CHAPTER 10.

TRANSPORT

Reducing transport need, switching to shared and human powered transport

Transport accounts for 31% of Devon's greenhouse gas (GHG) emissions.[1] The sector is the single largest emitter of GHG across the County, which also reflects the UK-wide position.

Reducing emissions from transport is key to successfully reaching net-zero. Addressing the challenge will require a combination of behavioural, policy and technological changes. The movement of people, as opposed to goods, accounts for around two thirds of all transport emissions. Whilst all areas of transport must decarbonise, and do so rapidly, transforming how we move about Devon will provide the opportunity to realise significant wider benefits: for our health, safety, public and personal finances and enjoyment of public space.

10.1 WHAT NEEDS TO HAPPEN?

We support the following hierarchy of action: [2]

1. **Reduce the need to travel**

2. **Shift to sustainable transport options.** These themselves have a hierarchy of active travel, followed by mass/shared transit (low/no emissions), and taxi (e.g. first/last-mile use)

3. **Electrification of the remainder of the private vehicle fleet** and reducing emissions from larger vehicles and aviation.

10.1.1 Reduce the Need to Travel

We must better consider our spatial planning and land use to reduce the need for travel and increase the ease, attractiveness and safety of active travel. Rural villages and towns have too often become locked into having to travel to access amenities and services, as well as employment. Successive planning policies and regimes have resulted in a loss of amenities and services from

rural communities, furthering the need for travel. Creating thriving and more self-reliant rural communities through a relocalisation of services is important to address the drivers of travel. However, when communities want and need to go further afield, they need access to sustainable travel and transport.

10.1.2 Modal-Shift to Sustainable Transport Options

Overall, public transport and active travel have not been attractive enough and have not been invested in to the same extent as the roads resulting in greater use of cars, except for in a few locations [3].Relatively, the cost of car travel has fallen whilst public transport has increased. Likewise, national policy, such as the freezing of fuel duty at successive budgets since the last recession, has only served to widen this gap.

Merely substituting existing transport usage in Devon with Electric Vehicles (EVs) and maintaining current behaviours could be a "successful failure", missing a once-in-a-generational opportunity to realise the benefits for health and wellbeing that increased active travel would bring[4] and the transformational changes that this could bring to Devon's town and city centres. Indeed, many of the changes we are proposing align well with changes recommended by Public Health Devon to tackle air pollution [5] , and with recent announcements on the role for active travel that have been brought to the forefront of policy by the Covid-19 pandemic. The Covid-19 pandemic has also highlighted the urgency of tackling the obesity crisis, which is closely linked to the ways in which we move. In addition, if current travel habits are maintained, the electricity demanded by electric vehicles would be likely to exceed that which could be supplied from existing zero-carbon sources, and the production of batteries and other components would place a significant burden on natural resources.

There is high recognition of the role of transport in climate change. The Department for Business, Energy and Industrial Strategy (BEIS) public attitudes tracker shows three of the top four items that the respondents feel would have the biggest impact on tackling climate change are transport-related[6]. Furthermore, the National Travel Attitudes Study, by the Department for Transport, shows high public recognition of the co-benefits associated with health from reduced vehicle use, 74% of respondents agree that motor vehicle use should be reduced. [7]

We need to encourage the use of sustainable transport by making it the most attractive choice, particularly in urban areas. There are challenges to shifting rural transport to sustainable modes, particularly due to Devon's dispersed geography and the need to access larger settlements for services. Further consideration will be needed on how best to deliver active travel opportunities for rural communities and improved public transport and shared mobility facilities for less densely populated parts of Devon viably. This is especially important given that Devon welcomes significant numbers of tourists annually to enjoy our countryside.

10.1.3 Electrification of the Remainder of the Private Vehicle Fleet

Personal vehicles will become electric, therefore we need to increase electric vehicle charging provision across Devon. Reducing emissions from larger vehicles and aviation poses distinct challenges from personal transport, as the power requirements are greater, and the travel patterns are different. Whilst technological solutions and prototypes exist, particularly for heavier vehicles, the technology is less well-advanced and the opportunities for rapid decarbonisation are fewer. We signpost a range of actions for finding solutions for larger vehicles, such as for freight, including - but not only - electrification. Devon has valuable aerospace expertise to contribute to pathways to net-zero aviation, but the timelines for bringing new airplanes to market are challenging and point to a need to constrain air travel nationally.

10.1.4 Action Diagram for Transport

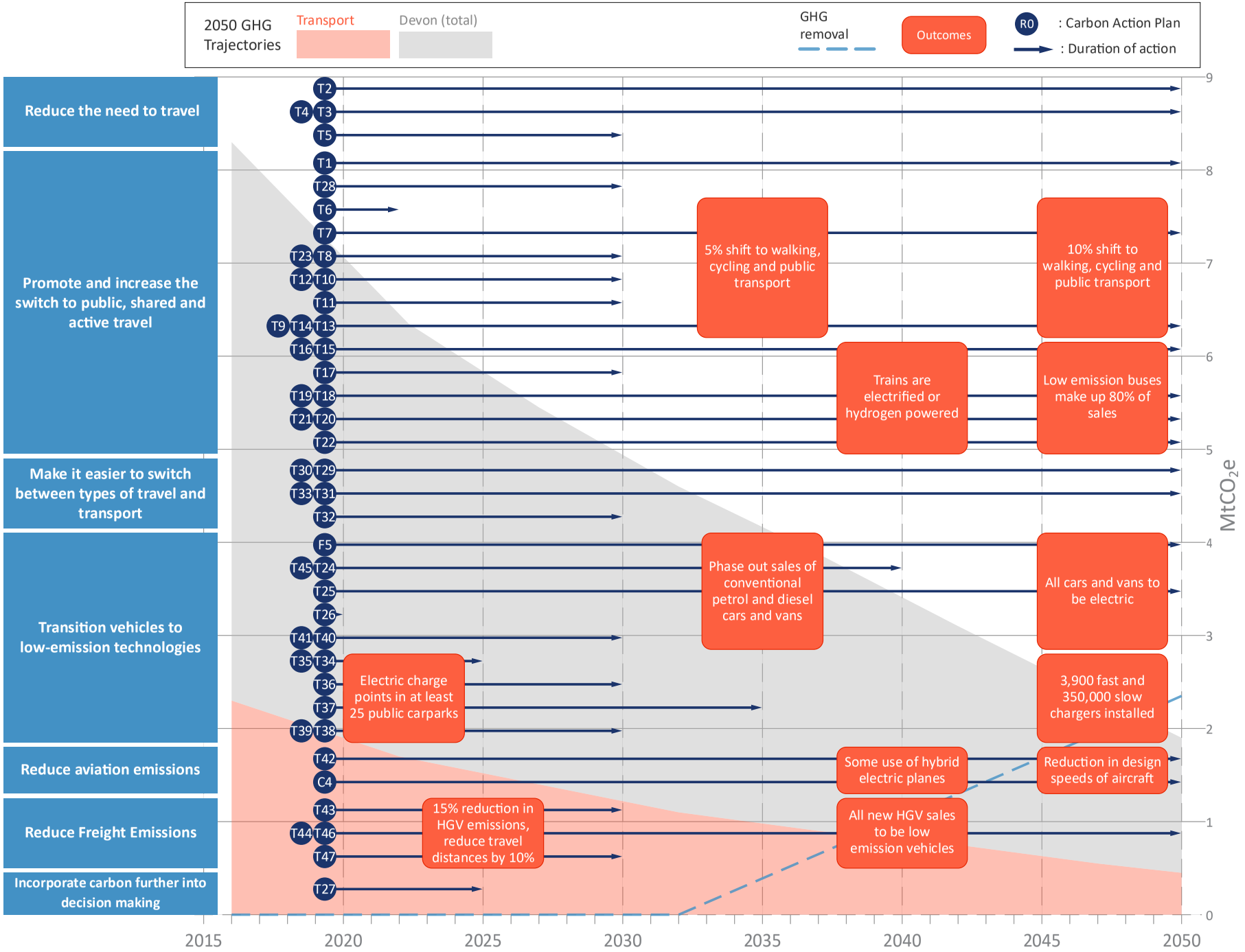

Figure 10.1 Diagram of the Transport Actions, showing the key trajectory for GHG emission reductions over time and the anticipated timing of actions.

10.1.5 Priority Actions

Reduce the Need to Travel:

T1. Provide up-to-date digital information and advice on reducing the need to travel and the most sustainable travel choice.

T5. Review opportunities to reduce vehicle capacity, particularly where it can support other objectives (i.e. urban centre regeneration, street cafes, active travel routes.)

T2. Promote development which will assist in relocalisation in all settings (rural through to urban), including mixed use development, development meeting local needs and creating opportunities to live, work and use services locally.

Promote Active Transport and Shared Mobility:

T7. Improve strategic cycle routes within and between settlements.

T30. Ensure provision of mobility hubs in new developments of appropriate size, where modal change can occur easily.

T22. Promote Total Transport, integrating various transport services (school transport, public bus services, patient transport etc.) to enable more efficient use of vehicles and reduce dead mileage.

Influence the Switch to Public Transport:

T20. Enhancement of bus priority measures, including bus lanes and bus-only streets, to make bus travel relatively more attractive than driving.

T21. Protect and seek to enhance funding for local bus routes, to ensure people can continue to access services, employment and events without requiring access to a car.

T24. Through the Peninsula Sub-National Body work with government to pilot and implement a low carbon fuel solution for rail travel in the South West.

Transition the Remainder of Vehicle Fleet away from Fossil Fuels:

T34. Develop an electric vehicle strategy to increase electric vehicle charging provision across Devon, including in key public spaces and workplaces, on street charging and plans to address the tourism sector.

T36. Electric charging and shared mobility on Devon Climate Emergency partner owned assets T37 DCE partner organisations and larger businesses in the County to transition their fleets to Ultra Low Emission Vehicles, including shared cycles and e-cargo bikes.

T39 Seek opportunities for funding for moving public transport fleets across to zero or low carbon

10.2 OPPORTUNITIES AND BENEFITS

The transition to net-zero transport provides a wide range of opportunities and benefits for Devon's residents, including:

- Reduced time spent commuting due to re-localising services and promoting working from home, allowing people to use this time to participate in local communities, or to shop or undertake leisure activities locally rather than close to their workplaces.

- Improved health:

    - Considerable improvements to air quality from the switch to active travel and electric vehicles [25]. Air pollution has been linked to a significant range of negative health impacts such as heart attacks, strokes and asthma and various types of cancer [8].

    - A shift to active travel and public transport would also reduce non-exhaust emissions such as those from brake and tyre wear, road surface wear and road dust, all of which are a significant contributor to Particulate Matter (PM) in our urban areas, and reduce traffic noise.

    - Improvements in mental health and wellbeing as well as physical health from active travel.

    - An increase in physical activity in the UK (based on scenarios of increasing the amount of walking and cycling relative to 2010 levels) has been estimated to save the NHS £17bn (in 2010 prices) within 20 years due to disease reduction. [25]

- Investing in active and shared travel can help 'level-up' society and enhance health equity: vulnerable and disadvantaged groups are often more likely to rely on walking, cycling and public transport, including people with disabilities, lower wage earners, ethnic minorities, women and younger and older people. [25]

- Economic benefits:

    - The average economic benefit-to-cost ratio of investing in cycling & walking schemes is 13:1.26 .

    - Although cyclists may spend less than car-borne shoppers per trip, their total expenditure

is on average greater because they tend to visit the shops more often.[26] On 9th Avenue (Manhattan), where a high-quality cycle lane was rebuilt in late 2008, retail sales increased by up to 49%, compared to 3% borough-wide. [26]

- Enhancing active travel in Devon would boost walking and cycle tourism and cycling related employment such as bike mechanics and e-bike conversions. [26]

10.3 KEY OUTCOMES

- Relocalisation of services and technology and to reduce the need to travel
- Access to village, town and city centres is enhanced for pedestrians, cyclists and public transport
- All benefit from the relocalisation of facilities and services, including the local economy, particularly small businesses
- We are all feeling fitter and healthier from being more active outdoors
- Wider environmental benefits, including reduced pollution and improved biodiversity
- Ultra-low emission vehicles are used for travel in rural areas and between rural and urban areas where the distances are prohibitive for active travel and existing commercial models for public transport are not viable
- A great proportion of people travelling by sustainable modes of transport

10.4 GOAL: RELOCALISATION OF SERVICES, AS WELL AS USE OF TECHNOLOGY REDUCES THE NEED TO TRAVEL IN ALL COMMUNITY TYPES

Travel is Devon's largest source of territorial emissions, at 31% in 2018[1] .Reducing transport related emissions will require both technological and behaviour changes [9]. Demand reduction, i.e. not needing to travel so much, will be key. Travel is largely a derived demand, in that people predominantly travel to enable other activities, for instance to work, to meet friends and relatives or to study. so it is important to consider the drivers of travel as much as the modes by which people travel. [3]

Reducing Energy for Travel Through Demand

Reducing the need to travel is vital because whilst electrification of transport might seem straightforward, the electricity itself needs to be. Transitioning our transport energy requirement from fossil fuels to electricity, combined with electrifying heating in our buildings, is collectively estimated to increase Devon's 2018 electricity consumption by about two and a half times. If Devon were to generate all this new demand within our boundary, we will need to install approximately eight times[10] more renewable electricity generating capacity than we currently have available. Furthermore, large quantities of earth minerals will be required for batteries and renewable electricity generation. Concerns have been raised about the potential for bottlenecks in the availability of metals (such as lithium, nickel, zinc, platinum and copper) and the ecological cost of mining [11].

The Role of Planning

The Call for Evidence and Thematic Hearings identified an enhanced role for spatial planning in shaping travel behaviour and reducing the need for private transport. The National Planning Policy Framework (NPPF) highlights the role of planning to "shape places in ways that contribute to radical reductions in greenhouse gas emissions" [12].

That the planning process must accelerate progress towards net-zero is not new. The Royal Town Planning Institute (RTPI) argues in "Plan the World We Need" that planning must accelerate progress towards net-zero, through the location and design of new mixed use affordable housing, regenerating and repurposing existing buildings and areas, improving local services and amenities, attracting businesses and supporting the "resurgence of social and cultural activity" [13]. They assert that we cannot rely on market-driven approaches and we must be proactive, ensuring new developments are less car-dependent[14]. Likewise, the Chartered Institution of Highways and Transportation in its "Better Planning, Better Transport, Better Places" highlights that the effective integration of planning and transport is fundamental to achieving a sustainable system that improves our health and combats climate change.

Continuing to support the genuine participation of communities in planning decisions, including around responding to climate change will be important to an inclusive Covid-19 recovery. [13] Place-based shared visions are vital to ensure coordination between stakeholders and balancing strategic and community objectives in delivering net-zero. The publication of the recent Planning White Paper by Government creates uncertainty around future planning legislation and, whilst it recognises planning as a key tool in addressing climate change, does not seem to put a great enough emphasis on the need to plan for a low carbon future [15]. There is particular concern over local flexibility and the future control of planning.

Communications Technology

The Thematic Hearings and Call for Evidence echoed the RTPI in identifying the need for enhanced digital connectivity to promote further flexible and remote working patterns and reduce the need to travel. The response to the Covid-19 pandemic demonstrated the extent to which home-working can reduce travel: during the height of the pandemic work trips fell by 68% in the UK [13]. Whilst it is recognised that not all people can work from home, enabling and supporting those who could continue to work from home in the future could lead to a material reduction in the demand for travel – particularly in peak hours. The County could seek to ensure that provision, or passive provision for high quality communications technology is provided in any new infrastructure.

A Need for Thriving Rural Communities

As Devon is a predominantly rural county, and half of our population lives in rural areas, measures such as reducing the need to travel and other approaches to emissions reduction must also speak to rural communities and not just seek greater urbanisation. The Thematic Hearings highlighted the need for thriving rural communities and the ever-increasing importance of land-based activities for producing food, biofuels, timber and carbon sequestration. High car-based mobility has meant that many rural communities have lost local services. However, many rural settlements and communities have significant potential to contribute to net-zero through emphasis on relocalisation - development meeting local needs and creating opportunities to live, work and use services locally.

10.4.1 What Needs to Be Done?

Where there are alternatives to travelling to access services and products individuals should be made aware of this, alongside advice on modes of travel.

The continued use of home working and remote meetings should be encouraged, e.g. virtual consultations with doctors, and businesses enabling flexible home working. Whilst Covid-19 has helped normalise home working, improved broadband is needed to both sustain and grow this behavioural change. The Connecting Devon and Somerset Programme has already made superfast broadband accessible to over 290,000 residents and businesses in the region, Phase 2 will deliver to remaining hard to reach premises such as on Dartmoor and Exmoor[16]. We must enhance and maintain broadband access and speed that will enable all of Devon's residents to work from home and to do so without feeling constrained by reducing their travel.

Relocalisation of services and amenities, including recreational opportunities for leisure time, is needed to reduce travel demand. This means delivering high quality new mixed-use developments, but crucially also supporting the revitalisation of rural communities who may have become almost entirely residential.

10.4.2 The Actions:

T1. Provide up-to-date digital information and advice on reducing the need to travel and the most sustainable travel choice.

T2. Promote development which will assist in relocalisation in all settings (rural through to urban), including mixed use development, development meeting local needs and creating opportunities to live, work and use services locally.

T3. Continue to make use of funding opportunities to provide employment and community assets across Devon, particularly where the market is unlikely to provide this, in order to minimise the need to travel for access to services.

T4. Ensure that the carbon implications are considered when making efficiency savings to community services

T5. Review opportunities to reduce vehicle capacity, particularly where it can support other objectives (i.e. urban centre regeneration, street cafes, active travel routes.)

10.4.3 Co-Benefits

Transport is a large expenditure for households, therefore reducing the need for travel can help to alleviate poverty. Currently rural communities face a range of challenges associated with accessibility and connectivity, especially those without a car. Households in rural areas have a higher average transport spend compared to urban residents[17].

Additionally, by re-localising services and promoting working from home, we reduce the amount of time people spend commuting, allowing them to use this time to participate in local communities, or to shop or undertake leisure activities locally rather than close to their workplaces.

10.5 OPPORTUNITY FOR DISCUSSION AT THE CITIZENS' ASSEMBLY: THE ROLE OF REDUCING ROAD CAPACITY TO REDUCE TRAFFIC

New roads and increased road capacity are often seen to be important contributors to relieving traffic congestion in urban areas and in cases reducing air pollution, as well as ensuring communities are well connected to support economic growth. However, continual private and business transport focussed road-building poses challenges to achieving a net-zero Devon.

Increased Traffic

Some evidence has suggested that new roads can "induce traffic[18]" „ by making driving more attractive than previously. In one study, a random sample of 13 road schemes saw a 47% increase in traffic on new roads over and above background traffic growth trends[19].

Questionable Additional Benefits

The typical appraisal of new roads, or road widening to create extra capacity, considers the economic benefits to travellers derived from travel time savings, changes in fuel cost and indirect tax receipts to the government. Frequently, appraisal also considers the impact on the wider economy and the benefits derived from enhanced connectivity in providing opportunities for work and agglomeration benefits to businesses, increasing the economic status of settlements the schemes connect, helping to promote investment. Such appraisal follows government guidance set out by the Department for Transport, demonstrating Value for Money to the public by offsetting the investment and maintenance costs against the derived economic benefit. Whilst Carbon and Greenhouse Gases (GHGs) are valued as a core part of this process, the impacts of these are generally far outweighed by other elements, such as the valuation of travel time savings.

The Campaign to Protect Rural England (CPRE) report 'The end of the road? Challenging the road-building consensus' questions the evidence for economic gains from road investment and highlights their lasting impact on the environment[20]. A later study considered 25 road schemes justified by predicted local economic benefit, of which only 5 delivered as hoped[19].

Contribution to Climate Change and Environmental Impacts

New road schemes can have multiple environmental impacts for landscape, biodiversity, heritage, GHG emissions, local air quality and noise pollution. Whilst requirements for environmental net gain mean that compensatory measures are made, this is considered by critics as an inadequate equivalence for the losses which could have been avoided. Highway construction requires carbon-intensive materials such as concrete, steel and tarmac, for which there are currently few alternatives, as well as embedding long-term increased vehicle use which contributes to emissions.

Alternative Solutions

Alternatives to increasing road capacity which could be considered include financial mechanisms to deter car use, such as road pricing, levies on workplace car parking and more cost-effective public transport; strategic investment in public transport as well as active travel routes; reducing the need to travel at source by enhancing local employment and amenities and encouraging the use of digital tools to replace in person trips. However, we feel that road building and expanding road capacity is a contentious issue on several fronts, both for and against and therefore deserves the attention of the citizens assembly.

It is suggested that the role of reducing road capacity to reduce traffic be deliberated by the Citizen's assembly, possible questions for discussion include:

Should Devon cease new road improvement schemes focused solely on providing increased highway capacity?

Reducing road capacity leads to reduced traffic, therefore should Devon reduce road capacity?

Furthermore, should Devon stop supporting capacity enhancement schemes by Highways England within the County?

What would you tell us if you are invited to the citizens assembly?

10.6 GOAL: OUR STREETS ARE SAFE FOR ALL, WITH CYCLING, WALKING, SHARED AND PUBLIC TRANSPORT PRIORITISED

Advice

Devon's residents and visitors can be unsure of the options for travel around the County and often lack confidence walking and cycling due to concerns around safety.

Making Towns More Active Travel Friendly

Our settlements and roads frequently feel vehicle-dominated, with streets often dominated by private car use. Whilst there has been a more recent realisation of the need for dedicated space for walking and cycling, the majority of our urban areas lack fully segregated facilities, thus deterring active travel. The Committee on Climate Change assumes that 10% of car journeys, by distance rather than by trip, need to be shifted to walking and cycling in order to achieve net-zero by 2050[21].

"In the Netherlands, approximately 20% of all distance travelled is by bicycle, compared to only 1% in the UK." UK FIRES

Shared Transport

Heavy traffic and congestion make many routes less pleasant for active travel and slower for all, including shared transport such as buses and taxis. However, our road space is used inefficiently: many vehicles are single-occupancy and increasing vehicle occupancy would reduce the number of vehicles on the road. However, drivers and passengers wishing to lift-share may not know how to find each other easily or worry about the safety of sharing with strangers. There is also currently little reward or incentive to share lifts, other than a saving of some petrol money or knowing you are reducing emissions.

As most cars are only used for a small proportion of the day, shared transport facilities offer an efficient use of resources and require less overall space for parking.

The average car is parked at home for 80% of the time, parked elsewhere for 16% of the time and is only on the move for 4% of the time
RAC Foundation[22]

Public transport set timetables for journeys can be less convenient than choosing your own time to travel, especially as some services only operate at certain times or on certain days. Many journeys are also not financially viable for commercial bus operators, meaning that unless the local authority intervenes to subsidise a journey, it will simply not be available.

10.6.1 What Needs to Be Done?

Advice

It must be easier to access information on travel options within Devon, including how to get started with active travel, such as choosing the right bike. Travel Devon and Sustrans are just two of the organisations already contributing to this.

Making Towns More Active Travel Friendly

We must be able to travel between and within settlements in Devon, both urban and rural, safely, conveniently and confidently by a range of modes, including cycling and walking. For this to happen further improvements to the layout and linkages within and between areas are needed. There are a variety of well-documented case studies from other areas of the country and world to learn from, demonstrating how we can shift the experience of our transport networks away from being car-dominated.

Shared Travel

Public transport is just one way of achieving shared travel. Technology is making it increasingly easy to identify the travel plans of others in your neighbourhood and workplace, to facilitate lift sharing or vehicle sharing, when it is not in use by the owner, but they wish to rent it out.
The speed of buses can be enhanced through ensuring true bus priority on routes wherever possible. Innovative models to increase the viability of public transport in rural areas will be needed,

such as community-run services and demand responsive subscription-based services. Examples of successful community run services already exist in Devon, such as Bob the Bus[23], as well as innovative examples further afield like Wales' Bwcabus[24].

Emissions from taxis can be reduced through incentivising the transition of the fleet to Ultra Low Emissions Vehicles (ULEVs) via taxi permit incentive mechanisms. Such changes in fleet could be market-driven and are already occurring – for example, Apple Taxis based in Exeter with a fleet of 200 cars, already have 39 hybrid vehicles – but Devon's District Councils could legislate to ensure a faster and deeper transition.

10.6.2 The Actions:

Travel Advice

T1. Provide up-to-date digital information and advice on reducing the need to travel and the most sustainable travel choice. Examples could include workplace and school travel planning

Cycling and Walking

T6. Develop local cycling and walking infrastructure plans (LCWIPs) with communities for each city, town and their surrounding areas.

T7. Improve strategic cycle routes between and within settlements.

T8. Greater provision of cycle training, including bike maintenance and repair

T9. Where possible, design pavements and junctions to prioritise pedestrians and cyclists over vehicular traffic.

T10. Enable schemes that would allow residents to trial different types of cycles.

T11. Introduce reduced speed limits for safer public spaces.

T12. Provide support for bike rental schemes

T13. Local Plans to ensure new developments are designed with filtered permeability to promote sustainable travel

T14. Implement car-free days in Devon's urban areas

Shared and Public Transport

T15. Help to develop innovative transport solutions in rural areas

T16. Promote car sharing technology and platforms to make it easier to link drivers and passengers

T17. Introduce Ultra-Low-Emission-Vehicle taxis by placing requirements on the licensing process.

T18. Explore long term sustainable options for community and voluntary sector transport.

T19. Extend the prevalence of true bus priority on the highway

T20. Enhancement of bus priority measures, including bus lanes and bus-only streets, to make bus travel relatively more attractive than driving.

T21. Protect and seek to enhance funding for local bus routes, to ensure people can continue to access services, employment and events without requiring access to a car.

T22. Promote Total Transport, integrating various transport services (school transport, public bus services, patient transport etc.) to enable more efficient use of vehicles and reduce dead mileage.

T5. Review opportunities to reduce vehicle capacity, particularly where it can support other objectives (i.e. urban centre regeneration, street cafes, active travel routes.)

Needing Action Beyond Devon

T23. Request that national government removes VAT from bicycles and e-bikes.

T24. Through the Peninsula Sub-National Body work with government to pilot and implement a low carbon fuel solution for rail travel in the South West.

T25. Through the Peninsula Sub-National Transport Body, work with government to improve strategic and branch line rail infrastructure and services, including reviewing the reopening of lines and increasing access to rail and integration with other modes of transport. Work with government for required funding.

T26. DCE to write to government, giving their support to increase the fixed penalties for idling under The Road Traffic (Vehicle Emissions) (Fixed Penalty) (England) Regulations 2002, from £20 to £50. Implement an awareness raising campaign for the public.

T27. Work with government to incorporate the cost of carbon into highway funding decisions.

T28. Take advantage of opportunities arising from the upcoming National Bus Strategy to deliver long-term, sustained improvements in bus services

10.6.3 Co-Benefits

- Considerable improvements to air qualilty and consequently reduced strain on the NHS. Air pollution has been linked to a significant range of negative health impacts including cardiovascular and respiratory diseases such as heart attacks, strokes and asthma, various types of cancer (particularly lung cancer), diabetes and eye, kidney and liver disease[25].

- A shift to active travel and public transport would not only reduce exhaust emissions, but also non-exhaust emissions such as those from brake and tyre wear, road surface wear and road dust, all of which are a significant contributor to Particulate Matter (PM) in our urban areas, and reduce traffic noise.

- Increased physical activity as a result of reduced private car use, which can help prevent some cancers and obesity. Active travel also benefits public health through improving mental health and wellbeing as well as physical health. An increase in physical activity in the UK (based on scenarios of increasing the amount of walking and cycling relative to 2010 levels) has been estimated to save the NHS £17bn (in 2010 prices) within 20 years due to disease reduction[25].

- Reduced prevalence of cars in urban centres could help to reduce road traffic collisions. This includes potentially both the number and severity of road casualties, as for example bike to bike crashes are much less severe than car to bike collisions[26].

- Our current over-reliance on motorised transport imposes significant economic costs on society, beyond the health costs, these include pollution damage to buildings, ecosystems and agriculture, geopolitical costs of maintaining fossil fuel supplies in an increasingly unstable global environment and congestion[27].

- Transport systems that prioritise active and shared transport along with better urban land use, can help improve access for vulnerable groups, including people with disabilities, and lower wage earners, enhancing health equity[25].For instance, shared car or bicycle schemes may improve access to opportunities for those who cannot afford the cost of purchasing a car or bicycle.

10.6.4 Case Study

Changes to Travel during Covid-19

During the period of the first 'lockdown' (March-May 2020), significant increases in active travel were observed, with 7-day average cycle flows at leisure-oriented sites in Exeter frequently exceeding figures for equivalent periods in 2019 by more than 50%. Across Devon as a whole, cycle flows increased more than 25%, with these increases largely being sustained through June and July, in spite of subsequent relaxations of 'lockdown' rules.

In an attempt to 'lock-in' these behavioural changes as residents returned to work and schools, and speed up progress in delivering strategic cycle routes in Exeter, Devon County Council used money made available through the Department for Transport's Emergency Active Travel Fund to deliver several 'pop-up' (temporary) walking and cycling improvements. These included modal filters, which have closed roads to through car/van traffic, but remain open to pedestrians, cyclists and (where relevant) buses, contra-flow cycleways and widened footways, and helped establish quieter and safer corridors along cycle routes E3 (Redhayes Bridge to Exeter City Centre via Whipton and Heavitree) and E9 (Newcourt/Pynes Hill to Exeter City Centre via Wonford). In addition, pedestrianisation schemes, parking suspensions and new cycle parking were delivered in several other settlements across the County.

Following public consultation and the announcement of a second tranche of the Emergency Active Travel Fund, work has continued to refine and build upon these improvements. Whilst one measure (the temporary modal filter on Vaughan Road, Exeter) received considerably more negative responses than positive, and so will be removed, other 'pop-up' measures will either be made permanent or trialled for an extended period, allowing further consultation and monitoring. Additional crossing facilities and shared cycle paths are also proposed in Barnstaple and Newton Abbot.

10.6.5 Opportunities

- Enhancing active travel in Devon would boost walking and cycle tourism, bike and outdoor shops[26].

- The average economic benefit-to-cost ratio of investing in cycling & walking schemes is 13:1.[26]Furthermore, many of these benefits accrue to people in disadvantaged groups (e.g. women, people in minority ethnic groups, younger and older people, and people in lower income quintiles), who are more likely to rely on walking and cycling, and so investing in active travel can help 'level-up' society.

- Although cyclists may spend less than car-borne shoppers per trip, their total expenditure is on average greater because they tend to visit the shops more often[26].

- On 9th Avenue (Manhattan, New York), where a high-quality cycle lane was rebuilt in late 2008, retail sales increased by up to 49%, compared to 3% borough-wide[26].

- Potential for increased cycling related employment: Bike mechanics, e-bike conversions and e-bike maintenance, such as for co-bikes scheme as expanded[26].

- Learning from Emergency Active Travel Fund, Devon County Council have delivered a 4km quiet corridor through the city within a month of funding being announced, for relatively low cost.

10.7 GOAL: IT IS EASY TO TRANSITION BETWEEN DIFFERENT TYPES OF TRAVEL AND TRANSPORT

Integrated Travel

Cycling and walking may not feasible for the entirety of journeys: for instance, the overall distance of a trip may be too long but access to either a bus stop or railway station could be achieved via a shorter cycle or walk trip. Such journeys could become more viable if they could be combined with public transport. However, the limited capacity of trains and buses to take individual's bikes so that the journey can be completed at the other end and the need to book a bike space ahead of a journey can deter uptake. The lack of secure, high-quality cycle storage facilities at many potential interchange locations also hinders sustainable, multi-modal trip making. Multimodal journeys are further frustrated by the need for multiple tickets for the distinct legs. With the risk of delays in one part of the journey making cheaper advance tickets risky, or requiring the allowance of extra time, leading to longer overall journey times and less convenience.

Public transport set timetables for journeys can be less convenient than choosing your own time to travel, especially where there is a lack of integration and planning between modes (e.g. rail and bus) which leads to long waits at interchange locations.

10.7.1 What Needs to Be Done?

Integrated Travel

Multi-modal journeys can be made easier and more seamless through greater collaboration, to offer integrated ticketing, planning of timetables, and ensuring that space is given for mobility hubs. Mobility hubs offer easy interchange, such as through co-located bus and train terminals, taxi ranks and shared electric car and bike facilities, with good pedestrian access. This is already found at some of Devon's train stations such as at Exeter St. David's and Exeter Central, which host Co-Bike docking stations, and has bus stops and taxi ranks immediately outside the entrance hall. However, more integrated planning and more secure and high-quality storage facilities could further promote the use of multiple modes to rival both travel times and costs for the same journey made by private car.

Strategically placed nodal car parks on urban peripheries could facilitate car sharing or switching to active/public transport before entering town and city centres, reducing congestion within urban centres, which is a particularly significant contributor to air pollution, due to the stop-start nature of queuing traffic.

10.7.2 The Actions:

T29. Greater provision of cycle parking across Devon and at key interchange locations

T30. Ensure provision of mobility hubs in Local Plan policy for new developments of appropriate size.

T31. Ensure public transport enables easy transition to active travel for the first and last mile.

T32. Introduce integrated ticketing

T33. Create nodal car parks at strategic points to encourage onward car sharing

10.8 ALL REMAINING VEHICLES ARE ELECTRIC, OR ARE LARGE VEHICLES SUCH AS HGVS WHICH RUN ON ALTERNATIVE LOW CARBON FUELS

Even with a highly successful behavioural and social change programme that leads to a large reduction in travel and a material shift to active travel, there will still be a need for motorised transport: both for personal and business reasons. It will, therefore, be essential to transition the remaining vehicles away from fossil fuels to low and zero carbon fuels. For personal mobility, Electric Vehicles (EV) are the front running technology; indeed, the need for rapid decarbonisation should rule-out waiting for new technologies and further prototyping. Larger vehicles such as HGVs pose distinct challenges and are considered separately in the Carbon Plan.

The Transition to Electric Vehicles

The UK government has brought forward the date at which petrol, diesel and hybrid cars will cease to be sold to 2035, in line with the Committee on Climate Change Further Ambition recommendation towards achieving net-zero by 2050.[21] It is widely understood that the 2035 date may be further brought forward to 2030. Whilst sales of electric and hybrid cars overtook those of diesel-powered vehicles between April and June of this year, this is still small in comparison to the sale of petrol-powered vehicles and represents a small proportion of the UK fleet.

Simultaneous to the electrification of vehicles, the Committee on Climate Change recommends increasing the fraction of road fuel that is derived from sustainable biofuels to 11% in 2030. To do so, the government legislated the new R**enewable Transport Fuel Obligation (RTFO)** target. This will reduce the carbon intensity of the remaining non-EV vehicles, which are also anticipated to become more efficient. However, there is evidence that conventional car CO2 emissions are currently rising, with the trend of preference for purchases of Sports Utility Vehicles (SUVs) and larger family cars meaning that, overall, the new fleet performs worse than the older fleet. [28]

"At present UK cars are on average used with 1.8 people inside, but weigh around 1,400 kg, which is ~12times more than the passengers, so almost all petrol is used to move the car not the people."
UK FIRES on the importance of lighter smaller cars

Range

Globally the large-scale adoption of EV will require the evolution of technology to bring down costs and improve range, the latter is currently limited by battery capacity.[21] Already though, some models of EVs can do more than 200 miles on a single charge, far exceeding the average journey need.

Cost

The Committee on Climate Change estimate that EVs will become cost-effective compared to combustion engines in the 2020s, or 2030 in the case of electric vans.[9] To accelerate the adoption of EVs financial incentives would need to be offered to consumers. Rural areas' needs are challenging to meet primarily through public transport and active travel, so electrification and charging infrastructure is important. However, the development of charging networks is unlikely to be economically viable in many rural areas and therefore will need extra support. Rural areas also welcome tourists from across the country who need to have confidence in local EV infrastructure.

An apportionment of the Committee on Climate Change Net Zero report, implies a spend in Devon of £3.6 million per annum from now to 2050, to result in a total of approximately 2,626 chargers of between 22 kW and 350 kW.[9] Western Power Distribution (WPD) state that the existing network is likely to have the capacity to support charging of EVs at expected rates. Domestic chargers with 3 kW or 3.7 kW capacities can be simply connected. It is estimated that around 239,000 households in Devon in 2050 would have this type of "slow" charger, for off road parked charging.[9] Chargers of 7 kW or greater are likely to require some network upgrading and will incur a cost from WPD. Chargers will also need to be installed for those households that do not have off street parking, as well as in public places. If Devon is to roll out rapid chargers of 150 and 250 kW at a rate much accelerated from national action it may incur higher costs associated with being a first-mover.[9]

The Thematic Hearing on Mobility

The Thematic Hearing on Mobility identified a lack of clear strategy nationally on EVs, including the availability of grants, limited progress developing on-street charging infrastructure and poor reliability of existing charging networks, including work-place charging. The Hearing also highlighted a lack of knowledge, myths and misconceptions around EVs as a barrier to update within the County, for example over range, battery problems in winter and charging anxiety.

10.8.1 What Needs to Be Done?

Local and national leadership is needed to accelerate the adoption of EVs. DCE partner organisation fleets and other larger businesses have an opportunity to aggregate procurement to bring down costs of vehicles and charging infrastructure, stimulating local EV markets through providing volume. These

employers can also encourage their staff to purchase EVs through provision of workplace charging and other incentives such as loans and dedicated 'green' vehicle parking spaces.

A strategic approach to ensuring adequate Devon wide charging infrastructure would support residents and the wider economy such as tourism. A Devon-focused strategy needs to address the variety of charging requirements, including off street, on street and workplace, with the appropriate speed of charger in each location.

Devon needs to work with national government to ensure that the incentives are in place to help bridge the existing cost difference between EV and conventional vehicles. As well as new building and parking facilities delivering future proofed electricity capacity to avoid later electricity grid upgrades for EV charging. Ideally new-builds should have EV charging points built in now, so that there are not costs to retrofit them in future. This will be considered in the electric vehicle strategy and should also be considered by spatial planning.

10.8.2 The Actions:

T34. Develop an electric vehicle strategy to increase electric vehicle charging provision across Devon, including in key public spaces and workplaces, on street charging and plans to address the tourism sector.

T35. Local Plans to ensure provision of Electric Vehicle charging points where parking spaces are provided in new developments

T36. Electric charging and shared mobility on Devon Climate Emergency partner owned assets

T37. DCE partner organisations and larger businesses in the County to transition their fleets to Ultra Low Emission Vehicles, including shared cycles and e-cargo bikes.

T38. Support operators to decarbonise bus fleet, e.g. through supporting applications for central government funding

T39. Seek opportunities for funding for moving public transport fleets across to zero or low carbon

Needing Action Beyond Devon

T40. Work with government to ensure financial incentives are set at the required level to encourage the purchase of ultra-low emissions vehicles

T41. Work with government to ensure electricity supplies in new buildings provide capacity for electric vehicle charging, including shared charging facilities in high-density development.

T27. Work with government to greater reflect and prioritise the cost of carbon in highway funding decisions.

10.8.3 Opportunities

- Electric vehicle associated employment opportunities such as the installation of charge points and vehicle maintenance.

- Shared vehicles in neighbourhood centres that can serve business and residents.

10.8.4 Co-Benefits

- Improvements to air qualilty[3] However unlike a switch to active travel it doesn't get rid of particulates from tyre and brake wear. Air pollution has been linked to a significant range of negative health impacts including cardiovascular and respiratory diseases such as heart attacks, strokes and asthma, various types of cancer (particularly lung cancer), diabetes and eye, kidney and liver disease.[29]

10.9 GOAL: FLYING IS REDUCED AND DEVON IS CONTRIBUTING TO THE DEVELOPMENT OF LOW CARBON AVIATION TECHNOLOGY

Aviation's Contribution to Emissions

The baseline analysis of Devon's production emissions, by Exeter University, omitted aviation due to the incomplete nature of the emissions data and high levels of uncertainty.[9] Similarly the Committee on Climate Change Carbon Budgets don't explicitly count aviation. However estimates of aviation emissions for flights out of Exeter Airport suggested that aviation emissions from this source were some 3% of Devon's total emissions, 9% of transport emissions.[9] Nationally GHGs from aviation and shipping made up 10% of total UK emissions in 2017, with emissions from long-haul international aviation being the largest source.[21] Aviation emissions have more than doubled since 1990, with 80% of journeys being for leisure. 21 Tackling flying is particularly important as emissions at high altitude cause additional warming effects.

Devon's Powers to Act

Reductions in aviation emissions require national and international legislation, as well as personal choice. Devon's local authorities have limited powers and are legally required to consider aviation associated planning applications on a case by case basis, as with all planning applications. There is also a risk that attempts to unilaterally constrain aviation in Devon would lead to a form of carbon leakage, i.e. residents would travel to other airports outside of the County to fly, potentially increasing total emissions by increasing distances travelled to access airports.

Devon's Aerospace Expertise

The South West is renowned for its aerospace industry cluster with 14 of the 15 world-leading aerospace companies having bases in the region[30], a number of Devon-based companies supply the industry, such as Aero Stanrew in Barnstaple, a world leader in aerospace electronic components. The County's

universities support local innovation through research and development with industry partners, such as into materials development. There is an opportunity to contribute to the development of zero-carbon aviation.

Pathways to Low Carbon Aviation

Currently though, there are no commercially available zero-carbon planes[31]. Long lifetimes of aircraft and the challenges in developing and deploying new technologies make decarbonising aviation by 2050 difficult.[21] The Committee on Climate Change outlines that emissions reductions will require action on engine and aircraft technology and design; airspace management and airline operations; alternative fuels including sustainable biofuels and synthetic fuels and demand reduction.[21] However the UK Fires report Absolute Zero concludes that the only feasible option is to phase out aviation in the next 20 years to 2050, with resumption only occurring once zero-carbon planes are viable.[30]

Biofuels will be limited in supply and therefore may be better used for other sectors of the economy. Synthetic fuels for aviation, using electrolytic hydrogen and carbon dioxide, are electricity hungry to produce and so uptake would require higher levels of renewable generation – 200TWh - in 2050 than current Committee on Climate Change scenarios.[21]

The Committee on Climate Change scenarios point to residual aviation emissions needing to be offset by GHG removal. Devon has great potential to deliver natural GHG removal through land use, however offsets will also be needed for other sectors and land also needs to be used for food, timber and biofuels, as well as protecting other habitats, such as moorland and culm grassland. Nationally offsetting aviation emissions may also require utilising underdeveloped forms of Carbon Capture and Storage technologies.

10.9.1 What Needs to Be Done?

Given the limited local authority legislative powers to influence aviation, the role for the County must primarily be to raise the awareness of the carbon impacts of aviation in Devon and to support the acceleration of technology to enable zero-carbon aviation. Devon is well placed to do so given its existing aerospace expertise and skills base.

Applications for aviation infrastructure will need to be considered on a case by case basis for their compatibility with Local and Neighbourhood Plans, and where these outline achieving net-zero in Devon (as we hope them to), future developments will need to demonstrate their compatibility.

10.9.2 The Actions:

T1. Provide up-to-date digital information and advice on reducing the need to travel and the most sustainable travel choice.

T42. Seize opportunities to trial low carbon propulsion for aviation.

C4. Local Plans and Neighbourhood Plans to demonstrate how they will shape places in ways that contribute to radical reductions in greenhouse gas emissions to facilitate the achievement of Net-Zero in Devon, as a primary planning objective. This must include the requirement for new development to provide credible plans for it to contribute to Devon's net-zero carbon future.

10.9.3 Opportunities

- Devon's aerospace industry could contribute to the development of zero-carbon aviation. A number of Devon-based companies supply the industry, such as Aero Stanrew in Barnstaple, a world leader in aerospace electronic components. The County's universities support local innovation through research and development with industry partners, such as into materials development.
- If flying is to be discouraged nationally then Devon may benefit from greater domestic tourism.[30]
- Opportunities for train and bus operators to pick up increased mid-range travellers.[30]

10.10 ENERGY FOR FREIGHT TRANSPORT IS REDUCED THROUGH EFFICIENCIES OR MODAL SHIFT AND VEHICLES ARE TRANSITIONED TO LOW CARBON FUELS SUCH AS HYDROGEN OR SYNTHETIC FUELS.

The Challenge

Larger vehicles such as HGVs will be harder to tackle due to their power demand and less advanced prototyping. Possible technological solutions may include the use of biofuels, synthetic fuels, bio-methane, hydrogen or electrification of the HGV fleet.[9] Solutions for larger vehicles such as HGVs remain in the demonstration and testing phase, but a move towards mass market offers is expected in the late 2020s, if take-up is strong in the 2030s then the Committee on Climate Change anticipate that emissions for freight can reduce to near-zero during the course of the 2050s nationally.[21]

Reducing Energy Demand through Logistics

The Committee on Climate Change sees opportunities for logistics improvements for freight, reducing HGV mileage by around 10% nationally.[21] Energy savings can be achieved through optimally-located distribution centres, zero emission last mile delivery and new collaborative networks to promote co-loading. The technology to realise these savings in logistics already exist or are anticipated to be commercially available shortly, but require new ways of businesses working together.[30] Out of town, urban freight consolidation centres provide an

opportunity to reduce freight travel into large urban areas, with onward travel by greener vehicles. However, these have proven to be difficult to operate without subsidy in the past.

Modal Shift

Within urban areas freight can be distributed on from consolidation centres using more sustainable modes, such as electric cargo bikes.

Rail is the lowest-carbon form of land transport for long-distance freight but currently market demand is low and infrastructure constraints place limits on its scope locally. Nonetheless, there is a danger currently that in the absence of demand we lose vital infrastructure, such as rail side warehousing. In future financial incentives or increased competitiveness would be needed to stimulate the uptake of rail freight. Rail itself, whilst being only a small proportion (less than 1%) of Devon's surface transport emissions, will also need to be converted to electric or some other ultra-low emissions form of traction (e.g. hydrogen) to meet net-zero .

Identifying the Right Fuels

Different fuels will likely be solutions for different sectors, depending on the geography of their network and requirements. Farming has the advantage of co-located feedstocks for bio-methane production. Synthetic fuels may allow existing conventional vehicle fleets to reduce their emissions intensity. Hydrogen fuels will likely need to be accompanied by Carbon Capture and Storage as 84% of hydrogen production will come from reforming gas into hydrogen and CO2.[9] Electrification of larger vehicles will require an extensive and dependable network of suitably fast charging facilities.

Shipping

Although shipping is not included in Devon's emissions it is worth noting that changes in fuels for shipping (to hydrogen and ammonia) may suggest significant changes in Devon's dockyards.[9] Existing fuel storage infrastructure in Plymouth's dockyards could be important in future alternative fuel distribution networks.

10.10.1 What needs to be done?

Reducing Energy Demand through Logistics

Hauliers are best placed to improve logistics efficiencies in order to reduce the energy demand of their large vehicle fleets. Facilitating collaboration between hauliers and large organisations and supporting them in achieving the required infrastructure, in part through spatial planning, will be important. Devon is well placed to use data insights to enable improvements, such as through the services of the Environmental Futures and Big Data Impact Lab.

Modal Shift

On a localised scale, we can support the modal shift of the final distribution leg to make better use of electric cargo bikes or ultra-low emissions vehicles into our urban areas.

Locally we can safeguard rail freight infrastructure for the future by considering the needs of rail freight in spatial planning strategies. Whilst there are limited levers available locally to stimulate rail freight uptake, Devon can work with regional and national bodies to promote rail freight and to achieve greater support for modal shift.

Identifying the Right Fuels

Efforts to transition large vehicle fleets to non-fossil fuels can be accelerated through collaborative approaches to trials and demonstrations of new fuels. This can lower the risks for partners through shared learnings, leading to increased confidence in the capacity and adoptability of new technologies. Collaborations also hold the possibility of reducing costs through shared infrastructure or collective procurement. This might also include supporting local research and providing land for fuelling stations.

Shipping

There may be opportunities to repurpose existing dockyard infrastructure to support the storage, delivery and distribution of new fuels, such as hydrogen.

10.10.2 The Actions:

T43. Support the provision of electric cargo bikes to enable low-carbon deliveries in urban areas

T44. Work with hauliers to identify opportunities to reduce emissions from freight movement, for example by planning consolidation centres

T45. Trial, demonstrate and share learnings of synthetic fuels, biogas and hydrogen powered HGVs and other large vehicles.

T46. Local Plans to safeguard existing rail freight infrastructure, such as Okehampton and Heathfield lines.

F5. Support the development of on-farm bio-methane collection from agricultural wastes to supply bio-methane for farm machinery. Seize opportunities to trial on County farms together with electrification. (Discussed in more detail in Food, Land and Sea).

Needing Action Beyond Devon

T47. Work with government to restore and promote rail freight grants to incentivise modal shift and provide funding for new terminals and infrastructure

10.11 ACTION SUMMARY TABLE FOR TRANSPORT

Cross Cutting Theme	Action Number	Action	Prioritisation Score
Knowledge sharing, skills and learning; Behaviour transformation and community engagement	**T1**	Provide up-to-date digital information and advice on reducing the need to travel and the most sustainable travel choice	
Spatial Planning	**T2**	Promote development which will assist in relocalisation in all settings (rural through to urban), including mixed use development, development meeting local needs and creating opportunities to live, work and use services locally.	
Finance, economy & resource access	**T3**	Continue to make use of funding opportunities to provide employment and community assets across Devon, particularly where the market is unlikely to provide this, in order to minimise the need to travel for access to services.	
	T4	Ensure that the carbon implications are considered when making efficiency savings to community services	
	T5	Review opportunities to reduce vehicle capacity, particularly where it can support other objectives (i.e. urban centre regeneration, street cafes, active travel routes.)	
	T6	Develop local cycling and walking infrastructure plans (LCWIPs) with communities for each city, town and their surrounding areas.	

KEY				
Potential Carbon Impact				
High	3			
Medium	2			
Low	1			
		1	2	3
	Ease of implementation	Hard e.g. requiring change in	Medium e.g. requires multi-agency	Relatively easy e.g. local actions

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations and Businesses	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils, District and Borough Councils, NHS and Public Health	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils and District and Borough Councils, Town and Parish Councils	City and Town	Within existing resources	
	County Council, Unitary Councils	Will occur everywhere	New local resource required – identified but not secured	Government active travel funding, related to Covid

Cross Cutting Theme	Action Number	Action	Prioritisation Score
	T7	Improve strategic cycle routes within and between settlements.	
	T8	Greater provision of cycle training, including bike maintenance and repair	
	T9	Where possible, design pavements and junctions to prioritise pedestrians and cyclists over vehicular traffic.	
Behaviour transformation and community engagement	T10	Enable schemes that would allow residents to trial different types of cycles.	
	T11	Introduce reduced speed limits for safer shared public space.	
	T12	Provide support for bike rental schemes	
Spatial Planning	T13	Local Plans to ensure new developments are designed with filtered permeability to promote sustainable travel	
	T14	Implement car free days in Devon's urban areas	
	T15	Help develop innovative transport solutions in rural areas	
	T16	Promote car sharing technology and platforms to make it easier to link drivers and passengers	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	County Council, Unitary Councils	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils, Community Organisations, Education Establishments, Businesses	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils	Will occur everywhere	Within existing resources	
	Businesses, Community Organisations	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations	Will occur everywhere	New local resource required - yet to be identified	Government active travel funding, related to Covid
	County Council, Unitary Councils, District and Borough Councils	City and Town, Suburbs	Within existing resources	
	County Council, Unitary Councils	City and Town	Within existing resources	
	County Council, Unitary Councils	Rural	New local resource required - yet to be identified	
	Local Enterprise Partnership, County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations and Businesses	Will occur everywhere	Within existing resources	

Cross Cutting Theme	Action Number	Action	Prioritisation Score
	T17	Introduce Ultra-Low-Emission-Vehicle taxis by placing requirements on the licensing process.	
Finance, economy & resource access; Procurement and commissioning	T18	Explore long term sustainable options for community and voluntary sector transport.	
	T19	Extend the prevalence of true bus priority on the highway	
	T20	Enhancement of bus priority measures, including bus lanes and bus-only streets, to make bus travel relatively more attractive than driving	
Finance, economy & resource access; Procurement and commissioning	T21	Protect and seek to enhance funding for financially-supported local bus routes, to ensure people can continue to access services, employment and events without requiring access to a car.	
	T22	Promote Total Transport, integrating various transport services (school transport, public bus services, patient transport etc.) to enable more efficient use of vehicles and reduce dead mileage.	
Finance, economy & resource access; Procurement and commissioning	T23	Request that national government removes VAT from bicycles and e-bikes.	
	T24	Through the Peninsula Sub-National Body work with government to pilot and implement a low carbon fuel solution for rail travel in the South West.	
	T25	Through the Peninsula Sub-National Transport Body, work with government to improve strategic and branch line rail infrastructure and services, including reviewing the reopening of lines and increasing access to rail and integration with other modes of transport. Work with government for required funding.	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	Unitary Councils and District and Borough Councils	City and Town	Within existing resources	
	County Council, Unitary Councils, Town and Parish Councils and Community Organisations	Rural	Within existing resources	
	County Council, Unitary Councils	City and Town	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils	City and Town	Within existing resources	
	County Council, Unitary Councils	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils and District and Borough Councils, NHS and Public Health	Will occur everywhere	Within existing resources	
	All partners	Will occur everywhere	Within existing resources	
	Local Enterprise Partnership, County Council, Unitary Councils, Businesses	Will occur everywhere	New local resource required - yet to be identified	
	Local Enterprise Partnership, County Council, Unitary Councils, Businesses	Will occur everywhere	New local resource required - yet to be identified	

Cross Cutting Theme	Action Number	Action	Prioritisation Score
	T26	DCE to write to government, giving their support to increase the fixed penalties for idling under The Road Traffic (Vehicle Emissions) (Fixed Penalty) (England) Regulations 2002, from £20 to £50. Implement an awareness raising campaign for the public.	
Finance, economy & resource access; Procurement and commissioning	T27	Work with government to greater reflect and prioritise the cost of carbon in highway funding decisions.	
	T28	Take advantage of opportunities arising from the upcoming National Bus Strategy to deliver long-term, sustained improvements in bus services	
	T29	Greater provision of cycle parking across Devon and at key interchange locations	
Spatial Planning	T30	Ensure provision of mobility hubs in new developments of appropriate size, where modal change can occur easily.	
	T31	Ensure public transport enables easy transition to active travel for the first and last mile.	
	T32	Introduce integrated ticketing	
	T33	Create nodal car parks at strategic points to encourage onward car sharing	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	Unitary Councils, District and Borough Councils and NHS and Public Health	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils	Will occur everywhere	New local resource required – identified but not secured	Related to the upcoming National Bus Strategy
	District and Borough Councils, Town and Parish Councils, Education Establishments, NHS and Public Health, Businesses, Community Organisations	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils and District and Borough Councils	City and Town, Suburbs	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils, Businesses	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils and Businesses	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils	City and Town, Suburbs	New local resource required - yet to be identified	

Cross Cutting Theme	Action Number	Action	Prioritisation Score
	T34	Develop an electric vehicle strategy to increase electric vehicle charging provision across Devon, including in key public spaces and workplaces, on street charging and plans to address the tourism sector.	
Spatial Planning	T35	Local Plans to ensure provision of Electric Vehicle charging points where parking spaces are provided in new developments	
	T36	Electric charging and shared mobility on DCE member owned assets	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations, Local Enterprise Partnership, Businesses	Will occur everywhere	Within existing resources	Use aggregated purchasing power to reduce costs of vehicles and charging infrastructure •Existing fleet management budgets. •Fuel bill and maintenance savings •Government grant and incentives as available.
	Unitary Councils, District and Borough Councils	Will occur everywhere	Within existing resources	
	All partners	Will occur everywhere	New local resource required - yet to be identified	•Use aggregated purchasing power to reduce costs of vehicles and charging infrastructure •Existing fleet management budgets. •Fuel bill and maintenance savings •Government grant and incentives as available.

Cross Cutting Theme	Action Number	Action	Prioritisation Score
	T37	DCE partner organisations and larger businesses in the county to transition their fleets to Ultra Low Emission Vehicles, including shared cycles and ecargo bikes.	
	T38	Support operators to decarbonise bus fleet, e.g. through supporting applications for central government funding	
Finance, economy & resource access	T39	Seek opportunities for funding for moving public transport fleets across to zero or low carbon	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	All partners, Businesses	Will occur everywhere	New local resource required - yet to be identified	•Use aggregated purchasing power to reduce costs of vehicles and charging infrastructure •Existing fleet management budgets. •Fuel bill and maintenance savings •Government grant and incentives as available.
	County Council, Unitary Councils, District and Borough Councils	Will occur everywhere	New local resource required – identified but not secured	•Existing fleet management budgets. •Government grant and incentives as available.
	County Council, Unitary Councils, Businesses	City and Town	New local resource required - yet to be identified	•Existing fleet management budgets. •Fuel bill and maintenance savings •Government grant and incentives as available. •Aggregated demand and procurement to deliver savings and economies of scale.

Cross Cutting Theme	Action Number	Action	Prioritisation Score
	T40	Work with government to ensure financial incentives are set at the required level to encourage the purchase of ultra-low emissions vehicles	
	T41	Work with government to ensure electricity supplies in new buildings provide capacity for electric vehicle charging, including shared charging facilities in high-density development.	
Knowledge sharing, skills and learning	T42	Seize opportunities to trial low carbon propulsion for aviation.	
Spatial Planning	C4	Local Plans and Neighbourhood Plans to demonstrate how they will shape places in ways that contribute to radical reductions in greenhouse gas emissions to facilitate the achievement of Net-Zero in Devon, as a primary planning objective. This must include the requirement for new development to provide credible plans for it to contribute to Devon's net-zero carbon future.	
	T43	Support the provision of electric cargo bikes to enable low-carbon deliveries in urban areas	
	T44	Work with hauliers to identify opportunities to reduce emissions from freight movement, for example by planning consolidation centres	
Knowledge sharing, skills and learning	T45	Trial, demonstrate and share learnings of synthetic fuels, biogas and hydrogen powered HGVs and other large vehicles.	
Spatial Planning	T46	Local Plans to safeguard existing rail freight infrastructure.	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	Local Enterprise Partnership, County Council	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils	Will occur everywhere	Within existing resources	
	Local Enterprise Partnership and County Council	City and Town, Suburbs	New local resource required - yet to be identified	
	Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations, Individuals	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils and District and Borough Councils, Community Organisations and Businesses	City and Town	New local resource required - yet to be identified	
	Local Enterprise Partnership, County Council, NHS and Public Health, Businesses	City and Town	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils, Businesses	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils and District and Borough Councils	Will occur everywhere	Within existing resources	

Cross Cutting Theme	Action Number	Action	Prioritisation Score
Knowledge sharing, skills and learning	F5	Support the development of on-farm bio-methane collection from agricultural wastes to supply bio-methane for farm machinery. Seize opportunities to trial on County farms together with electrification. (Discussed in more detail in Food, Land and Sea).	
Knowledge sharing, skills and learning	T47	Work with government to restore and promote rail freight grants to incentivise modal shift and provide funding for new terminals and infrastructure	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	County Council, Businesses, Farmers	Rural	New local resource required - yet to be identified	
	Local Enterprise Partnership, County Council, Unitary Councils	Will occur everywhere	New local resource required - yet to be identified	

[1] T. A. Mitchell, October 2020, Devon Greenhouse Gas Emissions 2018, CENTRE FOR ENERGY AND THE ENVIRONMENT
[2] Banister, 2008, The sustainable mobility paradigm, Transport Policy, Vol 15. Issue 2, p 73-80 https://www.sciencedirect.com/science/article/abs/pii/S0967070X07000820?via%3Dihub
[3] Independent Transport Commission, 2010, Long Distance Travel in Britain: Prospects in a time of uncertainty , http://www.theitc.org.uk/docs/2.pdf, accessed 5/10/2020
[4] Morgan,J. July 2020, Electric vehicles: the future we made and the problem of unmaking it, Cambridge Journal of Economics, Volume 44, Issue 4, , Pages 953–977, https://academic.oup.com/cje/article/44/4/953/5859377
[5] Devon County Council, Planetary and Human Health: Public Health Annual Report 2019-20, https://www.devonhealthandwellbeing.org.uk/aphr/2019-20/ , accessed 5/10/2020
[6] Department for Business, Energy & Industrial Strategy, 2020, BEIS Public Attitudes Tracker (March 2020, Wave 33, UK), UK
[7] Department for Transport, 16 January 2020, Statistical Release: National Travel Attitudes Study, Wave 2, UK
[8] Jennings, N. et al. , 2019, Co-benefits of climate change mitigation in the UK: What issues are the UK public concerned about and how can action on climate change help to address them?, Grantham Institute Briefing Paper, 31, Grantham Institute, Imperial College, London
[9] D. Lash, A. Norton & T. A. Mitchell , August 2020, Net Zero Devon, CENTRE FOR ENERGY AND THE ENVIRONMENT, Internal document 974
[10] Preliminary calculations by the Net-Zero Task Force
[11] Inigo Capellan-Pereza,b,⊠, Carlos de Castroa,c, Luis Javier Miguel Gonzaleza,b, 2019, Dynamic Energy Return on Energy Investment (EROI) and material requirements in scenarios of global transition to renewable energies, Energy Strategy Reviews 26 , 100399 https://www.sciencedirect.com/science/article/pii/S2211467X19300926?via%3Dihub
[12] Ministry of Housing, Communities & Local Government, 2019, National Planning Policy Framework, accessed 3/9/2020 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf
[13] Royal Town Planning Institute, RTPI, 2020, Plan The World We Need: The contribution of planning to a sustainable, resilient and inclusive recovery, p8, accessed 26/8/2020 https://www.rtpi.org.uk/media/5688/plantheworldweneed_june2020.pdf
[14] Foundation for Integrated Transport, Transport for New Homes
PROJECT SUMMARY AND RECOMMENDATIONS JULY 2018, https://www.transportfornewhomes.org.uk/wp-content/uploads/2018/07/transport-for-new-homes-summary-web.pdf
[15] Ministry of Housing, Communities & Local Government, Planning , August 2020, Planning for the Future, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/907647/MHCLG-Planning-Consultation.pdf
[16] Connecting Devon and Somerset, 2020, About Connecting Devon and Somerset, https://www.connectingdevonandsomerset.co.uk/about-us/#:~:text=Connecting%20Devon%20and%20Somerset%20has%20been%20set%20up,to%20bring%20superfast%20broadband%20to%20Devon%20and%20Somerset.
[17] Titheridfe, H. Christie, N. Mackett, R. Oviedo Hernandez D., Ye R. 2014, Transport and Poverty, A review of the evidence, https://www.ucl.ac.uk/transport/sites/transport/files/transport-poverty.pdf
[18] Campaign for Better Transport, 2020, New roads create new traffic, accessed 3/9/2020 https://bettertransport.org.uk/roads-nowhere/induced-traffic
[19] Sloman, L. , Hopkinson, L., and Taylor, I., 2017, The Impact of Road Projects in England, Transport for Quality of Life, Commissioned by CPRE accessed 3/9/2020 https://www.cpre.org.uk/wp-content/uploads/2019/11/TfQLZ-ZTheZImpactZofZRoadZProjectsZinZEnglandZ2017.pdf

[20] CPRE, 2017, The end of the road? Challenging the road-building consensus accessed 3/9/2020 https://www.cpre.org.uk/resources/the-end-of-the-road-challenging-the-road-building-consensus/

[21] Committee on Climate Change, 2019, Net Zero Technical Report, https://www.theccc.org.uk/publication/net-zero-technical-report/

[22] Spaced out: perspectives on parking policy, 2012, Spaced Out Perspectives on Parking http://www.racfoundation.org/research/mobility/spaced-out-perspectives-on-parking

[23] Bob the Bus accessed 5/10/2020 http://bobthebus.org.uk/

[24] Bwcabus, accessed 5/10/2020 https://www.bwcabus.traveline-cymru.info/about-us/

[25] Jennings, N. et al. , 2019, Co-benefits of climate change mitigation in the UK: What issues are the UK public concerned about and how can action on climate change help to address them?, Grantham Institute Briefing Paper, 31, Grantham Institute, Imperial College, London

[26] Cycling UK, 2016, Cycling and the Economy, https://www.cyclinguk.org/campaigning/views-and-briefings/cycling-and-economy

[27] Cycling UK, 2016, Cycling and the Economy, https://www.cyclinguk.org/campaigning/views-and-briefings/cycling-and-economy

[28] IEA, 2019, Growing preference for SUVs challenges emissions reductions in passenger car market, IEA, Paris https://www.iea.org/commentaries/growing-preference-for-suvs-challenges-emissions-reductions-in-passenger-car-market

[29] Jennings, N. et al. , 2019, Co-benefits of climate change mitigation in the UK: What issues are the UK public concerned about and how can action on climate change help to address them?, Grantham Institute Briefing Paper, 31, Grantham Institute, Imperial College, London

[30] 2018, Europe's Aerospace Powerhouse: Think Aerospace, Think UK South West https://heartofswlep.co.uk/wp-content/uploads/2018/11/European-Aerospace-Powerhouse.pdf

[31] Allwood, J.M.a, Dunant, C.F.a, Lupton, R.C.b, Cleaver, C.J.a, Serrenho, A.C.H.a, Azevedo, J.M.C.a, Horton, P.M.a, Clare, C.c, Low, H.e, Horrocks, I.e, Murray, J. c, Lin, J.f, Cullen, J.M.a, Ward, M. d, Salamati, M.d, Felin, T.e, Ibell, T. b, Zho, W.f, Hawkins, W b., 2019, Absolute Zero, UK FIRES,