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Just Parking:

Fair and Sustainable Travel Policies for Large Organisations

Working Paper

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About Energy SHINES

This paper is an output from Energy SHINES (Energy Social sciences and Humanities Insights for Non-Energy Sectors) – a project delivered through UKERC's Whole Systems Networking Fund.

Energy SHINES was set up to facilitate partnerships between women Early Career Researchers from energy social science and humanities backgrounds and organisations in key non-energy sectors undertaking work towards net zero.

Access all publications produced from the project here.

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1. Executive summary

This report is an output from a research placement with the National Health Service (NHS) Net Zero Travel and Transport team, focusing on NHS trust staff parking policies in England.

Parking at large healthcare sites such as hospitals can be limited, and demand often exceeds supply. Providing more parking would be expensive, and can mean healthcare facilities are moved away from the communities they serve. The NHS England Net Zero plan also requires a reduction in private car use to meet emissions goals. High car use has other negative environmental and health impacts, such as air and noise pollution, contributing to sedentary lifestyles and lack of urban green space.

Parking demand management can help organisations manage limited parking supply and encourage sustainable commutes. However, despite staff support for pro-environmental measures, calls from learned societies for more stringent air pollution limits and from doctors' associations for the NHS to lead on encouraging sustainable travel, measures to limit parking at NHS sites are unpopular. Major health unions oppose charging staff to park at work, and one trust states "car parking is probably the most contentious area amongst staff in the Trust".

Figure 1: The carpark at Victoria Hospital in Fife, flooded by thunderstorms following a heatwave in August 2020.

Used with the permission of @WindyWilson88

This report considers the challenges facing organisations taking leadership roles on environmental matters, particularly regarding travel to work. It reviews how driving to and parking at work has become a national habit, and why this makes measures by employers to change how people commute particularly difficult. It provides a short summary of how fairness has been conceptualised in NHS parking policies, and how different components of justice can be incorporated in organisational sustainability policies.

For organisations wishing to promote sustainable travel, the three key recommendations from this work are:

- **Use the Avoid-Shift-Improve hierarchy when developing sustainable travel plans.** Measures that reduce travel demand should be prioritised, then policies to encourage active and public travel, and finally, more-efficient private vehicles. Some private transport will remain necessary within NHS England and beyond. However, there is no zero-impact private transport option, so these should be minimised. This can also improve service efficiency.
- **Work with local and national government to reorientate the transport system and built environment towards more sustainable mobility.** Any one organisation controls only a small part of the transport puzzle, but meaningful change requires a whole systems approach. How towns and cities are laid out is as important for sustainable travel as how people get around.
- **Meaningful consultation with staff is essential to ensure sustainability policies are acceptable and effective**. Policies that affect how staff travel to work also affect their lives outside of work. Particularly while the wider system catches up with the NHS' sustainability ambitions, 'push' policies that make it harder to travel by car should be applied within the framework of fairness and compassion that is central to the NHS mission.

2. Introduction

This report is an output from a five-week placement by the author with the National Health Service (NHS) England Net Zero Travel and Transport team. The placement was part of the Energy SHINES project, led by Anglia Ruskin University and funded by the UK Energy Research Centre. The project placed women PhD students working in the Social Sciences and Humanities within non-energy organisations that are facing energy-related challenges in their transition to Net Zero. The aim for insights from the Social Sciences and Humanities is to inform the host's strategic position and to help them develop practical solutions.

The placement hosts wanted to understand the scale of parking challenges in the organisation and have better guidance to support English NHS trusts in developing solutions. The lead author reviewed 24 NHS trust parking policies and undertook data analysis on parking provision in the NHS in England, aiming to support the development of best-practice guidance.

This report reflects on the challenges faced by organisations taking leadership roles on environmental matters, particularly regarding travel to work. The first section considers how travel by car has become the norm in England, and societal factors often work in opposition to the changes needed for a more sustainable transport system. The recommendations in this section consider how to overcome these factors. The second section considers how concepts of justice are incorporated in parking management, when limited organisational parking resources mean that difficult decisions need to be taken. This section reflects on how ensuring all staff can contribute to the development of parking policies can reduce confrontation and increase effectiveness.

3. Staff parking in context

3.1 Parking challenges

In NHS England, staff parking policies serve two goals. The first is to ration limited resources fairly. Many trusts have fewer parking spaces available than the number of staff who might wish to use them. Uncontrolled ‘first-come, first-served’ parking systems can create problems of predictability and conflict, and the resultant congestion and ‘informal’ parking can impede service delivery and damage relations with the local community.

The second purpose of parking policies is behaviour change. The climate emergency is a health emergency. Climate change will have several direct and indirect negative effects on the health of the UK population, and these are likely to exacerbate existing health inequalities (Health Expert Advisory Group, 2020; UK Climate Risk, 2021). In addition to carbon emissions, air and noise pollution from private car use directly damages the health of local populations (Chief Medical Officer, 2017; Department of Health and Social Care, 2022). Land used to park private cars is not available for other uses, such as healthcare facilities or green space.

However, measures to limit staff parking can be unpopular. By its nature, the commute is an interaction between people’s home and work lives. Asking staff to change how they travel to work also asks for changes to their private lives. Morning routines, childcare arrangements, shopping trips and household budgets might all be affected in a change in commuting behaviour. Travel planners know that travel habits are most susceptible to change around major life events (such as moving home, changing jobs or starting a family) because making changes to existing routines is very difficult (Marsden and Docherty, 2013).

3.2 The drivers of driving to work

Most people in the UK drive to work. Social, economic, infrastructural and policy conditions mean driving is often the quickest and cheapest choice, and sometimes the only realistic option. As society has become more oriented around the car, travel by non-car modes has been made more difficult.

Figure 2: Average minimum travel time, in minutes, to nearest service, by key service and mode of transport, England, 2019. (Department for Transport, 2021)

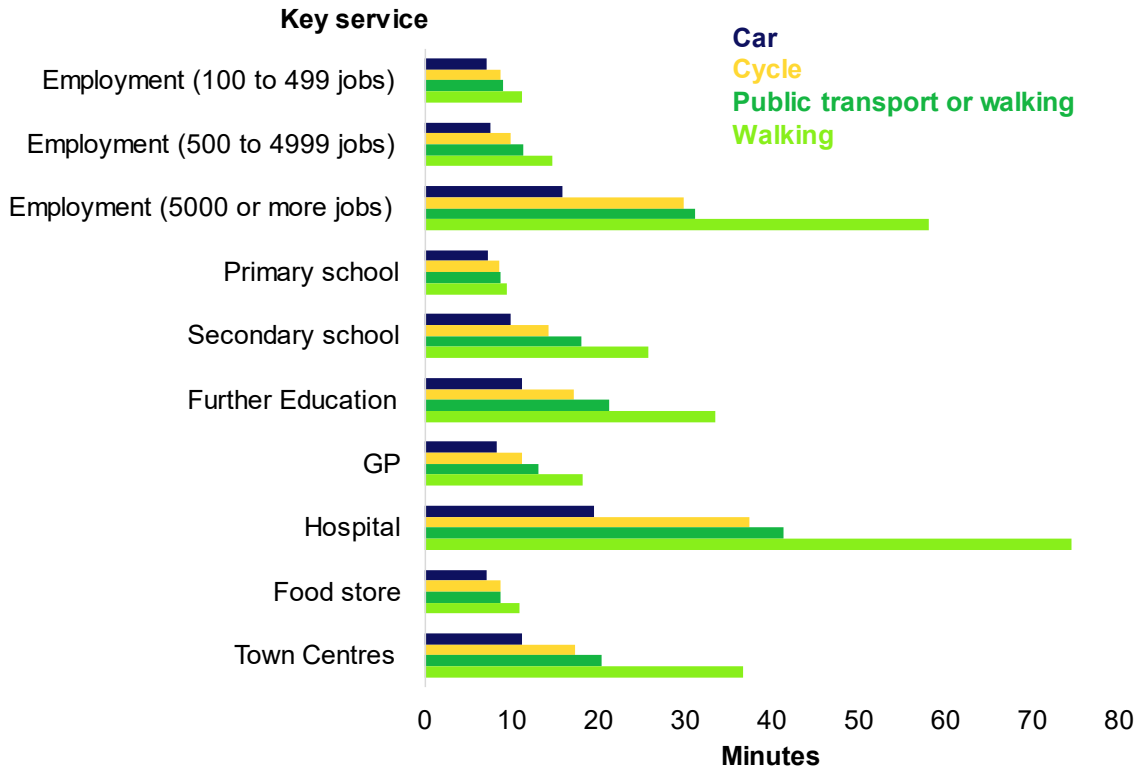
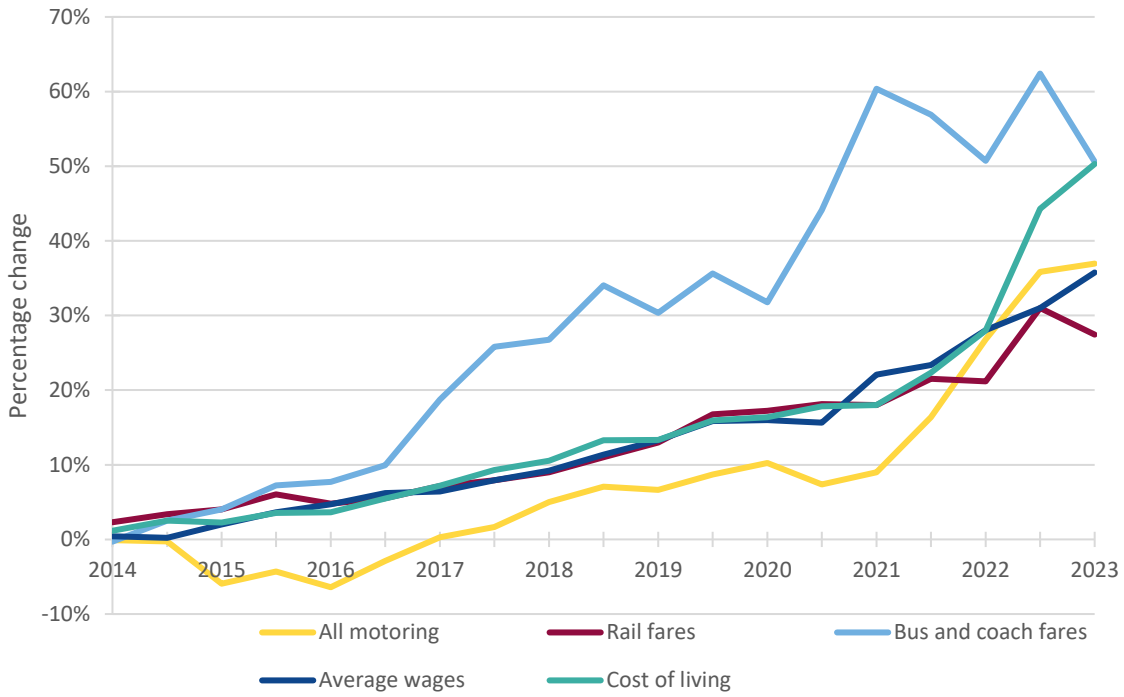


Figure 2 shows average minimum travel times to a range of key services. All destinations can be reached more quickly by car. It is therefore unsurprising that, nationally, 68% of people drive to work (Department for Transport, 2022c). However, it is not inevitable that the car should be the fastest or most convenient mode of transport.

Since the 1970s, the number of trips people take has stayed the same, but distance travelled has increased by 45% (Department for Transport, 2022b). Cars make it possible to travel large distances relatively easily. This is now the expected norm and, increasingly, a requirement to participate fully in society (Lucas, 2012).

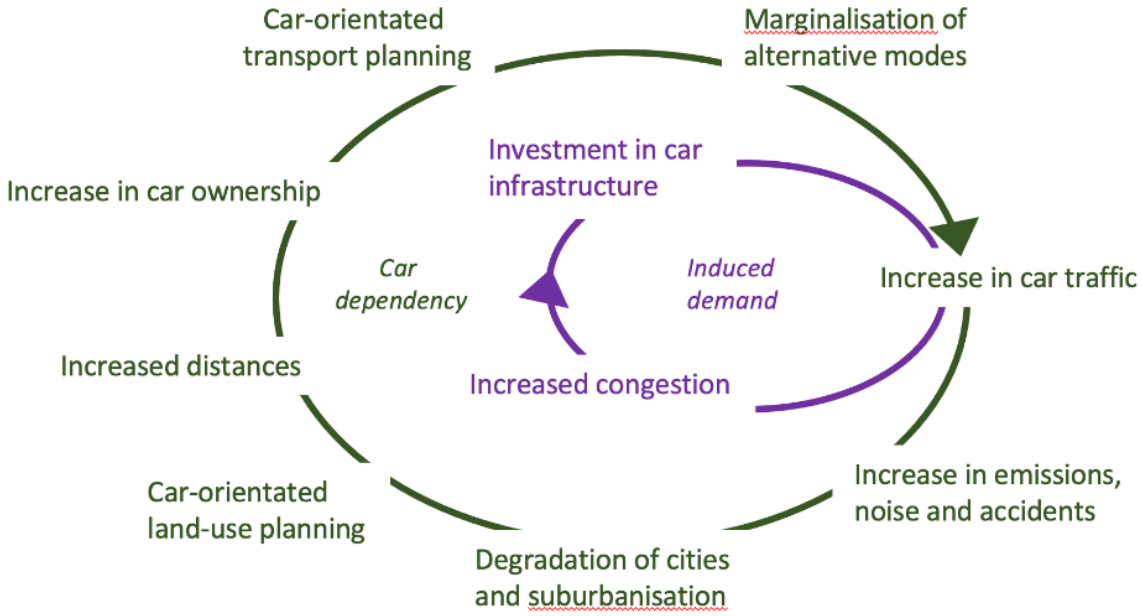
Figure 3: Percentage change in the cost of motoring, the cost of rail and bus fares alongside changes in the cost of living (RPI) and average wages. Adapted from (RAC Foundation, 2023)



While distances travelled by car have increased, travel by non-car modes has become more difficult. Buses are the most common form of public transport but, following privatisation outside of London, the bus system has become “expensive, unreliable, fragmented, and dysfunctional” (Alston, Khawaja and Riddell, 2021). In the last decade there has been a 29% reduction in bus services (Campaign for Better Transport, 2022). Furthermore, the cost of public transport, particularly bus transport, has increased more than the cost of motoring and the cost of living, as shown in Figure 3. While miles driven have increased, walking and cycling miles have decreased (Department for Transport, 2022b). These options are less feasible when everyday services are more distant and increased car traffic makes them less safe and enjoyable (Jacobsen, Racioppi and Rutter, 2009).

The cycle of how increasing car use makes transport by other modes more challenging and leads to car dependency is illustrated in Figure 4. Nearly three-quarters of UK motorists say they would find it very difficult to adjust to life without a car (RAC, 2020). This causes problems for individuals as well as the environment. The lack of other options means households feel compelled to own a car, even when they have to forego other necessities to pay for one (Larrington-Spencer and Jackson, 2020). This disadvantages those who are unable to drive because they are too young, too old or have other health conditions (Lucas et al., 2019). However, undoing car dependence will involve difficult, disruptive change (Schwanen, 2021).

Figure 4: The cycle of car dependency and induced demand. Adapted from (TUMI, no date)



3.3 Avoid - Shift - Improve

Current rates of car use may be incompatible with a Net Zero society. Models predict at least a 20% reduction in road traffic levels, relative to current predictions, is needed by 2030 (Hopkinson *et al.*, 2021). The Scottish government has adopted traffic reduction targets, but England has not (Marsden, 2023).

The Avoid-Shift-Improve framework describes how to reduce environmental harm from travel (GIZ, 2016). *Avoid* measures reduce travel demand – for example, building homes near workplaces to shorten commutes, or digital technology that reduces the need to travel. *Shift* considers how remaining journeys can be completed by sustainable modes, such as active and public travel. *Improve* looks to technological improvements, such as electrification, to reduce the environmental impact of any residual journeys. Avoid-Shift-Improve measures should be applied hierarchically: no one strategy can mitigate all the environmental impacts of travel, but focusing on avoid first, then shift, then improve leaves most headroom to meet ambitious goals. Reducing travel demand, for example, by delivering appointments virtually or in the community, leaves greater space in the carbon budget for remaining essential trips.

The current NHS England Net Zero plan relies heavily on Improve measures: more than 50% of transport emissions reductions are expected to come from electrification (NHS England, 2022). Greater attention could be paid to reducing travel demand. As a positive step, NHS England has adopted a sustainable travel hierarchy which prioritises digital solutions to remove journeys (Woodward, 2021). Travel demand can also be minimised in other ways. For example, ten service partners in Greater

Manchester that had been delivering cross-city care were instead each assigned a local area (Jones and Blackadder, 2022). This led to a reduction in emissions, reduced travel time and improved cost savings. Carers had more time to spend on providing care, providing a better service and improving job satisfaction.

The first recommendation of this report is that **organisations should use the Avoid-Shift-Improve hierarchy when developing sustainable travel plans.** There are no zero-impact private vehicle options, but some vehicle journeys will be necessary. Focusing on reducing travel demand, then mode shift, and finally, the use of more efficient private vehicles leaves maximum space in the carbon budget for the remaining necessary trips, and can bring cost and efficiency benefits.

3.4 Parking restrictions for mode shift

Even with widescale Avoid measures, some staff will need to travel to work. NHS England and other organisations are therefore right to think about Shift and Improve measures for these journeys. Restricting parking is one measure, alongside other interventions, that make it less convenient to drive and more feasible to use alternatives.

The most effective mode shift strategies include a mix of push measures, which make driving less convenient/attractive, and pull measures that increase the convenience/attractiveness of alternatives (Creutzig, Mühlhoff and Römer, 2012). Some pull measures, such as providing real-time public transport information, can be provided without significant impact elsewhere. However, given relatively fixed amounts of space and money for transport, others, like protected space for cycling or bus priority measures, require a corresponding push measure, such as reducing the amount of road space available for private cars (Cohen, Navarro Eslava and Frost, 2021).

Push measures are often less popular than pull measures (Wicki, Fesenfeld and Bernauer, 2019). This is perhaps unsurprising. However, employers who include push measures as part of their workplace travel plans achieve higher reductions in the percentage of employees who drive a private car to work than those who do not. In particular, restrictions on the availability of workplace parking are associated with more than double the reduction in car use, from 9% to 18% (Cairns, Newson and Davis, 2010; Petrunoff et al., 2015). Within NHS England, parking restraint is often a matter of necessity rather than choice, as there is frequently insufficient capacity at hospital sites. However, for other organisations that wish to minimise the environmental impact of staff travel to work, workplace parking restrictions can be an effective measure, but an unpopular one.

3.5 Swimming upstream: the challenge of societal car dependence

How transport policy-making is distributed can make it harder to take co-ordinated action to change how people travel. Each organisation controls only one part of the transport 'puzzle', whereas each journey interacts with the whole system. The lack of central government ambitions to reduce car use may make it harder for organisations, such as local governments and employers, to introduce car restraint measures.

Combining push measures, like workplace parking restrictions, with pull measures that make it easier to get to work by other means, increases their acceptability (Wicki, Fesenfeld and Bernauer, 2019). Across NHS England, trusts offer incentives such as discounted public transport passes and tax-free cycle purchasing to encourage sustainable travel to work. However, once again, the commute involves interaction with spheres beyond the organisation's control. A discounted cycle is only useful if there is a safe route from home to work, and a bus pass only helps if there is a bus to catch. NHS England needs the cooperation of other actors to achieve meaningful mode shift.

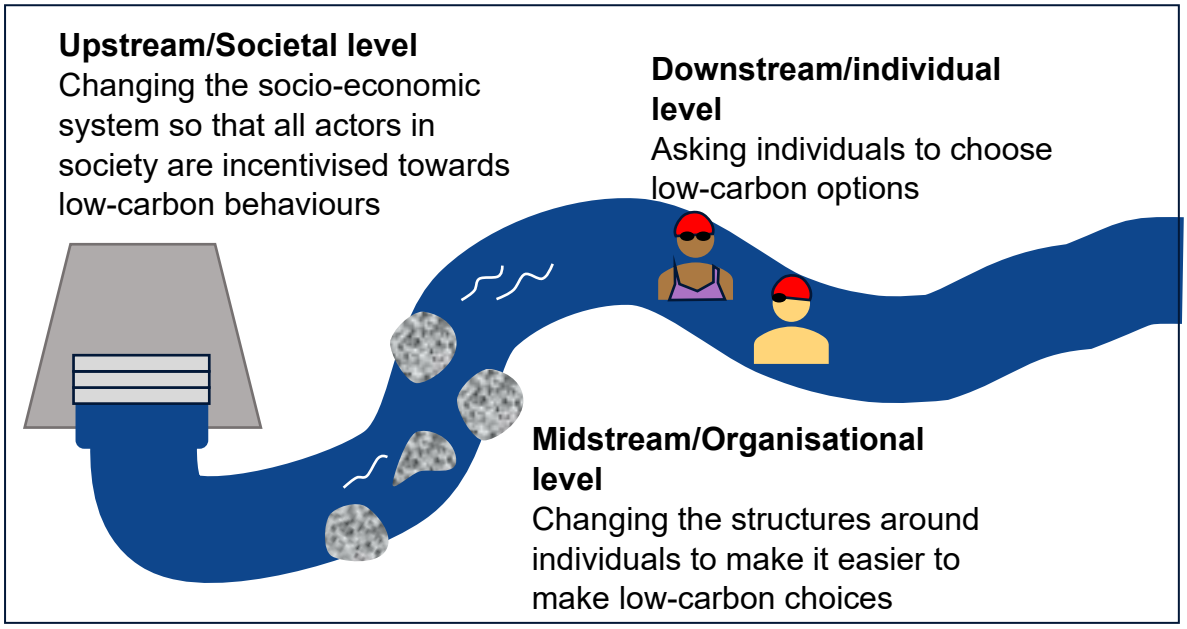
Lines of responsibility for reducing carbon emissions from transport in England are not clear. This can make it harder for organisations to take bold action. Transport policy is shared between national, regional and local government in complicated and area-specific ways (Urban Transport Group, 2022). The UK has a legally binding commitment to reach net zero by 2050. However, there is no overall plan for how this will be achieved, and no legally binding interim targets set for what should be achieved by a specific time, industry or region (Climate Change Committee, 2023). This creates a system of 'fuzzy accountability', where everyone is aware that s*omeone* should take action on climate change but no one *has* to take action (Bache et al., 2015). Without a requirement for action, there is little incentive for organisations to take unpopular decisions.

Given wider societal car dependence, asking staff not to drive to work could be seen as asking them to 'swim upstream'. This uses a metaphor from 'Upstream-Downstream' model of behaviour change summarised in Figure 5 (Park et al., 2023). NHS England can change parking supply, but has limited influence over the wider transport system. It has access to some push measures and some pull measures, but not the full range. Asking staff to commute by non-car means will therefore require effort at the individual level, and it is not surprising this is often met with resistance.

More broadly, the lack of bolder action by national and local government can be seen as leaving organisations to swim upstream. NHS England has adopted a Net Zero strategy, but without other organisations adopting similar measures, they will be unusual in expecting staff to commute by sustainable modes. How easy it is for staff to adopt more sustainable commutes depends on policies adopted by the wider

community. If society more generally is not working towards concrete Net Zero plans, it will be substantially more difficult for NHS England to achieve its goals.

Figure 5: The Upstream Downstream Model of Behaviour Change, adapted from 'How to build a Net Zero society'(Park et al., 2023)



The second recommendation is therefore that **large organisations should use their position to lobby for wider changes to the transport system and the built environment**. For NHS England, this will make it easier to meet net zero ambitions. It will also reduce concerns around 'competitive disadvantage' in terms of staff recruitment and retention, as they will not be an outlier. Finally, it fits with NHS England's remit to improve the health and wellbeing of the nation.

4. Managing transitions

4.1 Designing fair parking policies

The previous section considers steps organisations could take to reduce demand for parking and support staff to travel sustainably in the medium to long term. However, in the here and now, many staff want to park at work and there are not always enough spaces available. Organisations face an immediate need to manage staff parking and want to do this as fairly as possible.

Many English NHS trusts operate a permit system that restricts entitlement to park. Parking rights are granted only to those identified as having the greatest parking need. However, only two relatively unproblematic criteria for establishing priority parking were identified: Blue Badge holders and those who car share. These two criteria alone are insufficient to capture the range of parking needs. However, other measures were seen to have practical or theoretical limitations.

For example, distance from home to work was used as a proxy for how easy it was to get to work by other means. On a practical level, distance does not directly correlate with accessibility: patchy public transport networks mean sometimes a large distance can be crossed relatively easily, whereas short journeys might require multiple changes. Theoretically, distance-based criteria might reward and reinforce high-carbon lifestyles for those who choose to live further from work. From an equity perspective, distance criteria assume all workers have an equal say over their home location and that the same journey is equally feasible for all members of staff.

The examples above show that fairly allocating limited resources is difficult. Unfortunately, it is sometimes also necessary. Academic literature offers some guidance for how to fairly allocate limited resources. Several academics have considered how to apply theories of justice from political philosophy to transportation (for example, see Martens, 2017; Sheller, 2018). One approach considers fairness in the move towards sustainable transport systems as having three dimensions: distributional justice, procedural justice, and justice as recognition (Schwanen, 2020).

Distributive justice considers how benefits and burdens are distributed in society (Pereira, Schwanen and Banister, 2017). This concept is familiar within NHS England: a founding principle is that health services are provided “based on clinical need, not an individual’s ability to pay” (Department of Health and Social Care, 2021). Similar ideas appear in staff parking provision: where parking is limited, all trusts chose a regulated permit system with a right to park granted according to either individual need (how easy it was for staff to reach the site by non-car means) or organisational need (cars needed for work purposes) rather than market-based measures. Distributive justice is also an important part of the rationale for change. Climate change will exacerbate existing health inequalities (Health Expert Advisory Group, 2020). The poorest areas of the UK, and those with the youngest populations, emit the least pollution but are the most exposed and suffer the most

from its impacts (Barnes, Chatterton and Longhurst, 2019). Low-income households are less likely to have a driving license or access to a car, so have most to gain from a move away from car dependence (Department for Transport, 2022a)

Procedural justice concerns how decisions are made, including whether processes are fair and transparent, and whether all parties can contribute to decision-making. Justice as recognition means that the *"*rights, needs, values, understandings and customs of those affected by transition dynamics*"* are respected (Schwanen, 2021, p. 685). NHS England sustainability teams are rightly concerned with ensuring the service meets its net zero commitment. Estates professionals want smooth and efficient parking operations. But commuting to and parking at work interacts with life outside of work, and so parking policies must also fit with staff values of family life, leisure time and other personal needs and wants.

The final recommendation is therefore that **good consultation with staff is essential to ensure sustainability policies are acceptable and effective, and reflect the diverse needs of NHS staff**. NHS England's overall net zero goal is fixed in law, and physical parking supply is not easily changed. But there are many different ways parking resources can be distributed. Good consultation aids the development of effective, equitable and acceptable policies. This is compatible with ambitious policy goals, when staff are able to choose between multiple viable options.

5. Conclusions and recommendations

Changing how people commute is difficult because, by its nature, commuting is the interface between people's professional and private lives. When employers try to change how people arrive at work, this impacts lives outside of work. Moving people away from car-based commutes is particularly difficult because of the way society in England has become structured around the car. Undoing car dependence requires physical and cultural change. This will require coordinated efforts from multiple organisations. It also requires considerations of justice, because people have different capacities to respond to the necessary changes in the transport system. Justice concerns not just the outcomes of policies that support sustainable travel, but also the processes used to develop them.

Despite the challenges, it is worthwhile for organisations to promote sustainable travel to work. Sustainable commuting is good for the environment, has health and wellbeing benefits for individuals, and supports efficient use of resources. For organisations wishing to promote sustainable travel, the three key recommendations from this work are:

- **Use the Avoid-Shift-Improve hierarchy when developing sustainable travel plans.** Measures that reduce travel demand should be prioritised, then policies to encourage active and public travel, and finally, more-efficient private vehicles. Some private transport will remain necessary within NHS England and beyond. However, there is no zero-impact private transport option, so these should be minimised. This can also improve service efficiency.
- **Work with local and national government to reorientate the transport system and built environment towards more sustainable mobility.** Any one organisation controls only a small part of the transport puzzle, but meaningful change cannot be achieved without a whole-systems approach. How towns and cities are laid out is as important for sustainable travel as how people get around.
- **Good consultation with staff is essential to ensure sustainability policies are acceptable and effective**. How we travel affects how we live our lives. Policies that affect how staff travel to work will also affect their lives outside of work. Particularly while the wider system catches up with net zero ambitions, 'push' policies that make it harder to travel by car should be applied within a framework of fairness and compassion – values at the core of the NHS and other public services.

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7. References

Alston, P., Khawaja, B. and Riddell, R. (2021) *Public Transport, Private Profit*. Centre for Human Rights and Global Justice. Available at: https://chrgj.org/wp-content/uploads/2021/07/Report-Public-Transport-Private-Profit.pdf.

Bache, I. *et al.* (2015) 'Blame Games and Climate Change: Accountability, Multi-Level Governance and Carbon Management', *The British Journal of Politics and International Relations*, 17(1), pp. 64–88. Available at: https://doi.org/10.1111/1467-856X.12040.

Barnes, J.H., Chatterton, T.J. and Longhurst, J.W.S. (2019) 'Emissions vs exposure: Increasing injustice from road traffic-related air pollution in the United Kingdom', *Transportation Research Part D: Transport and Environment*, 73, pp. 56–66. Available at: https://doi.org/10.1016/j.trd.2019.05.012.

Cairns, S., Newson, C. and Davis, A. (2010) 'Understanding successful workplace travel initiatives in the UK', *Transportation Research Part A: Policy and Practice*, 44(7), pp. 473–494. Available at: https://doi.org/10.1016/j.tra.2010.03.010.

Chatterjee, K. *et al.* (2020) 'Commuting and wellbeing: a critical overview of the literature with implications for policy and future research', *Transport Reviews*, 40(1), pp. 5–34. Available at: https://doi.org/10.1080/01441647.2019.1649317.

Chief Medical Officer (2017) *Annual Report of the Chief Medical Officer 2017: Health Impacts of All Pollution – what do we know?* Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/690846/CMO_Annual_Report_2017_Health_Impacts_of_All_Pollution_what_do_we_know.pdf (Accessed: 12 June 2023).

Climate Change Committee (2023) *Progress in reducing emissions: 2023 Report to Parliament*. Available at: https://www.theccc.org.uk/publication/2023-progress-report-to-parliament/ (Accessed: 28 June 2023).

Cohen, T., Navarro Eslava, L. and Frost, M. (2021) *Stakeholder engagement in an emergency: Lessons from low-traffic neighbourhoods | Local Government Association*. Available at: https://www.local.gov.uk/publications/stakeholder-engagement-emergency-lessons-low-traffic-neighbourhoods (Accessed: 22 June 2023).

Creutzig, F., Mühlhoff, R. and Römer, J. (2012) 'Decarbonizing urban transport in European cities: four cases show possibly high co-benefits', *Environmental Research Letters*, 7(4), p. 044042. Available at: https://doi.org/10.1088/1748-9326/7/4/044042.

Department for Transport (2021) ‘Journey time statistics, England: 2019’. Available at: https://www.gov.uk/government/statistics/journey-time-statistics-england-2019/journey-time-statistics-england-2019 (Accessed: 31 May 2023).

Department for Transport (2022a) *Driving licence holding and vehicle availability*, *GOV.UK*. Available at: https://www.gov.uk/government/statistical-data-sets/nts02-driving-licence-holders (Accessed: 29 May 2023).

Department for Transport (2022b) ‘National Travel Survey’. Available at: https://www.gov.uk/government/collections/national-travel-survey-statistics (Accessed: 22 June 2023).

Department for Transport (2022c) ‘Transport Statistics Great Britain: 2022 Domestic Travel’. Available at: https://www.gov.uk/government/statistics/transport-statistics-great-britain-2022/transport-statistics-great-britain-2022-domestic-travel (Accessed: 31 May 2023).

Department of Health and Social Care (2021) *The NHS Constitution for England*, *GOV.UK*. Available at: https://www.gov.uk/government/publications/the-nhs-constitution-for-england/the-nhs-constitution-for-england (Accessed: 28 June 2023).

Department of Health and Social Care (2022) *Chief Medical Officer’s annual report 2022: air pollution*, *GOV.UK*. Available at: https://www.gov.uk/government/publications/chief-medical-officers-annual-report-2022-air-pollution (Accessed: 28 May 2023).

GIZ (2016) *Sustainable Urban Transport: Avoid-Shift-Improve (ASI)*. Available at: https://ledsgp.org/app/uploads/2016/01/SUTP_GIZ_FS_Avoid-Shift-Improve_EN.pdf (Accessed: 12 June 2023).

Health Expert Advisory Group (2020) *Sustainable Health Equity: acheiving a Net Zero-UK*. Climate Change Committee. Available at: ttps://www.theccc.org.uk/publication/ucl-sustainable-health-equity-achieving-a-net zero-uk/.

Hopkinson, L. *et al.* (2021) *The last chance saloon: we need to cut car mileage by at least 20%*. Transport for Quality of Life. Available at: https://www.transportforqualityoflife.com/u/files/211214%20The%20last%20chance%20saloon%20to%20cut%20car%20mileage.pdf.

Jacobsen, P.L., Racioppi, F. and Rutter, H. (2009) ‘Who owns the roads? How motorised traffic discourages walking and bicycling’, *Injury Prevention*, 15(6), pp. 369–373. Available at: https://doi.org/10.1136/ip.2009.022566.

Jones, P. and Blackadder, S. (2022) *The role of cross-sector collaboration in reducing the need to travel*. SUMP-PLUS Policy Brief #2.

Larrington-Spencer, H. and Jackson, M. (2020) *Caring for those who care—free parking is not it*, *The BMJ*. Available at: https://blogs.bmj.com/bmj/2020/12/08/caring-for-those-who-care-free-parking-is-not-it/ (Accessed: 28 May 2023).

Lucas, K. (2012) 'Transport and social exclusion: Where are we now?', *Transport Policy*, 20, pp. 105–113. Available at: https://doi.org/10.1016/j.tranpol.2012.01.013.

Lucas, K. *et al.* (2019) *Inequalities in Mobility and Access in the UK Transport System*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784685/future_of_mobility_access.pdf (Accessed: 29 June 2023).

Marsden, G. (2023) 'Reverse gear: The reality and implications of national transport emission reduction policies – CREDS', 16 May. Available at: https://www.creds.ac.uk/publications/reverse-gear-the-reality-and-implications-of-national-transport-emission-reduction-policies/ (Accessed: 14 June 2023).

Marsden, G. and Docherty, I. (2013) 'Insights on disruptions as opportunities for transport policy change', *Transportation Research Part A: Policy and Practice*, 51, pp. 46–55. Available at: https://doi.org/10.1016/j.tra.2013.03.004.

Martens, K. (2017) *Transport justice: designing fair transportation systems*. New York, NY: Routledge, Taylor & Francis Group.

NHS England (2022) *'Delivering a "Net Zero" National Health Service'*. Available at: https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2022/07/B1728-delivering-a-net zero-nhs-july-2022.pdf (Accessed: 28 May 2023).

Park, T. *et al.* (2023) *How to build a Net Zero society*. The Behavioural Insights Team. Available at: https://www.bi.team/wp-content/uploads/2023/01/How-to-build-a-Net zero-society_Jan-2023.pdf (Accessed: 25 June 2023).

Pereira, R.H.M., Schwanen, T. and Banister, D. (2017) 'Distributive justice and equity in transportation', *Transport Reviews*, 37(2), pp. 170–191. Available at: https://doi.org/10.1080/01441647.2016.1257660.

Petrunoff, N. *et al.* (2015) 'Carrots and sticks vs carrots: Comparing approaches to workplace travel plans using disincentives for driving and incentives for active travel', *Journal of Transport & Health*, 2(4), pp. 563–567. Available at: https://doi.org/10.1016/j.jth.2015.06.007.

RAC (2020) *Dependency on the car is increasing*. Available at: https://www.rac.co.uk/drive/features/rising-car-dependency-2019/ (Accessed: 29 June 2023).

RAC Foundation (2023) *Transport price index*. Available at: https://www.racfoundation.org/data/cost-of-transport-index (Accessed: 31 May 2023).

Schwanen, T. (2020) ‘Low-Carbon Mobility in London: A Just Transition?’, *One Earth*, 2(2), pp. 132–134. Available at: https://doi.org/10.1016/j.oneear.2020.01.013.

Schwanen, T. (2021) ‘Achieving just transitions to low-carbon urban mobility’, *Nature Energy*, 6(7), pp. 685–687. Available at: https://doi.org/10.1038/s41560-021-00856-z.

Sheller, M. (2018) *Mobility justice: the politics of movement in the age of extremes*. London ; Brooklyn, NY: Verso.

Sustainable Development Commission (2011) *Fairness in a Car-dependent Society*. Available at: https://www.sd-commission.org.uk/data/files/publications/fairness_car_dependant.pdf.

Thomas, G.O. (2014) *Exploring alternatives to rational choice in models of Behaviour: An investigation using travel mode choice*. University of Bath. Available at: https://researchportal.bath.ac.uk/en/studentTheses/exploring-alternatives-to-rational-choice-in-models-of-behaviour.

TUMI (no date) *Vicious Cycle of Automobile Dependency*, *TUMI*. Available at: https://transformative-mobility.org/multimedia/vicious-cycle-of-automobile-dependency/ (Accessed: 13 July 2023).

UK Climate Risk (2021) *Health and Social Care Briefing*. Available at: https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Briefing-Health-Social-Care.pdf (Accessed: 14 June 2023).

Urban Transport Group (2022) *UK Transport Governance - an introduction*. Available at: https://urbantransportgroup.org/index.php/system/files/general-docs/UK%20Transport%20Governance%20-%20an%20introduction.pdf (Accessed: 28 June 2023).

Wicki, M., Fesenfeld, L. and Bernauer, T. (2019) ‘In search of politically feasible policy-packages for sustainable passenger transport: insights from choice experiments in China, Germany, and the USA’, *Environmental Research Letters*, 14(8), p. 084048. Available at: https://doi.org/10.1088/1748-9326/ab30a2.

Woodward, K. (2021) *An introduction to the sustainable travel hierarchy*, *Energy Saving Trust*. Available at: https://energysavingtrust.org.uk/an-introduction-to-the-sustainable-travel-hierarchy/ (Accessed: 12 July 2023).