

Will this take
us to where
we need to
get to, in
time?

The Transport Decarbonisation Puzzle (TDP)



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Published Jul 15, 2021 (original: <https://www.linkedin.com/pulse/transport-decarbonisation-puzzle-tdp-glenn-lyons/>)

Yesterday, 14 July 2021, marked the end of the beginning for decarbonising transport in the UK: we have a Plan - *Decarbonising transport: a better, greener Britain*. It's 220 pages long and even a slew of colourful pictures to help break up the detail cannot escape the immense amount of content to come to terms with. Addressing the sector of the economy that makes the largest contribution to greenhouse gas emissions (27% in 2019) is no mean feat.

We awoke on the morning of 14 July to a press release hailing the Plan's pending arrival. For discerning transport planners, one paragraph in that release (also in the Foreword of the Plan from the Secretary of State) jumped out:

"It's not about stopping people doing things: it's about doing the same things differently. We will still fly on holiday, but in more efficient aircraft, using sustainable fuel. We will still drive on improved roads, but increasingly in zero

emission cars. We will still have new development, but it won't force us into high-carbon lifestyles."

Could this be right? What did 'doing the same things differently' mean – greening business as usual? Would that be enough?

Then came the appearance of the Plan itself – swiftly followed by a series of supporting documents. One of these I have had the privilege to contribute to: [“Decarbonising UK transport: final report and technology roadmaps”](#) (as part of a team from Mott MacDonald and partners).

So, having read the Plan from cover to cover, what are my views? I have ten things I want to say. But to first conclude the preamble, I applaud those who have worked tirelessly to bring us to this point of publication. This is incredibly challenging territory and we are privileged in the UK to have this Plan, and the ambitions within it, to now express our views on. When you come to the end of the document you will see that my glass is half full. I Chaired a [Fireside Chat](#) in March 2021 to discuss transport decarbonisation and one of the observations has stuck with me: “things take longer to happen than you think they will, and then they happen faster than you thought they could”.



1. A huge puzzle

Decarbonising transport amounts to completing a huge puzzle. There are so many pieces of the jig-saw: cars, buses, coaches, HGVs, trains, planes, ships, places, people, institutions, standards, markets, technologies, prices, politics, governance... Staring at them all can be overwhelming. **What the Plan does is try and give us the picture on the box to work from and the pieces we need to try and put that picture together.** By seeing the overall picture we have a sense of what we have to try and achieve. Some parts look reasonably distinct and putting those pieces together may be relatively easy (though nothing in this picture can really be considered easy) - for example, progressing electrification of the car fleet and the supporting charging infrastructure. Other parts are going to be a headache to deal with – the sky and water of a jig-saw puzzle are always where things are less clear and more challenging to put together (and aviation and shipping are where decarbonisation is toughest in terms of solutions by 2050).

The Plan goes further than the picture on the box and the contents. It does start to put the edge pieces together that frame the puzzle – for example reminding us of

commitments already in place (such as the phasing out of petrol and diesel cars by 2030) and achievements already made (such as “over 190,000 private chargepoints in homes and business across the country”). **The challenge now is that we only have 29 years to complete the puzzle**, we may struggle to find some of the pieces, some of the pieces will be hard to fit together, and there is a chance that some of the pieces are missing.



2. Deliberative intent

This is a plan. It therefore sets out intentions. And there are many of them: **the document includes the phrase “we will...” over three hundred times** (300 puzzle pieces or three hundred puzzles of their own?). Here are some examples: “*We will deliver a world class cycling and walking network in England by 2040*” (I’ll come back to that); “*We will ensure the UK’s charging infrastructure network meets the demands of its users*”; “*We will plot a course to net zero for the UK domestic maritime sector*”; “*We will support transport providers to develop communications campaigns that encourage mode-switch and sustainable transport behaviours*”; “*We will help build a skilled workforce for the future of transport*”; and “*We will better coordinate local transport funding*”. Each one of these is important but also substantial, complex and challenging.

And each one invites the question “and how will this be done?”. How well this question can be answered at this stage (according to the content in the Plan) varies across the different intentions. This is also reflected in the fact that ‘consult’ is mentioned a hundred times in the Plan. Not all the answers are yet apparent, and where possible answers are apparent there has not yet been an opportunity to gauge the views of all the key actors involved regarding how convincing or acceptable those answers are. **If all the we-wills are converted in due course into we-haves then we have an inspiring time ahead.** If...



3. User emissions

If you think all this is challenging, ‘you ain’t seen the half of it’. In seeking to tackle around a quarter of the problem of reaching a net zero economy by 2050, the Plan is focused upon emissions from *use* of transport – so called ‘direct’ emissions or

'tailpipe' emissions. **It is not the business of the Plan to (directly) address 'upstream' emissions.** These include: emissions associated with the generation, storage and distribution of forms of energy that ultimately propel low or zero emission vehicles; embodied emissions associated with manufacture of vehicles; and capital carbon – "*emissions associated with the creation or major modification of an infrastructure asset*". The Plan points to other Government initiatives that are addressing these.

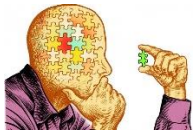
Nevertheless, **dealing with use of transport has significant 'upstream' implications. Put simply, if there is less demand for vehicles and for vehicle distance travelled then pressure is eased on emissions associated with vehicle production and new infrastructure construction,** as well as eased on direct emissions from vehicle use. I come back to this below. The Plan is clear about the need for the transport sector to focus on *green* hydrogen as part of a green energy system. Having been part of the Mott MacDonald team that worked on developing the masterplan for the [Multi-modal Transport Hydrogen Hub in Tees Valley](#) I was pleased to see this assume its place in the Plan. This is an exciting example of bringing energy sector and transport sector thinking and practice together. The Hub will aim to use renewably generated electricity to power an electrolysis plant that in turn produces green hydrogen to propel trial vehicles across modes. Such a Hub forms part of not only the Plan but also the even bigger puzzle of cross-sector energy transition – we're told an overarching Hydrogen Strategy is coming later this summer.



4. Not the old normal

The Plan refers in its title to a better, greener Britain. Who wouldn't want that? The question is, what does better and greener look like? Does greener reach beyond reduced tailpipe emissions? Does better include happier, healthier, fairer as well as economically more prosperous? **Across the Plan, there are some very positive signals of what better and greener could include which also strongly suggest a rejection of the 'old normal'.** As the UK readies itself to host one of the most critical meetings affecting humanity, the Plan points out that at COP26 almost every country in the world "*will decide whether to deliver, and whether humanity takes what many believe to be its last best chance to get runaway climate change under control*".

So, what might a new normal include according to the Plan as we in the UK address the ‘last best chance’? Here are some examples: “*As we build back better from the pandemic, it will be essential to avoid a car-led recovery*”; “*we must make public transport, cycling and walking the natural first choice for all who can take it*”; “*We want to reduce urban road traffic overall*”; and “*We need to move away from transport planning based on predicting future demand to provide capacity (‘predict and provide’) to planning that sets an outcome communities want to achieve and provides the transport solutions to deliver those outcomes*”. Inspiring stuff. **But transport professionals will recognise similar phrases from the past in policy documents over a period of many years. They will also recognise the policy-implementation gap.** And indeed, *how* will such characteristics of a new normal be assured – especially if we are shaping and not predicting the future? There are some encouraging signs in terms of statements of support and reiteration of investment commitments, for example in relation to public transport, cycling and walking. However...



5. Missing puzzle pieces?

While commendable technological intent and effort is strongly apparent in the Plan when it comes to reducing and removing tailpipe emissions, I would say **the jury is still out when it comes to efforts to tackle travel demand and mode choice.** The Plan notes that “*Climate Change Committee (CCC) analysis indicates that 59 per cent of emissions reductions to reach net zero will involve some form of societal behaviour change*”. DfT’s own behaviour change research last year revealed “*multiple opportunities to change travel behaviour, but that travel decisions are driven primarily by convenience and cost, not environmental concerns*”. There is a big challenge in influencing hearts, minds and ultimately behaviours.

Part of the Plan is to “*deliver a world class cycling and walking network in England by 2040*”. If one were to be picky with this aim then why ‘world class’ and not ‘world leading’, and why 2040 and not sooner? What the statement acknowledges is that we are not world class at the moment. The [Gear Change White Paper](#) with £2Bn of new funding is a great opportunity. This tends to devote most attention to cycling. **If we want a world class walking network then wouldn’t the Plan have been the perfect place to confirm there will be a nationwide ban on pavement parking in England?** This is one of the missing puzzle pieces for me. Instead pedestrians remain at the mercy of obstacles

in the form of parked cars, wheelie bins and now charging points. The jury is out on whether the Plan has teeth when it comes to travel behaviour change.

Meanwhile **there is passing mention in the Plan of RIS2 – the £27bn Road Investment Strategy that has been grabbing news headlines because of its unclear relationship with decarbonisation.** Not quite a missing puzzle piece but one that still doesn't quite fit either. We're told that continued high investment in our roads "*will remain, as necessary as ever to ensure the functioning of the nation and to reduce the congestion which is a major source of carbon*". While almost half of the £27bn is *not* for new capacity, this suggests the remainder is, which still sits uncomfortably with avoiding a car-led recovery (while noting that roads are not only used by cars). However, there is the intention in the Plan to review the [National Policy Statement for National Networks](#) – written in 2014 (which guides Secretary of State decisions on nationally significant infrastructure).



6. Up in the air

Aviation, even more than shipping, is the most challenging part of the modal mix in transport to address in terms of technological solutions – "*Decarbonising aviation is one of the biggest challenges across the global economy*". Yet **while behaviour change intentions apply to surface transport, 'Fly less' and 'fewer flights' are not phrases that appear in the Plan.** Domestic aviation accounts for 1.4% of total domestic transport CO2 emissions.

However, *international* aviation (and international shipping) in line with the Committee on Climate Change recommendation, are now to be included in UK carbon budgets from 2033. The Plan notes that "*Air travel may represent only seven per cent of UK greenhouse gas emissions – far lower, of course, since the pandemic – but it gets a great deal more than seven per cent of the political attention in this debate*". There's a sense from this quote, in spite of the monumental challenge this represents, of 'what, little old me?'.

Post-COVID, the message is that "*we expect air travel to recover*". In line with this, the Plan rises to the challenge of how to decarbonise domestic and international aviation. This includes the intention to "*kick-start commercialisation of UK sustainable aviation fuels (SAF)*" and "*consult on a target for UK domestic aviation to reach net zero by 2040*". Indeed, ambition is sky-high - "*we have set ourselves the objective of flying the first zero emission flight across the Atlantic*" (though no date or size of aircraft for this is clarified). Down on the ground within the Plan itself, the modelling for aviation (domestic and international together) of decarbonisation

trajectories (as is shown for all modes) is distinctive in not reaching decarbonisation by 2050, by some margin. This does not mean that reductions in emissions will not be achieved. But **the Government is required to reluctantly pull out its ‘carbon offsetting’ card to deal with the anticipated (substantial) residual emissions** – “*Any residual emissions in 2050 will be offset to ensure that aviation reaches net zero*”.



7. Over to you

The Plan notes that “*As of February 2021, over 70 per cent of local authorities had declared the urgent need to act on the causes and impacts of climate change*”. I’m immediately side-tracked by wondering why nearly 30% of local authorities don’t see an urgent need to act. There is the prospect that if this Plan works, “*People everywhere will feel the benefits – villages, towns, cities, and countryside will be cleaner, greener, healthier, and more prosperous and pleasant environments in which to live, work and enjoy*”. The Plan promises to better coordinate local transport funding and then seems to draw breath to say “**Local authorities will have the power and ambition to make bold decisions to influence how people travel** and take local action to make the best use of space to enable active travel, transform local public transport operations, ensure recharging and refuelling infrastructure meets local needs, consider appropriate parking or congestion management policies, initiate demand responsive travel, as well as promoting and supporting positive behaviour change through communications and education”.

I’m sure local authorities want to be developing solutions that are tailored to the needs of their local populations and would welcome power and flexible use of funding to play their part. However, what comes across here is a clear sense that **while Whitehall will deal with technology fix, local administrations can deal with influencing behaviour**. It seems self-evident that the electorate will take more kindly to switching from petrol and diesel cars to battery-electric ones than they will to any restraint on their car use. I’m seeing (rightly or wrongly) where things are heading for the pavement parking consultation outcome. Where there are opportunities for central government to be responsible for measures that could positively influence behaviour across the land,

I do hope it will seize them. On that point, another missing puzzle piece is national road pricing (not least to guard against the car-led recovery that may be encouraged by cheaper EV motoring that the Plan wishes to avoid).



8. In it together

I appreciate that this is a Plan that has an awful lot to deal with and that it should never be considered only as a single document, but instead as the arrowhead for a series of documents and co-ordinated action to address the many challenges and opportunities ahead. Nevertheless, **another missing puzzle piece for me was explicit consideration of how such fundamental changes to our transport system and its use might lead to differential impacts across a diverse population** and how to avoid actions emanating from the Plan exacerbating inequality and exclusion.

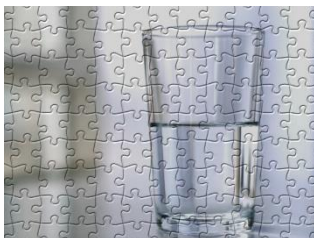
I've searched for 'inclusion'. The only three instances were "*inclusion of measures*", "*inclusion of carbon data*" and "*inclusion of international aviation and shipping*". In terms of 'inclusive' there is brief mention of: improvements to public transport enabling inclusive mobility; a reformed planning system supporting good design and making communities more inclusive; and past out of town developments that have been car-centric and less inclusive. The terms 'equity' and 'equitable' are not anywhere in the Plan. There are already concerns that the (early) beneficiaries of electric vehicles are those who are more affluent, while all taxpayers are contributing to the infrastructure to support them. While this may be a feature of catalysing the early adoption of new technologies (from which there are wider benefits in terms of reduced noise and air pollution), **I look forward to seeing what steps are taken to ensure that better and greener is also fairer and more inclusive** as we cope with the financial aftermath of the pandemic and the climate emergency.



9. Capacity

From 2016 to 2020 the Department for Exiting the European Union was formed to oversee negotiations relating to Brexit. According to [Wikipedia](#), the Department had over 600 full-time equivalent posts for this challenging task. Late last night as I finished reading the Plan, I felt exhausted by trying to process its breadth and depth of content. I found myself thinking how exhausted the civil servants behind developing the Plan must be feeling. Then I realised that **while the writer's exhaustion may eclipse that of the Plan's readers, so too would the writer's exhaustion be eclipsed by the prospects of exhaustion ahead for those charged with executing the Plan.** There is also (quite rightly) monitoring of progress and reviewing and updating of the Plan to attend to – “*We will publish our progress and review our pathway at least every five years*”. While efforts to address transport decarbonisation are not confined to the Department for Transport, I'm left wondering how many civil servants are currently dedicated to the monumental task of transport decarbonisation and how many will need to be as we move further from planning to execution? We cannot afford to stint on this.

With so much to be done and with multiple changes to take place concurrently or in swift succession in the next 29 years, co-ordination will be critical. **I see two scenarios: one where the different dynamics become mutually supportive across the sector and a real sense of momentum and confidence builds up; and the other where different dynamics are in conflict and where inter-dependencies lead to disruption of progress and loss of momentum.** We cannot afford the latter. It is encouraging within the Plan to see several co-ordinating bodies that have been, and are being, set up to help address the different parts of the puzzle and bring industry and government together. We then turn to the matter of who co-ordinates the co-ordinators. In this respect the Department for Transport deserves full support from its political masters, as do the sub-national transport bodies and local authorities.



10. Reference point

The gravity of the climate crisis can be hard to comprehend. The enormity of addressing decarbonisation of transport to help address this is very apparent. I'm very conscious in drawing to a close of **how easy it can be to be the critic and neglect to put oneself in the shoes of those responsible for**

that which is being critiqued. With the stakes so high environmentally, economically and socially there is a natural inclination to want to see the Plan get it 'right'. Yet there will be multiple perspectives on what 'right' should be and what it has missed or has 'wrongly' included.

I often remind myself to compare the situation now with only three years ago when a then 15 year-old Greta Thunberg first began her 'school strike for climate'. We have moved on a lot, if not far enough and fast enough since then in terms of growing awareness, concern and willingness of authorities to at least acknowledge the climate emergency if not yet (know how to) act. **The Plan viewed from a reference point of three years ago is inspiring for its considerable set of pieces, and remains so today, even if we are frustrated that more of the picture has not yet been put together** or that the picture on the cover of the box is not entirely to our liking.

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[Todd Litman](#)

Thanks for your good work, Glenn! You may be interested in my new report, "Comprehensive Transport Emission Reduction Planning. Guidelines for Evaluating Transportation Emission Reduction Strategies" (<https://vtpi.org/cterp.pdf>). I submitted a version of this for presentation at next year's TRB annual meeting. Abstract Many jurisdictions and organizations have ambitious greenhouse gas (GHG) emission reduction targets and plans. This study critically evaluates the methods used to develop these plans. It finds that the process is often biased in ways that exaggerate the benefits of clean vehicles, such as hybrid and electric automobiles, and undervalue vehicle travel reduction strategies such as transportation demand management (TDM) programs and Smart Growth development policies. Many plans are overly optimistic about the speed and effectiveness of clean vehicle implementation, and use outdated emission models that underestimate TDM effectiveness. Most plans overlook clean vehicle embodied and upstream emissions, rebound effects and resulting external costs, plus the high costs and inequities of clean vehicle subsidies. Most plans overlook some of the most effective TDM strategies and their co-benefits. As a result of these biases, most current emission reduction plans overemphasize clean vehicles and underemphasize vehicle travel reductions compared with what is optimal. This study suggests that to be efficient and equitable transportation emission reduction plans should rely at least as much on vehicle travel reductions as on clean vehicle strategies, with particular emphasis on "quick win" strategies. This study provides recommendations for improving analysis methods. Please let me know what you think of this analysis.

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2 Likes

2w



[Paul Stanton](#)

Governments have only had three and a half decades (being generous) to reach a coherent view on this. They are still failing to do so. Just as the then UK government decided that the best way to tackle pressing problems back in the 60s was to split them up thematically (e.g. Buchanan on traffic in towns, Hall on motorways, Beecham on rail, Smeed on road pricing) the current administration has also seen fit to duck the main issues. Either the politicians are incapable of recognizing the bigger picture or else it is a tactical decision on their part. The fact remains that all sectors are interrelated and carbon emissions are just one of the many human induced ecological issues that need urgent attention. So not only is this particular puzzle incomplete in itself but it is also part of a larger puzzle for which most of the pieces appear to be missing! Time to adopt a systems approach.

Like

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1 Like

3w



[Claire Haigh](#)

A brilliant article Glenn, which has sparked an excellent debate! For me the big missing piece of the jigsaw is behaviour change. Government needs to have an honest conversation with the public about hard choices ahead, instead of implying technology will enable us to continue our current lifestyles unchanged. It can't be left to local leaders to make all the tough decisions! Some great sections in the plan about the need to avoid a car-led recovery, better integration of transport with planning, how public transport, walking and cycling are to become the natural first choice etc. - but where is the target for reducing car use?

Like

Reply

9 Likes

4w



[Glenn Lyons](#)

Couldn't agree more Claire.

Like

Reply

3w



Lynn Basford

Excellent review Glenn, thank you. I can't help thinking that the "exhaustion" could be eased if we had all taken on board the steps set out in the CCC report?

Like

Reply

1 Like

4w

Stephen Holt

A thoughtful and insightful summary, thank you. I agree it is a mammoth puzzle, and the efforts to build a plan that tackles such a challenging area should be applauded. I cannot conceive however that, if this is our last chance to halt runaway climate change, we can keep doing the things we have always done. If every owner of a car replaces it with an electric equivalent our towns and cities will still be a mess (even if we can find the resources to produce the required vehicles). Let's just focus on the unsexy, non tech but achievable and get short journeys completed on foot or by bike. How about free public transport to provide more equitable funding across society? And I agree that we badly need a national walking plan, this is the secret magic mode of sustainable travel.

Like

Reply