

NewStatesman

Spotlight

TRANSPORT: A TIME FOR BIG IDEAS

David Blunkett / Sir John Armitt / Maria Caulfield MP



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Washington, DC may be at risk of losing its status as Capital of the Free World, but it is still a leader in traffic jams. The US capital topped the list of the country's most gridlocked cities in the 2015 Urban Mobility Scorecard, which found that Washington's commuters spend an average of 82 hours per year going absolutely nowhere in their vehicles. Nationwide, the US spends nearly 7 billion unnecessary hours in its cars, burning 3 billion gallons of fuel. Sitting in traffic, listening to the radio, Americans burned almost twice as much petrol in 2015 as Bangladesh – a country of 157 million people – uses in a year.

Here in the UK, while we do not waste nearly so much fuel, we waste time. According to the TUC's most recent survey, around 10 per cent of the UK workforce spends more than two hours per day travelling to and from work. In 2014, a study of 60,000 people by the Office for National Statistics found that longer commutes had a demonstrably negative impact on commuters' wellbeing.

Specific areas of our transport infrastructure, including the rail routes currently underserving areas such as Lewes and the air pollution and congestion in UK cities, clearly need decisive action. At the larger scale, however, it is worth acknowledging that there is no legislating against inefficiency of the magnitude found in current systems. If, as predicted by the UN, 66 per cent of the world's population is to live in cities by 2050, only very large and very bold ideas will provide the infrastructure future generations will need. The first people to board the 200-metre-long Crossrail trains in 2018 will get a sense of the new scale that must apply to all thinking about transport: it is no longer something that can simply be upgraded. Only huge amounts of confidence and ingenuity will get the future moving faster than the past.

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4 / Lord Blunkett

The former Home Secretary on the huge employment potential infrastructure projects offer

8 / Sir John Armitt

The country's pre-eminent civil engineer on the grand ambition of the National Infrastructure Assessment

14 / Maria Caulfield MP

The Lewes MP's constituents are the country's most frustrated commuters

18 / The new age of airships

The world's largest aircraft promises zero-carbon flights

22 / The school run

The need for better provision in both rural and urban settings

30 / James Thornton

The environmental lawyer has twice defeated the government in court on air pollution

Heathrow expansion will broaden our horizons

Investment in national infrastructure will lead to mass employment opportunities, according to David Blunkett

Finally, the government has given a green light to Heathrow expansion. This project, along with the Thames Tideway Tunnel, Crossrail 2 and HS2 will herald a new spirit of growth and development not seen in this country since Victorian times.

To 16-year-olds starting to look at career opportunities today, this push for infrastructure growth could be transformational for their future. Over the next few years, they will have the opportunity to gain apprenticeships and secure jobs in several of those projects. In 10 to 15 years they could be part of the most advanced workforce in the world, sought after by projects across the globe looking for the level of experience that UK infrastructure will provide over the coming decade.

The job of the Heathrow Skills Taskforce, which I chair, is to ensure this vision becomes a reality and that Heathrow is at its core. Our strategy will ensure Heathrow's expansion addresses areas of current unemployment in

SHUTTERSTOCK / ALICE-PHOTO



Arrivals





Bridging the STEM skills gap is crucial

London and the South East; but it must do much more than this. We need to ensure a legacy of skills creation that will deliver UK-wide economic growth, employment and infrastructure improvements for decades ahead.

As a former Secretary of State for Education and Employment, this long-term vision is particularly important to me. I joined the Taskforce as Chair precisely because I have seen too many lost opportunities where expensive projects build up their teams, and then leave them to waste. We must ensure all our large-scale infrastructure projects deliver benefits beyond their individual construction phases. This entails driving such projects together, to dovetail timetables for training, recruitment and employment and for the benefit of small and medium-sized companies.

I'm very pleased to count on the experience of the 13 members of the Skills Taskforce, drawn from the fields of employment, education and skills, and youth social action. We will be advised by additional representatives from education organisations, who will ensure our recommendations are consistent with existing curriculums and programmes.

Having had our inaugural meeting at the end of October, the Taskforce is now charting the number of infrastructure projects underway or scheduled to be delivered across the UK. Through collaboration with these projects, we can maximise the effectiveness and reach of our skills and apprenticeship programmes. We can learn from projects which are seeing success, like Thames Tideway and Crossrail 1 which offered substantial routes to apprenticeship training.

Without this holistic approach, I believe the delivery of these projects is at risk. Instead of building a new kind of workforce together, lack of cooperation will lead us to compete over a limited and shrinking pool of skilled workers. Already, there is ever-widening skills gap in STEM subjects, and a severe shortage of UK candidates in fields like engineering. Greater Manchester

Chamber of Commerce research released earlier this year found Heathrow expansion would require a 25 per cent increase in construction workers alone.

Working together, we can also ensure investments in the UK workforce avoid overheating certain parts of our economy and country. A decentralised approach to procurement will be key in spreading the regional benefits of each infrastructure project.

In Heathrow's case, 95 per cent of its procurement spending will be with the British supply chain, 60 per cent of which will be outside of London. Heathrow will engage early with its supply chain to bring skills and apprenticeship opportunities to regional procurement hubs, where suppliers will manufacture, pre-assemble and consolidate components critical to the expansion project. This will ensure young people across the UK benefit from Heathrow's investments.

Delivering infrastructure projects of such a scale, and of such importance as Heathrow expansion will not be easy. In Heathrow's case, the major demand for employment will be in 2020/21 which requires urgent action to ensure that measures are in place to turn aspiration into meaningful results. This clearly will be followed by a whole range of employment possibilities way beyond construction and civil engineering.

Getting this right is a challenge post Brexit which we cannot afford to duck. All those with positive ideas to turn good intentions into practice will be welcome to contribute, whether or not they are not in agreement with the go-ahead for the third runway.

In fact, Heathrow is one the UK's largest single site employers, a thriving economy of its own where exporters, businesspeople and travelers converge. Labour requirements will not end when the first plane lands on the new runway – we need to build the workforce that will run the UK's hub airport, its biggest port by value, and for decades to come Our Taskforce will aim to deliver that.

Lord Blunkett is the Chair of the Heathrow Skills Taskforce

The road ahead: driven by smart data and safety

Lee Rushbrooke, chief executive of Colas, outlines the future of the country's highways



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Roads are about more than getting from A to B; they are key to connecting centres of business and knowledge to transport hubs, and supporting the development of labour markets and thriving communities. The move towards more devolved administrations provides opportunities to address regional and local transport issues with appropriate solutions that can deliver improved and more durable infrastructure.

With local roads making up 98 per cent of highways in England and Wales, and road maintenance expenditure down by 16 per cent in the last year, the private sector is key to helping bridge funding gaps.

Colas has a local focus, informed and supported by global expertise, and as a group we invest heavily in R&D, with 2000 engineers and technicians future-proofing our infrastructure. Our experience of investing in over 80 PPP projects worldwide will be invaluable – given the need to reconsider funding options in the UK. We are responsible, via our contracts with Highways England, for around 23 per cent of the strategic road network. The future of this network is underpinned by intelligent data sourced from a hidden hive of digital processes delivering greater safety and road use monitoring that a few years ago would have seemed the stuff of science fiction.

High-accuracy GPS and Internet of Things connectivity permit realtime uploading to the Datex II data interface to warn and inform road users and

highways workers. Wireless worker interconnection and instant alarm technology help to prevent collisions.

Nationally and regionally, we don't just use roads nowadays – we read them. But recording data is just the beginning. Automatic monitoring technology protects our workers on-site. Colas' Project Yellow system uses thermal imaging cameras and analytics software to send an audible warning to operatives if a vehicle is on a collision course within 150m.

The next step will be the delivery of autonomous versions of these systems, as part of a general movement towards driverless vehicles and greater safety, removing human error and moving towards zero deaths or injuries in roadworks.

We are also working on Smart Motorway technology, with active management of diversion routes giving drivers real-time information on diversion-impacted journey times and better directions via portable Variable Message Signs.

This creates a real-time window on how diversion routes are working, and crucial geosocial data for the travelling public, local communities and planners in the future.

Colas research is leading towards sustainable energy creation, too. Our new Wattway solar road surface is at the forefront of this pioneering activity, providing clean, renewable electricity whilst being ultra-resilient, yet lightweight. Wattway is just one step towards a truly intelligent road system that not only supports travel, but contributes to energy creation and the greater wellbeing of communities, with self-powering signs, lights, homes and even businesses.

International research serving local communities with new technology, new skills, new investment and new partnerships – this is the formula for the smart and sustainable infrastructure future that Colas is building.

For more information, visit:
www.colas.co.uk/statesman

A project of unprecedented size and scope, the National Infrastructure Assessment will lay the foundation of this country's future. Sir John Armitage says the decisions being made now will shape policy for decades to come

The foundations of tomorrow's Britain



Our national infrastructure is enjoying a spell in the limelight. Long overdue decisions have been taken and senior ministers have signalled their commitment to invest. In Crossrail we are home to the largest development in Europe; we lead the world in offshore wind and HS2 is progressing from conception to construction as fast as anything in the Western world.

But we have been here before, and the overall picture remains mixed. The UK's infrastructure ranks 24th in the world, and decisions can still take decades.

This matters to each and every one of our daily lives. From travelling to work, to keeping in touch with friends and family and powering and protecting our homes, our national infrastructure

represents the networks and systems that keep our country and communities on track. When it fails the results range from minor frustration to a catastrophic breakdown of the order on which we rely.

So we must seize this moment to secure a permanent shift in the way we plan and deliver major projects in this country. There is nothing to prevent the UK from delivering world-class infrastructure if we set about the task with the seriousness and determination it requires. This is precisely what the National Infrastructure Commission (NIC) intends to do.

In January 2017, the Commission – of which I am Deputy Chair – will be placed on a permanent footing as an executive agency, operationally independent of



Light at the end of the tunnel: Crossrail aims to bring an additional 1.5m people within 45 minutes of central London

We must ensure our industry is future-proofed

SHUTTERSTOCK / PAUL DANIELS

government with complete discretion to determine how we work and what we recommend.

Already the Commission has published detailed analysis and clear advice across three landmark studies. Our recommendations – to bring forth a Smart Power revolution through interconnection, storage and flexible demand across our electricity network, move forward with Crossrail 2 in London and to create a HS3 network connecting the great cities of the North – secured more than £400m of investment at Budget 2016, but government has more to do to make these proposals a reality.

The NIC takes its responsibility to ‘hold Ministers’ feet to the fire’ seriously.

If government is to open the way for a better, more efficient electricity network able to take advantage of the innovations we describe then BEIS must move forward with gusto, starting with the publication of its long-promised, and overdue, consultation.

In the North of England, all eyes are on Transport for the North and the next phase of their plan to make a High Speed North a reality. The Department for Transport and the Treasury must continue to offer their support. And in London the government’s commitment to submit a Crossrail 2 hybrid Bill by Autumn 2019 will be sorely tested if TL are not allowed and encouraged to move forward with the necessary preparation.

The National Infrastructure Commission will monitor developments closely. Where government gets it right the Commission will say so, but be in no doubt that we will make our voice heard if progress is not made.

Individual projects like these, however, represent only a small part of what we do. Alongside new studies, considering the infrastructure needed to make a success of 5G and an assessment of the strategic requirements of the growth corridor stretching across Cambridge, Milton Keynes and Oxford, the National Infrastructure Commission is undertaking a piece of work unmatched for size and scope anywhere in the world – the National Infrastructure Assessment (NIA).

At its heart, the NIA asks a simple question – what infrastructure will the UK need over the next 30 years to remain competitive, foster growth and ensure high quality of life? Our task, is to inject the rigorous analysis and strategic thinking we need to plan and deliver the infrastructure of the future.

How can infrastructure best support growth, how should we decide what we repair and what we rebuild, what is affordable, who should pay for it and how? These are the sorts of big questions we need to answer if we are to replace sporadic decision making with a long-term strategy.

The UK deserves world-class infrastructure



It is crucial that we enhance the connections between the UK's key regions with greater High Speed infrastructure

For example, we can all see that the inter-relationships between sectors like energy and transport are not always as clear as the walls which separate Whitehall departments. A move to electric vehicles would have enormous implications for our power supply; cooling our power supply may mean dramatic new demands on our water supply. Yet all too often our strategic planning remains uncoordinated across, and even within, government departments.

Our economic infrastructure is not a series of discrete networks, but a system of interlocking systems. For the first time, the NIA will seek to assess and plan for our future need by studying and addressing those connections.

Underpinning that work will be an assessment of the four key drivers of the supply and demand of infrastructure - broadly fluctuations in population, the economy, the pace of technological advance, and the impact of climate change – and the scenarios over the medium term that they suggest.

To give one example, we need to

understand how new technology will allow us to manage capacity in transport and energy and what that will mean for our networks.

This is complex, technical work, with dramatic real world consequences. With a deeper understanding of the trends which will shape our future, policy makers will be better equipped to ensure that improvements arrive in plenty of time to head off the crises we are all so desperate to avoid.

So developing the NIA will be an enormous undertaking, but the prize is greater still. A successful NIA will stand as the cornerstone of a serious and strategic long-term approach to our infrastructure that will help reduce unnecessary delay, costs and congestion, making our lives easier and our economy stronger.

World-class infrastructure can form the basis on which the UK succeeds for decades to come. Today, we have the chance to turn that hope into a reality. In the aftermath of the Brexit decision, it is crucial that we seize it.

MTR – Bringing a fresh perspective to UK rail

The world's highest-performing railways have lessons for the UK, writes **Jeremy Long**, CEO of European business at MTR

Among the critical investment challenges the government will face over the next few years, there are few more pressing than transport infrastructure, particularly railway improvements, and the need to meet housing demand.

An innovative approach is needed. International experience shows how private investment can help deliver rail upgrades and provide more residential and commercial space in a way that minimises the burden on taxpayers. As one of the world's leading operators of rail systems and a successful property manager working in seven major cities worldwide, MTR has first-hand experience of this holistic approach to rail and property development, and the improved results it can deliver: stronger integration, major station developments, and growth.

Joined-up railways

Close collaboration of rail operation and infrastructure is vital to ensure that a railway runs as seamlessly as possible and delivers the best possible service for passengers.

On our London Overground and TfL Rail services, for example, MTR co-operates closely with Network Rail, which ultimately allows us to deliver a better service for passengers – as two of the best performing railways in the UK. With Network Rail devolving to individual regional routes, the industry needs to continue to look at how to make this collaboration and joint working even more effective. The benefits could be significant.

In Hong Kong, where there is no separation of ownership between train and track, MTR operates the trains and manages the infrastructure for the city's metro system under a single company. The Hong Kong metro system is one of the busiest globally, but still delivers 99.9 per cent of passenger journeys on time, making it one of the highest-performing railways in the world.

Rail development spurs growth

The Government has an ambition to build a million new homes by 2020 to address a chronic housing shortage in the UK.

Again, international models show clearly how more effective development and commercial use of stations could bring increased revenue into the UK's railways, which could be used to fund new homes as well as rail lines, extensions and upgrades to the network, while reducing the burden on fare payers and taxpayers.

MTR has led a number of 'rail plus property' investments, particularly in Hong Kong as well as Mainland China. For example, MTR's Shenzhen Metro Longhua Line Property Development will feature 1,698 residential units and a shopping centre of about 10,000 square metres upon completion.

In order for this kind of development to be realised in the UK, the right commercial and asset ownership environment is needed. In particular, this involves introducing and making use of mechanisms to allow investors to share risks and rewards with the public sector over the longer-term.

There are transferable examples from abroad that could play a key role in helping the Government achieve its aims of improving rail infrastructure maximising value capture for the taxpayer and building new homes in Britain. The time is now for the Government and the rail industry to work together to bring new ideas to the table, and we look forward to taking part in this vital debate.

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Next stop: the future

Atkins' technical director
John McCarthy explains
how technology is set
to transform the
transport sector



The story of the UK's transport system – its roads, rail lines, tunnels and canals – is one of extraordinary feats of engineering. For more than 150 years, communities, industries and economies have been built around them. But the future of the transport network is much less clearly defined. One thing, however, is certain: much of the infrastructure that will take us into the 21st century will be as much in the Cloud as on the ground.

Reinforcing our physical connections alone will not enable us to meet all of the social and environmental challenges we face. In 15 years, 60 per cent of the world's population will live in cities. That will place enormous pressure on our public transport infrastructure and add vehicles to our already congested roads. We must also act now to reduce the impact that our transport system has on the environment. The UK has a legally binding obligation of an 80 per cent reduction in carbon emissions by 2050 (compared with 1990 levels) and meeting that ambitious target will require a fundamental shift in the way we connect people, places and goods.

For the first time, we have the

building blocks in place to do this. Advances in technology and access to a huge volume of data have given us the tools we need to unlock new opportunities. We can already check live bus times or buy train tickets online. But there is more to come.

Several private- and public-sector providers in the UK are already embracing a totally new way of thinking about transport provision, called 'intelligent mobility'. Why 'intelligent'? Because it uses data and emerging technology to help provide a more personal, efficient, safe and sustainable network.

Intelligent mobility offers to the travelling public:

A customer-centric design – one that combines all transportation options and presents them to the customer in a simple and integrated manner. The emphasis is on how to get successfully from A to B rather than on being tied to any individual transport mode or service.

A seamless experience – that connects people with the right information at the right time, and in real time. It provides trusted travel information on demand, across all devices, and enables people to

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manage their journey on the go.

Connected and autonomous vehicles – an organised network of driverless vehicles will offer greater connectivity and autonomy, giving us the opportunity to open up new business models, and in doing so to provide tailored services and connections that are not available at present.

In order to achieve these goals, fundamental to intelligent mobility are data and intelligence, so that operators can make the best possible strategic decisions about the performance of the network, and that the network will exist in a resilient and secure online environment.

At the heart of intelligent mobility is the belief that the public transport of the future will move away from a ‘top-down’ menu of pre-defined options, towards a reconfigurable matrix of choice and flexibility. Traditionally, public transport has delivered a relatively inflexible service to passengers. Train and bus routes are fixed and everything runs to a pre-determined timetable. The traveller must work out how best to slot themselves into these schedules. And

very often, the different services do not, or cannot, ‘speak’ to one another – they can only speak for the particular service they offer.

Intelligent mobility shifts the focus, to put people, their experience and travel requirements at the centre of provision. It aims to provide travellers with the means and information to create a seamless experience across all modes of transport. Why is this important? Because public transport will remain critical for supplying significant capacity for increasing populations, especially in our towns and cities.

It’s a big shift, and it can be hard to conceptualise. But imagine... instead of waking at a set time each work day, arriving at the train station to find the service is delayed and – when it does arrive – there’s only standing room, a different solution. The alarm would wake the commuter five minutes earlier than usual and alert them to problems on the network. They could leave for the station in time to catch an earlier and more comfortable train, or they might be told a driverless car could take them to an alternative station....

Intelligent mobility means integrated journeys, drawing on a wealth of data to relieve the traveller from anxious planning. But how do we go about realising such a fundamental shift?

Understanding new infrastructure requirements

Many of the benefits, particularly CAVs, will rely on fast and secure wireless connections. So, authorities need to put the digital infrastructure in place to support real-time interaction between vehicles and the navigation and traffic management systems. CAVs will need, for example, to understand the curvature of the road or the turning width. We must also tackle the interoperability of the systems and the technological standards that will need to be met to ensure that the opportunities provided by CAVs are realised.

Intelligent mobility also gives us the opportunity to re-envision our public

realm. CAVs, for example, need less physical infrastructure than traditional vehicles. Their safety benefits could remove the need for crash barriers and reduce the quantity of road signs. Over time, this would give authorities the chance to transform areas into new public spaces.

Delivering benefits through the use of big data

Until a decade ago, most of the world’s data came from scientific, industrial and administrative sources. Today, an unprecedented volume is generated daily through social media and online shopping.

From a network-operator and customer-experience perspective, the next step is converting data into something for the public good that is available at the right time, and is readily usable and digestible. Intelligent mobility allows everyone to benefit from big data. Important is establishing the framework and practices around safety by designing an end-to-end customer experience. Naturally, issues such as cyber security, privacy and protection must be to the fore, with guidance around data usage and ownership established.

But we must understand that data is valuable; and when gathered, analysed and transformed into operational and business intelligence, in real time, it becomes invaluable.

Put people first

We have an extraordinary opportunity to change the way people think about transport and to deliver benefits that will extend beyond the individual to entire communities. Developing a national policy that connects with technological development while at the same time provides an independent guide on the adoption principles will be fundamental to enable any sustainable deployment. But we need leadership to continue on our journey. Above all, we must ask: Are decision makers, designers, developers, service providers and users on this journey together?

“We must get our railway services back on track”

MP for Lewes Maria Caulfield talks to Rohan Banerjee about the need to deliver more reliable public transport



The train journey from Lewes to London Victoria is supposed to take just over an hour. Persistently poor services, however, have reduced any such reality to a pipe dream; leading many East Sussex commuters to question whether the thousands they’ve spent on season tickets are actually worth it at all.

So far public anger has mainly been directed at Govia Thameslink Railway (GTR)’s Southern operation and according to MP for Lewes Maria Caulfield this seems a good place to start. “Southern have a serious case to answer in my mind,” she says. “They have been antagonistic towards the rail unions and to their own workers. They’ve steam-rolled ahead with a number of initiatives without any consideration of the knock on effects they’ll have.” Caulfield, who raised the concerns of her constituents in Prime Minister’s Questions earlier this month, isn’t wrong. Just as guards went on strike in April over the introduction of driver-only trains, Southern moved to scrap employee perks such as free travel for family members. Staff absence through sickness soon doubled and drivers stopped volunteering to work overtime. In July, Southern withdrew 15 per cent of their total services until further notice.

The impact on Lewes’s local economy,

Caulfield is quick to point out, is nothing short of severe. “The whole sell of being a commuter town is rooted in accessibility and transport. People move to areas like Lewes with that mind, so we have a responsibility to deliver. Train services simply haven’t been up to standard and what should be just over an hour’s journey is now often closer to three hours. Estate agents are noting a fall in house prices, because people are starting to explore alternatives where the commute is closer to what they were promised.”

Just as important as commuters being able to travel to work, Caulfield adds, is the ability of tourists to reach Lewes. “Tourism is massively important to Lewes and the surrounding areas. We’ve got South Downs National Park, two big fishing towns in Seaford and New Haven; and if people can’t get here, then they will start visiting places where they can.”

GTR has claimed that more than 10,000 Southern cancellations between the end of April and August were down to industrial action. During these peak tourist months, Caulfield reveals that trade in Lewes went down roughly 20 per cent. She says gravely: “When you’re a tourist area and your busiest months are through the summer, and you need that trade to keep you ticking over through the winter, then having



Caulfield is “not against nationalisation as a concept”

a blow like that is absolutely devastating.”

And there is a social dimension to be considered too. With only one main train line connecting Lewes to London, Caulfield highlights the risk of isolation that unreliable services present. She warns: “In addition to the obvious problem of not being able to reach work leading to job loss, you’ve got to remember that people have to use transport in their everyday lives too. What about people who have to use childcare services? There’s an additional cost. If people are constantly being hit by delays, they’re spending less time at home with their families.”

While Caulfield doesn’t hesitate to criticise Southern’s performance, she recognises that there are other culprits who have contributed to commuters’ current malaise. “Southern have definitely failed on the management side of things, but Network Rail themselves have got to accept some responsibility. The old mainline is desperately in need of modernisation and has lacked any real infrastructure investment for about 20 years. As a result, we’re seeing constant problems with the actual track, signal failures, splintering and the like. The problems associated with that lack of investment and upkeep are now coming home to roost and it’s not uncommon that we’re seeing engineering works overrun from a weekend onto the following Monday morning.”

Similarly, Caulfield says, the unions are not entirely blameless. “Although I can understand their frustrations, I don’t think the scale of industrial action by the unions has helped. Over Christmas, we’ve got planned strikes to contend with which means that any sympathy for their situation is going to be undermined. The public who rely on the train services to visit relatives over the holidays or the people who work anti-social hours are going to have find alternative means of transport and that contempt might eventually boil over. At the end of the day, most people won’t care who’s most at fault, they just want a rail service that’s able to get them from A to B without any hassle. Right now,

we don’t have that.”

So what is the solution? While Caulfield admits she is “not against nationalisation as a concept”, she feels that there are less drastic measures that should be explored first. She believes that Transport Secretary Chris Grayling’s £20m investment pledge can be the flagship of a new holistic approach. “We certainly need to have more direct investment from government in modernising the railways and £20m is a welcome boost.”

Caulfield cannot, though, hide her disappointment in GTR’s performance with Southern and is open to handing over the franchise to another operator. “When I look at their performance, I just can’t say that I’ve been impressed and there has to be a way of holding them to account. They need to really look at themselves.”

The same goes, she suggests, for the unions. “Delivering a reliable rail service really does need to be addressed as a matter of urgency. I want the Prime Minister and the secretary of state to knock some heads together, get these parties in a room and not let them out until they’ve sorted out their problems once and for all; and by that I mean having a greater dialogue between the unions and the managers. While I do sympathise with how a lot of the new ideas have been implemented, it’s difficult to unpick that when there’s nearly some sort of strike every week now. Equally, it makes it very difficult if we do consider changing operators, because no-one wants to take that route while there’s this level of disruption.”

As a long-term target, Caulfield notes that something must also be done to address the narrowness of the London commute. “We are exploring a second line – which admittedly could take years – to beat that bottlenecked route into Victoria. A second line leading towards the Canary Wharf side of London would not only open up a wealth of new working opportunities, but could play a huge role in limiting congestion as people wouldn’t all be clamouring for the same service.”

Unshackling the Midlands' potential

As the UK prepares for Brexit and its new role in the world, having strength in our regions is more important than ever, writes Midlands Engine director Maria Machancoses

A thriving Midlands economy is key to a buoyant and re-balanced UK. If you look around the world you will see that the most successful countries are built on a network of strong, well-connected regions. With a population of 11.5m, 14 cities, 27 universities, two international airports and a third of the UK's manufacturing jobs, the economic potential of the Midlands is self-evident. With Brexit on the horizon, it's time we realised that potential and lightened the load on London.

Improving transport links to speed up journey times not only from the Midlands to the north and south, but between the east and west of the region, is vital for growing the economy and increasing productivity. Research has shown that faster journey times can secure a £1 bn-a-year boost to the regional economy, create 300,000 additional jobs and save businesses nearly £500m. With this in mind a collaboration of local enterprise partnerships and local authorities in the Midlands has committed to work together under the banner of Midlands Connect with the aim of establishing a unified position on what strategic transport initiatives are needed to maximise the possible growth of the area and the UK as a whole. Midlands Connect serves as a platform for engagement with government and is in the process of drawing up a long-term transport strategy that will set out the investment in infrastructure needed to deliver those faster journeys and secure the maximum benefits possible

from HS2 which will have four stations serving the region.

Many of the UK's most prominent enterprises and world-class research centres are located in the Midlands. Strategic industrial sites with an export vocation include aerospace, automotive and advanced engineering as well as service industries such as banking and insurance. The concentration of specialised manufacturing is a key strength of the Midlands' economy with the sector employing 12 per cent of the workforce - higher than the national average. The clustering of Jaguar Land Rover, JCB and Rolls Royce along important corridors fosters specialisation, reduces supply chain costs and makes for a more dynamic labour market.

With 90 per cent of all UK businesses based within four hours of the Midlands, the area is a prime location for logistics sites, corridors and interchanges. The presence of freight infrastructure benefits local business by providing access to both national and international markets. Exports from the Midlands rose by 38 per cent between 2010 and 2013, outperforming the 15 per cent increase in UK exports as a whole.

Devolving more transport powers to the region by putting Midlands Connect on to a statutory footing as a sub-national transport body, can help put more of the decision-making process in the hands of local people with an informed knowledge of the area's needs. For too long, the UK has been over-reliant on London; the Midlands offers a ready-made supplement to the capital and subsequent solution to this dependency.

It is not about detracting from London, which has set the bar high for what cities should aim to emulate, but it is about rebalancing the distribution of our businesses and industries. That our best and brightest graduates are almost invariably drawn down south is counterproductive for the rest of the country. So the work to harness the potential of our regional economies has begun in earnest and the Midlands Engine is leading the way.

IN ASSOCIATION WITH



A new type of aircraft, built by a British company, could soon deliver cheap, highly efficient, low-carbon transport with little need for infrastructure. Will Dunn speaks to Hybrid Air Vehicles' Chris Daniels about the new age of airships

The biggest idea in aviation

In architectural terms the village of Shortstown, on the outskirts of Bedford, is unremarkable but for a pair of gigantic green buildings, each more than 240m long and 50m high. These are the buildings of the former Cardington Royal Airship Works, built in 1915 to house the huge R101 airships that the Air Ministry intended to use as sky-going liners that would take passengers to India, Egypt and Canada in peacetime, and to carry troops and vehicles in times of war. The age of the great airships came to an end in the 1930s with a series of high-profile crashes, most notably the *Hindenburg* disaster, and the sheds fell into disrepair, left behind by the accelerating forces of war, technology and the jet age. The sheds found new life as film studios – at five times the size of the largest sound stage, they were the only buildings large enough to house Christopher Nolan's sets for *Inception*

and *The Dark Knight Rises* – but in recent years, lorries carrying very large gas tanks have once more begun to visit Cardington. In the left-hand shed, behind a pair of doors that would loom over a 10-storey building, a British company has built the world's largest aircraft: the Airlander 10.

"There has been a niche British airship business for about 40 years," explains Chris Daniels of Hybrid Air Vehicles, maker of the Airlander. "For most of that time it was driven by one man, an engineer called Roger Monk."

For engineers, airships have a particular fascination: part aircraft, part architecture, their flight depends on the calculable principle of buoyancy rather than the brute force of thrust. The great British engineer Barnes Wallace was an airship engineer – he worked on the giant R101s at Cardington – and when he had finished his work on the bouncing bombs

that proved so decisive in the Second World War, Wallace continued to think about how the airship might fly once more.

"The story goes that Roger Monk, in his 20s, met Barnes Wallace," says Daniels, "and asked him why airships hadn't happened. Barnes Wallace went through five key technical issues – materials technology, testing, having vectored turning engines, and so on – and Roger decided that he would solve all of those issues. And that's what he did."

Monk's work drew him to a type of airship that, unlike the blimps of the 1930s was actually heavier than air – "what we call hybrids: airships with a significant proportion of aerodynamic lift. It's a concept that people have played around with for a century or more, but no-one had really done anything with it, because there wasn't the computer power to do the modelling, nor the materials technology to make the hull.



**The 92-metre-long
Airlander cruises at
148km/hr and can fly
non-stop for five days**



**It is 30 per cent
longer than
the largest
passenger jet**

But both of those have come to the fore in the last 10-20 years.”

The Airlander might have remained an engineering hypothesis, however, had it not been for the American military, which saw the idea’s potential for use as a surveillance platform in Afghanistan.

“In 2010, this British company, which was working out of a Portakabin on the outskirts of Bedford, won a \$500m contract for the US Army against Lockheed Martin.”

The army’s enthusiasm did not last long – “the programme was cancelled just after its first flight,” says Daniels, “due to budget cuts” – but he says that it was enough to get HAV to a prototype. After the contract ended, “we bought the aircraft back from the US. We maintained all the intellectual property, and we started, at the beginning of 2013, to redevelop, reconstruct and make a better one.”

The result, hidden in the Cardington shed, is an aircraft that is almost 30 per cent longer than the Airbus A380, the world’s largest passenger jet. The Airlander 10 is a more flattened ovoid than the blimps of old, less sleekly bullet-like, more carefully modelled for airflow.

“In effect,” says Daniels, “It’s a very light flying wing. Airships of old floated, and that’s how they generated their lift. The trouble with that is, it makes them very susceptible to wind and weather conditions. It also made them very difficult to land. We’ve made an airship that’s a little heavier than air, so that it always naturally sinks to the ground, but it gets lift from being wing-shaped – as soon as there’s more than about 20mph of wind flowing over it, either from the engines pushing it forward or because it’s heading into the wind, it generates enough lift to counteract

the weight of the aircraft.”

Despite the Airlander’s huge size, this weight is trivial in comparison with a jet. “On the ground, it weighs between one and 10 tonnes, depending on the buoyancy. A 747 weighs between 100 and 200 tonnes, depending on how fully loaded it is. Obviously, you need a lot more energy to get something that weighs 100 times as much off the ground.”

Inside the Airlander’s immense bulbs of laminated fabric are the 38,000 cubic metres of space that are its most significant source of lift. “A cubic metre of helium, at atmospheric pressure, lifts about a kilo” explains Daniels. “If you want to make an airship in your back yard, that’s a useful thing to know. So we have a lifting power of about 38,000 kilos and about 20,000kg of weight – the engines, the hull material, and so on. With about 6-10,000 cubic metres of air, that leaves enough to lift about 10 tonnes.”

A 10-tonne payload is only the beginning. This, the largest aircraft in the world, is the smallest Airlander that HAV will ever make. “We have another on the drawing board that will carry 50 tonnes. What we’re never going to do is make them smaller. They will only get bigger.”

As with other airships, the bigger the Airlander, the more efficient it is. The current model is already vastly more efficient at getting weight airborne than a jet – the four v8 engines are of the kind used by light aircraft, and have been specially adapted to provide still more efficiency – but HAV’s long-term aim is to make the Airlander the first zero-carbon aircraft.

“We’ll take a staged process to electric engines. Initially we’d have diesel engines at the rear and electric engines at the front, and take off with all four, which works from a regulatory perspective and gives us a power boost. Then we’d switch off the rear engines, run off the electrics in the air, and have the diesel engines as backup. The next stage would be to go all-electric, with a big bunch of batteries. Stage three would be to cover the hull with thin-film solar panels, and then you’ve got an aircraft that can fly forever.”

“That’s quite a few years away,”



Daniels acknowledges, but he points out that “a zero-carbon aircraft has to be the future. The civilian aerospace industry at the moment is somewhere between four and five per cent of global carbon emissions. That percentage is going to go up, even the aircraft are getting more efficient, because more people are using them. It’s going to become a big political issue. You cannot get any plane that works on what’s currently normal in aerodynamics to the level of efficiency where you’re massively reducing carbon.”

Reducing carbon is not the only benefit of being so fuel-efficient. It’s also much, much cheaper: a 747 typically goes through around four litres of jet fuel per second, and fuel makes up around 30 per cent of the operating costs of most airlines. Any technology that can significantly reduce fuel dependence has huge gains to offer. Daniels says the fact that the Airlander doesn’t need an airport means low-cost, short-haul flights will become a target for HAV: “The success of Eurostar comes from the fact that you’re

not schlepping out to Heathrow, having to arrive two hours before your flight, then getting a train into Paris at the other end. Your total journey time is much quicker. If you take an average journey time to Amsterdam, it’s four hours. But if I can take off from, say, the roof of St Pancras, or from the Thames, and I can fly straight to the stretch of water behind Amsterdam central station – if I can do that in two hours, people are going to use that service, because it’s a lot quicker. In effect, it’s a portable Eurostar service.”

The Airlander is also versatile in regulatory terms – “we fly in general aviation space, below the standard air corridors, so we can fly wherever we want” – and there’s no need to build a new airport for a new route to be opened up. All that’s needed is passengers.

“Say I’m in Norwich, and I want to go to Liverpool,” Daniels suggests. “Given the way that transport works in the UK, with all transport radiating from the capital, it takes a really long time to make this short journey.” (Although it’s about



It could take off from the St Pancras roof, or the Thames

190 miles by air, it's a 255-mile drive, five hours by car or train.) "With modern technology, however, if there are enough people who want to make that journey, people could use an app to book seats and once the flight was, say, 80 per cent full, it would become profitable for the operator to run the flight from Norwich to Liverpool on a given date. Because you don't need an airport, it becomes a kind of Uber service in the air."

The first Airlander passengers, however, are likely to be tourists. "Initially, this will be for some sort of experience tourism, people just getting up and flying because people just want to fly around in this amazing thing, seeing the views, opening the windows; experience flights over Machu Picchu, safaris, dining flights over Paris or London."

Engineering, too, could make use of the Airlander: "The oil and gas industry is now moving into very deep offshore drilling, beyond the range of most helicopters. We can do that – and there are lots of other areas in which we could

move a number of people over some rough terrain or a hazard. We can land on water or sand, and we'll be able to land vertically in anywhere that has 200m-300m of flattish space."

All this is possible, but launching a new form of air transport will be difficult. The technical challenges are by no means overcome, and the Airlander 10's most recent flight ended in what Daniels calls a "heavy landing". "We need to train for a new set of procedures," he explains, "because everything we're doing is new. The aircraft will be ready to fly again very soon, but we want to make sure the people are ready, too. We're in a situation now where the aircraft is actually slightly ahead of the people."

The main challenge HAV faces, however, is financial. "One of the problems I've seen in industry is that large companies have the money and wherewithal to influence both the government directly and the trade bodies. Our trade bodies represent us, but they represent the big boys more. The government needs to enable level playing fields."

Only with a level playing field, says Daniels, will next-generation transport technologies really take off. "There is a megatrend to start looking at new ideas, and especially green alternatives, but it's also true that the only reason electric cars are taking off is because the governments of the world have supported the infrastructure for them. So much of what the government does, and what it taxes, fundamentally influences the behaviour of people and of companies. These new industries need investment."

Ultimately, though, he is confident that the Airlander will succeed, "because we don't allow the innovation to take over completely. We have a group of pragmatic people who mirror an innovative group of engineers, and we strike a very good balance between business and innovation."

If Daniels is right, we will once more see huge airships floating through the skies above London, bringing with them a new type of journey.

The school run must gather pace

Inadequate school transport causes congestion, air pollution and social isolation. Rohan Banerjee spoke to the Campaign for Better Transport and Transport for London about what needs to change

The law in England states that a person aged between 16 and 18 must be in full-time education or training, but the harsh reality of public transport cuts over the last decade have made adhering to that rule extremely difficult for those in rural areas. According to the Campaign for Better Transport (CBT), over 300,000 children and 50,000 sixth form or college students have lost their access to public transport since 2008 – the equivalent of 10,000 single decker buses per day. The same research found that two-thirds of local authorities no longer provide any free bus or train services to people over the age of 16, and the loss of school transport is estimated to have resulted in more than 100 million additional car journeys each year.

CBT Campaigns and Outreach Coordinator Lianna Etkind paints a grim picture: “I think what it comes down to is that there have been so many cuts to local government and local authorities have extremely squeezed budgets as a

result. Many of them have decided to cut back on school transport to respond to this, right back to the statutory minimum, without considering the knock-on effect, not only for children and their families, but also for people who don’t have children who will still have to put up with the increased congestion in the area.”

Aside from the heightened risk of air pollution, Etkind adds that the lack of public transport provision is removing any element of choice for parents when it comes to deciding what school or college their child attends. “For many parents, the decision whether to work or take their children to school is becoming a distinct standoff. In some instances, they also have to be more restrictive in choosing what school or college they can realistically reach nearby.”

Etkind is quick to point out that the limited public transport services can also contribute to enervating social mobility. “We’ve seen case studies where young people have managed to get onto





Over 350,000 students have lost transport since 2008

prestigious internships and placements, but haven't been able to get to the companies on time because the buses in their local areas didn't start running until after they were meant to have arrived at work. Likewise, a bus service finishing too early has meant that some students miss out on after school or extracurricular clubs and we all know how important these can be in terms of UCAS points and accessing the top universities."

Congestion, Etkind continues, also carries a considerable risk to people's safety: "Very often in rural areas, the walking route is just not safe and people having to cross major roads or walk through the countryside in the dark are going to be in real danger. Equally, the more cars you have on narrow roads, the more likely you are to see collisions."

So, what does CBT recommend? Etkind suggests that the government extending statutory school and transport provision up to the age of 18 and a consistent national concessionary fares

scheme for young people would be a good start. Sustained cuts, she warns, will only serve to compound myriad social problems, beyond the education sphere – such as isolating rural citizens – and increased car usage will not only ramp up pollution levels but render many transport operators commercially unviable. The current 16-25 rail card, she highlights, is not permissible to use during peak hours, which is exactly when young people need to use their discounts the most.

While Etkind concedes that "inherent limitations in terms of population densities," mean it is unrealistic for rural areas to ape the frequency of public transport in London, she wants to see a concentrated effort to improve the quality and reliability of what services are on offer. "The argument that people won't use public transport anyway falls a little flat. Right now, there simply isn't a sufficient or affordable service for them to use; if it improves, then we are likely to see a greater willing from students and

“Young people find it more enjoyable than being ferried in a car”



Cuts to local government have left many without access to their first choice of school

the wider public alike.”

It is important to realise, however, that London – though considerably better equipped to respond to public transport demands – is not immune to many of the challenges that Etkind identifies. In the city, the school run is similarly undermined by personal car journeys, adding to the problem of inner-city air pollution. Clare Mulholland, Schools and Young People Programme Manager at Transport for London (TfL), is committed to combatting congestion in the capital. So, what does she think are the causes behind it? “A lot of parents have a perception that it’s safer and it’s a choice of comfort and convenience, but we’re aiming to challenge perceptions around time, because often it can be as quick to walk or take public transport.”

Using a Zip Oyster photo card, 16- to 18-year-olds in London can travel at a half adult rate on all TfL services, while 11- to 15-year-olds can travel for free on buses and at half price on the tube. Children between the ages of five and 10 are exempt from TfL fares completely. Although Mulholland is proud of the public transport London has to offer – “we do want people to have a choice” – she is fully aware of the importance of

reducing “needless” traffic on the roads.

Donna Harman, Project Manager for TfL’s STARS programme, agrees. “STARS is TfL’s accreditation scheme for schools and colleges. It’s designed to encourage young Londoners to travel sustainably, actively, responsibly and safely by championing active travel behaviours like walking and cycling. It aims to improve pupils’ wellbeing as well as reducing congestion at the school gates and improving road safety and air quality.”

As much as anything else, Mulholland says, travelling to school is a social experience while growing up. “I think there is something symbolic about it and being independent, young people taking those journeys to school with their friends, talking on the way, are going to find it more enjoyable than simply being ferried from A to B in a car.”

Ultimately, The Education Act of 1944 introduced compulsory secondary education and since then local authorities have had a responsibility to ensure that students can access schools, regardless of their means or place of residence. A commitment to this must remain a priority, therefore, for both rural and urban areas.

Smart energy efficiency can be simple

Dr Richard Bull, reader in Energy and Behaviour Change at IESD, De Montfort University Leicester, says that any and all energy saving initiatives must be designed with the involvement of the end-user

The majority of the world's population now live in cities and contribute more than two-thirds of global carbon emissions. If countries like the UK are to meet their challenging carbon reduction targets - 80 per cent by 2050 - then how our cities are governed and managed to maximize energy efficiency is vital.

Most visions of 'smart cities' revolve around increased ICT efficiency through what has become known as the digital economy. Smart cities offer a seemingly utopian vision of urban integration, efficiency and subsequent carbon reductions. So, what might this look like in practice and how can we ensure people are receptive to these changes?

Research shows the best approach is to involve citizens from the outset. Too often there is a risk of 'smart' seeking maximum technical efficiencies without giving enough consideration to the end-users.

De Montfort University Leicester (DMU) has been at the forefront of a range of research into the idea of the smart city and in particular in the analysis of user responses to innovation. In this way we can learn the factors which will not only make our smart cities more efficient, but which will work for the citizens who live in them. Our work encompasses the domestic sector - from analysing the efficacy of retrofitting older housing stock with energy-saving measures to working on the UK's first zero-carbon solar house which produces its own energy - and our work spaces. Current projects

include work in the public sector to reduce energy demand by using social media tools to engage staff, using creative visualisations to show the environmental impact of their activities.

Researchers from the Institute for Energy and Sustainable Development (IESD) at DMU were able to test the acceptability of smart recharging through participation in the My Electric Avenue project. The anticipated uptake of electric vehicles (EVs) poses serious questions for the electricity grid, which could become overwhelmed with demand as numerous EVs require recharging. However, rather than allowing unrestrained charging, EV users can be incentivised to recharge at times that improve the grid's efficiency and its carbon footprint - so called 'smart' recharging.

Supported by Ofgem's Low Carbon Networks Fund, this project included collaborators from the power sector, a leading EV manufacturer and related service providers, plus academic research teams. It proved that smart recharging can be implemented with minimal intervention by the user, because most EVs were charged overnight at home.

Assuming preferential electricity tariffs can make such behaviour the norm, the smart charging of EVs can remove the threat of network overload and, perhaps more importantly, opens up vast potential for demand-shaping to balance the variable or inflexible output of low-carbon generators.

There is enormous potential for citizens to play a much greater role in designing smart cities but it requires a shift in behaviour and attitude. Incentivised tariffs, peer pressure and engaging social influencers should be part of the mix considered for innovative smart city developments.

Unless the politicians and businesses feel like citizens actually care, they may not take these issues seriously.

IN ASSOCIATION WITH



Legal NGO ClientEarth has defeated the government in court twice in the last 18 months on air pollution. **James Thornton**, their CEO, explains why this is a vitally important issue

“Air pollution is now the second biggest threat to public health”



I imagine a country where people are being poisoned by the air they breathe. Imagine the outcry when it becomes clear that thousands of deaths each year are preventable. And imagine the government loses twice in court while refusing to do anything about it.

Welcome to the UK.

These are the circumstances in which we find ourselves in 2016. Why does the government continue to break the law while people die?

Air pollution from our buses, taxis and cars is responsible for 40,000 premature deaths a year across the country. If 40,000 people a year in the UK died from cholera, wouldn't the government do something?

Every year, heart attacks and strokes are triggered, lung growth in children

stunted and respiratory conditions aggravated. Air pollution is now the second biggest threat to public health after smoking.

Instead of confronting the problem the government hopes no one will notice. This is why ClientEarth took the government to court, and beat them this month.

Cleaning the air isn't rocket science. Not doing so is unacceptable political behaviour. And it's illegal.

Our recent case is the second time the government has lost on air pollution in the last two years. In April 2015, ClientEarth won a Supreme Court injunction against the government. It ordered ministers to come up with a plan to bring air pollution down within legal limits as soon as possible. The plans



The supreme court called it a public health emergency

SHUTTERSTOCK / IR STONE

they produced were so poor that ClientEarth took the government back to the High Court to enforce the injunction.

In a damning indictment of ministers' inaction on dangerous air pollution, Mr Justice Garnham agreed with ClientEarth that the Environment Secretary had failed to take measures that would bring the UK into compliance with the law "as soon as possible" and said that ministers knew that they were using overly optimistic pollution modelling. Put simply, they were cooking the results, knew it, and have been found out.

The government has decided not to appeal. That is a good thing because the problem is even worse than the court rulings suggest. Britain is not just above legal limits for nitrogen dioxide, as the court held. It is also above the limits set

by the World Health Organisation for particulate matter, microscopic particles small enough to penetrate deep into the lungs, traces of which were recently found in the brain tissue of people from Manchester. London is a bad place to breathe, but the capital is not unique. Residents in one in four English local authorities were breathing unlawfully high levels of nitrogen dioxide in 2015.

The Supreme Court called our toxic air a public health emergency. So why is the government so neglectful? A reason some give is the cost to the economy and the Treasury and the impact on business, hauliers and motorists.

But the economic argument cuts the other way. As well as harming people's health there is also a substantial economic and societal harm from air pollution. Defra's own analysis suggests that the cost to the UK economy from early deaths by air pollution is £27.5bn every year.

Even the government admits their current inadequate air quality plans would have a net benefit of £555m over ten years. Imagine the economic gains of doing this properly. A smart chancellor would invest in clean air.

So what should the government be doing? Firstly, take immediate action and bring in a national network of Clean Air Zones. These must prevent the worst polluting vehicles from entering our towns and city centres.

We also need a scheme to retrofit buses and heavy goods vehicles to make them comply with legal emissions limits. In addition, a diesel scrappage scheme, part-funded by the car industry, to fund low emission vehicles and alternatives to car use.

Other solutions should run in tandem: a clean public transport system and a car labelling scheme so that motorists know that the cars they buy comply with emissions limits in the real world. Call it the Volkswagen sticker.

That would be a start. The long-term goal must be to move to zero-emissions vehicles as soon as possible. The UK should seize this opportunity. We could

“Electric cars are four times more efficient”

become a leader in sustainable transport, creating the solutions that other countries will also need.

The technology exists and the private sector is ready. Some car companies are doing the right thing. Toyota says that almost all of its vehicles will be emissions-free by 2050. Electric cars are four times more efficient and vastly cleaner than petrol or diesel.

Uptake is still low, but the government can change that with tax incentives and investment in electric charging stations. In Norway, which has already introduced those policies, electric or hybrid cars enjoy a market share of 25 per cent.

Plenty of progressive policies such as car sharing have been swiftly adopted and integrated by other European countries. By integrating additional modes of transport into their cities’ public network, journeys have become shorter, faster and more efficient, reducing emissions and traffic.

In the US, President Obama has seized on electric vehicles as a tool for rebuilding American’s crumbling car industry while reducing both air pollution and carbon emissions. He has now spent two terms promoting the technology, investing in R&D, and providing rebates to push automakers and consumers closer to the age of electricity.

Just this month, the Obama administration announced that the US will create 48 electric vehicle corridors over 25,000 miles of highway and through 35 states, in which there will be a charging point available at least every 50 miles. You will be able to drive comfortably from one end of the country to the other in your electric car. This is not a bad legacy.

Electric vehicles need not be the preserve of the rich either. A recently introduced pilot program in California has incentives aimed at getting old polluting vehicles off the roads while putting low-income drivers behind the wheels of clean cars.

The program from CARB (California Air Resources Board) works by “providing increasingly larger cash

payments for the lowest-income families to move up to the very cleanest cars.”

As Wards Auto recently reported, in the right set of circumstances, it is possible for low-income motorists to “end up driving off with a free EV.” What’s more, Green Car Reports noted: “The program doesn’t even require you to buy a replacement car. Instead, depending on your income level, you could, in return, get public transit passes worth between \$2,500 and \$4,500.”

So let’s think creatively. If we want to improve air quality and reduce traffic in the UK, these are the kinds of forward-thinking policies we need. We are entering an age of optimisation, where you can plan a route, get a meal or hire a car outside your door at the click of your smartphone. Harnessing the power of technology is essential if we want to keep our country moving and breathing.

The policy solutions to solving our clean air crisis will benefit business. We need to encourage both a residential and a commercial behavioural shift towards greener ways of getting around and doing business. This will not only benefit human health but also create economic opportunities for businesses that develop the new products and services.

We know we can do this. We’ve led the way before. The Clean Air Act of 1956 was a response to the great smogs of the 1950s. That law was globally leading, and saved thousands of lives by getting rid of belching factories from towns and cities.

Now car exhaust pipes have supplanted industrial chimneys and the air is dirty again. Radical action is needed. We need a new Clean Air Act for our times.

The last Clean Air Act was held up for years by vested interests. Our nation’s health must triumph today as it did then in 1956.

This time the government must move faster. There is no excuse. The economic opportunities are staring us in the face. We know what is needed. All we lack is the political will.

We must end the reign of King Car

Claire Haigh,
chief executive of
Greener Journeys,
says that addressing
the dominance of
the car is key to
solving Britain's
congestion crisis

Britain is suffering from a national congestion crisis. Unless we find a way to break the hold of King Car, any talk of a low carbon, sustainable transport future will remain just that. Last year saw the number of cars on English roads increase to a staggering 25.8m vehicles. As more cars clog up our roads, the government predicts that traffic will have grown by a further 55 per cent by 2040.

The effect is clear. Research by Greener Journeys this year revealed that average bus speeds have fallen below 10mph in the UK's busiest cities. Buses, which carry more commuters than all other forms of public transport combined, are seeing their journey times increase by 10 per cent each decade. As buses slow down and journey times become less reliable, fewer and fewer people choose to use them. According to the latest figures from the government, 4.5bn bus journeys were made in the year to June 2016 – a 2.7 per cent fall since the year before.

The car, and the congestion it causes, is killing the bus sector and damaging the wider economy. Every year that bus journey times continue to increase costs an estimated 5,000 jobs.

And it's damaging our health too. Research by Lancaster University revealed that toxic nanoparticles from car exhausts have been discovered in "abundant quantities" in human brains leading to an increased risk of Alzheimer's Disease. Air pollution even endangers lives on the roads. Scientists at the London School of Economics linked high levels of

pollution to increased incidence of road accidents, as drivers found themselves distracted or their judgement impaired by smog.

There are, however, some glimmers of hope. There is growing political support for the workplace parking levy, with cities such as Oxford and Cambridge now considering following Nottingham's lead. Sadiq Khan's plans for tackling air pollution in London with charges for high polluting vehicles and an extended Ultra-Low Emissions Zone are encouraging. In parliament, debate on the Bus Services Bill has highlighted the effect of congestion, and Greener Journeys is calling for the Bill to provide guidance encouraging local authorities and bus operators to set average speed targets.

Still, the government needs to take action to reduce car use. That means unpopular policy measures to make it less convenient and more expensive for people to drive. The cheap cost of private motoring is drawing people away from public transport. As a first step, government should increase fuel duty. The motoring lobby will oppose such measures, of course, but without intervention, a clean, sustainable transport future cannot be achieved.

Our latest report, *The Value of the Bus to Society*, shows that the bus has to be part of the answer. It lays bare the clear link between an improvement in local bus connectivity and a reduction in social deprivation. For example, a 10 per cent improvement in local bus service connectivity in the most deprived wards in the country could result in almost 10,000 more people in work.

From autonomous vehicles to inter-modal travel, smart-ticketing to networked cities, the transport community finally has the expertise to create an efficient network. But unless we address the dominance of the car, radical change will remain elusive and we will find ourselves gridlocked.

For more information, visit
www.greenerjourneys.com

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Kick-starting an industrial strategy

Jason Millett,
COO for Major Programmes and Infrastructure at Mace, wants to see a more cohesive plan for locally-led transport projects

The details of Theresa May's industrial strategy are slowly becoming apparent, but the overarching policy is already the lens through which her team view an increasing number of decisions, from Heathrow expansion to regional devolution. So, what should this strategy involve?

The industrial strategy is already being positioned by ministers as the driving force behind a more balanced economy, in which every region of the UK is equipped to identify and support the sectors that will best drive local growth. This, however, lends itself to a bottom-up, locally-led strategy, and has created debate over whether central government can create a coherent industrial strategy in this space at all.

In our view, the thrust of a modern industrial strategy has to be local and locally differentiated. Regional businesses and political leaders are far better placed than central government to understand the particular sectors that will drive growth and jobs in their areas, and thus how to form a cohesive strategy with local universities and local enterprise partnerships.

Central government's role should be to focus on the bigger picture: how to achieve harmony and forethought in terms of the national policies and projects that hang different regional strategies together. In essence, how to better connect regional economies to one another and in a post-Brexit world, also to new international markets. The Prime Minister for

instance travelled to India last month and part of any trade deal done there needed to reflect an industrial strategy that translates investment into real jobs and growth in local towns and cities, whilst also promoting and developing our successful infrastructure design and delivery skills.

In his Autumn Statement, the Chancellor's commitment to invest in motorway and trunk road upgrades was welcome. Smaller regional projects are faster to deliver than the major infrastructure schemes such as HS2 or Crossrail 2, but can bring significant local benefits while providing a stronger stimulus to the wider economy. The key, of course, is getting the balance right between the two. Projects of the size of HS2 are crucial to speeding up connections between and within our regions, as well as focusing regional development on national as well as local need. Delivering on airport expansion is also essential if we are to connect regional jobs to the new growth markets of the wider world.

While such big-ticket projects are already in development, what really makes the National Productivity Investment Fund part of an effective industrial strategy is support for the essential down-track connectivity that spreads the economic benefits of such projects. On HS2, we are only just starting to look at the smaller onward connections from the main route could leverage the project's value further at a local level. A recent report published by HS2 provided some excellent case studies from the north of England – such as Preston being able to add over £3m to its local economy each year due to its proximity to the route.

The government has made its commitment to HS2 clear, but as with so many of these major infrastructure projects, without connecting it to a localised, integrated plan, the real transformative value won't be felt by the very communities it aims to enhance.

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The subscription culture: a new way to travel

Steve Cassidy, managing director, Viaqgio (part of ESP Group), says the business models of Spotify and Netflix can inform the future of travel

Brits have always traditionally been focused on owning things – cars, houses – but the focus on ‘ownership’ is on its way out, and the subscription economy is on the rise. Non-ownership culture has changed the way people interact not only with businesses, but with their surroundings. At the heart of this shift is a willingness in people to subscribe to the outcomes they want, when they want them, without buying them outright.

People and their expectations have changed drastically. On-demand services such as Spotify, Netflix and Amazon Prime have created new business models not just in the consumption of entertainment, but almost every aspect of life, and transport will not be missed out.

We are now seeing a shift towards ‘Mobility as a Service’ (MaaS), which is made possible by two trends. Firstly, the rise of the smartphone, which has changed the way people consume information relating to their journey. Real-time traffic updates, delay notifications, virtual tickets, platform alterations and intelligent journey planners mean transport bodies are able to offer personalised, journey-critical information to everyone.

Secondly, the generational shift to the sharing economy of Airbnb and BlaBlaCar, which allow people to share or lend fixed assets with others. The millennial traveller sees transport simply as another part of life which should be accessible as something used rather than owned.

The public transport industry is

increasingly looking to technology to attract and retain customers, through more attractive websites, apps and ticketing. But the seismic shift towards subscription means that, now more than ever, the industry needs to start putting real user needs at the heart of service design. Transport is a lifestyle product; it shapes the lives of people all round the country, and it is therefore critical that their needs are put first. At ESP Group, we focus on life transitions people face in order to develop integrated services to achieve user outcomes and deliver real value. One example is our Car Freedom service, currently being trailed in Birmingham with the support of Transport for the West Midlands. When people receive an older person’s bus pass, they look to use the car less, and indeed as people age the incidence of giving up their car increases. Car Freedom as a service, co-designed with older people, offers support to make this transition as smooth as possible.

Another example is our involvement in the Pick&Mix project, Scotland’s first ever MaaS application. The platform is being co-designed by young people, for young people, to create a mobility service which removes the barriers they perceive to travel. Their involvement in the development provides invaluable insight into what matters most to those using it.

The transport industry is going places, but it is crucial that it works collaboratively and puts the user at the heart of every journey to really flourish. As the nation’s transport authorities start to think with the user at the centre, they will begin to realise they are able to grow the public transport industry. What mobility service would provide such clear value to a user that they would subscribe immediately – forgoing the car? Once the industry starts addressing this question, it will allow it to not only increase revenue but to provide a new form of customer service, and revolutionise the industry.

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