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Project acronym:	**CREATE**
Project title:	**Congestion Reduction in Europe - Advancing Transport Efficiency**
Project website	**www.create-mobility.eu**

D4.2 - Technical reports for Stage 3 cities

Work Package 4 "Qualitative analysis of Transport policy developments"

		Date of preparation:	**May 2018**
Start date of project:	**1st June 2015**	Duration:	**36 month**
		Version:	**1**
		Prepared by:	**C. Halpern**
		Checked by:	**C. Buckingham**
		Verified by:	
		Status:	**VF**
		Dissemination level:	**Public**

1 Introduction to deliverable D4.2 "technical reports for stage 3 cities"

How to reduce road congestion in large cities in Europe and the Euro-Med? How to encourage a switch from cars to more sustainable transport modes? Historically, rapid urban growth has led to a growth in car ownership and use, and consequential increases in urban road traffic levels. These increases, in turn, are associated with a range of negative impacts, including traffic congestion, traffic collisions, social exclusion and dangerous levels of air and noise pollution.

Recently, some European cities (Berlin, Copenhagen, London, Paris, Vienna) appear to have been successful in decoupling economic growth from traffic growth – and in the process, have been able to offer urban living environments that are cleaner and less congested, while maintaining increases in living standards. Why have these cities been able to achieve this turnaround, and what lessons can be drawn for other parts of Europe and the Euro-Med?

To answer this fundamental question, the CREATE project (Congestion Reduction in Europe, Advancing Transport Efficiency) brings together a team of international analysts in order to explore historical patterns of urban road traffic and car use, to identify success factors in encouraging modal shift and lessons learnt in Western European capital cities, and to work with Eastern Europe and Euro-med city partners (Adana, Amman, Bucharest, Skopje and Tallinn) to assist them in developing sustainable strategies.

Further information available on the CREATE Website: http://www.create-mobility.eu/

1.1 About Work Package 4 in the CREATE Project

How to account for the shift away from car-oriented policies towards sustainable urban transport policies?

As part of the CREATE project, the primary goal of Work Package 4 (WP4) is to analyse the historical 'Transport Policy Evolution Cycle' processes in Stage 3 cities, i.e. five Western European capitals (Berlin, Copenhagen, London, Paris and Vienna): Can we identify similar qualitative drivers of change across European cities? What are the main differences between cities and how to account for them? To what extent does the analysis of policy developments over time helps us make sense of recent policy choices and deadlocks? This is done by identifying the qualitative and contextual drivers that have enabled – or hindered – a shift from Stage 1 "urban congestion growth" to Stage 3 "encouraging sustainable mobility and liveable cities" policies. It also contributes to highlighting lessons to be learnt in order to speedup these processes in Stage 1 cities.

The work done as part of WP4 is coordinated by Dr. Charlotte Halpern, at Sciences Po, Centre d'études européennes et de politique comparée (CEE), CNRS, Paris.

1.2 About these documents, D4.2 technical reports for stage 3 cities

These documents, **D4.2 technical reports for stage 3 cities**, reflect the work produced as part of WP4 during Task 3, "Qualitative analysis of transport policy development cycle processes in the five Stage 3 cities during the Shift from Stage 1 to Stage 3". Paying attention to case-specific contextual factors, policy instruments and programmes and involved stakeholders, **this case-study approach unveils the processes and the main drivers for change**[1].

D4.2 reports contribute to understanding the shift away from car-oriented policies towards alternative transport policies in different city contexts. Each report seeks to develop a comprehensive qualitative analysis of the historical development of policies relating to traffic congestion and car use over the past four decades. It investigates the ways in which transport policies are designed and implemented in the five Stage 3 cities, how they have evolved over time, which policy mix has been favoured at different times, their intended/unexpected effects, and how coordination has been ensured.

Each report draws on the following datasets:

[1] For more information, see D4.2 reports and technical notes.

- The work done in Tasks 1 and 2, as introduced in the 1st WP4 Technical report. This first technical report developed the common analytic framework, methodology and data collection strategy that is applied in WP4, provided a first assessment of the spatial and chronological perimeter it targets, and a brief mapping out of multi-level institutional and transport governance settings in the five Stage 3 cities, including a chronology of the shift from Stage 1 to Stage 3. Data sources include policy documents, proposed and passed measures, yearly budgets, and expert interviews with key policy actors.
- The dataset that were constituted as part of the WP4 database, interviews, workshops and site visits. This provided invaluable support for analyzing dynamics of change in each city and understanding the discrepancy we found between policy objectives and effective change.

Drawing on the common outline developed during Task 4.1, a case study analysis was developed for each stage-3 city in order to identify major factors of change and provide a detailed analysis of transport policy developments. The list of case study writers is provided here. We are thankful to Charles Buckingham (TfL) for his support in editing these reports and for his comments and suggestions for change.

List of case study writers for D4.2 reports

Stage 3 city	Case study writers
Berlin	Charlotte Halpern and Ann-Kathrin Bersch
Copenhagen and its region	Charlotte Halpern and Alessandra Carollo
Greater London	Dr. Caralampo Focas (on behalf of TfL)
Paris and Île-de-France region	Charlotte Halpern and Alessandro Maggioni
Vienna	Charlotte Halpern and Nicole Badstuber (UCL)

More precisely, these case studies assess the relevance of the 3 stages approach, characterize dynamics of transport policy change (incremental versus disruptive), and highlight factors of policy change (e.g., institutional and political, organizational, social movements, politics etc.).

More precisely, each D4.2. report includes the following information:

- A short summary
- Context: socio-demographic changes, major evolutions in urban development
- Institutional and political arrangements
- The governance of transport
- The organization of transport, including the transport offer
- Main policies, measures, or projects
- A brief conclusion about the 3 stages approach
- References, including grey literature and major policy reports, main publications about urban governance and transport.

The work achieved as part of WP4 is complementary to other work produced as part of the CREATE project. Particularly noteworthy is the work done as part of WP3 and D3.2 reports, which introduce transport supply data and policies influencing travel demand in each city. When relevant, specific sections from D3.2 reports are referred to. This will be done systematically during Task 4, and as part of WP5.

These reports are not in themselves a definitive synthesis of transport policy evolutions and their causes, but rather it is a compendium of resources, with some basic interpretation, to feed into this further analysis. It is complementary to the work produced as part of WP3, which reviews transport supply data and policies influencing travel demand in the city.

These reports only reflect the authors' view. Where opinions are expressed about the causes of change or the significance of specific aspects, these are with the sole intention of guiding further analysis under the CREATE programme and to act as a starting point for that further analysis.

1.3 Summary findings for D4.2 reports

For each of these report, the Sciences Po team (C. Halpern and C. Orlandi) produced a technical note, which content will be available on the project website as part the CREATE project's technical notes series – TN 6 to 9. These six-pages notes are meant to reach out to a wider audience. They highlight key drivers and processes explanatory of the shift towards stage 3, current and future challenges, as well as a discussion of the relevance of the stage-1-to-3 approach. This will reach out to a wider audience. We are thankful to Charles Buckingham, Radu Gaspar and the EIP team for their support in editing the final version of the Technical notes.

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Project acronym: **CREATE**

Project title: **Congestion Reduction in Europe - Advancing Transport Efficiency**

Project website **www.create-mobility.eu**

D4.2 - Technical report for Stage 3 city: London

Work Package 4 "Qualitative analysis of Transport policy developments"

Date of preparation: **26 september 2016**

Start date of project: **1st June 2015**

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Prepared by: **TFL**

Checked by: **C .Halpern**

Verified by: **C. Buckingham**

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1 The CREATE project

1.1 Brief reminder about the CREATE project

How to reduce road congestion in large cities in Europe and the Euro-Med? How to encourage a switch from cars to more sustainable transport modes? Historically, rapid urban growth has led to a growth in car ownership and use, and consequential increases in urban road traffic levels. These increases, in turn, are associated with a range of negative impacts, including traffic congestion, traffic collisions, social exclusion and dangerous levels of air and noise pollution.

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Further information available on the CREATE Website: http://www.create-mobility.eu/

1.2 About Work Package 4 in the CREATE Project

How to account for the shift away from car-oriented policies towards sustainable urban transport policies? As part of the CREATE project, the primary goal of Work Package 4 (WP4) is to analyse the historical 'Transport Policy Evolution Cycle' processes in Stage 3 cities, i.e. five Western European capitals (Berlin, Copenhagen, London, Paris and Vienna): Can we identify similar qualitative drivers of change across European cities? What are the main differences between cities and how to account for them? To what extent does the analysis of policy developments over time helps us make sense of recent policy choices and deadlocks? This is done by identifying the qualitative and contextual drivers that have enabled – or hindered – a shift from Stage 1 "urban congestion growth" to Stage 3 "encouraging sustainable mobility and liveable cities" policies. It also contributes to highlighting lessons to be learnt in order to speedup these processes in Stage 1 cities.

The work done as part of WP4 is coordinated by Dr. Charlotte Halpern, at Sciences Po, Centre d'études européennes et de politique comparée (CEE), CNRS, Paris.

This document, **D4.2 London**, is part of the second series of technical reports produced as part of WP4 during Task 3, "Qualitative analysis of transport policy development cycle processes in the five Stage 3 cities during the Shift from Stage 1 to Stage 3". It seeks to develop a comprehensive qualitative analysis of the historical development of policies relating to traffic congestion and car use over the past four decades. It investigates the ways in which transport policies are designed and implemented in the five Stage 3 cities, how they have evolved over time, which policy mix has been favoured at different times, their intended/unexpected effects, and how coordination has been ensured.

By highlighting discrepancies between policy choices and policy results, D4.2 reports contribute to understanding the shift away from car-oriented policies towards alternative transport policies in different city contexts.

This is done across the 5 cities as follows:

- Explore urban sustainable policy dynamics by looking at three policy dimensions:
  - policy objectives (i.e. Which are the main policy documents? How are power and resources distributed among different levels of government? Major policy reforms? Proposed, passed and failed measures?),
  - policy structures (i.e. what are the main resources: legal, financial, organisational? Evolution of budgets? Organisation charts? Creation of new agencies?)
  - policy instruments (i.e. regulatory/legislative, economic/fiscal, agreement-/incentive-based, informative/communication-based).

- Map out the evolution over time since the policy shift began by explaining the dynamics of issue salience, institutional and political changes, as well as changes in the governance of transport.
- Understand how controversies regarding urban sustainability policies were resolved by looking at policy results (failed/accepted measures).

The completion of Task 3 draws on the work done in Tasks 1 and 2, as introduced in the 1st WP4 Technical report. This introduced the common analytic framework, methodology and data collection strategy that is applied in WP4, provided a first assessment of the spatial and chronological perimeter it targets, and a brief mapping out of multi-level institutional and transport governance settings in the five Stage 3 cities, including a chronology of the shift from Stage 1 to Stage 3. Data sources include policy documents, proposed and passed measures, yearly budgets, and expert interviews with key policy actors.

The work achieved as part of WP4 is complementary to other work produced as part of the CREATE project. Particularly noteworthy is the work done as part of WP3 and D3.2 reports, which introduce transport supply data and policies influencing travel demand in each city. When relevant, specific sections from D3.2 reports are referred to. This will be done systematically during Task 4, and as part of WP5.

1.3 About this document, D4.2 London report.

The D4.2 London report develops a case study of this specific Stage 3 city. Similarly to other D4.2 reports, this report was written following the suggested outline developed by Sciences Po in December 2015. Some adjustments were made under the supervision of Dr. Charlotte Halpern (Sciences Po), in order to take into account each city's specificity (see disclaimer below).

More precisely, each D4.2. report includes the following information:

- A short summary
- Context: socio-demographic changes, major evolutions in urban development
- Institutional and political arrangements
- The governance of transport
- The organization of transport, including the transport offer
- Main policies, measures, or projects
- Brief conclusion about the 3 stages approach
- References, including grey literature and major policy reports, main publications about urban governance and transport.

This D4.2 London report provides a first analysis of transport policy developments in Greater London, and provides key data and high-level interpretations for London to feed into the wider cross-city analysis of transport policy evolutions being undertaken for Work Package 4 of the CREATE project. This D4.2 London report is not of itself a definitive synthesis of transport policy evolutions and their causes in London, but rather a compendium of resources, with some basic interpretation, to feed into this further analysis. It is complementary to the work produced by Transport for London (TfL), as part of WP3, which introduces transport supply data and policies influencing travel demand in the city.

Where opinions are expressed about the causes of change or the significance of specific aspects, these are with the sole intention of guiding further analysis under the CREATE programme and to act as a starting point for that further analysis.

1.4 Short summary of D4.2 London report

From the historical analysis undertaken, **London has followed the three 'stages of change' model, but it has not done so categorically**. There is an added level of complexity that has to do with legacy, geography and plurality. As with other older cities there was never a pure stage 1 type situation in London as there was an extensive public transport system in operation well before the mass advent of the motorcar. Furthermore, whilst Inner London has moved from stage 1 type thinking to stage 3, parts of outer London and London's peri-urban area still display aspects of car-based stage 1 type policy making. Even, if there is a general shift in thinking towards stage 3, there will be groups such as the freight industry that still champion stage 1 policies.

2 An analysis of transport policies in London.

2.1 Introduction

There are a number of issues that are of paramount importance regarding transport policies in London, many of these common worldwide to large metropolises faced with the need to enable the effective movement of people and goods for the smooth functioning of the city. One of these, that perennially preoccupies Londoners and their policy makers, is road traffic congestion. The famed urbanist Peter Hall writing in the 1960s stated "Londoners are fond of saying that London's traffic is grinding to a halt: they have been saying it for at least a century, and probably since the Middle Ages" (Hall 1966). It is not surprising that it has been recently reported in the news that London is the "most congested city in Europe" based on an annual analysis of traffic congestion in the main European cities by INRIX[1].

Low traffic speeds have historically been given as the main reason and justification for all new road proposals in London and even for some public transport schemes - with the idea that they would alleviate traffic congestion by shifting some drivers onto public transport and thus freeing up space for motorists. Martin Mogridge who wrote in the 1990s, noted that traffic speeds in London have been largely stable since 1908 except for some short periods, such as those of the oil crises of the 1970s (Mogridge 1990), implying that new construction had little impact overall. The latest report on traffic speeds in Central London in 2015, reports them as being 8.1 mph on average (Transport for London 2015).

This analysis of transport policies in London is based on the historical evolution of policies and outcomes since the 1940s. It was in the 1940s that the first comprehensive city-wide transport plan was made for London and its surrounding region, in the Greater London Plan, written by Patrick Abercrombie (1946).

The analysis of transport policies in London is geared to exploring the drivers and tipping-points of policy change in London over the decades, largely based on the three 'stages of change' model (Jones 2013 & 2016), which are at the heart of the CREATE project. Transport policies are analysed and an interpretation is given as to how well they fit in within the three 'stages of change' narrative.

This report uses literature from a variety of sources. It does not aim to provide a comprehensive literature review of post-war transport policies for London, but uses sources that best exemplify the issues that are under analysis and sources are referenced. Emphasis is given to the writings of authors that have commented and analysed both the planning and policies of transport over an extensive period, such as Tony Travers, Michael Hebbert and Peter Hall. Furthermore, unlike many contemporary studies, and with this report being largely a historical analysis of transport policy, it is not confined to recent literature on the subject but also uses some historic literature that has been now mostly forgotten.

Despite London being a city with a developed public transport system, car oriented policies were prevalent for a number of decades from the 1940s onwards. What these policies achieved was to enable a lower density suburban growth, but at the cost of the removal of some of the city's public transport infrastructure, such as the entire tram network.

The opposition to road-based policies came from the grassroots. It emerged in the 1970s as a popular movement against demolition of houses to make way for urban motorways. Although road based transport policies have largely been eclipsed in London itself they are still pursued in recognisible form in the rest of South East of England.

With the reintroduction of local democracy in London with the election of a Mayor in 2000, there came a remarkable change in the transport policy. The thinking regarding transport changed radically to reflect the concerns associated with stage 3 type preoccupations such as air quality and health. Yet if one were to walk around London one would not see a city geared to the needs of cyclists and pedestrians, but it is clear that transport policies and the public mood are moving increasingly in that direction.

[1] See INRIX London congestion trends report, May 2016: http://inrix.com/wp-content/uploads/2016/05/INRIX_London_Congestion_Infographic_May2016.pdf.

From the historical analysis undertaken, **it can be said that London has followed the three 'stages of change' model, but it has not done so categorically**. There is an added level of complexity that has to do with legacy, geography and plurality. As with other older cities there was never a 'pure' stage 1 type situation in London as there was an extensive public transport system in operation well before the mass advent of the motor car. Furthermore, whilst Inner London has moved from stage 1 type thinking to stage 3, parts of outer London and London's peri-urban area still display aspects of car-based stage 1 type policy making. Even, if there is a general shift in thinking towards stage 3, there will be groups such as the freight industry that still champion stage 1 policies.

2.2 Prioritising the motor vehicle

The type of thinking that planners and politicians typically adopt when facing for the first time the growth of car traffic is to build more roads. This type of thinking characterises the stage 1 of the three 'stages of change' theory. London proved no exception to this.

The use and ownership of the private motor car expanded rapidly before the Second World War. Whilst motoring was a luxury hobby in 1900 with only 8,000 cars registered in Britain, the number of cars on the roads began to rise during the 1920s as manufacturers started to make small, lightweight and cheaper vehicles for a wider market. Driving licences issued to London addresses rose from 100,000 in 1920 to 261,000 in 1930[2]. This increase in car and other motor vehicle traffic led in the 1920s to the beginning of modern traffic management with the installation of Britain's first traffic lights in Piccadilly Circus.

From the turn of the century the government attempted to deal with the new car traffic issue at a citywide level. Up until the 1940s, a variety of road plans were produced most of which included some form of orbital roads around London.

Table 1. List of main plans, prior to 1943:

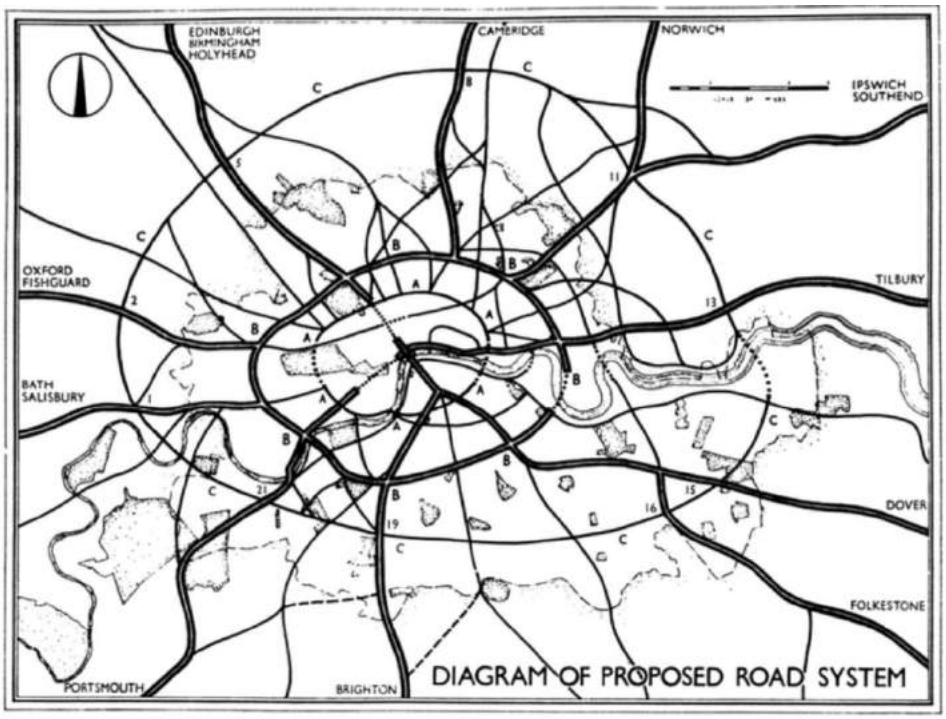
1905 - William Rees Jeffreys on behalf of the Road Improvement association and the Automobile Club to the Royal Commission on London Traffic which included "a boulevard around London".
1911 – London Traffic Branch within the Board of Trade produced the Great Road Plan consisting of over 120 miles of new roads.
1913 – The 1st Arterial Road Conference was held. Over 100 local authorities and other groups participated at the Conference.
1916 – The 2nd Arterial Road Conference was held and effectively approved the Board of Trade's 1911 plan.
1933 – The Greater London Regional Planning Committee proposed 71 new or improved road routes. It suggested that diagonal routes were best suited to London rather than "ring and circumferential roads".
1938 – The Highway Development Survey 1937 by Charles Bressey and Edwin Lutyens for the Minister of Transport was produced. This was comprehensive regional road plan including three orbitals.

2.2.1 Patrick Abercrombie's road plan

Following the end of the Second World War one action characterised London's development for many of the following decades: **it was the creation of a road plan that based on a number of radial roads emanating from the centre and a series of five orbital roads, prescribed in the Greater London Plan, written by Patrick Abercrombie (1946)**. The thinking behind the plan was heavily influenced by the writings of the former Metropolitan Police Commissioner for Traffic Alker Trip who advocated traffic segregation in the interests of road safety (Hebbert 1998).

[2] Now there are over 2.5 million cars licensed in London (Transport for London: Roads Task Force 2013). As car ownership rose, so did traffic collisions. There were 4,886 fatalities in 1926 due to traffic accidents rising to a peak of about 8,000 in the mid 1960s. In 2014 there were only 127 fatalities in London as a result of a road traffic collisions (Transport for London: Surface Transport 2014).

Map 1. Patrick Abercrombie's Road Plan for London



Source: Forshaw and Abercrombie 1943.

The County of London Plan was based on the widespread belief that a modern city should cater for the motor car and was grounded in the ideathat road traffic was like a hierarchical circulatory system. Longer distance traffic needed to be separated from ordinary street traffic by running on a segregated road network. At the highest level of the hierarchy would be the arterials, which would be a new kind of road, a grade separated, limited access multi-lane highway similar in form to the newly created Italian Autostrada or the German Autobahn (Hart 1976). Below were various levels of sub-arterials, down to local streets. The creation of the new arterials was seen as a way to remove car traffic from local and residential streets. It was seen as a method of "corrective surgery… that would necessitate the insertion of artificial channels, or canals, to drain away traffic from areas where it was both unnecessary and unwanted" (Hart 1976). The hierarchical road system was seen as natural as the body's blood circulatory system, whose terms it adopted. Mixing uses for road space was to be avoided. Forshaw and Abercrombie (1943) in The County of London Plan, give the example of Oxford Street that is neither a through street nor a local one. They state, "Oxford Street is perhaps the clearest example of the mix-up of through, stopping and pedestrian traffic".

The legacy of Patrick Abercrombie's Greater London Plan remained a key reference point for London's urban development for decades. There had been extensive destruction of property during the bombing of London during the Second World War, which allowed the rebuilding of entire areas of London and the possible construction of new roads.

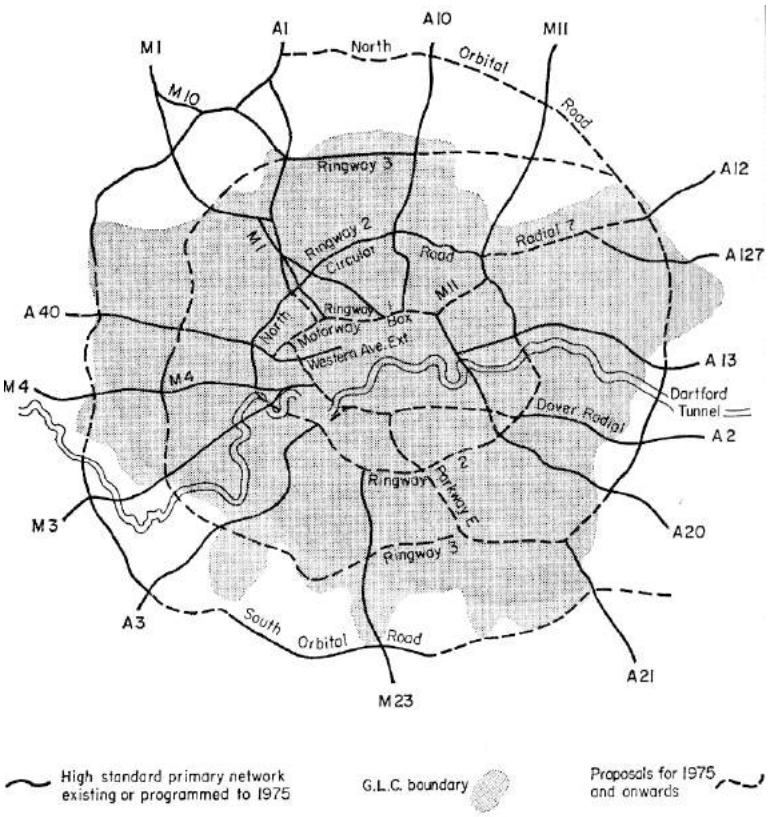
Of the original five orbital roads proposed, only the M25 and the North and South circular roads are recognisible in this form today[3]. Of these only the 188 km M25 is of motorway standard. It was started in 1973 and completed in 1986. Although the Greater London Council still pursued the motorway plans for London well into the late 1960s (they became known as the 'Ringways' and the most inner ring, the 'Motorway Box'), most were eventually abandoned due to cost and a public mood less inclined to accept urban motorways.

[3] These two orbital roads have developed to fulfil the role originally envisaged.

By the 1950s **the issue of increasing traffic congestion was again becoming a common preoccupation in London**. Increasing car ownership was leading to increasing car use partly encouraged by the derationing of petrol, following recovery from the Second World War in 1950. The London County Development Plan of 1951 stated that increased traffic congestion was largely due to a saturation level having being reached at important intersections (London County Council 1951). The road network was seen as unable to cope with ever increasing traffic, leading to ever-declining traffic speeds. According to the government's Road Research Laboratory, during peak times the average speed in Central London was about 11 miles per hour in 1953. Edward Carter (1962) claimed that between 1909 and 1958 vehicle journey speed in central London decreased from 11.4 miles per hour to 10.3 miles per hour. According to John Hart (1979) by 1959 the traffic speed had fallen to almost 8 miles per hour (Hart 1976). In 1956 London's main newspaper the Evening Standard reported how the London and Home Counties Traffic Advisory Committee was forewarning that "unless radical action is taken traffic will come to a standstill" in Central London "within five years" (Hart 1976).

The London County Development Plan of 1951 also bemoans a lack of adequate parking provision. Indeed parking was a main issue for the Ministry of Transport that set up a committee, the London and Home Counties Traffic Advisory Committee, to look at the future of car transport in London. It proposed underground car parks in central squares and they were to have a nominal charge to encourage drivers to use them (Plowden 1971).

Map 2. The Road Plans for London in 1969



Source: Thomson, J. et al. 1969.

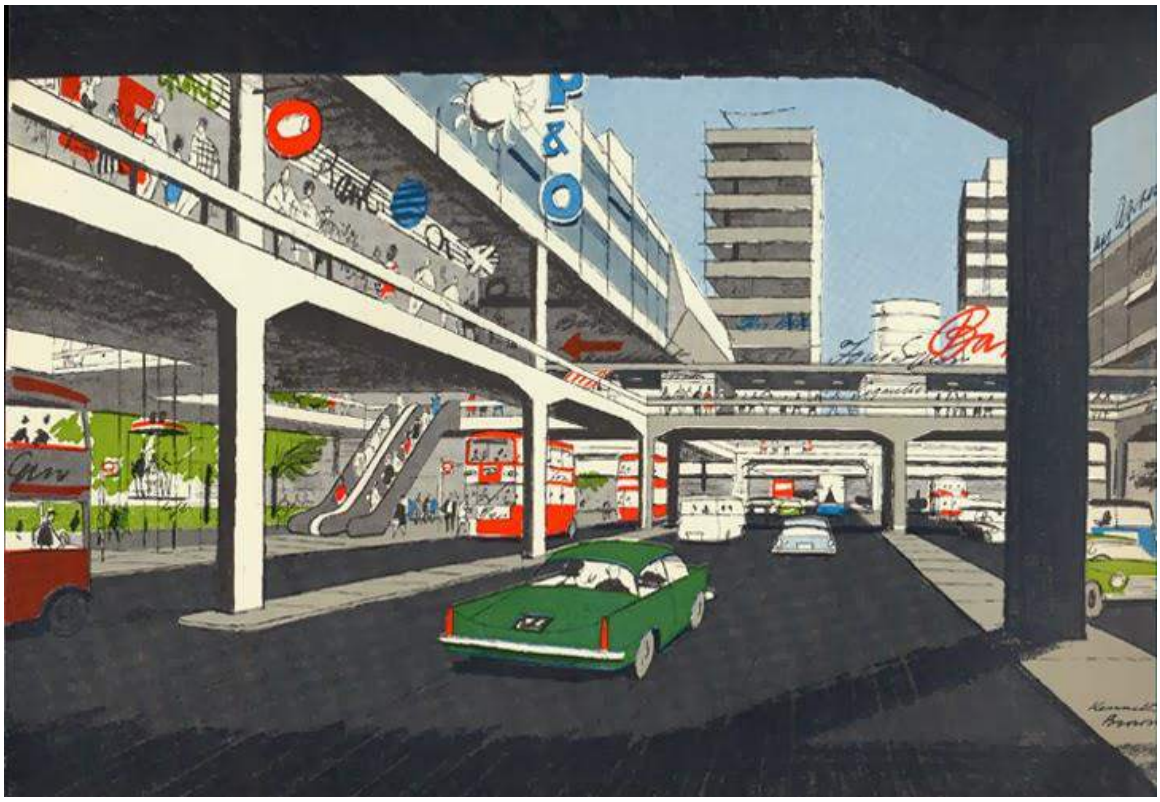
Increasing road capacity to meet the demand of rising traffic was an accepted and largely undisputed orthodoxy with transport professionals, at that time nearly exclusively engineers, the public and politicians. The problem of creating roads for cars in London was not that of opposition but rather that of cost and difficulty of implementing the proposed high volume radials and orbitals in a dense urban environment.

The building of roads had widespread support in the 1950s and 1960s. In 1955 the Roads Campaign Council was formed representing road users' groups and launched its "Roads Crusade". Both the Trades Union Congress and the Employers' Federation pushed throughout the decade for extra road building.

2.2.2 Making the car-oriented city material: the Buchanan report.

It was Patrick Abercrombie who presented the framework for road building in the 1940s **but it was Colin Buchanan who presented the tools for analysis and evaluation in the 1960s**. The 1960s were characterised in terms of transport policy by a report commissioned by the Ministry of Transport and published in 1963, *Traffic in Towns,* also known as the *Buchanan Report* (Buchanan 1963). The report became influential in town and transport planning in Britain. It became so popular that it was published even as a paperback. The report headed by Colin Buchanan had as its primary objective the environmental consequences of increasing car use. It proposed ways to accommodate the car in cities through the creation of appropriate roads, residential areas, enhanced car parking and segregating pedestrians from cars. Although concerned with the impact of the car on cities, *Traffic in Towns* ultimately attempted to accommodate the car through measures such as changing the frontage of shops, from facing the road to look back at more pedestrian friendly squares with multi-story car parks. The report used the area north of Oxford Street in London as an example of how to segregate vehicular traffic from pedestrians if cars and pedestrians were to inhabit the same space.

Figure 1. Buchanan's view of Oxford Street



Source: Buchanan report, 1963

Possibly, after Abercrombie, the *Buchanan Report* was the most influential document regarding transport planning in London and Britain as a whole. Its influence remained undiminished until the end of the century. Indicative of this is that the *Roads and Traffic in Urban Areas*, an authoritative manual of transport planning issued by the Institution of Highways and Transportation and the Department of Transport in the late 1980s commenced by stating: "the '*Buchanan Report*' achieved wide acceptance and continues to provide the basis for many traffic management policies in use in the 1980s. The report demonstrated that whilst there are absolute limits to the amount of traffic that can be accepted in towns, if urban areas are to function efficiently, then land use, transport, highway and traffic developments have to be planned and managed together as part of the same process. This philosophy is true today as it was then, especially as car ownership continues to rise. (Institution of Highways and Transportation and Department of Transport 1987)".

We thus see that in post-war London, the prevailing policies were those of enabling the use of the car, channelling it in 'appropriate' roads, which, for main arteries, meant urban motorways. The Buchanan report managed to bring together those concerned about the need to build roads to cater for increasing motorisation as

well those concerned about the environmental impact new roads would have on the city and especially residential neighbourhoods.

Throughout the 1960s, car ownership and car use continued to rise in London. Some 7.4 million journeys were undertaken by car in London in 1971 compared to 5.4 million journeys undertaken in 1962 (Greater London Council 1985b). In the same period public transport journeys fell, from 5.8 million to 5.0 million (Greater London Council 1985b). Bus fares continued to be higher than car running costs, including parking, for private vehicles (Greater London Council 1968).

In the 1960s much attention was given to roads and the increasing car traffic whilst public transport was viewed as increasingly uneconomic and in need of rationalisation. London's trams and trolleybuses were seen to be uneconomic and were viewed as a barrier to car traffic. By 1952 all of London's trams had been closed down and by 1962 so were all of London's trolleybuses.

Transport planning became an increasingly technical activity to be carried out by highway engineers. This technicalisation was mirrored in the administrative structures of local government with the Greater London Council setting up the Department of Highways and Transportation to perform a particular task: to plan and provide a large increase in highway capacity (Hall 1982). Even when it was later merged with the Planning Department, it was seen as a takeover by the Highways Department and planning became, not a holistic approach to the shaping of the urban sphere but a problem solving one, where traffic was the most important one to be solved. The philosophy of accommodating traffic in the metropolis was prevalent amongst transport and planning professionals well up until the 1990s.

2.2.3 The limits to Stage 1 thinking.

It is argued that stage 1 of the three 'stages of change' theory is characterised by rapid urban economic growth, leading to a fast growth in car ownership and use, and general support for policies to build new roads. The Abercrombie plans, the London Ringways and the Traffic in Towns report fit in very well within this stage. However, London had a developed public transport network well before the growth of car ownership and use. Some public transport was indeed ripped up, such as the tramlines to make way for the car, but to a large extent, public transport was very significant throughout the post-war years, commanding about half of all motorised travel. Some zoning policies and street designs discouraging walking and cycling were adopted in implementing the road hierarchy, segregating the car from pedestrians on top level roads through walkways, as advocated in the Buchanan report, but this redesign and reconstruction of London was not widespread.

London, being an old city, faced traffic congestion, as mentioned by Peter Hall, by people and animals as early as medieval times. The centre of London can be seen as having always been congested. Commuting from the suburbs was occurring in Victorian England well before the car appeared. In London, the roadway plans were to be superimposed on what now are termed "transit oriented developments" of pre-automobile times.[4] The destruction of parts of London in the bombing of the Second World War would have provided an opportunity for some of the urban motorway proposals to be taken forward. However, in London, only very few of the road proposals of the 1940s were actually implemented, even though they commanded widespread political support, and were championed by the transport planning professionals for a long period of time..

Stage 1 type city structures developed more clearly in the new suburbs that emerged from the 1930s onwards: suburban detached housing with cul-de-sacs, collector and distributor roads. Most of that type of development took place outside Greater London in new towns and developments. Many of these types of car-based developments are still being built in the South East of England outside Greater London, where low density housing prevails.

Thus, while stage 1 type thinking can be seen to have taken hold amongst the transport professionals in London, **the three 'stages of change' does not ideally describe London**. The urban form was already well developed before the advent of the car. So, what can be said about London up until the 1970s and the 'three stages of change' theory, is that although politically it was a stage 1 city, the stage 1 policies were not well implemented because it was an already well functioning metropolis with an established public transport system

[4] Transit-oriented development or TOD is a form of urban development developed by Peter Calthorpe in 1993 in the United States. It seeks to create "compact, walkable, pedestrian-oriented, mixed-use communities centered around high quality train systems" (Cervero 1998).

based on radial commuter railways and an urban largely underground metro. Thus, the accommodation of the car in the 1950s and 60s did not wholly take place, and certainly not with major urban road construction. Furthermore, from the 1970s these road-based policies faced an intense grassroots rebellion.

2.3 Against motorways

Up until the 1970s there were very few voices that questioned the axiom that building roads was necessary to cater for the inevitable growth of car ownership. The Greater London Council's 1968 Greater London Development Plan advocated an increase in capacity of the primary route network by simply upgrading most of Abercrombie's sub-arterials to arterials which, in the 1960s Greater London Development Plans, meant motorways (Hall 1989).

Yet, by the 1970s the public and the political climate was turning against the urban road solutions. A report commissioned by the London Amenity and Transport Association, *Motorways in London* (Thomson et al.1969) published in 1969 was a first attempt to suggest that a different transport strategy was required to solve London's transport problems and it did not involve urban motorway construction. By the mid 1970s more voices were being heard opposing new road construction.

2.3.1 Local grassroots anti-roads campaigns.

The changing views on urban road construction were especially vociferous at the local level. The 1970s saw a grassroots anti-roads campaign taking shape in London and coalescing in the 'Homes Before Roads' group. It was a group that married political ecology, environmentalism and a 'not in my back yard' type of reaction. The group opposed the road-building programme of the Greater London Development Plan. It fought it at public inquiries and put up 80 candidates in the 1970 Greater London Council elections. They did not win any seats but it changed the political atmosphere so that the London Labour party started too to oppose the road plans. In the 1973 Greater London Council elections the London Labour Party, which was originally responsible for the motorway proposals (Thomson 1977), fought and won on a political platform that included the abandonment of all urban motorway construction.

Figure 2. Front page of The Guardian in 1995 featuring the Barrier Block


45p
Thursday
April 27
1995
Published in London
and Manchester

The Guardian

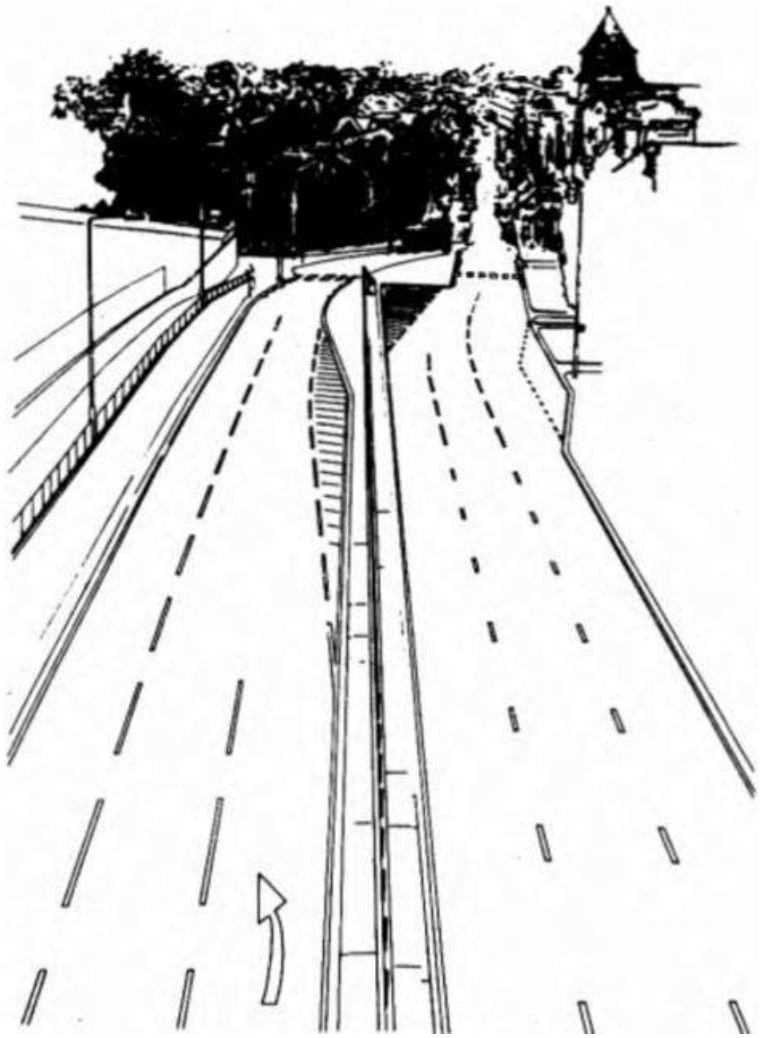
'There they stand, grey, sullen wastelands, robbing people of self-respect'

Source: The Guardian, April 27, 1995

Most of the Ringways and Motorway Box plans were never actually realised in Greater London. The only main urban motorway that was completed was the Westway, much of it elevated above ground. However, the negative effects of the plans left scars in the city in other ways. An example of one such destructive element was the 'Barrier Block' (officially named Southwyck House) in Brixton, South London. This was a series of three large multi-storey apartment blocks, commissioned by Lambeth Council in 1970 and completed in 1983, which were characterised by a façade of a long wall with tiny windows, to deflect the noise and pollution of the southern route of the Motorway Box, that they were planned to abut. The motorway was never built but these blocks remained and became one of London's infamous, crime ridden, run down, inner city council estates.

The new philosophy that started to emerge in London in opposition to Buchanan's one of accommodating traffic, even if segregated from residential areas, was that any extra traffic would inevitably create an overspill and thus residential areas would be burdened with ever increasing traffic. This philosophy was embraced by those most affected by the urban road proposals. The main proponents argued that land use planning should seek to provide a maximum range of facilities within easy walking distance without the need for car travel (Hall 1982).

Figure 3. Northward view from the A1 Archway Road



Source: Adams 1981

Throughout the 1970s there was an emerging significant grassroots activism against the road-building programme. Enid Wistrich (1983) notes how remarkable it was that these new activists, residents and public transport users' groups joined forces with existing environmental and civic societies, such as Friends of the Earth and the Civic Trust to campaign together on transport matters.

Indicative of this new grassroots activism were the “infamous” Archway inquiries into the widening of a stretch of the A1 trunk road in north London. Four public inquiries[5] were held between 1973 and 1984 to create a stretch of urban motorway on the road leading from the north of England to the London docks. The first inquiry started in 1975 and was concluded two years later. The second inquiry, in 1976 was abandoned because of the inspector's ill health and an organised campaign of disruption. In 1977, the third inquiry was adjourned after six months of almost continual disruption and harassment of the inspector[6]. The fourth inquiry in 1984 was also abandoned after the inspector resigned due to severe harassment. Local politicians Ken Livingston and Jeremy Corbyn campaigned by “fighting tooth and nail” against the plans[7]. Most of what was originally proposed was eventually abandoned and now, as can be seen in figure 3, a short six-lane grade-separated highway turns abruptly into the very urban ordinary Holloway Road on one end and the narrow Archway Road in Highgate at the other end.

2.3.2 Managing road capacity as opposed to the car-oriented city.

By 1976, a new approach was being taken by the Greater London Council and became adopted in the updated Greater London Development Plan. The new Plan moved away from the roads solution to London’s transport problems. The Greater London Council now adopted a policy to manage road capacity in such a way as to restrain what was considered ‘inessential’ traffic, and to make the best use of the existing system so as to assist public transport and protect the environment and the safety of both drivers and pedestrians (Wistrich 1978). In it’s transport policy programme of 1977, the Greater London Council declared its intention to reduce peak hour traffic levels in central London by a third (Adams 1981).

The Inner London Parking Area[8] was extended, meter charges were raised and a number of public car parks were closed. The biggest problem, however, was the number of private car parks in office and shopping centres. Here the Greater London Council was faced with the consequences of its own earlier policies, for in the 1950s and 1960s planning permission for new developments had always required ample provision for off-street car parking. Furthermore, there was the issue of enforcement. According to Peter Hall (1982) fines failed to keep with inflation and this “led to violations of parking and loading regulations on an epic scale”. And by the early 1980s all that had been gained before from traffic management was wiped out (Hall 1982).

The preoccupation of accommodating extra road traffic due to an expanding section of the population that owned a car however still remained orthodoxy in the transport planning profession. The difficulty of achieving that, especially in a large urban area such as London, was the challenge. Traffic restraint, although somewhat necessary, was seen by some as a threat to economic efficiency. In the *Roads and Traffic in Urban Areas* manual, it is stated that some “Scandinavian cities have restrained traffic to minimise the impact of private cars. This type of policy brings with it its own risks such as a threat to the economic prosperity of the area because both car users and businesses may transfer to alternative areas (Institution of Highways and Transportation and Department of Transport 1987)”.

Although there had been quite clear opposition to new roads in London in the 1970s and many schemes were shelved or abandoned, in 1984 the UK Government produced further proposals for major road improvements, the London Road Assessment Studies[9]. The first reports of the Assessment Studies emerged in 1988 and 1989 and, although having the support of some of the outer London boroughs, led to such a high level of public opposition that the schemes were scrapped by 1990. Transport 2000, the national environmental transport campaign, brought together more than 150 action and environmental groups from around London and

[5] The procedure of the public inquiry was chosen by then secretaries of state for transport, as this was a controversial planning decision and could be better carried politically with an inspector’s recommendation. However, it was also politically hazardous as it gave a very public voice to protestors.

[6] See: Hansard, House of Commons Debate 28 April 1978 vol. 948 cc1934-46 and House of Commons Debate 11 May 1984 vol. 59 cc1268-76

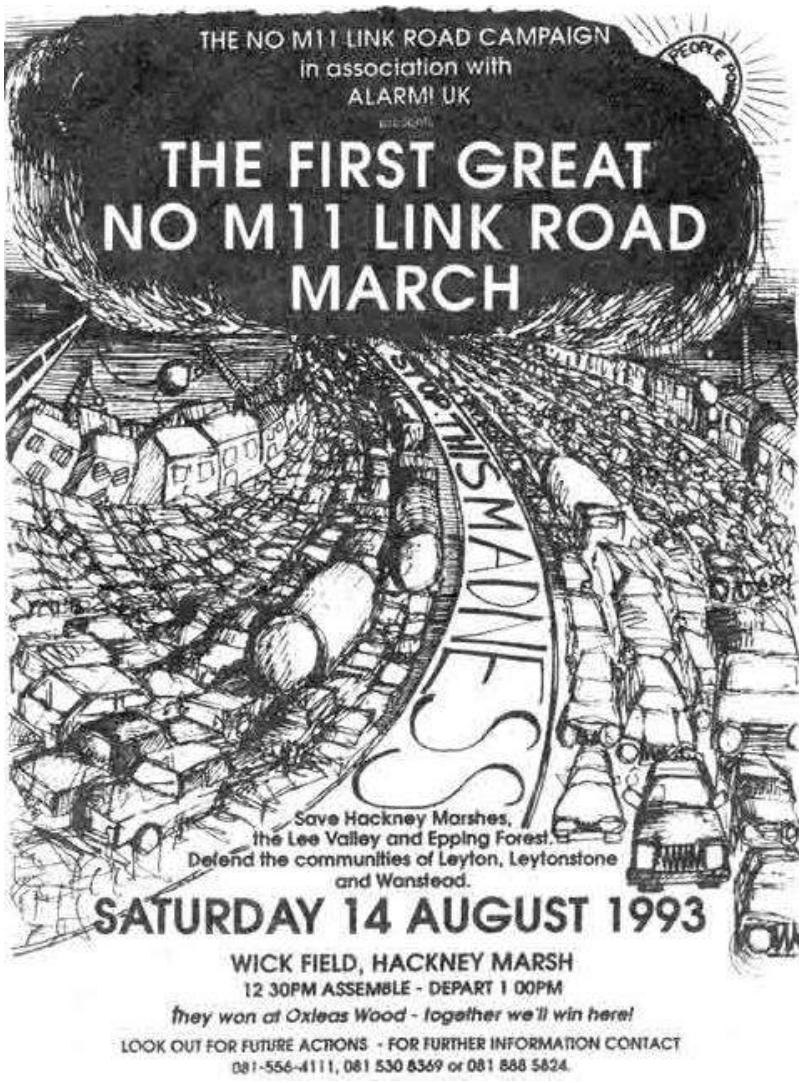
[7] Source: http://jeremycorbyn.org.uk/

[8] The Inner London Parking Area was created by the Greater London Council in 1969 to restrict parking on main thoroughfares with the aim of both smoothing traffic flow and discouraging parking in high demand areas. This later became a policy to discourage car commuting and speeding up bus traffic in the capital.

[9] This initiative should not only be seen in a context of changing central-local relations, as some groups and boroughs, mostly outer London ones, supported the Assessment Studies.

the result was the formation of an effective umbrella co-ordinating and facilitating body, known as All London Against the Roads Menace - ALARM[10]. By the 1980s, citizens' organisations' ability to fight schemes with over a decade of experience was growing and becoming very effectual (Wood and Blancher 1999).

Figure 4. Activists' poster against the extension of the M11 motorway in the East End of London



Despite the reversals all major road proposals were receiving, in London the transport planning profession was wedded to a system of planning based on the forecasting and modelling of traffic: the so-called 'predict and provide' approach. In London, it gained its prominence from the 1970s to the 1990s through the huge and overarching London Transportation Studies (LTS) model[11]. This was a traditional type of transport model

[10] ALARM became a national body after 1989 as a response to the Government's White Paper, Roads for Prosperity, detailing a massive road-building programme across the United Kingdom, which according to ministers was the 'largest road building programme since the Romans' (Goodwin 2003). The widespread road protests organised by ALARM and other grassroots bodies led to many of the schemes contained within it to be abandoned in 1996 (and the consequent disbanding of ALARM, which had now achieved its purpose).

[11] The LTS was a traditional four stage transport model whose data came from the 1971 London Travel Survey and later the 1981 survey. It was based on a large household survey and a series of roadside cordon surveys, plus some public transport surveys. The model divided London into about a thousand zones. The LTS model was developed at the Greater London Council but from 1986 onwards it was taken over by the Department of Transport and run by private consultants. As with other such type of models, the traffic forecasts come as a 'given', based on population and gross domestic product forecasts. The extra

based on household and roadside data. Traffic forecasts were linked to predicted increases in population and the Gross Domestic Product.

The lack of building new roads did not mean that London turned to investing in the public transport system. Pulcher and Lefèvre (1996) note that in 1975 the Underground amounted to 381 kms of lines and by 1993 it had grown to only 394 kms. Not only was there a dearth of new infrastructure but maintenance was also being neglected, to the point that, as ridership started to pick up by the early 1990s on the suburban railways and the Underground, overcrowding, deterioration of quality and increasing unreliability of service resulted (Bayliss 1991).

2.3.3 Transport infrastructure crisis in Greater London? Characterising Stage 2.

The lack of any type of investment in the capital's transport system was seen as a major liability in an increasingly competitive environment for attracting inward investment as a 'world city'. Peter Hall (1989) summed up what was becoming a common view - he saw the relationship between the development of the city and its transport system was becoming out of synchronisation. He stated, "if we continue thus to fail, the penalty may be severe: London may increasingly lose out to its non-muddled, highly rational neighbours, who are doing the things we should have done and are doing them rather well (Hall 1989).

Throughout the 1980s and 1990s public discontent grew as the Underground and suburban rail were becoming increasingly unreliable due to a prolonged lack of investment in maintenance. For instance, the Northern Line became known in the press and media as the "Misery Line"[12]. In popular culture London was becoming the car-chocked city whose public transport system was left to rot. Typical of this was a comedy best selling novel, *Gridlock* by Ben Elton (1991). The novel depicts a near-future London in which traffic congestion has reached almost critical levels, such that accidents in a few key places could bring the entire city's traffic network to a halt[13]. Indeed, the idea of potential gridlock became a talking point in the local media in the 1990s[14]. Peter Hall (1989) describes a real life incident in December 1987 where a vehicle collision in Blackfriars, a burst water main in Hampstead and a gas leak on the Finchley Road "caused traffic progressively to lock in increasing circles. By about 7 in the evening, an estimated 50,000 cars were stuck in a motionless jam that stretched from Hendon in the north to New Malden in the south".

Stage 2 of the three 'stages of change' theory is characterised by a realisation that road building cannot solve an area's need for mobility. There is no longer a general support for policies to build new roads and there is a shift in thinking from the road vehicle to person based mobility that is better served by public transport, especially rail-based public transport. In London the abandonment of the Abercrombie plans for the London Ringways are very much a part of the thinking and outcomes that characterise this stage. However, although London abandoned new road building as a viable option by the 1970s, in the three decades that followed there was not a concomitant investment into new public transport infrastructure, as the stage 2 model of the three 'stages of change' theory suggests. Instead London from the 1970s right up to the turn of the century saw little investment in any form of transport.

The lack of investment can be partly attributed to a variety of factors; these range from:

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traffic had to be accommodated by the local area. The LTS model was extensively employed to validate the London Road Assessment Studies.

[12] The term "misery line" started being used in the 1980s, became common in the 1990s and continued whenever problems reappeared on the line. Example of press, internet, radio and television coverage: BBC News Channel (2005), LBC/IRN (1994), Mail Online (2016) and Thames News (1988).

[13] In the novel (Elton 1991), the government is aware of the problem and plans a major new road-building program to relieve the pressure. The alternative, heavy investment in public transport, is ignored because it clashes with the government's ideology. The climax of the book sees shadowy forces deliberately instigate the necessary simultaneous accidents that do indeed bring the whole of London to a standstill for several days. The resulting chaos is used as an excuse to press ahead with the road-building scheme.

[14] In the 1990s a number of bomb attacks by the Irish Republican Army and hoax calls caused numerous closures of main roads and evacuation of busy railway stations, causing road traffic to get blocked, often for hours.

- a declining population up until the mid-1980s[15],
- lack of city government between 1986 and 2000 with the abolition of the Greater London Council,
- Financial stringency and new neo-liberal thinking that it is 'up to the private sector to build and operate transport systems'

Thus London can be seen as having entered a stage 2 phase from the 1970s, although it was a particular form of stage 2. It was a phase where the paradigmof the 'predict and provide' approach to road building was effectively abandoned, but where a new mobility paradigm did not take its place. Perhaps because of the pre-car existing extensive public transport network that has been mentioned as an anomaly in the analysis of London's stage 1, there was perceived to be no immediate need to undertake any extensive new public transport infrastructure investment. However, the lack of new investment and the lack of investment in the maintenance of the existing public transport infrastructure, led to a period of widespread discontent with both road traffic and the service offered on London public transport network.

2.4 New thinking for a democratic and liveable city

The 1980s and 1990s can be seen in London as a period of neglect and stagnation. The Greater London Council, which acted as a pole of opposition to Margaret Thatcher's neo-liberal conservative policies, was abolished by parliament in 1986, which left London as the only large metropolis in the world without a central administration[16]. Its abolition led to a policy vacuum and an incredible fragmentation of the metropolis' functions.

The transport functions of the capital were transferred to central government. Cutting public expenditure was the key ideology permeating that decade and saw no new transport infrastructure in London, with the exception of a few schemes in the redeveloping Docklands, and a corresponding underinvestment in public transport.

Nothing much changed in the operation of London's transport. The public transport system faced neglect but no new significant road building was undertaken instead. Traffic restraint, although somewhat necessary, was seen by some as a threat to what became termed by politicians as the "car owning democracy"[17].

By the time Tony Blair became prime minister in 1999, both the political and the intellectual climate was changing. The demand for a democratically elected government for London led to the creation of the post of Mayor to be elected through universal suffrage.

The Mayor and the Greater London Authority administer and direct Transport for London, the Metropolitan Police and the London Fire and Emergency Planning Authority. 63 per cent of the Mayor's budget goes to transport (Mayor of London 2016) and hence much of the Mayor's attention and policy is directed to London's transport.

In 2000 Ken Livingstone was the first elected Mayor for London, running on a left-wing platform against both the Conservatives and Labour[18].

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[15] See Figure about basic population trend for Greater London, showing relationship to indicators of total travel demand, in D3.2 London report, p.17 (extracted and added in the annex section).

[16] Although the creation of the Greater London Council took three years of deliberations and careful planning, its abolition appeared in the 1983 Conservative Party manifesto "out of the blue" (Hebbert 1998) and was very much a personal decision of the prime minister, Margaret Thatcher (Travers 2004).

[17] The term "car owing democracy" was first used by the Steering Group on the Study of the Long Term Problems in Traffic in Towns in their comments on the *Buchanan Report* (Buchanan 1963). It was also used much later by Prime Minster Margaret Thatcher, who referred specifically to the "great car owing democracy" in defining the neo-liberal philosophy for Britain, similar to the phrase, the "great property owning democracy" that she used.

[18] Ken Livingston was considered to be too left wing for the Labour party which had shifted to the right under the leadership of Tony Blair. He failed to be selected as the Labour Party candidate for Mayor and stood as an independent. In the first Mayoral elections he beat all other candidates, including the Labour Party's, to become the first Mayor of London. He was expelled from the Labour Party but readmitted few years later to run for the next election for Mayor of London in 2004, which he also won.

2.4.1 Reforming transport governance.

Investment in public transport infrastructure that was sorely required from the 1970s finally came thirty years later. By the late 1990s there was general agreement that it should be a priority to secure investment in London Underground in order to improve services and bring the network up to modern standards after a long period of underinvestment that created a big backlog of maintenance. This could only be achieved with a stable funding regime to allow investment to be planned ahead. While the previous Conservative Government announced its intention to privatise the Underground, the Labour Government that took office in 1997 opted instead for a Private-Public Partnership. Private infrastructure companies were to upgrade and maintain the railway system for a number of years and the hand it back to the Greater London Authority. In taking this decision it faced opposition from a number of quarters, including unions and safety campaigners and the first Mayor of London, Ken Livingstone. Ken Livingstone and his Transport Commissioner, Bob Kiley, took the government to court over the decision and championed an alternative method of raising money, via the issue of bonds secured against future fare revenues from London. The bonds proposal was rejected by the Treasury. Ken Livingstone was ultimately unsuccessful in his judicial challenge and the Public-Private Partnership went ahead in 2003.

Unlike the Bus network, private infrastructure companies were to upgrade and maintain the Underground railway system for a number of years and then hand it back to the Greater London Authority. However, the Public-Private Partnership was plagued by problems. In 2007 one of the private companies went into receivership and Transport for London, the new body set up to run all of London's transport, including roads, took it over. By 2010 the whole Public-Private Partnership scheme had collapsed and it was all taken over by Transport for London. The collapse of the Public-Private Partnership vindicated Ken Livingstone's position and made a severe dent in the proposition that risk could be transferred to the private sector in government sponsored transport infrastructure projects.

With the new millennium London started to see significant investment also being made in other parts of the public transport system. These included:

- Crossrail, a new East-West rail line running underground through central London - building work commenced in 2009;
- The Channel Tunnel Rail Link and the re-building of St. Pancras station;
- On-going improvements on Thameslink - the cross-London rail line linking north and south suburban rail lines through a short underground rail stretch near St. Paul's cathedral;
- London Overground: improved suburban rail lines taken over by Transport for London and rebranded;
- Docklands Light Railway – Eastern extension and river crossing to Woolwich;
- Tramlink – A new tramline opened in 2000 operating in the Croydon area of South London.
- New buses, including the introduction of the articulated 'bendibus' followed by a redesigned rear open platform Routemaster[19];

Most of the finance for these projects has come from central government. In London the biggest single infrastructure project was the new east-west cross-London rail line, Crossrail[20], which is still currently being built.

2.4.2 A new generation of transport policy measures and tools.

London's new thinking on transport led to one of the most radical policies ever undertaken in a large metropolis, the introduction in 2003 of the road area-charging scheme known as the Central London Congestion Charge. The new policy involved the introduction of a £5.00 entry fee for vehicles to enter Central London. The scheme is managed by Transport for London and its proceeds, minus administration expenses, are ploughed back into supporting public transport operations. The charge has now risen to £11.50 with a penalty of between

[19] The operation of the bendibus was deemed to be dangerous for pedestrians and cyclists. In a period when articulated buses made up approximately 5 per cent of the London bus fleet, they were involved in 20 per cent of all bus-related deaths. These statistics eventually led to their replacement.

Boris Johnson introduced a new bus designed specifically for London, the New Routemaster. The original Routemaster was a famed standard London bus type, with a rear open platform allowing for quick boarding and alighting, crewed by both a driver and conductor. The last Routemaster was produced in 1968. By 2005 all Routemasters, except two heritage lines, had been withdrawn. It is expected that one thousand New Routemasters, that also have a rear open platform, will enter passenger service by summer 2017 (https://tfl.gov.uk/modes/buses/new-routemaster).

[20] The Elizabeth line as it will be known when completed and in operation

£65 and £195 levied for non-payment. The scheme initially recorded a 30 per cent cut in traffic congestion in its area. This has progressively been eroded as measures such as the introduction of cycle and bus lanes have reallocated road space away from cars. Now congestion is at a level close to what it was before the introduction of the Congestion Charge, albeit at significantly reduced traffic volumes, but, according to Transport for London, without the Congestion Charging scheme, traffic congestion would now be greater (Transport for London 2014b).

From the turn of the millennium, air quality, vehicle and greenhouse gas emissions have also formed an important determinant of London's transport policies. In 2003 Ken Livinstone first published *The Mayor's Air Quality Strategy*, putting forward a range of policies and proposals designed to move London toward the point where air pollution no longer posed a significant risk to human health (Mayor of London 2001 and Mayor of London 2002). Ken Livingstone also started to make plans to adapt the central London Congestion Charging scheme to based on the CO_2 emissions of vehicles. This would have created a maximum charge of £25 and zero charge for the least polluting vehicles. The proposal was opposed by many car manufacturers. Volkswagen subsidiary, Porsche, demanded a judicial review. When Boris Johnson, Ken Livingstone's Conservative successor, got elected in 2008 he abolished plans for converting the Congestion Charge to be based on CO_2 emissions as well as removing western extension of the Congestion Charging area instituted by his predecessor.

However, by 2011, the new Mayor had produced strict targets for reductions in CO_2 emissions through the *Mayor's Climate Change Mitigation and Energy Strategy* (Mayor of London 2011). The new strategy document set an overall target to reduce CO_2 emissions in London by 60 per cent, against 1990 levels, by 2025. Transport would be expected to play its part in achieving this overall reduction. According to the *Mayor's Climate Change Mitigation and Energy Strategy*, for the overall 60 per cent reduction target to be met, CO_2 emissions from transport would have to be reduced by 48 per cent. By 2008 London had adopted the London Low Emission Zone (broadly the same as the Greater London area), which is a traffic pollution regulation scheme with the aim of reducing noxious emissions of diesel-powered commercial vehicles in London. Vehicles that do not conform to higher emission standards are charged whilst other, cleaner vehicles, may enter the controlled zone free of charge. In 2015 the Mayor of London announced the introduction in the Congestion Charging area in central London of an even stricter Ultra Low Emission Zone by 2020[21].

Since the turn of the century there has been a substantial shift in mode share for Londoners. There has been over a ten percentage point shift away from car use towards public transport walking and cycling between 2000 and 2013. Now public transport trips exceed those for private transport in London for the first time. According to Transport for London, "this is a feat unprecedented in any other world city, and means that there are today almost two million fewer daily car journeys than there would have been. This reflects the priorities of successive Mayors to invest in public transport, as well as increasing constraints – both historic and contemporary – on the ability of the road network to accommodate traffic demand" (Transport for London 2014c). London is at the forefront of the so-called 'peak car' effect that has been prevalent in most economically developed nations for over a decade (Focas and Christidis, 2016).

2.4.3 Redefining the role of roads as a means towards the liveable city.

Apart from rediscovering public transport, a radical shift in transport thinking more broadly had also started to taken place in London. Although towards the end of the millennium it had become increasingly accepted that "it is shared wisdom that new roads, in any event, appear to achieve only temporary relief from congestion - relief soon swamped by existing or potential suppressed demand" (Focas 1998) and car based solutions to London's transport problems were no longer envisaged, transport thinking started to favour non-motorised solutions which were seen to be more environmentally friendly and made a direct contribution to the health of Londoners.

The thinking that now prevails in Transport for London (the transport body that succeeded London Transport and has taken responsibility for all modes of transport in the capital, including roads and road traffic), is

[21] The Ultra Low Emission Zone will require cars to meet Euro 6 standard for diesel engines and Euro 4 standard for petrol engines. Non-compliant vehicles will still be able to enter the zone but will be required to pay a daily charge of £12.50 on top of the Congestion Charge. Motorcycles and commercial vehicles will also fall under the scheme.

that what is paramount, other than providing for the necessary transport of residents, commuters and visitors, is improving the quality of life in the capital. This thinking draws on projected population and travel demand growth to 2031[22]. Cyclists and pedestrians have been given more prominence than ever before in the planning of the city's urban environment. Thus rather than transport being seen as a 'derived demand' for a variety of functions, and transport planning being a mechanism of managing demand, it has started to be seen, other than a necessity and enabler of economic activity, as an integral means to improve the quality of life, including the health of its residents and the environment.

This change of emphasis can be seen in the new (statutory) goal setting Mayor's document on transport (Mayor of London 2010b); this was a revision of the Mayor's first *Transport Strategy* issued in 2001[23]. In 2010 the Mayor issued strategy documents both for transport (Mayor of London 2010b) and air quality (Mayor of London 2010a). The Mayor's transport strategy had five goals:

- enhance the quality of life for all Londoners,
- improve the safety and security of all Londoners,
- reduce contribution to climate change and improve resilience,
- improve transport opportunities for all Londoners, and
- support economic development and population growth[24].

These goals are a significant change from previous transport strategies for London in that they deal with far more than purely the means of transport[25].

Indicative of the change of attitude is the *Mayor's Transport Strategy* approach to roads. In its introductory paragraph on managing the road network, it states "London's road network serves a variety of purposes. It is, most obviously, the means by which people travel from A to B – by foot, cycle, motorcycle, taxi, car, bus – and by which the vast majority of freight is moved, accounting for over 80 per cent of all trips in London. But the road network also constitutes a very large proportion of London's public realm, where people can relax, socialise and enjoy the atmosphere of this world city" (Mayor of London 2010b). For the first time in a citywide transport strategy document there is no mention of any new specific road schemes with the exception of two river crossings in east London, one at Silverown and a possible one at Gallions Reach. By contrast, sixty years earlier, the London Development Plan of 1951 had 81 specific and costed new road proposals in an area a fifth of the

[22] See Figures produced in D3.2 London report about Projected trip growth to 2031, and London's changing labour market balance, respectively p.19 and 33 (extracted and added in the annex section).

[23] In May 2009 the Mayor for London published a "Statement of Intent" to produce a new transport strategy (Mayor of London 2009). The reason for a revised strategy was that despite transport improvements that were made in the preceding decade significant challenges remained. "London's roads and public transport services remain among the most crowded and congested in the country (road traffic congestion is worsening in all areas of London including central London), its overall air quality remains the poorest of any region in the UK (with transport emissions as a major contributory factor), and the challenge of tackling climate change continues to be as intractable as ever, with transport (including ground-based aviation) responsible for around 22 per cent of London's total carbon dioxide (CO_2) emissions" (Mayor of London 2009).

[24] See Figures produced in D3.2 London report about projected trip growth to 2031, and London's changing labour market balance, respectively p.19 and 33 (extracted and added in the annex section).

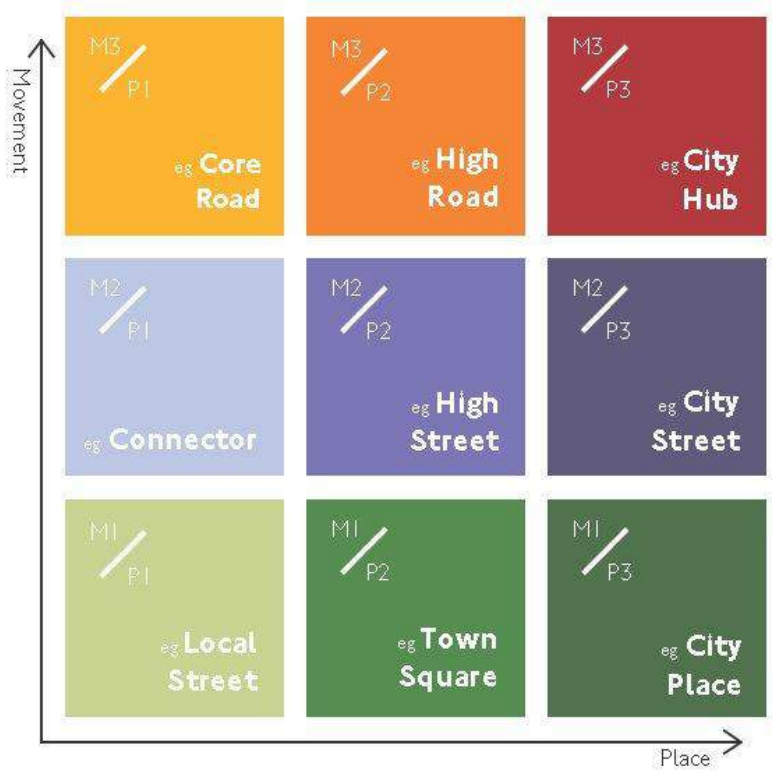
[25] Subsequent Mayor's Transport strategies have confirmed and strengthened this approach. The Mayor's latest strategy, published in 2018, proposes to:

- Transform Oxford Street
- Introduce and expand the Ultra Low Emission Zone
- Eliminate deaths and serious injuries on London's streets
- Develop a London-wide network of cycle routes

size of what is now Greater London (London County Council 1951)[26]. Instead of new roads, the Mayor has championed cycling with a variety of schemes[27].

Important in the new type of thinking on transport was the abandonment of the road hierarchy typology of arterials, distributors and collectors to be replaced by a nine-fold classification of 'street-types' (see Figure 5 below), "representing the variety of roles that streets and roads play in a well-functioning and successful city" (Roads Task Force 2013). Roads now are not to be seen nearly exclusively for the movement of motor vehicles but also for walking and cycling. In the new type of thinking roads and other public spaces are not seen only as enabling mobility but also as places to be in and enjoy outdoor living[28].

Figure 5. London's new street classification



Source: Transport for London, 2012

Together with increased environmental awareness is also the realisation of how transport and "street environments" impact on health and wellbeing. In 2014 Transport for London issued a document detailing how its transport strategy will have positive results for Londoners' health. It contains explicit action plans to achieve this. This linking of transport and health is a significant policy shift in emphasis of the role of transport in London. The transport and health strategy adopts a new "whole-street" approach to London roads; again a significant departure, from the past where they were seen nearly exclusively as a conduit of traffic. Now the "whole-street" strategy includes 10 health and quality of life indicators: pedestrians, cyclists, air pollution, safety, noise, easy to cross, shade and shelter, seating, good urban design, and stress (Transport for London 2014a).

In London now there is definitely a much greater emphasis put on urban quality of life as would befit the thinking of a stage 3 type city. This shift in policy seems to be driven by a change in attitude of what is important.

[26] The schemes mentioned in the London Development Plan of 1951 were confined to the area of the County of London, which was only 303 km^2, whilst the area of Greater London is 1,569 km^2.

[27] In 2013 the Mayor published a specific strategy to encourage cycling (Mayor of London 2013) comprising "a proper network of cycle routes throughout the city, a substantial increase in cycling, and all the benefits – fitness, enjoyment and easy travel for millions, cleaner air and less traffic for all – that will follow".

[28] This is current TfL policy. It does not abolish the official road hierarchy as defined in legislation and by the DoT.

It has become common practice, especially in inner London, to reallocate road space to bus and cycle lanes. Health and transport are increasingly being linked with policies encouraging walking and a widespread preoccupation regarding the high levels of air pollution. An early example of such policies was 'World Squares for All' (Department of the Environment, Transport and the Regions 1998) which led to the high profile redesign of Trafalgar Square, removing vehicular traffic from one side of the square. Now, it's the proposed pedestrianisation of Oxford Street, London's main shopping street, by 2020. Perhaps the most emblematic policy of this change in thinking, is the flagship for the 2013 Mayor's strategy for cycling, a "Crossrail for the bicycle", a substantially segregated cycle route of at least 15 miles including reallocating road-space on the Westway.According to the Mayor, "the ultimate symbol of how the urban motorway tore up our cities, will become the ultimate symbol of how we are claiming central London for the bike" (Mayor of London 2013).

This stage in London is well associated with relative and absolute reductions in car use[29]. In 2013 the Mayor set up a roads task force to create a new policy on roads. This was the first time that a holistic roads policy was drawn up for the benefit of all road users (Roads Task Force 2013). Particularly interesting is that for the first time there is the realisation of how transport and "street environments" impact on health and wellbeing (Transport for London 2014a) and how reducing car use can improve citizens' health (Mayor of London 2015). Transport for London has even developed an "Integrated Transport & Health Impact Model" to enable the comparative assessment of the impacts of physical activity, air pollution and injuries on the population of London (Woodcock et al. 2013).

Yet any visitor to London will not notice a great difference to what one would expect to see in any large metropolis. There is still a huge amount of road traffic snarling up the streets and a crowded public transport system. It would take far bolder stage 3 type thinking to truly transform the metropolis.

2.5 Concluding remarks

Although it can be said that the development of transport in London has been following the three 'stages of change' model, it has not done so categorically. It is clear that there was never a pure stage 1 type situation in London as there was an extensive public transport system in operation well before the mass advent of the motorcar. Indeed, this leads to the conclusion that a redefinition of the three 'stages of change' model may be needed to take into account of cities and regions with a long history and a developed transport system existing before mass motorisation. This is not to deny that in London there was a distinct stage 1 type of policy making. Stage 1 type thinking was prevalent for a number of decades from the 1940s onwards; however it had to be superimposed on a transport structure that already facilitated mass movement through a rather dense system of urban and suburban railways and an urban fabric not suited to it. What stage 1 policies achieved was to enable a lower density suburban growth in London and the relocation of some activities, such as shopping in new out-of-town shopping centres. This type of policy had also the effect of removing some of the city's public transport infrastructure, such as the entire tram network, and left the rest of the public transport system underfunded and under-maintained.

The period of stage 1 type policy making in London did not have the effect, as it did in other metropolises, of creating a network of urban motorways. The reason for this is that, although there was a commitment at a political level and was also mirrored by the planning profession, it never gained popular appeal.

Stage 2 type thinking came about in London from the grassroots. It emerged as a popular movement against demolition of houses to make way for urban motorways. It was most vocal, sustained and strong as a movement mainly in the more affluent north London. It formed a wide coalition against the road proposals bringing in a variety of groups such as conservationists and environmentalists. From the mid 1970s it was no longer possible to successfully propose new roads in London. The only major road infrastructure constructed in London, was the orbital M25 motorway; this was largely built in the green belt and not necessitating demolition of homes[30].

[29] See detailed figures about shift in transport mode in the annex, as extracted from D3.2.

[30] This major piece of new infrastructure was completed in the 1980s. It is a high capacity motorway that completely encircles the Greater London area (most of it is located just outside the administrative boundary). For a discussion of its effect on traffic levels (see WP3, D3.2 report, p.47).

Although stage 2 type thinking had closed the door to urban motorway construction, it did not have the effect of seeing investment being poured into public transport. The 1980s and 1990s saw London face a period of stagnation, where it lost its elected local government and faced the cuts in public expenditure imposed by the then Conservative government.

Thus in London, stage 2 saw the end of any serious attempt to provide a roads based solution to London's transport and mobility needs, but public transport was not a beneficiary of this. London's roads faced congestion and the public transport was underfunded and unreliable.

With the reintroduction of local democracy in London, there came a significant change in the transport policy. The thinking regarding transport changed radically to reflect the concerns associated with stage 3 type preoccupations such as air quality. Furthermore, substantial new investment was made in public transport; a belated stage 2 type policy. Now transport concerns in London are not just traffic congestion and the meeting the mobility needs of people and freight, but also well-being, high quality of life and increasingly health. Streets, that have been for decades considered only as conduits to vehicular movement, are now seen as urban spaces where people may interact, play, shop and move around.

If one were to walk around London from the distant suburbs to the city centre, one would not see many urban squares or quiet local streets with children playing. However, policies and a large proportion of the public mood are clearly moving in that direction. Flagship proposals, such as the part pedestrianisation of Trafalgar Square, that was undertaken by Mayor Ken Livingstone in 2003 and new Mayor Sadiq Khan's proposal, to pedestrianise Oxford Street by 2020, are leading the way, of what may become part of a wider stage 3 type cityscape across Britain's capital city.

Figure 6. An artist's impression of a pedestrianised Oxford Street

Source: www.urban-graphics.co.uk [may need copyright permission if this report is published].

However, some stage 1 type policies have been present to a variety of degrees at national level and in the counties surrounding London. Although these policies have ceased to be dominant in London from the late

1990s, the national government has persisted with some motorway proposals, such as the recent one crossing the river Thames in the East[31].

Furthermore, it is clear that it is possible to have stage 2 policy dominating the transport policy discourse in one part of the city while stage 1 type thinking is dominant in an other. In the case of London, it can be postulated that stage 2 type thinking became dominant in Central London from the beginning of the 19th century, as it became apparent that no road strategy could serve the unique movement needs of this dense urban area. Yet stage 1 type thinking continued to characterise transport planning in the suburbs well into the 1990s. The stage 1 type of approach to transport planning may still be dominant in many local authorities in non-urban areas outside the M25 motorway.

Table 2 (see below), based and adapted from (Banister 2002), indicates how successive governments in the United Kingdom continued to pursue a roads based transport policy.

[31] See: http://www.lower-thames-crossing.co.uk/about/ and (Mayor of London 2014).

Table 2. Continuity of road transport based polices by successive governments from the 1940s

Date	Political party in power	Roads Policy	Road Policies and Plans for London
1946	Labour	Adopted the "tea-room" plan[32] for trunk roads.	Greater London Plan, by Patrick Abercrombie - 1946).
1951	Conservative	Encouraged car ownership and continued the policy but curtailed spending.	London County Development Plan – 1961.
1964	Labour	Revived the trunk road programme.	Greater London Development Plan – 1968.
1970	Conservative	Continued with the strategy and investigated its implementation in urban areas based on land-use transport studies.	Conservative control of the Greater London Council. Urban motorways are continuing to be pursued.
1974	Labour	Attempted the implementation of the roads policies in urban areas until the balance of payment crisis in 1976. Then most urban schemes abandoned, downgraded or put on hold.	The Labour Party won the Greater London Council elections on a political platform that included the abandonment of urban motorway construction - 1973.
1979	Conservative	Continued with a policy of motorway construction but not in London.	The Greater London Council is abolished - 1986. Very low levels of investment in roads and public transport in London.
1997	Labour	Initially adopted a transport policy championing the environment but by 2000 changed it to include substantial road building.	A new mayor is created, who introduces road charging for central London. The Mayor's transport policy encourages public transport, walking and cycling.
2010	Conservative and Liberal Democrats	Road building continuing, but mostly on smaller schemes.[33]	The new Conservative mayor champions health and cycling but halves congestion charging zone and stalls on fully implementing a low emissions zone.
2015	Conservative	Continued with previous governments policies.	The new Labour mayor vows freeze public transport fares for four years.

Source: based and adapted from (Banister 2002)

Thus although stage 1 type thinking has become more marginal from the mid 1970s in London it formed a strand of thinking that has been dominant and to some extent continues to be pursued in national government.

Perhaps, rather than seeing the stages as distinct, it may make more sense understanding them as philosophies that run in parallel with different groups adopting them at various points. The stage 1 type philosophies formed the orthodoxy of transport planning policy up to the 1970s. Thereafter, stage 2 type thinking emerged with stage 3 type thinking only recently entering the mainstream debate.

Thus the three stages may coexist and be espoused by a variety of stakeholders at different times. As shown by the recent LSE Cities study on transport opinions in London and Berlin, there are a variety of public attitudes and views that reflect the diversity within an urban environment (LSE Cities and Innoz 2015). Thus rather than seeing the three phases abruptly succeeding one another it may be more useful to see them as representing different philosophies and policies that coexist but whose appeal and strength varies through time.

[32] It is said, that the "tea-room" plan was presented by the then transport minister, Alfred Barnes, in the Members' tea-room in the House of Commons in 1946. The plan showed an 800 mile network of motorways, which were to be completed within a decade (Banister 2002).

[33] Government transport policy as the government saw it (Department of Transport – Highways Agency 2015).

The historical analysis of transport policy in London, leads to supporting the 'three stages of change theory' but with three added levels of complexity. These can be summarised as:

1. Geography: A large city region may display different stages according to location. The inner city may be more likely to move more quickly from a stage 1 to a stage 3 situation than the outer suburbs. In London the peri-urban area that encompasses most of the South East of England, still has many of the characteristics of car-based stage 1 policy making.

2. Plurality: Many groups in society have different outlooks and aspirations. These groups tend to align themselves with the differing philosophies regarding roads and public space depending on their interests. The strength of these groups and the extent to which their philosophies gain a wider acceptance determines the overall stage of development of the city. For instance, from the 1940s to the 1960s the view of the city accommodating the increase use of the car was dominant in London.

3. Legacy: The 'three stages of change theory' may fit perfectly in explaining the development of a new city. However, older cities may retain legacies of transport systems that pre-date the car. For instance, London had developed an extensive rail-based public transport system from the times of the reign of Queen Victoria. Stage 1 in London had to be superimposed on this legacy. Stage 1 type thinking had the effect of removing London's extensive tram network but it did not close down its urban and suburban railways.

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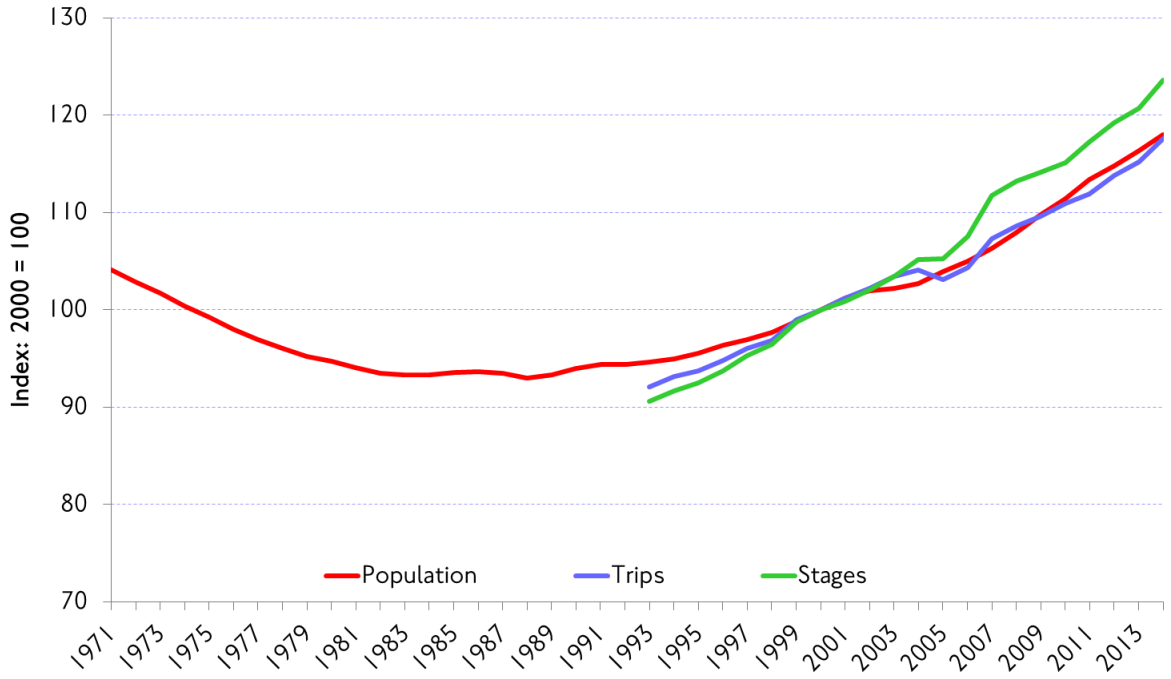
3 Annexes

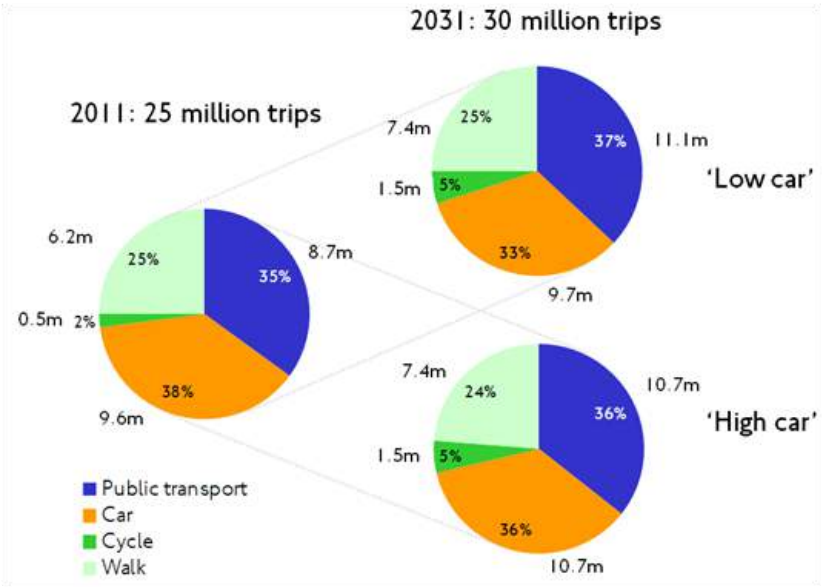
Most figures have been extracted from the D3.2 London report or from presentations made by Charles Buckingham at CREATE meetings.

Figure 1. Basic population trend for Greater London, showing relationship to indicators of total travel demand.



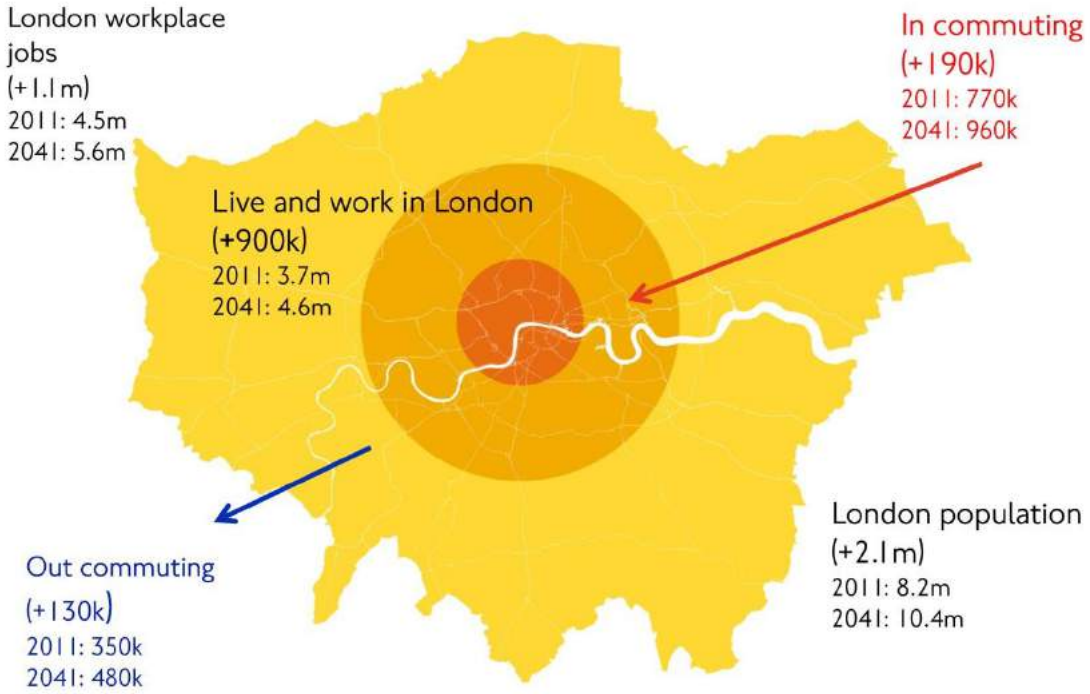
Source: Transport for London, CREATE project, D3.2 report, p.17.

Figure 2a. Projected trip growth to 2031 – 'high' and 'low' car scenarios compared. CREATE Zones 1 and 2 combined.



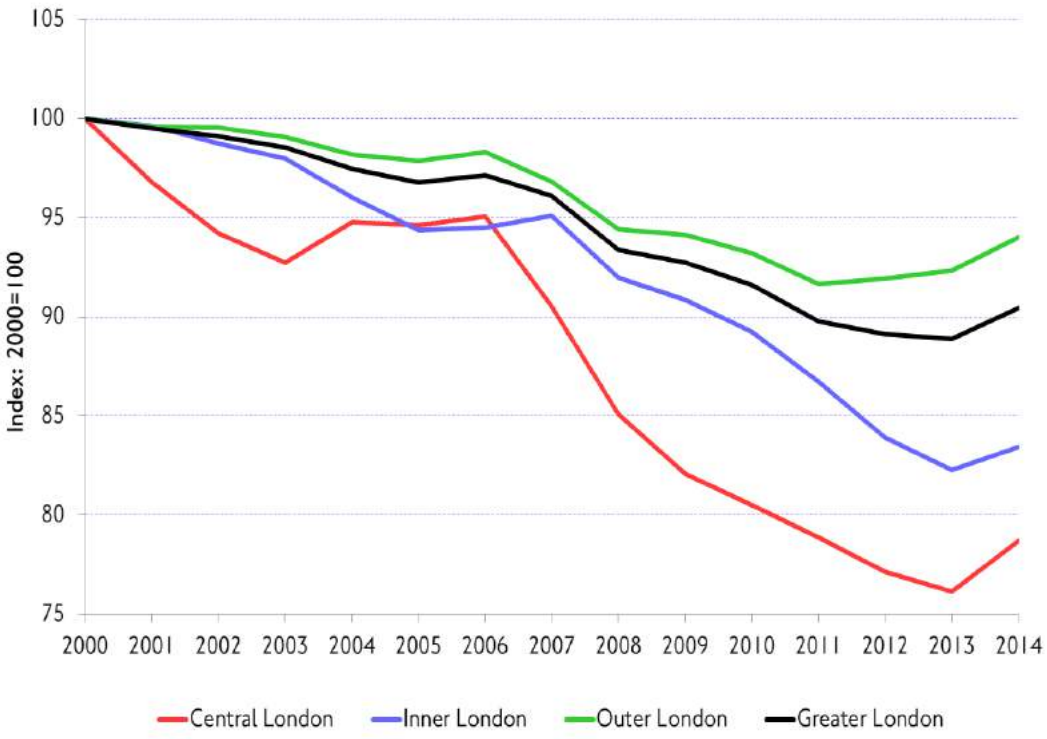
Source: Transport for London, Strategic Analysis, extracted from CREATE project, WP3, D3.2 report, p.19.

Figure 2b: London's changing labour market balance.



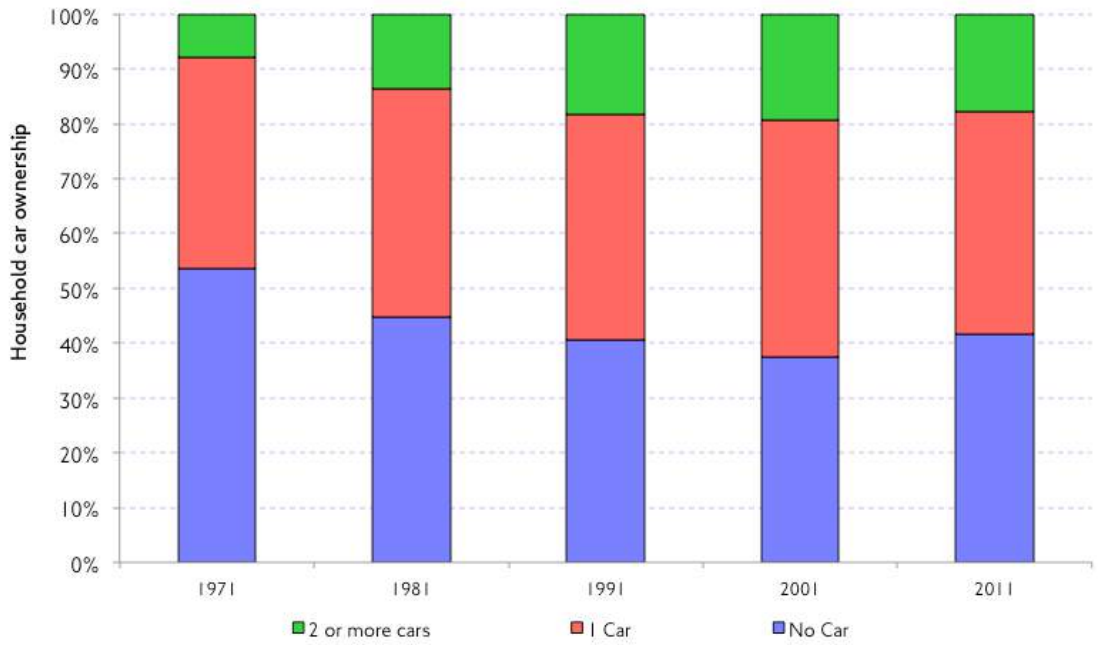
Source: Greater London Authority, extracted from CREATE project, WP3, D3.2 report, p.33.

Figure 3. Decline in road traffic



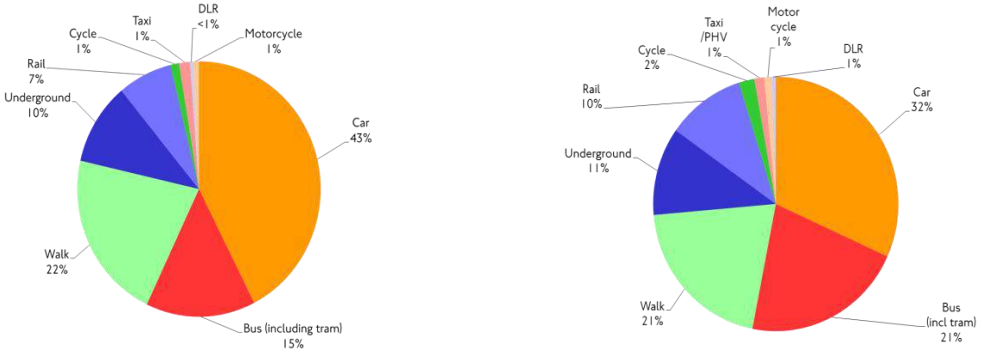
Source: Greater London Authority, extracted from CREATE project, WP3, D3.2 report, p.33.

Figure 4. Long term trend in household car ownership in Greater London.



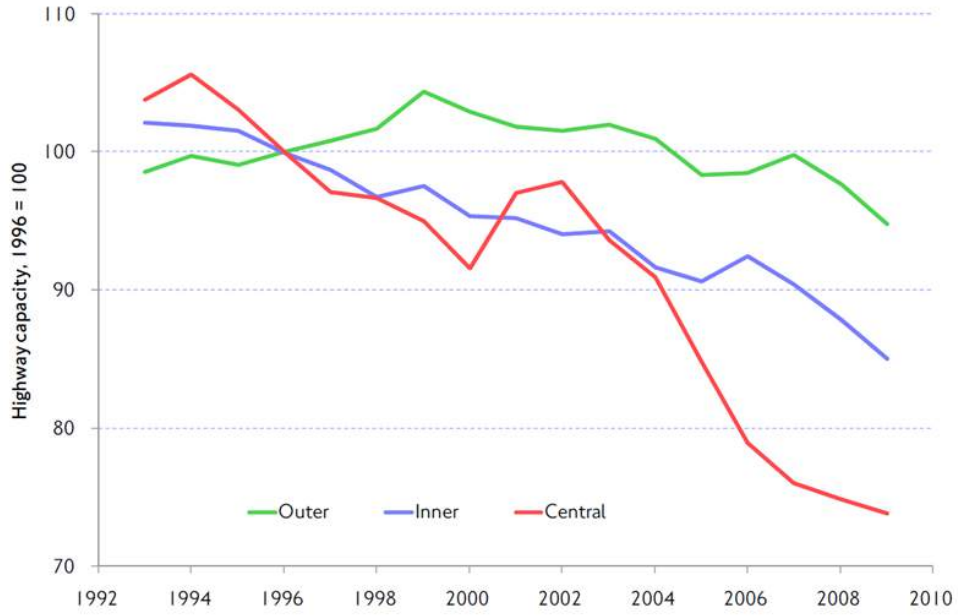
Source: Greater London Authority, extracted from CREATE project, WP3, D3.2 report, p.77.

Figure 5. An 11 percentage point net shift in mode share, 2000-2011.



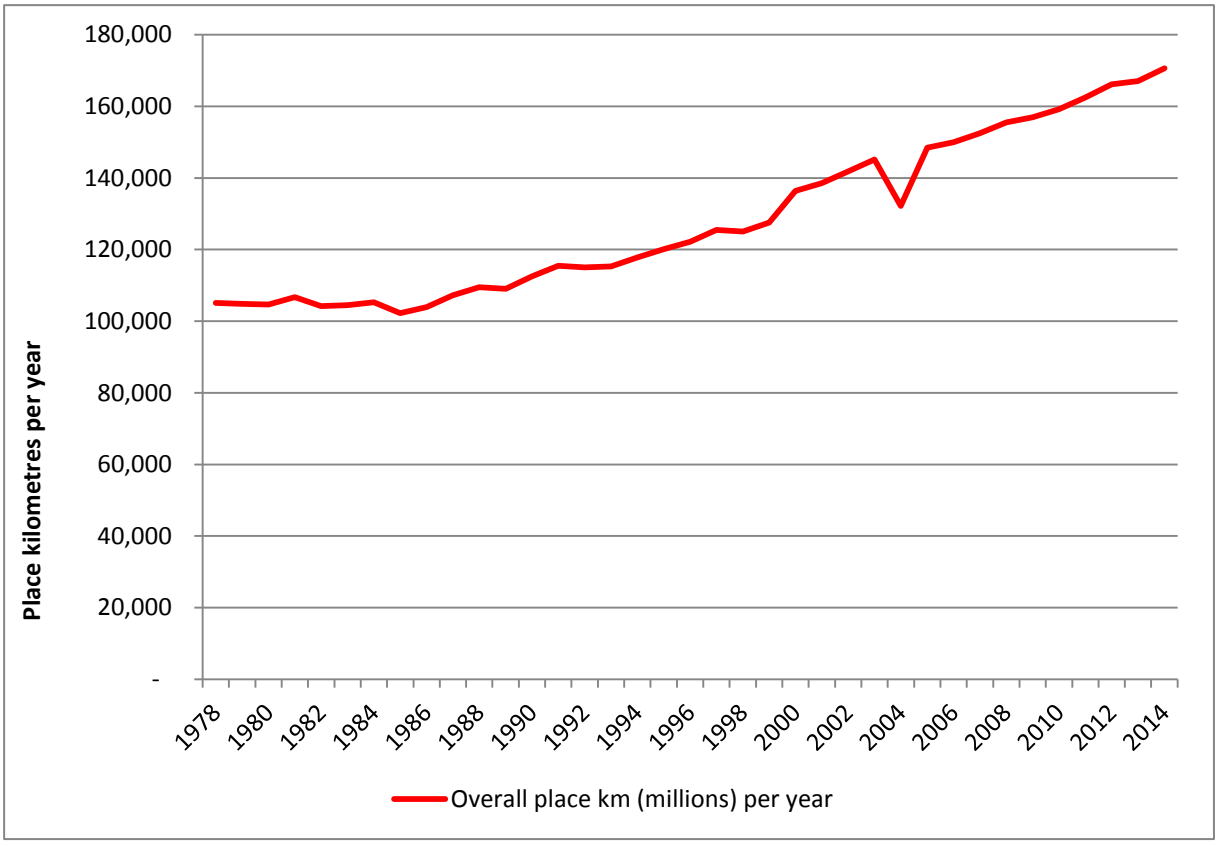
Source: Transport for London, CREATE project, Charles Buckingham, Amman SC meeting, October 2016.

Figure 6. Inferred change in effective road network capacity in Greater London.



Source: Greater London Authority, extracted from CREATE project, WP3, D3.2 report, p.52.

Figure 7. Public transport capacity in Greater London. Million place kilometres provided per year. Indicative trend.



Source: Greater London Authority, extracted from CREATE project, WP3, D3.2 report, p.60.

4 Table of illustrations.