

The Little Book of CAR FREE CITIES



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the Liveable Cities Team

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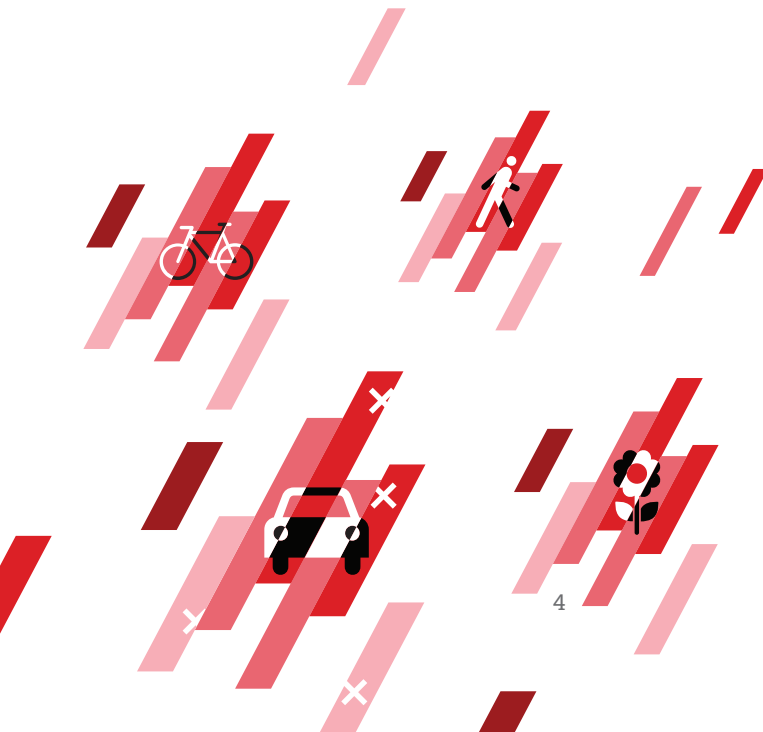
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What this little book tells you

This Little Book examines whether it is possible for cities to function in the future without cars. The book examines what is a car, what the car-system is and how it works, and whether it is possible to ensure that the uses and benefits of cars could be realised without millions of moving and parked cars and their associated infrastructures. It also presumes that any radical change in the system should not reduce human wellbeing.

The Book begins with briefly documenting the history of the car system and how it became central to most cities over the course of the last century. Following this it is shown how this system resulted in very significant personal, social, economic and environmental costs. It is then noted that there are many significant ‘cracks’ appearing in this system. One response to these is to ‘wedge’ them open through the worldwide development of car-free initiatives, which we briefly document. Many of them stemmed from the anti-car, anti-roads social movement as well as from major shifts in public policy. We consider whether a massive shift is occurring in the place of cars within the urban fabric. The paper ends with a sociotechnical re-engineering of Birmingham (UK) including designs for car-free areas near the city centre.



Is car-free the future for cities?



Introduction

In July 2017 the UK Government's Environment, Food and Rural Affairs (Defra) minister, Michael Gove, announced that petrol and diesel cars will be replaced entirely by electric vehicles by 2040. Newspaper headlines have detailed these plans, which is part of the government's policy to improve air quality in our towns and cities, and have also highlighted complaints and concerns from various interested parties. For example, the AA (Automobile Association) is concerned that the demand for energy to re-charge cars at peak times will overload the national grid. The Green party are angry that this plan will take too long, and more people will become ill or die early from complications caused by air pollution over the next 23 years. Others have raised concerns that there is inadequate infrastructure to support such a move and that the making and disposal of all the car batteries will be massively problematic.

While the argument continues and debates proliferate, the 'rights of the driver' and car owners appears to remain protected by government policy; that is, the personal freedom to own a vehicle and to drive it when, wherever and how often the driver wishes. In this conversation, the role of the car and its presence in our lives goes unchallenged.

Over the last five years, we have been working on the Liveable Cities project.¹ One of the aims of this project is concerned with how cities of the future will ensure

¹ www.liveablecities.org.uk

wellbeing for its citizens within the context of living in a low-carbon way. We have tried to do this by imagining alternative futures; in this case, we felt it was important to think about a future without the car and this Little Book details a thought experiment where we examined whether cities could function without them.

In this thought experiment, we began by considering how the *car system* became central to how most cities work. We looked back at the history of the motor car, how it developed and how it became the most dominant form of transport. Then we asked our team working on the Liveable Cities project to search for examples of cities and towns who were trying car-free initiatives. We considered these to be evidence of 'cracks' in the car system and later we explored how these cracks may be more substantially wedged open. After this, we documented the nature of a car-free future and identified the social movement and policy initiatives that are seeking to bring about car-free cities. Finally, we conducted a workshop in Birmingham with a range of young architects, city planners and designers to think about and re-design a future car-free Birmingham.

This Little Book tells you the story of this thought experiment and the route we took, as described above. The work was led by Professor John Urry of Lancaster University and was supported by the rest of the Liveable Cities team at Lancaster University (Katerina Psarikidou, Cosmin Popan, Rachel Cooper, Nick Dunn, Serena Pollastria, Stephen Clune, Christopher Boyko and Claire Coulton) the University of Birmingham (Joanne Leach, Susan Lee, Nikos Kalyviotis, James Hale, Dexter Hunt, Martin Locret-Collet, Chris Bouch, Marianna Cavada, Valeria De Laurentiis, Mike Goodfellow-Smith and Chris Rogers), University College London (Nick Tyler, Adriana Ortegon and Katie Barnes) and the University of Southampton (Luke Blunden). Most of the academic references for this book are grouped together in sections, at the end of the document. Footnotes link to webpages throughout to enable those reading online to go to relevant links whilst reading; but again, all further reading references can be found at the end.

The 'car system'



Earlier, we used the term 'car system' and by this we mean that the 'car' is not a single object but a complex assembly of mechanics, car bodies, electrics, repair systems, computers, oil pipelines/tankers, roads/pavements, refineries, driving tests, shopping centres, modern culture, leisure sites and suburban housing. For example, just imagine everything involved in one, ordinary journey to the supermarket. You need a driving licence, the ability to drive the car, a road-worthy vehicle, roads to drive on, sign posts, fuel for the car, a supermarket stocked with food – to name but a few things. Just imagine all the people, agencies, businesses and infrastructure that have been involved in those things alone. We can see then, that over the past century, this system that developed around the motor car has transformed economies, resource-consumption, social life, air quality, noise, personal safety, global climate, notions of the 'good life', geopolitics, warfare and almost every town and city.

However, at the end of the 19th century, when horse-drawn vehicles and steam engines were still the norm, the idea that petrol driven 'horseless carriages' would come to be the dominant mode of transport across the globe was unlikely and cities were more concerned with how to deal with the increasing amount of horse manure. A combination of cheap American oil greatly increased the viability of petrol-driven horseless carriages and the new systems of mass production and consumption eventually saw the replacement of horse-drawn vehicles and petrol-driven motor cars. The discovery of oil led the petrol system to be rapidly 'locked-in', with the first Model T Ford appearing as early as 1908. The steel-and-petroleum car system built momentum very quickly during the early 1900s with alternatives and competitors being, literally, driven out. Ultimately, we have now arrived at a place where almost all activities that involve movement rely upon oil; and there are now few significant activities that do not involve mechanized movement.

So, over the 20th century and into this century, we saw cars becoming the exemplary manufactured object produced by leading economic sectors and iconic firms. Cars

contributed to our sense of status and also affected our emotions through speed, security and safety. They are also associated with sexual success, career achievement, freedom, family and masculinity.

The success of the motor car saw it expand and dominate over other systems and this became to be seen as inevitable; consequently, cities have been remade and remodelled to fit the car system. The car system also came to monopolise roads, to the point where other users were marginalised and sometimes forced off-road. For example, just think how often you see a horse and carriage being driven on the road? Over time, the idea that roads are for cars, that they are good for business and that they are necessary for a modern economy and society has become accepted as the norm and has seen little in the way of serious challenge. Until recently, this car system has had much forward momentum, spreading and bending almost every society to its will.

Cities, cars and automobility




By 2007, more than half the world's population was living in urban areas and cities continue to grow larger and larger. There are a number of 'mega cities' in the world with a population of well over eighteen million. Smaller cities are not only growing in size but growing in number all over the world, as people continue to move away from rural areas into the urban.² Cities are places of intense, overlapping and energy-dependent movements of people, objects and information. Movement takes place in cities all day and all night; the flow of things like water and sewers underground, electricity and gas through cables and pipes, people, cars, buses, and goods vehicles on road and pavements. Goods, food, animals and waste products all come in and out through various means, but primarily this movement is energy dependent.

As we discussed in the previous section, the car came to dominate over other systems of transport and cities have adapted over the years to accommodate the growing number of vehicles. Our right to drive our cars on the roads is seen as inalienable; subsequently, many of us drive our cars everywhere, for all activities. This is called automobility, and refers to the endemic use of the private car. Let's explain this in more detail. Traditionally we have lived, worked, socialised and conducted our business in a small area, or in a particular locale, but the car system has allowed for all of these domains of life to take place at much greater distances from each another. For example, some of the Lancaster University team who worked on this research project live in Manchester and commute to Lancaster to work. One of us lives in Lancaster but has family in Bristol, and drives regularly to visit them. So automobility, while giving us unprecedented, autonomous personal freedom, also splits our homes from our work, from town centres and shops (which are now often bypassed) and from our leisure activities, which often require a car to get to. We have witnessed the birth of urban sprawl, as urban commuting became possible with our

² See the United Nations article (2014) <http://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html>

own personal transport, that could cover great distances in a short amount of time. According to the architect, Richard Rogers: "it is the car which has played the critical role in undermining the cohesive social structure of the city... they have eroded the quality of public spaces and have encouraged suburban sprawl ... the car has made viable the whole concept of dividing everyday activities into compartments" (1997: 35; Ross, 2014, on zoning).

The cost of the car system and automobility



Utopias often do not turn out as imagined. The imagined perfect society (Autopia) in which we have personal freedom to drive where we want, and where society and the economy benefit and thrive because of the car, has been challenged and critiqued by many. Cars are not free, often not mobile, and they contaminate the air through which they move. How did autopia turn into what Heathcote Williams (1991) terms a dystopic *Autogeddon*?

1. There have been huge increases in the numbers of cars on the world's roads – now thought to be close to 1 billion and expected to grow to 2 billion within a couple of decades – and almost every town and city is now car dependent.
2. Car-based movement within cities reduces community and civic engagement partly because at least two-thirds of car trips involve driving alone and urban space is fragmented. Suburban sprawl is expensive; costing US\$1 trillion a year in the US because of the need for much transportation infrastructure, less efficient city services, increased pollution, greater vehicle expenses, more collisions, congestion and illness.³

³ See <http://usa.streetsblog.org/2015/03/24/study-sprawl-costs-every-american-4500-a-year/> for more details on this .

3. In 1970, Joni Mitchell sang: ‘they paved paradise to put up a parking lot’; and she was right. Much of the physical space of cities is devoted to cars; car parking spaces and roads account for up to one-third of urban land area. Each car has access to very many parking spaces. For example, it is thought that in Houston, Texas, there are approximately 30 parking spaces for every car. Subsequently, there may be up to two billion parking spaces in the US, almost all of which are empty at any moment. Furthermore, cars actually go unused for most of their lifetime. Imagine one week in the life of your own car. There are 168 hours in a week (or 10,080 minutes), how many hours or minutes in the week is your car actually being driven? Last week one of this Little Book’s authors only drove her car for about two hours in total, so, it was stationary for over 98% of the week.
4. Cars transform the movements of other machines and people. Pedestrians have to give way to cars, facing long waits at red lights followed by short, green-light periods. Crossing the streets is not a human right but something pedestrians and cyclists wait and apply for (Ross, 2015). Roads and cars also transform the habitats, pathways and movements of almost all other species. For example, just think about all the road-kill you have seen in your life time.
5. WHO statistics show that 1.25 million people die each year from road traffic crashes, the largest cause of death among young people. There are wide variations in the statistics, with the lowest rate of 3 deaths per 100,000 people found in both Norway and Sweden), 12 deaths per 100,000 people in the United States and 40 deaths per 100,000 people found in Libya. Half of those dying on the world’s roads are pedestrians, cyclists and motorcyclists. Between 20 and 50 million people suffer non-fatal injuries each year.⁴ No wars or terrorist attacks cause anything like this toll of death and injury.
6. Car traffic results in high levels of nitrogen dioxide (NO₂), particulate matter and noise. City-dwellers living or working next to congested roads are exposed to increased air pollution and noise and are vulnerable to heart attacks while their children grow up with underdeveloped lungs. Air pollution is the leading global environmental cause of premature death, as well as huge extra health costs.⁵

⁴ See <http://www.who.int/mediacentre/factsheets/fs358/en/> for more details on these statistics.

⁵ See the following WHO link for further details relating to air pollution related deaths: <http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/>

7. Demand for rubber in vehicle components, principally tyres, has wide-ranging detrimental impacts where it is grown, produced and disposed of. Reducing the total number of cars would have many consequences (positive and negative) upon the rubber industry and several economies and ecosystems in developing nations.
8. At least one quarter of rising CO² emissions results from various modes of transport (Sims et al, 2014). So most of the fossil fuels still under the ground must remain there so as to ensure future global temperatures do not rise above 2°C. Oil is problematic because changes in its price are particularly significant for the viability of cities and future climate changes – and yet for the foreseeable future almost all machine-based transportation is ‘locked-in’ to oil.⁶

Bearing in mind all these problems associated with the car system, our question is: can cities begin to deal with these huge problems by moving towards a car-free future? One obvious problem is that most people’s lives are currently built around car travel. Superficially, it seems impossible to take away cars without reducing people’s wellbeing. However, car dependence is only a century old and is a much more recent development in most societies; for example, 1970s China was more or less car-free.

Finally, how people live their lives is always changing, in the future it may change so that we no longer have to or want to use cars. Therefore, old car-based practices would not necessarily have to be fulfilled by other means if cars were to disappear from cities. For example, with the growth of smartphones new social practices have emerged, like online grocery shopping, where one van delivers groceries for a number of households meaning that there are fewer cars on the road. Consequently, with fewer cars on the road, our lives and how we live them may actually become easier.

⁶ Read the following for further information: Carbon Tracker, 2013; Berners-Lee and Clark, 2013; Murray and King 2012; Urry, 2013.

Cracks in the car system



As part of our thought experiment we decided to investigate where there were *cracks* in the car system. We discovered that much experimentation is taking place around the world developing new ways of producing, using and organising ‘personal vehicles’. Innovators in the area include large motor vehicle manufacturers, other large and small corporations, Non-Governmental Organisations (NGOs), cooperatives, universities, software designers, science institutes, city councils, community enterprises and consumers. Some cities are concentrated spaces for such experimentation.

Frank Geels, René Kemp, Geoff Dudley and Glenn Lyons (2012) have documented ‘cracks in the system’ where the car system could be put into reverse gear if they were wedged open and connected with each other: For example;

1. Policy makers, transport planners and the car industry are becoming aware of the petrol-based car’s health, environmental and energy problems. The British government is acting to try to end the damage caused by banning petrol and diesel cars by 2040.
2. There appears to be a weakening in the commitment of policy makers and manufacturers to business-as-usual, and major manufacturers are increasingly ‘rebranding’ as organisers of mobility rather than just car builders.
3. There is much experimentation by SMEs, NGOs, city governments and large corporations in developing different fuel types (diesel, hybrid, plug-in hybrid, electric vehicles (EVs), hydrogen fuel cells) and lighter body materials.
4. Urban design is moving towards car restraint, including parking restrictions and tariffs, traffic calming, pedestrianized city centres, bus lanes, Bus Rapid Transit (BRT), bicycle lanes and tracks, public bike schemes, road pricing/congestion charging and car clubs.
5. Severe doubts have arisen as to whether burning fossil fuels and especially oil

will continue to be feasible, and supplies of cheap oil are uncertain in the longer term.

6. Research shows that cities with less car-based movement display higher levels of wellbeing for residents and visitors. As a result, some cities now organise car-free days.
7. There is some reduction in car driving in car-dependent societies, including reducing numbers of young people obtaining driving licences. In the UK, the number of teens taking the practical part of the driving test has fallen dramatically in the last ten years possibly due to the cost of driving lessons, insurance and the growing costs associated with attending university. Furthermore, it has been found that younger generations often prefer smartphones and two-thirds prefer to spend money on ‘new technology’ rather than cars
8. ‘Millennials’, especially in the US, increasingly desire to live in dense, diverse places that are walkable, bikeable, and accessible by public transport, particularly as social media technologies replace automobile dependence.

Bearing these points in mind, car travel appears to have peaked and in some cases has been declining. The graph⁷ below demonstrates this.

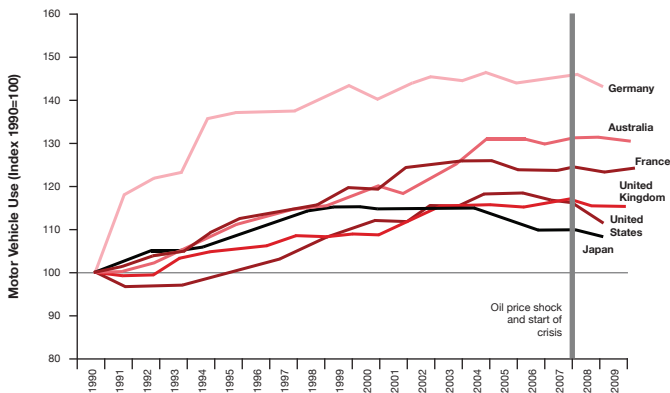


Figure 1. Peaking of car travel in six industrialized nations (Adam Millard-Ball and Lee Schipper, 2011).

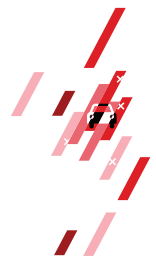
⁷ See Lyons and Goodwin, 2014; Metz, 2014 for further information.

Whilst noting these cracks in the car system, we acknowledge that there are still formidable technological, economic, organisational and social problems in further reducing car use. The first is the significance of what is called carbon capital – the network of relationships between oil companies, TV advertising/programmes (such as Top Gear), auto companies, state oil corporations, states and governments – that protects the interests of oil-based production systems and movement.

Second, any future system must not eliminate everything the car system gives us. Mimi Sheller wrote in 2004 that, “Car consumption is never simply about rational economic choices, but is as much about aesthetic, emotional and sensory responses to driving, as well as patterns of kinship, sociability, habitation and work”. Any new system must be fashionable, enabling new social practices that people may not know they need. Social media is driving changes in how people use transport, but not necessarily away from cars. Uber, Lyft, Hailo and similar ‘sharing economy’ models based around flexibility and affordability may, together with driverless and low-carbon cars, give rise to a new car system.

Third, there is a massive economic, physical and social investment in the car system. A new system could cost trillions of US dollars. Developing a new system would require a new model of financial calculations so that innovations could be assessed against each other on a level playing field. Levelling the playing field is necessary because many existing infrastructures are privately owned so commercial confidentiality hides many costing/pricing calculations. In addition, the full cost of innovations must be assessed. Many costs associated with our current car system are hidden or compartmentalised. For example, road maintenance (a public expense) and vehicle maintenance (a private expense) form part of the total cost of driving our cars, yet we often don’t recognise them as such or account for them even if we do. Overall, the collective, long-term interests of a city and not just the interests of individuals must be taken into account when making calculations.

Car-free scenario



So far we have described the history of how the car came to dominate other systems of mobility, and how a vision of *autopia* developed but has many different problems associated with it. We have also discussed where we have seen cracks opening up in the car system. Now we examine one possible approach to addressing these multiple problems; that is, the exclusion of cars from cities and the engineering of a different urban lifestyle and experience. Arguably, the one intervention that made a real difference to urban life has been pedestrianizing the most valued areas within cities. We consider whether it is possible to expand pedestrianization to include whole cities. We assess a new utopia of cities free from the movement and parking spaces of privately owned, steel and petroleum cars.

Recently, a global social movement developed and extended a utopian scenario of car-free cities. We monitored this car-free scenario through establishing a ‘Car-free Observatory’ partly drawing on previous studies.⁸ This scenario could potentially enable people and policy-makers to ‘reboot’ their city into one that was not dependent upon providing the free and easy movement of cars. The car-free city partly stemmed from radical movements opposed to new road building. Major protests against road construction and automobility shaped the contemporary imaginary of a car-free future. Especially significant in the UK was the anti-roads movement beginning with opposition to building the M3 extension on Twyford Down in 1991-92. This campaign and that at the M11 extension in North East London drew people into a political movement around the building of roads for the first time. These protests gave rise to street parties and resistance movements like *Reclaim the Street*.

Another related movement has been Critical Mass, initiated two decades ago in San Francisco. This is “an international, monthly event where bicyclists briefly take over

⁸ See the following for more information on car free initiatives: <http://worldcarfree.net/> and <https://www.fastcompany.com/3040634/7-cities-that-are-starting-to-go-car-free>

city streets to celebrate bicycling, demonstrate their collective strength and send a clear message to the public that they have the same rights as cars”. This performative critique of motorized traffic now takes place in over 300 cities worldwide.⁹

More recently, these counter-cultural movements have transformed into more mainstream events organized by municipalities and corporations. The European Mobility Week, first organized by the European Union (EU) in 2002, encourages cities to organise mobility-related activities and implement practical measures to get people to opt for sustainable modes of transport. The first car-free days were held in Switzerland in 1974. By 2014, over 2000 cities from 44 countries participated. Seven hundred and eighty-three European cities have organized a Car-Free Day during Mobility Week and Park(ing) Days were organized for the first time in 2005 by designers and activists from San Francisco, transforming a metered parking spot into a small park complete with turf, seating and shading.¹⁰

Extensive social movement and consumer pressure has helped develop the car-free city movement. We documented over 150 significant initiatives within 88 cities across the world – these have been detailed by two of the Liveable Cities Researchers, Adriana Ortegon and Cosmin Popan, in a conference paper (see Reference section). The Car-free Design Manual sets out how to organize car-free cities drawing inspiration from European cities with squares, street furniture, arcades, high densities and narrow streets. High-level support is developing for car-free cities. The 2014 Davos Summit of the World Economic Forum argued that up to US\$90 trillion should be spent redesigning and rebuilding cities to function without cars.¹¹ Former United States Vice President Al Gore alongside former Mexican President Felipe Calderon and others argued that climate change should be dealt with through the worldwide rebuilding of car-free cities.

Around the world experiments are taking place to reduce car-dependence, although there are, as yet, no car-free cities except the unique centre of Venice. This said, many cities are moving to become less car dependent. Few cities now plan to become *more car*-dependent, except, arguably, Sydney, Australia and some Chinese cities.

⁹ See the following link for more information on Critical Mass bike rides: http://criticalmass.wikia.com/wiki/List_of_rides

¹⁰ See <http://mobilityweek.eu> and <http://parkingday.org/> for further information on Mobility Week and Parking Day.

¹¹ Read the following article for further information: <http://uk.businessinsider.com/plan-to-spend-90-trillion-redesigning-cities-without-cars-2015-1?r=US>; accessed 12.4.15

Mostly the car is no longer seen as the pathway to modernity. Below, we document some elements that must be assembled to engineer a car-free city – which involves designing out the car and designing in reduced car-based practices – and provide some exemplars.

Restrictions on car movement

In most Chinese cities, car ownership is controlled through restricting new car registrations using the system pioneered in Singapore by which people bid for a certificate conferring the right to purchase a car. Congestion charging has been introduced in London and Durham, while many major Italian cities have limited private car use within historic centres. In Milan those not using their car receive a voucher for public transport instead. Car ownership in the city centre of Paris fell from 60% to 40%, with certain streets only accessible by ultra-low emitting vehicles. The banning of cars on given days based on odd/even number plates is implemented in Athens (Greece), Beijing (PR China), Bogota (Columbia), Mexico City (Mexico), Santiago (Chile), Davis (US), and Sao Paulo (Brazil), although this is not always effective as car owners may buy cheap, low-efficiency cars with the opposite number plate.

Restrictions on parking cars

Vauban in Freiburg (Germany), is often viewed as the exemplary car-free urban area. Vehicle circulation is permitted at walking speed but there is no parking available. Car owners purchase a place in one of the multi-storey car parks on the periphery run by a council-owned company. Their very high cost is a disincentive to car ownership with only 165 private cars registered per 1,000 inhabitants. In the UK, restricting parking is common to reduce congestion and improve air quality.

Making other modes more attractive through sharing technologies

In Finland, Helsinki's car-free vision views mobility as a service. It is developing an app that enables citizens to call up a shared bike, car, taxi, or find the nearest bus or train. In a decade, the city hopes to make it unnecessary to own a car and to have no individually-owned cars by 2025.¹²

¹² You can read more about Helsinki's plans in the following Guardian article: <http://www.theguardian.com/cities/2014/jul/10/helsinki-shared-public-transport-plan-car-ownership-pointless>.

Innovating new mobilities

At Vantaa Airport in Helsinki, a new Ring Rail Line will provide Easymile driverless vehicles to cover the last mile. This electric shuttle covers short distances and predefined routes. Starting in July 2015, four EZ10 shuttles provide a feeder service to connect the new stations. EZ10 shuttles are also operating as part of the European Project CityMobil2 at the Swiss Federal Institute of Technology in Lausanne (EPFL).¹³

Improving bicycle infrastructure and services

In Copenhagen, there are now 200 miles of bike-lanes and half the population bikes to work. Many cities are copying the Copenhagen model, seeking to make cycling more convenient, safe and secure, with cycle lanes, parking and facilities integrating bicycles with public transport. Examples include Auckland, Christchurch, Wellington (New Zealand); Bristol (UK); Davis, New York, Portland, San Francisco, Seattle (USA); Dublin (Ireland); Graz (Austria); Melbourne (Australia); and Toronto (Canada). Bicycle sharing schemes are increasingly common, such as the world's largest in Hangzhou (China); Lyon, Paris (France); Washington D.C., New York (USA); Cologne (Germany); Barcelona (Spain); London, and, recently, Manchester (UK). The Barcelona bike sharing scheme is financed by car parking fees, member's dues and sponsorship.¹⁴

Improving pedestrian infrastructure

Cities are increasingly reclaiming pedestrian spaces and promoting a vision of a 'walking-city' in central areas, with new residential developments and nearby public transport. As most public transport trips include a walking segment (usually at the start and end of the trip) improvements in pedestrian conditions usually improve public transport accessibility. Madrid (Spain) has plans to pedestrianize much of the city's central area within five years, with major streets redesigned for walking. The city of Hamburg is also making it easier for residents not to drive, aspiring to make 40 percent of the city car-free by 2034. City officials are creating networks of green spaces filled with parks, playgrounds, promenades, sports centres, cemeteries and gardens.

¹³ Further details on all EZ10 initiatives can be found here: <http://easymile.com/>

¹⁴ To find out more about bicycle sharing in Barcelona see: <http://faircompanies.com/news/view/how-barcelona-is-slowly-becoming-a-cyclists-city>

Sustainable housing

Vauban in Freiburg (Germany) combines community-wide mobility planning with an attractive environment, good accessibility provided by public transport, and environmental and social objectives. In London, many of the housing developments under construction in Hackney are car-free, with the council guaranteeing alternatives to personally-owned cars including a commitment that every resident will live within three minutes of a car-club bay. Enfield, Kingston and Waltham Forest (tagged 'mini-Hollands') are minimising through traffic with the mobility needs of other modes being encouraged.¹⁵ In Malmö (Sweden), the sustainable housing development Bo01 is dense, walkable, and virtually car free.

Revive social functions of streets

For the past 40 years, Bogotá, Cali, Medellín and other Colombian cities have closed many main streets to cars between 7am and 2pm each Sunday and public holidays. Streets are used by runners, skaters, walkers and cyclists. Similar initiatives are found in Jakarta (Indonesia), Mumbai (India) (Equal Streets), US and Canadian cities (Open Streets), and ViaRecreActiva in Guadalajara (Mexico). In many cities, overpasses and elevated road infrastructure are being repurposed to allow walking and public transport. Many roadways have been turned into parks. In Seoul (South Korea), an abandoned highway was transformed into an elevated public park while each summer a portion of the Paris Expressway in France is turned into a car-free inland beach with sunbathing, kayaking and picnicking. Perhaps most famously, a social movement in New York (US) developed the High Line Park along a disused freight line, which is used by 5 million people a year.

Information campaigns to promote sustainable travel

In Helsinki (Finland), the Transport Authority sends staff into schools and workplaces to try to convert people to walking, cycling and public transport, especially targeting older people. The Walking Tube Map for London and Legible London scheme provided clear information to navigate by foot, while in the cities of Toulouse (France), Debrecen (Hungary), Ljubljana (Slovenia), Venice (Italy) and Odense (Denmark), the EU funded *Mobilis* project has involved city leadership

¹⁵ For more information of the TfL's mini-Hollands see: <https://tfl.gov.uk/travel-information/improvements-and-projects/cycle-mini-hollands>

working closely with local mobility stakeholders to create a new culture of clean urban mobility.¹⁶

There are many examples of car-free city initiatives from around the world. Such car-free cities can be characterised by revived public spaces and streets that are full of life, public buildings designed for access and sociability, areas designed to facilitate movement by non-car modes, cars that are increasingly costly to use and/or less convenient, other slower modes becoming more attractive and/or convenient, housing being people-centric with density and design facilitating interaction, and streets engineered for people and not cars.¹⁷

Such developments have come together in Ljubljana (Slovenia), which the EU has just designated as the 2016 European Green Capital. Its core is car-free: only pedestrians, bicycles and buses are allowed, while an electric taxi service called Kavilir offers free rides to the elderly, disabled and mothers with children. If people live in the centre or want to drive there, they must park at an underground garage outside the car-free area and walk. Business and tourism have increased in the historic centre.¹⁸

Overall, planning is crucial in developing car-free cities. Amsterdam in the Netherlands is one of the world's great biking and walking cities but this was only achieved through major planning and policy interventions over the previous forty years. If the future of cities is to be car-free, a strong and visible hand is needed.

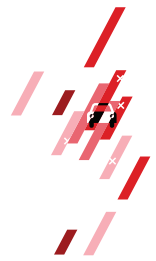
We turn now to examine Birmingham, arguably Britain's second city. With a history of innovation, it was once the manufacturing centre of the UK and in the 1960s Birmingham was promoted as Britain's premier car city, reflecting its urban design and central role in vehicle manufacturing. It might be argued that if Birmingham can become car-free then, so can any city in the world.

¹⁶ See the following link for the Mobilis initiative: <http://civitas.eu/content/mobilis->

¹⁷ See the following Guardian article for a discussion on the movement to make cities car-free: <http://www.theguardian.com/cities/2015/dec/09/car-free-city-oslo-helsinki-copenhagen>

¹⁸ See the following link for more information on Ljubljana <http://citiscopes.org/story/2016/how-ljubljana-turned-itself-europes-green-capital#sthash.hy7vZQUK.dpuf>

Car-free Birmingham



The Campaign for Better Transport conducted research in 29 English towns and cities and demonstrated large variation in car dependency in UK cities.¹⁹ By far the largest city, London is the least car-dependent. They also found that the most car-dependent are smaller cities such as Milton Keynes, Colchester and Peterborough. Car dependence can change through the scale and coherence of public policy. Birmingham is currently the eighth least car dependent city in England and is no longer Britain's premier car city. At the policy level it is developing an alternative framing of mobility known as Birmingham Connected, which focuses upon improving mobility within Birmingham (which, it should be noted, is not the same as making it car-free although there may be common elements).

Although a car-free future vision may not be fully realized in Birmingham, this vision can play a powerful role in enabling people and policymakers to imagine and work towards a different kind of city.

We begin with some broad features of mobilities in Birmingham. Its transport services are privatised and fragmented with no single responsible body. However, the West Midlands Combined Authority (WMCA) is newly established and incorporates seven metropolitan councils and three Local Enterprise Partnerships (LEPs²⁰).

At the regional level, the West Midlands Integrated Transport Authority recently published a Strategic Transport Plan.²¹ Its key aims include:

- A fully integrated rail network connected to bus networks;

¹⁹ See the following link for details: http://www.bettertransport.org.uk/sites/default/files/pdfs/Car_Dep_Scorecard_2014_LOW_RES.pdf

²⁰ LEPs are partnerships between local authorities and businesses. They decide what the priorities should be for investment in roads, buildings and facilities a particular area or region.

²¹ Available online here: <https://www.tfwm.org.uk/media/1099/movement-for-growth.pdf>

- Increasing the number of people within 45 minutes' travel time by public transport;
 - Improvement in air quality and reducing carbon emissions;
 - Improving the public realm;
 - Ensuring that walking and cycling are safe by providing a strategic cycle network;
 - Making it easier to access education, employment and leisure and health;
 - Enabling businesses to connect to supply chains, key markets and gateways.
- The plan also proposes a four-tier, integrated network consisting of national/regional, metropolitan and local tiers linked through 'smart mobility'.

Birmingham's transport infrastructure is still influenced by what was termed as the 'concrete collar': raised ring roads designed by Herbert Manzoni and built during the 1960s. Their removal has been central in Birmingham's recent redevelopment, although in some cases, the road layouts have changed little other than being brought down to ground level. A further issue is that Birmingham's (congested) road network is nationally important since one of the biggest motorway junctions in Europe, Junction 6 on the M6 (also known as 'Spaghetti Junction'), lies close to Birmingham city centre. Birmingham is seeking to reduce the impact of private cars in terms of congestion, air pollution, noise and health. Birmingham's plan makes the city centre much less car dependent, improve access via public transport for areas outside the centre, and ease private vehicle flows elsewhere. Significantly, 36% of Birmingham's households do not own a car so they will greatly benefit from lower car dependence within the city.²²

City authorities have been reluctant to constrain parking since it is believed this weakens economic growth, although examples from our Car-free Observatory suggest the opposite. There are major challenges in bringing about a significant reduction in car-dependence. Some areas, such as in the city centre, possess relatively good public transport connectivity but for various reasons pose major challenges

²² The Office of National Statistics provides a range of data on this aspect of mobility practice. Further details on national car availability per household can be found here: <http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/rft-table-ks404ew.xls>

to the full removal of cars. Such wards also offer opportunities to local businesses and tourists who derive benefit from moving around car-free environments. Other, often poorer, wards are less well connected, so moving to a car-free environment would necessitate wholesale changes to the urban infrastructure if it is not to disadvantage those living there. The city is also experimenting with car-free streets near Birmingham New Street Station on Hurst Street, a gateway to the city's Chinese quarter and Hippodrome theatre.

The major form of public transport in Birmingham is, for the foreseeable future, buses. The city is attempting to improve their safety and quality partly through a new Platinum service, along with the launch of Sprint ('Metro's little sister'), which is a tram-like bus service. The Midland Metro Line One connects Wolverhampton and Birmingham with major city-centre tramline extensions currently being developed.

West Midlands Rail Ltd has been created by the region's local authorities and is seeking to procure and manage the next rail franchise. The long-term aim is full rail devolution to the region by 2024. Like the rest of Britain, rail use in Birmingham is increasing. Twenty five of Birmingham's 40 wards possess at least one connection with rail and four train companies run services through Birmingham New Street with a train departing every 37 seconds. Transforming Rail Travel is a partnership between Transport for the West Midlands (the body that oversees public transport within the region, formerly Centro) and London Midland (a private rail operator) to improve rail travel through smartcard technology, improving connectivity, better customer satisfaction, safety and environment, marketing and promotion, and more information. The development of HS2 (High Speed 2) – the proposed high speed rail line linking Birmingham, together with Manchester and Leeds, to London – is potentially a very significant development, although it is particularly contested.²³

Birmingham City Council has planned for public transport to increase its use of digital technology with smart ticketing, the use of GPS (global positioning systems) and apps, as well as lower emissions vehicles. The Birmingham Mobility Action Plan argues that taxis should play a major role in reducing the carbon footprint of public transport as taxis comprise a small part of the overall vehicle fleet in the city but have a disproportionate impact because of their high mileage. EV (Electric

²³ See the following BBC article for a discussion of the pros and cons of HS2: <http://www.bbc.co.uk/news/magazine-24159571>

Vehicle) technology will contribute to greening taxis through a network of electric charging points, although such an approach may encourage more car use.²⁴ A link with Nissan is expected to assist the uptake of EV taxis. Taxi sharing, especially at stations, the airport and sporting events, is being explored and it is expected that Uber will significantly (and controversially) transform taxi services around the West Midlands.

Birmingham is one of the UK's four 'Walking Cities'.²⁵ Living Streets is undertaking a £250k Walking Cities Project to address socio-economic inequalities by focusing on residents in disadvantaged neighbourhoods near the city centre. The Walking Cities project aims to challenge mainstream approaches to pedestrianisation as well as the myth of the role of car-parking in the economic viability of local businesses. For example, the Eastside City Park and the Church Street district pedestrianisation led to local businesses flourishing. Creating high quality environments has been central to using public space for slow movement.

Birmingham's walking and cycling strategies are interconnected, as many argue that cycling is viable for many short journeys up to five miles. As part of Birmingham's Cycle Revolution funding, infrastructural developments on the canal towpaths as well as other off-road green routes contributed to re-utilising existing street spaces. This is despite conflict in their shared use: cycle lanes on canal towpaths potentially create conflicts with other canal users. Enhancing the skills and confidence of cyclists has been identified as essential for encouraging cycling among non-traditional cycling groups, including women, unemployed and ethnic minorities. BikeFest and Big Bike Birmingham support the organisation of Bikeability courses. As part of Birmingham Smart City, the availability of route planning mobile applications as well as other technologies is making cycling more inclusive through increasing safety and security at different times of the day and night. Finally, Birmingham's Cycle Revolution resulted from Birmingham City Council's bid for £17m funding to improve cycling facilities within a 20-minute cycling time of Birmingham city centre and it is hoped that over the next 20 years this will lead to 95 kilometres of improvements to existing routes and 115 kilometres of new cycle routes.

²⁴ See the following for more information on EV taxis: <https://tfl.gov.uk/info-for/media/press-releases/2017/april/tfl-drives-forward-18-million-electric-vehicle-scheme>

²⁵ More information about Walking Cities is available here: <https://www.livingstreets.org.uk/what-you-can-do/campaigns/walking-cities>

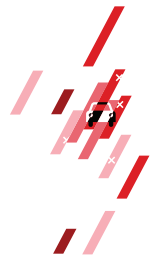
Cycle schemes such as Cycle and Ride, the ‘We Cycle for You’ Cargo Bike, and Brompton bike-sharing are expanding within the city centre, offering solutions to the movement of goods to private houses as well as to businesses and shops. However, acceptance among the local population is key and consultation schemes have sought to ‘normalise’ these developments.

Overall then, Birmingham City Council, as well as the West Midlands more generally, are seeking to reduce car-dependence, limit air pollution and lower CO² emissions. Walking and cycling are being encouraged, with better provision and an increasing numbers of cycle routes. The development of light rail should reduce the number of cars in the city centre. In addition, improving the bus network and the quality of the buses, as well as making bus stops more attractive, assist in moving people out of their cars. However, one overarching concern is the long-term decline in bus travel in Britain since privatisation took place in the mid-1980s.²⁶

From this, we can see that Birmingham is making attempts to designing out the car both via restricting car movement across the city and restricting access to parking. Birmingham is also developing initiatives to design in alternative social practices. These include improving public transport (quality and quantity), enhancing bicycling and pedestrian infrastructures, experiences and access, and developing information campaigns to promote sustainable travel. There is less evidence, however, of the city innovating new mobilities, reviving the social function of streets and/or greatly extending public spaces.

²⁶ Important to note here that privitization of buses did not take place in London. Further details of annual bus use statistics can be found at the following link: <https://www.gov.uk/government/statistics/annual-bus-statistics-year-ending-march-2015>

'Re-design' workshop



At this point in our research project we had spent a great deal of time investigating and researching the history of the motor car, and how a system developed around it, along with an autopian vision. We had also spent a good deal of time developing a Car-Free Observatory that detailed 'cracks' in the car-system. Finally, we had investigated the city of Birmingham, which had formerly been known as Britain's car city, and saw that the city, along with other stakeholder groups, were developing alternatives for moving people and goods around and into the city that relied less on motor transport and encouraged cycling and walking. However, what we also wanted to do was work through what might be involved in a future car-free Birmingham. To do this, the Liveable Cities team ran a 're-design' workshop involving experts on mobility working alongside a group of architecture students from Birmingham City University. During the workshop, four different car-free designs relating to three sites within Birmingham were generated by workshop participants. These designs are detailed and discussed below:

Group 1

The first group design sought to develop bonds across the inner ring road, in an area bounded by Hanley Street to the north of St. Chad's Queensway and by Steelhouse Lane to the south.

This proposal forms connective tissue between the city centre and inner suburbs by providing a ten-minute walkable route. By breaking down physical elements along designated streets, the linear pedestrian route offers nodes of intersection for cultural and social interaction, further reinforced by cultural centres to assist the diverse communities that currently pass through them.

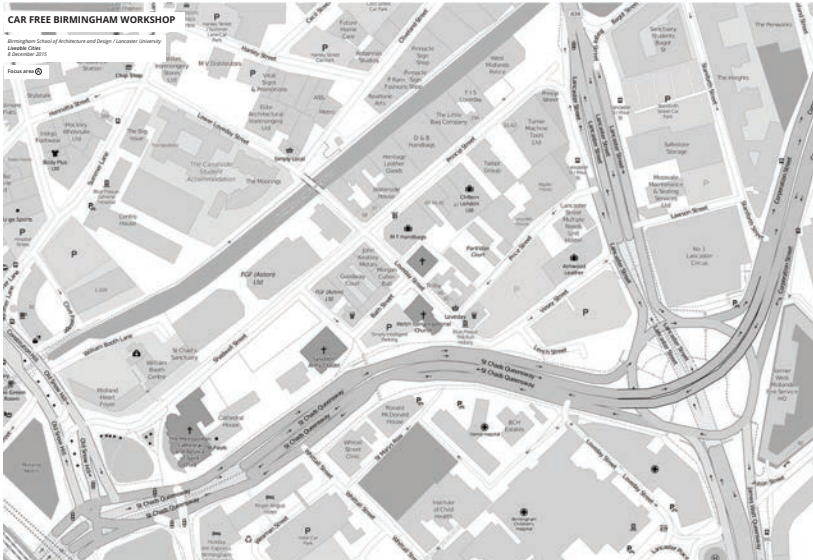


Figure 2. The area of Birmingham redesigned by Groups 1 and 2



Figure 3. Group 1's design for 24-hour use

Large nodal points are here imagined as architectural landmarks to aid the imageability of the city for pedestrians. The emphasis here is not just horizontal connection at street level, with the large nodal points also facilitating vertical connection to service multi-modal transport interchanges including an automated bus system operating in a radial manner around the city centre. This inverts the current status of the monolithic inner ring road by recasting it as an attractor in the urban environment, a destination of interaction for students, health workers and other communities that use the area and transforming it into a neighbourhood with increased face-to-face interaction. At a city level, the automated bus system is part of an interwoven, elevated infrastructural ribbon that threads through the urban fabric with priority given to emergency vehicles when needed. Conceived as a shared space, it combines strands of green space, cycle lanes and interchanges for movement to lower levels. A final aspect of the design is the temporal dimension, which enables freight to move around and through the city out of hours of use by residents, workers and those socialising.

Group 2

The second proposal, which considered the same site as above (see Figure 1) used a design fiction approach, based on a family living in this area in the future.

One of the parents works for the council, one works for the NHS. They have two children, one is studying at a university in central Birmingham and the other still goes to school. The family commutes together across the city each day. They could take the tram, but because it is a nice day they are cycling in. They're using the old canal routes that are now also cycle routes.

The core aspect of this design concept is permeability between the city centre and its surrounding suburbs via access across the ring road, inside of which private cars are prohibited. By converting streets for pedestrian use, there are clear walkways in and out of the city centre. A tram system allows people to travel further, connecting not only to places of employment but also to residential and recreational areas, enabling people to use it to commute, meet family and friends around the city or travel to larger parks on the periphery. There are also places where buses provide services to areas not connected by the tram route, as well as plenty of cycling lanes.



Figure 4. Group 2's Design for a tram, cycling and walking system

Repurposing many of the infrastructures associated with the car system, such as roads, parking and petrol stations, this scheme opens up plots of previously inaccessible land. This makes way for new housing schemes and initiatives, cooperative buildings and community platforms that enhance community cohesion and foster interaction for children and between adults. Multi-modal transport interchanges provide options to access the city-region and encourage economic growth through novel business opportunities. Unlike the first proposal, this design involves demolishing car-based infrastructure (such as raised motorways) and opens them up as shared space, enabling people to move from suburb to city centre at street level. This also provides development opportunities for housing, retail and business, such as using the canals to transport freight.

Group 3

The third design examined an area one mile north of the city centre, bounded by Clifford Street to the north and New John Street West to the south.

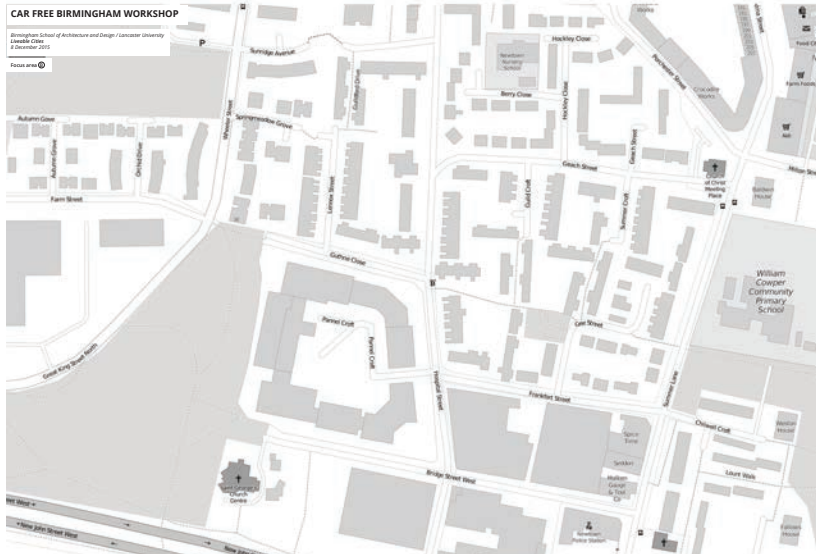


Figure 5. The area of Birmingham being redesigned by Group 3

They envisioned the city as a series of interconnected villages, thereby reducing the need for many journeys. Commuting was specifically targeted: the design sought to minimise wasted time and money that could be more valuable if kept within the neighbourhood. A key consideration in this design was the intergenerational nature of the community, with facilities for all ages and a clear acknowledgement of an increasingly ageing population. Intrinsic to this is the importance of social interaction, walkability and natural surveillance (eyes on the street) to promote and strengthen community relationships and sense of place. Whilst the main roads in the designated area – the dual carriageway and ring road – were retained, this was exclusively used by public transport (buses and a metro system), with deliveries and refuse collection operating during off-peak periods.

Wellbeing featured as a primary concern of the design with facilities including a community centre, a swimming pool and gym, alongside good-quality public realm and green space for people to interact. The scheme proposed a variety of dwelling types for residents, with mixed tenure in relation to changing needs over the life course of residents, promoting ‘stickiness’ to place. Suburban streets were redesigned as shared space with slow moving buses, bicycles and pedestrians using these to connect to interchanges for quicker transport across the city. By removing privately



Figure 6. Group 3's design for wellbeing

owned cars, green space was increased through reclaiming parking spaces and driveways. The design featured medium-density housing to ensure community cohesion and attachment to locale.

Group 4

The fourth design addressed a sector to the west of the city centre known as the Jewellery Quarter, previously separated from the centre by railway lines.

Currently comprising warehouses, various council housing schemes and 1960s low-rise buildings, this redesign reconnected housing with industry whilst also revitalising the area through connectivity with the increasingly vibrant quarter. Privately-owned cars stop at the outer ring road where distribution nodes and interchanges enable travel into and out of the city via autonomous cars and buses for primary routes, whilst rickshaws, bicycles and walking provide mobility between these.

This proposal also took a design fiction approach.

Mr Smith is 87 and he has a dodgy hip, meaning he doesn't walk very well. He's got a doctor's appointment in the morning and he uses his local health service who run a 'nurses on bikes' scheme, meaning he doesn't have to leave his home – they come to him. Mr Smith's local area 'hub' also has a market and small-scale businesses servicing his area, creating a vibrant local economy and meaning Mr Smith doesn't have to travel far for the things he needs. This includes transportation. If Mr Smith needs to travel into the city centre (or elsewhere in the city) he can call for an autonomous vehicle, or take a bus or a tram. The local hub also works as a distribution node servicing local businesses and connecting them to wider distribution networks.

The scheme proposed a three-minute cycle ride to the edge of the city centre or a fifteen-minute walk, with a strategy to link various squares and public spaces to allow for a continuously walkable network of routes across the city. Pivotal is the quality of provision of the streetscape, integration of people and pop-up markets to engender interaction and a sense of place. In addition, there were 'pocket parks' which re-use existing car parks to provide green spaces in close proximity to residents and workers.

Concluding comments



In this Little Book we have documented a new programme of urban transformation that we have seen to be rapidly moving across the globe. This programme involves many people, groups, organizations, NGOs, city officials and media commentators that seek to move cities in a car-free direction. We have collected many examples from around the world, a difficult task as their range and scale appear to be growing. We have also shown that cars constitute a ‘system’, so any significant reversal of this system will need a wide range of radical changes to be made, many located far away from the ‘car’.

This worldwide trend involves imagining a different future to the one that we know today, and what has been termed ‘autopia’. We identified major cracks in the existing car-system, and noted some of the causes and consequences as well as the scale of the car-free movement. There are many constraints upon significant reductions in the car-dependence of cities but the key issue, to use a mobility metaphor, is the overall ‘direction of travel’; and, that does seem to be towards reimagining and redesigning cities without nearly so much movement and parking of millions of cars.

We also focussed on the British city of Birmingham and noted the significant efforts being made by this once leading car-city to move in a car-reduced direction. Many authorities and activists are seeking to engineer a much less car-dependent Birmingham although we note that the legacy of existing public transport of mostly trains and buses so far limits the opportunities for eliminating cars from many areas.

Finally, the design workshop afforded us the opportunity to develop some future visions as to how Birmingham could become car-free in particular areas. This proved no easy task; however, by focusing on better provision of public realm and green spaces, alongside reworking infrastructures, these designs re-programmed streets, parking spaces and car parks. Within contrasting areas of the city, the designs sought to promote walkability, greater opportunities for face-to-face interaction and

more mixed-use rather than zoned development. These designs especially focussed upon re-imagining the city around the needs of pedestrians, partly because, more-or-less, everyone is a pedestrian at some point in every journey and also because, in Birmingham, over a third of households do not have access to a car. It should be noted that all four designs involved both ‘designing out the car’ and ‘designing in reduced car-based practices’ as attempts to transform behaviours and the built environment.

However, these designs do not deal with various other requirements for moving to a car-free Birmingham. These include:

- How to integrate slow modes of transport with ‘public’ transport hubs in both design and systems of charging;
- How to develop new social practices that embed non car-based modes of movement or avoid the need to move far or frequently;
- How to make available safe and secure movement/access at varied times of the day and night for all social groups;
- How to move food, consumer goods and waste without using petrol-based vehicles; alternative ways of enabling access by emergency vehicles; determining the role of taxi and demand-responsive travel, and lastly;
- How to help people appreciate cities without the noise, movement, smells and tastes of the car.

All these issues need to be dealt with in order to move Birmingham toward a car-free future.

Drawing from visions of car-free utopias and the four car-free workshop designs and backcasting to the current performance of Birmingham’s transport ecosystem, we identified three major barriers to Birmingham achieving car-freeness: the first is in generating high-level, long-term political support (a necessity in any city but especially so in Birmingham, which is in a state of political flux); the second is the collaborative working towards a common public transport vision (a vision which currently eludes Birmingham); and finally, it is in overcoming economic concerns (in economically difficult times within the City).

Finally, we wonder whether a car-free future may make it difficult to remember former ‘motoring days’. Will cars be like old steam engines, laid up on derelict railway lines and only brought out for show within museums and car heritage centres? Or maybe this car-free movement is a passing fashion and some new

car-system will be re-established? There are huge limits upon realising a car-free 'utopia' and here we recognise that there is another possible future on the horizon, of increasingly driverless, sustainably powered, car-like vehicles. Is this new car-system of interconnected, driverless, 'networked vehicles' waiting in the wings, ready to take over on roads that are full of sensors streaming data on road conditions and capacity? Currently, there is a developing momentum towards this latter, 'smart vehicle' future.

Therefore, we end by saying that the future of cities may be hovering between two alternatives. On the one hand, there are *smart*, tech-dominant, high-mobility cities being imagined as the future by Google and other technology giants. On the other hand, there is the future analysed here of people-dominant, lower-mobility cities where wellbeing is not tied to distance and much of the car-infrastructure is not so much smart as 'peopled'.

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