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transport for quality of life

Friends of the Earth

Getting the Department for Transport on the right track

A damning indictment of the failure of the Department for Transport to give proper regard to the Climate Change Act.

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Summary

This paper, written by Lisa Hopkinson and Lynn Sloman from Transport for Quality of Life, is a damning indictment of the failure of the Department for Transport (DfT) to give proper regard to the Climate Change Act in its governance of transport.

The legally binding Climate Change Act's intention was to ensure that decisions across government contributed appropriately to the UK reducing its cumulative emissions in line with agreed targets. Yet as this paper demonstrates, the Department for Transport has side-lined climate change in its strategies, plans and guidance to local authorities and bodies such as Highways England.

In other words, the Department for Transport has gone rogue on climate change.

The paper identifies what institutional changes are needed to bring the department back on track.

Introduction

This is the fifth in a series of eight papers commissioned by Friends of the Earth on the transport policies that are needed to cut carbon emissions in line with the Paris Agreement. The first paper showed that we will need to reduce demand for car travel significantly, in addition to a rapid transition to electric vehicles, if we are to limit global warming to 1.5°C above pre-industrial levels[1] .

Achieving the necessary reductions in road traffic and carbon while meeting people's travel needs will require a realignment of funding priorities and the right institutional structures and governance[2] . Unfortunately many elements of good governance are lacking in the current system of transport governance: in particular, clear goals and vision; leadership; accountability; effectiveness; and transparency.

This paper looks at what can be done to create a governance system that can deliver high quality, low or zero carbon road transport.

Carbon reduction should be a key policy requirement

Because the consequences of climate change are so serious, we need the government to make it a top priority to reduce carbon emissions.

This is especially important for transport because it is the largest single contributor to emissions and there is a large and growing gap between emissions and targets.

Radical, Paris-aligned carbon reduction should therefore be a primary requirement of transport policies and plans at all levels.

Benefits of reducing emissions

Action to reduce traffic and carbon emissions would also benefit public health, improve air quality, make roads safer, be more equitable, improve quality of life, and support local economies.

Transport policy shifts away from carbon reduction

Unfortunately since 2010 there has been a shift in UK transport policy goals away from reducing carbon. Currently, enhancing economic development and reducing congestion are primary goals of transport policy.

There has been a move back to a policy of building more road infrastructure, in the belief that this will deliver on current goals[3] . This belief persists despite scant evidence of benefit to local economies[4] and a wealth of evidence stretching back nearly one hundred years that building more roads increases traffic[5] .

Key national and sub-national road transport policies and strategies in England that purportedly prioritise economic growth and congestion, while failing to address carbon reduction, include the **Transport Investment Strategy**[6] , **National Policy Statement (NPS)**[7] **for national networks**[8] , **Strategic Transport Plans** of the Sub-national Transport Bodies (STBs)[9] and **Major Road Networks (MRN) guidance**[10] .

Where transport carbon is mentioned or addressed directly by government, as in the **Road Investment Strategy (RIS)**[11][12] , **Clean Growth Strategy** and **Road to Zero Strategy**, it is asserted or assumed that a shift to electric vehicles will enable carbon goals for surface transport to be met.

There is little recognition that the Road Investment Strategy will in fact generate more road traffic and increase carbon emissions[13] . Nor is there acknowledgement that even with quicker take-up of electric cars than currently proposed, carbon budgets cannot be met unless traffic volumes fall[14][15] .

Unlike England and Northern Ireland[16] , the Scottish[17] and Welsh[18] Governments have made carbon reduction a key transport policy goal. Putting carbon reduction centre-stage, as the Scottish and Welsh governments have done, is an essential first step the UK government has to take.

Accountability: carbon budgets

Once there is a policy requirement at national level to reduce transport carbon, the next step is to establish a coherent framework of accountability for its delivery.

UK carbon reduction targets and budgets[19] should be translated into targets and budgets for government departments and regional and local bodies.

This does not happen at present. Instead, a multitude of national, regional and local bodies have responsibility for transport policies that will affect carbon emissions but with no guide to how much they need to achieve, or by when[20] . This fuzzy accountability means that, in effect, nobody is responsible[21] .

Main problems

There are three main problems:

There is no **overarching assessment** showing how all transport carbon emissions (from surface transport and domestic and international aviation and shipping) will be cut in order to meet current climate targets, let alone Paris-aligned ones[22] .

At **national level**, the Department for Transport (DfT) has only vague commitments in its strategic objectives to make sure transport is sustainable[23] .

Highways England (HE) has no accountability for the carbon impact of traffic on the Strategic Road Network (SRN)[24] and other departments whose policies affect transport carbon also have no accountability[25] .

In Wales there is little linkage between Welsh government carbon targets and local implementation[26] . Northern Ireland has yet to develop its own climate legislation or targets[27] . Scotland fares slightly better with a duty for public bodies to help achieve carbon targets. Though how this is enforced is unclear[28] .

The situation is no better at **local level**. Mechanisms to measure local action in England against national carbon targets were removed in 2011. There are no longer agreements between government and local authorities to reduce carbon emissions in local areas[29] .

While some authorities have developed their own targets, there is no way for them to know if the chosen target is too high (or too low), and no way to allocate transport emissions between local and strategic roads. Instead, local contributions “are left to be defined or divined”[30] .

Local action on climate change is now generally in spite of, rather than because of, national policy[31] .

Binding budgets

The introduction of **binding departmental, regional and local carbon budgets** would provide an essential link between national carbon targets and implementation at all levels.

A 2009 government White Paper proposed that all the major government departments be allocated their own carbon budgets and produce a plan to show how they would stay within budget[32] . Thus DfT was allocated the majority of the carbon budget for transport, with other departments given smaller allocations depending on their share of responsibility[33] .

If this in fact happened, every major decision would take account of the impact on the carbon budget as well as the financial budget. Departmental budgets like this are even more urgent now than they were 10 years ago. They would provide departments, including DfT, with a clear role and impetus to reduce carbon.

Given that over one third of road mileage[34] (and therefore a similar proportion of road carbon emissions) takes place on the SRN, DfT should set carbon budgets for Highways England, consistent with national revised budgets. These should be written into HE's licence and HE should be repurposed accordingly.

Local and regional carbon budgets

The 2009 White Paper also discussed new powers and flexibilities for local authorities to support their role in meeting national carbon budgets. It follows that DfT should work with regional and local transport bodies to agree how to allocate carbon budgets at regional and local level.

There would also need to be some form of sanction for failing to comply with budgets[35] . However DfT should be responsible for ensuring that overall transport emissions do not exceed the national budget.

At regional level, new statutory bodies (eg Energy for the North), could be set up to take overall responsibility for regional carbon budgets[36] . Alternatively the existing STBs in England (eg Transport for the North) or Combined Authorities[37] could be given a transport carbon budget.

At local level some local authorities have already developed carbon budgets, in spite of a lack of support from government.

For example, the Lake District National Park Authority (LDNPA) pioneered the first carbon budget in 2010[38] . It set a target to reduce carbon emissions (measured on a consumption basis), developed an Action Plan and monitors the carbon savings annually[39] . However, the LDNPA's limited powers to control the main (predominantly transport) sources of carbon, and lack of funding, has meant that progress has flat-lined[40] .

Zero carbon pledges

A growing number of towns and cities have adopted zero carbon pledges and plans, spurred on by the Paris Climate Agreement.

Greater Manchester Combined Authority and Manchester City Council have both pledged to become carbon neutral by 2038 with annual cuts in CO_2 of 15% and 13% respectively[41] . Both are developing action plans detailing how they can stay within their Paris-aligned carbon budgets which they consider will make the city more attractive, liveable and prosperous[42] [43] .

This political buy-in is essential to the success of a carbon plan[44] . Many other local authorities and Combined Authorities are aiming to become climate neutral[45] , though generally with less developed plans, powers and funding than Manchester.

Collaboration

Having carbon targets that are aligned at all levels would foster a culture of collaboration, which in turn would encourage more ambitious climate strategies[46] .

Norway offers a good example of how this could work. There agreements between the national, regional (county) and local (municipality) levels of government on urban development, environment and transport promote economic growth without traffic growth[47] .

This stems from a 2012 parliamentary climate agreement which stated that any population growth in the largest Norwegian cities could not result in any growth in road traffic[48] . This zero-growth objective is also part of the Norwegian national transport plan.

The Norwegian government has introduced measures which support the zero-growth objective including planning and land use controls[49] .

It gives regions increased responsibility for budgets so they can balance priorities between public transport, cycling, road safety and roads[50] .

There are Urban Growth Agreements between municipal, regional and state authorities over land-use and transport-system development. The agreements are normally for 7-year periods and include national funding of transport infrastructure and public transport services, provided that the local authorities have set zero-growth as an objective and can demonstrate how this will be achieved. Studies are prepared to demonstrate different options to achieve the zero-growth objective[51] .

There are existing powers in UK law which could be used to set traffic reduction targets, analogous to the zero-growth objective in Norway[52] . Government funding for local transport infrastructure and public transport services could be dependent on demonstrating packages that can achieve a zero or negative traffic growth target.

Effectiveness: strategies and plans should have a carbon audit

All transport strategies and plans, including the **RIS**, **Road to Zero Strategy**, and **NPS for National Networks**, should be subject to a carbon test. This would check (a) whether they include a carbon reduction target and pathway and (b) whether their carbon impacts have been audited to confirm they are consistent with this target and pathway[53] .

There should be no further funding for RIS2 until it has passed the carbon test ie until a carbon reduction target and pathway for the SRN has been set and RIS2 has been modified to make it compliant[54] .

The NPS for National Networks, which has many other problems, will require a significant rewrite[55] . The NPS guidance that road schemes should not be rejected on grounds of increased carbon emissions unless the increase is “so significant that it would have a material impact on the ability of Government to meet its carbon reduction targets” should be immediately withdrawn[56] .

This policy has led to the carbon impacts from individual road schemes effectively being ignored despite the significant cumulative impacts[57] .

Carbon audits should quantify emissions in use from new (or existing) roads. This needs to be done at the strategy stage to avoid wasting time and resources developing non-compliant transport schemes[58] . They should also include the significant embodied emissions associated with new infrastructure[59] , as recommended by a cross-party group of MPs[60] .

Carbon reduction pathways

At sub-national level, carbon audits of transport strategies have already been done by Transport for London (TfL) and Transport for the North (TfN)[61] .

In London the Mayor’s Transport Strategy provides fully quantified carbon emissions reductions for specific measures and reduction targets[62] .

TfN’s transport strategy contains a commitment, obtained following lobbying by transport activists, to set a carbon reduction pathway that is compatible with national targets for carbon reduction[63] . Preliminary estimates indicate that adopting this carbon reduction pathway could save over 50 $MtCO_{2e}$ across the region in the next decade[64] . An additional clause was added that the transport strategy programmes and schemes already included in the published Investment Programme would be constrained in due course to fit the carbon pathway[65] .

By law, the transport strategies of statutory STBs must have regard to the carbon impacts associated with implementation of the strategy and the Climate Change Act targets[66] . The law also appears to require the relevant local authorities to set their transport policy in line with the STB strategy[67] .

To give added weight to these legal duties, the Government should direct STBs to ensure that all transport strategies and investment programmes show full compliance with national carbon targets[68] .

This would have profound implications for the schemes proposed throughout the STB region and at district level, including proposed new roads.

Suitable performance metrics will also need to be introduced to monitor carbon reduction on an annual basis, so that strategies can be adjusted accordingly[69] . For example it is vital that **RIS2** has a performance indicator for road user emissions (not just construction and operational emissions) and a target that is Paris-compliant[70] **.**

A fit-for-purpose scheme appraisal method

In developing their carbon-compliant strategies, transport bodies need some way of assessing which individual schemes can best meet carbon and other public policy goals, including value for money. This will require significant reform of the current transport appraisal methodology and the way it is applied.

In theory, transport appraisal begins with an option generation stage which considers “all modes, infrastructure, regulation, pricing and other ways of influencing behaviour” to address a defined problem[71] . In practice, it is common for a very limited range of options to be appraised (eg Route A or Route B for a new road with no non-road options). Where alternative options are proposed by local communities, these are generally ignored[72] . Regulation or pricing to manage demand are rarely considered.

The next stage under the current approach is to undertake detailed appraisal of the most promising options. A major part of this is an analysis of costs and (monetisable) benefits of a scheme[73] , resulting in a benefit-cost ratio - a single number that is supposed to show whether the scheme represents value for money[74] .

Bias in favour of road building

However cost-benefit analysis has built-in biases that favour road schemes over other options. It has been criticised repeatedly for its perverse logic[75] , double counting[76] , and the high importance given to time savings of a few minutes for millions of motorists[77] [78] . When combined with over-estimated forecasts of traffic growth[79] , these aggregated notional time savings translate into enormous benefits which generally account for the vast majority of predicted monetised benefits from road schemes[80] .

In a comparison of the appraisal of three alternative transport projects in North West England, over 90% of the benefits of the road scheme were due to notional time savings, while the cost of increased CO_2 was put at less than 1% of the time saving benefits[81] .

Cost of carbon emissions underestimated

By contrast, the assigned cost of carbon emissions is severely underestimated and costs of carbon emissions in future years are heavily discounted[82] . The high rate of discounting coupled with the uncertainty of carbon costs in the long period over which the disbenefit is calculated (generally 60 years for road projects) also makes the accuracy and ethics of the economic appraisal highly questionable[83] .

This bias towards time savings and the discounting of carbon impacts means that environmentally damaging road projects that increase carbon emissions continue to get approved.

The current predict and provide/cost-benefit appraisal process needs to be replaced with a transparent approach which gives more weight to carbon impacts and is not biased towards road-building.

Some possible approaches include backcasting[84] or a multi-criteria analysis (MCA) that makes the options and their contribution to different criteria explicit[85] . The latter is the approach adopted by the Mayor of London's Transport Strategy which has clear targets for carbon and a system of monitoring, appraisal and evaluation to ensure delivery stays on track[86] .

It was also the approach used to compare the proposed M4 Corridor around Newport in Wales with an alternative package of public transport and active travel measures. The analysis showed that a comprehensive alternative transport package would not only significantly outscore the preferred M4 Route but would cost a fraction of the £1.4 billion designated for the M4[87] .

Note that if an MCA approach was adopted, only schemes that enabled compliance with carbon targets should be taken forward.

Funding

Local authorities have considerable scope to influence transport carbon emissions through land use and transport planning, yet in recent years have lost power and funding to unelected Local Enterprise Partnerships (LEPs)[88] .

Despite a lack of transport planning expertise, LEPs now manage the bulk of the capital funding for local transport projects[89] . The majority (ca. 65%) of LEP funds are spent on road projects[90] , and much of the remaining funding also goes to schemes that exacerbate car dependency and carbon emissions[91] .

Serious concerns have been raised about the LEPs' lack of transparency, ineffectiveness and lack of accountability and even LEPS themselves "have serious reservations about their capacity to deliver"[92] [93] [94] . Few appear to have any carbon reduction targets[95] .

Compared with LEPs, local authorities are more transparent and accountable, have the necessary transport planning expertise, can integrate transport with land planning, and can balance social and environmental aims with economic goals.

In view of this and the already serious concerns about LEPs' effectiveness, the funding powers for transport planning should be removed from LEPs and returned to County/ Unitary Councils, Combined Authorities and STBs (led by local authorities not LEPs). This would mean that funding for local transport was under the control of the bodies that would be responsible for achieving carbon budgets[96] .

Conclusions

Must do actions on governance to reduce transport carbon:

Make radical reduction of transport carbon emissions a **key policy requirement** of all national, sub-national and local transport policy and plans.

Prepare a **national assessment** showing how all transport carbon emissions (from surface transport and domestic and international aviation and shipping) will be reduced in line with Paris-aligned climate targets.

Allocate departmental carbon budgets to all major government departments, including DfT, and require them to produce a plan to show how they will stay within their budgets.

Include in Highways England's licence a **carbon budget for the Strategic Road Network** (including emissions in use from new and existing roads, and embodied emissions) consistent with national revised budgets.

Develop **regional and local carbon budgets**, with sanctions for non-compliance.

Require all national and sub-national transport strategies and plans including Road to Zero, RIS, the NPS for National Networks and transport strategies of Sub-national Transport Bodies(STBs) to have a **comprehensive carbon audit** to ensure that the measures proposed are compatible with Paris-aligned carbon budgets. Strategies should be modified or rewritten where necessary and monitored against year by year reduction targets.

Replace the current appraisal system for transport schemes with an unbiased and transparent one that enables compliance with carbon targets and budgets.

Align transport funding with accountability for local carbon budgets by returning funding for transport infrastructure from LEPs back to Unitary / County Councils, Combined Authorities, and STBs led by local authorities.

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A PDF version of this briefing with full references including hyperlinks is available on the Transport for Quality of Life website.

Notes

1. We estimate car mileage will need to be reduced in the order of 20-60% by 2030 compared with 2016 levels, depending on a range of factors such as the rate of uptake of electric cars, improvements in conventional car emissions, and rate of decarbonisation of the power grid. However even if 100% new cars are electric by 2030 there will need to be significant reductions in mileage of all cars before then. Hopkinson L. and Sloman L. (2018) More than Electric Cars: Why we need to reduce traffic to reach carbon targets. Briefing for Friends of the Earth. February 2019.

2. The OECD defines governance as “the exercise of political, economic and administrative authority necessary to manage a nation’s affairs.” The IMF defines it as “the process by which decisions are made and implemented (or not implemented). Within government, governance is the process by which public institutions conduct public affairs and manage public resources.” OECD (20017) Glossary of statistical terms, accessed 18.01.2019.

3. The government’s Transport Investment Strategy states “Expanding existing capacity to ease congestion: In many cases we need to invest to upgrade and enhance the existing network, making it better able to cope with demand by adding capacity to reduce congestion and crowding.” Department for Transport (2017) Transport Investment Strategy. July 2017.

4. In his evidence to the M4 public inquiry, Professor John Whitelegg produced a list of 17 independent scientific sources on the economic impacts of major transport infrastructure, which showed that there is either no proven link or in some cases a negative link. Whitelegg J. (2017) Proof of Evidence In the matter of: Public Local Inquiry into the M4 relief road around Newport: The Economic case: jobs, inward investment and regeneration. On behalf of Gwent Wildlife Trust. February 2017.

5. Professor Phil Goodwin has pointed out that it has been known since 1925, and demonstrated in multiple subsequent reports, that new roads generate traffic. Goodwin P. (2006) Induced Traffic Again. And Again. And Again. Local Transport Today, 450, 24 August 2006.

6. This guides spending decisions, especially around the Strategic Road Network (SRN). It has four objectives around reducing congestion, enhancing growth, global competitiveness and new housing delivery. Department for Transport (2017) Transport Investment Strategy. July 2017.

7. There are 12 National Policy Statements including three for transport on National Networks, Ports and Airports. They comprise the government’s objectives for the development of nationally significant infrastructure in a particular sector and state including “how this will contribute to sustainable development”.

8. This NPS sets out the vision and policy for nationally significant road and rail infrastructure projects, including new motorway and trunk roads which will become part of the strategic road network (SRN). It states (misleadingly) that “The impact of road development on aggregate levels of [CO2 and pollutant] emissions is likely to be very small”. Department for Transport (2014) National Policy Statement for National Networks. December 2014.

9. The STBs plan and prioritise transport infrastructure investment in a region. Currently the statutory STBs include Transport for London and Transport for the North, but in future they are likely to include Transport for the South East, Midlands Connect, England’s Economic Heartland and emerging bodies in the South West, South West peninsula and East of England.

10. This guides spending decisions on major roads. It has five objectives around reducing congestion, enhancing growth, new housing delivery, supporting all transport users and supporting the SRN. Department for Transport (2018) Investment

Planning Guidance For the Major Road Network and Large Local Majors Programmes. December 2018.

11. The Road Investment Strategy (RIS1) for 2015-2020 does include an aspiration for “major reductions in carbon emissions across the network” but assumes these will be achieved by electrification of the fleet. Department for Transport (2015) Road Investment Strategy: for the 2015/16 – 2019/20 Road Period. March 2015.

12. The draft Road Investment Strategy 2 (RIS2) for 2020-2025 refers to other government documents such as the 25 Year Environment Plan, Clean Air Strategy and Road to Zero strategy but has no specific carbon reduction requirements. Department for Transport (2018) Draft Road Investment Strategy 2 Government Objectives. October 2018.

13. At both a strategy and scheme level the amount of induced traffic generated by new roads is often underplayed. The RIS1 presented forecast traffic growth as inevitable and something to be provided for rather than managed. For RIS2 there is some recognition of induced demand but DfT relies on Highways England’s evaluation of major road schemes to conclude that induced traffic ‘occurs in only a minority of road schemes’. Department for Transport (2016) Analysis to Inform RIS2 - DfT’s Strategy. By contrast our own assessment of Highways England’s data for major road schemes concluded that induced traffic occurred on many road schemes, with average traffic increases of +47% in excess of background trends in the long run (8-20 years). Sloman L., Hopkinson L. and Taylor I. (2017) The Impacts of Road Projects in England. Report for CPRE, March 2017.

14. Hopkinson L. and Sloman L. (2018) More than Electric Cars: Why we need to reduce traffic to reach carbon targets. Briefing for Friends of the Earth. February 2019.

15. Vaughan A. (2019) Electric cars won’t shrink emissions enough – we must cut travel too. Article for the New Scientist, 20 March 2019.

16. Northern Ireland’s Department for Infrastructure (An Roinn Bonneagair), which oversees all transport services and infrastructure, has yet to agree its vision, goals and objectives. Northern Ireland Department for Infrastructure website, accessed 19.02.19.

17. The Scottish Transport Strategy has tackling climate change as one of its three objectives. Transport Scotland (2006 and refresh in 2016) National Transport Strategy.

18. The Welsh Transport Strategy has tackling climate change as one of its many outcomes but top of its list is reducing car-dependency. Llywodraeth Cynulliad Cymru/Welsh Assembly Government (2008) One Wales Connecting the Nation: The Wales Transport Strategy.

19. These targets and budgets will need to be revised in line with the Paris Agreement. The Committee on Climate Change have been asked to provide advice on when the UK should reach net zero in line with the Paris Agreement; if that target should be set now; the implications for emissions in 2050 and how such reductions can be achieved. This advice is expected in May 2019. Committee on Climate Change (2018) Building a zero carbon economy - Call for Evidence.

20. At national level this includes government departments, non-departmental public bodies, arms-length agencies, boards, commissions and quasi government organisations. Bache I. et al. (2015) Blame Games and Climate Change: Accountability, Multi-Level Governance and Carbon Management.British Journal of Politics and International Relations, 17, pp. 64–88.

21. Bache I. et al. (2015) Blame Games and Climate Change: Accountability, Multi-Level Governance and Carbon Management. British Journal of Politics and International Relations, 17, pp. 64–88.

22. The need for an overarching carbon reduction policy framework covering all emissions from the transport sector will be covered in a future paper in this series.

23. The only objective in the 2018 DfT single departmental plan relevant to reducing carbon from road transport is: "(4.2) Ensure sustainability underpins future transport investment including promoting new technologies to reduce emissions." Department for Transport (2018) Single departmental plan. May 2018.

24. Highways England's aims and objectives are set for it by the Government in the Highways England Licence, which requires HE to 'calculate and consider the carbon impact of road projects and factor carbon into design decisions, and seek to minimise carbon emissions and other greenhouse gases from its operations' but makes no reference to the need to reduce carbon emissions from traffic on the Strategic Road Network in order to meet the carbon budgets set by the Committee on Climate Change. Department for Transport (2015) Highways England: Licence. April 2015.

25. Despite contributing to increased car use and carbon emissions through planning, the Ministry of Housing, Communities and Local Government has nothing in its Single departmental plan about transport carbon.

26. Roberts C. (2018) Re-energising Wales. Decarbonising transport in Wales. Report for the Institute of Welsh Affairs. June 2018.

27. Cave S. (2017) Climate Change legislation in Northern Ireland: Is it just a lot of hot air? Blog from the Northern Ireland Assembly Research and Information Service. 30 November 2017.

28. Under the Climate Change (Scotland) Act 2009 public bodies have a duty to 'act in the best way calculated to contribute to the delivery of targets'.

29. Between 2008-2010 Local Authorities, as part of Local Strategic Partnerships (LSPs) were required to report on performance via national indicators, including three on climate change. These indicators included 'N186: per capita emissions of CO2 in a local area', which included emissions from surface transport. Two thirds of LSPs signed up to N186 and set targets to reduce emissions by 2011. Under the 2011 Localism Act indicators were abolished. Bache I. et al. (2015) Blame Games and Climate Change: Accountability, Multi-Level Governance and Carbon Management. British Journal of Politics and International Relations, 17, pp. 64–88.

30. Marsden G. and Groer S. (2016) Do institutional structures matter? A comparative analysis of urban carbon management policies in the UK and Germany, Journal of Transport Geography, 51, pp. 170-179.

31. Willis R. (2018) Building the political mandate for climate action. Report for Green Alliance, November 2018.

32. HM Government (2009) The UK Low Carbon Transition Plan. National Strategy for Climate and Energy. July 2009.

33. For the first carbon budget 2008-2012 transport was allocated 648 MtCO2e of which the Department for Transport was responsible for 76%, Business, Innovation and Skills 9%, Communities and Local Government 4%, Department of Culture, Media and Sport 4% and Ministry of Defence 3%. This budget was successively reduced over the 2nd and 3rd budget periods. DfT was also allocated small budgets within the waste, industrial process, farming and land, and public sectors. HM Government (2009) The UK Low Carbon Transition Plan. National Strategy for Climate and Energy. July 2009.

34. Department for Transport (2018) Road Traffic Statistics (Table TRA0103) Motor vehicle traffic (vehicle miles) by road class and region and country in Great Britain, annual 2017.

35. At departmental and sub-national level this could involve withholding funding. Alternatively there could be new legislation introducing a statutory duty with fines for non-compliance, the revenue from which could be ringfenced for local authority zero carbon transport measures.

36. Laybourn-Langton L. et al. (2017) Net Zero North. Delivering the Decarbonisation Mission in the North of England. Report for IPPR. December 2017.

37. Combined authorities comprise a legal agreement between two or more neighbouring authorities, with additional powers conferred by devolution deals. There are currently 9 combined authorities, 8 of which have agreed devolution deals and 7 of which have directly elected mayors. Sandford M. (2017) Combined Authorities. House of Commons Briefing Note 06649, July 2017 (numbers updated for this paper). Integrated Transport Authorities deliver integrated public transport in combined authorities, for example Transport for Greater Manchester.

38. This budget assessed how much carbon the Lake District is responsible for, including by visitors travelling to and from the area, their consumption within the national park and everything residents do within or outside the park boundary. Lake District National Park (undated) Carbon budget for the Lake District. Website, accessed 21.02.19.

39. The transport sector was found to be responsible for the majority of emissions, with 45% of the budget accounted for by visitors getting to and from the area (flying and driving). Berners Lee M. (2017) A new carbon baseline for the Lake District National Park. November 2017. Report by SW Consulting for the LDNPA.

40. Willis R. (2019) Personal communication by telephone, 21.01.2019.

41. The targets were developed by the Tyndall Centre for Climate Research using science-based evidence of how Greater Manchester and the City of Manchester can make a 'fair' contribution towards the 2°C commitment enshrined in the Paris Agreement. Kuriakose J. et al. (2018) Quantifying the implications of the Paris Agreement for Greater Manchester. Report by the Tyndall Centre, March 2018; and Kuriakose J. et al. (2018) Quantifying the implications of the Paris Agreement for the City of Manchester. Appendix 2. Report by the Tyndall Centre, July 2018.

42. The City of Manchester's draft city-wide 2020-2038 framework was adopted in March 2019. A final plan is due by 2020. Manchester City Council (2019) Manchester Zero Carbon 2038 – Manchester City Council's Commitment. Head of City Policy Report for Resolution. March 2019.

43. Greater Manchester adopted a 5 year environment plan 2019-2014 at a Mayoral Green Summit in March 2019. Transport proposals include doubling the number of electric vehicle charging points; moving to an emissions-free bus fleet; and investing up to £50m per year for three years to transform cycling and walking in the city-region.

44. Marsden G. and Groer S. (2016) Do institutional structures matter? A comparative analysis of urban carbon management policies in the UK and Germany, Journal of Transport Geography, 51, pp. 170-179

45. At the end of February 2019, over 40 first and second tier councils in UK had declared a climate emergency, with 27 aiming to become climate neutral by 2030 or before. Climate Emergency Declaration website, accessed 21.03.19.

46. Eckersley P. (2018) Who shapes local climate policy? Unpicking governance arrangements in English and German cities, Environmental Politics, 27:1, 139-160.

47. Government of Norway (2019) The rewards scheme, urban environment agreements and urban traffic reports. Article (translated) 4 February 2019.

48. Tennøy A. and Øksenholt K. V. (2018) The Impact of Changed Structural Conditions on Regional Sustainable Mobility Planning in Norway. Planning Theory & Practice, 19 (1). 93-113.

49. A coordinated housing, land use and transport planning law has a primary emphasis on sustainable development, although interviews with county officials suggested this made little difference in practice as the principle was already well accepted at local level. There are also legally binding land use provisions, such as steering housing and retail development towards central locations. Tennøy A. and Øksenholt K. V. (2018) The Impact of Changed Structural Conditions on Regional Sustainable Mobility Planning in Norway. Planning Theory & Practice, 19 (1), 93-113.

50. In 2010 80% of national roads were transferred from national to county control. Tennøy A. and Øksenholt K. V. (2018) The Impact of Changed Structural Conditions on Regional Sustainable Mobility Planning in Norway. Planning Theory &

Practice, 19 (1), 93-113.

51. Measures that have been found to have the most potential to avoid or reduce car travel include: toll/road pricing, compact urban development and densification, increased parking fees and reduced access to parking spaces, better public transport services, pedestrian and bicycle facilities and reduced road capacity for the car. Government of Norway (2019) The rewards scheme, urban environment agreements and urban traffic reports. Article (translated) 4 February 2019.

52. The Road Traffic Reduction (National Targets) Act 1998 requires the Secretary of State for Transport to set and publish in a report targets for road traffic reduction in England, Wales and Scotland. Section 4 allows it to apply to Northern Ireland by Order in Council. Section 2(3) lists the adverse impacts, which include greenhouse gas emissions. Under Section 2(2) if the Secretary of State considers other targets or measures would be more appropriate there would need to be a report to Parliament explaining the reasons for using other targets/measures, with an assessment of the impact of these on road traffic reduction.

53. Rae A. (2018) Comment: Does the draft TfN strategy pass the crucial 'carbon test'? Article, Transport North website, 4 March 2018.

54. Under the Infrastructure Act 2015, Section 3(7)(a) the Secretary of State must lay before Parliament a report explaining why a RIS has not been set. The SoS should explain that RIS2 is being delayed because of the need to reconsider its impact on the environment under Section3(5), and specifically meeting Paris targets.

55. For example as well as the likely significant carbon impacts there are many other problems with the NPS on National Networks including the fact it would result in a 121% increase in congestion by 2040. CPRE (2015) National Networks National Policy Statement. A CPRE briefing for the House of Commons designation debate – January 2015.

56. Paragraph 5.18 from the National Policy Statement for National Networks. Section 11 of the 2008 Planning Act enables suspension of all or part of an NPS and could be used to suspend this paragraph.

57. In a study for CPRE, we estimated that road schemes completed in the 8-year period between 2002 and 2010 increased annual carbon emissions from the trunk road and motorway network by at least 3%. Even allowing for better vehicle efficiency, the significantly greater planned expenditure for the period 2020-2025 means that schemes to be built in the next five years will cause a substantial increase in carbon emissions from the trunk road and motorway network. Sloman L., Hopkinson L. and Taylor I. (2017) The Impacts of Road Projects in England. Report for CPRE, March 2017.

58. This should be a comprehensive and transparent carbon audit as part of a Strategic Environmental Assessment (SEA), with quantitative assessment of carbon impacts rather than a qualitative or traffic light assessment. The carbon emissions should be quantified for different schemes or packages of schemes, including a do-minimum case, and compared with reductions required under a Paris-compliant budget. All major assumptions should be listed. This contrasts with the SEA for the NPS on National Networks which gave no explanation for the unlikely conclusion that the cumulative carbon impacts from increased traffic and speeds on the SRN would be 'small', an increase of 0.43% in CO2 by 2040 compared with the baseline. Ramboll (undated) The National Policy Statement for National Networks. Appraisal of Sustainability.

59. It was estimated the embodied emissions in UK's planned transport infrastructure between 2014/15 and 2020/21 was nearly 57 MtCO2e. Scott K. et al. (2015) Embodied greenhouse gas emissions of the UK National Infrastructure Pipeline (NIP). Report by Sustainability Research Institute, University of Leeds.

60. Cross-party MPs recommended that the National Policy Statement for National Networks include an estimate of the impact on carbon emissions resulting from building more road infrastructure. This recommendation has still not been implemented. House of Commons Select Committee on Transport (2014) National Policy Statement on National Networks. Transport Committee 16th Report, April 2014.

61. This comprehensive audit showed that the Strategic Transport Plan (STP) would reduce carbon by 15-18% by 2025 and 22-27% by 2030 compared to 2015 levels, a significant shortfall compared to the 51% and 57% reduction necessary from

1990 levels as set out in the Committee on Climate Change's fourth and fifth carbon budgets. The audit recommended that the STP should consider a 46% carbon reduction target by 2030 compared to 2017 levels. Atkins (2018) Transport for the North Strategic Transport Plan lSA. Carbon Review. Report for Transport for the North. November 2018.

62. This includes a target to reduce greenhouse gas emissions by 0.3-1.5 MtCO2e by 2030. Mayor of London (2018) Mayor's Transport Strategy. March 2018.

63. The STP recognises the need for transport to meet the emission reductions for the current 4th and 5th carbon budgets and "acknowledges that total national carbon reduction levels may need to be even deeper, according to recent advice from the CCC." Transport for the North (2019) Final Draft Strategic Transport Plan.

64. Rae A. (2019) If climate change targets can be enforced in the North, then why not everywhere? Viewpoint in Local Transport Today, 66, 15-28 February 2019.

65. Rae A. (2019) If climate change targets can be enforced in the North, then why not everywhere? Viewpoint in Local Transport Today, 66, 15-28 February 2019

66. The Cities and Local Government Devolution Act 2016 creates the powers to establish STBs. Section 102I states that in preparing or revising its transport strategy an STB must have regard to "(b) the social and environmental impacts in connection with the implementation of the proposals contained in the strategy, (c) any current national policy relating to transport that has been published by or on behalf of Her Majesty's Government". The latter includes the Climate Change Act. Thanks to Anne Robinson and Anthony Rae for highlighting this.

67. Subsection 102I (10) of the Act states that "The constituent authorities of an STB must exercise transport functions with a view to securing the implementation of the proposals contained in the STB strategy" suggesting that the carbon reductions and pathway in the STB strategy must be applied by all the subsidiary local authorities in the region. Rae A. (2019) If climate change targets can be enforced in the North, then why not everywhere? Viewpoint in Local Transport Today, 66, 15-28 February 2019.

68. The legal duty to have regard to environmental impacts is only advisory and regulations should be drawn up to make carbon targets enforceable at different levels and to fill the accountability gap. Invoking powers in the 2016 Cities and Local Government Devolution Act, the regulations could (1) make provision about the Constitution of STBs (Section 102G) including reporting, review and scrutiny of planned and outturn transport carbon emissions; (2) under general functions (Section 102H), require provision of advice to the Secretary of State about how to ensure exercise of transport functions in the area leads to an emissions reduction trajectory that is Paris-compliant; and (3) give STBs a power of direction (Section 102P) over constituent authorities to exercise their powers in a way that meets the Paris trajectory and where needed for exercise of local transport functions (Section 102J).

69. Road management strategies such as speed limit enforcement, speed reduction, or reallocation of road space could be done relatively quickly if carbon emission reductions were not in line with the performance indicators.

70. For example the DfT's 2014 Road Investment Strategy Performance Specification contains no Performance Indicator for carbon dioxide emissions, and only a vague commitment to develop one. This still hasn't been done after five years.

71. Much of the process that is detailed in the official guidance is sensible and involves, for example, establishing the need for an intervention, identifying objectives, identifying interventions, and considering a wide range of options. Department for Transport (2018) Transport Analysis Guidance. The Transport Appraisal Process. May 2018.

72. There are numerous cases where local groups have proposed effective alternatives to roads that have been ignored. For example, in the public inquiry for the proposed M4 Corridor around Newport, Friends of the Earth Wales proposed options to address the congestion around Newport which would obviate the need for the proposed new road. FoE Cymru (2016) Submission to the Public Local Inquiry into the M4 corridor around Newport. September 2016. In another case alternatives to a link road to the M6 in Lancashire were proposed by the local community but not considered by the Planning Inspector.

James A. (2010) Heysham M6 Link Road. Review and Proposal. Report to Transport Solutions for Lancaster and Morecambe (TSLM).

73. Similar excel-based tools are used to assess costs and benefits comprising WebTAG in England, WelTAG in Wales, ScotTAG in Scotland, while Northern Ireland also appears to use the DfT's tool for appraisal. The results from these 'blackbox' calculations are presented in a single appraisal table.

74. A benefit-cost ratio (BCR) >1 indicates that the benefits of the scheme outweigh the costs. The higher the BCR, the greater the apparent value for money. While the guidance says that impacts that cannot be monetised should still be considered, in practice these other impacts (e.g. loss of tranquillity) are effectively ignored. DfT (2018) TAG UNIT A1.1. Cost-Benefit Analysis, May 2018.

75. For example, less traffic and lower fuel consumption are treated as 'costs' in WebTAG rather than 'benefits' due to reduced tax receipts from fuel duty.

76. Journey time savings are used as a proxy for all economic benefits, but other economic benefits are also added, leading to double-counting. Buchan K. (2014) Only major reforms can restore confidence in appraisal. Letter from Keith Buchan, Director MTRU, to Local Transport Today, 643, March/April 2014.

77. David Metz, former chief scientist at the Department for Transport, has made many criticisms of the use of travel time savings in scheme appraisal: Metz D. (2008) The Myth of Travel Time Saving Transport Reviews 28, 3, pp.321-336; Metz D. (2014) Travel demand: the basics. Local Transport Today, 643, March/April 2014; Metz D. (2015) Economics of road investment – a critique, article on Peak Car website, 22 May 2015, accessed 21.02.19. Professor John Whitelegg has also argued that travel time savings should not feature in scheme appraisal: Whitelegg, J. (2012) How much transport can landscape tolerate: new ways of thinking about traffic, landscape and nature? in Koerner, S. et al. (eds) Landschaft und Verkehr, University of Kassel, Germany, ISBN 978-3-86219-358-5, pp 93-114. The principal criticism is that in practice, no time is actually saved (except in the very short term). Instead, new transport infrastructure opens up land for development of housing, shopping centres or business parks, and people have to travel further to reach jobs, shops etc.

78. In the case of a new high speed road, the predicted time saved per driver is assigned a generous monetary value which is then multiplied by the millions of drivers forecast to use the road over its lifetime of say, 60 years. For example, in WebTAG the perceived value of the Working (Employers' Business) Time of a car driver is £14.86/hour in 2018 (at 2010 prices), which increases to £41.52/hour for 2070.

79. The current approach to traffic forecasting not only appears to generate unrealistic estimates of growth but there is also a tendency to treat the 'central' case or scenario as the 'most probable' outcome. See Marsden G. et al. (2018) All Change? The future of travel demand and the implications for policy and planning. May 2018. The First Report of the Commission on Travel Demand; and Goodwin P. (2018) How should we use the road traffic forecasts in practice? Local Transport Today, 12 October 2018.

80. In a review of major highway projects, the forecast journey time savings accounted for 85% of the predicted scheme benefits, while the remaining 15% resulted from predicted reductions in collisions. The actual benefits after completion were found to be 79% for journey time savings, reductions in collisions were 20% and all other factors were 1%. Sloman L. et al. (2017) The Impacts of Road Projects in England. Report for CPRE, March 2017.

81. The three projects were specifically (1): Tram Extension to Lytham; (2): Tram-Train Preston-Blackpool; (3): M6 Heysham Link Road. Hickman R. (2015) The problematic application of CBA in transport appraisal. Presentation, Sintropher final workshop, Brussels, 2015.

82. The practice of discounting, which places greater weight on costs and benefits in the short term, is supposed to reflect the fact that people, and society as a whole, prefer to receive goods and services now rather than later. However this means environmental problems such as climate change which incur large costs in the longer term count for little. For example a £1 billion environmental cost in 50 years time is discounted to a net present value of £147 million. Hickman R. (2015) The

problematic application of CBA in transport appraisal. Presentation, Sintropher final workshop, Brussels, 2015.

83. The costs and benefits occurring in the first 30 years of a programme, project or policy are generally discounted at an annual rate of 3.5%, declining thereafter. A high discount rate suggests those alive today are worth more than future generations, which some argue is unethical. This is why the Stern Review on the economics of climate change published in 2006 adopted a lower rate of 1.4%. Carbon Brief (2017) Q&A: The Social Cost of Carbon. 14 February 2017.

84. For example backcasting, an alternative to forecasting, starts with a desired future scenario and works backwards to determine what actions and decisions are needed to reach that scenario. This has been used by DfT in its 2004 VIBAT UK study and has been proposed as a useful approach for dealing with complex problems such as sustainable mobility. Miola A. (2008) Backcasting approach for sustainable mobility. Report by the European Commission Joint Research Centre Institute for Environment and Sustainability.

85. This approach does not rely on monetary values and makes the options and their contribution to different criteria explicit. Department of Communities and Local Government (2009) Multi criteria analysis: a manual.

86. TfL use a multi-criteria framework tool to appraise schemes against targets. As well as monitoring progress on a London-wide basis, all major schemes will also be monitored to assess their contribution to the strategy aims. Mayor of London (2018) Mayor's Transport Strategy. March 2018.

87. The M4 Corridor around Newport is a proposed 14-mile three-lane motorway in South Wales which the Welsh Government is promoting because the existing M4 is congested. An alternative sustainable travel package outscored the preferred M4 route using both the Welsh Government's economic appraisal method (WelTAG 2017) and a MCA using the criteria mandated by the Well-being of Future Generations (Wales) Act 2015. The Future Generations Commissioner for Wales, the Centre for Transport and Society (CTS), University of the West of England, Sustrans and New Economics Foundation (2018) Transport Fit for Future Generations. September 2018.

88. LEPs are private sector led partnerships with the public sector whose aim is to promote economic growth and jobs in local areas. There are currently 38 LEPs. LEP Network, website, accessed 21.02.19.

89. As of March 2016 £7.3 billion of Growth Deal funding had been allocated, as well as a further €6.5 billion (ca. £5.7 billion) of EU funding for the period 2014-2020. Ward M. (2017) Local Enterprise Partnerships. House of Commons Briefing. Number 5651, 2 May 2017.

90. Berry, S. (2014). The truth about those road spending figures. Blog for Campaign for Better Transport, 23 November 2014.

91. For example, funding for out of town Enterprise Zones and business/science parks. Hopkinson L. and Sloman L. (2019) Planning for less car use. Briefing for Friends of the Earth. February 2019.

92. National Audit Office (2016) Local Enterprise Partnerships. 23 March 2016.

93. LEPS are not required to consult the public on their activities, and are not subject to Freedom of Information or the EU Environmental Information Regulations. The majority of LEPs do not allow the public to attend their meetings. Robinson A. (2019) Personal communication by email, 25.02.19 and 15.03.19.

94. Pike A. et al. (2015) Local institutions and local economic development: the Local Enterprise Partnerships in England, 2010-. Cambridge Journal of Regions, Economic and Society, 8, pp. 185-204.

95. Greater Birmingham and Solihull LEP are one of the few LEPs to develop low carbon energy and transport plans, with reduction targets for CO2 in line with the existing Climate Change Act. However, this does not appear to have been followed through with quantified actions and monitoring of progress. Greater Birmingham and Solihull LEP (2016) Low carbon energy plan. Summary Report, March 2016. Low Carbon Transport and Mobility Plan. Summary Report, March 2016.

96. Suggestions for different ways to fund a world class public transport system can be found in paper 2 in this series: Sloman L. and Hopkinson L. (2019) Transforming public transport: Regulation, spending and free buses for the under 30s. Briefing for Friends of the Earth. February 2019. A more comprehensive paper on funding options for a low and zero carbon transport system is forthcoming.