



Place-Based Solutions for Transport Decarbonisation

Submission to the Department for Transport's Transport Decarbonisation Plan Consultation

Professor Greg Marsden

On behalf of the DecarboN8 Project

28th August 2020

DecarboN8 is a UKRI funded research network+. A key aim of DecarboN8 is to develop the knowledge to enable an effective and socially just place-based approach to support the rapid decarbonisation of transport. The network brings together academics, government, industry and citizen and community stakeholders to co-create new approaches to cut carbon. The network is co-ordinated at the University of Leeds and comprises partners from the eight most research intensive Universities across the North of England. Full details of the partners and the network's work can be found at <https://decarbon8.org.uk/>

This submission should be referenced as:

Marsden, G., Anderson, K., Büscher, M., Densley-Tingley, D., Spurling, N., Sun, H., Thankappan, S., Walker, R., Walker, S. and Whittle, K. (2020) Place-Based Solutions for Transport Decarbonisation, Submission to the Department for Transport's Consultation on the Transport Decarbonisation Plan.



Place-Based Solutions for Transport Decarbonisation

Place-based decarbonisation is a recognition that, whilst the decarbonisation of transport has to happen everywhere, it is enacted in places. Defining place-based solutions as a strategic priority, as DfT's *Decarbonising Transport: Setting the Challenge* does, will have value if it enables the faster and more cost-effective achievement of the prime objective: early and rapid progress to meet the nationwide necessary emissions descent pathway.

Places start from different positions in terms of the activities they support, the communities they serve, the transport options and networks which are available and the energy infrastructures to which they connect. Places have different demographic, socio-economic, political and cultural contexts and are situated in different governance structures which distribute the power to act in different ways. Place-based decarbonisation therefore recognises that the capacity to act, the pathways to action and the costs of those pathways will differ across different places.

A place-based approach also engages communities and businesses in building the vision of the neighbourhoods, towns, cities and villages they want to live in. We have never tried to effect a transition in how we live which is as profound or rapid as that implied by the Decarbonisation Plan and it is in places that these difficult choices will play out. There is a need to both understand and build the societal readiness for these transitions and to know that this will not be uniformⁱ.

However, whilst diversity is essential to understand and may offer benefits, it also presents risks. People and goods frequently move across administrative boundaries. Technologies might need to work over whole countries or continents to become affordable at scale. Too much diversity could be confusing to consumers or expensive to co-ordinate. Place-based decarbonisation also, therefore, recognises that sometimes actions are better coordinated to ensure that the sum of the parts is better than the sum of the individual policy paths.

Ultimately, the progress towards the commitment to zero carbon emissions from the transport sector is made up of the sum of the progress in all different places. If progress is to be slower in some areas then it will need to be faster in others. If it costs more in some areas than others then this needs to be factored in to funding allocations or the deployment of restrictions in new ways. Where this is the case, place-based approaches should help in designing fair allocations of resources and rights, as well as in standard setting.

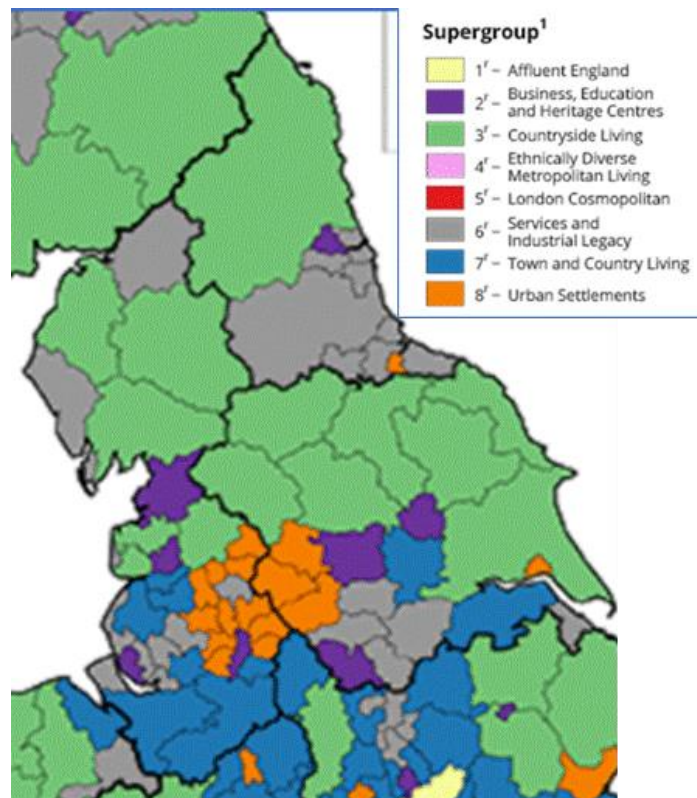
In this submission we set out some key elements of place-based decarbonisation and set out what we think the full Transport Decarbonisation Plan needs to address to unlock the potential that a place-based approach holds.

Section 1: Understanding Diversity

The transport decarbonisation challenge is very different in different places. Analysis conducted for the DecarboN8 network suggests that across the UK, the districts with the highest per capita emissions are between 2.5 and 3 times higher than those with the lowest emissions.ⁱⁱ

There are different factors at play which explain this gap but, broadly speaking, affluent populations living at lower density are more likely to own more cars and to drive them further. Populations living at higher densities tend to own fewer cars, even where they are affluent.

DecarboN8 has looked at different ways of classifying places in order to allow comparison of the baseline performance of places with similar characteristics. So far the analysis has only been done at the local authority district level for private car based travel. The ONS area classification combines socio-economic, demographic and settlement-type elements to arrive at a categorisation of districts blending both population density and socio-economic deprivation/affluence characteristics. A comparison of how the 71 districts across the North of England vary has been conductedⁱⁱⁱ with the summary findings shown in Table 1 below.



Perhaps as important as the variation between broad categories of places is the variation within categories as shown in Figure 1 below.

Table 1: Comparison of CO₂ emissions by ONS area type classification

ONS area classification	Number of districts	2011 population (m)	Share of Population	Population Density (hd/km ²)	Cars/thous and population	Cycle once per month	Share of Total Emissions (%)	Average emissions/capita (kg CO ₂)
Countryside Living	14	1.66	11.0	125	431	6	14.8	787
Town and Country Living	9	1.76	11.6	688	432	6	15.3	757
Services and Industrial Legacy	25	4.95	32.7	1241	351	4	33.7	579
Urban Settlements	16	3.93	26.0	1634	325	5	21.3	525
Business, Education and Heritage Centres	7	2.83	18.7	2153	285	9	14.8	461

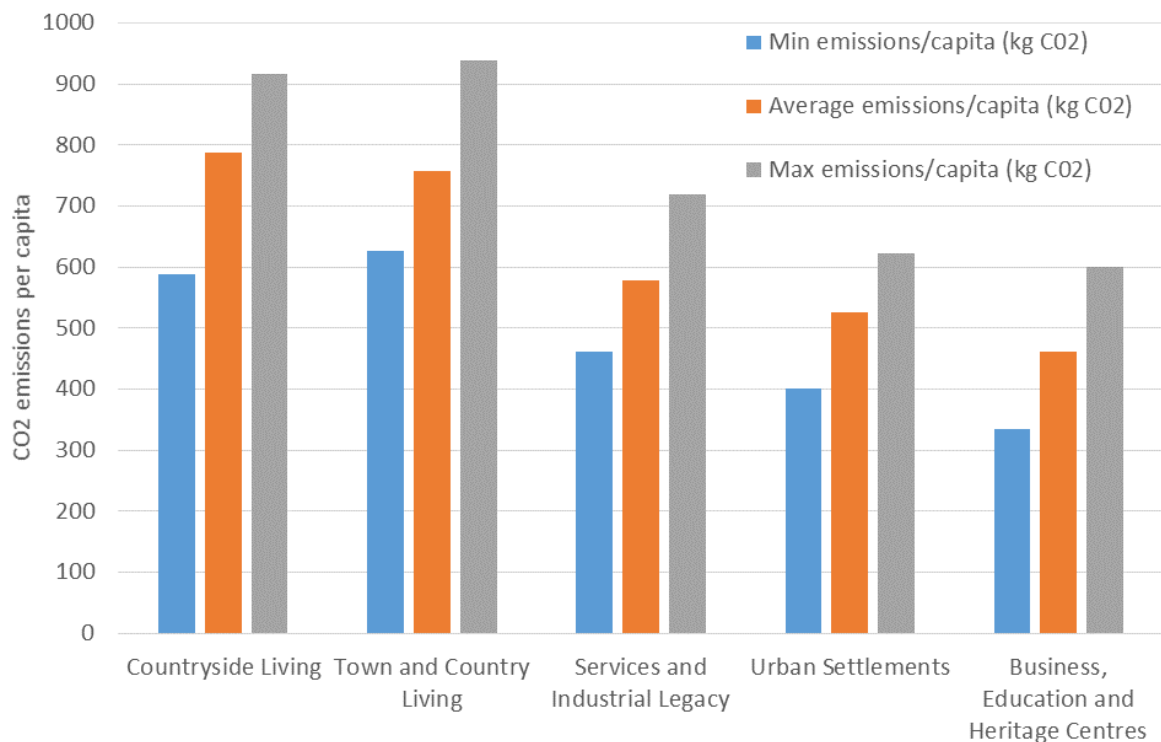


Figure 1: Variation within ONS classifications for the 71 Northern ONS areas

The variation (range) in emissions within area classifications is above 40% of the average for all of the ONS categories.

There are several important messages to take from this analysis.

- The start points for decarbonisation are significantly different between places;

DecarboN8

- Factors such as density, affluence and car ownership levels influence the start position but they are not the only factors at play;
- There is significant variation between places which have apparently similar socio-demographic characteristics which already points to the potential for local action to help deliver different outcomes

We now turn to some of the key elements which contribute to the diversity which exists and which will need to be factored in to a coherent place-based approach.

Key Element 1: Places have different functions

The first key element of a place-based approach is to think about the diversity of places and why they have the travel patterns they do. From ports to national parks, from University cities to former mining towns, the demand for travel can be really diverse, as can the balance between people and freight, residents and visitors.

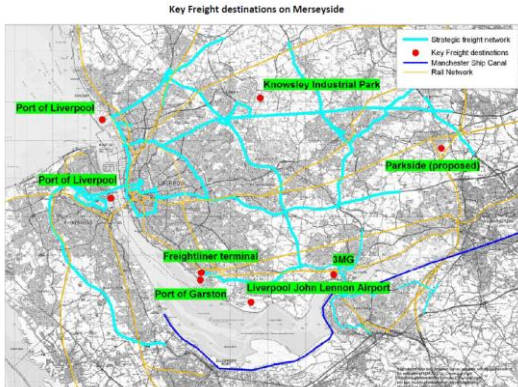
Example 1: Tourism



There are 40,478 people living within the [Lake District National Park](#).^{iv} In 2018 there were 28.5m tourism visit days to the Lake District. That is about twice as many days as the resident population spends in the Lake District. The carbon impact of tourism movements within the Lakes falls overwhelmingly to visitors. On top of this, it is necessary to consider how

people access the Lake District, with 93% of people accessing National Parks doing so by car. The impacts vary across the year, with summer room occupancy being twice that of winter months.^v

Example 2: Freight distribution hubs



Liverpool has the fourth largest UK container port operations. It deals with over 32 million tonnes of freight every year. This is a major part of the 38 million tonnes of road freight moved within Merseyside every year. Of the HGV trips generated by the port, 22% go to destinations within Merseyside, such as 3MG, Knowsley Industrial Park and Liverpool City Centre; 35% go to destinations within the North West, particularly along the M62

Corridor; and 43% are to destinations outside the North West.^{vi} The considerable carbon footprint of the freight operations of the port is, therefore, more than three-

DecarboN8

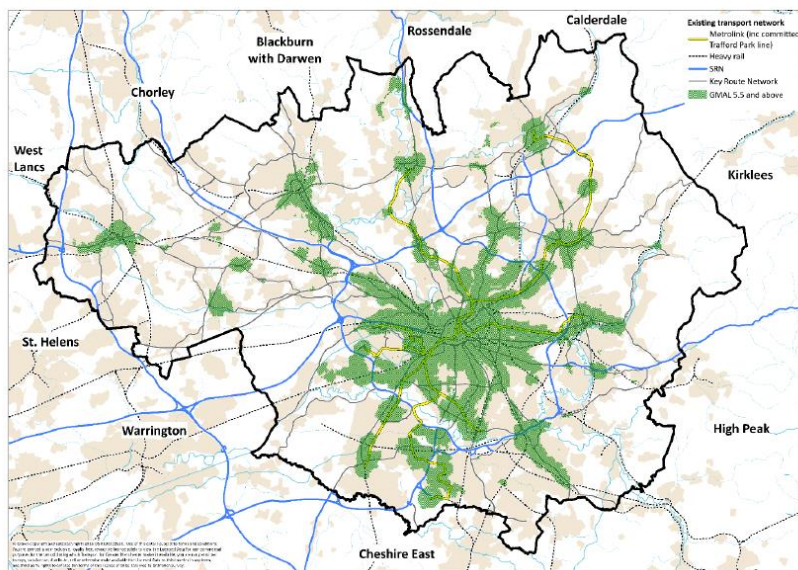
quarters attributable to areas outside of the administrative boundaries of even the Liverpool City Region.

These two short examples illustrate the importance of the Decarbonisation Plan being clear about how to attribute such emissions. Even once this is clear, the actions necessary to get to zero carbon will require a blend of national, regional and local interventions. Progress will be dependent on coherent coordinated action.

Key Element 2: Places have different transport options

Even if we had a uniformity of function in our places, there are very different opportunities in terms of baseline infrastructure and services. The topography and existing built environment of places has influenced how transport networks and services have evolved. This will also influence how easy or challenging changing the mix of transport modes or technologies will be. The marginal costs and the marginal benefits of interventions will be radically different in different areas.

Example 1: Public Transport Accessibility

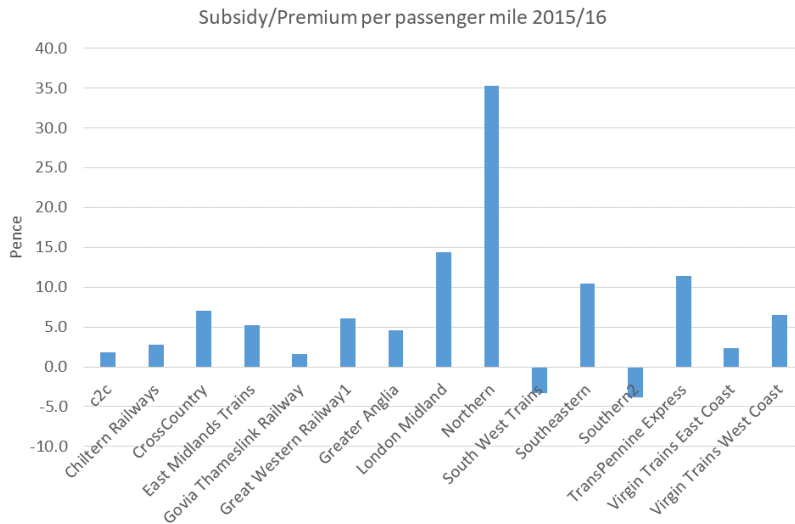


Public transport accessibility is generally good around major corridors and between main centres. This map of Greater Manchester^{vii} shows in green areas with a high accessibility index, covering around 1/3 of the GM area. Outside of these main corridors and centres public transport is not as

adept at serving local and regional accessibility needs. To reach out beyond the commuter routes which have traditionally benefited from public transport investment would require a significant shift in policy.

Example 2: Different costs of rail service subsidy

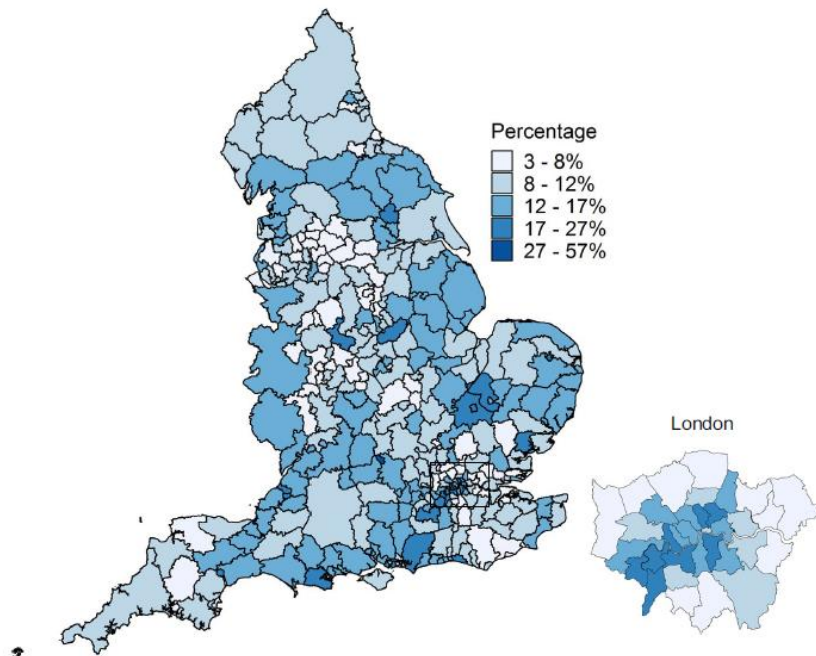
The costs of subsidising rail and bus services vary with levels of demand and type of journey. Northern for example is around three times the cost of Trans-Pennine



Express as it serves smaller intermediate stations with lower demand.^{viii} The costs of upgrading different parts of the network also vary and can be difficult to assign. For example, major pinch points at Manchester and Leeds stations can limit the ability to get more services working through intermediate stations.

Example 3: Cycling

Map 2: Proportion of adults cycling at least once a week by Local Authority, England, 2017-2018 [CW0302]



This map from the DfT shows huge variations in the numbers of people cycling once a week in England. An area such as South Cambridgeshire has 27.5% of the population cycling once a week whereas Harrow has 4.5% and Wellingborough has 4.3%.

Levels of cycling can be changed by better provision of infrastructure and facilities as recognised by the recent Gear Change cycling and walking plan issued by the DfT.^{ix} Other factors such as gender and ethnicity matter to the take up of cycling and, indeed, to cultures of mobility around modes of transport. Non-white communities are only half as likely to cycle as white communities.^x

Key Element 3: Places have different built environments

There is likely to be a shorthand tendency to equate ‘place’ with ‘local authority’ but this will overlook the diversity within our local authorities. Consider a local authority like Leeds City Council. There exist a wide range of different communities and contexts which it needs to deliver zero carbon transport for.



Terraced housing levels vary from between 10% and 30% of the housing stock in Leeds districts. Across the UK only 51% of terraced houses have on-street parking, and for just under half of those it is *inadequate* on-street parking. Pavements can be extremely narrow. Are there inclusive designs which would work for charging in what can be quite large areas? How likely would such schemes be adopted? Current

estimates are that public charge points can cost up to three times the costs of charging from a domestic supply.^{xi} Where such areas have good public transport access, they may benefit more from an early shift to shared mobility innovations rather than electric vehicle adoption.



There are also areas of lower density suburban housing with relatively few barriers to making the switch to electric vehicles. Such areas may be well suited for early adoption of EVs through individual investment in vehicles and charge points, supported in the short term by Government grants. The constraints to EV adoption are lower.



As well as considering the built environment form it is important to recognise the agency of different communities to act. In Leeds, for example, on average, the proportion of people in private rented accommodation is 17% with some areas being as high as 45%. Households have limited rights to implement charging solutions in rented housing and factors such as the security of tenancy may also influence a willingness to invest. Social housing is a further category with different community needs.

The examples here have focussed on housing and electrification. They illustrate that even where there is broad consensus at a national level, the local implementation realities require place-based insights. Beyond this, road and footpath space allocation considerations for public transport, parking, cycling and new mobility services are at the heart of local political concerns and are equally locally contextual.

Key Element 4: Equity and place

A place-based approach prompts comparison at different scales, and highlights growing inequality. Within England more than 25% of the most deprived areas are in the North, and, as Figure 2 shows, deprivation in the North is deepening.^{xii1} The Government has set out an agenda for levelling up across the UK but what this means for the decarbonisation agenda has yet to be established.

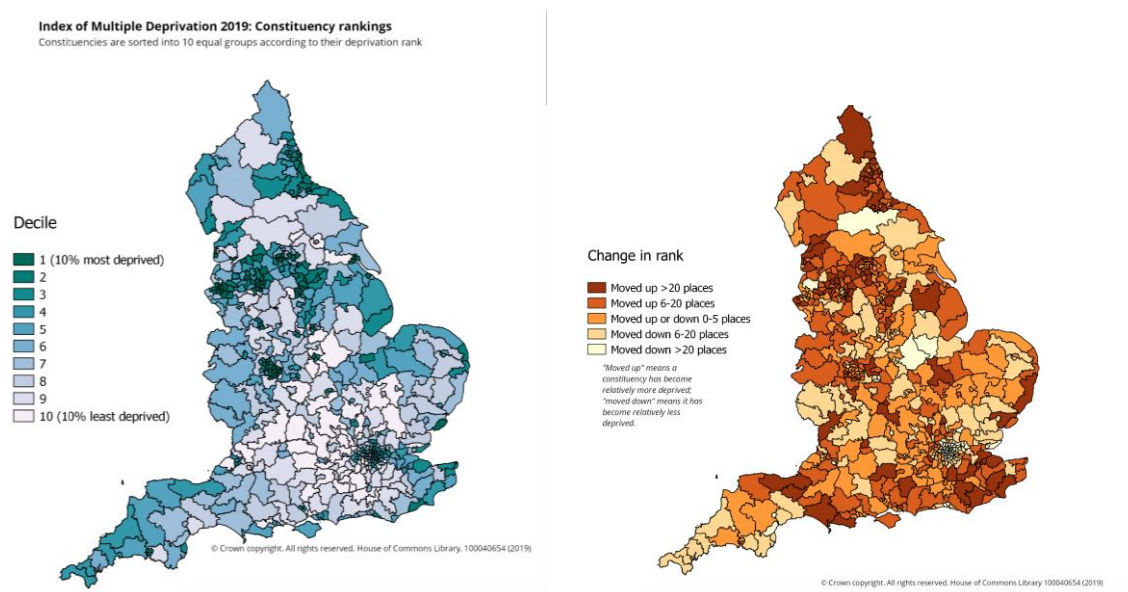


Figure 2: Index of multiple deprivation and change in index rank

Different places have a different age and ethnic mix. We know, for example, that non-white communities are only half as likely to cycle as white communities. What difference does an ethnic mix of 25 per cent Asian/Asian British which we see in Bradford make to activities, modes and cultures of travel compared with Wakefield where the corresponding figure is just 2 per cent. The needs of travellers at the younger and older end of the spectrum are also quite different. Urban centres can comprise 40 per cent of under 25s but much fewer over 65s. Elsewhere the

population is more than a quarter over 65 and rising. The financial resources and the proportion of the population with mobility impairments will vary substantially.

Many interlinked factors play into existing transport inequality.^{xiii} Economic deprivation, and disadvantage based on age, ethnicity, disability, gender often overlap, exposing some individuals and communities to amplified disadvantage. And, while ‘transport disadvantage and social disadvantage are not necessarily synonymous, they do interact, resulting in transport poverty’.^{xiv}

Concepts of ‘mobility justice’ and methods of ‘equity assessment’ are forming in response to moral concerns as well as considerations of the scale and speed of innovation required to address the decarbonisation challenge.

Transport spending is a key factor. Analysis by IPPR shows that, while London is set to receive £3,636 infrastructure and service investment per person in 2019/20, the North will receive just £1,247 per person. Yorkshire and the Humber will see just £511; and the North East £519.^{xv}

Within regions, the pattern continues. During winter, rural communities in Cumbria, and especially the elderly, experience isolation. About 60% of the area’s bus services were discontinued in 2014. The pattern of reduction in spend on supported bus services is unevenly distributed across the country with major reductions in more rural counties. Ten authorities provided no financial support at all for additional buses.

Local transport authority	2009/10	2018/19	Total reduction	Percentage reduction
Hertfordshire	£8,669,071	£2,042,105	£6,626,966	76%
North Yorkshire	£7,846,520	£1,371,039	£6,475,481	83%
Nottinghamshire	£10,014,330	£4,100,000	£5,914,330	59%
Lancashire	£8,564,887	£3,500,000	£5,064,887	59%
Derbyshire	£7,221,855	£2,864,586	£4,357,269	60%
Northamptonshire	£4,492,075	£429,543	£4,062,532	90%
Oxfordshire	£4,036,999	£0	£4,036,999	100%

Table 2: Reductions in revenue support for local bus services (CBT, 2019)^{xvi}

Remoteness and deprivation also exacerbate disaster-risk and vulnerability to extreme weather. The 2015 floods saw more than a quarter of flooding in the 30 per cent most deprived households of Cumbria and incurred a total of £1.6 billion in



damages, including more than £340 million in transport damages. Historical and systemic inequalities can be perpetuated by decisions.

To address challenges of equity in decarbonising transport, our research suggests a range of measures:

- public engagement with a focus on underserved communities and groups
- explicit equity assessment of measures, based on criteria co-designed with underserved communities and groups
- effects-driven innovation that identifies goals in collaboration with diverse groups
- iterative and experimental implementation, phased explicitly to balance economic viability and meeting equity requirements
- equitable investment in infrastructure and services
- a systemic approach to transport, including consideration of housing, education, work, considering whole mobility systems, not just transport

Section 2: Implications for Action

Our analysis of the nature of the decarbonisation problem and the importance of understanding diversity across place should help to encourage a more realistic and people centred understanding of the decarbonisation challenge. This section turns to the implications of these challenges for action.

We take as a starting point that everywhere needs to decarbonise. Implicit within whatever pathway commitment is finally adopted by the Department for Transport, is that this commitment comprises the sum of the parts, or places, across England. There is, therefore, scant room for different speed of progress between places. Put another way, one area's slow progress will require other areas to go faster if the progress pathway is to track that required. This requires, in some form, a meta-steering role for the Department for Transport such that the balance between national and local initiatives is clear and the performance differentials and funding and policy needs between areas is understood. The failure to drill down below the national 80% reduction target to a clear set of operational transport goals led to blame shifting and inaction following the adoption of the 80% reduction target in 2008.^{xvii} We set out some of the issues and options for establishing a clear carbon accounting framework which is meaningful at a local level in our working paper.ⁱⁱ

Key Element 5: Place-based policy embraces diversity of approach

As we established in part one of the paper, different places begin from very different start points. This makes the societal acceptance of a need to act quite different as

DecarboN8

well as presenting authorities with a different set of options which are likely to contribute to decarbonisation most effectively.

The DecarboN8 project partnered with the Centre for Energy Demand Reduction Solutions to conduct a project for the Local Government Association which examined how prepared local authorities thought they were to take action after they had declared a climate emergency. It compared the approaches they were considering adopting and what the key knowledge gaps were. The full set of briefing notes is being released during September 2020 at <https://www.local.gov.uk/decarbonising-transport>. Some of the headline findings which should influence the Decarbonisation Plan are discussed in brief below.

First, fewer than one in five authorities have set a target for all transport activities in their area and only a handful had a clear idea of the trajectory or implications from setting a target. The pace of change is not yet recognised and so the scale of local action is not yet in step with the necessary carbon reduction commitments. The Decarbonisation Plan should close this gap so local authorities have a clear framework where they can establish what is expected of them.

When looking at the likely mix of actions which authorities think may be necessary there is considerable variation. The project used the “Avoid, Shift, Improve” framework which seeks to categorise policy options by those which avoid the need to travel as often or as far, shift to less polluting modes of transport or improve the emissions technology of journeys remaining on motorised transport. Figure 3, taken from one of the workshops, shows just how different this mix could be.

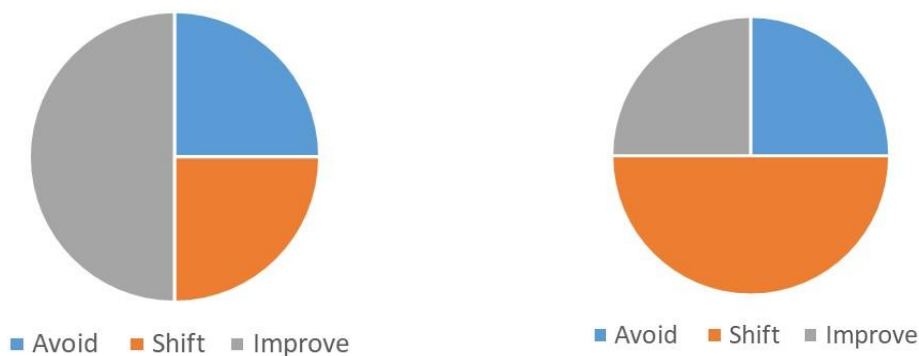


Figure 3: Different strategy mixes in different places

It was also evident that local political preferences and other non-climate policy objectives are important influencers in setting out ‘likely’ policy mixes. Authorities are still seeking (and obtaining) funding from the Department for schemes which make already stretching carbon reduction goals even harder. It is essential that transport carbon policy is at the heart of overarching place-based strategies. The societal



changes which are implied by the decarbonisation goals are too profound to sit in a bolt on strategy or to attempt to achieve them by looking for ‘win-win’ solutions and ‘co-benefits’ alone as we set out in Section 1.

Key Element 6: Place-based approaches build in different funding needs

In Section 1 we identified very different levels of funding support for transport across England. On top of the existing imbalances our analysis suggests that different places will adopt different strategies which in turn will have different costs. Looking back to Figure 3, the authority relying more heavily on technology improving strategies is likely to be offering only relatively small emission reductions in the early part of the plan period. This will mean other places have to be ahead of the national trajectory to balance this out and there may be a need to target funding accordingly.

The total funding requirements to deliver a 50% emissions reduction through mode shift as identified by the authority on the right of Figure 3 could be much higher than that for the authority seeking a quarter of its emission reduction through this set of options. The Department will need to balance the different strategy mixes, ambition and pace of change and adapt its funding and policy support accordingly. This suggests a place sensitive approach to funding, which links to the other objectives which the government is seeking to support.

There is significant disagreement within the transport profession about how to account for carbon reduction in appraisal and decision-making. By definition the WebTAG appraisal procedures are a national standard approach to assessing interventions. A place-based approach acknowledges that the costs of action will be different in different places. Whilst this is always the case with transport interventions, the carbon imperative means that rapid progress is required everywhere even if some places appear to be comparatively poor value for money. The role of appraisal in decision-making may need to be adapted. There is not the scope within this submission to address the appraisal issue in detail but the DecarboN8 network would be happy to contribute further to such discussions.

Section 3: Concluding Reflections

This submission provides a framework for the Department to explain what it means by ‘place-based’ approaches to decarbonisation. It identifies the importance of place-based approaches in delivering the truly ambitious vision which the Decarbonisation Plan will set out. Place-based thinking acts as a counter-weight to the necessary, but necessarily aggregate, approach to carbon emission reduction trajectory development which the Department has undertaken in “Setting the Challenge”. It underlines that the profound changes to the technologies, costs, policies and



behaviours play out in places and will do so in different ways. Such change will require societal buy in across a whole range of actors if this is to be politically deliverable. To do so means understanding and building in diversity of approach across places from the start.

Place-based decarbonisation is not though a call for the devolution of ‘the problem of decarbonisation’ to local government. Without a clear national carbon accountability framework and without co-ordinated action on issues of pricing, technology standards, regulatory change and many other matters local government will not have the tools, funding nor the will to help get to a zero emission transport system.

A place-based approach recognises that everywhere and everyone has a stake in the problem and in the solutions. Everywhere must act and change. Done right, a place-based strategy will enable those differences to be part of the solution and to deliver a zero carbon transport emissions future which advances other key policy agendas.

References

-
- ⁱ Büscher, M. and Spurling, N. (2019) Social Acceptance and Societal Readiness Levels, <https://decarbon8.org.uk/social-acceptance-and-societal-readiness-levels/>
- ⁱⁱ Walker, R., Morgan, M., Marsden, G. and Anable, J. (2020) Carbon accounting for local authorities: A comparative analysis of NAEI estimates and MOT test data based estimates, DecarboN8 working paper 1.1 <https://decarbon8.org.uk/wp-content/uploads/sites/59/2020/09/DecarboN8-WP1.1-Walker-et-al-2020-1.pdf>
- ⁱⁱⁱ Walker, R. (2020) Transport carbon emissions variation by local authority districts in England: Analysis of MOT test data, DecarboN8 working paper 2.1 <https://decarbon8.org.uk/wp-content/uploads/sites/59/2020/09/DecarboN8-WP2.1-Walker-2020.pdf>
- ^{iv} Statistics taken from <https://www.lakedistrict.gov.uk/learning/factsandfigures>
- ^v Images courtesy of Friends of the Lake District
- ^{vi} Port of Liverpool Access Study, 4NW, 2010
- ^{vii} Transport for Greater Manchester (2019) Greater Manchester Spatial Framework: Transport Topic Paper, <https://www.greatermanchester-ca.gov.uk/media/1742/transport-topic-paper-w-cover-web.pdf>
- ^{viii} <https://www.gov.uk/government/publications/rail-subsidy-per-passenger-mile>
- ^{ix} DfT (2020) Gear Change: A bold vision for cycling and walking, Department for Transport, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904146/gear-change-a-bold-vision-for-cycling-and-walking.pdf
- ^x http://rachelaldred.org/wp-content/uploads/2018/05/APS_paper_TRF.pdf
- ^{xi} <https://www.whatcar.com/news/electric-vehicle-charging-%E2%80%93-what-does-it-really-cost/n16833>

xii

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/442823/ERDF_OP_Annex_on_CLLD_FINAL_070715.pdf

^{xiii} Lucas, K. (2012) Transport and Social Exclusion: Where are we now? *Transport Policy*, **20**, 105-113

xiv

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/843487/Transport_and_inequality_report.pdf

^{xv} <https://www.ippr.org/news-and-media/press-releases/revealed-north-set-to-receive-2-389-less-per-person-than-london-on-transport>

^{xvi} CBY (2019) The Future of the Bus, Campaign for Better Transport, London. <https://bettertransport.org.uk/read-our-report-future-bus-funding>

^{xvii} Bache, I., Bartle, I., Flinders, M. and Marsden, G. (2015) Blame Games and Climate Change: Accountability, Multi-Level Governance and Carbon Management, *British Journal of Politics and International Relations*, **17**, 64-88