EDRC
Energy Demand Research Centre

Integrated National Transport Strategy: EDRC Response to Consultation

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Integrated National Transport Strategy: a call for ideas

The Energy Demand Research Centre (EDRC) is a UK-based interdisciplinary initiative focused on reducing energy demand across sectors such as buildings, transport, and industry to support a sustainable and equitable future. Operating from 2023 to 2028, EDRC collaborates with policy, industry, civil society, and academia to develop evidence-based solutions within five themes: Futures, Flexibility, Place, Governance, and Equity. The EDRC aims to inform and inspire energy demand reductions for a secure Net Zero society while managing a Flexible Fund to foster interdisciplinary research and support Early Career Researchers. The authors of this report have drawn on the work being undertaken by the Flexibility, Governance and Place themes at the EDRC.

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Executive Summary

Integrated National Transport Strategy Recommendations

The Integrated National Transport Strategy (INTS) is a critical framework for reshaping how the UK approaches transport across various modes and sectors. Our response outlines a set of key recommendations aimed at improving integration, sustainability and support for local authorities, while addressing both current challenges and future opportunities in the transport landscape.

Broad Range of Transport Modes

The INTS should consider all modes of transport, ensuring that policy and infrastructure support a seamless journey experience across different systems, from rail to road, bus, and emerging mobility services.

Transforming Travel in Different Areas

It is essential for the strategy to explain how travel will evolve in different regions, considering local needs and challenges while promoting balanced, accessible transport solutions nationwide.

Support and Funding for Local Authorities

The strategy must clarify how national government will support local authorities and Mayoral Combined Authorities with the funding and resources needed to implement more ambitious transport strategies and solutions.

Managing the Changing Costs of Motoring

A clear plan is needed for how to manage the rising costs of motoring for those who have to rely on it, while also ensuring public transport can compete effectively. This will help encourage shifts toward sustainable, accessible transport alternatives.

Decarbonisation of Transport

The INTS must outline how it will contribute to decarbonising transport, integrating low-carbon technologies, and policies that align with the UK's environmental goals.

Integration Beyond Modes

The strategy should not focus solely on transport modes but also on the broader systems and activities that make life easier for users—such as better connections between transport and other services.

Supporting Housing Growth

The strategy should link transport planning with housing growth targets, ensuring that new developments are located where meaningful integration opportunities exist, contributing to sustainable urban growth.

Contributing to Public Health

The INTS should clearly state how transport policies will support public health goals, ensuring that transport systems contribute to healthier communities through access to active travel and cleaner environments.

Energy Integration in Transport

The strategy must address how travel options will be integrated with the energy system, with a focus on local authorities' roles in ensuring fair and sustainable outcomes in energy-efficient transport.

Funding for Integration

To create meaningful change, the strategy must outline a clear increase in funding for transport integration, with a shift towards outcome-based scrutiny over traditional ex-ante checks and balances.

Adapting to New Mobility and Energy Challenges

The INTS should articulate a vision for how transport will adapt to emerging challenges, including the integration of energy systems and new mobility services, while addressing past shortcomings in planning and delivery.

Freight and Passenger Transport

The strategy must also address the future of freight transport alongside passenger services, ensuring that both sectors are integrated into a cohesive, efficient transport system.

Consultation response

In your opinion, how could the transport network be better 'joined-up'?

In developing an Integrated National Transport Strategy and asking questions about joining-up and improved user experience it is important to be clear about the different forms of integration or 'joining up' that should be under consideration. Based off May et al. (2006) it is suggested that these forms are:

- Integration between modes;
- Integration across transport policies; and
- Integration between policy areas.

We consider each in turn.

1. Integration between modes

The launch of the INTS and the questions asked of users mainly focus on this first category.

Research shows that smooth connections between different types of transport are important. This includes things like common fare systems, multi-zone travel cards (like in London), good first and last mile links to public transport, simple and well-coordinated timetables (such as Swiss railways), and clear, up-to-date travel information. However, two key changes have made integration easier: 1) recent policies have improved the business case for transport providers to work together, and 2) increased local control of buses and national control of railways means that the passenger experience can now be more easily integrated across bus and rail.

However, for disabled passengers, the poor accessibility of public transport and insufficient space for wheelchair/mobility users is a major barrier to their mobility in general. For journeys requiring onboarding more than one mode of public transport, lack of information about accessibility or a difference in accessibility between the modes (the bus is accessible, but the train leg of the journey has no level boarding, for example), can make a journey unviable. Similarly, information about the working condition of different modes of transport, such as broken lifts at a station, is essential for these passengers.

An integrated travel experience must recognise that the transport system involves cars, shared mobility, bikes and walking and must also look ahead to the growing range of powered light electric options which are changing what might be seen to be normal (e.g. the rise of e-bikes – Philips et al., 2022; 2024). In 2019, CREDS published a report on shared mobility with several recommendations to improve the integration of shared mobility into the transport system (Marsden et al., 2019). This included placing a responsibility on National Highways to provide multi-modal interchanges as part of its network duties. Different combinations of modes will enable lower carbon journeys to be made for different types of

journeys and in different types of places. The 'full' range of modes which might form part of an INTS was also set out, drawing on work commissioned by DfT (and co-authored by the current CSA!) and shown below. **The Integrated National Transport Strategy needs to look across a broad range of modes.**

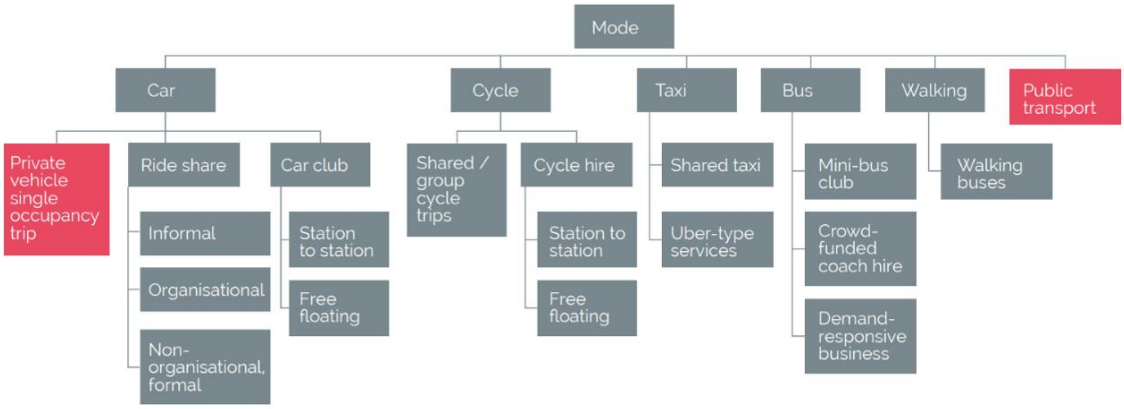

Figure 1: Defining the options to be integrated (Adapted from Golightly et al., 2019 and reproduced with permission from Marsden et al., 2019)

There are many people who are car dependent for various reasons or do not engage with public transport out of choice. Car owners tend to be less likely to use public transport with people more likely to just use one form of transport if they:

- Have mobility difficulties
- Are over 60 years old
- Are not white
- Live in a smaller settlement
- Have lower household income
- Work full-time
- Have regular access to a car
- Do not own a public transport pass
- Do not own a bicycle (Heinen and Chatterjee, 2015, p266).

Car ownership, personal and household circumstances, lifestyle choices, attitudes, and personality traits all influence how people respond to messages about changing their travel habits. Because of this, messaging campaigns alone have limited success in encouraging more people to use public transport or active travel. (Pangbourne, et al 2020, Maldonado et al, 2014, Le Vine et al, 2013).

To better 'join-up' public transport, the offer needs to be more appealing to non-users as well as its users. For example, if you live in a place with insufficient opportunities for work or

leisure and limited public transport services, then a more integrated transport model is unlikely to change people's attitude to car ownership. Place-based characteristics may determine choices far more than operational integration in some areas. The Energy Demand Research Centre (EDRC) Place Theme explores the difference in transport use, energy and carbon emissions across different places in the UK. Previous work (Walker et al., 2020) showed how variable bus provision is across the country and bus utilisation. Similarly, work by Dr Malcolm Morgan found that across England and Wales, urban bus services outside London dropped by 48% and rural buses by 52% between 2008 and 2023. The work showed that "Some regions have fared worse than others, with services down 60% in the East Midlands, 57% in Wales and 52% in the North-East." (See report on How Britain's bus services have drastically declined).

From a 'place' point of view, socio-economic factors, access to public transport and alternatives to cars will vary widely. A national transport strategy should consider these differences in its structure and presentation. Further work is underway in EDRC under the Flexibility theme to explore the relationships between activity patterns, travel and choice, building on the work of Rovira et al. (2022). Large urban areas might benefit from multi-zone, multi-modal single fare integration to cater for the 'many-to-many' chaotic travel patterns of towns and cities. More rural areas might benefit more from greater bus to rail coordination as well as the coordination of services with public services such as having appointment times and opening hours that are coordinated with public transport timetables. There is scope for better first and last mile connectivity to bus stops and rail stations to enhance the catchment areas in most areas. **The Integrated National Transport Strategy needs to explain how it might transform travel in different types of places.**

2. Integration across transport policies

The second type of integration is about the coordinating policies across different transport modes, including pricing road space allocation, prioritisation and spending.

It is essential to set the findings of 'effective' transport policies in the context of the overall relative cost structures and spatial constraints for different modes, both locally and nationally. For example, whilst Copenhagen achieves a bike mode share of 30% for journeys between 5 and 10km, it does so partly because it has invested in an intensive cycle lane network over several decades AND had a long established 'new vehicle purchase tax' which, until recently, was around twice the value of the car alone. This means that both the fiscal environment in which the decision to use the bike, and the value of investing in bike infrastructure and bike to public transport interchange, are different.

It has similarly been understood that high city centre parking prices, limited parking spaces, good bus priority, and Park and Ride, are crucial to the relatively high patronage of Park and Ride schemes in towns such as York and Oxford. A key issue has been the lack of political will to deliver the meaningful car restriction policies with a few notable exceptions (e.g. London, Nottingham, Oxford) but this is in the face of considerable public backlash and, at best, an ambivalent national political commitment. So, whilst many Local Transport Plans are ambitious, they fail to follow through (Verlinghieri et al., 2024). **The Integrated National**

Transport Strategy should set out a clear position on how national government will support and fund local authorities or Mayoral Combined Authorities in delivering more ambitious strategies.

The INTS is to cover a period during which a major transition towards electric vehicles (EVs) will take place. This is underpinned by the Zero Emission Vehicle Mandate. Currently, the costs, and awareness of the costs, of switching to electric remain amongst the key factors impacting widespread adoption of EVs, as indicated by the significant impact of household income in models of EV ownership (Yiu et al, 2024). Over the course of the INTS however, electric vehicles will be slightly more expensive to buy but significantly cheaper to run than fossil fuel powered cars, particularly if the majority of EV charging occurs at home. The cost of fuel, per mile, has been falling relative to the cost of public transport use for most of the past two decades and this looks set to accelerate with electrification.

The implications for the INTS seem quite clear. The investments spent on integrating bus, bike, walk and rail will all achieve less if the price of driving relative to the price of alternatives decreases in cost. Not only will there be less public support for public transport, but there will also be more congestion which will, in turn, impact on the goals of the INTS by increasing unreliability and making roadspace reallocation yet more contentious (see recent briefing paper: Paying for driving: is doing nothing an option?). **The Integrated National Transport Strategy must set out the plan for how the changing costs of motoring will be managed so that public transport can compete more effectively.**

3. Integration between policy areas

Integration across policy areas matters in several ways.

- Given the critical importance of decarbonisation across the whole of government, the INTS is an opportunity to ensure that we do not have an Integrated Transport Strategy that is separate to the Decarbonisation Plan. **The Integrated National Transport Strategy must set out how it contributes to the delivery of the plan for decarbonising transport.**
- Planning transport services to match changing travel habits—like more remote work, or new leisure activities—makes them more useful. (Rovira et al, 2022). Examples include coordinating with shift changes and supporting the nighttime economy. The system is still adjusting to post-Covid travel trends, especially different weekend travel patterns. (Anable and Marsden, 2021). **An Integrated National Transport Strategy should not just be about modes, but about activities and how an integrated system makes life easier.**
- Transport is closely linked to long-term policy areas like land use. When planned well, integrating transport and land use can reduce car travel and increase public transport use by focusing on factors like density, diverse land use, design, destination accessibility and distance to transit (the 5Ds – Ewing and Cervero, 2010). However, this often fails because suitable land is hard to develop, leading to car-dependent areas near

motorways or on city edges which inevitably builds car dependency. This is important for 'joining-up' transport services because once people own cars, they tend to use them. With the government's housing growth targets, new developments must be located where multi-modal travel is a real option (Headicar, 2017). The Place-Based Carbon Calculator helps identify locations for sustainable housing with better transport integration. **An Integrated National Transport Strategy must support housing growth targets by specifying how local authorities can steer this to locations with meaningful integration opportunities.**

- There are also longstanding links between means of travel and health. This relates to mental health and commuting, physical exercise levels and active travel, as well as road safety concerns. The public health agenda means there is now much greater openness to planning across the health and transport sectors and increasingly robust evidence that more active travel as part of daily life delivers health benefits (e.g. Friel et al., 2024). **An Integrated National Transport Strategy should set out how it contributes to the UK's public health and how these links can be grown.**
- Finally, the transition to net zero means that this INTS, unlike its predecessors, must address the integration of transport with the energy system, given the shift to electrification, and consider how the vehicle charging system will be seen in the energy system. There are possibilities, with V2X (vehicle to grid, vehicle to home), for vehicles to play a role in grid balancing during peak periods and to charge at times where excess electricity is generated by renewables. Equally, being able to participate in the V2X market could significantly reduce the cost implications of owning and operating EVs. However, how this will play out is unclear. Only those households which can connect direct to vehicles will be able to engage in this type of flexibility service, raising the risk that some drivers who cannot access such services will pay several times more per mile if they charge at the public rapid charge network, which would be hugely inequitable (Marsden, 2024). Very little thought has been given to this by local or regional transport planners (Ternes et al., 2024). The Flexibility Theme within EDRC is exploring how the new energy system might be built to accommodate the required flexibility from private EVs (Li et al, 2025) as well as from buses and other fleets. **The Integrated National Transport Strategy must set out how travel options will be integrated with the energy system and what role local authorities should play in this to support fair outcomes.**

How could data be used to improve the transport network?

Our discussion focusses on improving decision-making in transport. Data integration across multiple actors is key to enhancing the journey experience, but data sharing remains a challenge, both in transport and research. One solution is to set minimum data-sharing

requirements for revenue-generating transport services on public networks while ensuring GDPR compliance.

How could technology be used to improve the transport network?

Our discussion focusses on improving decision-making pertaining to transport networks. We must clarify what problems technology solves and how it adds value alongside policy and investment. While it can improve integration for operators and users, it won't fix the deeper structural issues highlighted above. A responsible approach is essential to ensure technology doesn't exclude people simply because they aren't captured in algorithms. Work being undertaken in the Transit Digital Twins Hub by Greg Marsden and Kate Pangbourne will explore some of these issues.

How, if at all, would you improve the way decisions are made about the transport network?
The transport system has mainly managed commercial interests, however the previous Integrated Transport White Paper, and the efforts since have aimed to influenced operators to serve passengers better. The creation of Great British Rail (GBR) and expanded bus franchising offer a major chance to prioritise passengers and improve integration.
Once the conditions for more integrated decision-making are introduced, then the way in which decisions are made should be prioritised. Key questions remain about decision-making levels. For example, rail needs differ for long-distance travellers and commuters, but how GBR and Combined Authorities will address this is unclear. Likewise, National Highways has little obligation to support the objectives of the local areas through which it operates.
Clear funding for capital and revenue is essential to deliver the INTS. While Local Transport Plans have strong visions, lack of funding makes them hard to implement (Verlinghieri et al., 2024), leading to isolated successes instead of widespread integration. Improving rail and bus coordination helps make the most of available resources but doesn't address the underlying decision-making structures. Effective collaboration within these structures is also needed (Pangbourne, 2010). Limited capital funding should be used where it adds the most value. There's strong economic support for smaller-scale investments in towns and cities (Eddington Review), but this isn't reflected in current funding allocations for rail, National Highways, and local transport. **The Integrated National Transport Strategy should set out how much additional funding will go into integration relative to recent spend if there is to be a credible change on the ground. DfT should require fewer ex-ante checks and balances with a greater emphasis on understanding and scrutinising outcomes.**
Crucially, as transport is increasingly electrified, there is a need to develop closer collaboration between transport and land use planning, as discussed above, but also with grid providers, with action needed at both national and regional/local level. Steps must be taken to ensure that the electrification of transport can be achieved for all modes across the whole nation, whilst also meeting the needs of high energy users in industry (Britton et al

2024; Poulter, et al 2025). Existing research has demonstrated that closer collaboration across sectors can improve outcomes, if the capital resources and appropriate powers are made available at every level. Moscholidou et al (2023) demonstrate this in the context of steering the outcomes for cities when smart mobility is introduced, including platform-mediated services such as Mobility as a Service. The complexity of bringing together different modes (with different legal frameworks), data providers, and a mix of public and private service providers highlights that there is a significant risk of worsening transport problems, and social and environmental outcomes without government action (Pangbourne, et al 2020; Pangbourne et al 2018). The emergence of super-apps, in which transport is only one service that can be purchased, may help to the 'blur the edges' of sectors, and may have implications for achieving policy goals. However, there is not yet any UK research into this, since most super apps have been launched in Asia. **The Integrated National Transport Strategy needs to set out a vision for how transport will respond to the new integration challenges of energy and new mobility services as well as fixing the shortcomings of the past.**

The INTS must also include an energy transition strategy for freight and logistics, not just passenger travel. Decarbonizing road freight requires bringing together various stakeholders to co-design the transition (Churchman et al., 2023). In urban areas, increased home deliveries and business services are driving more Light Commercial Goods Vehicle (LGV) traffic. These issues, which involve multiple stakeholders, are closely linked to passenger travel (Marsden et al., 2020). **The INTS must consider the future of both freight and passenger transport.**

Any other comments?

The Energy Demand Research Centre is researching the design and implementation of policies across the energy and decarbonisation landscape and addresses many of the issues about policy integration in different place settings. We would be happy to meet with the INTS team and explore how we can inform the strategy development. Please contact Prof Greg Marsden G.R.Marsden@its.leeds.ac.uk or Dr Sarah Higginson S.L.Higginson@bham.ac.uk to set this up. Other contributors are Professor Kate Pangbourne, Dr Malcolm Morgan, Dr Angela Smith and Professor Aruna Sivakumar and Professor Mari Martiskainen

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About EDRC

The Energy Demand Research Centre (EDRC), grant number EP/Y010078/1, undertakes research for an affordable and secure low energy future. Our interdisciplinary research programme identifies evidence-based energy demand reductions for a sustainable and more equitable future. We work closely with partners from policy, industry, civil society and academia.

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