# Parking: new ideas for smart cities

City planning, regulation and policy

John Hayes MP / Iain Stewart MP / Llewelyn Morgan
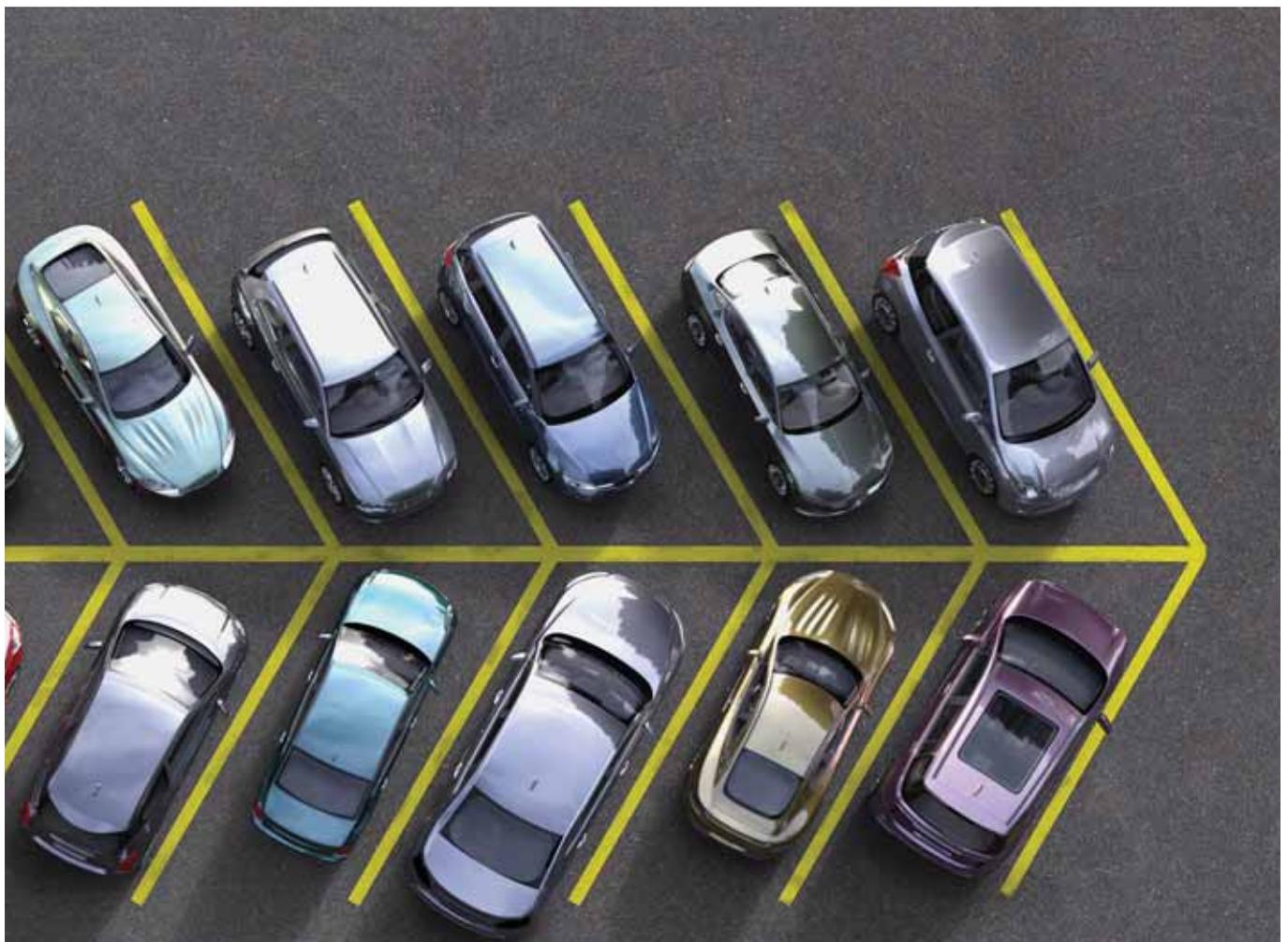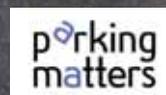
The power of parking

39 million

journeys end in a parking space every day in the UK.

30%

of drivers in city centres, at any time, are looking for a parking space.

82,000

people are employed by the parking industry in the UK. The majority (72,000) are employed by the private sector.

3min

an electric car was registered every three minutes in the first three months of 2017.

95%

The UK's more than 30 million cars spend, on average, 95 per cent of their time parked.

£1.5bn

The estimated total yearly turnover of parking for local authorities across the UK. The turnover for the private sector is thought to be higher.

Paving the way for the future

We are on the brink of a revolution in driving and parking, writes John Hayes MP, Minister of State for Transport 2014-2015 and 2016-2018

We are creatures of habit. Though cars come in different shapes and sizes, purchasers tend to be sceptical of novelty, sticking with the same brand for years. And when we trade in our old vehicle for something new, many of us emerge from the showroom driving much the same.

Customers' reticence about change has slowed the pace of progress in the automotive industry over many decades. The basic design and format of the car hasn't altered significantly since Henry Ford introduced the Model T.

Now that's about to change. We stand on the verge of radical change as the automated, connected, and ultra-low emission cars that are in development now represent an unprecedented leap forward in the history of the automobile. So much so that future generations will see 20th-century motoring, with a driver at the wheel, controlling a vehicle powered by an internal combustion engine powered by petrol or diesel, as at best a step on the journey to cleaner, more efficient and fully autonomous road transport.

Car ownership has long been a means of social mobility. Once you have a car, travel to every kind of opportunity is easier. As working people acquired cars in the years after the Second World War, horizons widened and lives became richer.

In that spirit, connected and automated vehicles will offer unprecedented social benefits – notably for elderly people, or those with disabilities, who are currently unable to drive. Easy and convenient travel will change people's life chances.

There is a chance, too, for Britain to lead this change. We're already the largest market for ultra-low-emission vehicles in the EU, and the fourth biggest in the world. There are now more than 100,000 ULEV cars in the UK. We're making them too. Around one in five battery-electric cars sold across the EU are made in the UK. All this means new skills and more jobs.

New driver assistance technology is market-ready too. For example, the government recently launched a consultation on new remote parking systems, and more sophisticated cruise control. Remote control parking could help motorists with mobility issues, or help drivers make more efficient use of garages and parking spaces. Improved cruise control could make motorway journeys safer, cheaper and cleaner.

Remote control parking is about to be fitted in some production cars – so it is vital that we make sure motorists can use it safely. This is an important step towards our next objective – to see self-driving cars on UK roads by 2021. We can also make more efficient use of the road network as an automated car fleet could reduce delays by 40 per cent on the strategic road network, and 30 per cent in urban areas.

But, just as importantly, there are huge safety implications. Self-driving cars should make road travel far safer; human was last year responsible for over 85 per cent of all reported UK road incidents.

To prepare for the motoring revolution ahead, the Automated and Electric Vehicles Bill is currently making progress through Parliament. Its passage has been marked by thoughtful consideration from all parties – an example of what the House of Commons can achieve when it works at its best.

There are major opportunities in this fast-emerging market for those who are best prepared. That's why we are committed to becoming a global leader in the design and development of these new kinds of vehicle. It's all a long way from the technology of the past. Yet the new kind of motoring must embody the essence of social progress in the way it has for all my lifetime. By embracing change, we can benefit from a motoring future which succours the common good and secures the national interest.

Chair of the APPG for Smart Cities and the Future of Transport, **Iain Stewart MP**, explains that while the way people get around is changing, the need for parking will be an enduring factor

Where will we want to park in the future?

At first glance, car parking may seem a dull policy area. When it works well, few people care. But when there is a problem – be it a hike in the charge to park in the town centre or at the station, insufficient parking in housing developments, or a lack of spaces near the shops – elected representatives will quickly have irate constituents demanding immediate action.

We are on the threshold of significant change in mobility. From the innovations in electric/hybrid cars and CAVs (connected and autonomous vehicles), and the development of MaaS (mobility as a service) to changes in how we shop and work, our relationship with the car will change. By extension, the places where we will want to park will change too. There is a need fully to anticipate and understand the different developments that will be in play.

There is certainly a strong argument to make that personal car ownership will decline in the medium to long term. The evolution of demand-responsive transit will allow us to summon an autonomous vehicle, private cab or minibus, such as the Arriva Click service being piloted in Sittingbourne. Smart ticketing technology as part of MaaS will make it easier for households to reduce the number of vehicles they own or even go car-free.

Even without this new technology, there are evolving cultural and economic shifts. It is dawning on an increasing number of people that the traditional patterns of car journeys make the private car a redundant asset – sitting unused in the home driveway, outside the office or at the railway station – for the vast majority of the time. A number of entrepreneurs (such as HiyaCar) are setting up short-term care hire

companies that will allow someone to rent a private car for a few hours while the owner is not using it. While changing work patterns and the rise of home-working might mitigate this trend somewhat, it will not remove it.

The traditional cultural norm of the first car as a rite of passage into adulthood is on the wane. Shopping trends, too, point to a decline in traditional car use; as we buy more and more online and visits to shops are more of a leisure activity, a reduced need to carry goods home may diminish the need for town-centre parking, especially if public transport/park-and-ride options are available.

Furthermore, for people who do want to park in traditional places, smart technology will enable a much more efficient use of existing spaces, as algorithms can direct vehicles to the best available spaces.

Combined, trends such as these ought at least to reduce the pressure to build ever greater numbers of car parks, and quite possibly enable the redevelopment of some urban centres into pedestrian-friendly public spaces.

But there are also factors that point to a growing need for additional parking spaces. The simplest point is that the UK's population is forecast to grow by several million in the coming decades. That creates an ever-upward pressure on demand for transport.

Another factor that will create an upward demand pressure on car use is the beneficial and liberating advantage of CAVs. Many disabled and elderly people cannot currently drive a car. CAVs will enable them to make the type of independent car journeys that many of us take for granted.

There is also a risk that the evolution of environmentally friendly electric cars and CAVs will reduce demand for public transport. If it is easier to use cars because they are more efficient and there is less guilt about polluting the atmosphere, will there not be a tendency to stick with the privacy and convenience that private car use provides? A lack of available parking space at railway stations, too, could constrain demand for rail travel. If we want more people to take the train, we may have to make it easier and cheaper to park.

The balance to strike between encouraging use of modern personal car transport against encouraging modal shift to public transport is a debate for another place; but for here we cannot ignore the potential for a growth in the number of these vehicles and the inescapable fact that they will have to be parked somewhere.

A further consideration with electric vehicles is their charging requirements. While many will be charged at home or during journeys at service stations, many households (around a third) do not have the off-road parking necessary for most home charging systems. This includes people living in apartment blocks and traditional terraced housing with no private parking. Whether at work, at shops or some other off-road location, more parking with a charging infrastructure will be required if the desired shift to ULEVs is to be achieved.

The future picture for parking demand is therefore complex. Traditional parking options may have to evolve but there will still be a strong demand for parking. I don't pretend to have all the answers, and there will be other considerations that I have not had the space to discuss in this article. It is important that a holistic view of the different trends and needs is taken. Later this year, the Transport Select Committee in the House of Commons will be conducting an inquiry on parking, and I look forward to a thorough and lively debate about these issues.

Iain Stewart is the Conservative MP for Milton Keynes South. He is a member of the Transport Select Committee and chairs the All-Party Parliamentary Group for Smart Cities and the Future of Transport

A cleaner, safer and less congested world

Enabling innovation and securing better regulation will be key to a successful future transport network, writes **Andrew Pester**, chief executive of the British Parking Association

At first glance it may seem a mundane topic, but each journey on our roads begins and ends with parking. It takes such an important role in everyone's lives and when we look to the future, we all have a desire to live in a cleaner, safer, less congested world where we can move around freely and easily.

Effective parking management enables this to happen every day. Without it, access to places and people would be significantly harder.

Effective management ensures that parking isn't a free-for-all. In our view the blanket removal of parking controls isn't the answer, as seen when Scottish and Welsh hospitals abolished charges for use. We saw a situation where parking spaces were taken up by commuters and staff, to the detriment of patients and visitors. This free-for-all spilled out into surrounding residential streets filled with people who could not find a space at the hospital. In some cases, bus companies refused to offer a service because they couldn't get through congested streets. There was also a fear that children from nearby schools were being put at risk by reduced visibility as they crossed the street. A policy designed to benefit people actually meant that the most vulnerable and those that rely on public transport were most affected.

There are costs associated with providing parking such as surfacing, fencing and cleaning car parks. Where tariffs apply, there is also the cost of collecting that charge. Someone, somewhere, has to pay for all this. Furthermore, demand for parking spaces often outstrips supply. Effective demand management helps to enable positive outcomes such as patient access to hospitals or more vibrant high streets.

In order to ease congestion and get cars quickly and efficiently into parking spaces, local authority and private

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parking provision need work in conjunction as seamlessly as possible.

With 39m vehicles on Britain's roads, and increasing every year, it is essential that parking is provided, well managed, and that it works.

Levelling the playing field

There are stringent laws surrounding the way councils manage parking. Enforcement income is ring-fenced and can only be spent on car parks, roads and public transport subsidies. While many people think that councils make surpluses from parking ticket income, the costs of enforcement are high and in most cases it is barely covered by parking ticket income.

Private parking is managed by contract law, which some believe does not have full authority. This is not true. However, proper regulation of the sector would ensure consistent standards are applied across the board. In 2007, we introduced a code of practice for private

parking operators which continues to set the standard today. The code is a living document that is continually improved and updated in consultation with motoring groups, consumer groups, government and others.

Accompanied by a full internal and third-party audit and Scheme of Sanctions, for many years motorists have been treated more fairly. In 2012 we launched POPLA, an independent appeals service for parking charge notices issued on private land in England and Wales. This service is free to the motorist and run independently of the BPA, in agreement with government.

In our continuing work with government over a number of years, we have been calling for better regulation of the private parking sector. We believe all operators should adhere to a single Code of Practice, for motorists to have access to a single independent appeals service, and for the establishment of a single standards setting body to oversee this. This will ensure fairness and avoid any potential race to the bottom when it comes to eradicating bad practices.

We have a situation where there is more than one code of practice for private operators – and the potential exists for more. Multiple codes create confusion in how they are applied and how appeals processes work.

We therefore very much welcome the Parking (Code of Practice) Bill sponsored by Sir Greg Knight MP and in Scotland, the Members Bill launched by Murdo Fraser MSP, both of which we hope will tackle all of these issues – and provide greater consistency for all.

An informed and transparent process

Nobody likes to receive a parking ticket but our advice is never to ignore it. You should either pay if it has been issued fairly or appeal if you feel it hasn't.

Unfortunately there have been a few cases recently where motorists felt tickets had been issued unfairly but refused to communicate with parking operators or use the appeals process available, sometimes following incorrect advice online. This has

resulted in an escalation in charges which is no good for anyone.

We have developed the *Know Your Parking Rights* website to provide helpful information and advice for motorists who are confused by parking and tickets and are unsure what to do.

Parking data is at the heart of our future transport network

This is truly an exciting time for the sector. Consumer preferences and technology are changing rapidly. The parking sector needs to be responsive to such needs. Smarter parking technology is already delivering benefits to towns and cities worldwide, for businesses, road users and local municipalities. As a not-for-profit association we work closely with members and stakeholders to inform and encourage this innovation and move us towards a truly mobile society where everyone benefits.

It's clear we live in a digital world and our actions create ever-increasing stores of data. The appropriate use of this data is transforming our day-to-day lives.

Key components of our future transport network will be underpinned by parking data, which will enable connected and autonomous vehicles and consumers to search, book and pay for parking quickly and easily, reducing congestion and harmful emissions and getting people where they need to go. The opportunities are immense and we are leading the charge on its appropriate use to make parking smarter and a better experience for all. Raising standards is what we are about.

The BPA is the leading authority for parking with 50 years' experience. As a not-for-profit organisation, we promote the sector by advancing knowledge, raising standards and professionalism. Parking is a dynamic sector and it's changing more rapidly now than at any other period during our 50-year history. We have always placed the consumer at the heart of our thinking and will continue to provide strong leadership in the sector, working closely with government and others to achieve excellence in parking for all.

From pain point to painless: parking's future is smart

Technological change will make fines a thing of the past, writes **Keith Williams**, technical director at Parking Matters

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parking matters
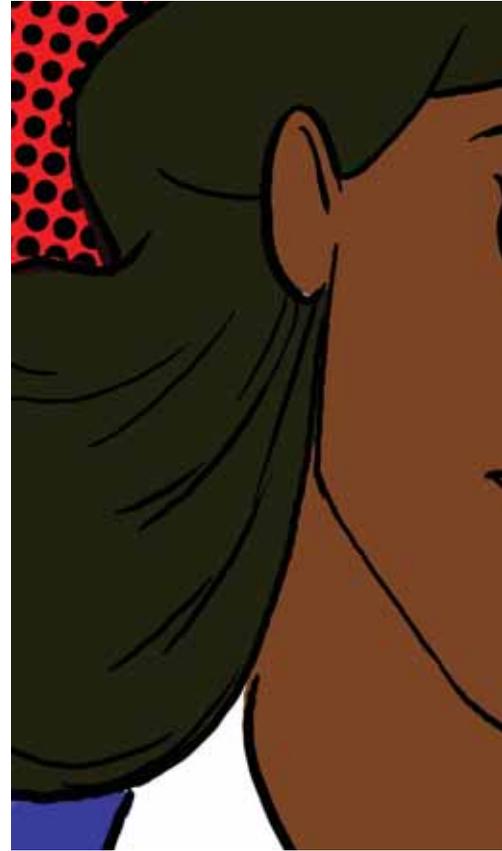
If Hercules had faced a thirteenth labour, it surely would have been parking in a crowded town centre on a busy Saturday afternoon. For many, parking conjures up visions of endless searching, pricey car parks and frantic dashes to feed the pay-and-display machine to avoid a penalty. Those days are coming to an end. A wave of new technology is ripping through the parking industry, changing the status quo and profoundly altering the parking journey and changing consumer behaviours. What does this mean for drivers, towns, cities and parking operators?

According to Nigel Williams, managing director of UK parking consultancy Parking Matters, "we can see how technological innovation, combined with societal and demographic change, is transforming the way we work, spend our leisure time, travel, and shop. Those same

forces will also transform how we own and use cars, and consequently the way we park. The good news is that the days of parking fines and penalties are numbered."

The UK, European and North American markets are awash with parking apps. These apps have proven popular because they help drivers overcome one of the most time-consuming, environmentally damaging and frustrating aspects of parking – finding an available space within a specified area at a reasonable price. Their arrival constituted the first phase of a revolution for parking consumers and signalled a shift in focus for the parking industry. These new apps form part of what the British Parking Association calls the "Positive Parking Agenda". They give customers information, choices and greater control over their parking, reflecting the new reality that shoppers and visitors

increasingly need to be wooed.

Digital visibility – ensuring that apps and their users are aware of what's on offer – will be key to the success of towns and cities. With big data at their fingertips, customers know what the options are and will choose the best available. Going forward, if you're not on the map you simply won't exist and if no convenient parking is available, then cars and apps will recommend alternative destinations. This fundamental change will essentially alter the way that towns, cities and parking operators approach consumers. Proactive strategies for creating online visibility will become an absolute must. Those who have taken their first steps are already ahead of the game.

Tech start-ups aren't the only ones actively working on converting consumer pain points into golden opportunities. The automotive industry is also getting into the game as part of its drive towards a future of autonomous vehicles. With their next generation of cars, parkers will be able to entirely delegate the hassle of parking. "Our cars will be able to locate an available space near the driver's destination, guide them there, make sure the space meets comfort and budget requirements, park themselves and even pay the parking fee,"says Ulrich Vornefeld, head of parking at BMW Group.

Although the media sometimes makes it sound as though autonomous cars are just around the corner, it will be many years before the majority of cars in urban areas are driving themselves. This is because of the complex legal, regulatory and technical issues involved. However, automated valet parking (AVP) is a much simpler prospect. With AVP motorists have a lot to look forward to. They will get out of their cars at a drop-off point, their vehicles will drive away and park themselves in the nearby car park and then be waiting at the pick-up point when the drivers are ready to leave. We can expect to see this service being introduced within the next five years.

The technological advances needed to make this automation possible, and the resulting change in consumer expectations, signal a seismic shift that will constitute a challenge for both public and private parking operators. Local authority parking services will have to adapt to increasing expectations of an efficient, user-friendly service operating within the context of intense public scrutiny. They will need to evolve from enforcers to enablers and to fully embrace the important role that parking plays in creating and maintaining attractive, safe and healthy communities. A change of emphasis from issuing penalty notices to providing real-time information to apps, connected vehicles and drivers on where to park and how to pay easily is essential for the regeneration of the high street.

To achieve this metamorphosis, at a time of immense pressure to reduce costs, local authorities will have to rely heavily on technology. Parking management, both on and off-street, will be totally dependent on technology and become largely a question of data and payment systems. Forward-looking local authorities are already implementing smart parking to improve service for consumers and reduce operating costs. They are also introducing a Positive Parking Agenda that focuses on parking management rather than enforcement. These actions will ensure that valuable kerb space is shared fairly, in ways that improve the environment and help maintain urban centres as vibrant cultural, retail and leisure destinations.

Nigel Williams concludes that "the parking industry is changing, radically so. If we get things right, parking will soon be a completely painless experience for the customer." Hercules and the British public certainly hope he's right.

Smart parking: less pollution, less congestion

Max Crane-Robinson, commercial director at NCP, says smart parking can change cities – but only if public and private partners collaborate

Parking is one of the cornerstones upon which smart cities will be built across the UK. It offers the opportunity to reduce pollution and congestion and enable new mobility solutions such as car sharing, self-driving and electric vehicle infrastructure. But to achieve that, the UK parking sector has to modernise and enable rather than hinder, as it does today, these much-needed developments.

Connected transport systems are a critical part of the plans for UK smart cities, and parking is firmly at the heart of those developments.

Connected mobility – and with it, greater operational efficiencies and improved revenues, improved user experience through aggregated transport information, digital ticketing and better connected inter-modal transport – relies on parking becoming smart.

The battle for access to the kerbside, which will only intensify as more businesses demand a share, must be addressed. And parking charges need to be reduced or, if appropriate, increased to nudge driver behaviours for the better.

These are all issues that smart parking can solve. In cities where parking has been made smart, the benefits have been clearly demonstrated. For example, in

San Francisco's SFPark initiative, the time taken to find a space decreased by 43 per cent as a result of less circling, and vehicle miles driven in pilot areas dropped by 30 per cent. Greenhouse gas emissions, as a result, also dropped 30 per cent. Total traffic volume decreased by eight per cent. At the same time, on-street parking availability improved by 22 per cent during peak periods. What UK city would not want to realise those benefits?

With technology that digitally connects vehicles to roads, and the associated insights delivered by the resulting data, it's now becoming possible to recognise individual motorists and their behaviours, and to use this information to better manage traffic flows.

Today, however, a host of challenges stand in the way of making that vision a reality. Many of them are created by the structures in place for the management of the nation's parking assets.

At present, 75 per cent of the country's parking lies in the hands of a multitude of bodies including the DfT; The National Assembly for Wales; county councils, unitary authorities and metropolitan districts; the counties and county boroughs; London borough councils (or the City of London); and TfL.

This structural issue needs urgent attention to ensure that the UK's parking network is smart-city ready, and that future benefits can be realised.

Achieving a truly connected transport system requires substantial capital investment (in digital solutions more than in physical assets) and a singular vision that no one body can achieve on its own. The current state of fragmentation has meant that consumers find themselves managing a proliferation of apps and payment mechanisms as they move from one location to the next – an experience that is anything but satisfactory. Moreover, all those bodies responsible for the nation's towns and cities are unable to access crucial data to enable today's demand for smarter environments.

Such implementation could help

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deliver reduced pollution, reduced congestion, simpler and more efficient transport planning and ticketing and supports the implementation of new mobility solutions including car sharing, EV charging networks and the management of on-demand ride hailing and increased deliveries.

But that is unlikely to happen with today's outdated infrastructure in place that often rely on disconnected , anonymous cash and card transactions at payment machines.

The NCP proposal is a simple one. A nationwide partnership between public and private sectors would provide the means for a new approach to parking.

Firstly, we need to create an open market for smart parking solutions in the UK. A key starting point is to end the exclusive nature of local authority mobile payment parking solutions and allow consumers to chose their preferred means of finding spaces, parking and paying for them across the country.

Providers will then have to compete in a consumer marketplace for their position – a much tougher game than when competing for a contract.

Competing on-and off-street parking businesses (digitally enabled as they must become) will have to provide unified data to the towns and cities they serve, as well as using and accessing that data to enable customers to find and pay for spaces more easily. Both cities and citizens will benefit.

This would not remove the ability to manage and set prices or manage operations or physical infrastructure from the existing public bodies. But it would enable private sector businesses to offer a seamless parking experience in both public and private environments. Customers could find spaces, on or off the street, and pay for them through the provider of their choosing.

Secondly, we need to harmonise regulation across the public and private sectors. For example, acknowledging that public bodies should be free to use camera-based enforcement in parking – as they do now with all other forms of traffic infringements. There should

Problems

Too many exclusive apps causes frustration

30m drivers choose traditional options

Outdated cash orientated equipment continues to prevail

Technology doesn't support customer or offer data

New mobility and smart cities struggle to develop

Opportunities

Offer non exclusive and open source mobile parking payment solutions

Allow customers to select preferred app or solution

Digital solution adoption grows exponentially

Competition drives innovation & tech to benefit customers & cities

New mobility & smart cities deliver efficiencies & reduce pollution & congestion

be no material difference here with private firms.

At the same time, this would bring into line other disparities. For example, the same VAT regime could be applied to both on-street and off-street parking – acknowledging that the "product" is in the same marketplace either way as far as the consumer is concerned.

These changes would drive the market to implement parking solutions fit for the 21st century at a far greater speed than any single regulatory or public body could, enabling the rapid adoption of much-needed new mobility solutions.

They would also put in place a platform on which parking providers, automotive manufacturers and technology providers can create the new services that will bring innovations which deal with the issues of environment, congestion and

costs that we face as a nation.

The precedent has been set with innovations used elsewhere.

At its core, SFPark enabled private business access to a public APIs and open data for all parking across San Francisco meaning parking became more readily available and a dramatic and positive environmental impact could be realised.

While this initiative is in a single city, it does offer the UK a clear direction of travel. The technology and tools exist. The will to create such a platform is clear from the private sector.

A collaborative approach could make smart cities a reality and parking a cornerstone of their development – delivering benefits to local towns and cities, consumers, the national purse and the planet.

For local authorities, encouraging innovative approaches to mobility can pay off in many different ways, writes Llewelyn Morgan, service manager for infrastructure, innovation and development at Oxfordshire County Council

Embracing disruption

With major development in many areas increasing the number of trips taken, Oxfordshire is subject to increasing congestion pressure. Fortunately, the county is also home to innovative business people with close ties to Oxford's universities; recently, these local entrepreneurs asked the local authority to look at Oxford's transport problems in a different way.

The County Council supported the development of a working group and we found that for a city like Oxford to develop new agile solutions, it's necessary to develop a "living laboratory" approach. Councils have to get close to research like this, because user-influenced solutions are going from research to implementation more quickly than ever before. In the past, a new transport solution could take ten years to go from research to implementation. Now, it can take as little as 18 months to two years for some solutions, particularly those that are user-centred and software-driven.

While getting hold of data is important to the innovation process, the collective approach also brings people with different areas of expertise together to share and challenge ideas.

From our initial work, then, we established MobOx Foundation CIC, because we decided that the central core, which enables innovative projects to happen, needs to be neutral. So we set it up as a form of social enterprise. Its aim is to support, incubate and develop new ideas and new opportunities, to solve the problem of urban transport in Oxford and elsewhere, with Oxford and Oxfordshire to act as a supporting "test" facility.

Oxfordshire is now part of a number of exciting projects, from CAV to Hydrogen and EV projects to smart parking. The aim is to learn about these solutions and, where possible, to integrate and develop them. One of the first proposals was to develop a platform building user tools such as personalised journey planning, network management integration, and feedback. While we didn't get funding for this, it was still a step in the right direction as we developed close working relationships with research and industry to mutually support all our ambitions.

Over the last two years we have worked closely with an SME called Zipabout, which moved to Oxford to develop its business. In this time we've opened up our transport data to Zipabout and a number of other projects. Working closely with Zipabout, we have supported them in developing a new platform called Transport Graph. This is a big data and communications platform that can incorporate bespoke transport schemes, including sustainable initiatives such as dockless bikes, lift shares and park 'n' ride, into any existing public transport network. It powers a journey planner that we will launch later this year, called Zipp.to, which will help bring an integrated Mobility as a Service (MaaS) solution to Oxfordshire.

This has been an exciting project to work on as it incorporates unique demand-mapping technology alongside some cutting-edge data technology pioneered by web giants such as Facebook. Supply is fully matched to passenger demand in real time. And Zipabout, through working with the council, has seen the reality of funding for innovation in the public sector and has now released this as a free-to-use platform for all public authorities. For us, it's great to see work completed in Oxford having a positive impact across the UK's public sector, and we hope it will help to enable innovation in mobility in many more authorities.

One of the highest-profile areas in which Oxfordshire is excelling is that of autonomous vehicles (AVs). We now have four companies in Oxfordshire working on AVs, including Street-

A self-driving car navigates Oxford's traffic

Drone, Robo-Race, Arrival and Oxbotica, while at Culham we also have the RACE real-world trial site for AVs, one of the world's first. The council has worked with all these partners to support them and to learn from them. The latest project is the DRIVEN consortium, which is testing a fleet of autonomous vehicles using Oxbotica software. Oxbotica have already begun testing vehicles on the street in Oxford, the first company to do this on UK roads. The aim of the project is to have a fleet of driverless cars operating at level 4 autonomy on Oxford-to-London roads by next year. For the council, this is all part of learning about parameters - how much regulation do you need for autonomous vehicles? Can real-time data be used for insurance, congestion management, charging and parking?

It is important for Oxfordshire that we focus at least as much on rural residents as we do on city dwellers. Increasingly, projects are being developed with countywide application in mind, and even if they start in Oxford we want to enable our partners to implement them across the county as quickly as possible.

For example, we are working with the city council on a "Living Lab" project for on-street EV charging in residential streets in Oxford. While this is a very focused project, it is also helping to inform procurement strategies for a smart-city lighting approach for the whole county, to ensure our existing infrastructure is used to its best abilities, and to support smart applications and EV charging infrastructure in more rural towns and villages.

The big challenge for us is to start work on more projects that begin in rural areas and benefit rural residents - particularly those with specific accessibility requirements.

Oxfordshire has strong communities. By matching these communities up with specific projects, we can improve their chances of success. On an emerging project with HiYa car – which provides a service that could be described as "AirBnB for cars" – we're working with the Blenheim estate to develop the initial project out of the town of Woodstock, using Blenheim's fleet of vehicles, which they will also upgrade to EV, as the basis of a community resource through the HiYa platform when they're not in use by the estate. This will be a continuous learning project for all partners and has potential to feed into how Blenheim supports its new housing developments, to encourage lower car use and reliance even in rural areas. From our perspective, we also hope we can integrate this onto the Zipp.to platform as a journey option.

This approach to tackling "council" problems, which started with mobility as the challenge, has enabled us to work with partners across the county. We've also set up Smart Oxford, which provides an even broader support network for the "living lab" approach and an ability to connect projects and develop innovative ideas that aim to tackle Oxford's challenges.

Integrating this innovation approach into the day-to-day work of a local authority has taken time. But by making the most of projects and opportunities, this approach has successfully built one of the largest council innovation teams in the UK, with a core team of 12-14 staff, at no extra cost to the authority. It has also embedded completely new skills into our organisation, such as lean project development, data science, AI, and even entrepreneurship. This year, the county council will be establishing an innovation hub that will go beyond its original focus of mobility and energy, and support more idea and project development in all of the county council's service areas.

The system for appealing parking fines is a mess

Alex Shipp, who campaigns as the Parking Prankster, says the disparate nature of appeals processes favours unscrupulous operators

Parking places are a resource and so need to be managed. Most parking management companies do a reasonably good job of this, but as the Parking Prankster I still get thousands of emails a year from people who think they have been unfairly treated. Most of these are as a result of the behaviour of a small number of these companies – the bottom-of-the-barrel companies who bend the rules, play dirty and actively try to trap motorists into incurring charges. Typical tricks include charging a motorist if they briefly stop and then leave, without giving them a chance to read signage; making motorists guess how much to pay in a pay-as-you-leave car park; allowing motorists to enter an invalid number plate when their cameras know which plates are and are not in the car park; forging timestamps to pretend a car has been parked longer than it has.

The problem is compounded by multiple codes of conduct and appeal systems with no independent safety checks, which are run on completely opposite lines. For instance, one appeal body (POPLA) recognises that if keeper liability does not apply then the legal situation is that the parking company

There are multiple codes and appeals systems

must identify the driver. Their rivals the Independent Appeals Service (IAS) ignore the legal situation and rule that the keeper is always the driver, whatever the circumstances. This means that the same appeal to the different appeal bodies will have different results. Additionally, while POPLA is always free to the motorist, and not binding on them, the IAS can charge up to £25 and the result can also be binding. Even more dangerously, while POPLA takes motorists' evidence into account, the IAS routinely rules it as not admissible, with weight only given to parking company evidence. The result is that many motorists are pressured into paying charges which would not be upheld in a court of law.

In the worst cases, some individuals have been able to take control of the process from end to end. For example, the Independent Parking Committee, now renamed United Trade and Industry Limited, was established by at least one current or former director of Gladstones Solicitors, who the British Motorists Protection Association says were responsible for filing thousands of county court claims on behalf of parking operators in 2017. There is no way that a trade organisation such can be said to offer impartial advice or appeals to motorists if its owners or directors stand to profit from every fine extracted from them via another business.

This is obviously unfair to motorists. A better way would be for government to impose a uniform code of practice which includes oversight of the appeals process. There is a private members bill currently winding its way through Parliament. It is sponsored by Sir Greg Knight MP and due for its next reading in February. Although the details of the bill will not be known until the second reading, it is to be hoped that there will be a common code of practice and appeals system across the industry. This will hopefully result in the appeals bodies aligning themselves with the courts, rather than being allowed to use made up rules which have no bearing on the way the legal system works.

If this is not forthcoming then business pressures will force more and more parking companies into bad behaviour so that they can survive against their unprincipled rivals.

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Philip Howell, Senior Business Development Manager at WPS, one of the UK's leading parking systems providers, discusses the need for operators, particularly in the public sector, to reinvest into parking in order to improve services.

Hospital car parks are one public sector area where WPS works closely with car park operators to install systems that provide convenience and ease-of-use for patients and visitors, as well as the efficiency and reliability required to protect hospital resource.

WPS has built up an extensive portfolio of hospital and Healthcare Trust clients over the last 25 years, with highly-successful hospital car park installations that include James Cook

University Hospital, Torbay, St Helens, Whiston, Royal Preston, Salisbury District and Musgrove Park in Taunton.

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Many hospitals are making the very valid switch from Pay & Display to Pay-on-Foot parking. The challenge is two-fold: one is ensuring the technology installed is reliable and proven in field; the second, is that the system supports a better customer experience. In tenders, understanding these factors during the selection process is vital to making the right investment decisions.

All too often we see low-quality systems or the wrong technology being selected – resulting in unreliable or customer-unfriendly solutions for the hospital both in the immediate term and over the life of the equipment. This leads to a poor parking experience for patients and visitors, who vent their frustrations on hospital staff.

Getting the procurement right requires a proper understanding of what new, smarter systems can now achieve, and asking the right questions that will allow providers to demonstrate the true capabilities and advantages of their proposed solution.

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