CLIMATE SAFE STREETS

Delivering Zero Carbon Roads
in London by 2030

LONDON CYCLING CAMPAIGN

CONTENTS

1. FOREWORD

Fran Graham,
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London Cycling Campaign

The London Cycling Campaign (LCC) is a democratic, membership-based organisation. Our vision for London is a city where people of all ages and abilities can cycle safely and enjoyably. We believe that making cycling the number one transport choice for everyday local journeys will generate immense quality of life, environmental, health and economic benefits for everyone.

For over 40 years, LCC has been fighting for a city where everyone who wants to cycle, can. In that time, we've achieved some huge steps forward for cycling in the city with our activists, members and supporters.

In 2012, our *Love London, Go Dutch* London mayoral election campaign challenged the accepted view that painted lanes were adequate cycling infrastructure, and championed the introduction of Dutch style measures. These now form the basis of London's emerging cycling network. In 2016, we won a promise that protected space for cycling in London would be tripled, and won action to make Direct Vision Lorries – vehicles that enable drivers to see much more from inside their cab to improve the safety of those outside them – the norm on our streets.

With the upcoming mayoral election 2020, we are now stepping up to the biggest threat facing humanity – the climate emergency. Enabling more people and goods to move by bike in our cities is one of the key solutions to cutting our climate wrecking emissions. As an organisation born out of the environment movement, this has always been a core reason we do what we do. It's the reason LCC activists, members and supporters joined the School Strikers last summer, calling for urgent action to avert the climate emergency. We were part of the global movement, sparked by Greta Thunberg and her solitary *Skolstrejk för klimatet* (School strike for the climate), which has been growing louder and louder, demanding climate action.

These next few years will determine London's response to the climate emergency, and this report sets out a road map for decarbonising the capital's roads. Political will at both the mayoral and borough level is essential to achieving this, which is why our activists, members and supporters will be pressing

politicians, first at the May 2020 Mayoral elections, and then at the 2022 Local Council elections, to commit to Zero Carbon Roads by 2030.

This report draws extensively on the views and comments that we have gathered from a range of experts in sustainable travel, transport in general and the business sector (see Acknowledgments). We would like to thank them all for their time and advice, pointing us towards solutions and alternatives to our fossil fuel-based road transport system.

We'd also like to give special thanks to Urban Movement for assisting in authoring this report. With such a wealth of data and such a broad suit of challenges to evaluate, they helped us sift through everything to build a roadmap to Zero Carbon Roads by 2030, and brought to life a Climate Safe vision for our city's streets over the next ten years.

If we rise to this challenge, we will not only have met our global responsibility to cut carbon emissions and protect the future for the planet and millions of people, but also will create a better London – one with fewer cars, less pollution, greener streets and much, much more high-quality cycling infrastructure.

2. INTRODUCTION

Dr Ashok Sinha,
Chief Executive,
London Cycling Campaign

It looks like the Cassandras were right: we are indeed risking the collapse of civilisation as we know it. After all, how else to describe the humanitarian, security and economic turmoil that will be caused by human-induced climate change? Or the parallel collapse of ecosystems caused by pollution and our rapacious consumption of the planet's natural resources?

Yet it doesn't have to be this way.

'Crisortunity' was a much-used word in climate change circles many years ago, intended to encapsulate how the climate crisis can be midwife to the birth of a new, greener, fairer economy. This idea used to be dismissed as crazy economics, but today it is mainstream. The new normal is talk of how renewable energy can power our future; how we can all live in warm, low energy houses; how our economies can be circularised to eliminate waste; how we can electrify transportation; how we can capture emissions from industrial processes; and how we can reform agriculture and regenerate ecosystems.

And to that, the London Cycling Campaign would add: how we can relinquish our dependence on car ownership and switch to cycling, public transport and smarter private mobility services.

Because the really crazy idea has always been that we should live in cities where vast swathes of precious real estate is given over to getting around in big, heavy, low-occupancy metal boxes – not only emitting vast quantities of carbon dioxide but creating lethal levels of pollution, clogging up the arteries of our cities, and contributing to a crisis of sedentariness that is damaging public health.

We can change this.

Back in 2012, LCC's *Love London, Go Dutch* campaign changed the minds of the Mayor and Transport for London in favour of a mass roll out of Dutch-style cycling infrastructure and traffic reduction. We have seen the multiple benefits of this radical rethink accruing since then. But despite the undeniable progress, we remain far away from achieving the profound transformation of our urban landscape that is ultimately required. We need to go much further still, not only to make

cycling the norm for everyday journeys, but also to provide a full suite of affordable and convenient alternatives to our over-dependency on private cars. The good news is that the necessary market-pull and market-push tools are already available to enable this. The central question is whether London's politicians, decision makers and authorities have the political will to embrace them.

Which takes us to the climate emergency.

The 2015 Paris climate change agreement set a goal of limiting global average heating to 1.5°C to avoid unconscionable risks to us all. Only rapid and deep cuts in carbon emissions will give us a chance of staying within that limit. Indeed, even if global emissions were to permanently cease after 2030 then (based on current emissions) humanity would still face a one-third chance of exceeding this limit, with the odds worsening with each year of delay. Yet five years after Paris, global emissions are still rising, not falling, and there remains no technological means to extract carbon dioxide from the atmosphere at speed and scale. We shouldn't be gambling with the lives of future generations in this way. Nor should we put our faith in the false god that is the notion we can adapt our way out of this.

We can and must take a more revolutionary approach.

LCC is calling on all the candidates in the London mayoral election 2020 to put our city firmly on track to decarbonising London's roads by 2030. We of course recognise that this will be far from easy. This report therefore not only makes the case for this transition, but also describes precisely how it can be achieved. In particular, we define the concomitant, priority policies London's next Mayor must implement during the next four year mayoralty.

The actions called for in this report will not alone serve London's obligation to fully decarbonise. But whereas decarbonising electricity and gas is largely out of the Mayor's direct control, transport – the biggest single source of London's direct carbon emissions - is a central competency. If the next Mayor of London does one thing to directly address the climate emergency, then decarbonising London's roads is it.

And let us not forget that we owe it to the world to act.

As Europe's only megacity, London is home to immigrants from the four corners of the world. Its diversity is oft-cited as a principal reason why it is the best on Earth. London has grown rich by being an international city, as well as through our high historic use of fossil fuels. Many Londoners, or their forebears, hail from countries that are on the front line of climate change,

which is hitting the most vulnerable and least responsible first and worst. We now owe it to the world to do our fair share to avert worldwide climate chaos, in recognition of what the world has given London.

Finally, this isn't about saving the planet.

Life on earth has always bounced back from every past mass extinction event; life always finds a way. Instead we're talking about clutching the opportunity from the jaws of catastrophe to clean up and retool human civilisation, not least for the sake of the unborn who bear no responsibility for the disaster they will otherwise inherit. A simple but profoundly important step towards that goal will be to make London a mass cycling metropolis. And when we see how much happier, healthier, and attractive London is as a result, we'll wonder why on earth we didn't do it sooner.

3. EXECUTIVE SUMMARY

The Urgent Need

The way we travel has to change. And quickly.

In October 2018, the UN Intergovernmental Panel on Climate Change (IPCC) warned that we then had around 12 years to take bold action to limit global heating to 1.5°C. Beyond that level, even just half a degree of extra warming will bring the prospect of increased drought, severe flooding, extreme heat and impoverishment for hundreds of millions of people.

A year and a half of those twelve has already passed.

Recognising the pressing need to take action, the UK Parliament, the Mayor of London and now over three-quarters of 33 London Boroughs, have rightly declared a climate emergency. Yet the fundamental question remains unanswered by all of them: what action will they take to get to zero carbon in the next 10 years?

Greenhouse Gases (chiefly carbon dioxide) are the primary cause of global heating. The transport sector is the main contributor to total UK and London carbon dioxide emissions, with road emissions rising, not falling. Decisive and transformative action to slash transport, and especially road, emissions is therefore especially urgent; London has the opportunity, the potential, the status and the responsibility to lead the way.

It is true that the Mayor's Transport Strategy, published in 2018, has a target for 80% of all trips in London to be made on foot, by cycle or using public transport by 2041; but a recent study by the Land Transport Academy revealed that, even if London had already met that target, it would still have more car use than four comparator world cities had back in 2014.

The climate emergency demands the pace of change must be now greatly accelerated; and indeed the current Mayor, Sadiq Khan, has joined leaders of other cities in setting out his ambition that London should be carbon neutral by 2030. This ambition would demand far more and faster action than Mayor's Transport Strategy assumes.

The urgency is further increased by the public health crisis that's also associated with our current travel habits: toxic air in

far too many streets, and shorter lives resulting from inactivity. The next ten years are crucial, and the first few especially so if the remaining time is to be used to maximum effect.

London elects a new Mayor in 2020, and new councils in 2022. **The London Cycling Campaign is therefore calling on the next Mayor of London, and all London councils, to make London's roads zero carbon by 2030; and to put London's roads on a firm pathway to achieving that goal on their watch, not simply make easy promises for future leaders to inherit.**

The work needs to start on Day One of the 2020 Mayoralty, to create Climate Safe Streets within a decade.

Changing How We Travel

Making London's streets carbon-neutral cannot simply be about making all vehicles electric. It is tempting to think technology can save us – and, when it comes to reducing the carbon footprint of transport, a lot of hope is being pinned on electric vehicles. But, however comforting, these hopes are misplaced. Transitioning from a fossil-fuelled fleet to one that's clean-fuelled, and embodies zero emissions in its manufacture, is essential but insufficient.

The simple fact is that, however clean, the car can no longer be king. What's urgently needed is that we travel differently.

The UK Committee on Climate Change observed "the continued rise in road transport emissions highlights the urgent need for stronger policies to reduce growth in demand for travel". It has urged the Government to set out a vision for future travel demand planning "for economic growth while reducing car traffic, by promoting walking, cycling and public transport and deterring car and van traffic".

In the same vein, the recent *'Clean Growth'* report by the House of Commons Science and Technology Committee stated: "The Government must develop a strategy to stimulate a low-emissions transport system that should aim to reduce the number of vehicles required, such as by promoting and improving public transport; reducing its cost relative to private transport; encouraging vehicle usership in place of ownership; and encouraging and supporting increased levels of walking and cycling".

In other words, the climate emergency demands not just electric vehicles, but mass mode shift too, as a top priority. In turn this means London's streets must become safer and more convenient for walking and cycling; that bus travel must become cheaper, more reliable and more convenient; that people must have easy access to zero-carbon shared motor transport as an attractive alternative to car ownership; that

freight operations become much smarter and cleaner; and that motor traffic on London's roads is managed equitably on the 'polluter pays' principle.

The Wider Benefits

Embracing mode shift as an imperative isn't actually bad news. Quite the reverse. The case for changing how we travel isn't simply about staving off the worst effects of the climate emergency: it's about a better quality of life and better health for everyone; more choice and less congestion; greater fairness, affordability and convenience; increased business and job opportunities; and thriving high streets. The transport sector can integrate more closely with decarbonisation in other sectors to enable greater coherence and impact of these combined efforts. And for London as a whole, we can give our city a globally competitive edge through 'first mover advantage.' Climate Safe Streets is good news for all.

Making London's Streets Climate Safe

The need to make London's streets Climate Safe by 2030 is clear, as is the need for change in how we travel to empower this, and the wider benefits of doing so. The big question is how?

With rapid and substantial mode shift the key goal to ensure Climate Safe Streets by 2030, everything that can be done to enable people to choose non-car modes must be done. This means major investment in schemes and initiatives that are likely to have most effect. And it also means investment (albeit on a more modest scale) in other, less glamorous, measures designed to make it that bit easier for people to leave the car at home - or indeed to find they don't need one at all. Accordingly, the list of actions we believe need to be taken is as follows, and the word 'rapid' should be taken as preceding each one.

→ Expansion of the Strategic Cycling Network, at the highest quality

→ Coordinated expansion of easy access to low-carbon shared mobility services

→ Development and implementation of a London-wide Smart Road User Charging System

→ Expansion of coverage of Low Traffic Neighbourhoods, to make walking, cycling and scooting the natural choice for short journeys

→ Expansion and optimisation of a network of conventional and demand-responsive zero-emission bus services

→ Proactive support for transition to low-carbon freight transport

→ Enabling shift to low-carbon vehicles

→ Enabling of car-free planning

Climate Safe Streets are a necessity for London, and we believe that, combined, these actions will meet that need. We are convinced about this because of the evidence we've researched: the data, the science, the expert commentary, and the practical experience of others. The evidence demands the Mayor, and the London borough councils must be bold – not least to capitalise on what is now offered by the private mobility sector, which is champing at the bit to embrace new opportunities to innovate in London. This really is a case where a partnership between all levels of government in London and the private sector can deliver the revolutionary change we need.

Londoners Deserve Climate Safe Streets

We know, of course, that having compelling evidence isn't the same as having a compelling story. The presumption that people will always resist change is untrue. Although politicians and practitioners may be all too familiar with the voice of the loud minority, the vast majority of Londoners are deeply concerned about the effects of climate change and are looking for leadership about how they can make a difference.

Those same people, however, won't choose alternatives that don't meet their needs. They need to be enabled to change; and that's what the actions we call for will do. Put simply, the Climate Emergency demands, and Londoners deserve, much better transport options.

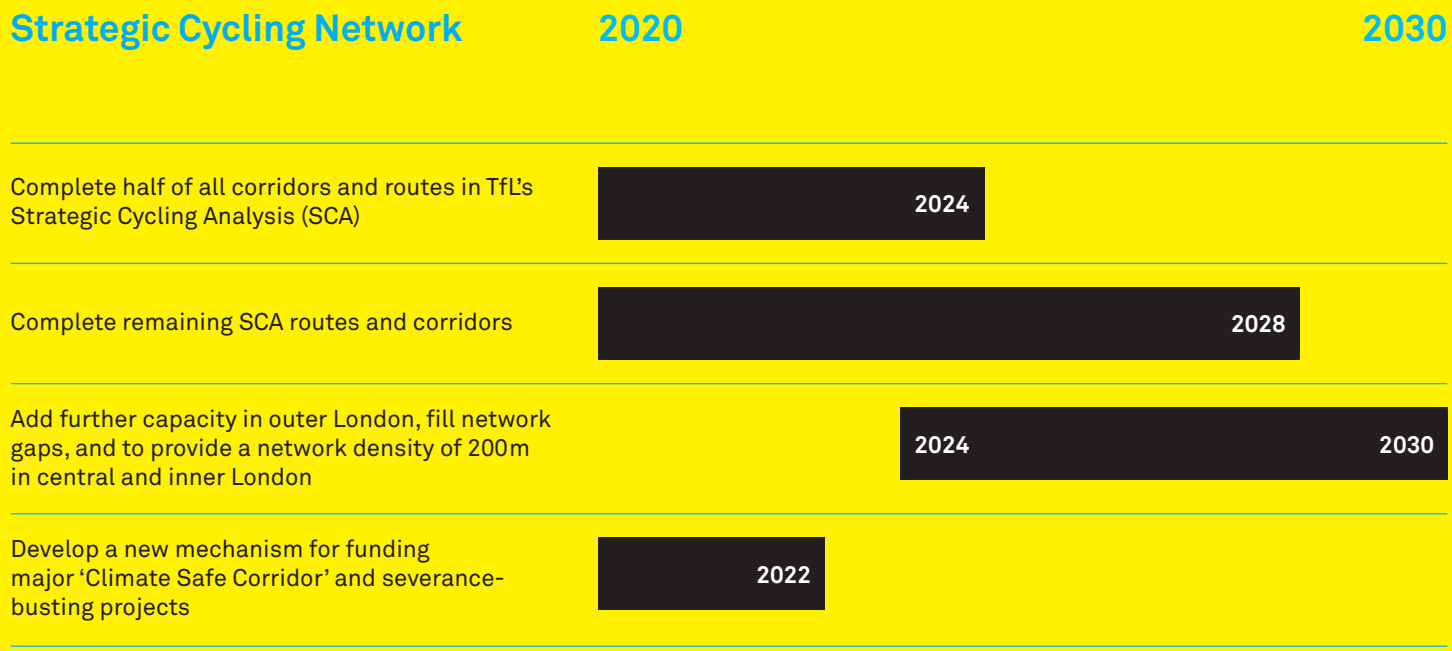
They deserve better than to sit in traffic, making it worse; than to breathe toxic air; than to feel unsafe while walking or cycling; than to suffer delayed and crowded buses; than to feel unable to turn the school run into a stroll; than to think they have no option but to spend so much money on owning and running cars that sit idle 95% of the time.

Londoners also deserve to be better engaged in the process of change. They don't, and shouldn't, take kindly to being talked down to or told they should use inadequate transport alternatives. So, the process of change must embrace a better understanding of people's needs, obtaining and providing better information, communicating the wider benefits, and demonstrating how all can play their part. The knowhow to do this is available.

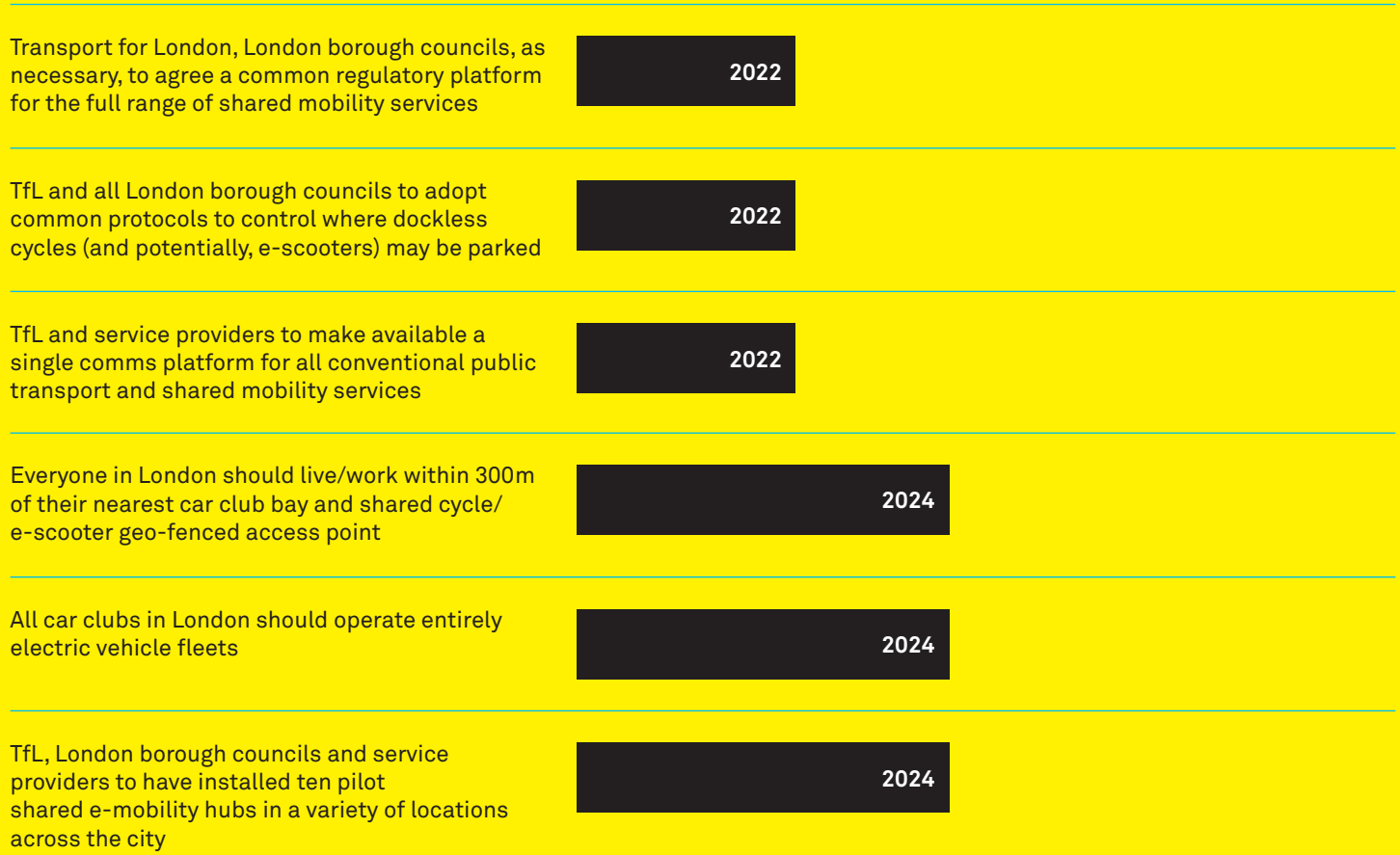
Enabling all Londoners to travel differently and therefore live better is within the city's grasp. The task of creating zero carbon, Climate Safe Streets is tough, but achievable. The decisions taken by the next Mayor of London, and by the leaders of London's councils, will be make or break. They can and must lead the way towards decarbonising London's roads by 2030, and inspire not just the country, but the world as well.

4. TIMELINE FOR CHANGE

Strategic Cycling Network



Shared Mobility Services



Smart Road User Charging

2020 — 2030

Deliver the London-wide Low Emission Zones (LEZ) and the expanded Ultra-Low Emission Zone as currently proposed	2021
Prepare a strategy to consolidate the existing London Congestion Charging Scheme, U/LEZ and London Lorry Congestion Scheme (LLCS) within a single London-wide Smart Road User Charge (SRUC) system	2020
Undertake and complete the research and consultation necessary to underpin specific proposals for implementing the SRUC	2024
Complete implementation of the SRUC	2028

Low Traffic Neighbourhoods

2020 — 2030

London borough councils with TfL as necessary, to developed core local journey network plans	2021
London borough councils to prepare a costed three-year improvement programme for these plans in their Local Implementation Plans (LIP) bids	2021
TfL to prepare a comparable improvement programme for the Transport for London Road Network (TLRN)	2021
TfL to require School Streets and Low Traffic Neighbourhood programmes within all Boroughs' LIP bids	2021

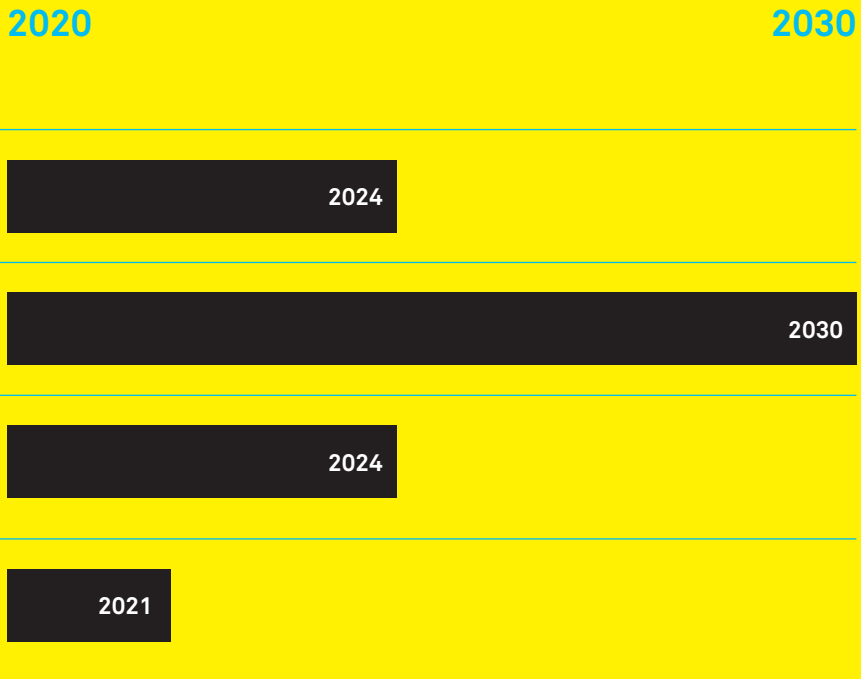
Clean Bus Network

	2020	2030
TfL to develop a comprehensive plan for improving bus priority on key routes to explore making selected streets general traffic-free	2021	
Complete all planned bus lane improvements that do not require traffic filtering.	2024	
Complete five pilot general-traffic-free Climate Safe High Street projects (Zero Emission Zones) in selected town centres.	2024	
Establish a new target for an entirely zero-emission bus fleet by 2030	2030	
Review the current trial demand-responsive bus services and report on how such services can be delivered in other areas.	2020	
Publish a plan for increasing the number of new types of service in partnership with relevant service providers	2021	

Low Carbon Freight

	2020	2030
The Mayor and TfL to refresh the Freight and Servicing Action Plan in line with a target of a zero-carbon London by 2030. To include:		
A ‘bold new scrappage scheme’	2020	
A review of the London Electric Vehicle (EV) Infrastructure Delivery Plan	2020	
Guidance & deadlines for Area Freight & Servicing Management Plans	2020	
Short-term changes to the London Lorry Control Scheme	2020	
Plans for Greater London Authority (GLA)/TfL land to be used for local distribution/collection centres	2020	

Clean-fuelled Vehicles



Car-free Planning

5. LONDON IN 2030

Amidst the rush of a spring morning, someone takes a seat under the shade of a tree, coffee and pastry in hand, and watches the world go by. A few years ago, the view was mostly parked cars, but it's people that draw the attention now, especially people on the move. Small groups of young children walking to school, some with an adult, some with just their friends; others striding, strolling or rolling to and fro; loads of people cycling to school, work or who-knows-where, sharing the cycle tracks with folk on mobility and other scooters; passengers on the quiet, clean-fuelled bus; and the driver who occasionally rings its bell to make certain others know the bus is there.

There are other sights to take in: the trees, the flowers and the little green spaces where people sit and play; the electric van driver trolleying his load to the greengrocer's before the morning delivery window closes; the cycles and scooters in their designated space, ready to be hired; the occasional e-cab, or e-car with its club logo; buildings no longer hidden behind a layer of grime; and, now and then, an emergency vehicle hurrying on its way, unobstructed by the congestion that used to slow it down.

As the siren fades into the distance, a host of other sounds can be heard. There are voices at various pitches and volumes (they seem mostly happy, but it can be hard to tell); there are different types of bells, a horn from time to time; and there's the sound of tyres on tarmac. Sometimes, you can also hear the birdsong, but it's the voices you notice most – or perhaps you don't, because they're now such a familiar backdrop.

Despite the busy-ness, the atmosphere is energising, not enervating. It feels good. It looks good. It sounds good. It even smells and tastes good, and that's not just the coffee. It's because it's clean and there's nothing to choke on – unless a bit of pastry goes down the wrong way.

* * * * *

This is a vision of London a decade from now. A city with streets designed and managed so that everyone who wants to (e-)cycle for their everyday journeys, can. Where walking is safer and more convenient. Where better and smarter public

transport services connect our town centres and residential areas. And where no-one need have the expensive burden of owning a motor car, because of the convenient and affordable alternatives available: shared (e-)cycles, e-scooters, electric cars and vans; ride-sharing networks; and zero carbon taxis and private hire vehicles.

It may seem a world away, but we think the city can get there – and we know we have to try.

Because the scene described is a Climate Safe Street, these are streets are for people, not cars. Streets that enable people and goods to move in ways that tread lightly on our precious planet. Streets that help us meet the demands of the climate emergency and help us stay healthy.

Streets for all. Streets for life.

* * * * *

This is what London can be.

People are the city's greatest resource and streets are its most valuable public asset. For a long time, we have needed to use these streets more wisely, and the consequences of not doing so are now stark.

So, this report is a call for urgent change. If its present and future generations are to thrive – indeed, perhaps, to survive – London needs Climate Safe Streets.

6. THE URGENT NEED FOR CLIMATE SAFE STREETS

6.1. Climate Emergency

A landmark report by the UN Intergovernmental Panel on Climate Change (IPCC)[1] warned in October 2018 that if we are to have a 66% chance of keeping global average heating under 1.5°C, the global carbon budget remaining will be used up by 2030 under a business-as-usual scenario. In other words, we had 12 years – now it's nearer to ten years – to take the necessary actions to limit heating to 1.5°C, beyond which even half a degree will significantly worsen the risks of drought, floods, extreme heat and poverty for hundreds of millions of people.

Recognising that a climate emergency is upon us, parliament, the Mayor of London, and (by February 2020) 24 of the 33 London local authorities have declared a climate emergency.

6.2. Where We Are: transport and carbon emissions

The energy gained from the burning of fossil fuels is arguably the single most important reason why we have seen an unprecedented rise in global living standards since the industrial revolution. However, we are now facing a climate emergency because of the global heating caused by the greenhouse gases (principally carbon dioxide) that are emitted from this combustion. The UK transport sector is the country's largest emitter of greenhouse gases (see chart), with 33% of all carbon dioxide emissions in 2018 being from this sector, and road transport alone accounting for around 20%. What's more, unlike the traffic sector, in recent years the power[2], industry[3] and waste[4] sectors have achieved significant reductions in emissions

Reference Figure 1 (p21)

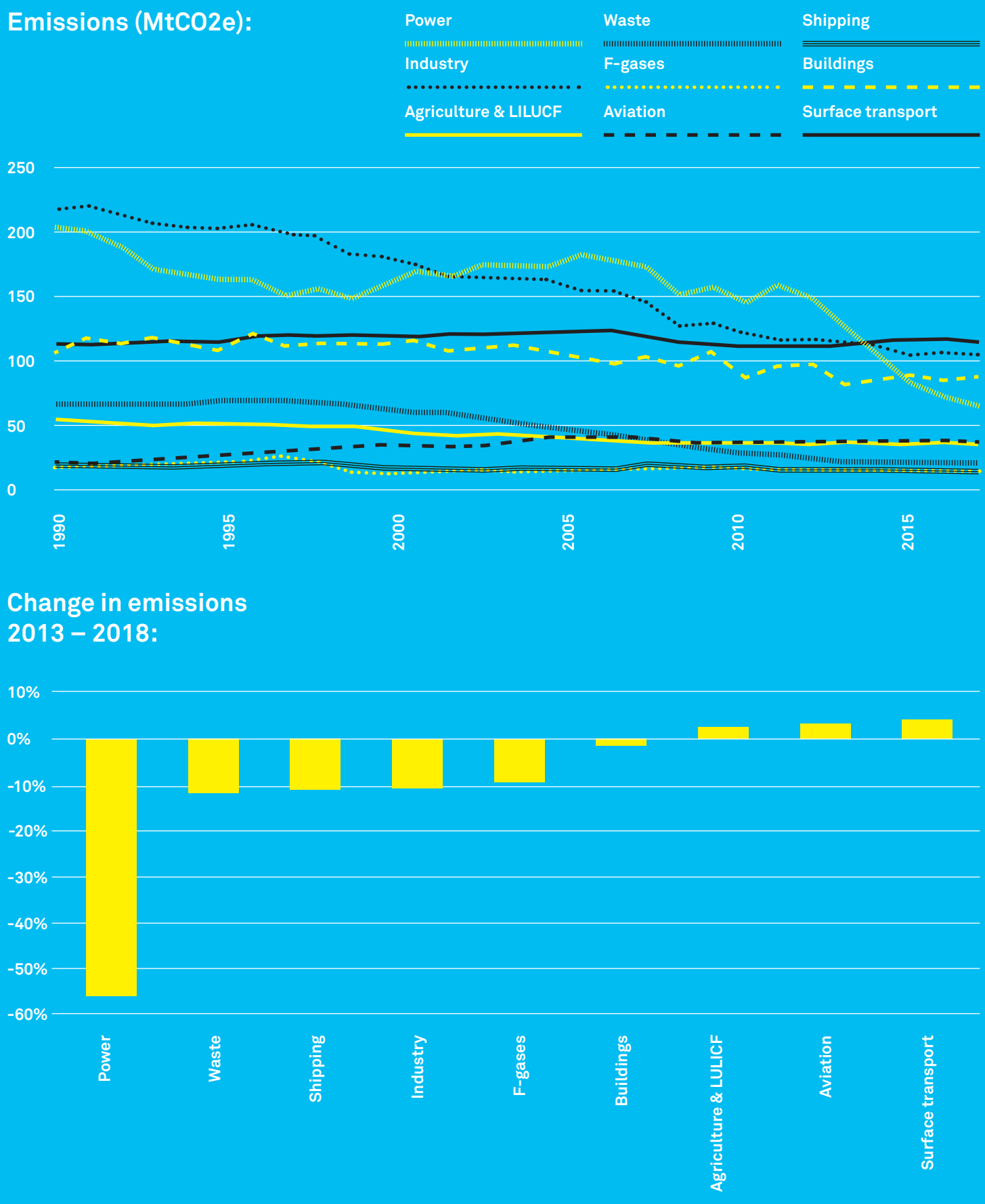
The picture in London is similar to the national one. Road transport contributed around 21% of all carbon dioxide emissions in 2017. Although domestic and industrial/ commercial emissions were respectively 35% and 54% lower in 2017 than they had been in 2000, the reduction in the transport sector was just 9%[5], with road transport emissions rising[6].

Reference Figure 2 (p22)

Change within the transport sector is therefore especially urgent, and London has the opportunity, indeed the responsibility, to lead the way.

In transport terms, the city has the ingredients for being one of the most sustainable large cities on the planet. Almost half

Figure 1 - Trends in UK sectoral GHG emissions

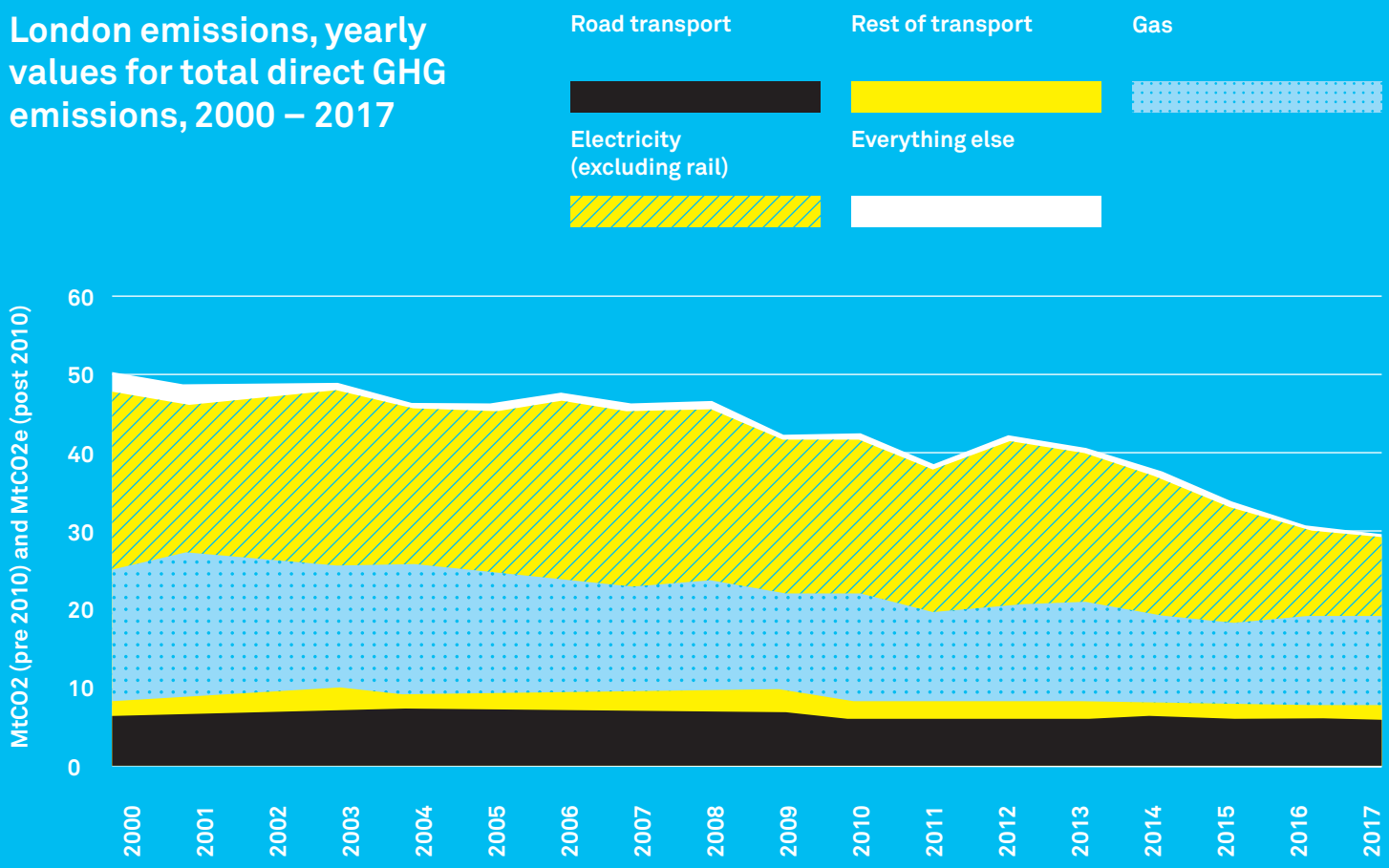


Source: BEIS (2019) 2018 UK Greenhouse Gas Emissions, Provisional Figures; BEIS (2019) 2017 UK Greenhouse Gas Emissions, Final Figuresl; CCC calculations.

Notes: The chart on the right-hand side shows changes in sectoral emissions between 2013 and 2018 for all sectors except for Agriculture, LULUCF, Watse and F-Gases which cover the period 2013 – 2017; buildings emissions in this chart are temperature-adjusted.

Figure 2

London emissions, yearly values for total direct GHG emissions, 2000 – 2017



Trip-based mode shares by type of transport, 2000 – 2018

Year	Public Transport	Private Transport	Cycle	Walk
(2000)	(27%)	(48%)	(1.2%)	(24%)
2009	33%	41%	1.9%	24%
2010	33%	40%	2.0%	24%
2011	34%	39%	1.9%	24%
2012	35%	39%	1.9%	24%
2013	36%	38%	1.9%	24%
2014	36%	38%	2.1%	24%
2015	36%	37%	2.2%	24%
2016	36%	37%	2.4%	25%
2017	35%	37%	2.4%	25%
2017	36%	37%	2.5%	25%

Source: London Energy & Greenhouse Gas Inventory (GLA) https://data.london.gov.uk/dataset/leggi

Source: Strategic Analysis, TfL City Planning.

Note: Trips are classified by the mode that is typically used for the longest distance within the trip.

of households do not own a car, and this is in large part thanks to the extensive public transport network, which offers people a viable, cost-effective and efficient alternative to private car use, especially for longer journeys. The 2019 *Travel in London* report looks at travel trends between 2000 and 2018, looking at how mode share (main mode for all personal trips) has changed over the past ten years. Their table, reproduced below, shows that trips by motorised public transport (buses, tubes, trains) now represent more or less the same share as those by motorised private transport (cars, motorcycles, taxis), and the share of trips on foot and by cycle has also grown over the past decade.

Reference Figure 2 (p22)

Examined closely, however, these trends are not as encouraging as they initially appear. As the figure reproduced opposite shows, although the amount of motor traffic on London's roads (measured in vehicle kilometres) fell consistently in the six-seven years after 2006, levels have picked up again in the last five years, especially outside central London. This represents a significant threat to meeting the core target set out in the 2018 Mayor's Transport Strategy (MTS) for 80% of all trips in London to be made on foot, by cycle or using public transport by 2041[7].

Reference Figure 3 (p25)

The growing climate emergency means that not only does it remain vital for this 80% target to be met, but that it is necessary that it should be achieved sooner than 2041.

How does currently London rank as a Climate Safe City? The Land Transport Academy reported on transport mode shares in 27 world cities, and the results show that London performs poorly by comparison [8]. While London is often compared favourably with other UK cities, this report indicates that when rated against reasonable and obvious comparator cities across the globe, the story is much bleaker. Of the 22 cities for which statistics for walking and cycling (as well as private and public motor transport) were reported, London is ranked tenth place for walking and cycling, sixteenth for public transport and sixteenth for private transport (i.e. London has the seventh highest private transport mode share of the 22 cities). A graph showing the rankings and comparator global cities is shown on page 25 (figures for Greater Manchester have also been included to offer a UK comparison).

Reference Figure 3 (p25)

If London had already achieved the MTS 2041 target of 80% of trips made by walking, cycling and public transport, this would give it the fifth lowest mode share for private cars. Since most of the other cities are also trying to tackle emissions by reducing private car use (even if they are not being overt about it at present), London will have even more to do to become a leader.

It is also essential not to lose sight of the fact that current travel habits have direct negative consequences for the health of all London's inhabitants. The over-dominance of motor traffic has made our streets toxic[9], with our citizens dying early from air pollution[10] and inactivity-related diseases [11].

6.3 Where we need to be: A healthy, liveable and climate safe city

Professor David Metz at the Centre for Transport Studies produced a study in 2015 looking at changes in travel patterns as a consequence of population growth at increasing density, taking London as its example[12]. Car travel in London peaked in 1990 with a 50% mode share, but this had dropped to 36% by 2015, and Professor Metz predicted it would drop to 27% by 2050. The MTS target that no more than 20% of all trips in London will be by car by 2041 outstrips this prediction, but the climate emergency demands that the city needs the rate of decline in car use to be even more rapid.

The graph reproduced on page 27 is from Metz's study. On it we have annotated both the MTS target of no more than 20% of London travel by car in 2041 and a more challenging target that we think is now necessary in light of the climate emergency: no more than 10% of London travel by car in 2041. (This target embodies the associated target that none of these car trips will involve internal combustion engines.)

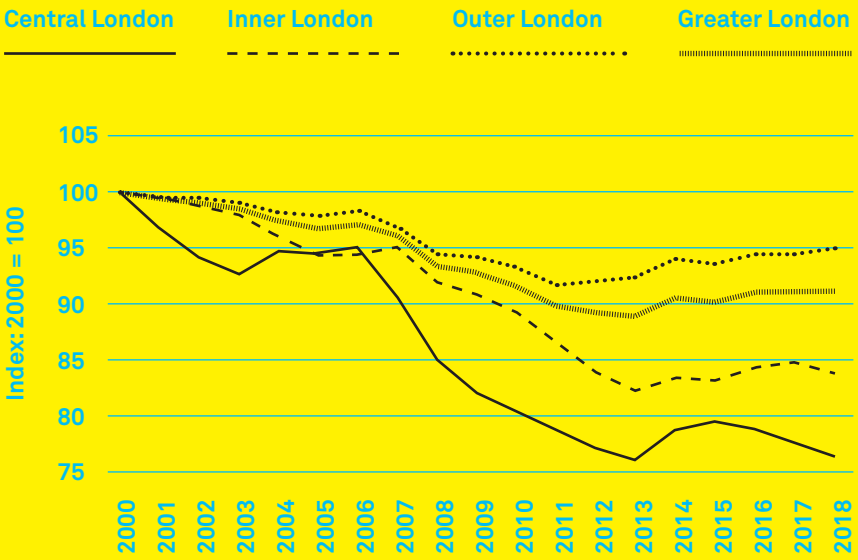
Reference Figure 4 (p27)

The need to accelerate the pace of change in terms of transport emissions is widely accepted, as evidenced by announcements from the Prime Minister[13] and from Mayor Sadiq Khan, who committed in January 2020 to making London carbon-neutral by 2030, if re-elected[14]. In short, the climate emergency means we have to go further and faster. For London, this means, for example, both the rapid expansion of the Liveable Neighbourhoods programme and of the Strategic Cycling Network, and the urgent review of the decision to proceed with the Silvertown Tunnel project, as currently proposed. But much more is also needed.

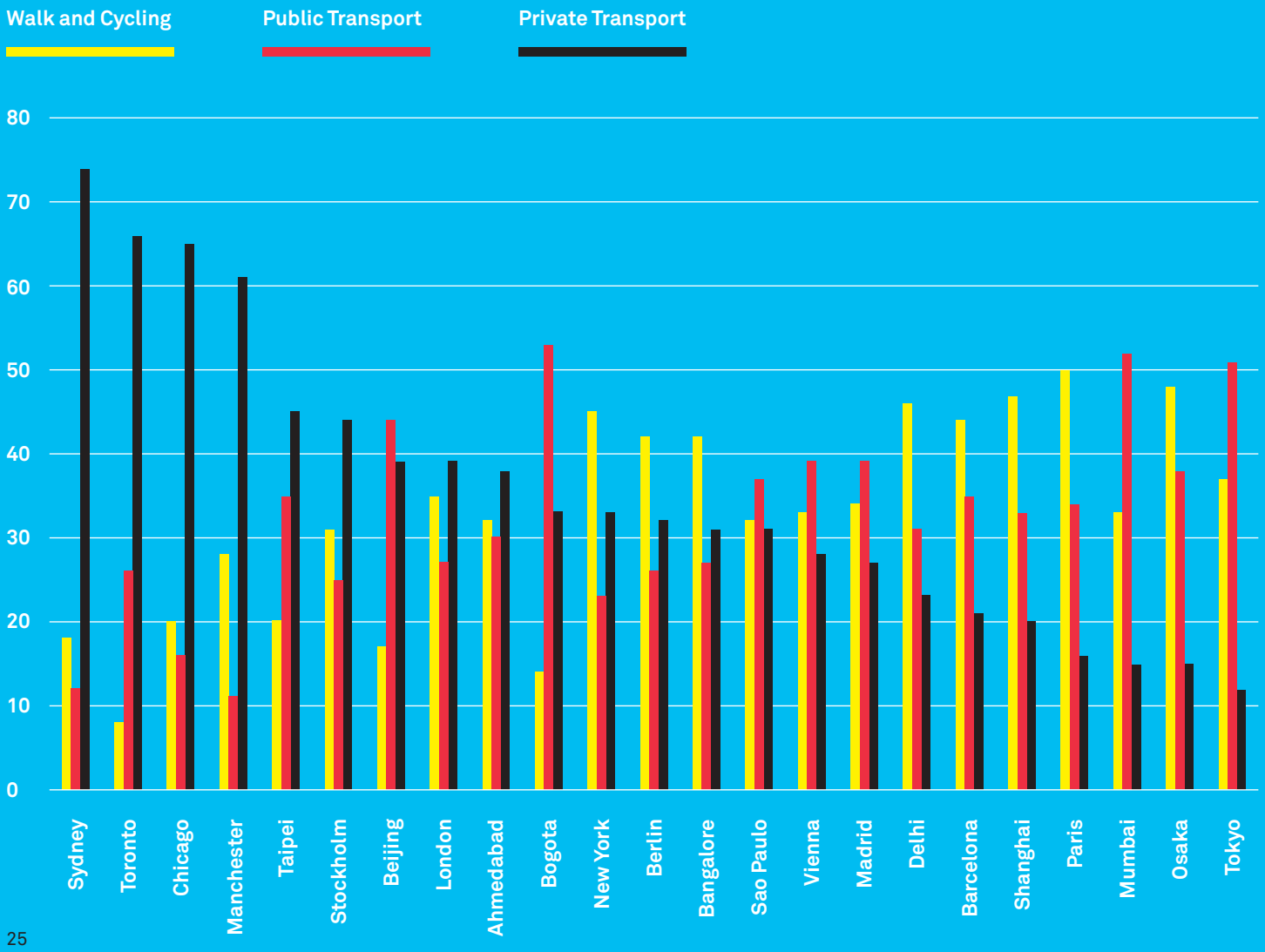
The comprehensive review of the current system of congestion charging is especially urgent. The MTS acknowledges that "changing the way Londoners pay for using private vehicles on London's roads could help significantly to reduce the congestion and emissions associated with car dependency," and that "fifteen years after the introduction of the Congestion Charge, the challenge facing central London has changed." In fact, the challenge facing all of London has changed to such an extent that the MTS proposal to keep the current Congestion Charge scheme "under review" (Proposal 20) is too passive a response. What London now needs, and what must be delivered in the next Mayoralty, is what the 2018 MTS (Proposal 21) proposes only investigating: "the next generation of (more sophisticated road user charging... replacing the Congestion Charge, Low Emission Zone and Ultra Low Emission Zone."

Figure 3

Trends in the road traffic (vehicle kilometres), all motor vehicles in central, inner, outer and Greater London, 2000 – 2018



Graph showing mode share for comparator global cities. Ordered by private car share.



Charging those users who make the least efficient use of scarce street space, and who pollute most, is both reasonable and fair, but we know that the visceral responses to the idea from some users has caused it to be perceived as a 'hard sell' politically. We believe, however, that the 'polluter pays' principle can become broadly accepted when presented as part of a package of measures designed to improve everyone's quality of life: measures that make travelling on foot, by cycle and by public transport much more attractive, and that enable people to use shared, low-emission vehicles for essential trips. Urgent action on these fronts is what London needs. It is worth noting that the Government reasserts both the polluter pays principle and the precautionary principle[15] as two of five core principles enshrined within the 2020 Environment Bill[16].

Some people like driving to out-of-town shopping and leisure centres because, when there, they can leave their cars behind, relax and enjoy themselves. But everyone, not just those with access to a car, should be able to have a comparable experience much nearer to home. Our town centres and neighbourhoods need to become just as attractive and relaxing, and active travel – strolling, riding a cycle, jumping on a bus – needs to be easier to choose than the alternative (often sitting in traffic jams).

London is successful, vibrant, diverse and outward facing: a city that the world looks to and whose lead others often follow. Yet, although our public transport system is often looked at with envy, our streets have a poorer reputation, thought of as congested, polluted and unsafe. While many streets have become better places in the past decade or so, the need to increase the pace of change is now urgent. The next ten years are crucial, and the next few especially so if the remaining time is to be used to maximum effect.

Transport is one of the main policy responsibilities of London's Mayor, and perhaps the most important in terms of making the city Climate Safe. This report is calling on the next Mayor to focus on making London's streets Climate Safe by 2030.

We do not underestimate the size or complexity of the challenge, yet it is relatively simple to articulate. London needs far fewer trips by motor vehicles that emit greenhouse gases and harmful particulates, and that also use scare street-space inefficiently. To achieve this, Transport for London and the 33 local authorities must enable and encourage people to choose to travel differently; and also to enable and encourage the movement of goods and services to take place in less polluting and more space-efficient ways.

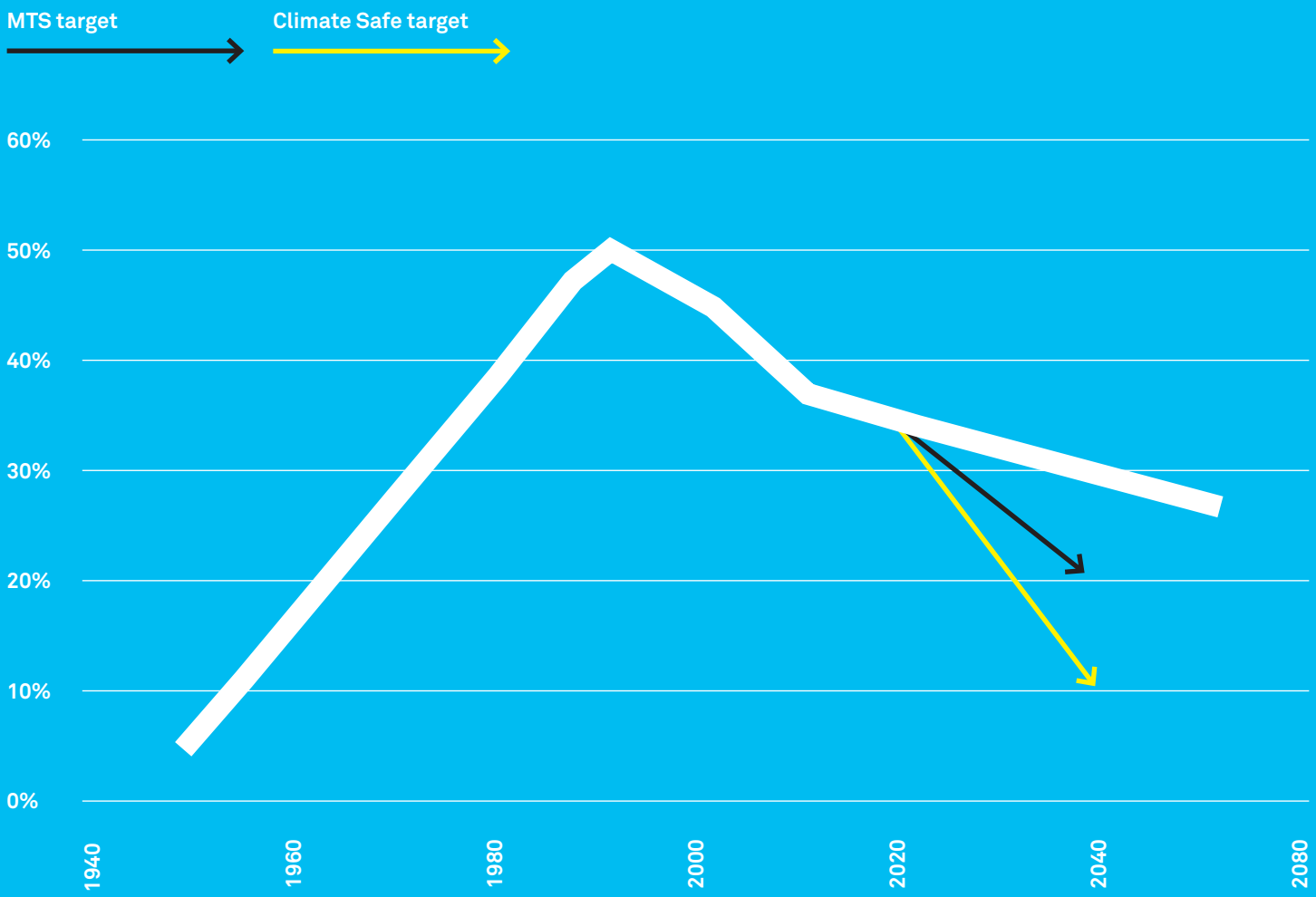
The current MTS (Policy 10) states that "the Mayor, through TfL and the boroughs, and working with stakeholders, will use the

Healthy Streets Approach to deliver coordinated improvements to public transport and streets to provide an attractive whole journey experience that will facilitate mode shift away from the car." These are the right words, but what the climate emergency demands – what London must have – is that, from Day 1 of the new mayoralty, such words are matched by deeds.

Transport for London's response to the transport challenges of the 2012 Olympics showed that, despite doubters, the city's streets can successfully be prioritised away from private motor traffic. This report makes the case for implementing swift and effective operational changes for a much more important and urgent purpose.

Figure 4

Share of journeys by car in London 1950 – 2050



7. CHANGING HOW WE TRAVEL

7.1 However clean, the car can no longer be king

In May 2019, the UK Parliament declared an environment and climate emergency.

A few months later, the Prime Minister Boris Johnson said he was "deeply optimistic about the potential of technology to make the world a better place[17]." And in his launch speech of the COP26 conference to be held in Glasgow in November 2020[18], he focused very heavily on technological change – and specifically electric vehicles – as the answer to the challenges we face.

This being the case, why do we worry? Can't we just carry on more or less as we are, and leave the scientists and innovators to harness technology to reduce our carbon footprint? Aren't electric vehicles and, later on, autonomous vehicles the answer? The simple, factual answer is 'No'.

The belief that advancing technology will save us from having to make difficult decisions is comforting, and thus tempting. It is, however, a misplaced faith. In the specific case of road transport, transitioning from a fossil-fuelled to a clean-fuelled fleet is essential, but it's not nearly sufficient. Similarly, while the prospect of driverless vehicles may be fascinating, it offers little new in terms of environmental performance and is, in any case, far too distant to meet the demands of the climate emergency.

If Climate Safe targets are to be met, overall traffic levels must reduce substantially. The precise scale of the reduction needed is yet to be clarified by the Committee on Climate Change, a non-departmental public body that advises the government. However, provisional work has found that even if all new cars were ULEVs by 2035 (80% battery electric, 20% plug-in hybrids), a 58% reduction in car mileage between 2016 and 2035 would be needed for car carbon dioxide emissions to be in line with a 'well below 2°C' pathway[19].

There are, in any case, serious doubts about how quickly the transformation of the UK's existing vehicle fleet to cleaner fuels can be achieved. To coincide with the Prime Minister's COP26 launch speech, the government announced that it plans to bring forward an end to the sale of new petrol and diesel cars and vans from 2040 to 2035, or earlier if a faster transition

is feasible, subject to consultation. But the justifiable scepticism with which this announcement has been met, not least by the auto industry and some groups representing the car-owning public, is an indication that the pace of technological change will prove inadequate in the context of the climate emergency we face.

Moreover, while achieving zero tailpipe emissions is plainly a worthy objective, the carbon dioxide emitted in the production phase of motor vehicles is already a concern in its own right, and greater for electric vehicles than internal combustion. There is also the damage caused by non-exhaust emissions from road traffic (particles from brake, tyre and road surface wear), respectively constituting around 60% and 70% of road transport emissions of primary PM2.5 and PM10, which have various adverse health impacts[20].

The key issue is that we need less car travel.

Responding to the Government's Road to Zero strategy[21], the Committee on Climate Change concluded that "our assessment of existing and newly agreed policies for road transport is that they are insufficient to ensure the reductions in emissions necessary to meet the 5th Carbon Budget in the most cost-effective way[22]." The committee's first recommendation to the government was therefore that it should set out a vision for future travel demand:

The continued rise in road transport emissions highlights the urgent need for stronger policies to reduce growth in demand for travel and stating that evidence "shows it is possible to plan for economic growth while reducing car traffic, by promoting walking, cycling and public transport and deterring car and van traffic."

7.2 Behaviour change

The Committee on Climate Change reported in 2019 that surface transport in the UK is responsible for 115 million tonnes of carbon dioxide per year[23]. This equates to roughly a quarter of all emissions. Accordingly, the committee set as priorities:

→ A sales ban on conventional vehicles moved to 2030-2035

→ A clearer approach to EU vehicle standards and testing

→ stronger incentives to purchase cleaner vehicles

→ Plans for roll-out of zero emission HGVs and stretching targets for carbon dioxide reductions

→ Schemes to support walking, cycling, public transport

These are set out as the first steps in the journey towards the UK being carbon-zero by 2050. The longer-term milestones given are: the continued development of electric vehicle charging infrastructure; a decision on how to switch HGVs to zero emission to be made in the 2020s; and a 98% reduction in transport emissions by 2050.

While it is encouraging that more walking, cycling and public transport are referenced as part of the solution, it is hard to see how these modest priorities would lead to the carbon-zero target by 2050, let alone sooner. They do not represent sufficient pressure for the necessary change, and this means that they also provide weak incentives for the private sector to develop new services. In addition, perhaps due to its faith in technological prowess, the government has failed to insist that mayors, or other local authorities, implement policies that would make their citizens and businesses change their behaviours.

The House of Commons Science and Technology Committee noted in its 2019 report *'Clean Growth*[24]*'* that "the Government wants 'almost every car and van to be zero emission' by 2050, which is equivalent to removing almost 20,000 conventional cars every week on average, from now until 2050." It goes on to observe, however, that only "around 1,200 new ultra-low emissions vehicles were registered each week in 2018." This helps visualise how foolish it is to lean heavily on electrifying the UK vehicle fleet as the solution to our transport emissions challenges.

Although the report devotes little space to the other, more effective transport changes we need, it provides a helpful reminder of the fact that the Committee on Climate Change has argued that "the continued rise in road transport emissions highlights the urgent need for stronger policies to reduce growth in demand for travel." It also notes the Government's admission that the estimated impact of all sustainable travel interventions since 2009 was for a reduction in the number of car kilometres travelled per year of just 0.5% by 2021.

In the context of this dismal record, the Science and Technology Committee hits the nail on the head when it states that "one important factor in consumers' decisions to purchase a vehicle or not would be the availability, quality and cost of public transport, alternative options such as walking and cycling, and car share schemes." Accordingly, the committee states that:

"The Government must develop a strategy to stimulate a low-emissions transport system, with the metrics and targets to match. This should aim to reduce the number of vehicles

required, for example by: promoting and improving public transport; reducing its cost relative to private transport; encouraging vehicle usership in place of ownership; and encouraging and supporting increased levels of walking and cycling."

In other words, both the Committee on Climate Change and the Science and Technology Committee agree that, in terms of transport changes required to meet the climate emergency, what's needed most is a reduction in car traffic through a shift to sustainable modes (walking, cycling and public transport). This can be achieved through improving the attractiveness of sustainable modes of transport and deterring car use.

Such an approach is also recommended by the European Academies Science Advisory Council in a 2019 report entitled *'Decarbonisation of Transport: Options and challenges*[25]*.'* It notes that there is no 'silver bullet' concerning what needs to be done to facilitate the transition to a decarbonised future. While electric vehicles are often talked of as though they are a panacea, the report promotes the Avoid-Shift-Improve order of priorities[26], which puts better vehicle performance in last place in terms of its potential benefits.

Avoiding or containing demand for passenger and freight transport services can be achieved by enabling people to live closer to where they work, shop, go to school, etc. This reduces travel distances and makes non-car modes more attractive for more trips, and thus promoting mode shift. Improving the tailpipe performance of vehicles must be part of the answer to decarbonising transport, but it is clear that we cannot carry on as we are, simply in cleaner vehicles.

What's really needed is that we travel differently.

2.3 Mode Shift

Reference Figure 5 (p34)

The climate emergency demands radical change in how both people and goods move about. At the national level, our transport priorities continue to promote and favour private transport, from fuel duty freezes to huge expenditure on road-building programmes designed to maximise motor traffic flow. This impacts transport in London in terms of funding and support for walking, cycling, public transport and shared mobility services, as well as having knock-on effects on the challenge of transition between the national road network and the city's street network, and public perceptions about how best to deal with transport problems.

The enduring main issue for London's streets is that private motor transport is an unacceptably inefficient use of scarce and valuable space. The inefficiency of cars as people movers

is highlighted by the fact that around 60% of car trips made by Londoners are single occupancy: just the driver, with no passengers[27]. But this isn't just about moving traffic, it's also about parked vehicles. In the UK, the average car is in use for only around 4% of the time[28], and it has been estimated that parking occupies 8,000 hectares of land in Central London (equivalent to 57 Hyde Parks)[29]. Shifting journeys out of private cars and into more sustainable modes of transport frees up space currently used by parked cars for cycling and walking infrastructure, shared mobility options and public space improvements.

With this in mind, the EASAC report includes mode shift as one of its core 'Avoid' recommendations, because the advisory council understands the importance of avoiding car use. Accordingly, it urges "cities, local authorities and business to promote walking, cycling, car sharing, working from home, teleconferencing, etc. to discourage use of passenger cars in urban areas".

Under the 'Shift' heading, the advisory council's key recommendations are to "raise the occupancy levels of existing public transport, and use mobility-as-a-service business models; to improve real time passenger information; to invest in more bus lanes; to increase the frequency of services; and to improve interchange."

In keeping with these priorities, our challenge to the Mayor and the boroughs focuses on what has the chance to make the greatest positive difference, fastest: enabling and, as necessary, incentivising people to travel less in cars and more by foot, on bikes, and on public transport. This will mean:

→ Making it more attractive for more people to cycle more;

→ Enabling people to use zero-carbon shared private transport (scooters, cycles, cars and vans) and thereby reduce car ownership;

→ Implementing a smart, equitable and London-wide system of road user charging, building on and integrating the existing Congestion Charge and ULEZ (Ultra Low Emission Zone) systems;

→ Making it safer and more convenient for people to walk short journeys, especially to school and to enable them to access public transport and shared mobility services;

→ Improving the quality, reliability, speed, accessibility and (as necessary) capacity of bus travel, as well as reducing its cost;

→ Reducing the emissions from freight operations in the capital, covering not just cleaner vans and lorries but also mode shift to e-cargo-cycles for ‘last mile’ deliveries.

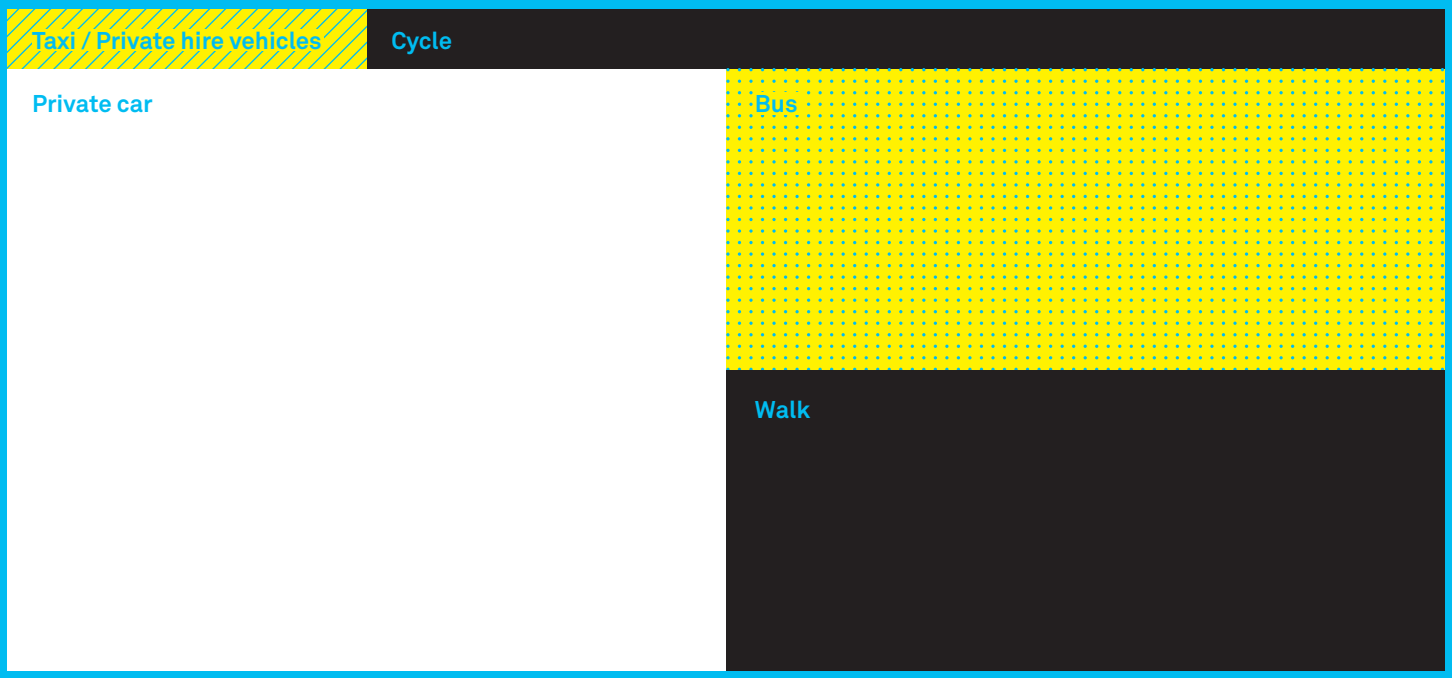
Whilst all of this is reasonable, and even achievable in broad terms, it is the speed with which London must decarbonise that is the central, sobering challenge. Incremental reductions in car use won’t be enough: mass mode shift away from private car use over the space of ten years will be required, necessitating a new surface transport paradigm for the capital. Thus, perhaps the single most important thing the Mayor of London can do is to make private motor car ownership unnecessary for the vast majority of Londoners by 2030.

Although our focus is on making the alternatives more attractive, we don’t underestimate how tough this will be or how politically scary it might look. But it can be done, and the good news is that making streets Climate Safe will be achieved by making improvements that bring a host of other benefits. Before we lay out the actions that will be required to make London’s streets Climate Safe, these benefits are briefly described in the following section.

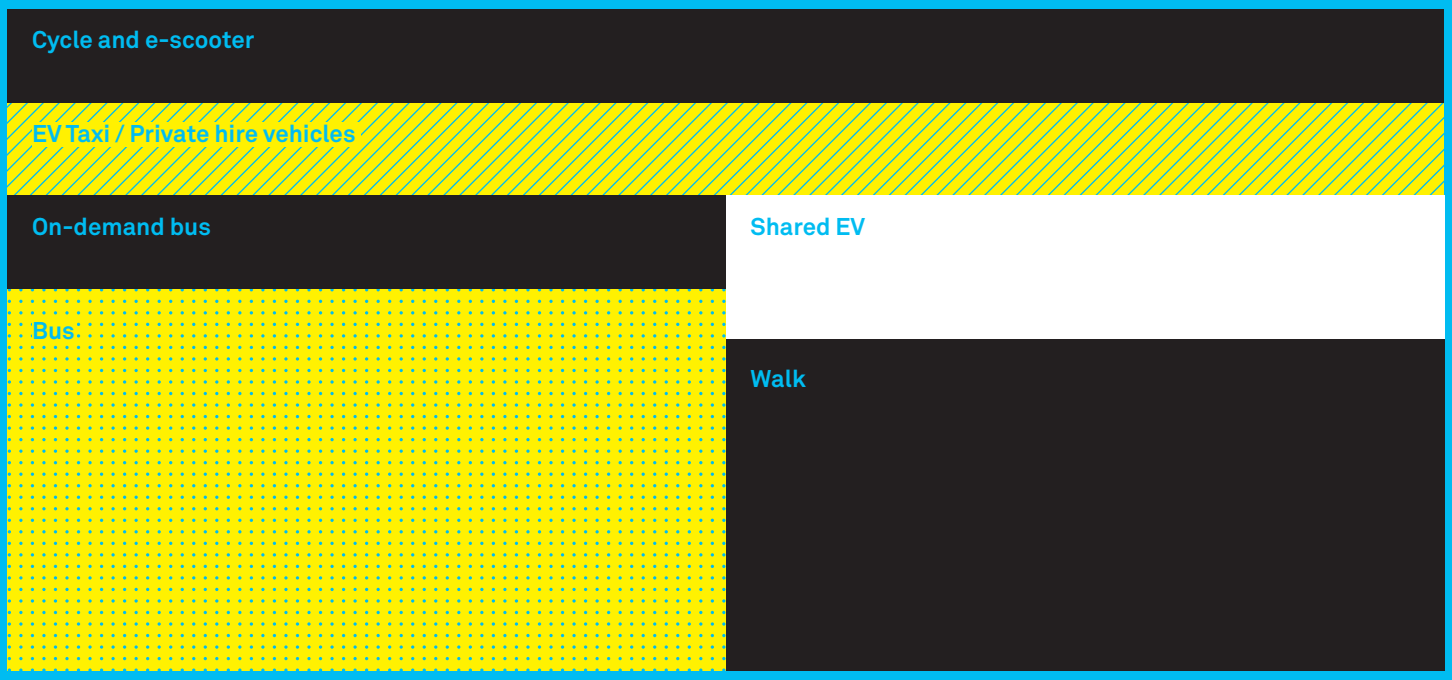
Figure 5

Potential mode shift 2020 – 2030

2020



2030



8. THE WIDER BENEFITS OF CLIMATE SAFE STREETS

Making London's streets Climate Safe isn't just a necessary response to the pressing threat posed by climate change, it's the opportunity to deliver a wide range of other benefits that will be felt by everyone. This section summarises the many ways in which Climate Safe Streets will be the better streets that Londoners deserve.

8.1 Better Public Health

Decarbonising motor transport would reduce pollution and its many harmful effects, including 40,000 early deaths annually in the UK through lung and heart disease[30]. Furthermore, at present only one-fifth of Londoners are getting the UK Chief Medical Officer's recommended minimum 150 minutes of exercise a week. A 15-minute cycle ride to and from work every day would alone provide exactly that amount of weekly exercise. While becoming physically more active can seem like a chore, the release of endorphins actually helps us feel good and is good for mental health[31].

8.2 Fairer Mobility

Transport is a social justice issue. The vast majority of Londoners don't have access to a car for most journeys. Moreover, studies have shown that those who suffer from the effects of private motor travel – delays, ill health, injury or death in collisions – are disproportionately those who are less well-off. All Londoners, irrespective of background of wealth, have the right to travel safely, healthily and efficiently. Those on low incomes who have no or very limited access to car travel for most trips deserve better alternatives than they currently have. Improving conditions for walking and cycling and providing better and cheaper public transport services are at the heart of making streets Climate Safe. A more comprehensive and accessible shared mobility offer – including car clubs – forms part of the Climate Safe Streets package, and will enable people who can't afford a car to access one on those occasions when it's the best mode of transport for the trip. It is essential also to take account of the costs of driving imposed on others, including fellow car travellers: congestion, pollution, and injury or death. The memory of fuel price protests should not mask the fact that drivers typically perceive the cost of any given journey to be very low and that they are generally more wealthy than those who do not own cars[32].

8.3 Just transition

Changing to a low-carbon economy, and specifically to low- or zero-carbon transport system, raises the prospect in people's minds of diminished livelihoods – most obviously, perhaps, as a result of lower car sales. However, there is huge potential for employment in the manufacture, sale and operation of more sustainable forms of transport (cycles, e-scooters, electric vehicles, connected and autonomous vehicle systems, systems integration platforms), and the countries or cites that lead the way will be the ones that reap the rewards. London is one of the few cities in the world well-positioned to innovate at speed and scale – from its it world class universities to a vast financial sector that is increasingly looking for green investment opportunities. At the same time, the city has many deprived and disadvantaged communities in real need of new employment opportunities. Transitioning to a carbon-neutral/ free transport system in ten years, using the right policy levers, will stimulate entrepreneurship, create jobs and open up new opportunities for training and skilling-up the workforce, especially in those deprived communities. Climate Safe Streets and climate justice go hand in hand[33].

8.4 Direct economic benefits

The cost of traffic congestion in the UK is estimated at around £8 billion per annum. In London, the annual cost is estimated to be around £1,700 per driver. In addition to this, the annual bill to the NHS due to physical inactivity is estimated at around £1 billion. Mode shift to walking, cycling and public transport presents the opportunity to substantially reduce both of these cost burdens, while the direct value of sustainable transport modes to the national and local economy has also been established by numerous studies. In London, a series of town centres studies between 2000 and 2016 show that walking and public transport are always (and cycling sometimes) more important to shops that car travel and that the value of car-borne trade to business is routinely over-estimated[34].

8.5 Better quality of life

The danger, noise and pollution from motor traffic keeps people from using their streets, from meeting their neighbours, from walking to school, from playing, from just enjoying being out and about. It reduces footfall, which is bad for the high street, it makes parents drive their children short distances, and it creates severance, which contributes to increasing urban loneliness. But it doesn't have to be this way: better streets are more healthy, safe, inclusive and attractive places. London has shown it knows how to do this, and indeed the capital's success is behind the Government's commitment to investing in a national programme of Mini-Holland Low Traffic Neighbourhoods. However, the climate emergency demands that we make more streets better and more quickly. It doesn't have to be expensive, but it does mean restricting where, how

fast and in what numbers private motor vehicles can move. It means trading minor inconvenience for some travellers for a better quality of city life for all[35].

8.6 First mover advantage

In 2003, when London launched what is still the world's biggest urban congestion charging scheme, it became a global leader in the field almost overnight. The reputational effect of the now decade-old cycle hire scheme has also been very positive, as it has been for the Low Emission Zone (2008) and the central Ultra-Low Emission Zone (2019). TfL is now showing that innovation in street design and management can be one of a city's best marketing tools in the global marketplace. In transitioning to Climate Safe Streets, London has another opportunity to demonstrate that it is one of the most progressive cities in the world in which to live, work and invest. London can become the first large Climate Safe City, thereby attracting global talent, exporting Climate Safe Streets know-how, and leaping forward in its competitiveness. Needless to say, Brexit and the emerging refocusing of UK policy away from London brings these questions into even sharper relief for the next Mayor. To lead on Climate Safe city action, or to lag behind? It is not difficult to work out which is best for London's people and businesses[36].

8.7 Policy coherence

Because transport is a vital component of everyday life, a clear declaration of intent to make London's streets Climate Safe will signal to policymakers in other areas – and to the market – that they too can, and must be, part of the solution. By shaping where people live and work, both the London Plan and the Mayor's Housing Strategy can enable Climate Safe Streets, and, integrated with the Mayor's Transport Strategy, they can show developers how and why they should contribute to and benefit from decarbonisation. Providers of new mobility services will also benefit from a clear, level policy field on which to compete. Currently, other sectors can point at transport and say, 'At least we're doing better than them.' But the climate emergency requires all sectors to unite around progressive policies and business plans – and, by making streets Climate Safe, transport can lead, not just play catch-up[37].

9. MAKING LONDON'S STREETS CLIMATE SAFE

We have made a case that London's streets must become Climate Safe by 2030. We have argued that mass mode shift away from cars is the core imperative. And we have laid out the extensive co-benefits of changing London's surface transport paradigm. The big question is how?

With rapid and substantial mode shift the over-arching goal, everything that can be done to enable people to choose non-car modes must be embraced. This means major investment in schemes and initiatives that can be shown likely to have most effect. And it also means investment – albeit on a more modest scale – in other, less glamorous, measures designed to make it progressively easier for people to leave the car at home, or indeed to find they don't need one at all. Accordingly, the list of actions we believe need to be taken is as follows:

1. Rapid expansion of the Strategic Cycling Network, at the highest quality

2. Coordinated expansion of easy access to low-carbon shared mobility services

3. Development and implementation of a London-wide Smart Road User Charging System

4. Expansion of coverage of Low Traffic Neighbourhoods, to make walking, cycling and scooting the natural choice for short journeys

5. Expansion and optimisation of a network of conventional and demand-responsive zero-emission bus services

6. Proactive support for transition to low-carbon freight transport

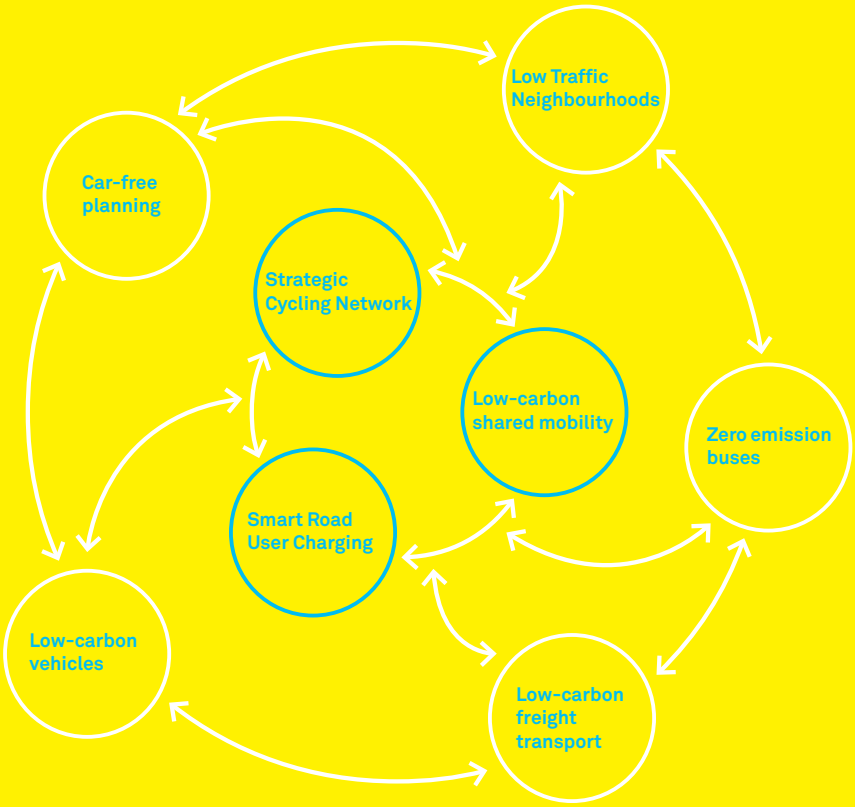
7. Enabling shift to low-carbon vehicles

8. Enabling of car-free planning

We now expand on the case for all these actions, and on what each will entail.

Figure 6

Policies to create Climate Safe Streets in London by 2030



9.1 Rapid expansion of the Strategic Cycling Network, at the highest quality

Working with the London borough councils, the Mayor and TfL should accelerate the implementation of the network of cycling routes identified in TfL's Strategic Cycling Analysis[38].

What and when

→ By 2024: Complete at least half of all corridors and routes in TfL's Strategic Cycling Analysis (of existing, top, high and medium potential corridors) to the highest quality[39].

→ By 2028: Complete remaining routes and corridors to the highest quality.

→ From 2024: Review the network to fill network gaps, adding further capacity in outer London and increasing network density in central and inner London so that most residents are living within 200 metres of a highest quality route by 2030.

→ By 2021/22: Develop a new mechanism for funding major Climate Safe corridors and severance-busting projects (e.g. river and rail bridges) that are beyond the scope of the Liveable Neighbourhoods programme but have high potential for mode shift.

Why and how

The European Cycling Federation issued a report[40] comparing the emissions per kilometre for bicycle use compared to car

use. They looked at emissions from production, maintenance, operation and fuel consumption. Although cycling is emission free on street, as it does not require fuel, it is important to consider the amount of carbon dioxide released in cycle production and maintenance and, indirectly, through the extra food that those partaking in physical activity sometimes require. Average car occupancy rates were included, but not more minor impacts such as rise in use of air conditioning and frequency of cold starts. Taking all matters into consideration, the ECF calculated that bicycles produce 21g of carbon dioxide for every kilometre they are used, while cars produce a total of 271g of carbon dioxide per kilometre – around 13 times more than cycles.

A report by Transport for Quality of Life also found that in urban areas a third of carbon emissions from driving could be avoided if people were able to switch to walking and cycling[41]. The report also refers to the role of e-cycles/cargo-cycles in extending the number cycle trip length and therefore the number of internal combustion engine trips that cycles could replace.

The benefits in terms of carbon dioxide emissions from increasing cycling and decreasing car use ("mode shift") are thus clear. So what is stopping us from rapidly achieving such a shift? It is well established that the main reason people don't cycle is because they feel it's too dangerous[42].

Research for Cycling Scotland in 2016[43], which looked at lessons from a range of European countries and cities, revealed that increased levels of cycling were closely correlated with the provision of protected cycling infrastructure. Moreover, it identified the following positive relationship:

Political commitment → Funding for cycling → Provision of better cycling infrastructure → Increase in the amount and mode share of cycling.

LCC's 2012 *'Love London, Go Dutch'* campaign calling for the next Mayor to radically improve cycling conditions in the capital was not only successful in its own right but also proves the truth of this relationship. As mayor, Boris Johnson built the first physically protected Cycle 'Superhighway' running along the Embankment. It involved reallocating space away from motor vehicles (either from parking spaces or carriage way) to construct the physically protected cycle lanes, and was met with significant resistance from various corners. Steadfast commitment from Mayor Johnson was essential to responding to the push-back, ensuring that the high-quality route was delivered, improving the safety and numbers of those using this route by bike.

Experience from Seville and other cities[44] further shows that mode share for cycling rises dramatically when a network of safe routes is provided over a significant proportion of the city and the potential journeys in it; and TfL's own analysis of cycling potential clearly recognises this causal relationship. Around two-thirds of all car journeys in London are shorter than 5 kilometres[45] and the potential for cycling to replace these car trips is clearly huge. With e-cycles and cargo cycles an even greater distance and variety of trips is possible, and this isn't even currently considered in TfL's cycling potential. So it is vital that we now rapidly move from a handful of isolated high-quality routes to a network of connected ones.

Reference Figure 7 (p42)

London needs to be a city where many more people feel they could cycle, and where everyone who wants to cycle, can. In short, it really does need to become "a byword for cycling", where the majority can feel safe and stress-free while riding from point to point and in between. To achieve this, i.e. to enable many more people to choose transport that is zero-carbon at the point of use, we need to rapidly accelerate the construction of a high-quality cycle network. That means lots more high capacity cycle routes, which are likely to come in the form both of main roads with cycle tracks *and* quiet routes. As figure 7 shows[47], recent investment in making cycling in London safe has had an appreciable, positive effect on the amount of cycling. It is now time to press on with making more streets safer for cycling, so that many more people can choose this climate-friendly mode.

Alongside protected cycle tracks on busy roads, programmes to create car-free neighbourhoods in London have also proved hugely successful at promoting mode shift; and these will likely be needed in most cases where quieter routes are being added to the network. Low Traffic Neighbourhoods are considered in more detail in a later section.

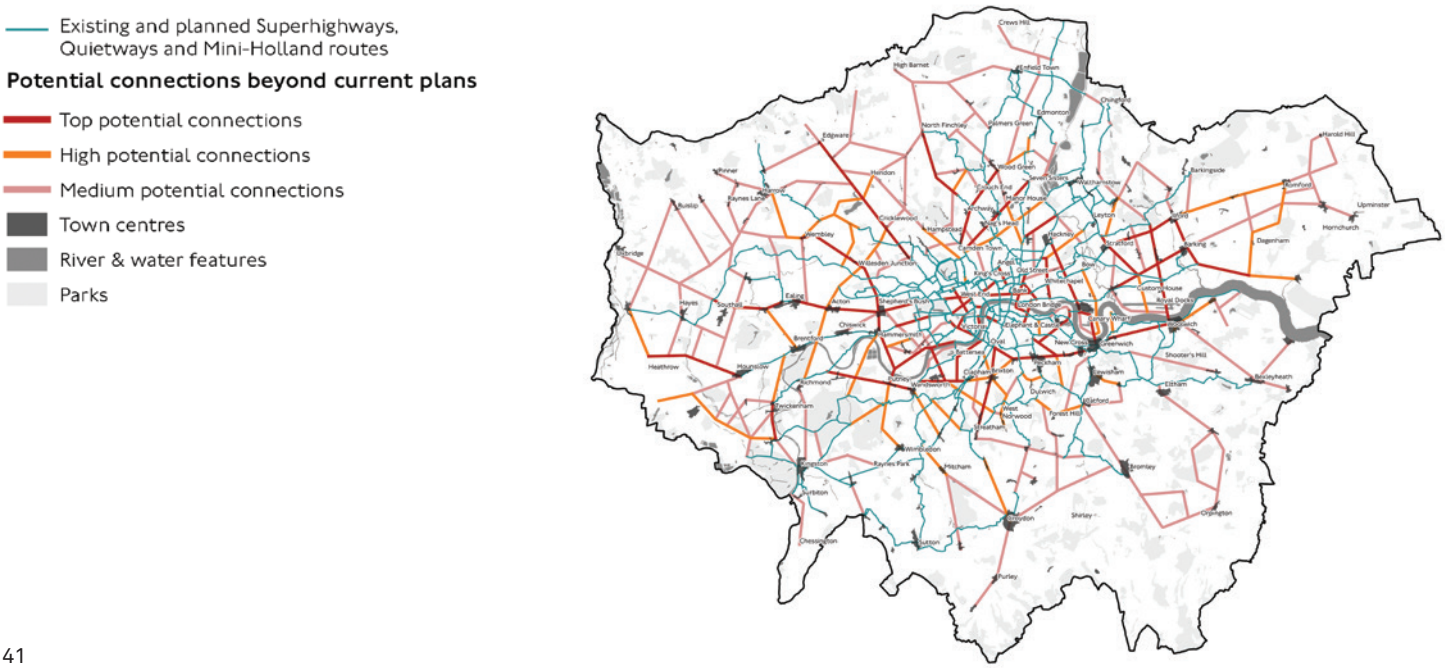
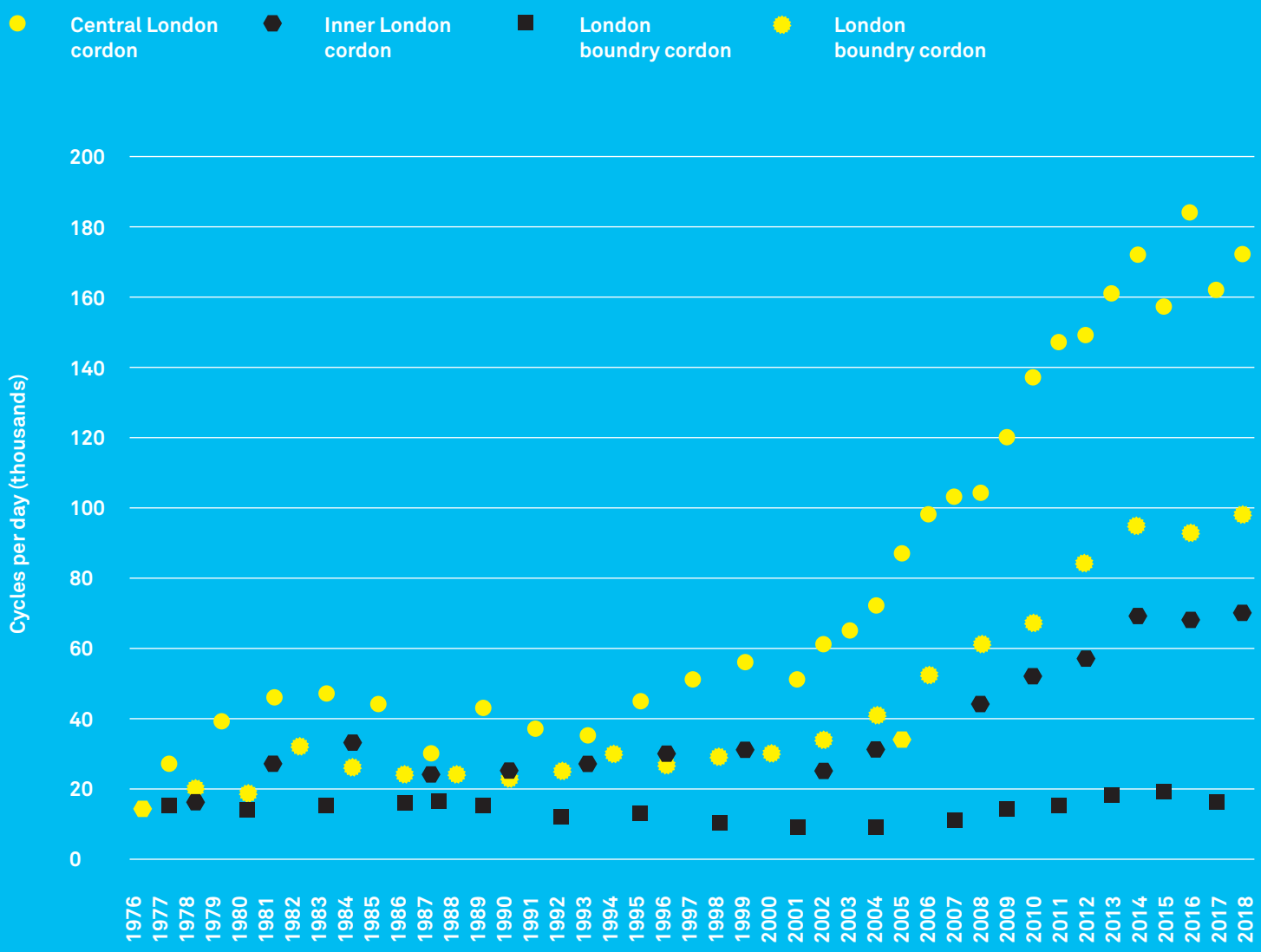


Figure 7

London emissions, yearly values for total direct GHG emissions, 1990 – 2017



9.2 Coordinated expansion of easy access to low-carbon shared mobility services

Every Londoner should have access to a range of affordable, low-carbon shared mobility services, within easy walking distance of where they live, work and shop. The necessary facilities should be developed by Transport for London and the London borough councils in partnership with selected service providers.

What and when

→ By 2022, TfL and London borough councils, as necessary, to have agreed a common regulatory platform for the full range of existing and likely future shared mobility services. This should be designed to enable service providers to bid for licenses to operate across administrational boundaries, removing the need for separate negotiations with each individual highway authority. Selected successful bidders could be awarded fixed-term licences to operate, subject to re-tendering every four years (say).

→ By 2022, TfL and all London borough councils to have adopted protocols similar to those currently operated by the City of London and Hackney to control where dockless cycles (and, potentially, e-scooters) may be parked.

→ By 2024, TfL and service providers to have agreed and made available a common communications and/or data platform so that anyone can use a single app/site to find real-time information about all their current travel options, including conventional public transport and shared mobility services.

→ By 2024, everyone in London should live and work no further than 300m from their nearest car club bay and shared cycle/e-scooter geo-fenced access point (which should ideally be co-located).

→ By 2024, as per the provision of the common regulatory platform, all car clubs in London should operate entirely electric vehicle fleets.

→ By 2024, TfL and London borough councils and service providers to have installed ten pilot larger shared e-mobility hubs[48] in types of location (e.g. railway station, residential area, employment area) across the capital.

Why and how

Londoners need a broader and better range of transport options to enable them to believe that they can leave their cars

at home more often and, indeed, that they can comfortably get by without owning a car at all. Alongside this, the general need for mode shift implies the need to shift private transport to a shared transport system – one where zero carbon modes of transport are accessible and available to everyone. The goal must be to allow almost everyone to choose to make their current car(s) the last they ever have to buy.

But to make shared mobility options attractive as alternatives for many trips will require tens of thousands of cycles/e-cycles, e-scooters, e-cars and e-vans across the city.

Such services aren't new to London. The Barclays/Santander cycle scheme was launched in 2010, and car clubs have been around in London since 2003. More recently, we've seen the rapid introduction of several dockless cycle hire schemes (both pedal cycles and e-cycles), and a range of different car sharing options; each to varying degrees of success. But despite some failures, and some practical and operational issues that remain to be addressed, these schemes have promoted a measure of mode shift. Studies have suggested that more than five privately-owned cars are replaced for each shared car added to the fleet[49].

A 2019 bike share user survey[50] found that 17% of cycle share commuters had previously travelled by car (driver or passenger) or taxi, while 37% said they were using their cars less or much less. Another report found that, of those using cycle share schemes, 43% were people restarting cycling having not ridden for a year or more[51]. Electric cycle share schemes also have the potential to overcome some of the traditional barriers to cycling, such as from long distances, hills and low fitness levels. A survey by CoMoUK found that nearly half (46%) said their regular shared e-cycle trips were previously made by car[52].

Certain cities are creating mobility hubs[53] – urban spaces to house different mobility modes – to increase access to shared mobility services. Where pioneered, in several German, Belgian and US cities, and in Exeter, they typically offer shared cycles (and e-scooters) and zero-emission cars, usually linked to a public transport location such as a rail station or bus stop. They could also offer cycle parking, a pick-up point/lockers for deliveries, EV charging points, travel information points and an improved public realm, which would build on and overlap with existing programmes to install cycle parking facilities at every underground and rail station, install several thousand EV charging points and consolidate freight deliveries and pick-up points. The different shared mobility modes are often accessed by a single app.

In one of the examples cited by CoMoUK the distribution of shared mobility access points in urban zones is suggested at

roughly one per 2000 residents[54]. That translates into around 100-150 per London borough. That, in turn, would be equivalent to around one access point every 300m in a Borough like Islington; and, in central London, a 300m figure is considered a typical distribution for cycle-share docking stations and car club bays. While mobility access points that involve electric cars obviously require greater space, an on-street access point just offering smaller vehicles (like cycles or scooters) could be either much smaller or virtual, as it currently is with some e-cycles.

There are concerns about e-scooters, which are currently common in many European cities, in terms of their legality and safety, as well as their 'active travel' credentials. Government announcements in the UK suggest that their legal status could soon change. In terms of environmental impact, research suggests that, although cycles perform far better than e-scooters in terms of embedded CO2, the latter do also have zero emissions at the point of use and are far less damaging overall than cars based on life-cycle emissions. They certainly could play a key role as disrupters of car dependency, with recent research in Portland, Oregon, finding that 35% of residents and 48% of visitors used an e-scooter rather than take a private car or taxi[55].

The fact that e-scooters are perceived as fun and convenient ways to get about is also a positive attribute and, if London can learn the lessons from other cities, then they should be a welcome addition to the city's travel options.

Although a range of private providers are already rolling out shared mobility services, and are ready to step in and provide them at scale, some have already come and gone from the London scene. Cycle share providers Ofo, oBike and Urbo are no longer present in the UK, while car service providers Drive Now and Blue City have recently left the city. Although the reasons for failure are not always entirely transparent, lack of clarity and coherence on regulations for shared mobility across London, as well as the lack of well-managed parking space, were cited as key concerns by those interviewed for this research , and are also foregrounded in a 2017 report *Crossroads: choosing a future for London's Transport in the Digital Age* by the Institute for Public Policy Research (IPPR).

Therefore, in order both to promote the use of zero-carbon shared mobility and to control it wisely, the Mayor and TfL must work with boroughs to establish a common strategy, with the aims of creating clear ground rules for participation by the private sector, of enabling seamless trips across administrational boundaries, and of both designating and freeing up appropriate street space for shared mobility vehicles of all types. This initiative should also include the introduction of pilot larger shared mobility hubs in the public

highway and/or on TfL/London borough council-owned land, e.g. near stations. It should also provide incentives for all shared car services to become e-cars only as soon as possible.

This will require the next Mayor to broker an unprecedented partnership with all the London borough councils to create the right London-wide market instruments to persuade private sectors to invest in confidence at the necessary scale; and to avoid a 'Wild West' situation with providers going from boom to bust and leaving their vehicles littering the street. TfL will also have a profoundly important role to play, mandated by the Mayor, in both regulating and facilitating this market. A simple, one-stop-shop, digital platform will be needed to journey plan and pay for the multi-modal, multi-hire daily travel patterns of the future.

Although they also involve a driver, not just a vehicle, black cabs and minicabs (Hackney Carriages and Private Hire Vehicles) will remain part of London's shared mobility market, and are of particular value to those who need a car for some trips but cannot themselves drive, or do not want to (e.g. after a night out). However, the inefficiency of current operations, in terms of the use of scarce street space for ranking/parking and of passenger-less running (exacerbated by the sheer number of cabs and PHVs currently working in London), needs urgently to be addressed; as does the cleanliness of the fleet. These inefficiency and pollution problems can both be tackled through the flexible controls inherent in our proposals for a Smart Road User Charging system (see 4.5). We also urge the next Mayor to continue, and as necessary expand, support for the conversion of the black cab fleet to low- and zero-emissions vehicles; and to help accelerate the transition to all zero-emissions vehicles.

To release the full potential of shared mobility to help make London's streets Climate Safe, the next Mayor will need to add another string to TfL's bow; enabling it to be not only the public transport authority, but also the orchestrator of mass shared mobility solutions provided by the private sector.

9.3 Develop and implement a London-wide Smart Road User Charge system

London needs a city-wide Smart Road User Charging (SRUC) system that responds to real-time congestion and demand on different parts of the network and fairly reflects the economic and environmental costs of the least efficient and most damaging vehicles. This should build on and replace the existing Congestion Charge Scheme and the proposed expanded Low Emission Zone (LEZ) and Ultra Low Emission Zone (ULEZ), and incorporate the existing London Lorry Control Scheme (as modified in the interim).

What and when

→ By the end of 2020: Deliver the London-wide LEZ as currently proposed.

→ By the end of 2021: Deliver the London-wide ULEZ as currently proposed.

→ By the end of 2020: Prepare a strategy to consolidate the existing Congestion Charge Scheme, Ultra/Low Emission Zones, and London Lorry Control Scheme within a single London-wide Smart Road User Charge (SRUC) system.

→ By the spring of 2024: Undertake and complete the research and consultation necessary to underpin specific proposals for implementing the SRUC.

→ By the spring of 2028: Complete implementation of the SRUC.

Why and how

It is naïve to think that supply side measures alone will alone deliver the mass mode shift away from car use that is required. At the same time, TfL and the Mayor are less able to access government funds for transport than ever before, while congestion has had a huge impact on bus journey time reliability, and hence ridership and revenue. All these factors point towards the need to introduce London-wide smart road user charging: a demand side measure intended not just to make driving less attractive, but crucially to help release space for cycles and buses, and to generate revenue for reinvesting in creating Climate Safe Streets.

The current Mayor has lobbied the government to reverse its decision that none of the £500 million of Vehicle Excise Duty paid by Londoners should be spent on London's roads, but so far with no success. By implementing a new road user charging system, the Mayor would have a new income stream to be re-invested specifically to enable London's streets to be made Climate Safe.

The sense of urgency in addressing the amount of car travel is severely undermined by a tendency to ignore the fact that transport costs are not limited to fares, fuel prices, and the initial and depreciating value of vehicles. The overlooked external costs encompass road traffic injuries and deaths, congestion, air pollution, noise, fuel's oil-well-to-tank journey and habitat damage. Research[56] shows that air pollution and climate costs make up 28% of the full costs of transport, marginally more than the 27% attributed to congestion (see also the graph below). The picture will be somewhat different in any given city, and TfL estimates the cost of air pollution at around £3.7 billion[57] and the costs of congestion at around £5.5 billion[58].

Reference Figure 8 (p49)

Research by EC Delft provided an estimate of the total costs of car use across Europe as close to €800 billion a year, and recent statements from the EU Commissioners suggest that the figure might be closer to a trillion euros. Approximately €360 billion is recouped in direct taxes and charges so it is the public that is ultimately paying the balance of around €500 billion a year. An earlier report from Germany[59] suggested that the average externalised cost of car use per UK inhabitant is over €900 per year, which means that every person, from the youngest to the oldest, subsidises car use to the tune of around £800 a year.

These costs would drop sharply if the vehicle fleet were decarbonised, if vehicle drivers and owners paid more for the damage they cause, and if the burden of congestion for essential vehicle trips (especially for goods) was addressed through mode shift of passenger trips to walking, cycling and public transport, as well as mode shift of many 'last mile' freight trips to cycles.

While no politician wants – or can risk being seen – to support actions that are detrimental to the economy, overlooking all of transport's external costs helps ensure that the fallacy of motor traffic as an undisputed economic good endures in both the political and the public mind. Now that the veil has been lifted over the full costs of car-based consumption, politicians should use this knowledge to be bolder in making decisions that limit car use.

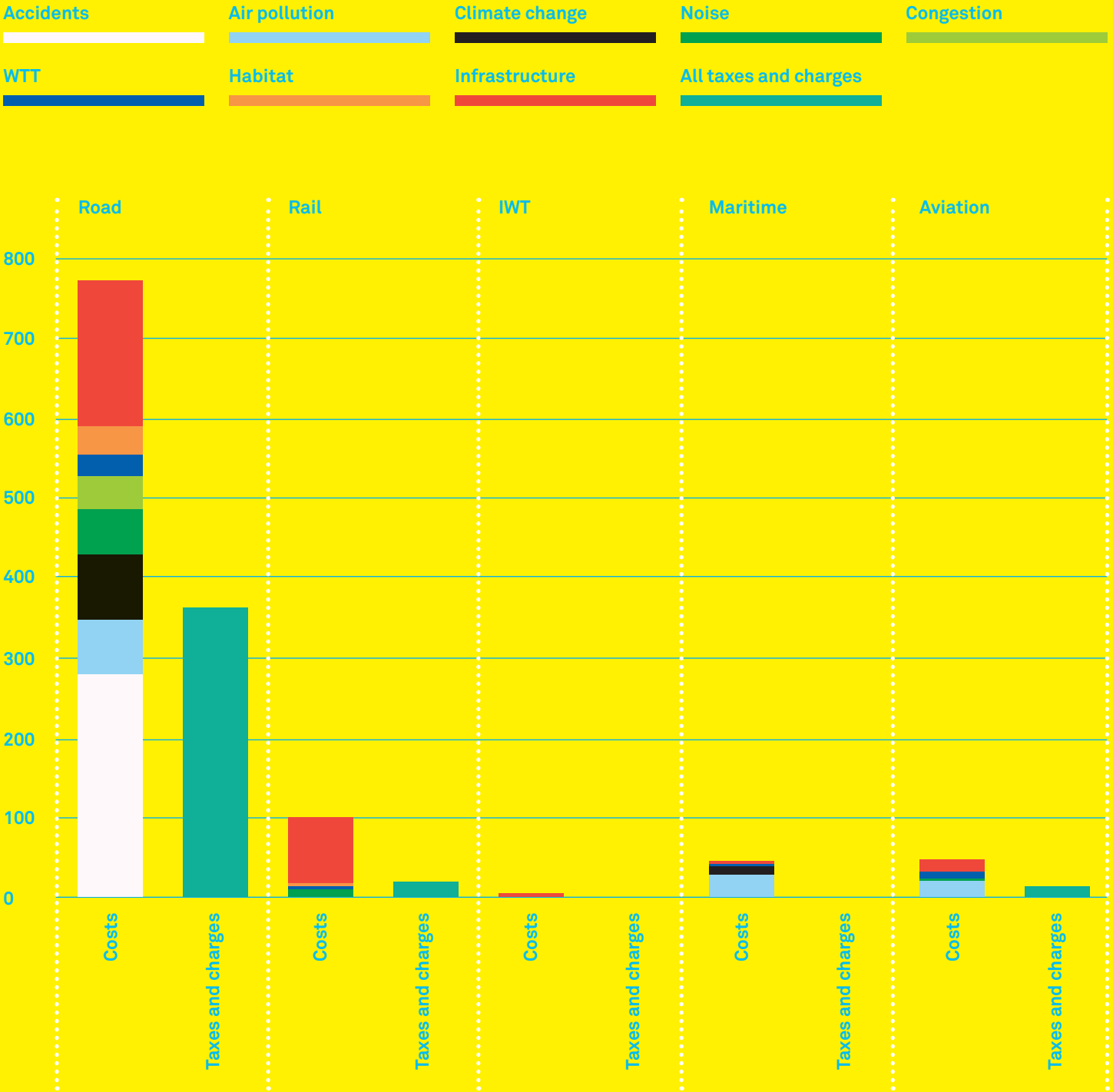
The clear message is that Climate Safe Streets are good for the economy and that Smart Road User Charging (SRUC) is essential for a progressive transport system, not least to reflect the principle that those causing the most damage should pay for it. Currently, the price signals for driving are far too weak to properly influence mode choice[60]. Moreover, by helping to cross-subsidise public transport, SRUC would ease congestion for the journeys by goods vehicles and cars that remain essential[61]. The potential benefits of SRUC are revealed by the initial results from the implementation of London's ULEZ: despite the small area of coverage, it has resulted in a 4% reduction in carbon dioxide in the central zone in the first six months (equivalent to 9,800 tonnes[62].)

The Centre for London has issued a report promoting new strategies for road user charging[63] which is one of the key policy instruments that the Mayor can directly control.
The report promotes the use of a single SRUC app with the suggested name of City Move. This would charge drivers per mile and would apply in areas of high demand and poor air quality. The report states that if users were charged in areas of high demand, road pollution could reduce by up to a fifth. This would certainly be useful as a first step, though charges would

Figure 8

Degree of internalisation for EU28 – total cost, taxes, charges:

Total (external and infrastructure) costs and who bears them (bn €)
Road, rail & IWT for EU28; Maritime & aviation for selected 33 airport / 34 ports



likely have to rise substantially to help achieve the reduced traffic targets necessary in light of the climate emergency.

We anticipate that, at least in the first phase, the SRUC system would be based on a development of the camera infrastructure currently in place for the central London congestion charge and ULEZ. Whatever technology is chosen, however, introducing a more flexible, responsive and fairer SRUC system, to replace the current fixed charge unrelated to distance or traffic and environmental conditions, would enable the Mayor to exercise better control over non-essential motor vehicle trips and would be a vital tool in reaching the 80% non-car mode shift target by 2030.

The SRUC system also has the potential to allow differential pricing for taxis/PHVs, and for shared cars, relative to private cars, and of course to differentiate between electric or other clean-fuelled vehicles and those with internal combustion engines. Differential pricing would enable the prioritisation of more efficient and less-polluting forms of transport on different parts of the network at different times. It could also prove to be a practical and effective means of limiting the number of taxis/PHVs circulating on busy streets, and thereby of addressing the current problems associated with the Mayor's inability to control the number of PHV licenses issued for the city.

9.4 Expansion of coverage of Low Traffic Neighbourhoods, to make walking, cycling and scooting the natural choice for short journeys

More than just the Strategic Cycling Network (see 9.1) will be needed to remediate London's over-dependence on cars. Measures are also required to enable walking, cycling and scooting to be the best options for shorter journeys, like the 'school run', and to better access bus stops, tube/rail stations and shared mobility services. This means implementing Low Traffic Neighbourhoods, 'School Streets', and other local improvements for walking, cycling and scooting, and measures to make driving unattractive for these short trips.

When and what

→ All London borough councils, with TfL as necessary, to have developed core local journey network plans by spring 2021 covering all non-distributor roads

→ London borough councils to prepare a costed three-year improvement programme for these plans in their 2021/22 LIP bids with the aim of improving all non-distributor areas within those three years

→ TfL to prepare a comparable improvement programme for distributor roads including the TLRN in 2021

→ TfL to require School Streets and Low Traffic Neighbourhood programmes within all London borough councils 2021/22 LIP bids to ensure through motor traffic is eliminated in non-distributor areas by 2028

Why and How

Almost everyone walks; while those who can't and need to use mobility aids also have to use the footway to get around. Put another way, nothing works without walking, which is especially vital as a 'feeder mode' for public transport (i.e. for trips and from bus stops and stations).

Walking, cycling and scooting also have key roles to play for trips to and from school. Nationally, it is estimated that as many as 1 in 4 cars on the road in the morning peak are taking children to school[64], and cars account for 45% of trips to and from primary school (36% for secondary school[65]). Although the figures are lower in London, car travel is nevertheless responsible for 21% of all trips to and from schools in the capital[66]. The average trip length to/from primary schools in London is 1.3 miles[67], meaning that many are eminently walkable, and virtually all are potentially cyclable.

More generally, around 15% of car trips in London are less than 1km in length (around a 15-minute walk), and around 60% are shorter than 4km[68]. These short journeys are those for which the internal combustion engine is especially polluting[69] and almost all of them are potentially transferable to walking, scooting and cycling, if people think these options have been made safer and more convenient.

Although walking is top of the accepted transport hierarchy, its contribution to London's movement system is poorly understood. We don't count walking in the ways we count other modes and we have only limited insights concerning how poor walking conditions affect people's choices. But lack of data doesn't mask the need to do more to enable walking for short trips, where it should be an obvious alternative to car travel. The ninth Travel in London Report[70] shows that improved walking priority and easier and safer crossings are key factors affecting whether people choose to walk (see graph below); and these factors are usually easy and cheap to address. Meanwhile, recent research concerning the effects of implementing low traffic neighbourhoods in London reveals a positive impact on walking and cycling levels[71].

Reference Figure 9 (p53)

This research concerns recent schemes introduced in Waltham Forest, which is one of London's most celebrated success stories in terms of active travel and transformed quality of life[72]. After securing funding through the Mini-Holland programme that LCC were instrumental in

winning during the 2012 mayoral election, the council has systematically improved conditions for walking and cycling in the Borough and as a result it has improved the health prospects for all its residents. Residential streets and areas have been calmed to make them more convivial, social, and healthy, using the Low Traffic Neighbourhoods approach.

The research found that after one year, people living in parts of the borough were significant schemes had been implemented were cycling for 9 minutes a week more than those living in comparable areas, and walking on average 32 minutes more weekly. This shows the benefits of creating low-traffic neighbourhoods across London, and the need for the evolution and rapid expansion of the Liveable Neighbourhood programme, so that everyone can make their local trips on foot, cycle or scooter.

Low Traffic Neighbourhoods are areas between “distributor” main roads, normally primarily residential, where through (or “ratrun”) motor traffic is either restricted or removed entirely. “Modal filters” such as bollards closing the road to motor traffic at a point, or width restrictions, one-ways or “bus gate” cameras ensure motor traffic cannot pass directly through the area from side to side, while those walking, cycling and on public transport can. The impact of such schemes has been demonstrated over and over to not only reduce overall motor traffic levels in the area, but also boost walking and cycling rates in and through the area by reducing motor traffic levels inside the “cell” area dramatically, as well as making short car journeys to, from and through the area less convenient.

As highlighted in other areas of this report, it is not enough to simply make short walking and cycling journeys better: the lesson from London’s Mini-Holland boroughs is that in order to trigger “mode shift” away from cars, reallocation of road space and priority away from cars is needed. Indeed the required major changes to our main roads to favour public transport, cycling and walking (particularly around high streets) will necessitate large reallocations in motor traffic capacity. But if we do not also then close through motor traffic routes (also known as “ratruns”) on residential and other non-distributor roads, drivers will simply redirect journeys to more and more inappropriate routes. We need Low Traffic Neighbourhoods not just to enable more people to walk and cycle short journeys, but to ensure people aren’t able to continue to conveniently drive short journeys, and to avoid providing extra motor traffic capacity for longer distance journeys at huge cost to our residential streets.

The funding required to tackle short car journeys and ratrunning – in terms of developing and then delivering a network of Low Traffic Neighbourhoods, School Streets and

other interventions – will be relatively modest in comparison to major infrastructure changes. Transport for London and the Boroughs simply need to focus with determination on making short journeys very safe, comfortable and convenient by more active modes, and less convenient by private cars; it is never easy to do so, but experience tells a story of communities won over every time they do.

Figure 9

Factors that would encourage Londoners to walk more

Source: TfL Customer Insight. Attitutes to Walking survey 2016

9.5 Expansion and optimisation of a network of conventional and demand-responsive zero-emission bus services

Working with the London borough councils, the Mayor and Transport for London should:

(a) expand the Low Emission Bus Zones initiative into a comprehensive, London-wide Clean Bus Network;

(b) optimise bus operations in central London, radically improve bus priority on key radial routes, and develop better orbital services on key corridors in outer London;

(c) work with service and communication platform providers to develop new types of offer, such as demand-responsive, flexible-route services for areas and routes poorly connected by conventional services.

What and when

→ By 2021: Develop a comprehensive plan for improving bus priority on existing key routes throughout London, including extending the hours of operation of existing bus lane controls, extending the bus lane network, and improving enforcement; embracing the principle of making high streets and town centres traffic-free where this is necessary to enable priority for walking, cycling and bus travel to be enhanced.

→ By 2024: Complete all planned bus lane improvements that do not require traffic filtering.

→ By 2024: Complete five pilot traffic-free Climate Safe High Street projects (Zero Emission Zones) in selected town centres.

→ Bring forward the current MTS target that all buses are zero-emission or hybrid from 2030 to 2028, and for an entirely zero-emission bus fleet by 2032.

→ In 2020: Review the current trial demand-responsive bus services in Sutton and Ealing and report on how such services can be delivered in other areas, including a consideration of the financial implications.

→ In 2021: Publish a plan for increasing the number of new types of service in partnership with relevant service providers.

Why and how

Buses are – and for the foreseeable future will remain – the heavy lifters of passenger transport on London's streets, and in London as a whole. Despite significant recent growth in the number of tube passengers, and a slight drop in the number

of bus passengers, buses carry 60% more people annually than the tube[73]. For London to become a Climate Safe City, not only will all buses need to be clean, but the number of people travelling on them will need to increase substantially. As the 2018 MTS notes, 'The beauty of the bus network is that it is flexible.' Routes, and the number of vehicles on those routes, are relatively easy to add (or remove), so they can be much more responsive to changes in demand than other forms of public transport.

The key problem is that London bus passengers are subject to routine delays that are commonly the result of too much highway and junction capacity assigned to space-inefficient private transport, and the illegal use of bus lanes by parked or moving vehicles. Since around three-quarters of traffic congestion is caused by excess traffic[74], there is already a strong congestion-reduction case for mode shift away from private vehicles. In the context of the climate emergency, the case for assigning more space and priority to buses – especially clean-fuelled vehicles – should be indisputable.

There is a strong case for reducing bus fares, and even making bus journeys free for all[75], but surveys generally show that the main reason people choose not to travel by bus is that they consider it too inconvenient and/or slow[76]. Indeed, delays due to congestion is cited by TfL as the principal reason why bus ridership has fallen. Given that in 2020, the 'Hopper' bus fare is a modest £1.50, it is clear that the most pressing priority in terms of increasing bus patronage is to improve bus journey time reliability.

However, it is essential that better bus priority is not achieved at the expense of space or capacity for walking and cycling. The concept of Climate Safe Streets embodies the recognition of a Climate Safe hierarchy of transport modes, in which walking, cycling and public transport are accorded a far greater priority than private motor vehicle traffic, especially in terms of passenger transport. For too long, these high priority modes have been set at odds with one another in order to preserve general traffic capacity. This has meant, for example, that measures to improve the safety and convenience of cycling have been resisted because of their feared effect on buses, or that measures to increase bus priority have diminished the quality of the cycling environment. From now on, walking, cycling and public transport must – together – be prioritised over general traffic.

It is likely that demand and route responsive bus services will have to play an increasingly important role; we pick this point up in section 4.8 below.

9.6 Proactive support the transition to low-carbon freight transport

Freight and construction operations must become more clean and efficient. This requires work on a number of fronts: providing infrastructure (for example, adequate rapid charging facilities) and other assistance to promote and enable a cleaner fleet; reviewing restrictions on where and when different types of vehicle can operate (see also 4.5); promoting and leading on data-sharing to help avoid empty mileage; and enabling cleaner 'last mile' deliveries, especially through the use of e-cargo-cycles, and through the development of an extensive network of distribution centres and collection points.

What and when

→ By the end of 2020, the Mayor and TfL must revise and strengthen the 2019 Freight and Servicing Action Plan so that is commensurate with the target of London's roads being carbon neutral by 2030.

Specifically:

- Publish details and a programme for a bold new scrappage scheme (FSAP Action 6b)
- Review the adequacy of the London EV Infrastructure Delivery Plan (June 2019) to meet the 2030 zero carbon target
- Publish guidance for Area Freight and Servicing Management Plans, and set deadlines for their production (FSAP Action 12c)
- Expedite changes to the London Lorry Control Scheme, first checking the extent to which the 2017 London Councils review meets the demands of the climate emergency (FSAP Action 15)
- Publish details of how the GLA/TfL will use its estate to enable the growth of local distribution centres/collection points (FSAP Action 18a)

Why and how

London can't survive without freight transport, whether it is food, medical supplies, building materials or waste. Food and drink alone account for a quarter of the tonne-kilometres travelled by trucks[77]. There are some 400,000 lorries in the UK of which 250,000 enter London each year at least once[78].

A major challenge arises because HGVs are significantly overrepresented in carbon emissions: although HGVs account

for 5% of the miles travelled in the UK they are responsible for 17% of greenhouse gas emissions and 21% of NOx emissions from transport[79]. According to TfL, 23% of road-related carbon dioxide emissions in London came from freight vehicles. Moreover, the use of vans for deliveries has increased sharply in the last decade amounting to 17% of all road miles travelled.

In 2018, the government set a target of up to 40% of new van sales being ultra low emission by 2030[80]. By contrast, as Mayor, Sadiq Khan stated his ambition to accelerate the government's target and to work towards all new cars or vans registered in London being zero emission by 2030[81]. We support this goal, but note that it will require accelerated incentives and provision of charging facilities.

The number of available zero emission van models has increased significantly in recent years, giving operators more choice. A growing number of delivery firms are using e-cargo-cycles for local deliveries for smaller loads (below 200kg). The efficiency of e-cycle delivery helps reduce emissions compared to electric vans. Such operations must be encouraged until a majority of small loads are delivered locally by cycle. Public bodies such as the GLA, TfL and the London borough councils should prioritise cargo cycles for all small loads delivered locally.

Eliminating the carbon emissions generated by heavy vehicles is perhaps the most challenging of targets for London's transport to be carbon neutral, notably because zero-emission HGVs (and associated fuelling infrastructure) are only in their infancy, preventing the Mayor from mandating their use. Development is, however, likely to accelerate. The EU has committed to sign a Climate Law in June 2020 that will set a new standard for zero emission vehicles (Euro 7) covering cars, vans and lorries. While this may not affect Britain directly, current leading truck manufacturers will be compelled to move to emission-free vehicles or risk losing business to newcomers.

While the Committee on Climate Change anticipates that electric vehicles will fully decarbonise light freight delivery[82], HGVs are a more complex proposition, with the option of different power sources. 'Decarbonising Road Freight,' a 2019 report produced by the Government Office for Science, states that one of the most effective ways to decarbonise transport is to electrify the freight fleets[83] Other options include vehicles fuelled by liquid hydrogen or biomethane. Whatever new propulsion might prove most attractive, lorry replacement cycles are in the order of seven to ten years, so, even assuming operators see the financial gain from switching to new fuels, it may take many years to effect the change we need unless incentives or regulations are in place. Innovative solutions

for emission-free HGVs, such as roads with overhead cables or induction charging points beneath road surfaces in urban areas, must also be explored.

But we are not solely dependent on vehicle technology. There is a second, parallel, approach which is to reduce the number of freight journeys.

Two statistics stand out from the Government Office for Science report: 28.6% of HGV vehicle-kilometres are running empty; and vehicles are utilised to only 63% of their capacity. It can be hard to get 'back-loads' from some destinations but what the Government describes as 'organisational constraints' – operators not cooperating – also plays a key role. When Kimberly Clark (toiletries) and Kellogg's (cereals) co-operated they saved 430,000 vehicle-kilometres[84], and new freight exchange communications systems increase the potential to match suppliers with empty vehicles.

Urban freight journeys must be reduced through the use of consolidation centres, and a reduction of trips by empty and part loaded vehicles. In London, several consolidation centres for the construction industry are already in place. Goods are delivered in bulk to the centre, then a single vehicle takes a mixed load of materials to their final destination.

To facilitate consolidation and minimise all freight trips, the City of London has recently mandated, through the planning process, that large new developments include consolidation centres within their buildings. The Mayor and the London borough councils should consider making similar requirements of large developments subject to a co-ordinated approach across the capital.

For heavier goods, out-of-town freight hubs have been proposed. If areas of disused land (for example, old industrial sites) are earmarked now, such as through guidance to boroughs in the London Plan, and through the Greater London Authority's own landholdings, the generation of energy from sustainable sources (wind, solar, biogas) could be co-located with giant lorry parks that provide fast electric charging, plus consolidation of goods and a transfer of freight from long-haul lorries (and possibly also trains and barges) to clean-fuelled urban vehicles. Land must be safeguarded now for the implementation of such large-scale facilities.

Local deliveries can similarly be based around 'mobility hubs[85],' where there would also be access to shared e-cycles and e-cars, smart lockers for deliveries, public transport connections and shops. Other innovations include a modern version of the old 'porterage' approach.

London is leading the world through the establishment of the ULEZ which reduced carbon dioxide across the central zone by 4% in its first six months[86]. The simple answer is to expand it and support the freight industry as it makes the changes to adjust. As set out in 4.5, the process of expanding the ULEZ should be part of a broader initiative to consolidate the ULEZ, the existing central London Congestion Charge Scheme and the current London Lorry Control Scheme (LLCS) within a single, London-wide Smart Road User Charging system. The LLCS has long been due for a comprehensive review, and we advise that the recommendations of its 2017 review by London Councils[87] should be revisited in the light of the climate emergency.

We acknowledge that freight decarbonisation may be the most challenging aspect of achieving Climate Safe Streets by 2030. We do not claim to have cast-iron solutions and recognise that this may have to be work-in-progress for the next Mayor, businesses and London borough councils. Early and fast progress on mode shift away from private cars during the 2020-2024 Mayoralty will buy time for a sharper focus on freight between 2024 and 2030.

9.7 Enable the rapid shift to low-carbon vehicles

Develop and implement a phased programme to eliminate the use of vehicles with internal combustion engines (ICEs) on London's streets by 2030. Enable this shift by working with energy providers and bus and freight operators to ensure sufficient electricity and other clean fuels can be supplied in optimal locations.

What and when

→ By 2024: Clean-fuel/hybrid buses only in central London.

→ By 2028: Clean-fuel/hybrid buses only across London.

→ By 2030: An entirely zero-emission bus fleet in London.

→ By 2024: A ban on ICE taxis and PHVs in central London.

→ By 2021: The Mayor to rethink scrappage incentives, to include not just the replacement of ICE cars with clean-fuelled alternatives, but also the purchase of e-cycles and credits for the use of public transport and shared mobility services.

→ In time for the 2022/23 Local Implementation Plan Programme of Investment: TfL and the London borough councils, together with energy providers, to develop a coherent, costed, London-wide strategy for EV charging, consistent with the need to prioritise walking, cycling and buses.

Why and how

While it is vital that the overall use of private cars falls substantially[88], the climate emergency and air quality concerns also need to be addressed by transition to an all-electric or otherwise clean-fuelled fleet. The transition of larger vehicles, such as buses and lorries, to alternative fuels will take longer than that of cars, but must also accelerate.

Smart Road User Charging will be the overall driver of a switch from ICEs to EVs, but this must be buttressed by other policy tools to ensure a complete phaseout of ICEs is achieved by 2030. As with the rollout of EV charging points, the differing approaches from borough to borough has already proved troublesome to pedestrians and cyclists alike, where they have been installed on narrow pavements or blocking potential cycle routes. Agreeing best practice, and linking the infrastructure delivery with other strategic documents, including the Strategic Cycling Analysis, will ensure that EV infrastructure supports the decarbonisation of London without hindering other low-carbon modes.

Restricting access for taxis and PHVs in central London to clean-fuelled vehicles only will help deal with the pressing air quality and space inefficiency issues associated with the recent growth in the number of PHVs on the most congested streets.

Simply switching to electric-powered vehicles still leaves us with a congestion (and therefore emissions) problem, air pollution issues (from brake dust, etc.) and road danger from collisions (see 2.1). That is even apart from concerns about the availability of high-quality lithium being at a bottleneck[89]. Thus, although EVs and the transition to other clean fuels must have a part to play in decarbonising the road transport system, it remains vital that we switch non-essential car journeys to more sustainable modes.

9.8 Enable car-free planning

The London Plan and London borough councils planning policies need to do more to enable shorter everyday trips, through the closer co-location of trip-generating development (homes, workplaces, schools and shops), and to help deliver more credibly car-free development across London through requirements related to the quality of local public transport and the provision of shared mobility services.

What and when

→ The next London Plan should embody a new measure – a Climate Safe Modes Accessibility Index – to help

ensure the provision of high-quality sustainable travel options in all locations.

→ This measure should replace the use of Public Transport Accessibility Levels (PTALs) and be applied so that Climate Safe Modes Accessibility (CSMA) targets are, as necessary, achieved by investment in new bus (conventional and demand-responsive) and shared mobility services.

Why and how

Planning policy has a vital role to play in enabling the use of sustainable travel modes, and in ensuring that residents and other occupiers of new developments are not locked in to car dependency. The 'Intend to Publish' version of the 2019 London Plan[90] (Policy T6) states that "car parking should be restricted in line with levels of existing and future public transport accessibility and connectivity," and that "car-free development should be the starting point for all development proposals in places that are (or are planned to be) well-connected by public transport."

While at the national level, less car-dependent development needs to quickly become a thing of the past[91], car-free development should be London's goal. Yet the Intend to Publish London Plan still allows for up to 1.5 private parking spaces for every new home in parts of outer London. It does so on the grounds of poor access to public transport in those areas, measured using the PTAL method.

There are two problems with this approach that need to be addressed within the next London Plan. The first is that allowing more car parking (thereby enabling greater car dependency) on the grounds of existing poor public transport has things the wrong way around. Instead, it should be required that new development be made credibly low-car or car-free by investments in local public transport services. The second is that the PTAL approach is no longer appropriate as a measure of access to non-private-car modes. It should be developed into a measure that considers the quality of connections between homes, jobs, schools, shops and so on by all Climate Safe modes of transport (walking, cycling, public transport, and shared mobility services). A Climate Safe Modes Accessibility (CSMA) index approach should therefore replace PTALs and be used to ensure that access to all new developments by these modes is made sufficiently high so that it is possible for private car use to be very low or eliminated altogether.

10.

LONDONERS DESERVE BETTER: THEY DESERVE CLIMATE SAFE STREETS

In the face of the climate emergency, Climate Safe Streets are a necessity, and we believe that, together, the actions we're calling for will meet that need. We're also sure that they're achievable, both technically and – just as importantly – politically.

We are convinced about this because of the evidence we've researched: the data, the science, the expert commentary, and the practical experience of others. It is evidence that demands of the Mayor, and of the London borough councils, that they should be bold. Simply encouraging people to change how they travel will never meet the need, because people simply won't choose to use alternatives that they think aren't good enough. They need to be enabled to change. The climate emergency demands, and Londoners deserve, much better alternatives to private car travel.

We know, of course, that having compelling evidence isn't the same as having a compelling story or popular narrative. Experience has shown that, irrespective of the facts, people can be remarkably unresponsive to approaches that make them feel 'got at' or guilty, or which are accompanied by finger-pointing or 'doom-preaching.' Most politicians and practitioners will be familiar with the visceral objections of some to the prospect of having their car use even modestly constrained.

However, although the notion of 'war on the motorist' has become a well-worn trope, it is vital not to equate sound and fury from some quarters with the views of the quiet majority. The simple statistics that almost half of London households don't have access to a car and that the city has well over three times as many people as cars[92] reveal that car-centric clamour is unrepresentative. In fact, the vast majority of people are genuinely concerned about the climate emergency[93], and we believe they're looking for inspired leadership about how they can make a difference.

The presumption that people will resist change, rather than choose it, is false. Londoners deserve to be better engaged in the process of change, better informed, not talked down to (our engagement briefing will expand on best practice with

communities in more detail). There is an imperative to travel differently, but the case for change isn't simply about staving off the worst effects of the climate emergency. As we have shown, it is also about a better quality of life and better health for all; about more choice and less congestion; about greater fairness, affordability and convenience; about increased business and job opportunities, and better access to them; about more footfall and greater time spent in high streets.

Making streets Climate Safe will enable almost everyone to be able to live decently without having to own or drive a car. This may sound radical and, to some, far-fetched, but it's also appealing[94]. Because Londoners deserve better than to sit in traffic, than to breathe toxic air, than to feel unsafe while walking or cycling, than to suffer a poor public transport experience, than to feel unable to turn the school run into a stroll, than to think they have no option but to spend so much money on owning and running cars that sit idle for more than 23 hours out of every 24[95]. They deserve a zero-carbon transport system that is universal, comprehensive, affordable and green[96].

And this isn't just appealing, it's credible. Enabling all Londoners to travel differently and therefore live better is within the city's grasp. Through the package of policy mechanisms, physical measures, and constructive partnerships with the private sector that we have proposed, the Mayor, Transport for London and the London borough councils can pursue change with confidence in the practical outcomes and, if they engage with Londoners as they should, in public approval.

The climate emergency means that we are actually all in this together. Londoners don't just deserve Climate Safe Streets, we need them within a decade. The biggest decisions will therefore fall upon the Mayor, who has the power to help ensure that London, and Londoners, will lead the way on climate action and inspire not just the country, but the world.

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