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THE FUTURE OF TRANSPORT

THE TRANSPORT CHALLENGE

MEETING THE CHALLENGE The UK is committed to cutting emissions by 80 per cent by 2050. Combine that target with increasing oil prices and it's clear that the transport sector must evolve, both in terms of technology and how it is used, writes **Felicia Jackson**

■ Our transport systems are changing. While the need for emissions reduction is driving many policy decisions, there is growing concern over securing our energy supply. With oil prices rising and resources increasingly constrained, the transport system needs to evolve from the frameworks which dominated the 20th century. Understanding what mobility could look like in the future is critical to transforming our transportation infrastructure.

DRIVING CHANGE IN TRANSPORT

In the UK today, despite an increasing focus on renewables and alternative fuels, demand for oil continues to increase. According to The UK Industry Taskforce on Peak Oil and

Energy Security petroleum products still account for 97 per cent of transport energy consumption. The question is what the right alternatives should look like. If we start down one path today, spending billions on new infrastructure, what happens if technological advances outpace that choice?

Rupert Fausset, principal sustainability advisor, Forum for the Future, points out that ordinary cars are making efficiency advances that contribute to lower emissions and fuel use, which are directly related. He says, "In the last few years, new car CO₂ emissions have fallen by more than 10 per cent, which could counteract the fuel price increases of so much concern to the modern consumer."

The BIS New Automotive Innovation and Growth Team (NAIGT) publication An Independent Report on the Future of the Automotive Industry in the UK recommended a portfolio approach. The report said that we should explore the role of new fuels, from biofuel to hydrogen; to look at more disruptive approaches like electrification and its accompanying infrastructure; and finally, to identify the systems in place for a hydrogen economy. Robin Haycock, head of transport at The Climate Group, and a contributor and supporting facilitator of the (NAIGT) report, says that this body of work was a contributing factor to the creation of OLEV, and its deployment of fiscal incentives, The Plugged in Car Grant, Plugged-in Places and the Technology Strategy Board's support for new technologies focusing on Electrification of Transport. The last year saw significant vehicle and infrastructure trials. 2011 should see real feedback, as we're now seeing real consumers driving real vehicles and charging with real infrastructure.

Of course as Mark Prior, group head of transportation at EC Harris puts it, "the easiest way to get low carbon transport is to get people out of cars and get freight off the road."

According to Prior, in the right circumstances, putting freight onto rail can reduce carbon footprints by up to 80 per

cent. This however usually involves the deployment of new infrastructure and, in the UK at least, we remain dependent on roads. Even the Government's promotion of high-speed rail has been promoted as a means of cutting flights rather than increasing freight, although other economic benefits are expected to accrue.

It is changes in patterns of use, rather than changes in specific technologies, that could have the greatest impact. According to Peter Head, global leader of planning at consulting engineers, Arup, what could prove more effective in the management of freight would be to move towards a model developed for eco-cities in China, the deployment of consolidation centres with delivery into the city using electric vehicles. When put close to road and rail, the model can free up roads, and supports matching between consumers and collection points.

One obvious solution is increased use of public transport. While an easier option in urban centres, the increase in passenger numbers, and the low availability of maintenance and improvements funds, has meant that for many consumers, public transport means 'dirty, unreliable and crowded'. Prior warns, "Many people see public transport as a distressed purchase."

Haycock disagrees that public transport is always best in terms of carbon emis-

sions. He says that the analysis should be about per person per km CO₂, which can be lower on a fully occupied SUV than a nearly empty bus. Public transport's greatest benefits are in the reduction of congestion and tail-pipe emissions. It's also best tailored to high volumes of passengers travelling on common journeys. But he says, "Stop being prejudiced about the private car because in a rural or town situation it may be the only truly low carbon option for mobility."

There are many changes taking place in other parts of the consumer transport market. Arup's Peter Head says that we're facing a key trend, beyond the pressures of emissions reduction, oil price and security of supply, towards urbanisation and city economic growth. He says, "Stationary vehicles are a problem in cities, that don't want pollution and do want more economic uses for the land. We're seeing pedestrianisation for economic reasons and increased cycling is part of that trend."

That focus on urban environments is playing a large part in the increasing profile of the EV. While the debate remains focused on the amount of renewable energy in the UK grid mix, the majority of EVs are already 40 per cent lower in carbon lifecycle terms than traditional

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CONTINUED FROM FRONT COVER

cars. This, combined with a growth in low carbon power, could result in lower emissions and fuel use.

GETTING THE PRICING RIGHT
 In selecting the make-up of a future transport portfolio however, basic economics around price and functionality will continue to drive the market. As David Fell of sustainability consultancy Brook Lyndhurst points out, "If EVs are more expensive per unit of performance it's a problem for the consumer." As Fausset says, "the key issue is upfront cost versus variable cost. Businesses do whole life costing, individuals don't. The separation between cost and the perception of cost is the barrier to the uptake of electric cars." Neil Wallis, head of communications at the Low Carbon Vehicle Partnership agrees, saying, "There is evidence that people discount future savings and are more sensitive to price at the point of purchase." The big question, according to Wallis, is "how do we reach critical mass, and how do we achieve manufacturing economies of scale?" It's likely that in the short to medium term, highly efficient internal combustion engines are going to continue to dominate the UK transport market. There is an enormous legacy market to overcome and a cultural shift required to change people's expectation of transport and its use. While the strongest drivers for change may be due to resource concerns and

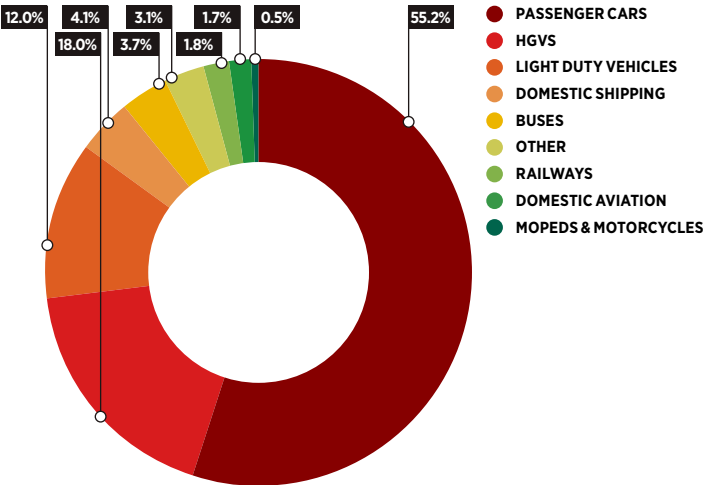
price pressure, changes are already taking place. There are trends around vehicle ownership models as well as technology solutions which could help to transform the way in which we travel. There are difficult and expensive infrastructure decisions to be made. Some milestones have been reached, while others have potential. For example, it wouldn't take many new charging points to connect the current eight Plugged-in Places pilots. If common standards are employed and the pilot projects are interoperable, it could provide the basis for an EV infrastructure.

97 per cent of transport energy consumption is from petroleum products

One thing is clear. Addressing emissions, through regulating industry or taxing fuel, is a political hot potato, as are alternatives such as road pricing and such attempts are notoriously unpopular with voters. In order to attract investment and engage with consumers and industry, we need a clear path to short, medium and long term goals, and a Government with the vision to get us there.

EMISSIONS FROM TRANSPORT IN 2008

PERCENTAGE PER SOURCE



Source: Department for Transport

LONDON: TRANSPORT INNOVATION

LEADERSHIP Effective low carbon urban transport systems require visionary leadership to bring stakeholders together. Transforming London's transport systems will help keep the city a cutting edge destination, writes Boris Johnson



My ambition is for London to remain the world's number one location – as a place to visit, a place to do business, and a place to invest. Top notch, innovative transportation is an essential element in achieving this goal.

It is for this reason that I am pursuing a mix of policies that will, taken together reduce congestion, reduce pollution and reduce the overall stress and bother of moving around this great city - with the ultimate goal of creating the foundations for a zero-emission capital.

Pioneering technology, old and new, is playing its part. Last year for example, I launched the Barclays Cycle Hire scheme marking a bright new dawn for cycling. It's aim is to make the humble bike as commonplace on our roads as it was in the early 20th century – in 1904 20 per cent of all journeys were made by bike. I am thrilled that Londoners have warmly embraced these new blue two-wheeled icons. In the first six months alone energetic users made 2.5 million journeys using these faithful steeds and clocked up a staggering 10 million kilometres. That's the equivalent of cycling to the moon and back 13 times.

This year we will introduce the UK's first hydrogen-powered bus route, comprising eight prototype vehicles. Operating through some of the most polluted areas of central London, these engineering marvels emit only water vapour. Manufacturers are also vying to develop a zero-polluting black cab to meet a tougher licensing regime.



Boris Johnson, who has said that transport is one of the Mayor's greatest responsibilities

2011 can also stake a claim as the birth year of mainstream electric car use. As a wider choice of electric cars is silently manoeuvring into the forecourts of enlightened salesrooms across the UK, so in London we are gearing up to ensure they can be driven with ease, simplicity and convenience. From next month we are delivering our Source London membership scheme, to provide a network of easy to access charge points for the first time – at least 1300 by 2013 - among other benefits. As the number of these exhaust pipe-free vehicles grows, so we can deliver significant reductions in filthy fumes and particulates.

Whilst the upfront costs of the current crop of electric cars remains high, the lucky owner niftily avoids the cost of the stagger-

ingly overpriced lagoon of fossil fuel required to drive a traditional model. And with a 100 per cent discount on the congestion charge to boot, the reasons why London is gearing up to become the electric car capital of Europe are clear.

www.sourcelondon.net



SIEMENS

The future of mobility

TECHNOLOGY Gordon Wakeford, managing director for Siemens Mobility Division, highlights the latest technology designed to improve the environmental credentials of transport

Transport has rarely been seen as an integrated sector. Aviation has been addressed separately from rail, itself separate from road transport. Public transport has been divorced from cars, while freight has been in a silo of its own. However, we are moving to a multi-modal world where journeys will involve many different types of transport which must be effectively integrated with each other. Crucially, these types of transport must also be more ecofriendly. In this article, we review some of the latest technologies developed by Siemens which contribute to reducing the carbon footprint of transportation.

ON THE RAILS

Recent innovations in train design at Siemens have focused on continuing to improve the energy efficiency of trains for urban, interurban and high speed routes.

The Desiro City train is the result of a €50 million investment programme. The train cuts energy consumption in half – even though it can carry 25 per cent more passengers in increased comfort, with improved operational performance for train operators. As a result of a range of innovative environmental features, it is projected that the Desiro City train will emit 10g of CO₂ per passenger per kilometre (g CO₂/km) under typical conditions. In comparison, planes emit around 175g CO₂/km and bus and coach journeys 81g CO₂/km, according to the National Atmospheric Emissions Inventory (NAEI).

Meanwhile, Siemens has played a significant role in the development of high-speed rail travel around the world and is supportive of the Government's plans to further extend the network in the UK. The Siemens Velaro high speed train operates in Spain, China and in Russia at top speeds of up to 350 km/h, helping to make high speed rail a credible alternative to air travel on short haul flights. The Velaro also provides travel at the lowest emissions level for long-range travel – on average, depending on the traction mix, a Velaro train produces at least three times less CO₂ per person-kilometre than an aircraft.

The environmental credentials of the Velaro train are demonstrated by its low energy consumption – equivalent to only 0.33 litres of fuel per seat per 100 kilometres, or just enough to fill a can of coke. The latest version, the Velaro D, will be put into service between Germany and France in December 2011.

ON THE ROADS

Although the UK railways are gaining more passengers year on year, 76 per cent of transport emissions still come from road traffic, according to the International Energy Agency. Siemens has developed various technologies designed to reduce emissions such as traffic management, hybrid drives for buses and electric vehicle infrastructure.

Siemens' systems underpin the London congestion charge, which has reduced traffic in the city by 60,000 cars a day, as well as the London-wide Low Emission Zone (LEZ) which discourages the use of the most polluting lorries, coaches and buses, in order to improve air quality. Road charging schemes have encountered resistance in other cities in the UK but it is anticipated that there will be more congestion-reducing initiatives in future. In London, the congestion charge combined with other measures to make travelling by bus more reliable and quick, reduced vehicle traffic by 20 per cent and increased bus usage by 38 per cent.

We are moving to a multimodal world where journeys will involve many different types of transport which must be effectively integrated with each other. Crucially, these types of transport must also be more ecofriendly

The Desiro City will be 50 per cent more energy efficient than current models



Looking specifically at bus travel, the latest drive technology from Siemens will be at the heart of the 'New Bus for London' hybrid buses that will be up to 40 per cent more fuel efficient than conventional diesel buses and significantly more efficient than current London hybrid buses.

Hybrid buses have a down-sized diesel engine in addition to a power pack. The power pack is kept charged by the energy that would normally be wasted when the brakes are applied on a conventional bus. The hybrid bus recycles this energy and thereby reduces fuel consumption. In turn, this increases the efficiency of the bus as it can achieve more miles per gallon than a conventional bus. They are ideally suited to use in built-up areas where the buses are constantly stopping and starting, thus generating a lot of recyclable power to power the bus.

The greener, hop-on hop-off double-deckers manufactured by Wrightbus – based on the iconic Routemaster – are

due to be on the capital's streets in 2011. Wrightbus and Siemens have previously teamed up to provide hybrid bus solutions in the UK.

While improvements in the operational and energy efficiency of public transport are important, the private motorist is the primary target of efforts to cut emissions. Siemens has a complete approach to electric vehicles (EVs), supplying everything from infrastructure including power transmission and distribution systems, charging technology and related standardisations to drive technology and high-performance electronics.

Siemens is involved in projects to boost the number of ecofriendly cars on the roads with the installation of charging points in cities such as London. In particular, the lack of charging points has held back the popularity of electric vehicles (EVs), which produce up to 40 per cent less CO₂ than their diesel and petrol counterparts. The Source London initiative will see more charging points than petrol stations in the capital with 1,300 free charging points installed by 2013 in locations such as supermarkets and NCP car parks, on the streets and near tube stations. As well as providing the charging infrastructure, Siemens is managing the Source London support operations for the next three years.

Even the humble traffic light is doing its bit to reduce energy consumption. Siemens has developed Extra Low Voltage traffic signalling equipment using energy efficient LEDs.

AT THE AIRPORT

Taking a systematic approach to transportation in and around airports is also an opportunity for improved energy effi-

ciency. Along with improved layout and routing of aircraft movements on the ground, a shift towards hybrid technology for the ground based vehicles can also have a big effect, not just on the operations of the airport but also on the performance of the aircraft that use it. Aircraft use far less fuel if they are towed rather than using their own engines to taxi and efficiencies are further improved through the use of hybrid tractors.

Integrating airports with the rest of the transport system is also important. Options range from encouraging car-sharing and clean taxis by the use of a special clean car lane to switching airport fleets to EVs and providing preferential parking for passenger EVs. Where it is possible, linking airports to high-speed rail systems is important. For airports, such measures will be at the end of a long list of initiatives to reduce their carbon footprint. Above all, treating the airport as one system and planning integrated solutions is the key to maximising the potential energy saving to be made, ranging from energy efficient baggage-handling systems to renewable energy installations, along with the full range of lighting and other green buildings solutions.

From this brief review, it is clear that technologies to improve the environmental credentials of transportation are already being implemented which is positive. However, the next decade will be a crucial time for transport in the UK. Government, industry and the travelling public must work together to achieve the potential impact of ecofriendly transportation through investment, innovation and behaviour change.

SWITCHING ON TO A TRANSPORT REVOLUTION

ELECTRIC VEHICLES 2011 sees the start of the electrification of the UK’s transport system, writes **Mike Scott**

■ There is a quiet revolution going on in the automotive industry. 2011 is the year that electric cars stop being the technology of the future and start rolling on to showroom forecourts.

Indeed, the current Car of the Year is electric – the Nissan Leaf, which went on sale at the start of February. “The Leaf is very important,” says Paul Clarke, editor of the Green Car Guide. “There have been electric vehicles (EV) before, such as the G-Wiz, but they have been classified as quadricycles rather than cars – and they have performed like quadricycles as well.”

Another important factor is that being classified as a car entails a whole raft of rigorous safety and quality tests that quadricycles do not face.

The Leaf is just one of a whole range of electric cars – from sturdy Volvos to the 125 mph Tesla roadster – that will be hitting the market in the coming months. And while the EV market is new, making the vehicles expensive, the government is supporting its roll-out.

From the start of this year, grants of up to £5,000 have been available for any qualifying car that has emissions of less than 75g CO₂/km. Currently nine vehicles are eligible (see chart below) but the list will expand as other cars come to market.

MARKET CHALLENGES

There remains a long way to go before EVs become a common sight on our roads. Nissan expects to sell no more than 1,500 Leafs this year, partly because currently only one factory is making them and that is in Japan. By 2013, however, the company will be able to produce 50,000 a year at its Sunderland plant and other manufacturers such as Peugeot-Citroen and Renault will also be producing at scale.

A survey by GfK Automotive suggests that up to 300,000 people will buy EVs over the next three years. There are a number of hurdles to overcome before they gain mass acceptance however. The first is price. Even with the government



grant, most EV models are well over £20,000. “Even with the incentives, it is difficult in these times of economic hardship for people to justify the outlay,” says Adrian Tink, motoring strategist at the RAC.

LOW EV RUNNING COSTS

With the price of petrol and diesel hitting £1.30 a litre recently – and little indication that oil prices are set to fall any time soon – the more relevant figure to look at is total running costs, according to Alan Nicolson, product manager for the Peugeot iOn. While even the smallest car now costs about £50 to fill up, the iOn costs just £1.72 to charge.

A recent trial of the Mitsubishi iMiEV suggests that it would cost a total of £270 for 12,000 miles of motoring. In addition, EVs are exempt from car tax and company car tax, and in London they do not have to pay the congestion charge. On top of that, given that EV engines have only three or four moving parts compared to the 300-plus in an internal combustion engine, servicing and maintenance costs will be lower.

Some people fear that EVs charged using electricity that is generated

using fossil fuels are not making any difference. However, studies have shown that even if an EV was charged using only the most polluting fossil fuel, coal, it would still be more efficient than an internal combustion engine – and the fact is that we do not use only coal. The amount of renewable energy in the system is increasing all the time, cutting the impact of EVs as it does.

BATTLING RANGE ANXIETY

Then there is the infrastructure issue. While most people are likely to recharge at home or at work, “people like to have the comfort of knowing that they can recharge when they’re out and about if they have to,” says Tink.

The government is rolling out a charging infrastructure through its Plugged-in Places scheme. Three areas – London, Milton Keynes and the North East – are already installing charging points and in December, funding was announced for five more schemes in Northern Ireland, Scotland, Greater Manchester, the Midlands and the East of England.

The move is in response to one of the barriers to EV adoption, the fear that the battery will run out in the middle of a trip, which is known as “range anxiety”. However, this anxiety seems mostly to apply to those who have never driven an EV. A number of trials have found that the average mileage of most drivers is less than 20 miles a day, Nicolson says, well within the 90-100 mile range of most EVs.

Nonetheless, some drivers are reluctant to buy an EV just in case they do have to undertake a long journey at short notice. Many believe that a nationwide charging infrastructure will be necessary to overcome this range anxiety.

The Nissan Leaf, winner of the 2011 Car of the Year award

Vauxhall has taken a different approach – its EV offering, the Ampera, will have a ‘range extender’ engine on board as well as a battery. Drivers will be able to drive for about 50 miles on battery power, which will cover most daily journeys, but the petrol engine will extend the range by another 310 miles – making it comparable to a normal petrol car. However, the first models will be almost £30,000 even with the grant.

Better Place offers another alternative, a battery swapping service

models incorporating innovations such as stop-start technology, lightweight materials and regenerative braking. Porsche has integrated flywheel technology similar to the Kinetic Energy Recovery Systems (KERS) used in Formula 1 into one of its models, while BMW has – on top of all the mainstream technologies – been working to make incremental improvements through measures such as recapturing the heat from the exhaust system and reducing the air turbulence around the wheel arches of its cars.

There will also be continued developments in biofuels, although their use remains controversial due to debate over whether they are contributing to the destruction of rainforests or to higher food prices.

Hydrogen remains the Holy Grail. It offers several additional advantages over EVs – longer range, the ability to refuel quickly, no emissions (except water). The car industry has committed to 2015 for the launch of hydrogen vehicles – with the options of using hydrogen engine or hydrogen fuel cell technology, according to Charles Purkess of ITM Power.

Unlike batteries, hydrogen fuel produced by electrolysis is a good way of storing renewable energy for long periods of time and it could be integrated into the existing electricity infrastructure. It is also flexible in that it can be burnt in a modified internal combustion engine or used to power a fuel cell vehicle. The perception that hydrogen cars remain a couple of decades away may be about to change.

For now, “the car has to be sustainable and efficient, but it also has to be great to drive,” says Clarke. ●

Grants of up to £5,000 have been available for any qualifying car that has emissions of less than 75g CO₂/km

so that an empty battery can be replaced with a charged one. It is working with Renault and carrying out trials in Israel and Denmark. It is also looking at providing quick-charging facilities that give up to 80 per cent capacity within 30 minutes, although fast-charging equipment is more expensive to build and install and presents challenges for electricity supply.

INNOVATION ACROSS THE BOARD

The development of EVs will not take place in isolation – cars powered by internal combustion engines will continue to become more efficient, with many new

QUALIFYING CARS

MAKE AND MODEL	1ST UK DELIVERIES
mitsubishi i-MiEV	JANUARY 2011
smart fortwo electric drive	JANUARY 2011
Peugeot iOn	JANUARY 2011
Nissan Leaf	MARCH 2011
Tata Vista	MARCH 2011
Citroen C-Zero	EARLY 2011
Vauxhall Ampera	EARLY 2012
Toyota Prius Plug-in Hybrid	EARLY 2012
Chevrolet Volt	EARLY 2012

Source: Green Car Guide



Break free from traffic

TomTom is doing more than just helping motorists find their way from A to B, it's HD Traffic navigation system could ease traffic congestion for everyone

"For many drivers, traffic congestion has become inevitable", says Damian Woodward, vice president of operations UK & Ireland at TomTom. "We think it's time to challenge conventional thinking with a simple solution to reduce traffic congestion on a very large scale."

TomTom can already reduce journey times for individual drivers by up to 15 per cent. Rather than simply informing the driver of the current traffic situation TomTom drivers are connected online

meaning that when a faster route becomes available, they are first to know. Journey times could reduce for all drivers by up to 5 per cent when 10 per cent of drivers use TomTom's HD Traffic navigation system in a device, smartphone or via an in-dash solution.

HOW WILL WE REDUCE CONGESTION?

Today, individuals driving with TomTom's HD Traffic navigation system

The GO LIVE 1000 and 1005 are available in store now, including HD Traffic free for 1 year. Prices start from £249.99



are constantly connected to the internet, so when faster routes become available they are the first to know.

In the future we'll reduce traffic congestion for everyone by making the best possible use of the existing road network.

TomTom's HD Traffic navigation system works by combining the world's most accurate traffic information with dynamic route guidance technology.

Our traffic information is the most accurate in the world because it covers more road kilometres on both secondary and main roads. It reports traffic jams with higher accuracy and also refreshes more frequently than any other service, with updates every two minutes.

THE COLLECTIVE SOLUTION TO TRAFFIC CONGESTION

Every driver on the road today has had to contend with traffic at some point in their lives. Naturally enough, town and city dwellers will find themselves battling through the jams more often than their rural counterparts, but the fact is, traffic is a problem virtually everywhere large communities of people are to be found.

There is a misconception amongst drivers that traffic is just one of those things, that there's not a whole lot that can be done about it, and that all a driver can do is cope with it as best they can.

One navigation company thinks it's time to really challenge this way

of thinking and help governments and town planners implement some changes that could reduce traffic congestion for everyone. That company is TomTom.

TomTom has spent years researching traffic and how best to tackle it, and this research has led to the development of HD Traffic, their class-leading navigation system. HD Traffic covers more road kilometres, reports traffic jams with higher accuracy and refreshes more frequently than any other navigation system. This combined with TomTom's experience in researching the causes of traffic could offer a real solution to the problem of congestion worldwide, and TomTom is on a mission to make sure this solution is seen as a viable option by drivers everywhere.

It offers a solution that doesn't involve building expensive new roads or introducing new congestion schemes in towns and cities, instead it encourages people to think and drive collectively in order to improve traffic flow everywhere. It's about changing attitudes and preconceptions and helping drivers to understand that traffic is not just someone else's problem. It's not just down to local planners and town and city councils, it's down to everyone to play their part.

TomTom is committed to working with the most talented people in the industry to find real and sustainable solutions, not just for today but for the future. The company's traffic manifesto

outlines these plans and explains how discussion, debate and organisation are crucial for the success of any initiative taken to reduce congestion.

Alongside these plans for an integrated approach to tackling traffic, TomTom also aims to continue with its own research and development. By introducing ever-more intuitive navigation systems and encouraging the driving population to change the way they think about traffic, TomTom aims to reduce journey times by up to 5 per cent for all drivers.

This is certainly a bold mission and one that will require a lot of work and commitment, but the benefits will be widespread and long-lasting, and will have positive implications for society as a whole. The company hopes to prove to drivers that even a small change can make a difference, and that a problem that seems insurmountable can be tackled by unified thinking. It's not just about finding the quickest route for individual drivers, it's about improving traffic flow for everyone and encouraging all drivers to see themselves as members of a wider community.

Overall, given the great problem of traffic congestion, with the possibilities TomTom portray in its manifesto, perhaps the company mantra "Freedom to Move" is now more relevant than ever before.

Visit www.tomtom.com/trafficmanifesto for more information

■ Curitiba is a prime example of how a city can address the challenges of suddenly increasing burdens on its urban systems. A wave of internal migration from the poor, rural northeast in the 1950s and 60s caught authorities unawares. The city experienced some of the highest population growth in Brazil. Services, particularly urban transport, went into a tail spin.

Curitiba came up with innovative solutions, including an urban Master Plan, incorporating a consolidated public transportation system. City planning and transport went hand-in-hand. Straight avenues linking the suburbs to the centre were designed to attract dense residential and commercial areas, served by frequent buses. Today Curitiba has the highest rate of public transport use in Brazil, at 45 per cent of all journeys.

The bus system, cheaper and more flexible than rail, remains at the heart of the Curitiba ideal. Express bus lanes parallel two local roads and the system carries an average of 2.4 million passengers every day. There is only one price no matter how far you travel and you pay at the bus stop. This is a novelty in Brazil where most cities use a turnstile within the bus itself. Private companies run the system with a flat charge of R\$2.20 (about 82p) – the fifth most expensive system in Brazil – with subsidies from the government.

GOOD URBAN PLANS CUT EMISSIONS

The layout and positioning of the most dense urban areas close to the bus network and the business district mean metropolitan Curitiba has a low annual average carbon dioxide (CO₂) emission of 4.2 tonnes per light vehicle. More sprawling Brasilia, Brazil's other great planned city,



CURITIBA: A VERY UNBRAZILIAN CONCEPT

CASE STUDY Curitiba

has been called the Zurich of Brazil, and has developed a reliable, affordable public transport system, finds John Rumsey

© Marcelo Rudini / Alamy

emits 6.2 tonnes per light vehicle, according to Fernanda Magalhaes at the Inter-American Development Bank. Overall, she says the Federal District emits 46 per cent more CO₂ emissions than denser, more transit-oriented Curitiba.

Curitiba has other plans in development. The Green Line, inaugurated in 2009, provides dedicated bus lanes, enabling buses to operate efficiently even in peak hours, as well as cycle and pedestrian lanes.

So far, just 9.2 kilometres have been completed as the overall project needs to be properly licensed. The city is also working to modernise its fleet of buses so that vehicles will use only soy-based fuel and a sub-way is scheduled to open ahead of the 2014 World Cup, when Curitiba is a host city although critics say the system is limited.

Despite these innovations, Curitiba is suffering from the same growing demand for cars as the rest

Curitiba's bus system provides a reliable and easy to use transport system. Subsidised by the government, travel is a flat fare anywhere in the city

of Brazil. Today, the city has more cars per head than any other Brazilian state capital, according to Algaci Túlio, a city councilor and former deputy for the state of Paraná. In 2008, Curitiba had an index of 606.92 cars per 1,000 inhabitants compared to Brasilia's 402.51, for example. That is partly because the city is one of Brazil's wealthiest.

THE CHALLENGE CONTINUES

Streets are starting to get badly clogged, slowing down buses, and the city needs to find ways to prioritize buses through the traffic, believes Tulio. "The Green Line needs to have proper access via pedestrian crossings", he adds. In a recent study by the Federal University of Paraná, a full 75 per cent of users of the articulated buses believed the system was poor or

average with just 23 per cent approving of it, he says. "There has been a loss of innovation in public management and the municipal administration is resigned," he believes.

Rapid bus transport is a cheap and revolutionary way of improving transport in clogged Latin cities and has caught the eye of urban planners everywhere. The system is the source of inspiration for the famous TransMilenio in Bogotá, the best-known scheme. It is also being used in Ecuador's second city Guayaquil, as well as in Guatemala City, Los Angeles and Panama City. Indeed, the Latin American Association for Bus Rapid Transit and Integrated Transport Systems was held for the first time last year and no prizes for guessing in which pioneering Brazilian city. ●

PORTUGAL'S ELECTRIC DREAM

CASE STUDY With the launch of MOBI.E, Portugal has become the first country to deploy a nationwide EV intelligent charging network, writes Felicia Jackson

Pedro Fragoso Pires, chief executive of MOBI.E International, says the project's success was due to the central co-ordination of stakeholders by the government. The network is being put in place by a public-private consortium including 25 municipalities, which identified the minimum infrastructure required to cover the whole country and minimize barriers to adoption.

Over 300 plug-in charging stations have been deployed which will increase to 1,350 by June 2011 and MOBI.E expects 4-5,000 EVs to be using the system by the end of 2011. With municipal charging points, and fast charge stations on connecting highways, it is now theoretically possible to drive anywhere in Portugal in an EV without worrying about range.

Any extensions to the network and further services will be done by the private sector and the system has been designed to an agreed set of standards, ensuring universal compatibility and no barriers to entry. Power will be provided for free during the pilot phase, but charges for power and use of the charging station will be introduced in 2012.

The introduction of EVs should have a major impact on the country's transportation carbon footprint, as 52 per cent of Portugal's electricity is already generated from renewable sources, mainly hydro and wind.

A CAPITAL CASE

CASE STUDY Costly infrastructure projects alone are unlikely to solve the capital's problems, as Peter Archer discovers

■ Updating London's transport infrastructure has been likened to performing open heart surgery while the patient is running a marathon.

Delivery of the new capacity required, both in the medium and long term, is a fundamental challenge. "Congestion is probably holding firm," says London's transport policy director Kulveer Ranger. "Not for lack of us trying to ease the problem, congestion is statistically stagnant. But we're running very fast to stand still."

Such are the considerable challenges facing London Mayor Boris Johnson and his team who recognise that part of the solution has to be a change in mindset or outlook.

GETTING OUT OF THE CAR

Hence the emphasis placed on encouraging more Londoners to get on their bikes for short journeys and commutes.

"It's part of the answer to a big question," says Kulveer. "We need to get people to do a modal shift away from the motor car. "We already have half a million journeys undertaken by bicycle each day in London."

More than a million Londoners own bicycles and the capital's Barclays cycle hire scheme, successfully launched last July, is being extended beyond central London. In addition, the first two Cycle Superhighways are further "enablers" in what the mayor sees as a biking revolution spreading into 13 outer boroughs.

But cycle culture needs to break out from the purist enthusiasts into the mainstream if it is to impact congestion, emissions and pollution. Phillip Darnton, chairman of Cycling England, says, "If we are to get more people cycling, we have got to persuade people that they can do it too."

Tom Bogdanowicz, campaigns and development manager of the London Cycling Campaign, says the cycle hire scheme is a move towards changing the capital's cycling culture.

"We have to improve cycle friendliness on our streets and reduce car speeds," he says. "We have to invest in cycling."

Few issues have dominated London policy debate in recent years as much as transport. Without a winning strategy to improve mobility and reduce congestion, London's prospects for sustainable growth are confined to the slow lane.

The capital's population and economy has expanded from the mid-80s onwards, leading to congestion on the roads and public transport system.

TRANSPORT FOR LONDON

Transport strategy and policy is driven by a complex interaction of social, economic and environmental considerations; the challenge is to balance each of these objectives.

Provision of transport infrastructure in London is diverse, ranging from London Underground and light rail, to commuter and intercity services, major and minor roads, buses, taxis, trams, bikes for hire and water transport on the River Thames, not to mention international airports.



Crossrail has been identified as one of London's most important infrastructure projects

Mayor Johnson has identified the delivery of Crossrail, a major new east-west cross-London rail link and the biggest project of its kind in Europe, as his top transport priority.

Andy Mitchell, Crossrail programme director, says, "Crossrail is one of the UK's most important infrastructure projects. London's population is growing fast, the capital needs additional transport capacity and without it London's future economic growth would be adversely affected.

"When it opens in 2018, Crossrail will boost London's rail capacity by 10 per cent, delivering new journey opportunities, faster journey times and up to 24 trains per hour between Paddington and Whitechapel during the peak."

An upgrade of the Tube system and improvements in the over-ground rail network will further boost transport capacity, along with enhancement of the north-south London Thameslink rail service.

The Thameslink programme is a £5.5 billion scheme to extend the service to a further 100 stations and increase capacity within central London. Some parts of the scheme will be in place by the 2012 London Olympics.

On the roads, Source London aims to boost the number of low-carbon electric vehicles in use through providing a network of publicly accessible EV charge points. The ultimate aim is for every Londoner to be within one mile of a charge point.

Private enterprise also has a part to play and an example is Green Urban Transport which runs an executive, 11-seater, zero-emission electric city transport service. "It provides shareholders, customers and employees with a visible commitment to excellence in corporate citizenship by cutting greenhouse gases, toxic exhaust emissions and noise," the company says. ●



PEUGEOT

iOn heralds an electric future

Peugeot's new electric car is just one part of a comprehensive low-carbon strategy that aims to meet the needs of all drivers without compromising on quality. And it's cheaper and more practical than you might think



Peugeot's iOn, which hits showrooms this March, will be one of the first electric vehicles (EVs) available in the UK.

However, it is not just a "halo" vehicle to give the company environmental credibility with its customers, it is part of a comprehensive low-carbon vehicle strategy that is at the core of Peugeot's plans for its future as a carmaker. In 2009, more than half of the vehicles the company sold had emissions of under 130g CO₂/km, which are exempt from car tax in the first year of ownership.

"It is about offering solutions that meet everyone's needs," explains Alan Nicolson, product planning manager for the iOn. "We have to offer cars that appeal on many levels – offering cars that are environmentally responsible is vital."

ALL-ENCOMPASSING MOBILITY

For the French manufacturer that does not mean putting all of its eggs in one basket by focusing just on EVs or hybrid models but ensuring that the entire range of vehicles that it makes has lower emissions. "This low-carbon approach is fundamental and the product is at the heart of it," he adds. "We made a huge investment in Research and Development to reach our goal but we are also the first manufacturer to offer an all-encompassing approach to mobility."


The Mu Programme, which is currently being trialled at showrooms in Bristol and Chiswick, allows people to rent cheaply anything from an electric scooter to a

large van, depending on their needs, ensuring that they have the most appropriate vehicle for a particular journey.

Mu is not only a good way for Peugeot to introduce drivers to its different models, it also opens up a new approach to vehicle ownership. While the scheme is open to anyone, it is an ideal complement to the iOn, which Nicolson is quick to acknowledge is not suitable for every driver or every journey.

"For someone who regularly does 70 miles or more a day, this is not the car for you. Something like a hybrid will be more suitable," he says. This year will see the launch of the company's diesel Hybrid4 3008, which will emit 99g CO₂/km and will do 74mpg. Next year will see the launch of a "plug-in" hybrid that will emit just 50g CO₂/km and do 141mpg.

"Diesel is already 25 per cent more efficient than petrol so it makes sense to build on those savings," Nicolson adds. The diesel hybrid, the first of its type in the world, is expected to cut emissions by 35 per cent compared to a conventional diesel engine. As the amount of biodiesel on the market increases, the

 We are the first manufacturer to offer an all-encompassing approach to mobility



Hybrid 4 will become even more environmentally-friendly.

The hybrid technology will be completely transferable to different platforms and will complement a range of other low-carbon technologies such as Peugeot's e-HDi (the next generation of stop-start) which puts the engine into standby when the car is not moving and improves fuel efficiency by 15 per cent. Available in a super-efficient 308 in May this e-HDi technology will reduce 308 emissions to a class-leading 98g CO₂/km and gives the new 508 only 109g CO₂/km. Peugeot's ongoing investment in THP (Turbo High Pressure), VTi (Variable Valve Lift and Timing Injection) and other highly efficient petrol engines, also deliver significant reductions in fuel consumption.

"The number of low-carbon vehicles is set to grow fast, but in the short and medium term, the market will still be dominated by conventional technology, so the biggest reductions in emissions will come from advances in conventional engines," says Nicolson.

Nonetheless, the time is right for the launch of the iOn, he adds, because it caters for the requirements of most drivers, even if that is not their perception. The average driver travels 20 miles per day during the week, with 7 out of 10 trips being less than 16 miles while 40 per cent of journeys are shorter than three miles. Yet one of the biggest barriers to EVs is "range anxiety", with people worried

that the car will run out of power and leave them stranded.

While it is obvious that the iOn will mainly be an urban car, its 93-mile range is more than enough to deal with the journeys outlined above, and the way most people refuel their EVs should also allay drivers' fears. While petrol or diesel cars are filled up then driven until they are nearly empty, trials have shown that EVs are plugged in at home every night, so they are fully charged every time you leave home. As EV use expands, drivers will be able to plug in at work, at the supermarket and on the street as well.

Despite the need for some small changes in behaviour, Nicolson stresses that while the EV is a revolutionary change for the car industry, the



iOn is not a revolution in motoring for the driver. Peugeot's slogan for the car is: "100% electric, 100% real." It is designed to highlight the fact that the iOn is not some kind of futuristic concept with little relevance to today's driver, but a credible alternative to any other small car that is available now.

"Unlike previous EVs, the iOn is a proper car that has all the equipment and meets all the safety standards that you would expect in, say, a really-well kitted out Peugeot 207," he says. "We are seeing a move away from low-carbon vehicles being seen as a compromise. You cannot compromise – the method of propulsion must be incidental."

Nonetheless, Peugeot expects a gradual start for the EV market, with early demand likely to be led by the fleet market. Businesses are increasingly under pressure to reduce their CO₂ emissions and demonstrate their environmental credentials, but they are also more used to assessing costs on total cost of ownership basis, while individuals focus more on upfront costs.

While buying an EV outright is currently an expensive proposition because the first cars are only just coming on to the market, the economics already stack up well if you lease the car. Peugeot is offering a four-year lease deal for £415 per month. At first sight, this compares poorly with the

£200-£220 per month you would pay for a 207. However, when you factor in the £50 plus it costs to fill up a normal car compared to £1.72 to charge an iOn, the electric option starts to look like a good deal. Factor in car tax and service and maintenance costs (which are included in the iOn package) and the comparison looks even more favourable.

While 2011 is a landmark year for EVs, with a number of new models being launched, Nicolson says that 2015 may be just as important for the new technology. "EVs will have been around for a few years by then and you will probably know someone who has one or you will have seen

iOn COMMERCIAL APPROACH

CUSTOMER PROPOSITION – PEUGEOT CONTRACT HIRE

- Four year contract 10,000 miles p.a.
- Vehicle, Battery & Drivetrain Warranty for length of contract
- Safety check of home / premises for charging
- Monthly rental £415 + VAT
- Includes £5,000 Government subsidy

AN ALL INCLUSIVE SOLUTION

- No additional hidden costs – just plug in and go
- 100 per cent charge for Peugeot iOn = £1.72*
- Offer includes 8 year 80,000 mile warranty (vehicle, battery & drivetrain)
- Full service and maintenance

*This price is for domestic customers on EDF Energy Eco 20:20 tariff in London region, charging during off peak periods and includes a 6 per cent direct debit discount. Terms and conditions apply. Prices valid from October 1st 2010 and are subject to change. Prices include VAT. A full charge requires 20 kWh. Prices correct at time of print.



The iOn is not some kind of futuristic concept with little relevance to today's driver, but a credible alternative to any other small car that is available now

them at the supermarket. People will be used to EVs and how they work."

But what will be really significant is that the first vehicles will be hitting the used car market, making the technology much more accessible to retail customers. "We are hugely conscious of the need to extend into the used car market," he says. "EVs will be even more of a success if there is a second life to them once the initial leasing period is up."

SECOND LIFE

It is at this point that the iOn will come into its own, Nicolson believes, because while most EVs have a five-year warranty on the battery and motor, the iOn has an eight-year warranty on the car, the battery and the motor. This tackles one of the big concerns for potential customers, which is how long the battery will last and how much it would cost to replace. "This creates a car that can be sold after four years where the second buyer still has the security of a four-year warranty. We don't see this as a risk because battery failures are exceedingly unlikely."

The iOn is likely to be attractive to a second hand buyer for the same reasons that it will appeal to fleet purchasers – there is no road tax, refueling costs are low and maintenance and service costs should be much lower than on normal cars. "There are only three to four moving parts in the drivetrain so servicing and maintenance is minimal, although obviously you still need to take care of areas such as brakes, tyres and steering."

In areas such as charging, maintenance and the economics of EVs, there is a lot for drivers to digest so Peugeot is restricting initial sales to just 22 dealerships that will have specially trained sales and aftersales staff to help customers negotiate the road to an electric future, along with on-site charging facilities. The dealers will be in major cities and in particular those areas covered by the government's Plugged-in Places initiative to create on-street charging infrastructure.

"EVs are hugely important – they are an investment in the future," says Nicolson. "But it is important to be aware that they are not a panacea. For certain customers it will be a fantastic solution but it is not all things to all people – that is why we are committed to offering an extensive range of different low-carbon technologies."

www.peugeot.co.uk



The iOn costs just £1.72 to charge and Peugeot's leasing package offers free servicing and maintenance. There's no road tax to pay either, making the iOn an attractive proposition for the urban driver

F1 FAST TRACK TO A GREENER FUTURE

DESIGN Creator of world-beating Formula 1 racing cars and hero of petrolheads, Gordon Murray has switched track and hopes to revolutionise automotive design. Peter Archer uncovers his big idea for small cars.

■ As the technical and design chief for Brabham and McLaren, Gordon Murray has mastered the fast-moving development of high-performance grand prix cars.

Now he aims to overtake the world of conventional car manufacturing with an innovative production process which minimises carbon emissions in manufacture and on the road.

"It's Formula 1 technology and a Formula 1 concept, but for everybody," he says.

The team at Gordon Murray Design in Shalford, Surrey, have developed a revolutionary manufacturing process called iStream, which offers the prospect of low-carbon, low-cost, high-volume car production.

For South African-born Murray, who in 2002 was made an honorary professor at Durban University of Technology, the key to minimising the car industry's considerable carbon footprint is in reducing vehicle weight.

"Lightweight with safety is king in Formula 1," he says. "That's the main driver of iStream."

REDESIGNING THE PROCESS

The iStream assembly process is a radical rethink and redesign of the traditional production line, resulting in a manufacturing plant just 20 per cent the size of current production lines.

"We've invented a new way of making cars," says Murray. "Cars have been made the same way – stamped out of steel – since the Model T Ford in the early-1900s.

It's Formula 1 technology and a Formula 1 concept, but for everybody

"Car manufacturing is a very energy-intensive process and it is difficult to save weight in the final product.

"In terms of the carbon footprint of production, we wanted to reduce not only the manufacturing damage to the environment but also the damage of running the vehicle. And reducing weight is absolutely the best way of reducing emissions."

The company is selling licences for the manufacturing process and is developing prototype city cars – the T.25 petrol-powered car and T.27 electric vehicle – to demonstrate the concept and capability as well as the relatively low-carbon materials used.

The body can be made from recycled plastic bottles and can itself be recycled. The overall vision sees the engine outlasting the bodywork, with the option of rebodilying the car after 10 years or so.

A variant for the bodywork is a low-cost composite material made of glass and recycled paper which, when bonded to the car's tubular steel frame, forms a strong, lightweight core structure.

The prototypes can be configured as one or three-seaters but the technology is flexible enough to be transferred to larger vehicles, up to small, 12 or 14-seater coaches.

The petrol T.25 could sell for around £6,500, including taxes, with

annual running costs cut to about 40 per cent compared to a Mini. The electric T.27 would be more expensive due to the current high cost of the required battery.

Murray is also exploring the possibility of a range-extender hybrid. "I think this is a good interim solution for the next 10 to 15 years until battery technology advances to something more affordable," he says.

Of the present £24,000 price tag on an electric vehicle, roughly half is the cost of the battery. "About 85 per cent of all business or commuter journeys in this country are single-occupancy in big, heavy motor cars. This is not necessary," says Murray. "Overall, the future of urban mobility lies in good public transport, but there will always be instances when people need personal mobility.

"We need to incentivise people and eventually legislate for lighter, smaller cars which do less damage to the environment and to people.

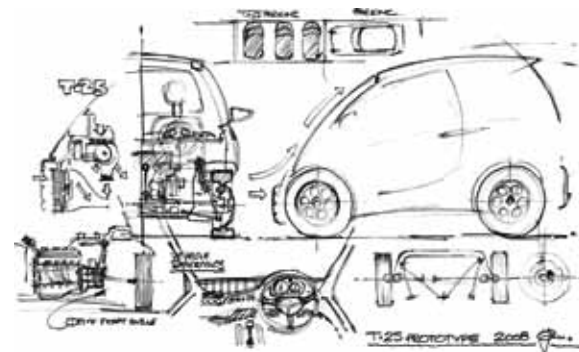
"A lot of pollution is caused by congestion with cars going nowhere or being driven around and around looking for a parking space.

"It's a complicated issue but it's largely solvable through technology, and car culture can be changed through government incentives." ■

© Motoring Picture Library / Alamy



A design sketch for the T.25 three-seater (right) takes the lessons Gordon Murray learned from the McLaren F1 super car (left) to help provide a safe, cheap solution to urban congestion



© Gordon Murray Design Ltd

WORKING TOGETHER: INDUSTRY, GROWTH AND ENVIRONMENT

PARTNERSHIP As the UK works to meet climate change commitments and ensure UK industry secures a strong position in the low carbon markets of the 21st century, the Low Carbon Vehicle Partnership (LowCVP) shows how a collaborative approach to policy development can bear fruit. By Greg Archer, managing director, Low Carbon Vehicle Partnership



Change through voluntary measures can prove very effective

■ In the past decade the fuel economy of new vehicles has improved by around 20 per cent; and in the next decade a further improvement of 30 per cent will increase the fuel economy of the most efficient vehicles to over 100 mpg.

In surveys, fuel economy is now consistently ranked as the third most important buying criteria (behind the purchase price of the car and its size and practicality). However the evidence shows that most private buyers don't know enough about the

potential of the most efficient cars to cut annual fuel bills by up to a third.

One of the most critical aspects of supporting the shift towards fuel efficient motoring is information. In much the same way as increased energy efficiency in white goods was driven by efficiency labelling, the Low Carbon Vehicle Partnership (LowCVP) helped deploy colour-coded fuel economy labels into new car showrooms, highlighting fuel economy, running costs and road taxes along with carbon dioxide emissions.

Launched in 2005, the voluntary scheme has been adopted by almost all UK new car dealers and nearly three-quarters of new car buyers say the label is useful in helping them to choose the make and model of their new car with a quarter saying it made a "significant" difference to the model they choose. In 2009 the labelling scheme was extended to the used car market. Around 1,500 dealers have joined the scheme with over a third of a million vehicles labelled in the first year. In 2011, at the request of the Government, the Partnership and industry will be looking to improve the information displayed – including ways to illustrate the savings in running costs achieved by newly available electric vehicles.

One of the challenges in customer engagement lies in understanding the meaning of 'green' claims by manufacturers. The voluntary Best Practice Principles for Environmental Claims in Marketing were designed to assist automotive marketers in avoiding the cost and embarrassment of making misleading green claims which can undermine consumer confidence. Despite a growth in green marketing, the number of ads ruled to be misleading has significantly declined since introduction of the Principles in June 2010.

Despite ongoing debate about its sustainability, today nearly 5 per cent of fuel in our cars is derived from bio-fuel – some produced from sustainable waste cooking oils but the majority from food-crops. The LowCVP has helped develop systems which identify more and less sustainable biofuels, and require companies to report on their performance as part of the Renewable Transport Fuel Obligation. The systems have now been adopted in Europe as part of mandatory sustainability requirements for biofuels.

We know emissions come from more than cars. The LowCVP has helped the UK develop the largest market for low carbon buses in Europe and is now working on a certification scheme for the freight industry to help give hauliers confidence that emerging technologies for fuel efficiency will deliver real world benefits.

The LowCVP believes that by working together Government, industry and environmentalists can help create the transport framework of the future. ■

For more information on joining the LowCVP: <http://www.lowcvp.org.uk/about-lowcvp/how-to-join.asp>



PEDAL POWER TO THE PEOPLE

CYCLING CITIES The citizens of a succession of cities around the world are getting on their bikes for a journey to a better lifestyle, reports Peter Archer

■ Cyclists in Copenhagen pedal 750,000 miles a day, almost like cycling to the moon and back – twice. Each and every day some 500,000 people choose to cycle in the Danish capital which, to adapt a well-known local slogan, makes it probably the best bike city in the world.

More than one person in three (36 per cent) commutes to work or school by bike and city leaders aim to boost this to at least 50 per cent by 2015.

“For people here, going on a bicycle ride is a bit like brushing your teeth – you don’t think about it,” says Andreas Rohl, who is in charge of the city council’s ambitious cycling programme. “The city has worked consistently to improve things for cyclists. Everything you see in Copenhagen today is due to decisions taken back in the 70s and early-80s.”

Forty years ago Copenhagen was as congested as anywhere else but the

need to get the city moving, cut carbon emissions and promote a healthier lifestyle prompted a culture change.

City leaders have – and continue – to incentivise or nurture the cycling culture with investment in infrastructure and improved facilities.

In all, there are some 220 miles of dedicated cycle tracks – tarmacked cycle paths separated from cars and pedestrians by kerbs – and 25 miles of green cycle routes through open, recreational areas.

Statistics show the more cycle tracks there are, and the wider they are, the more residents use their bikes. Every time the City of Copenhagen builds a cycle track on a road, 20 per cent more cyclists – and 10 per cent fewer cars – use that stretch.

The city offers a free communal cycle scheme which enables the use of a city bike for a small, returnable

deposit of 20 krone (£2.30). Such is the excellence of Copenhagen’s cycling example that it is being exported around the world as cities decide to “Copenhagenise”.

SPREADING THE WORD

Paris introduced a cycle hire scheme in the summer of 2007 and, despite thefts and vandalism, has proved a hit with the French and visitors to their capital.

The Paris “Velib” scheme allows cyclists to pick up and drop off bicycles throughout the city at more than 1,000 locations. A credit card is

In Copenhagen, every new cycle track results in 20 per cent more cyclists, and 10 per cent fewer cars

needed to leave a returnable deposit of €150 (£130). The first half hour is free; one euro for the next 30 minutes, two euros for the next half hour and four euros for every additional 30 minutes after that.

So the pricing structure encourages short-term use for short trips. For longer trips it is cheaper to rent from one of Paris’ bike shops or bicycle tour operators. The hire scheme, which has a commercial sponsor and is of no cost to the taxpayer, was an instant success with more than 1.6 million trips recorded in the first month.

There are downsides – with the success of the hire scheme came reports of inexperienced cyclists bending, if not breaking, the rules of the road. The rise in the number of people cycling seems to have increased bike awareness however and challenged the prevailing car mentality.

Going on a bicycle is a bit like brushing your teeth – you don’t think about it

COMMERCIAL FEATURE



On the fast track

HS1 Ltd owns and operates the UK’s first section of high-speed rail: High Speed 1, St Pancras International and the international stations at Stratford, Ebbsfleet and Ashford

The HS1 railway line continues to offer record levels of operation and performance. The average per train schedule delay on HS1 is now below seven seconds. The line also enjoys an exemplary safety and security record. Moreover, HS1 continues to prove itself to be a great and enduring boon for London and the South East, with independent

reports confirming that High Speed 1 is fostering regeneration and job creation with homes and community facilities. A major 2009 report put the contribution of High Speed 1 to the UK at almost £20 billion. HS1 Ltd is now privately owned with over £2 billion of the original construction cost having already been returned to the tax payer.



© Michael Walter / Troika

A Deutsche Bahn ICE train makes a guest appearance at St Pancras International (above); the Southeastern High Speed Service (left); a Eurostar train exits a tunnel on High Speed One (right)

And the more investment there is in infrastructure, resulting in separation of cyclists from motorists, the less friction there is, reducing levels of potential danger.

With 17,000 bikes and more than 1,200 stations sited roughly every 300 metres throughout the city centre, the Velib is the biggest system of its kind in the world and its impact was felt across the English Channel in London, which followed suit with a bicycle hire scheme of its own.

The start of the London Barclays cycle hire scheme has been trumpeted as a success with a total of 2.5 million journeys totalling more than six million miles.

“In just six months our blue bikes have made a huge contribution to the cycle revolution the Mayor (Boris Johnson) wants to bring to London,” says London’s transport adviser Kulveer Ranger. “Users say they feel healthier, fitter and invigorated when they reach their destination.”

Transport for London’s managing director of surface transport David Brown says, “Around 95 per cent of all journeys have been under 30 minutes which means that the vast majority of people using the scheme aren’t paying any more than their access period.”

Compared to other schemes, London’s is expensive. An annual subscription costs £45, seven days is £5 and 24 hours £1, plus a one-off £3 charge for an electronic key. The first 30 minutes of every journey is free and thereafter costs rise sharply from £1 for the next half hour to £50 for 24 hours. Casual users can rent a bike using a credit or debit card at a cycle docking station.

There are currently 6,000 bikes for hire from around 350 locations, with a further 2,000 cycles and additional docking spaces scheduled by spring 2012. ●

The numbers of passengers using the high-speed line is rising every year. HS1 is now poised to add at least one further major international train operator on to the line, offering passengers an increasing number of direct destinations in more countries across northern Europe. Travel via HS1 now accounts for up to 70 per cent of domestic rail journeys from parts of Kent into central London and Eurostar has already secured a market share on the London – Paris route of over 80 per cent against the airlines. These achievements are testament to the work of the team at HS1 Ltd and our partners including: the new HS1 Ltd shareholders; domestic and international train operating companies; developers; other European infrastructure owners; Network Rail; and government.

HS1 now provides over 16 million domestic and international travellers with a fast, safe and reliable railway and a chance to significantly reduce their carbon footprint on every journey. With such a track record and bright future, High Speed 1 is more than just a railway, it is defining the way people should travel.

HIGH-SPEED AHEAD

The high cost of the high speed rail network is leading many to question whether the funds wouldn't be better spent on upgrading existing railways



HIGH SPEED RAIL The Government has proposed a second High Speed Rail network to ease flight congestion within the UK, save on journey times and cut emissions. But not everyone is convinced, reports Flemmich Webb

■ In December 2010, the Coalition Government announced revised plans for a high-speed rail link between London and the West Midlands (initially published by the then Labour Government in March 2010), the first stage of a fast train route linking London with the north of England and Scotland. With the Coalition committed to preventing further airport expansion in London, it sees high-speed rail as a low-carbon means by which to link parts of the country and drive sustainable economic growth.

So what exactly is the Coalition proposing? It favours a Y-shaped network, HS2, to be built in two phases: the first between London and Birmingham; the second with lines to Manchester and Leeds, then connections further north via the East and West coast mainlines. Phase one will also include a link to HS1, the line that runs from between St Pancras in London and the Channel Tunnel in Dover. Phase two will include the building of a spur to Heathrow airport that would run alongside the M25 for part of its length.

Total cost is estimated to be about £33 billion (£17 billion for the London to Birmingham line), with construction to start around 2017, after Crossrail is completed, and the first trains to be in operation between London and Birmingham by 2026. While some parts of the business community back the proposal, there are a number of organisations, individuals and MPs that have raised concerns about HS2. The first, perhaps most fundamental question is, is a high-speed rail link the best environmental option?

NEED FOR CLARITY

In a paper published in January 2011, Friends of the Earth argued that HS2 is an expensive way of decarbonising domestic transport, if it does at all. It cites the findings of an environmental impact assessment report on HS2 published by HS2 Ltd in March 2010, describing its impact on emis-

sions reduction as “both complex and highly uncertain”, and concluding the rail link “would not be a major factor in managing carbon in the transport sector”.

The extent of the impact would, the report acknowledges, depend on three unknowns: the decarbonisation of the electricity supply used in the running of the trains, the degree to which domestic aviation is affected by the introduction of HS2 and train occupancy rates, and the amount of carbon emissions associated with the construction and materials used in the building of the rail line. Friends of the Earth's transport campaigner Richard Dyer says, “Investment in faster, better rail travel is urgently needed, but current high-speed rail plans will do little to cut climate-changing emissions — and may even increase them — nor will they entice many people out of planes and cars.”

Not true, according to the DfT. A spokesman said, “HS2 London-West Midlands will provide a much needed massive increase in capacity whilst being broadly carbon neutral. No other option can achieve that. And it will also act as a base to a wider network which is likely to have an even stronger carbon case — because with lines reaching further north it would be possible to see real switch from air to rail.”

The other argument underpinning the rationale for HS2 is the business case; that it will, in the words of Secretary of State for Transport Philip Hammond, “support economic growth and the rebalancing of the UK economy”. Does this argument stack up?

ECONOMIC CASE

The HS2 Ltd report estimates that the project would create 10,000 construction jobs, and a further 2,000 permanent jobs through maintenance and operation. Longer term, the analysis is constrained by a multitude of variables but the report suggests that the wider economic

impacts could include the benefits of improved linkages between different firms, and between firms and their workers, which could lead to economies of scale and other efficiencies.

These potential benefits form a relatively small part of the business case for HS2 at a national level, adding perhaps 10-15 per cent to the benefits. Time savings for business users, who are expected to comprise a third of trips on HS2, could be worth £17.6 billion, according to the report; the Government estimates central Birmingham would be brought within 49 minutes of London and within 65 minutes of Leeds.

The CBI, in its analysis of the business case, takes a more cautious tone. “Business won't sign a blank cheque on high-speed rail and it will be necessary for the Government to find a way of working out the benefits to the economy in terms of jobs, growth and regeneration,” says Neil Bentley, CBI's director of business environment. “There is more work to be done to make the broader business case for HS2.”

But Mike Hayes, head of rail planning at Atkins, which has carried out modeling, forecasting and business case analysis work on HS2, is confident of the benefits. “HS2 offers huge economic benefits by reducing travel times for business users and therefore increasing productivity, reducing congestion on the existing rail network and stimulating growth in areas outside of London, particularly important in the current economic climate,” he says.

The UK is, of course, not the only country with high-speed rail. Turkey, Taiwan, South Korea, Russia and Turkey have been building lines. In Europe, Spain recently overtook France as the country in the region with the largest high-speed rail network with China the world leader by some way. The evidence from these countries seems to be that given the right pricing, high-speed rail can capture passengers from aviation.

There are some challenges ahead, not least of which is how the network

should be funded. High-speed rail is expensive at €18 million per kilometre, according to a 2005 report. While HS1 cost around £6 billion, the previous Government sold a 30 year lease for only £2 billion, undermining the investment case. A study commissioned by the Government in March 2010, The High Speed Revolution, concluded that “returns to investment will not normally be strong enough to attract private sector funding, and most projects will only thrive where there is a large market, a substantial public sector commitment, and some degree of network co-ordination”.

LONG JOURNEY AHEAD

Another challenge will be convincing stakeholders that HS2 is worth the effort and investment. When the line was first proposed in March 2010 a suggested route was attached; the latest plans contain amendments to about 50 per cent of that after strong opposition and further consultation, but the arguments have still not convinced some.

In January 2011, a number of Tory MPs, including Cheryl Gillan, the Welsh Secretary and MP for Chesham and Amersham, went on record to say they might vote against the Government Whip and not support the proposed route.

The Campaign for Protection of Rural England (CPRE) is also wary, saying it will keep a close eye on the impact of proposed parkway stations on development and congestion in the countryside, and whether a slightly slower speed could deliver a better route.

The Government says it is committed to HS2, but there's still work to be done to convince many stakeholders of both the environmental and economic case for high-speed rail. And with cross-party support no longer a given — Labour is currently reviewing its entire transport policy including HS2 — the future of high-speed rail will depend on the Coalition winning these arguments. ●

Investment in faster, better rail travel is urgently needed, but current high-speed rail plans will do little to cut climate-changing emissions



CAN WE CUT EMISSIONS WITHOUT CHANGING OUR BEHAVIOUR?

BEHAVIOURAL CHANGE While improvements in technology will make a difference to emissions and fuel use, what else can we do? asks Felicia Jackson

According to industry body the Society of Motor Manufacturers and Traders (SMMT), the average emissions of a UK car are falling every year and with EU regulations limiting emissions to 130g CO₂/km from 2016, this trend should continue. There are however many ways to cut emissions beyond simply improving vehicle performance.

Emissions can be lowered through increased efficiencies, new low carbon fuels, electric vehicles (EVs) and even the hydrogen economy. The danger, warns Rupert Fausset, principal sustainability advisor at Forum for the Future, is the Jevons paradox, that increasing efficiency of resource use actually tends to increase the rate of consumption.

The TERM 2008 report by the European Environment Agency Transport at a Crossroads warned that all advances in technology aside, little difference in emissions can be made without behavioural change.

David Fell, director of sustainability consultants Brook Lyndhurst says "The big prize is changing transport behaviour and cutting down the amount we drive." Patterns of use are more important than the things that are used, and the challenge lies in changing those patterns. The key question is whether we should use regulatory enforcement, through banning certain options, or encouragement, by incentivising alternatives?

INCREASING OCCUPANCY

To date there has been emphasis on increasing efficiency and reducing emissions from our cars, but much more can be achieved by cutting individual use.

In most cars in the UK, 80 per cent of the available space on any journey is empty. In 2008, average car occupancy in the UK was 1.6, falling as low as 1.2 for commuter traffic. The means effective change is going to require a reassessment of the role of the car in everyday life. The change is already taking place. Neil Wallis, head of communications at the Low Carbon Vehicle Partnership says that already "we're seeing quite significant shifts in the way people view mobility. This is in part due to the impact of higher fuel prices and higher taxes on the use and ownership of vehicles with higher carbon emissions."

The big prize is changing transport behaviour and cutting down the amount we drive

There are a number of different ways in which occupancy can be increased. One option is Liftshare, a business Ali Clabburn set up in 2002 to enable people to get lifts with others. He believes that if we shared more, our emissions from transport could easily be half what they are and says, "We need to increase the efficiency of everything that we do."

According to Clabburn, the average person sharing a daily trip can save around 1 tonne of CO₂ per year, as well as cutting individual fuel costs. And it's not just individuals. Over 500 employers including Tesco, SKY,

Car use doesn't have to mean car ownership - could the right to use a car or a van when you need it be enough?

and the Environment Agency have set up schemes for their staff through Liftshare and over 412,000 people have registered with the network.

NEW OWNERSHIP MODELS

Another alternative which has been gaining momentum is the car club. As Jon Bentley, smarter energy lead, IBM Global Business Services, points out to be a car user, you don't need to be a car owner. He says, "The advantage of right-of-use rather than ownership is that the vehicle you use can be matched to needs - a small EV one day, a family hybrid another, or a van to shift furniture at the weekend. "Streetcar lets you rent a car for an hour, day, week or month, as does CityCar Club and many others. If you need a car, or a van, you can book in the time you need.

These schemes are most effective for drivers with localised and predictable needs but they don't just work by increasing individual vehicle use. They are also cost effective, giving access to vehicles without having to pay for insurance, servicing, MOT, taxes, parking or the overall cost of car maintenance.

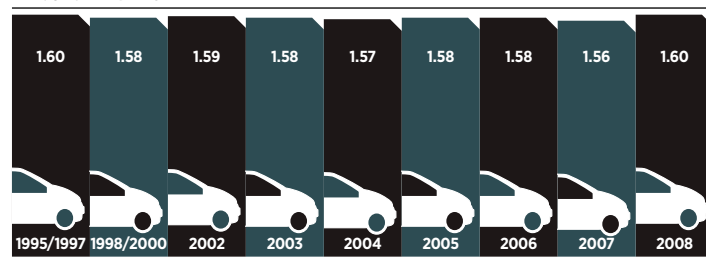
The market is expanding, with the recent launch of Mu by Peugeot. The programme provides access to the entire Peugeot range from cycles and scooters to the full range of Peugeot cars and vans, as well as all the accessories that might be required, from roof-racks to GPS. Richard Gavan, project manager, Mu by Peugeot says "It's all about flexibility". The service brings together the whole of Peugeot's low carbon strategy, with high efficiency IC, hybrids and EVs available to members.

Launched in France in 2009, at present the service is only operational in London and Bristol, and is run out of Peugeot dealerships. The idea is not simply to provide an additional service to Peugeot owners who might require short term access to a different mode of transportation, but also to other consumers who might not have tried a Peugeot but are attracted by the ease of use and simplicity of the service.

The focus on efficiency is interesting, not simply on efficient use of vehicles through rentals, but also as the service drives the efficiency of Peugeot's existing dealerships.

AVERAGE CAR OCCUPANCY IN GREAT BRITAIN

PERSONS PER VEHICLE PER YEAR



Source: Department for Transport

According to Gavan, "the efficiency of Mu is initially about the utilisation of resources that we've already got".

CORPORATE SOLUTIONS

The corporate market also offers a widespread alternative to ownership, and that's leasing. There are around 26 million cars on the road in the UK, and an estimated 2 million new vehicles per year. Half of these are company cars, many of which are leased.

According to David Brennan, managing director of LeasePlan UK, "LeasePlan has already bought Nissan's Leaf across Europe so that we can understand its role within the system, the impact on the customer as well as an assessment of residual value and maintenance needs." The purchase is part of the company's GreenPlan programme.

GreenPlan analyses customer fleets from an environmental perspective. The end result of optimising transportation means that environmental impact and customer cost reduce over time. That can mean addressing driving habits, whether a different vehicle would be more effective or even whether the vehicle is necessary at all. According to Brennan, "We start from the strategic purpose of the business and the role of mobility in your business."

Robin Haycock, head of transport at The Climate Group, believes that fleet coalitions are important and significantly feature in The Climate Group's EV20 programme. He says, "Governments are focused on the end consumer too much and not really thinking about fleets as a means of leveraging meaningful change. If you can take 10 per cent of that market you can achieve significant change. If you can target big business with big fleets that provides a buying signal to OEMs, that market signal will produce investment. Through fleets, we will also be touching a huge section of the population, allowing them to sample the real benefits of EVs without the perceived risk of ownership."

UNDERSTANDING THE BENEFITS

There is clearly a need for a wider understanding of the cost benefits, as well as the emissions benefits, of new ownership models. Fell says "behavioural change needs leadership through transition" and that means that we need to find ways to look at our vehicles and the way we use them. We need to make cost effective and efficient choices, and that's going to need more information, easier access to options and a broader cultural shift. We need to make such choices both cost effective and aspirational - and that's easier said than done. ●



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■ The return of \$100 per barrel oil has turned the spotlight once again on the aviation industry's efforts to reduce the amount of fuel it uses.

Every dollar increase in the price of oil adds \$1.6 billion to the sector's cost base, according to Giovanni Bisignani, head of the International Air Transport Association (IATA), providing a strong incentive to cut fuel use and therefore greenhouse gas emissions.

Aviation's emissions are only roughly 2 per cent of the global total but the industry is in the spotlight for two key reasons. The first is the rapid expansion expected in the sector over the next few decades and the second the fact that, due to altitude, aviation emissions have a warming effect 2-4 times greater than the CO₂ content of fuel burnt.

Nearly every part of the industry is involved in efforts to reduce fuel use, which reduces emissions. One of the most prominent initiatives is the inclusion of aviation in the EU's emissions trading scheme from 2012. The plan provoked protests from IATA and many airlines, insisting a global scheme was necessary to maintain competitiveness. Slow progress at the global level however pushed the EU to take action.

"The aviation industry has been a little bit reactive and quiet in discussions around the environment," says Paul Willis, head of aviation at the consultancy EC Harris. This could suggest that industry and the EU are at loggerheads over environmental action. Yet an enormous amount of work is being done, often in collaboration between the EU and aerospace companies.

AIRLINE REDESIGN

One of the EU's biggest-ever research programmes, the €1.6 billion Clean Sky initiative, is a joint venture between Brussels and the industry, focusing on every aspect of aircraft design, manufacture, operation and disposal. Clean Sky is looking at helicopters, regional aircraft and long-haul jets, as well as specific elements such as engines, wings, on-board systems and eco-design that will both reduce the amount of material used in aircraft and make the materials that are used more recyclable.

New aircraft such as the Airbus A380 and the Boeing 787 Dreamliner already offer considerable improvements on their predecessors. The giant A380 improves fuel efficiency partly just by having more seats on board, but also through increased use of lightweight composite materials, more efficient engines and improved design.

Boeing's Dreamliner consists of 50 per cent composite materials, which are lighter, more durable and suffer

FLYING THE FLAG FOR CLEANER SKIES



AVIATION The airline industry might object to EU plans to regulate emissions under its carbon trading scheme, but emissions and cost reduction are key priorities, writes Mike Scott

reduced corrosion and fatigue, need less maintenance and open up new design possibilities.

Three quarters of Boeing's Research and Development budget has an environmental bias to it, according to Nick West, UK director of communications, meaning that it spent about \$3.9 billion on environmental measures last year. "We have committed that all our new aircraft will be at least 15 per cent more efficient than their predecessors," he adds. "This is what airlines need to justify fleet renewals."

The engine manufacturers are also coming up with innovations that will cut the industry's environmental footprint. Clean Sky is examining a radical design, called the counter-rotating open

More efficient fuels, composite materials and increases in efficiency mean the aviation industry thinks they can create emissions free aircraft with the next fifty years

rotor (CROR) engine. This removes the covering from the engine and has two open propellers, one behind the other, rotating in opposite directions.

Rolls Royce and General Electric are both looking to develop CROR engines, which are more efficient than jet engines but major issues remain. These relate to noise, as well as the need to accommodate the forces that the engine generates, which mean that the engines are likely to have to go at the back of the plane. Meanwhile, Pratt & Whitney are investigating another technology called the geared turbofan, which improves efficiency by allowing the engine turbine to turn faster than the fan at the front of the engine meaning that both are running at optimum speed. This could make the engines on the new A320 15 per cent more efficient, allowing each aircraft to save 3,600 tonnes of CO₂ per year, says Tom Enders, the head of Airbus.

TRIALLING NEW FUELS

Improving efficiency is not just about the aircraft but also the fuel that goes into them. A number of airlines have tested biofuels for use in aircraft and "the results from testing have been incredibly positive," says West. "The fuel offers a 4

per cent increase in energy content and it is less polluting – the industry is really excited about biofuels."

Because of the need for stringent safety requirements, it has taken quite a while for biofuels to receive the certifications needed to allow them to be used in aircraft, but the first aviation biofuels are due to be approved by the end of the first quarter of 2011. Even when they are approved, there is a long way to go until the fuel becomes widespread. The need to scale up sustainable sources of bio-fuel around the world is likely to prove a bottleneck. Algae is one of the most promising feedstocks because it does not require land that would otherwise be used for food, it can grow in wastewater and it has much better yields than current biofuels, West says.

IMPROVING FLIGHT EFFICIENCY

Another way to cut the environmental impact of aircraft is to improve the way they are flown, otherwise known as Air Traffic Management (ATM). Better ATM could improve fuel efficiency and CO₂ emissions by up to 12 per cent, according to the Intergovernmental Panel on Climate Change, while IATA says: "Cutting flight times by a minute per flight on a global basis would save 4.8 million tonnes of CO₂ every year."

The problem is particularly acute in Europe because there are 37 different ATM authorities – the inefficiencies this involves leads to 16 million tonnes of unnecessary CO₂ emissions, according to the EU transport commissioner Siim Kallas.

The EU has been trying to introduce a 'Single European Sky', which could save the industry €340 million a year through reduced emissions, lower costs and fewer delays, for two decades. It has been dogged by national security concerns, vested interests in the air traffic control industry and government lethargy. However, aviation's inclusion in the ETS seems to have galvanised the industry and there are new signs of progress, with agreements to set up nine common airspace blocks starting to be rolled out.

Properly co-ordinated ATM can help to reduce emissions and cut noise by ensuring smoother ascent and descent during take-off and landing, less queuing above airports and better route planning. "Continuous descent can save hundreds of pounds in fuel costs for every flight," says West.

Even airports are playing their part. Under the Airport Carbon Accreditation Scheme, they can map their carbon footprint and then manage and reduce their environmental impact by measures such as changing the way they deal with waste, generate electricity and how people travel to the airport.

As the increasing cost of fuel combines with mandates for emissions reduction to pressure the industry for action, all of this should help IATA to achieve its aim of carbon neutral growth in the medium term and aircraft that produce no emissions within 50 years. ●

CLEAN SKY INITIATIVE

Clean Sky aims to meet targets set by the Advisory Council for Aeronautics Research in Europe (ACARE) that by 2020 there should be:

- A 50 per cent reduction of CO₂ emissions through drastic reduction of fuel consumption
- An 80 per cent reduction of NO_x (nitrogen oxide) emissions
- A 50 per cent reduction of external noise
- A green product life cycle: design, manufacturing, maintenance and disposal / recycling



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TRANSPORT AND ECONOMIC GROWTH



ECONOMIC RECOVERY Regeneration plans focused on the low carbon economy has seen Sunderland attract Nissan's new Leaf manufacturing plant. By Flemmich Webb

Transport is undergoing a revolution, driven by the need for low- or zero-carbon emissions. New technologies are developing fast, and some regions in the UK have been quick to recognise the economic benefits of a fresh wave of manufacturing. In March 2010, Nissan announced that Sunderland would be one of three international manufacturing hubs for the production of its Leaf electric car. The company expects the plant, and a new lithium-ion battery plant due in 2012,

to maintain about 2,250 jobs at Nissan and across the UK supply chain.

It represents an investment of more than £420 million in the plant supported by a £20.7 million Grant for Business Investment (GBI) from the UK Government and a proposed finance package from the European Investment Bank of up to €220 million (£185.8 million).

Cllr Paul Watson, leader of Sunderland City Council, said at the time, "With its legendary productivity, Nissan's Sun-

The Government hopes to see low carbon manufacturing and services result in local regeneration

derland plant has already proved itself many times over, and it's really exciting to see it leading on electric vehicle technology and green collar jobs.

"The decision to build the Leaf in Sunderland secures the city's place at the heart of the growing low-carbon economy. It also embeds Nissan further in the local economy at the same time as securing the future of the plant."

DRIVING GROWTH

But it's not just manufacturing that can bring benefits to the local economies — pioneering the use of low carbon transport technologies can be an important driver for growth.

The CABLED project is a trial of ultra low carbon vehicles taking place across Birmingham and Coventry in the West Midlands. The project will make a number of cars available to a cross section of consumers and collect data on how and where they are used. Its main aim is to demonstrate that ultra low-carbon vehicles are now a practical alternative to conventional cars in urban environments.

If successful, this could help stimulate the electric car market and drive economic growth in the region. CABLED estimates that by 2020 there could be between 1 and 1.5 million electric cars on the roads, and a significant proportion of these vehicles could be provided from the West Midlands manufacturing base and its supply chain.

"The CABLED programme makes the use of alternative fuel vehicles

real for users and the people around them, which stimulates demand for these cars," says Shariat Rokneddin, operations manager, economic development and partnerships at the Birmingham Chamber of Commerce.

"On the other hand, large-scale production of electric cars such as the Nissan Leaf will supply the demand. This creates an exciting opportunity for existing suppliers to auto manufacturers which will, in turn, help the local economy."

As the project notes, the data collected will help local authorities work out what the transition to a low-carbon transport economy means for their area and how they can translate this into opportunities for manufacturers, their supply chains and infrastructure providers.

DECENTRALISED PLANNING

Underpinning this potential economic growth is the Government's aim to promote a bottom-up approach to transport planning in contrast to the more centralised approach of the previous administration.

In its transport White Paper, Creating Growth, Cutting Carbon, published in January 2011, the Government announced that local authorities would be given control of funds — £560 million in a new Local Sustainable Transport Fund — to implement local initiatives. "We believe it is local authorities that know their communities best, and can make the changes needed to encourage people to travel

sustainably," says Transport Minister Norman Baker in the foreword.

This could give rise to low tech but highly effective schemes such as the Cuckmere Community Bus, a voluntary organisation based in Berwick, East Sussex that was established in 1976 with the assistance of East Sussex County Council and Southdown Motor Services Ltd (the local National bus company subsidiary).

The Community Bus scheme was set up to provide local residents who did not have access to a car, and visitors to the area, with a local bus service in the Cuckmere Valley region to fill the gap left by the local bus services that had shut down.

Now, through partnership with the local communities including parish councils, and supported by subsidies from East Sussex County Council, it operates a fleet of eight 16-seat minibuses on 14 local bus services serving over 15 local communities, improving local access to transport, reducing emissions and stimulating the rural economy.

The Government is confident that a combination of low carbon transport manufacturing, and locally targeted and designed transport initiatives will deliver the economic growth and emissions reductions it aspires to in the White Paper. But with councils having to make deep cuts to their budgets as part of the Spending Review, all parties are going to have to work hard to ensure the potential rewards become actual benefits. ●

COMMERCIAL FEATURE



The business benefits of greener fleets

It is not always obvious why it pays to adopt low-carbon vehicles, says the Energy Saving Trust, but there are considerable advantages

The Energy Saving Trust (EST) is known for its advice on how to reduce energy consumption in the home, but it is also working to show drivers, particularly those in company car fleets, how they can cut their fuel bills — and reduce their emissions at the same time.

In the long run, fleets will move towards vehicles powered by electricity and eventually maybe hydrogen. However, for the next decade most cars and vans will still run on petrol or diesel and "there is already a lot of good work going on in real fleets, now," says Ian Feather-

stone, fleet advice manager at the Trust, whose work advising fleets is funded by the Department for Transport.

There are three key elements to the EST's work with fleets — the vehicles that drivers use; the way they are driven; and the amount of miles that they cover. The EST offers advice on how to drive better through its Smarter Driving courses and also advice on how to reduce total mileage.

Many of the tax rules for fleets are now based on vehicle emissions, Featherstone points out, so there are big savings to be made on company car tax, writ-



ing down allowances and companies' national insurance payments by buying the most fuel-efficient models. Cars that emit no more than 110g CO₂/km are fully tax deductible for the first year, for example, and significant capital allowances are available for electric cars and vans. In London, drivers of low-carbon vehicles are exempt from the congestion charges.

Add these benefits to soaring fuel prices and the benefits of more efficient vehicles are clear. Nudged along by EU and UK regulation, manufacturers have risen to the challenge, with new models offering better fuel economy than their

predecessors thanks to new technology such as stop start, enhanced efficiency alternators, low energy tyres and lighter weight materials.

Plug in hybrids will bridge the gap from petrol power to electric vehicles over the next decade with drivers able to make short city journeys using just electric power but with the added security of an internal combustion engine to tackle the range anxiety that drivers currently have for pure electric vehicles on longer journeys.

The high up-front costs of electric vehicles (EVs) are one of the key barriers to their adoption today, but the EST pro-

vides analysis on the whole-life costs of the vehicles that shows fleet managers they can have financial as well as environmental benefits. "The advantages are not always obvious to people and we can help businesses to spot the opportunities," Featherstone adds.

One such opportunity comes from using electric vehicles as pool cars. "Where there is a lot of travel between sites, that is ideal for EVs, which cost about 2p a mile to run, whereas employees may be paid 40p a mile to drive their own cars," he says.

In the next decade there will be big advances in electric vehicles and the infrastructure to support them and costs will start to come down as the benefits of economies of scale kick in, the EST believes.

However, reducing the impact of drivers is about more than developing more efficient vehicles and "increasingly the Energy Saving Trust's work is orientated towards how vehicles are driven and how far," Featherstone points out.

Individual driver behaviour has a significant impact on fuel economy and EST smarter driving training can improve fuel consumption by 15 per cent immediately after training without increasing journey times, potentially saving the average driver about £200 a year.

The Trust also offers advice on journey management technology such as telematics and ways to remove the need for travel altogether, such as video conferencing. "For any business, staff driving time is dead time and increasingly the need to travel is being challenged," he adds.

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