers may also have different expectations compared with those of previous decades, as well as greater familiarity with, and use of, the new IC technologies.

Even though the total industry workforce requirement is expected to decline at least to some degree under all four scenarios considered in this report, an ageing workforce coupled with step changes between particular age cohorts, may well result in a significant loss of employees with technical expertise and experience due to retirement and other factors. Even under the scenarios of lower total workforce demand, recruitment of new employees with good basic skills will be required, and this will be from a diminishing pool of school leavers in what may be an increasingly competitive national marketplace for such people.

Given the rapid rate of change of technology anticipated in most scenarios, the question of what and how to teach new entrants to the sector will be a continuing issue. The question of what *not* to teach new entrants as old technologies wane will also be an issue.

Given that new technologies are likely to be arriving continuously, courses will need to be modular, flexible and up to date. Ideally, they should be tailored to each individual's needs. All stages should be certificated as evidence of competence as one way of improving the industry's image.

Identification of the best new entrants, both at recruitment and thereafter, will be important as levels of technology increase and higher skill levels are demanded. The less competent in the industry will also still need continual training to keep up with technological change. Indeed, there perhaps needs to be greater recognition that many skills in a technology-based industry are transient.

4.5 Recruitment and Staff Retention

Issues of recruitment and retention have already been touched upon earlier in this chapter, but they need to be re-iterated, given their likely future significance for the industry.

Recruitment of the best and most suitable new entrants has historically been an issue. This has been partly due to the poor public image of the industry, most notably that of the sales and maintenance and repair activities. This poor image, however, is by no means representative of the entire sector, but it has been perpetuated by the popular media and has certainly contributed to the problems faced by many employers in attracting high calibre staff. Other challenges to recruitment include the perception that pay levels are unattractive, that there is a lack of flexible working opportunities, that working conditions are poor and that there is a lack of opportunities for graduates.

The future offers particular challenges and opportunities with respect to technicians. In the *World Markets* and *Global Sustainability* scenarios which bring a high level of technological, probably largely electronic, change, the industry will not be able to attract good recruits in what is likely to be a booming market for skilled labour unless it changes its image from one of "greasy hands" to high tech. However, the technological changes that are occurring should be capable of helping the industry to improve its image in this respect.

New technology will demand a new type of recruit, comfortable with electronics, and new selection criteria will be needed. However, even in the high technology scenarios, it seems likely that most recruits will need to be technicians with electronic capabilities rather than electronic experts, as the rate of integration of technology and the relatively simple diagnosis and replacement of components, excepting a few difficult problems, will not justify having a purely electronics specialist sitting around in any but the very largest workshops. Indeed, the cost of having expensive skills under utilised may stimulate demand for on-line semi-automated diagnostic help lines, manned by experts and specialists. Some of these experts could be ICT specialists rather than technicians expert in ICT

In the less technically advanced scenarios, demand for electronic skills will not be so extreme, and the general availability of jobs in the overall labour market will be lower, so that employers may have an easier task in finding and recruiting suitable staff.

Overall, however, the general picture under all four scenarios is one of a decade and beyond where new recruits with higher levels of basic generic skills are required and where the importance of training will shift from that of training new entrants for a lifetime in the industry to continuous retraining of employees throughout their working life in order to maintain and increase their expertise as technology changes. Flexibility of both employment and training, individualised training methods and careful selection of recruits all seem likely to be central to success.

4.6 Regional Considerations

This project has not undertaken any detailed regional analysis, but a number of general observations have been made in Chapter Three concerning possible differences in levels and patterns of regional development and their potential implications for the automotive retail sector under each of the four scenarios.

Key points to note include the following.

- Under *World Markets* and *National Enterprise*, economic growth is likely to be skewed towards London and the South East which are likely to attract a significant proportion of new business investment and jobs. The more northerly and western areas of the country are likely to experience slower employment growth and more persistent levels of high unemployment, particularly in those areas that were excessively dependent upon high levels of public sector employment prior to the 2008/2009 recession.

- Under *Global Sustainability*, supported by active government policy measures and investment, economic growth and new business investment is likely to be more evenly distributed than under *World Markets* and *National Enterprise*, although there is still expected to be a bias towards the South East.

- Under Local Stewardship, the relative importance of London and the South East can be expected to show at least some decline, although it will still remain an important centre of economic activity. In contrast, regional towns and centres of specialist economic expertise are likely to grow in importance with the growing emphasis on sustainability, and the greater preponderance of small and medium-sized enterprises in providing a greater degree of regional and local self-sufficiency.

- To varying degrees, a combination of rising fuel and other motoring costs coupled with government policy towards, and available funds for investment in, transport infrastructure and public transport services are likely to work to the disadvantage of rural areas, particularly those in the more peripheral parts of the country.

Changes in the national political, social, economic and technical environment per se and technical and other developments in the automotive industry seem unlikely to result in significant differences in the fundamental nature of future skills required by the automotive retail industry between England, Wales and Scotland.

The actual mix of skills required will, of course, vary between countries, regions and localities and scenarios. For example:

- Electric vehicles are likely to achieve a higher market penetration in the larger urban areas where congestion is greater and space more limited, and where the nature of vehicle usage and length of journey is more likely to justify their higher capital cost and investment in supporting infrastructure. Certainly, initially, there will be concentration of need for EV capable technicians in the areas in which government is currently supporting the installation of EV infrastructure.

- Hybrids and higher specification more conventional luxury cars embodying greater levels of advanced technology are likely to make greater market inroads in the more affluent parts of the country and hence engender a greater demand in these areas for the associated sales and maintenance skills.

- The poorer and more rural areas of the country seem likely rely to a proportionately greater degree on older second-hand vehicles on account of issues of affordability, and hence the pace at which local service and repair workshops have to upgrade their skill base to cope with the new vehicle technologies may be somewhat slower than is the case in the major cities.

- Finally, under all scenarios, competitive pressures seem likely to lead to a further reduction in sales dealerships, and it is possible that the greatest fall and hence in required levels of sales personnel will be in the rural and other areas of lower population density.

In so far as it is possible to generalise within the scope of the present project, it seems most likely, taking into account the different demographic and economic characteristics of the major regions of the UK, that:

- the greatest impact of new technologies and other factors driving change on the automotive industry's skill requirements over the coming decade will be in the southern and eastern regions of the UK and in the other major conurbations and cities of England, Wales and Scotland; and that

- the least impact on future skill requirements will be in the rural and other thinly populated areas of the three countries.

4.7 Early Warning Indicators of Future Change

While there are clearly some common strands across all scenarios with respect to future workforce skill requirements and training needs, there are also some differences, particularly in terms of degree. It will therefore be advantageous in evaluating and planning future automotive retail industry skill and training needs if the IMI and other industry institutions monitor evolving changes in the wider economic, political, and social environment in general and in the automotive industry in particular, in order to identify the early warning indicators that may signal a particular future direction of change and increased likelihood that a given scenario or important elements of a scenario may occur.

Clearly, it is likely to be possible to gauge an indication of the general direction of change by tracking actual movements, and underlying trends, in a number of the key variables flagged in the individual scenario storylines, including:

- the rate and stability of UK GDP growth;
- the rate of change in real crude oil prices and the degree of volatility in the latter;
- changes in annual and underlying trend levels of new car sales;
- the rate of UK market penetration by hybrid and electric cars;
- the rate of increase in fuel and other taxes and charges imposed by the UK government on the UK motorist.

There are also a number of scenario specific policy and other developments that may act as useful pointers. While by no means exhaustive, Figure 18 provides some examples of the headline events that may occur under each scenario and provide advance warning of other associated developments.

Figure 18 Some Possible Early Warning Indicators

World Markets	National Enterprise	Global Sustainability	Local Stewardship
Significant progress on international trade agreements and co-ordinated G20 reform of international financial system	Heightened global security concerns Increased incidence of regional conflicts	Open global trading environment Major and binding global treaties on combating climate change	Growth in UK international trade stagnates Government and individuals struggle to reduce their indebtedness Deflationary pressures constrain economic recovery
	Trade wars and protectionism, particularly between the US/EU and China Euro crisis leading to two speed Europe		EU evolves into a loose association of European regions Much greater local democracy with devolution of power and decision making from national to local level
Slow international progress made in curbing carbon emissions Increases in international energy supplies moderate real increases in oil and gas prices	Highly volatile energy prices, and disruption to fuel supplies	EU co-ordinates action by individual member states to impose heavy taxation and carbon pricing aimed at slashing carbon emissions, action which is reinforced by appropriate legislation Success in developing low carbon industries and processes	Heavy taxation on energy consumption and carbon emissions, reinforced by legislation
Early start on substantial programme of investment in new UK nuclear power stations	Government struggles to attract private investment for new nuclear power stations Carbon and fuel taxes are increased in an attempt to reduce energy demand Power cuts become increasingly common	Heavy investment in new low carbon manufacturing and other activities, with UK government support and incentives	Emphasis on developing smaller-scale local UK energy sources, particularly with respect to low-carbon alternatives, supported by a combination of taxation, incentives and legislation
Major inward investment into UK by multinationals	Many multinationals relocate headquarters out of UK Marked decline in UK manufacturing with major plant closures. Government moves to protect key national interests and industries.	Development of new green industries flourishes with significant government support and incentives. UK continues to be seen as an attractive investment location by international companies.	Decline in share of big industry and business SMEs grow in importance
		Renewed, substantial UK government investment in public transport and rail infrastructure	
Chinese and Indian car manufacturers start to achieve significant penetration of western car markets	Substantial and growing excess global auto manufacturing capacity leads to consolidation and plant closures in Europe	EU Certification requirements for technicians working on hybrid and EVs	

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Appendix Two Cross Scenario Analysis

The following table provides a comparison of the key characteristics of the four scenarios presented in Chapter Three under a number of key economic, political and industry headings. A summary of the key similarities and differences between the scenarios is also given at the end of Chapter Three

	Topic	World Markets	National Enterprise	Global Sustainability	Local Stewardship
1	Real GDP growth rate	2½%	1½%	2%	1%
2	Real GDP level cf. 2007	20%	5%	15%	5%
3	Real household disposable income	Has risen slightly faster than GDP; income disparities have increased.	Has risen slightly faster than GDP; income disparities have increased.	Has risen more slowly than GDP; income disparities have reduced.	Has risen broadly in line with GDP; income disparities have reduced.
4	Employment/ unemployment	Little change in numbers employed.	Unemployment up. More people, particularly low skilled, looking for jobs in the informal sector.	Decline in both net immigration and unemployment.	Rise in unemployment contained but greater proportion of lower-paid jobs.
5	Real oil prices	Modestly up.	Significant real increases. Concerns over security of supplies.	Significant real increases.	Significant real increases
6	Stance of government	Light touch/self reliance of individual.	Light touch/self reliance of individual.	Active state intervention; direct provision of public services.	State intervention and provision of public services favoured but constrained by government finances.

	Topic	World Markets	National Enterprise	Global Sustainability	Local Stewardship
7	Degree of regulation	Light touch/self certification.	Light touch/self certification.	Substantial, particularly with respect to environmental, planning, sustainability, and health and safety issues.	Tight local regulation
8	Health & safety regulation	Gradual but progressive increase, largely EU driven.	Limited increase.	Marked increase.	Local implementation so variable
9	Investment in UK transport infrastructure	Limited public sector, private sector more buoyant. More road congestion.	Limited, both public and private. More road congestion.	Substantial public and private investment in sustainable transport and infrastructure supported by taxes, charging and tolling, particularly of road users.	Limited investment by both public and private sectors. Congestion at times.
10	Tolling/traffic management	Some increased tolling/telematics, more in pipeline		Widespread introduction of telematics, electronic traffic management and traffic information systems	Congestion charging introduced in some urban areas.
11	Taxes/charges on motorist	Up a little.	Up more than under World Markets.	Up substantially due to green agenda. Subsidies to encourage public transport and sales of hybrid/ electric vehicles. Possible taxation of transport electricity.	Substantially up.

	Topic	World Markets	National Enterprise	Global Sustainability	Local Stewardship
12	Demand for cars/transport	Trend growth relative to GDP trend growth broadly unchanged.	Trend growth relative to GDP trend growth slightly lower.		Reduced
13	Vehicle manufacture	Strong competition, spread of international best practice. Significant standardisation of components/vehicle platforms.	Excess global production capacity; further consolidation and plant closures. Some standardisation of components/vehicle platforms. More window dressing to create brand differentiation. Slower innovation and incorporation of new technology. Fewer new model launches	Intense global competition. Heavy R&D spend and innovation. Accelerated development low carbon emission models with enhanced H&S features including collision avoidance. Some commercial hydrogen fleets, but at experimental stages. More standardized components and shared vehicle platforms. Manufacturers' response to consumer awareness of lifetime cost of vehicle.	Excess global production capacity; further consolidation and plant closures. Western manufacturers being squeezed globally by lower cost BRIC manufacturers. More manufacturer (and customer) focus on lifetime costs of vehicles. Slower growth and excess production capacity has slowed rate of innovation and penetration of newer technologies.
14	New car sales cf 2007	Up 10%	Down 10%	Same	Down 30 %
15	Vehicle parc cf 2007	Up 15%	Up 10%	Small reduction	Little change

	Topic	World Markets	National Enterprise	Global Sustainability	Local Stewardship
16	Average age of fleet	Same	Slightly higher.	Slightly lower	Increasing significantly due to lower new sales, lower average mileages, extended vehicle lives.
17	Petrol share of new sales	40%	47%	30%	43%
18	Diesel share of new sales	40%	40%	35%	43%
19	Smaller IC engine capacities	Yes	Yes	Yes, drive for substantial increase in fuel efficiency.	Yes, very much so on account of cost and environmental awareness.
20	Electric share of new sales	5% Sales constrained by cost and lack of investment in infrastructure.	3% Sales constrained by cost and lack of investment in infrastructure.	10%	2% Sales constrained by cost and lack of investment in infrastructure except in some core urban areas
21	Hybrid share of new sales	15% Sales constrained by cost.	10% Sales constrained by cost.	25%	12% Sales constrained by cost
22	Share of parc by engine type	IC – 95% Hybrid – 4% Electric – 1%	IC – 96% Hybrid – 3% Electric – 1%	IC – 90% Hybrid – 7% Electric – 3%	IC - 96% Hybrid – 3% Electric – 1%

	Topic	World Markets	National Enterprise	Global Sustainability	Local Stewardship
23	Vehicle spec	Higher even on small vehicles/ more electronics. More options.	Some increase, particularly on medium to higher sized/priced models, but consumers more price conscious.	Many optional extras (such as comfort, entertainment and navigation systems) added to even the smaller models.	Consumers favour more utilitarian models due to personal budget pressures and social attitudes on conspicuous spending.
24	Warranty length	Increasing.	Modest increase.	Extended. More multiple year service packages included in vehicle price or offered as fixed price option at time of sale.	Increasing
25	Service intervals	Modest increase	Modest increase	Extended	Increasing
26	Service/repair content	More component replacement rather than repair, body, driver train & electronics.	More component replacement rather than repair, body, driver train & electronics.	More complex body components and materials. Much more replacement than repair.	Make do and mend where possible. Vehicles are more traditional anyway.

	Topic	World Markets	National Enterprise	Global Sustainability	Local Stewardship
27	Sales channels	Weaker brands and budget electrics increasingly through car supermarkets. Strong competition between brands regarding customer service.	Car supermarkets found in every town. Marked differentiation in customer service levels between luxury and budget brands/models.	Test drives delivered to customers' front-doors on following on-lie research/request for test drive by consumers. Budget electric cars sold in car supermarkets and manufacturers own outlets, squeezing established dealers.	
28	ITC/Internet/sales channels	More buyers use internet to research car purchases. More test-drives at consumer's front door. More use in business and supply chain management.	Use for increased private second hand sales	ITC technology has moved forward apace and with it, its take-up and range of applications. Online purchase of vehicles becoming commonplace.	Use for increased private second hand sales
29	Rental	Increased but at a slower rate than GDP growth	Static	Growing	Reduced
30	Leasing	Increased but at a slower rate than GDP growth	Overall market static although business is leasing a greater proportion of what is a smaller fleet.	Increasing, for both fleet customers and individuals.	
31	Car clubs	Growing		Growing	

	Topic	World Markets	National Enterprise	Global Sustainability	Local Stewardship
32	Service and repair outlets	Greater proportion authorised/supported by main manufacturers. Weaker brands through independents. Budget-electrics through specialist repairers	More DIY, black market, skipped services/non-essential (e.g. body) repairs, but more MoT retests. Little enthusiasm for self regulation at bottom of market Some entrepreneurial specialists focusing on service/repair of electric and hybrid vehicles.	More manufacturer franchised/accredited service and body repair outlets. Specialist outlets along lines of tyre and auto-glass specialists emerge for electronics systems batteries. Servicing of fuel cells/ hydrogen powered vehicles strictly regulated. Regulation virtually precludes DIY.	Consumers reducing service frequency and/or omitting services/non-essential (e.g. body) repairs, but more MoT retests. Small low-cost independents have benefited at expense of large dealers, particularly in rural areas and for work on older cars. Niche specialists emerge to service electric vehicles.
33	Business travel cf 2007	Increased but at a slower rate than GDP growth.	Limited increase, growth in freight being offset in part by decline elsewhere. Smaller company car fleets. More demand for coach/bus travel	Increase but at a slower pace than growth in GDP.	Reduced business travel.
34	Commercial transport	HGVs steady (but larger) More small vans.	More demand for coach/bus travel	Strict controls on HGVs and HGV drivers	Decline in freight transport due to emphasis on greater national and local self-sufficiency. More demand for inter-city and urban bus travel but decline in rural services.