Harrogate New Settlement DPD Climate Change Strategy

Final Report

Prepared by Third Revolution Projects on behalf of Harrogate Borough Council

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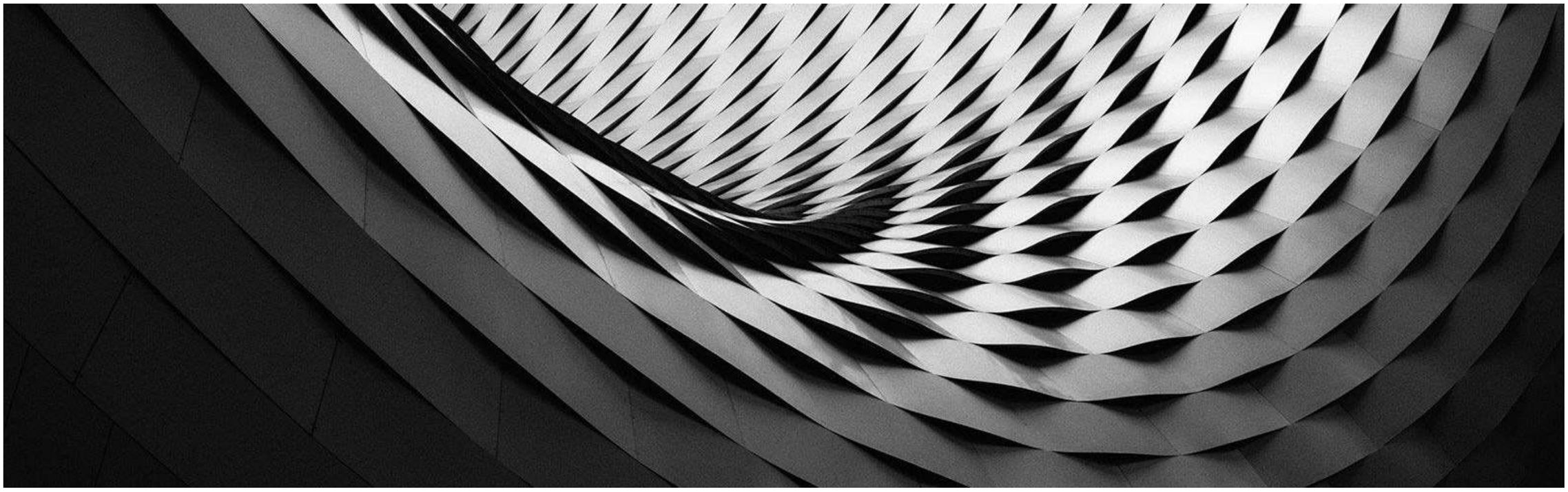

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1. Introduction

Third Revolution are planning and sustainability consultants and have been engaged by Harrogate Borough Council (HBC) to create a climate change strategy for the proposed new settlement around Cattal. The aim is to support delivery of the Borough's Carbon Reduction Strategy target of a net zero carbon economy by 2038[1].

The development takes place against the backdrop of major social, environmental, technological and economic change. Playing out over several decades, major global and local trends will be critical factors in its success. Understanding these is an essential part of creating a sustainable, future-proofed, commercially successful place that also delivers the homes, jobs and infrastructure needed in the Harrogate area. Development that does not do this, risks becoming obsolete before it's even completed.

Therefore, in creating the strategy, we are effectively engaged in future planning – designing a place in 2022 that meets the needs of residents in 2032 and beyond – and success requires that we think exponentially about technology and in societal leaps. This in itself poses a challenge since the human brain tends to think of the future as being similar to the present, perhaps with a linear progression of change. However:

- Change in technology tends to happen exponentially. Solar power or electric vehicles (EVs) for example have seen deployment and cost reductions double every year or so for many years. The impact is barely seen in the early years as volumes are so small, but suddenly a doubling from say 4 percent to 8 to 16 percent of electricity supply or vehicle sales happens in a short space of time and the technology becomes impossible to ignore.
- Societal change tends to happen more slowly and often requires a major societal event for change to leap forward. For example, the 2008 financial crash, followed by the Covid 19 pandemic have seen gradual trends towards home and hybrid working become mainstream.

The implications of these changes for places are profound. The Climate Change Strategy helps understand these and guide the process of future planning by placing ourselves in the shoes of those future residents, asking what their priorities will be and establishing how positive change can be achieved in today's constraints.

The outputs will provide an evidence base for policy in the emerging New Settlement Development Plan Document (DPD), propose policies and delivery mechanisms, and will also inform discussions with the site promoter, with the aim of delivering the highest possible standard of development.

1.1 Our approach

The project focusses on four interrelated climate change themes:

- Net zero carbon and active travel
- Net zero carbon energy supply and use
- Flexible living and working
- Climate resilience

The study focusses mainly on topics that will not be addressed through regulation. For example, the carbon emitted from new homes will be reduced in stages through the Future Homes Standard and current Government policy is to prevent local policy from seeking additional standards. However, there are currently no regulatory means to secure reductions in embodied carbon, the infrastructure needed for zero carbon places or measures to reduce carbon in the wider community, such as transport and neighbourhood structures. These will be the primary focus for this work.

The study began by creating a framework to explore the interaction between the drivers of climate change, technology, societal and economic change, and the resulting revolutions in net zero carbon movement, energy supply and use, flexible living and working and climate resilience – known as DROP (drivers-revolutions-opportunities). These are illustrated in Figure 1. Researching these allowed the team to identify the planning measures and infrastructure needed in the decades to come, either to support delivery or to avoid detrimental outcomes.

The findings are presented in the next section and were tested at workshops with stakeholders, including the project team, Harrogate Climate Change Coalition and the site promoter. Following the workshops, a set of ambitions and priorities were developed, which shaped a series of recommendations. These will inform the DPD and underpin negotiations with the scheme promotor, including:

- Draft planning policies.
- An evidence base to justify policy approaches.
- Mechanisms for securing the ambitions and ensure their long-term stewardship.
- Defining where further technical work would be needed and when.

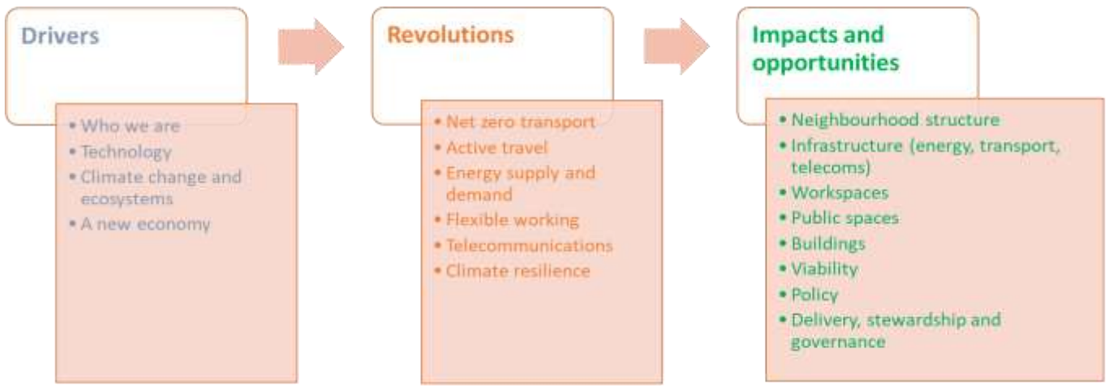

Figure 1 - Drivers-Revolutions-Opportunities (DROP) Framework

2. The evidence Base

This section presents the findings of the DROP analysis. It is structured around the four interrelated climate change themes noted in Section 1.1. The research has combined national with trends that are as local as data is available.

The risks and opportunities are presented at the end of each theme and conclusions drawn on the priorities for climate policy and delivery.

2.1 Net zero carbon and active transport

2.1.1 Societal drivers interacting with revolutions in net zero carbon and active travel

Nationally, there has been a consistent decline in car use over the past 20 years, both in terms of journey numbers and vehicle miles driven (Figure 2). The National Transport Survey reveals around 105 fewer car trips per person since 2002, albeit a flattening over the past 10 years. It also shows a 10% increase in cycling trips and 41% increase in distance (to 2019), with some increase in trips (and huge in terms of miles) during the pandemic year of 2020.[2]

But North Yorkshire (including Harrogate) vehicle miles buck this trend, with figures showing a substantial rise from 2012 following a drop during the recession. However, car miles driven do seem to be flattening out (Figure 3).

On the other hand, car trips per person have been consistently lower than the England average (excluding London) in the Yorkshire and Humber region[3]. Having fallen in the years from 2002 to 2010, they have risen again. The statistics are more variable relative to its regional neighbours, but dramatic falls in the West Midlands suggests that significant trip reduction is possible.

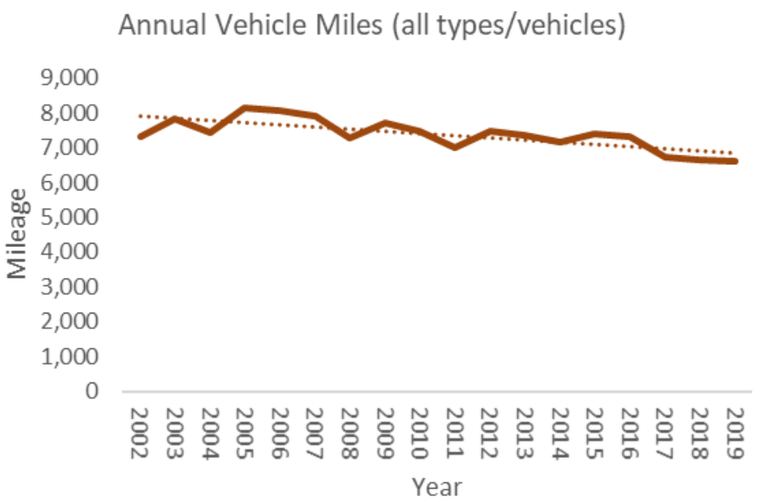

Figure 2 - Vehicle miles driven nationally, excluding 2020 (DfT)

4.51 billion vehicle miles were travelled on roads in North Yorkshire in 2020.

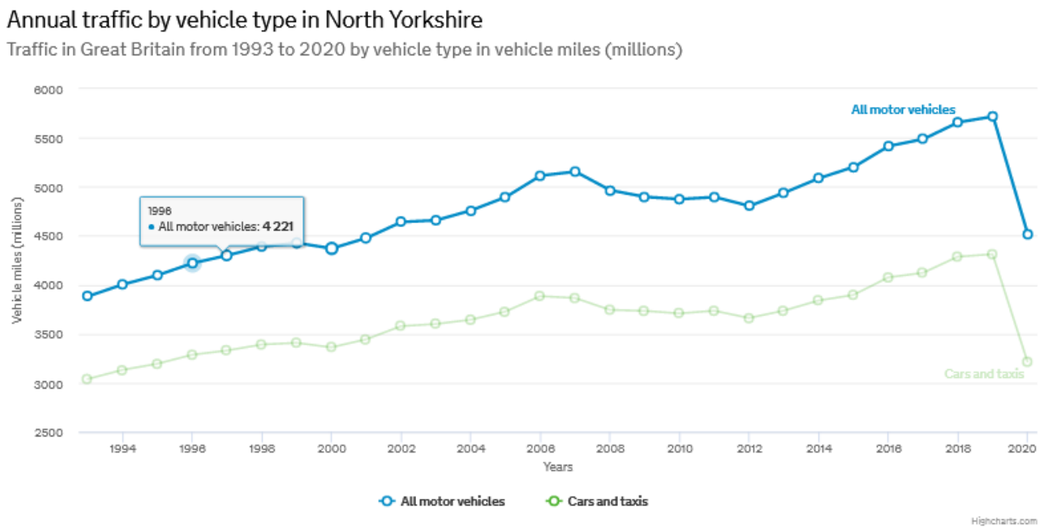

Figure 3 - Vehicle miles driven in North Yorkshire[4]

Holders of driver licences tail off significantly aged 65 (Figure 4) and over and so by the late 2020s when construction of the new settlement begins, many of the largest current cohort of drivers (those currently in their late 50s) will be driving less.[5] Young people are also less likely to own cars, but this is currently being offset by older people driving more.[6] However, data reveals that fewer younger people likely to learn to drive in next 5 years (Figure 5), suggesting they will never learn and so the long-term outlook is likely to see fewer drivers.

The reasons given for not learning shows *"no interest in learning"* jumping significantly for all cohorts in the ten years from 2009. Cost factors (learning and owning) have become more important, and some of the youngest seem too busy to learn in 2019! Interestingly, those citing environmental reasons have declined – maybe because of growth in EVs implies driving has less of an impact than it did (Figure 6[7]).

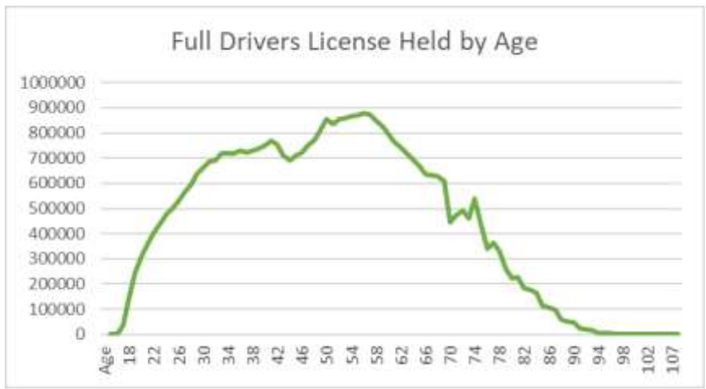

Figure 4 - Holders of driver licences by age cohort (GB Driving Licence Data, DfT, October 2021)

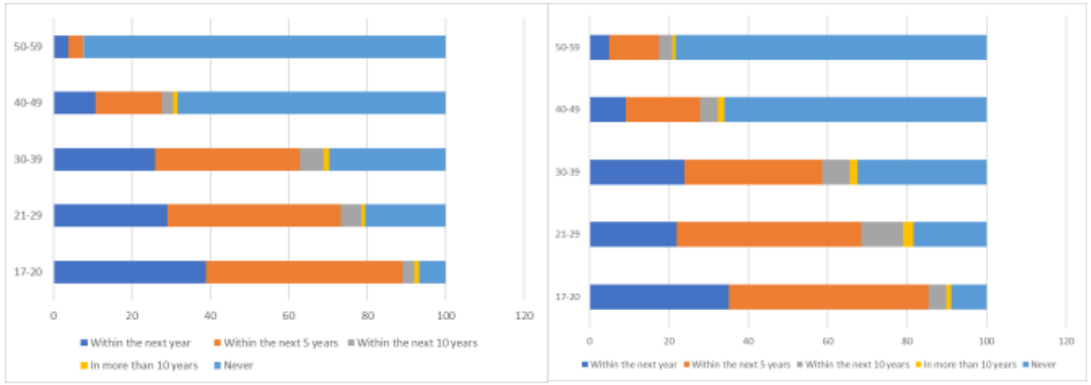

Figure 5 - Likelihood of learning to drive 2010 (left) and 2019 (right)[8]

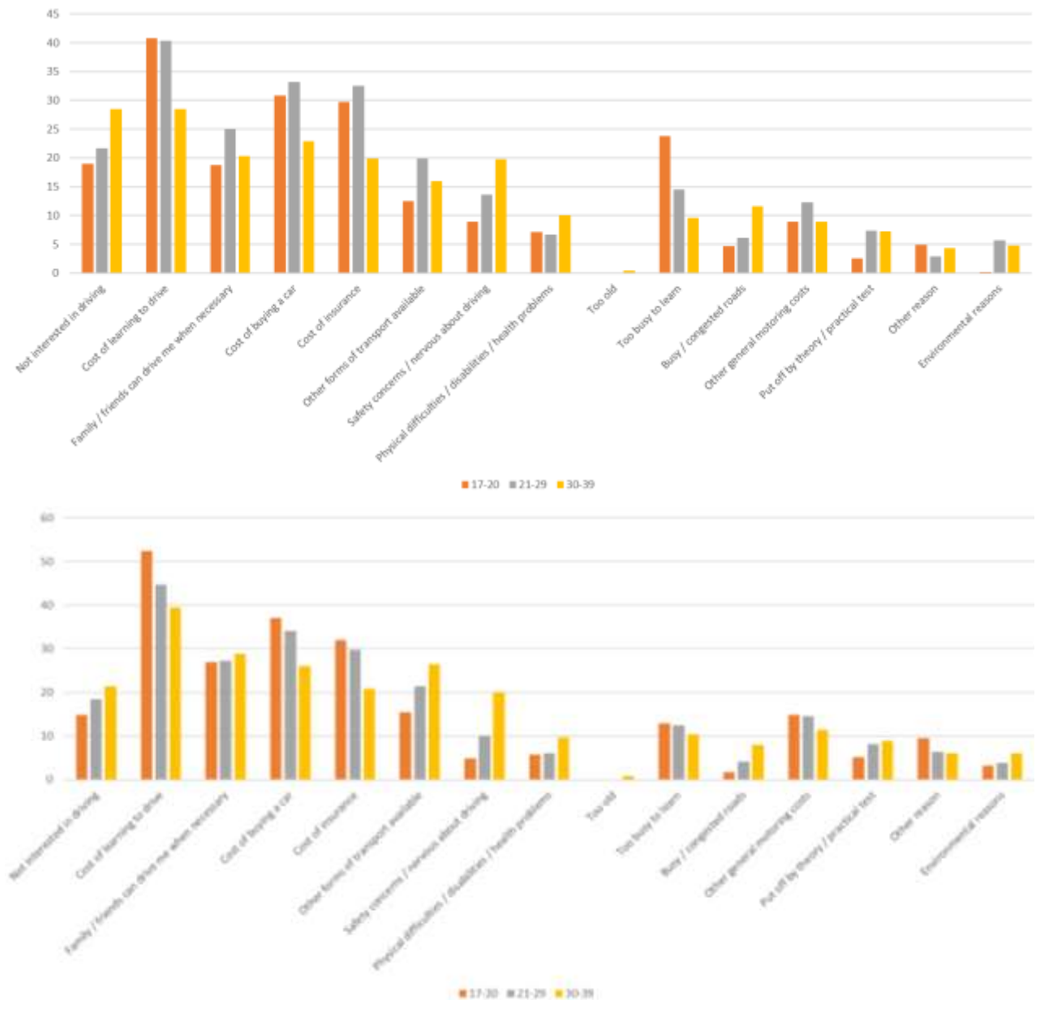

Figure 6 – Main reasons for not learning to drive (aged 17 to 39) – 2009 (top) 2019 (bottom)

The health benefits of active travel are significant[9]:

- Life threatening conditions could be prevented
- Regular cycling to work is associated with a 45% lower risk of developing cancer and a 46% lower risk of developing heart disease, compared to commuting by car or public transport.
- Those cycling and walking are often exposed to significantly lower levels of air pollution than those in vehicles travelling along the same urban routes.

2.1.2 Technology drivers interacting with revolutions in net zero carbon and active travel

UK-wide ultra-low emission vehicle (ULEV) sales are growing exponentially and at the expense of petrol and diesel vehicles. While the number remain relatively small as a proportion of the total fleet, it is reasonable to assume they will rapidly replace the incumbents during the 2020s.

ULEVs registered in Harrogate are significantly higher than national average[10].

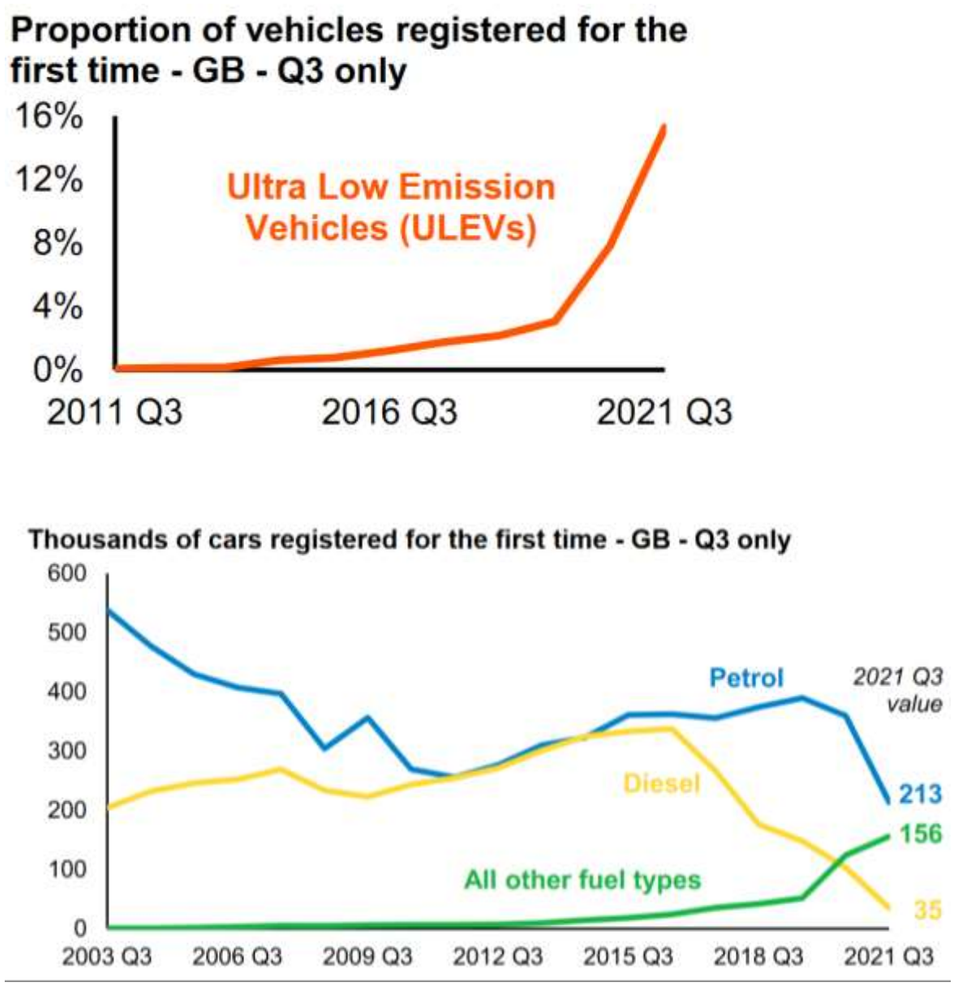

Figure 7 - Exponential growth in ultra-low emission vehicles (ONS Vehicle Licencing Statistics, 2021[11])

Investment in e-hailing mobility services is growing faster than any other within the industry[12] and there is some evidence that they reduce reliance on cars[13]. Examples include:

- Ride sharing
- Car clubs have grown by 765 percent in 10 years to 2017[14]
- Shared access to vehicles, which is enabled by technology
- Bike share schemes have increased from 26 location in 2017 to 33 in 2021[15]
- E-scooters can help local mobility, with York currently hosting a trial[16]

More than half of vehicles are now internet connected which allows for data to be used to manage congestion and monitor parking demand (extrapolated data[6]). More people use smartphones for travel planning, which allows real time information to inform choice of modes and journey routes.

According to the Government's Future of Mobility[6], road traffic could grow 55 percent between 2015 and 2050 if ride sharing fails to take off and vehicle occupancy decreases from 1.5 to 1.3. If ride-sharing becomes embedded and average vehicle occupancy increases from 1.5 to 1.7, growth in road traffic during the same period could be lower at 5%.

Scaled-back estimates of automated vehicles could be 66% of total passenger miles by 2040. The implications are very significant as road traffic could increase to 71 percent if self-driving vehicles also widen access to mobility and allow passengers to use their time in the vehicle more productively.

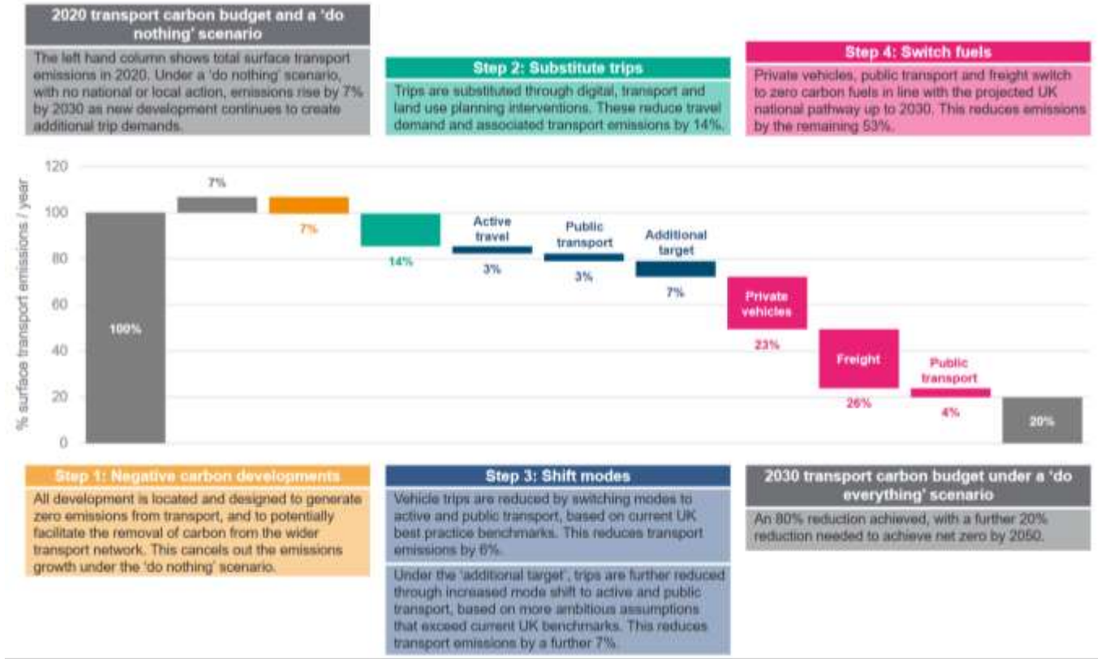

Figure 8 - An 80% carbon reduction pathway for 2020 to 2030 (RTPI/LDA Design, 2021[17])

2.1.3 Climate change drivers interacting with revolutions in net zero carbon and active travel

Tyndall Centre research for the Royal Town Planning Institute and LDA Design concludes that surface transport emissions need to reduce by 80% by 2030 to keep on track to the national target of net zero by 2050 (Figure 8). Critically, the switch to ULEVs only accounts for just over half of the necessary 2030 reductions. The remainder must come from design and planning, trip substitution (such as digital or home working) and modal shift to active and public transport.

2.1.4 Economic drivers interacting with revolutions in net zero carbon and active travel

The proportion of retail sales online rose to 26.6 percent in December 2021 from 19.7 percent in February 2020 before the pandemic. Takeaways made up 8 percent of food services pre-2020[18].

Growth in *"dark kitchen"* food deliveries (i.e. food preparation for delivery only, with no sales counter) has been particularly strong in northern England and up 12 percent in 2020 alone[19].

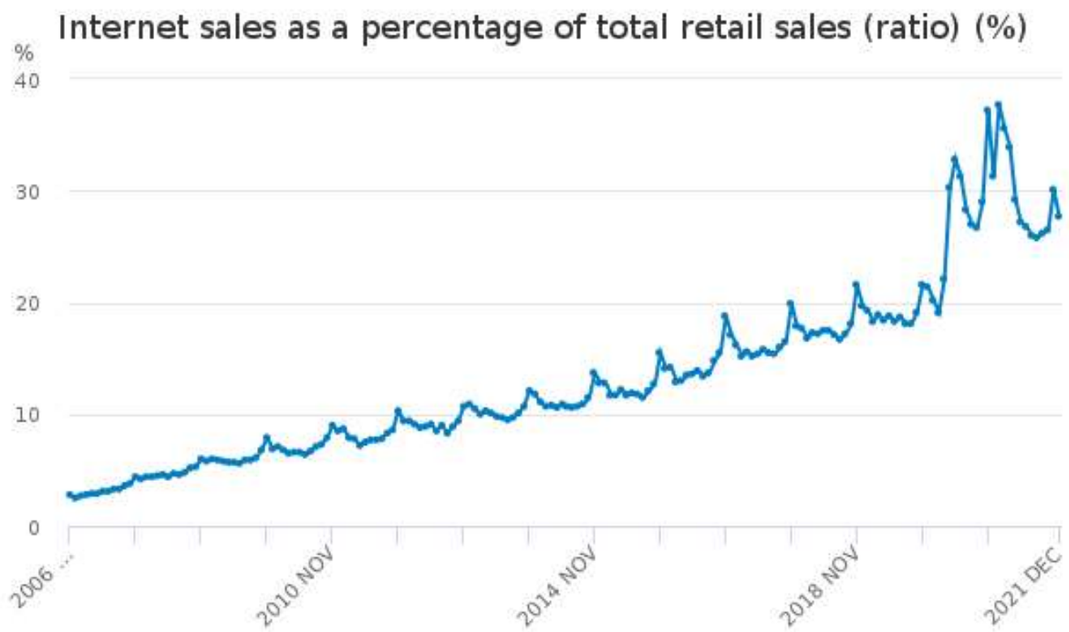

Figure 9 - Growth in internet sales[20]

2.1.5 Risks, opportunities and priorities from transport drivers and revolutions

The following risks and opportunities for the new settlement can be drawn from the analysis of drivers and revolutions:

- Fewer vehicle miles and trips across England (outside of London), suggest modal shift is possible.
- Fewer younger people learning to drive illustrates importance of providing alternative modes.
- Exponential growth in ULEVs will lead to significantly reduced carbon emissions in the new settlement from day-one secured through the market (i.e. do nothing). However,
  - The switch to cleaner fuels only accounts for just over half of the necessary 2030 reductions.
  - Electrification of transport will have an impact on electricity demand and the potentially viability of connecting the new settlement to the electricity grid.
  - New forms of infrastructure, such as on-street vehicle charging could lead to urban clutter.
  - There is a risk that people think they've done their bit for the environment and don't see the value in considering alternative modes.
- Growth in on-demand mobility services can reduce car ownership. But fully automated vehicles could be an extremely cheap mode of transport for those without cars or the ability to drive. In such a scenario public transport provision may not be viable.
- Today's younger people will make up a significant proportion of new residents and they will expect their choice of place to deliver on demand services.

Therefore, the priorities for a net zero carbon and active travel settlement are to:

- Design-in access to services, facilities and places by foot, cycle, micro-mobility and digitally to embed habits from first occupation.
- This will help secure benefits for health, carbon emissions and development viability, e.g. reducing need for expensive and space hungry roads and car parking.
- Design for growth in on-line retail and food services by including the necessary infrastructure, retail and logistics space because it will be expected by today's younger people and it will help avoid congestion and private travel.
- Provide for very high capacity telecoms services to support connected travel and monitoring of changing demand (e.g. for road space, modal split and parking) over time.

2.2 Net zero carbon energy supply and use

2.2.1 Climate drivers interacting with revolutions in energy

The 2015 United Nations Paris Agreement was reaffirmed at the Glasgow 2021 Conference of the Parties (COP26). It aims to keep global temperatures well below 2°C and pursue 1.5°C.

Harrogate Borough's emissions are dropping. But only around 20 percent is currently being delivered by renewable energy sources, compared to around 45% for Great Britain[21].

The Tyndall Centre carbon budget for Harrogate illustrates that to deliver on the Paris commitments requires reductions in CO_2 from energy of 13.4 percent per year. It is recommended that Harrogate promote the deployment of low carbon electricity generation within the region. Delivering the Carbon Reduction Strategy's[1] target of net zero by 2038 is even more challenging.

The Strategy defines net zero as becoming a carbon neutral in its own operations and promoting and supporting activity to help the Harrogate district as a whole to be carbon neutral by 2038. This includes new and existing buildings, transport, working practices, partnership and monitoring, plus the new settlement itself.

A balanced pathways for carbon abatement to 2038 identified by the York and North Yorkshire LEPLEP requires transport emissions reduce by 75%, buildings by 86% and power by 68%[22].

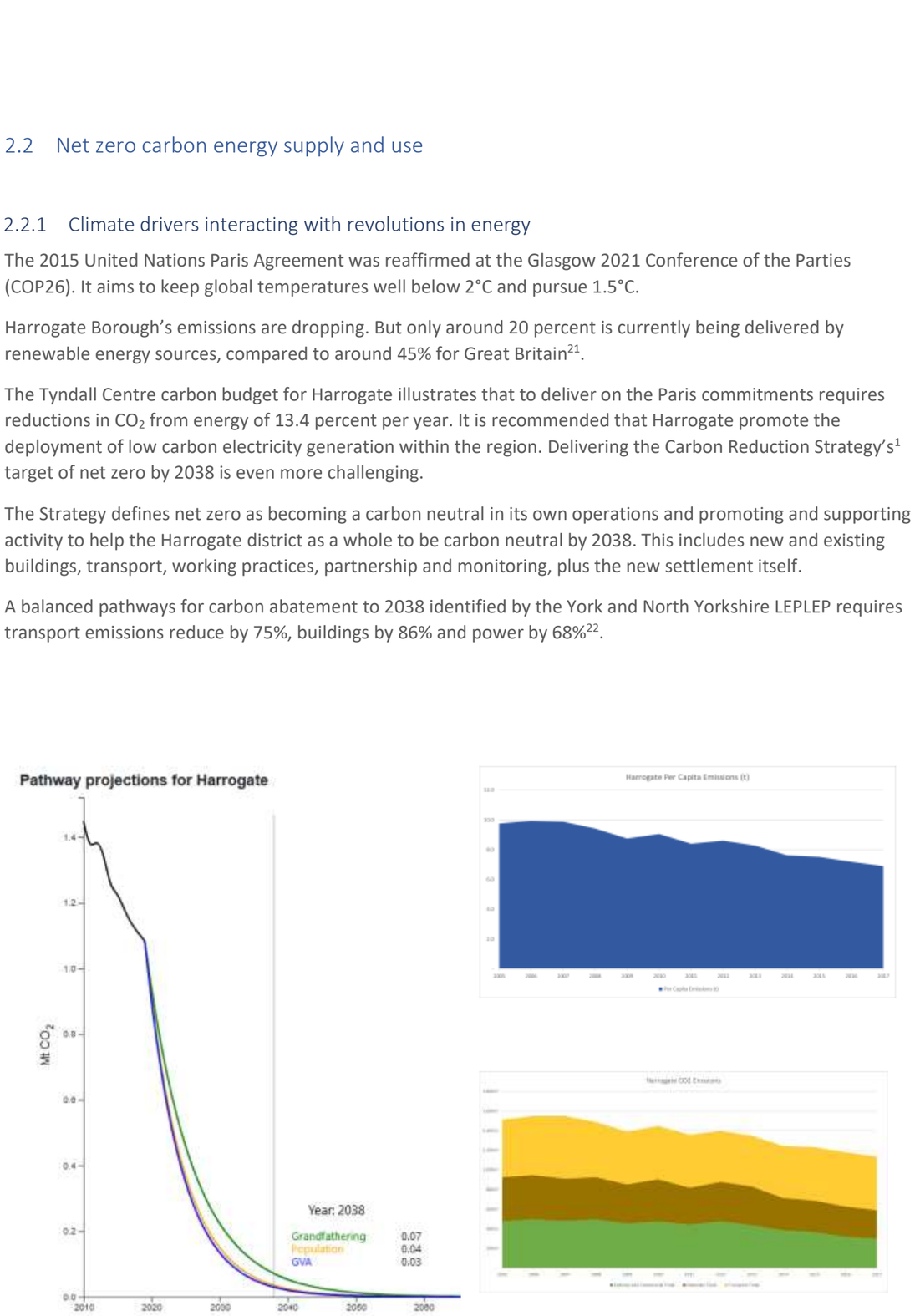

Figure 10 - Total (bottom right) and per capita CO_2 emissions in Harrogate (top right) and the Tyndall Centre's pathways to net zero projection (left)[23]

2.2.2 Economic drivers interacting with revolutions in energy

The York, North Yorkshire and East Riding Local Enterprise Partnership (LEP) Local Energy Strategy[24] is based on 4 elements: place-based strategic priorities; high-impact low carbon energy technologies; designing circular systems; and cross-cutting strategic enablers. Each will be important for delivering emissions reductions in the new settlement (Figure 11). The Strategy concludes:

- ULEVs could reduce carbon emission by 1.2 Mt/year CO_2 and associated gross value added (GVA) is expected to grow rapidly to become around 12 times its current size by 2030. Installation and maintenance of charging infrastructure is expected to provide the most substantial opportunity for job creation and increased economic output in the EV value chain.
- The LEP economy is worth £24.6 billion, with the energy sector contributing to 1.9 percent of total GVA. This is above the national contribution of 1.7 percent.
- In terms of employment, the energy sector is above the UK average but a relatively small component of total employment, reflecting the highly productive nature of the sector.

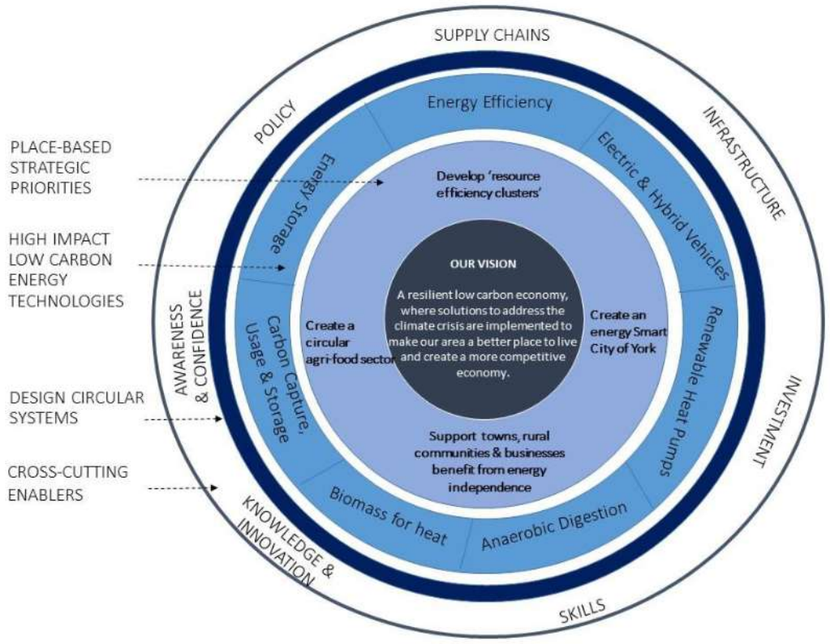

Figure 11 - LEP Local Energy Strategy's Strategic Framework

2.2.3 Technology drivers interacting with revolutions in energy supply and demand

The Government's Net Zero Strategy commits to a decarbonised power sector by 2035 and notes that renewable and net zero technologies are often already cheaper than traditional sources, such as gas and nuclear.

Energy demand is projected by National Grid to reduce in all scenarios, but heat and transport will become electrified, requiring significant investment in energy supply and a growth in electricity demand[25]. This additional demand will have major implications for the ability and cost of connecting many large-scale developments, such as the new settlement at Harrogate, to the electricity grid.

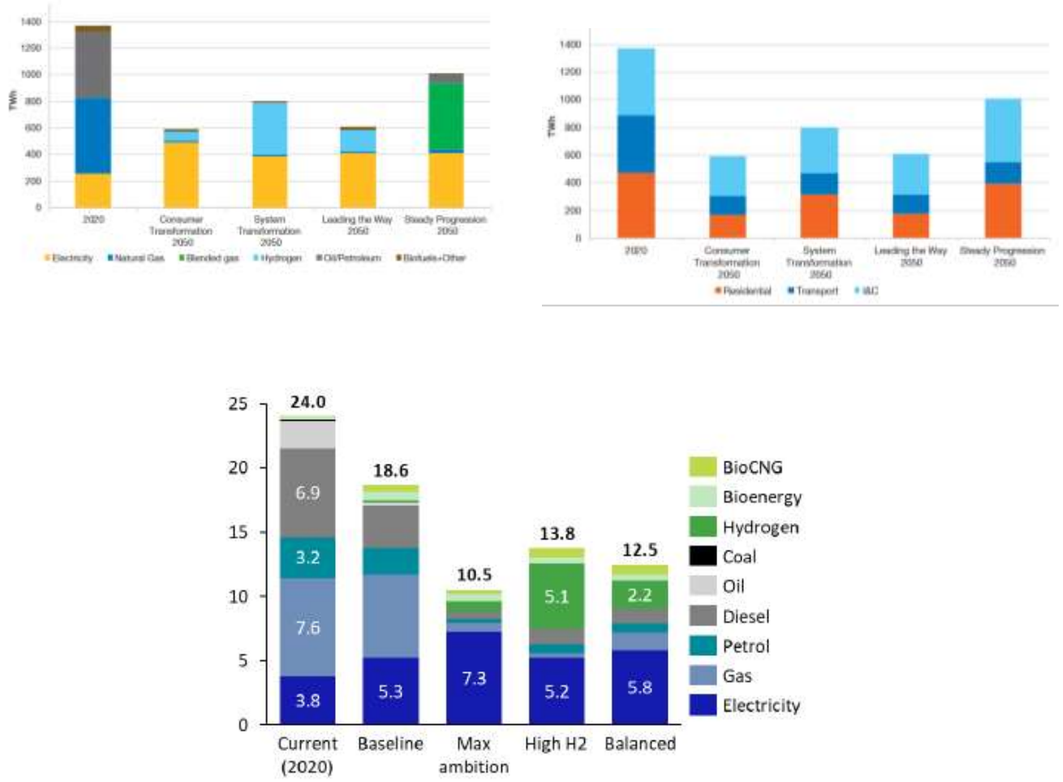

Figure 12 - National Grid's Future Energy Scenarios show demand falling to 2050 but electricity fulfilling much of this (top left and right). Right – fuel use scenarios in the LEP area.

The Government's proposed Future Homes and Buildings Standards[26] will reduce emissions relative to buildings constructed today from 2025without local planning policy action. These will cover building fabric, low carbon heat supply, risk of overheating, and result in buildings that are *"net zero ready"*, i.e. they will utilise grid decarbonisation to ensure residual emissions are net zero with no further retrofit.

However, the details and technical standards will not be confirmed until at least 2023 and it is very possible that residual demand will still be significant. These proposals also do nothing to address embodied carbon emissions in materials and supply chains.

District, home batteries and vehicle to grid battery technology may play pivotal roles in reducing residual demand and thereby the cost of connecting the development to the grid.

A net zero carbon energy system, which also includes electrified transport, is complex and dependent on large quantities of data to manage variations in energy supply and demand. Future trends, such as occupiers using the batteries in their homes and ULEVs to trade energy (e.g., to charge up when power prices are low or available in excess and sell when the reverse is true), will place heavy demands on infrastructure and telecoms. Therefore, high-capacity telecoms are essential to an integrated data intensive energy and transportation system.

2.2.4 Public attitudes interacting with revolutions in energy

National and local surveys of attitudes show very high levels of public support for renewables such as solar farms, including those that are close to where people live. For example, round table sessions[27] hosted by the LEP showed strong local support for:

- High standards for new housing ahead of Future Homes Standard.
- Inclusion of a target regarding flexibility and storage to reduce peak demand by 10 percent and deploy up to 736 MW (megawatts) of battery storage by 2038 from a 2020 baseline of 27 MW.
- Investment in new electricity infrastructure, enabling up to 102 percent higher annual demand by 2038.

2.2.5 Risks, opportunities and priorities from energy drivers and revolutions

The analysis of drivers and revolutions presents several risks and opportunities for the new settlement.

The national electricity grid is expected to be decarbonised by 2035 and new buildings will be net zero carbon ready from 2025. But just as ULEVs will only deal with half the transport emissions (see Section 2.1.3), grid decarbonisation and the Future Homes and Buildings Standards won't necessarily be enough to secure the level carbon abatement needed by 2038 (Section 2.2.1) for the following reasons:

- Energy supply for transport will largely be provided at home or neighbourhood in an electrified transport system.
- Residual demand in buildings may still be high even after Future Building and Home Standards have been applied.
- This is without considering embodied carbon in building materials.
- While this commission focusses on the new settlement, the cumulative carbon emissions from Harrogate's large existing stock will be high and without separate retrofit initiatives the carbon reduction onus on new development is even greater.

Therefore, a **priority for the net zero carbon energy strategy for the new settlement** will be to focus on energy supply and demand, including for power, heat and transport. An effective strategy will have significant economic benefits.

Solutions may include:

- Reducing transport demand by providing well serviced walkable neighbourhoods.
- Reducing building demand through encouraging energy standards that consider residual emissions (i.e. those emissions that are not directly covered by the proposed Future Homes and Building Standards).
- Investing in on-site energy generation and an efficient communal heat system.
- Exploring off-site energy generation, e.g., solar or battery farms nearby.
- Ensuring super-fast high capacity telecoms to support the connected energy and transport infrastructure needed to balance energy supply and demand (and thereby reduce peak demand).

Significant local support should be used to justify taking robust action. Policy and strategies will need to consider:

- What is possible in context of national policy, including responsibilities for delivery and stewardship.
- The implications for the masterplan and landscapes, including layout, land uses, density and design.
- Economic opportunities for the wider area from the creation of an exemplar place.

2.3 Flexible living and working

The way society is living and working has been gradually changing for many years, with a greater prevalence of home working. However, the Covid 19 pandemic has dramatically changed the landscape and these trends seem likely to stay for many:

- Nationally in 2019, 27 percent of the workforce worked from home at some point according to the Annual Population Survey (APS) data. This increased to an average of 37 percent in 2020, having been as high was 47 percent[28].
- Sky Broadband research in 2022 revealed that around a quarter of remote workers have a dedicated home office, while nearly 60 percent use makeshift spaces such as the kitchen or sofa.[29]
- IT, communications, scientific and technical activities had highest proportion of home working – sectoral make up of Harrogate more conducive to remote and flexible working than national average[30].
- ONS research shows: when asked about homeworking, working adults stated work-life balance was the greatest positive, while challenges of collaboration were the greatest negative. Of working adults currently homeworking, 85 percent wanted to use a *"hybrid"* approach of both home and office working in future. However, there was some uncertainty among businesses, with 32 percent stating they were not sure what proportion of the workforce will be working from their usual place of work[28].

It is too early (post pandemic) to say with certainty how permanent and widespread home working will be but there seems to be little doubt that hybrid working will be commonplace within certain sectors of the workforce. The ONS data suggests there is a positive relationship between current remote working practices and future homeworking intentions (Figure 13). Those in largely desk-based positions will benefit from this and the Harrogate area is above average in this regard.

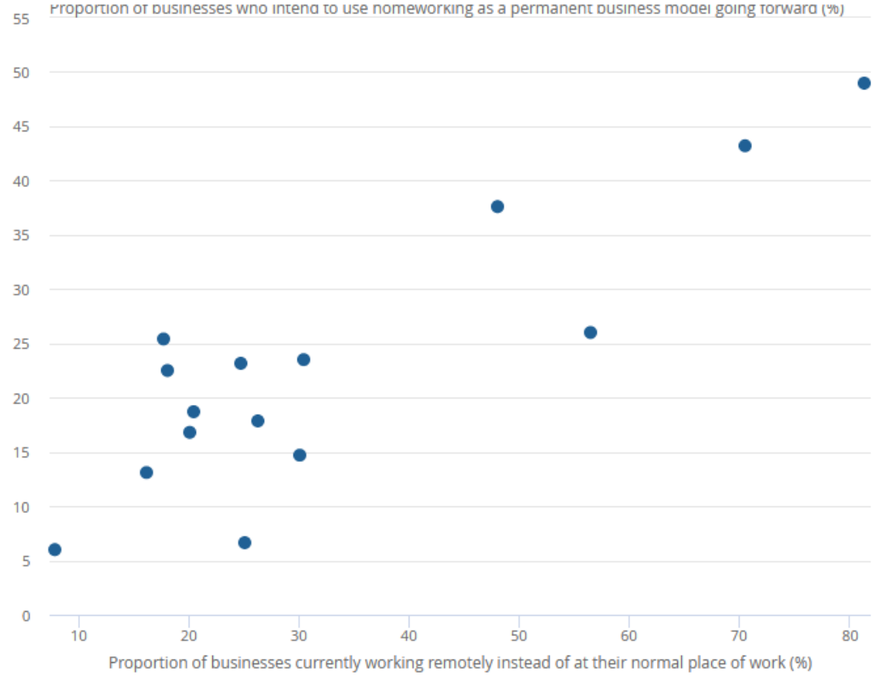

Figure 13 - Current working arrangements and future remote working intentions, businesses not permanently stopped trading, weighted by employment, broken down by industry, UK, 5 April to 2 May 2021[28]

The analysis of drivers and revolutions presents several risks, opportunities and **priorities for the new settlement**:

- More flexible working patterns place greater demands on how homes are used and therefore space needed. This should be used to justify use of Optional Technical Standards for housing.
- They also present opportunities to rethink service provision and facilities in neighbourhoods.
- Connectivity by non-car modes to good jobs and social infrastructure will have bearing on success of the place.
- Quality of place is likely to be of higher importance to many prospective residents and businesses than the ease of commute when they expect to spend more time within the settlement.

2.4 Climate resilience

Climate commitments made at COP26 are likely to result in at least 2°C of warming globally. The latest National Climate Change Risk Assessment[31] for the United Kingdom considers the likely economic impacts. It concludes:

- The UK is already experiencing large economic costs from climate extremes, e.g. flooding frequency and high temperatures.
- The High to Very High negative risks in a 2°C warming scenario include risks to: health from heat; property and infrastructure from flooding; water availability and quality; and building fabric. Each of these could be relevant to the new settlement.
- The priority areas for resilience, most relevant to the new settlement are: power failure; and exposure to heat in buildings
- Site specific risks also include flood risk, e.g., from increased impermeable surfaces and water supply constraints.
- There could be large economic benefits today from low/no regrets actions.

Some of these risks will be effectively mitigated through existing and anticipated national policy and regulation. The Environment Agency already requires applications for new development to factor in increased flood risk and the forthcoming Part O of the building regulations will mandate measures to reduce overheating risk in new buildings.

However, the new settlement is being created in its entirety and opportunities exist to consider resilience at the scale of masterplan and to other climate related risks, such as water availability.

Yorkshire Water's latest adaptation plan[32] shows that the region is not currently water stressed but predicts a declining availability of water to use due to climate change and increasing demand through growth in local population and economy (Figure 14).

The capacity of the new settlement to connect to existing water infrastructure in new settlement is uncertain and water efficiency measures are likely to be the most effective action to reduce demand.

Figure 14 - Yorkshire Water Baseline Supply and Demand Forecasts 2015-2045

2.4.1 Risks, opportunities and priorities from energy drivers and revolutions

The analysis of drivers and revolutions presents several risks, opportunities and **priorities for the new settlement:**

- Infrastructure and property should be designed for impacts of at least 2°C warming. Regulations will be important but inaction on infrastructure and the public realm risks locking in impacts and making the place a less attractive one to locate for future residents and businesses.
- Green infrastructure can combine resilience to higher temperatures and flooding with biodiversity and recreational benefits.
- The scale of the development (and therefore water demand), its long-term nature, and likely water supply constraints could be sufficient evidence to justify Optional Technical Standards for housing of at 110l/p/d.
- Building-scale measures should be supported by measures to reduce potable use in the public realm and landscapes.
- Measures to reduce heat risk in buildings will be largely covered by regulation, but the public realm is equally important. Street trees and other green and blue infrastructure should be considered alongside orientation and street design.
- Passive measures like opening windows will be aided by quieter streets resulting from modal shift away from motorised vehicles.

3. Priorities, Ambitions and Actions

Section 1 described the framework used to explore the interaction between the drivers of climate, technology, societal and economic change, and the resulting revolutions in net zero carbon movement, energy supply and use, flexible living and working and climate resilience.

The analysis in Section 2 identified transformational challenges and opportunities that will shape the new settlement:

- The transition to net zero technologies in which most of the energy is zero carbon and managed within the settlement.
- Ensuring a resilient place in the face of climate extremes, which necessitates a different approach to masterplanning and creates opportunities for multifunctional uses.
- Recognition that net zero carbon movement will require significant modal shift as well as electric vehicles.
- Hybrid working and young people's expectations for access to services and facilities, which focuses locational priorities away from the commute and towards quality of place and provision of movement infrastructure.

These revealed the priorities for policy in the DPD and for delivery by stakeholders. This section describes the ambitions, policies and actions needed to support delivery of these.

HBC's Carbon Reduction Strategy, and it's 2021 draft update, defines net zero as becoming a carbon neutral in its own operations and promoting and supporting activity to help the Harrogate district as a whole to be carbon neutral by 2038. This is informed by the Tyndall Centre research which concludes that the Leeds City Region (of which HBC is a part) should reach zero or near zero carbon no later than 2038. It sets out a series of measures to secure reductions including new and existing buildings, transport, working practices, partnership and monitoring. The scale of these challenges and the research in Section 2 of this report indicates a range of areas where the new settlement should go further. These are explored in the remainder of this report.

Acting on these challenges and opportunities will not only help reduce carbon emissions and embed climate resilience but will help ensure the settlement is a place people will want to live.

The transformational challenges, opportunities and priorities have informed a series of ambitions to secure the four climate change priorities of net zero carbon movement, energy supply and use, flexible living and working, and climate resilience. These are presented in the tables that follow and include a series of policies and action to support delivery or avoid detrimental outcomes.

The strategies for movement, energy, flexible living and working and climate resilience will set out the mechanisms to achieve these and expand on key issues. While these are described separately, the increasingly interrelated nature of energy, transport, climate and communications requires that they be considered in the round. For example, net zero carbon movement will be integral to a net zero carbon energy strategy. Policy should encourage this and HBC should discuss opportunities for joint public/private sector strategies with delivery partners.

Together they provide the strategic priorities and a proactive strategy for climate change, as required by the 2017 Neighbourhood Planning Act and NPPF. It is a key mechanism for securing the *"radical reductions in greenhouse gas emissions"* expected by the framework and delivering the local 2038 net zero target.

3.1 Priority 1 – Net zero carbon movement and active travel

Ambitions to secure climate priority	Policy and Local Authority Action	Developer	Opportunities to go Further by Engaging with Third Party Service and Infrastructure Providers	Development Partners
Masterplan and infrastructure that support trips beyond settlement to be typically made by train or bus	A **strategic net zero carbon movement strategy** demonstrating a modal split consistent with an 80% reduction in transport emissions by 2030, and net zero by 2050, and trip level consistent with this reduction, including trip substitution (e.g. hybrid working), public and on-demand travel, consideration of land uses, densities and connectivity.	**Key delivery and management asks:** ▪ Prepare and deliver the strategy, masterplan, and infrastructure. ▪ Infrastructure provision. ▪ Travel plans, monitoring and review. ▪ Governance/ stewardship arrangements	**Key funding, delivery, management asks:** Appraise funding options, including potential infrastructure in funding bid. Engage with on-demand transport and hub infrastructure providers and service providers (i.e. providers of services using infrastructure), e.g.: ▪ Role of Network Rail in providing hub services. ▪ Bus providers and on-demand bus providers, such as Zeelo. ▪ Technology providers to deliver digital information and signage. ▪ Hub service providers. Stewardship vehicle to ensure all infrastructure and services and managed long term.	S106 contributions towards movement provision. Provision of plot level infrastructure in accordance with masterplan and strategic infrastructure.
Support emissions reduction and move by a growing number of people away from car ownership or ability to drive by designing-in access to services, facilities and places by foot, cycle, micro-mobility, mobility services, and digitally to embed habits from day-one	A **site-wide net zero carbon movement strategy**, including recognition of the changing scope of mobility, introducing hierarchy of road users, setting masterplan criteria for a highly connected 15-minute place with filtered permeability.	**Key delivery and management asks:** ▪ Prepare and deliver the strategy. ▪ Set standards for service provides. ▪ Infrastructure and service provision ▪ Travel plans, monitoring and review. ▪ Governance/ stewardship arrangements.	**Key funding, delivery, management asks:** Identify infrastructure provision, including potential infrastructure in funding bid for non-car infrastructure. And service provision: ▪ On demand cycling and micro mobility services, e.g. Lime. ▪ Car clubs, e.g. Harrogate's Co-Wheels car share. ▪ Engage with providers of data services to monitor performance and changing baseline conditions. Stewardship vehicle to ensure all infrastructure and services and managed long term.	S106 contributions towards movement provision. Provision of plot level infrastructure in accordance with masterplan and strategic infrastructure.
Reduce provision for expensive and space hungry roads and car parking	A car parking ratio ambition of 1 space per home or less. It is recognised that higher levels of provision may be necessary in early years to avoid parking littering, but these should be largely unallocated spaces which can be reallocated to other uses over time in line with regular monitoring and review.	**Key delivery and management asks:** ▪ Prepare the strategy in line with policy. ▪ Set standards for service provides and reserved matters applications. ▪ Infrastructure and services provision. ▪ Periodic review of the travel plan and parking levels.	**Key funding, delivery, management asks:** ▪ Engage with providers of data services to monitor performance and changing baseline conditions.	Provision of plot level infrastructure in accordance with masterplan and strategic infrastructure.
Where public transport is not possible, electric vehicles are supported by high quality charging infrastructure in homes, street and car parks	Net zero carbon movement strategy assumes most vehicles will be electric even in early phases. All homes/parking courts to have 7-22kW smart charging, public parking to have fast charging (50kW to 150kW or higher).	**Key delivery and management asks:** ▪ Infrastructure installed to comply with policy, but level of provision to be determined by supply constraints. ▪ Infrastructure and services provision. ▪ Governance/ stewardship arrangements	**Key funding, delivery, management asks:** Installation and/or management of smart charging infrastructure, ideally combining energy supply and demand infrastructure: ▪ Engage with charging providers, e.g. Chargepoint, Gridserve, to understand requirements and market evolution of. ▪ This should feed back into the site's energy strategy. ▪ Stewardship vehicle.	Installation of home and plot charging equipment.

Provision for last-mile delivery by foot, cycle or electric vehicle.	**Last-mile strategy** to consider allocation of a distribution hub.	**Key delivery and management asks:** ▪ Masterplan to develop and implement a last-mile strategy. ▪ Space allocation. ▪ Governance/ stewardship arrangements.	**Key funding, delivery, management asks:** ▪ Explore potential operators of hub and spoke services, e.g. Gnewt Cargo. ▪ Stewardship vehicle.	Reserved matters applications to include measures in line with last mile strategy
Very high capacity telecoms services to support trip reduction, connected transport, energy systems and hybrid working	**Smart town strategy** to integrate energy, transport, water and communications.	**Key delivery and management asks:** ▪ Commitment to enable strategic infrastructure. ▪ Set requirements for partners.	**Key funding, delivery, management asks:** ▪ Engage with telecoms providers to provide required infrastructure and service level. ▪ Stewardship vehicle.	Reserved matters applications to include measures in line with strategic infrastructure strategy

3.2 Priority 2 – net zero carbon energy supply and use

Ambitions to secure climate priority	Policy and Local Authority Action	Developer	Opportunities to go Further by Engaging with Third Party Service and Infrastructure Providers	Development Partners
Reduce peak and overall demand, plus residual emissions, through on-site generation and efficient heating systems	A **site-wide net zero carbon energy strategy** should integrate heat, power and transport.	**Key delivery and management asks:** ▪ Prepare and deliver the strategy in line with policy. ▪ Infrastructure and services provision. ▪ Governance/ stewardship arrangements.	**Key funding, delivery, management asks:** ▪ Third parties to supplement multi-utility provider's energy services, such as Sustainable Development Capital, Public Power Solutions and SNRG. ▪ And to operate potentially complex site-wide supply and demand systems. ▪ Stewardship vehicle.	Installation of plot level infrastructure in line with site-wide strategy. S106 contributions.
Reduce peak and overall demand, plus residual emissions, through off-site generation, e.g. solar or battery farms nearby	**Options appraise** for: ▪ Allocation of land for net zero supply to reduce residual emissions to zero. ▪ Taking heat from existing waste heat, e.g. Allerton Waste Recover Park. ▪ Investment in grid infrastructure as a means to unlock housing growth and renewable energy projects. Policy of presumption in favour of community owned renewable energy development on/off site.	**Key delivery and management asks:** ▪ Use energy strategy to identify residual requirement for grid peak power/energy supply after demand reduction measures and on-site generation have been maximised. ▪ Then explore opportunities to supply this from offsite renewable energy projects or existing waste heat, to result in a net zero carbon energy development. Nb. this may also present opportunities for biodiversity net gain.	**Key funding, delivery, management asks:** ▪ Third Party developers and operators of energy projects, such as solar farms or battery energy storage. ▪ Consider community ownership to create a more direct link between the community and the energy generated. Eden Renewables are an example of a solar company that builds in partnership, but many others would be likely to open to the idea.	
Masterplan to reduce energy demand through orientation, density and design measures	**Net zero carbon energy strategy.**	**Key delivery and management asks:** ▪ Prepare and deliver the strategy in line with policy.		Incorporate space for on-site generation and be able to connect to site-wide infrastructure (if used).
Reduce building operational energy demand through higher standards	**Net zero carbon energy strategy.**	**Key delivery and management asks:** ▪ Prepare and deliver the strategy in line with policy. ▪ Consider working with partners with high sustainability credentials and using modern methods of construction. ▪ Explore funding for net zero homes through Affordable Homes Programme.	**Key funding, delivery, management asks:** ▪ Offsite manufacture, including potential for on-site manufacturing, e.g. Citu in Leeds. ▪ Companies such as Sustainable Development Capital are developing passivhouse products. ▪ Engage with smart demand management systems providers, e.g. SNRG and others. ▪ Stewardship vehicle	

		▪ Governance/ stewardship arrangements.		
Ensure building performance closely matches design standards	Ensuring that building perform as designed is essential. The **site-wide net zero carbon energy strategy** will demonstrate that the performance gap is minimised.	**Key delivery and management asks:** ▪ Set standards for partners to the ensure the performance gap is minimised. ▪ Monitoring of performance and ensuring improvements identified through this process are implemented.	**Key funding, delivery, management asks:** ▪ Engage with providers of monitoring services and equipment.	Provide performance data to the master developer and make improvements to buildings as required.
Help reduce global emissions by lowering embodied carbon in buildings and infrastructure, and support the shift towards a circular economy	An **embodied carbon, circular economy and life-cycle emissions strategy**.	**Key delivery and management asks:** ▪ Develop an embodied carbon, circular economy and life-cycle emissions strategy. ▪ Consider using modern methods of construction. ▪ Explore funding for net zero homes through Affordable Homes Programme.	**Key funding, delivery, management asks:** ▪ Explore partnership opportunities with companies demonstrating lower embodied carbon. An example is Stelling Modular.	Deliver standards set by master developer and policy.

3.3 Priority 3 – flexible living and working

Ambitions to secure climate priority	Policy and Local Authority Action	Developer	Opportunities to go Further by Engaging with Third Party Service and Infrastructure Providers	Development Partners
Hybrid working supported by provision of flexible spaces to work in the settlement and at home	A **hybrid working strategy.** Nb. the long timescales necessitates reappraisal and flexible land uses.	**Key delivery and management asks:** Developer to develop a hybrid working strategy in line with policy and allocate space and require housing typologies to meet this demand. Set standards for plot sizes and housing typologies to reflect changing use of homes for work and living Responsibility for long term stewardship.	**Key funding, delivery, management asks:** ▪ HBC to invest in a flexible working hub and include this within the stewardship vehicle. ▪ Engage with the LEP to see what funds and programmes they have. ▪ Engaging with specialist providers of co-working and other suitable flexible employment spaces	Provision of flexible employment spaces. Housing typologies to reflect changing use of homes for work and living.
Settlement served by day-to-day facilities, including a supermarket/ grocery store, post office, pharmacy, food services, café, flexible and co-working spaces, amenity and play space, other flexible use spaces, and schools	Policy should secure provision or space in the settlement centre for these uses. The local authority could consider investment in facilities.	**Key delivery and management asks:** Developer to allocate space and uses to accommodate a range of facilities in line with demand forecasts. Net zero carbon movement strategy that demonstrates how walking, cycling and micro-mobility will be preferred modes between homes and facilities. Responsibility for long term stewardship.	**Key funding, delivery, management asks:** ▪ HBC to provide settlement centre facilities as part of income generation strategy to fund the stewardship vehicle. ▪ Engage with potential developers of local centres. ▪ Engage with potential tenants/ operators.	Provision of uses.

3.4 Priority 4 – climate resilience

Ambitions to secure climate priority	Policy and Local Authority Action	Developer	Opportunities to go Further by Engaging with Third Party Service and Infrastructure Providers	Development Partners
Building standards to reduce risk of overheating	A **climate resilience strategy**.	**Key delivery and management asks:** The developer will be responsible for creating and monitoring the climate resilience strategy. They will collect settlement-wide data and use it to implement change over time.	**Key funding, delivery, management asks:** Engage with providers of data services to monitor performance and changing baseline conditions.	Delivery of on-plot and building resilience measures.
Masterplan to minimise risk of overheating and flood risk through green/blue infrastructure, orientation and design measures, and combine biodiversity benefits	A **climate resilience strategy**.	**Key delivery and management asks:** Develop the climate resilience strategy in accordance with policy. Provision of infrastructure. Deliver and monitor the strategy. The strategy should demonstrate how streets and space could be adapted in future.	**Key funding, delivery, management asks:** ▪ Provision and maintenance of appropriate GI. ▪ Stewardship to consider community involvement in maintenance of GI	Delivery of on-plot and building resilience measures.
Building standards to reduce potable water use	A **climate resilience strategy**.	**Key delivery and management asks:** Develop a climate resilience strategy. Provision of infrastructure. Responsibility for monitoring, operating and maintaining water efficient infrastructure.	**Key funding, delivery, management asks:** Engage with providers of water efficient infrastructure. Engage with providers of data services to monitor performance and changing baseline conditions.	Plot and building measures to deliver strategy, including ▪ Installing smart water meters. ▪ Rainwater harvesting systems. ▪ Appropriate responsibility to manage systems in perpetuity.
Reduce potable use in public realm and landscape	A **climate resilience strategy**.	**Key delivery and management asks:** Develop a climate resilience strategy which sets standards for partners, based on policy. Explore options for strategic greywater recycling as alternative to plot provision. Provision of infrastructure. Responsibility for monitoring, operating and maintaining water efficient infrastructure.	**Key funding, delivery, management asks:** Engage with providers of water efficient infrastructure. Engage with providers of data services to monitor performance and changing baseline conditions.	Plot and building measures to deliver strategy, including ▪ Rainwater harvesting systems. ▪ Appropriate responsibility to manage systems in perpetuity.

4. Planning policies for the DPD

This section sets out the proposed planning policies to be contained within the DPD. They have been informed by the DROP analysis (Section 2) and are designed to secure the four climate change priorities and associated ambitions.

Section 3 has demonstrated how the policies will work alongside expectations and opportunities for delivery through a variety of means, including infrastructure bids, third party provision and operation, as well as delivery by applicants.

It is important that the policies are considered as a whole since each has cross-cutting features and all are a necessary part of delivering the climate change priorities and ambitions.

4.1 Overarching policy to support a net zero carbon economy by 2038

HBC takes the risks of climate change extremely seriously and believes responses should be evidence based. HBC's Carbon Reduction Strategy, including the draft 2021 update, expects to use its place-shaping powers to achieve net zero by 2038 and identifies decarbonisation as a priority in the new settlement (Strategic Theme 5). Although sooner than the national 2050 target, the local target is informed by Tyndall Centre research which concludes it is necessary.

Not all sectors are relevant to the new settlement and so the priority sectors will be buildings, transport, and business in construction and operation. The details, definitions and measures against which a planning application will be assessed are included in the policies that follow.

Climate change policy 1 – Net zero carbon by 2038

Proposals should demonstrate how the settlement supports delivery of net zero by 2038 by including the detailed strategies outlined in the suite of climate change policies in this DPD. The net zero carbon target includes emissions from buildings, transport, infrastructure and business uses during construction and operation, and should include the measures proposed to achieve this across all development phases. Delivery of this target will be demonstrated through Policies 2 – 7.

[Examples for reference only and not for inclusion in the policy: Cornwall Submission Draft Climate Emergency DPD, 2021 – carbon neutral by 2030

Submission Draft Salford Local Plan, Development Management Policies and Designations – Policy CC1, carbon neutral by 2038

London Plan, adopted 2021, Policy SI2]

4.2 Policies to deliver Priority 1 – Net zero carbon movement and active travel

The Tyndall Centre research shows that transport emissions in Harrogate will need to be reduced by 80% by 2030 in order to meet net zero by 2038. Therefore, the new settlement will need to build-in all transport measures to achieve net zero, starting from first occupation. This will be achieved by providing for zero carbon modes, such as electric vehicles, supported by reducing the need to travel and making walking and cycling the preferred choice for most journeys through provision of high quality infrastructure.

While the infrastructure and service provision needed for this transition should be available to residents from first occupation, the Council recognises that modal shift will not happen immediately. Therefore, the policy sets challenging ambitions for car parking and modal choice and a mechanism for monitoring and review over time. It builds in measures to encourage trip reduction, including proposals to support hybrid working (see Policy 6) and high-capacity telecoms (see Policy 3).

The policy drive comes from the Climate Change Act, the Net Zero Carbon Strategy[33], the Decarbonising Transport Plan[34] and paragraphs 104 and 105 of the NPPF, and HBC's Carbon Reduction Strategy.

The strategy will include but not be limited to the following components:

Strategic movement between the settlement and key nodes (to be agreed with the LPA) to prioritise public transport, car clubs and on-demand travel services over private cars, and provision of associated services and digital information.

Site-wide movement that recognises the changing scope of mobility, including provision of car clubs and on-demand travel, micro-mobility (such as scooters, cargo bikes and mobility vehicles) and electrification. The strategy will demonstrate:

- A hierarchy of road users: walking; cycling/micromobility; public transport; on-demand transport; and private vehicles. It should demonstrate a connected 15-minute place that is highly permeable at the top end of this hierarchy and more restricted at the bottom. The definition of a 15-minute place In the context of the new settlement, is one where most daily trips can be accomplished by foot from residents' homes within 15-minutes. The purpose is to create walkable neighbourhoods. This should be tested in the masterplan and be based on actual routes and not as crow flies.
- Cycle infrastructure that follows the 5 Core Principles in Local Transport Note (LTN) 1/20 (or its successor): coherent, direct, safe, comfortable and attractive. The design of infrastructure should follow the guidance provided and achieve a minimum 70% on Cycle Level of Service (CLOS) and Junction Assessment Tool (JAT) assessments. This is level is expected for cycle infrastructure to be eligible for Government funding and is therefore also considered to provide an additional incentive for developers.
- Digital information and wayfinding across the settlement.
- How high levels of cycle parking can be achieved (informed by LTN 1/20 standards, or its successor) and regular monitoring via travel plan reviews.
- Locations and design of secure cycle shelters within the public realm, including next to homes, on street and in the settlement centre.
- Locations of mobility hubs, car club spaces, electric vehicle charging.
- How streets accommodate access for pick-up/drop-off, loading but not dominated by parking.
- A car parking ratio ambition of 1 space per home or less. However, higher levels of provision may be necessary in early years to ensure a high-quality environment. The majority of spaces should be unallocated, with ownership vested in an appropriate stewardship vehicle, so that spaces can be reallocated over time if evidence of changing demand is revealed. Regular monitoring of their use through remote or traditional surveys, supported by provision of non-car infrastructure and services and targeted travel plans to facilitate modal shift should enable this to happen.
- Electric vehicle charging infrastructure that is subservient to non-car modes and designed to avoid clutter in the public realm:
  - All homes/private parking areas should have minimum 7kW (ideally higher) smart charging.

  - The settlement should have provision for ultra-fast charging (150kW or higher).
  - Consideration should be given to Harrogate's Ultra Low Emissions Vehicle Strategy or its successor.

- A last-mile strategy to coordinate distribution of deliveries within the settlement. This could include allocation of a centralised distribution hub (use class B8) with onward deliveries made by foot, cargo-bikes or micro mobility as well as EVs. The settlement centre should include provision of drop off and collection facilities.
- The measures in this policy will help secure net zero carbon travel but are also key to ensuring active travel is embedded in the place. Principles such as Sport England's 10 Principles of Active Design provide a useful point of reference for the masterplan and infrastructure provision.
- The strategy should inform masterplan considerations of land uses, densities and connectivity. The strategy should demonstrate how modal split, trip and parking levels will be monitored and regularly reviewed in pursuit of net zero. This may include use of sensors or surveys and will be secured through travel plans tailored to different parts of the settlement and demographic groups. The masterplan will demonstrate flexibility in uses to enable reallocation of uses over time.

The following policies will help secure the priority of net zero carbon movement and active travel and accompanying ambitions.

Climate change policy 2 – Net zero carbon movement and active travel

Proposals should be accompanied by a settlement-wide **net zero carbon movement strategy**. This will include but not be limited to the following components, with detail provided in the supporting text:

- Measures to ensure strategic movement between the settlement and key nodes beyond the site can be achieved by public transport.
- Site-wide infrastructure will recognise and support the changing scope of mobility and demonstrate a connected 15-minute place. It should be designed around the following sustainable hierarchy of road users, whereby the development is highly permeable at the top end of the hierarchy and more restricted at the bottom:
  - Walking;
  - Cycling/micromobility;
  - Public transport;
  - On-demand transport; and
  - Private vehicles)
- The design of cycle infrastructure should follow the guidance provided and achieve a minimum 70% and no critical fails on Cycle Level of Service (CLOS) and Junction Assessment Tool (JAT) assessments.
- Travel plans tailored to different parts of the settlement and demographic groups with the aim of supporting use of non-car infrastructure. The applicant will agree the character areas with the LPA in which different travel plans will be applied. They should be reviewed and updated at least every 5-years in perpetuity.
- A car parking ratio of 1 space per home or less, unless applicants can demonstrate a clear parking reduction strategy, including timescales, for how they will achieve the target if this is not achievable on first occupation. This strategy may include higher levels of provision in early years to avoid parking littering, but these should be largely unallocated spaces which can be reallocated to other uses over time in line with monitoring and review at least every 5-years in perpetuity.
- All homes should include minimum 7kW smart electric vehicle charging on plot or within parking areas. Minimum 150kW charging infrastructure should be provided within the public realm or settlement centre should be positioned to be subservient to non-car modes and designed to avoid clutter in the public realm.
- A distribution hub and proposals to manage last-mile deliveries within the settlement. Space will be allocated in the masterplan to serve this [Consider carrying this into land use strategy, p11 and masterplan principles of Reg 19 DPD].
- Demonstrate how Sport England's Active Design Principles (or successor) have been incorporated.

The strategy should inform masterplan considerations of land uses, densities and connectivity.

Planning conditions and Section 106 agreements will be used to ensure the infrastructure and service provision consistent with the strategy is in place from first occupation, and that it will be operated in perpetuity.

Reserved matters applications will demonstrate how they comply with the settlement-wide strategy.

[**Examples for reference only and not for inclusion in the policy: London Plan, adopted 2021, Policy T1, T2, T5, T6, T]**

Telecoms will be an essential piece of climate change infrastructure in the new settlement. They are expected to become integral to the effectiveness of the energy, transport and water systems (Policies 2, 4 and 7) and to enabling flexible living and working (Policy 6).

A smart settlement is one in which these elements can be connected but also one where residents, businesses and services can take advantage of them, for example to improve waste management services, for wayfinding, energy use, or hybrid working, and to monitor modal splits and parking levels.

The electrification of transport (Policy 2) and decentralisation of zero carbon energy (Policy 4) means these two themes are becoming more and more integrated and is likely to allow residents to purchase power when it is readily available and cheaper. This requires access to real time data.

Because of the importance to all aspects of the climate change strategy, provision of high-capacity upload and download speeds throughout the settlement will be essential from first occupation.

To support the strategy, reserved matters applications should incorporate suitable building scale smart infrastructure, such as smart energy and water meters that can provide real-time usage and cost information to occupants and suppliers, and the telecoms equipment necessary to enable these.

Climate change policy 3 – Smart settlement strategy

Very high capacity (at least 1Gbps) systems should be enabled from first occupation.

Because technology changes rapidly, the new settlement infrastructure should support the ability to upgrade fibre capacity to at least 100Gbps with low latency in future, plus site-wide 5G connectivity (or greater) from first occupation across all neighbourhoods.

Reserved matters applications should incorporate suitable building scale smart infrastructure.

[**Examples for reference only and not for inclusion in the policy: London Plan, adopted 2021, Policy SI6]**

4.3 Policies to deliver Priority 2 – Net zero carbon energy supply and use

The energy used in buildings and supplied to the development will be a key part of achieving net zero by 2038. The policy drive comes from the Government's Green Industrial Revolution[35], Net Zero strategy[36], British Energy Security Strategy[37] and paragraphs 152, 155 and 16 of the NPPF, and HBC's Carbon Reduction Strategy. The Committee on Climate Change's Progress Reports conclude there are clear economic, social, and environmental benefits from immediate investments in low-carbon and climate-resilient infrastructure.

The UK's electricity grid is expected to be fully decarbonised by 2035 and gas will no longer be used to heat new buildings. At the same time, the vehicles will increasingly be powered by batteries. Therefore, it is likely that the energy needed for power, heating and transport will all come from electricity and unlike developments of the past, more of the necessary infrastructure will need to be delivered within the new settlement itself. The energy strategy will need to plan for this.

A range of scenarios and technologies should be tested in creating the site's energy strategy. This should be in line with anticipated policy, trends towards decentralisation and ULEVs, viability (for developers and occupiers), and site opportunities. The strategy will influence the masterplan, such as layout, density and landscape, infrastructure provision, and building standards.

Nearly half of the UK's annual carbon emissions are attributable to buildings and so energy efficiency and supply cannot be ignored, but the right energy strategy is place specific. Getting it right is crucial to supporting the local electricity grid, development viability, reducing CO_2 emissions in line with net zero carbon legislation, quality of place, and the long-term resilience of the development without locking the place into high emissions infrastructure.

Medium term regulatory change (prior to first occupation of the development) is likely to limit the extent to which policy can promote higher building standards. Therefore, the overarching energy ambitions seek to build on regulations and decarbonise the residual emissions after opportunities for demand reduction have been maximised, plus embodied and whole life carbon and operational performance. This will be supported by detailed ambitions and achieved through the suite of climate change policies and actions.

Energy efficient homes will be more affordable for residents because of lower energy costs but can cost more to construct. The cost baseline will be a home constructed under the Future Homes Standard, which will already be very efficient relative to a home built to earlier Building Regulations standards. Research published in 2019[38] suggests that achieving even higher standards, such as Passivhaus which sets a heat demand target of <15kWh/m^2/year, can cost only modestly more than a typical property and therefore may be comparable to a Future Home/Building Standard home in years to come. Therefore, it is appropriate to encourage the highest possible standards in new homes by offering applicants the opportunity to reduce their affordable housing contributions through Section 106 by the equivalent of the additional cost of the efficiency measures. This voluntary measure is expected to be revenue neutral within s106 but may be of significant benefit to applicants if the reduction in energy demand reduces the likelihood of needing expensive upgrades to the electricity grid. Applicants will be expected to provide verified open book cost appraisals, contributions will be reviewed in reserved matters applications and a claw-back mechanism introduced if agreed standards are not delivered.

The strategy and masterplan should consider how it has accommodated provision for EV charging in line with Policy 2, energy centres, infrastructure trenching, other space requirements and integration of proposed energy technologies (such as orientation, density and shading). The masterplan should be informed by the National Model Design Code guidance on passive design, form, microclimate and orientation.

Applicants should demonstrate how energy systems will be delivered and maintained in perpetuity, including the affordability of energy, and management of in-building equipment without needing complex or expensive maintenance by residents.

The difference between anticipated and actual performance is known as the 'performance gap'. According to the UK Green Building Council[39], various studies have found that in-use energy consumption can be 2 to 5 times higher than compliance calculations carried out at design stage would suggest. Therefore, ensuring that buildings perform as designed is essential. Applicants will demonstrate that the performance of dwellings and buildings in operation matches design performance.

Energy use, indoor air quality and overheating risk will be monitored for at least 30% of dwellings and other buildings within each development parcel, with a representative range of properties, for the first 5 years of their occupancy and ensure that the information recovered is provided to the applicable owners and the planning authority. Developers will be responsible for improvements identified through this process.

HBC will work with the North Yorkshire LEP and other partners in the public and private sectors to identify off-site grid and energy supply opportunities. Applicants will be expected liaise with public sector partners as part of developing their strategies.

HBC will work with the North Yorkshire LEP and other partners in the public and private sectors to identify off-site grid and energy supply opportunities, including:

- Allocation of land for net zero supply to reduce residual emissions to zero.
- Opportunities to include the new settlement within future Northern Power Grid investment plans.
- Opportunities to invest in electricity grid infrastructure as a means to unlock development and renewable energy projects.

The following policies will help secure the priority of net zero carbon energy supply and use and accompanying ambitions.

Climate change policy 4 – Net zero carbon energy supply and use

Proposals should be accompanied by a **settlement-wide net zero carbon energy strategy** which demonstrates the integration of heat, power and transport. It should take account of reasonable projections of energy demand across phases and demonstrate emissions reductions in line with the 2038 net zero target.

The strategy should reduce greenhouse gas emissions in all buildings and infrastructure in operation and minimise both annual and peak energy demand in accordance with the following energy hierarchy:

- Be lean: use less energy and manage demand during operation, including residual energy demand, using passive design measures. Applicants should consider an ambition for building carbon emissions standards for homes and buildings above building regulations (at time of construction). Prior to being mandated through building regulations, any buildings not designed to achieve the Future Homes or Buildings Standard should demonstrate how they achieve a minimum 20 percent reduction in carbon emissions relative to the Part L building regulations standards at the time of construction.
- Be clean: demonstrate how opportunities have been explored to exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly.
- Be green: HCC recognises the need to maximise opportunities for renewable energy by producing, storing and using renewable energy on-site or, if not possible, near site. HCC will support proposals for net zero carbon energy generation (including energy storage) projects where they can demonstrate they meet some of the needs of the new settlement, unless there is clear and demonstrable conflict with other plan policies.

- Be smart: demonstrate that energy systems can be integrated with telecoms and electric vehicle infrastructure, to minimise peak energy demand.
- Be seen: monitor, verify and report on energy performance. Applicants will implement a recognised quality regime that ensures the 'as built' performance (energy use, carbon emissions, indoor air quality, and overheating risk) matches the calculated design performance of dwellings and buildings. A recognised monitoring regime will allow the assessment of 30% of the proposed dwellings and buildings at least every 5-years following occupation.

Reserved matters applications will demonstrate how they comply with the settlement-wide strategy.

Applications demonstrating building carbon emissions standards beyond Future Homes and Buildings standards or equivalent will be eligible for reduced affordable housing contributions through Section 106. Verified open book cost appraisals will be needed and contributions reviewed in reserved matters applications and a claw-back mechanism introduced if agreed standards are not delivered. [Recommend consider implications and CIL regulations]

Applicants will demonstrate how energy systems will be delivered and maintained in perpetuity, including the affordability of energy and long-term management of in-building equipment for residents.

[**Examples for reference only and not for inclusion in the policy: London Plan, adopted 2021, Policies SI1, SI2, SI3; Milton Keynes PlanMK, Policy SC1 adopted 2019; Doncaster Local Plan, adopted 2021, Policy 58; Old Oak and Park Royal Development Corporation's Local Plan evidence "Post Occupancy Evaluation Study 2018"**]

Reducing carbon in the supply and use of energy is a key part of addressing climate change, however, it will also be necessary to reduce whole lifecycle emissions. Therefore, consideration will need to be given to embodied carbon in building materials and ensuring that buildings and infrastructure contribute to creating a circular economy by designing components to be repaired and reused.

This is an evolving area of climate change. Applicants should use a robust methodology, such as the RICS Whole Life Carbon Assessment for the Built Environment or successors, but recognise that there may be better options in future. As such, applicants should demonstrate they have used a best practice methodology.

The masterplan should be informed by the National Model Design Code guidance.

Climate change policy 5 – Embodied carbon, circular economy and life-cycle emissions

Proposals should be accompanied by a settlement-wide **embodied carbon, circular economy and life-cycle emissions strategy** to demonstrate actions taken to reduce embodied carbon and maximise opportunities for re-use. The strategy should be accompanied by a site-wide emissions audit, whole lifecycle assessment based on nationally recognised standards (such as BS EN 15978) and methodology (such as RICS Professional Statement: WLC Assessment for the Built Environment, or successors) and demonstrate how resource use and emissions will be minimised over the lifetime of the building or infrastructure.

The circular economy strategy should be based on a clear set of principles and demonstrate how it has informed development at all stages. The strategy should be reviewed against latest best practice as part of reserved matters applications.

[**Examples for reference only and not for inclusion in the policy: London Plan, adopted 2021, Policies SI7**

Brighton & Hove City Plan Part 2, has been examined and carries significant weight]

4.4 Policies to deliver Priority 3 – flexible living and working

Although it will not be possible or desirable for everyone to work remotely from business premises some or all of the time, more and more people will expect to work flexibly for some of the time. The new settlement will support those who can by providing a mix of facilities, services and infrastructure and the viability of this provision is expected to be supported by the higher levels of footfall across the day and week. Not only will this increase the attractiveness of the place to those people wishing to work flexibly, but the wider provision will also benefit those in traditional work-based employment, retired residents and those juggling work, education, child or elderly care.

Not only will this create a more mixed and inclusive community, but it will also bring significant climate change benefits by reducing the need to travel beyond the settlement for work, education and care.

Nationally Described Space Standards will be important to ensure homes are large enough for living and some flexible working. This will apply to homes in use class C3 and C4. Any homes falling into other classes, including sui generis, should ideally meet this standard or demonstrate why it is not appropriate.

It may not always be possible to provide additional space within homes for working without affecting affordability and so an appropriate balance between space to work at home and within the settlement should be demonstrated. Land use allocations within the masterplan will support this balance, including for example co-working and multi-functional spaces. The priority should be to create a prosperous settlement centre and most facilities will be expected to be located here. Any distributed facilities should demonstrate that they will not undermine the viability of the centre. The masterplan should demonstrate a settlement structure and connectivity between homes and workspaces to priorities walking and cycling, in accordance with Policy 2. [Consider adding into the local centre policy]

Climate change policy 6 – Supporting inclusive flexible living and working

Proposals should be accompanied by a settlement-wide **flexible living and working strategy** which demonstrates how flexible working will be enabled and what facilities will be provided within the settlement. This strategy will include, but not be limited by the following:

- All homes will meet Nationally Described Space Standards.
- A mix of residential typologies to ensure a diverse multigenerational community that meets the changing needs of residents over time, including but not limited to apartments, bungalows, detached and semi-detached properties, in a range of tenures, and in line with other local plan policies. [Review detailed wording against emerging DPD approach]
- An assessment of likely demand for flexible employment spaces (including within use classes B and E). Flexible workspace will be allocated in the masterplan, including space for future expansion, and demand reappraised at least every 5-years.
- Forecast demand for retail and community facilities, and provide space within the settlement centre, including demonstration how future expansion would be accommodated. Developers should set out measures to encourage smaller shops, flexible pop-up space, and facilities to support day-to-day living without needing to use a car. Demand should be reappraised at least every 5-years.

Applicants should demonstrate through partnerships or a business plan how services and facilities will be secured from first occupation, how demand will be monitored, flexibility to reallocate space to other non-

residential uses if necessary, and long-term stewardship measures. Stewardship arrangements should consider opportunities for community representation and/or ownership of facilities.

4.5 Policies to deliver Priority 4 – climate resilience

The overarching ambition is to deliver a site-wide climate resilience strategy to ensure homes, buildings, infrastructure and spaces are adaptable to a changing climate, particularly more extreme weather and drought. These strategies will inform spatial choices in the masterplan, such as layouts, density and green/blue infrastructure, as well as building design options.

The policy drive comes from the Climate Change Act 2008, Flood and Water Management Act 2010 and Paragraph 8 of the NPPF which states that *"mitigating and adapting to climate change"* is a core planning objective, and paragraphs 153 that *"Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures."*

The development of the settlement will take many years to complete and will need to remain resilient to changes in climate that will not be static. It is important that the climate resilience strategy is based on a sound understanding of carbon emissions and climate change trajectories using reasonable worst-case scenarios. In practice this means acting within the science set out by government in, for example, the UK Climate Projections and the UK Climate Risk Assessment. Nb. these are regularly updated and applicants should use the latest versions and integrate periodic review in to the management of the place.

It is expected that Part O of the building regulations will be how overheating in dwellings is controlled and site-wide flood risk under future climate scenarios through flood risk assessments. Therefore, the purpose of the strategy is to understand risks specific to the development and the integration of climate measures with place-making. For example:

- Use of green/blue infrastructure and SuDS to keep spaces cool and usable during extreme weather, such as green walls and trees.
- Use of multifunctional green/blue infrastructure where space, for example to combine climate resilience with biodiversity net gain and recreation.
- Plant species chosen for their suitability to projected climate scenarios.
- Water sensitive landscapes and public spaces that do not require potable water beyond establishment.
- Rainwater harvesting systems to be incorporated in landscapes and public spaces, and commercial or public buildings, to provide for irrigation and other non-potable needs for all spaces.
- Public spaces and streets to incorporate rain gardens.
- Modal shift and parking reallocation (see Policy 2) to create space to manage water, high temperatures, provide biodiversity and food growing opportunities.
- Spaces and streets with year-round high-quality microclimates, including use of *"cool materials"* and shading.
- Infrastructure and buildings designed to accommodate large shade giving trees.
- Publicly accessible *"cool buildings"* for respite.

The strategy should be monitored by the management organisation on a 5-yearly basis and measures adapted as required by changing baseline conditions. The approach should be agreed with the LPA in planning conditions and should consider updated climate scenarios, minoring of temperatures in key parts of the development and buildings (see Policy 4), performance of SuDS, availability of non-potable water for irrigation, and quality of green and blue infrastructure (e.g. survival and growth rates).

The following policies will help secure the priority of supporting climate resilience and accompanying ambitions.

Climate change policy 7 – Climate resilience

Proposals should be accompanied by a settlement-wide **climate resilience strategy**, demonstrating measures to ensure that under reasonable worst case climate scenarios buildings do not overheat, public spaces are pleasant places to be, that people and property are safe from flooding, and water use in buildings and public realm is minimised.

The strategy will be based on locally specific reasonable worst-case climate scenarios and impacts for the place and infrastructure, based on credible sources such as UK Climate Projections[40], UK Climate Risk Assessment[41] and the Environment Agency[42].

Within the public realm, applicants should integrate measures to demonstrate that the development and infrastructure will not overheat or flood and will remain safe and operational under the worst-case scenario.

Within buildings and private realm and to complement the requirements of Building Regulations, applicants should include:

- Measures to minimise risk of overheating, including but not limited to dual aspect properties, thermal mass and passive cooling measures, with the ability to retrofit solar shading to buildings.
- Foundations that can accommodate the growth of large shade giving trees and allows them to be planted close to properties and infrastructure.
- Optional technical standard for dwelling water use of 110 l/person/day, and minimum of BREEAM *"Excellent"* for water for non-domestic buildings, and demonstrate that they have explored opportunities to go further including making use of smart infrastructure, rainwater harvesting and efficient appliances.
- Avoiding impermeable surface materials where possible, within with public and private realm.

Measures where applicable should be easily maintainable by a management organisation in perpetuity. The strategy should be monitored at least every 5-years by the management organisation and measures adapted as required by changing baseline conditions. [Consider fall back if no stewardship vehicle has been agreed]

[**Examples for reference only and not for inclusion in the policy: London Plan, adopted 2021, Policies SI4 and SI53]**

5. Mechanisms for delivery and stewardship

This section draws out the specific measures referred to in the previous sections and describes the responsibilities for delivering and funding each, along with the links to stewardship. Stewardship will be explored in a separate report being prepared by Hive Land and Planning for HBC. This section should be read in conjunction with Sections 3 and 4 of this report. The purpose is to identify how, in addition to the planning policies, the measures can be delivered to ensure the priorities (in Section 3) are secured.

No.	Measure	Responsibility for delivery	Responsibility for funding	Stewardship links
1	Modal split consistent with 80% reduction in transport emissions by 2030, and net zero by 2038, and trip level consistent with this reduction.	Developer/ on plot developer	N/A	Sensors to review modal split & future adjustments to measures
2	Prepare and deliver masterplan and infrastructure including: Railway station enhancements, movement hub, car club, bike share, e-cargo bike, EV charging, busses and trains, digital info and delivery lockers.	Developer. Potentially third parties.	Potential for inclusion within an infrastructure in funding bid. Potentially third parties.	Potential inclusion of car club, bike share, e-cargo bikes and EV charging within a stewardship vehicle or third party may operate.
3	Set standards in accordance with LTN 1/20	Developer	N/A	Part of stewardship vehicle if not adopted by the Highways Authority (Note that HBC are considering adoption of open space, so this may include cycleways).
4	Include infrastructure in funding bid	N/A	To note.	N/A
5	Governance/stewardship arrangements	HBC & Developer	N/A	New stewardship vehicle to be created.
6	Highly connected 15-minute place – demonstrating it is easier to walk/cycle rather than drive.	Developer (masterplan)	N/A	N/A
7	Early provision of infrastructure – walking, cycling, micro mobility, secure cycle parking, car club, digital display, way finding, walk distances.	Developer/ on plot developer. Potentially third parties.	Potential for inclusion in an infrastructure funding bid. If not Developer/ on plot developer. Possibly third party for scooters etc.	Secure cycle parking and car club could be part of stewardship vehicle
8	Travel Plans tailored to different parts of the settlement and demographic groups	Targeted travel plan at OPA (Developer) and on plot developer	TBC	Developer or third party to monitor and review travel plans
9	Car parking ratio ambition of 1 space per home or less.	Developer (OPA) / on plot developer	N/A	Sensors to enable review of parking standards to be contained within stewardship vehicle.
10	Streets to accommodate access for loading but not dominated by parking.	Developer/ on plot developer	N/A	Feedback mechanism – how occupied the loading bays are
11	Secure cycle shelters next to homes, on street and in settlement centre and regular monitoring via travel plan reviews.	Developer/ on plot developer	Developer/ on plot developer	Stewardship vehicle
12	All homes/ parking courts to have 7-22kW smart charging.	On plot developer	Utility provider/ third party. On plot developers	Any charging meters in communal areas to be contained in stewardship vehicle
13	The settlement should have provision for ultra-fast charging (150kW or higher).	Developer. Third parties	Utility provider. Potential for inclusion within an infrastructure in funding bid. If not developer.	Any charging meters in communal areas to be contained in stewardship vehicle
14	Allocation of distribution hub (B8) for deliveries by foot, cargo bikes/ micro mobility, plus EVs, movement infrastructure and drop off/collection facilities.	Developer (Masterplan)	Third party potentially to provide distribution services. Potential for inclusion within an infrastructure in funding bid. If not developer	Operation and long term functioning of distribution hub
15	Infrastructure and management arrangements to facilitate integration of energy, transport, water and communications	Developer	Potential for inclusion within an infrastructure in funding bid. If not developer	Creation of an ESCO or similar, or form part of stewardship vehicle
16	Fibre capability with built in capacity to expand to 100Gbps	Developer. Infrastructure provider.	Potential for inclusion within an infrastructure in funding bid. If not developer	Privately operated, or form part of stewardship vehicle
17	Site wide connectivity for 5G (or future generations)	Developer. Infrastructure provider	Developer. Infrastructure provider.	Privately operated, or form part of stewardship vehicle
18	Site wide net zero carbon energy strategy – integrate heat, power,	Developer.	Potential for inclusion within an	Creation of an Esco for local energy

No.	Measure	Responsibility for delivery	Responsibility for funding	Stewardship links
	transport to Identify residual requirement for grid power after demand reductions and on-site generation maximised.	Developer. Infrastructure provider. On plot developer to implement.	infrastructure in funding bid. Infrastructure provider. If not developer/ on plot developer	ESCO, production or developer-led utility company, with opportunity for community representation. On-going monitoring and review of strategy.
19	Likely to include communal / building scale heating systems, net zero generation, battery energy storage, smart demand management and smart systems.	Developer. Infrastructure provider. On plot developer to implement.	Potential for inclusion within an infrastructure in funding bid. Infrastructure provider. If not Developer/ on plot developer	Operated by ESCO or developer-led utility company; opportunity for community representation. On-going monitoring and review of strategy. Communal buildings contained within stewardship vehicle.
20	Options appraisal: 1. Heat from existing waste heat e.g. Allerton Waste Recover Park 2. Investment in grid infrastructure 3. Allocation of land for net zero supply	HBC / N. Yorks LEP/ Third Party. Infrastructure provider/developer	Potential for inclusion within an infrastructure in funding bid. Third party development opportunity. If not Developer	Energy production could be contained within stewardship vehicle. Alternatively treated as separate asset, owned and operated by O&M company.
21	Policy of presumption in favour of community owned renewable energy development on/off site.	HBC	N/A	Anything community owned to be contained in stewardship vehicle. Potential for partnership with O&M company.
22	Include space for energy centres, heat/ cabling and above ground infrastructure	Developer & on plot developer	N/A	
23	Incorporate smart demand management systems.	Developer & on plot developer	Potential for inclusion within an infrastructure in funding bid. Infrastructure provider. If not Developer/ on plot developer	Systems to be contained in stewardship vehicle. Developer-led utility company
24	Constrained grid capacity may improve viability of building standards above those anticipated by Future Building Standards.	On plot developer.	Developer. Third Party	Monitoring via stewardship vehicle
25	Consider working with partners with high sustainability credentials and Modern Methods of Construction	Developer and plot developer.	Third Party.	N/A
26	Explore funding for net zero homes through Affordable Homes Programme	Developer/ on plot developer	Developer/plot developer to liaise with Homes England	Technology systems to be contained in stewardship vehicle. Developer-led utility company.
27	Monitor energy use, indoor air quality and overheating risk.	Developer to set standards. On plot Developers responsible for improvements	Infrastructure provider, plot developer and/or developer.	Stewardship vehicle. Developer-led utility company.
28	Minimise performance gap using a robust methodology	Developer to set standards for partners to follow	Infrastructure provider, plot developer and/or developer.	Stewardship vehicle.
29	Embodied carbon, circular economy and life-cycle emissions strategy.	Developer to set standards for partners to follow	Developer	Monitoring measures to be contained within stewardship vehicle.
30	Assessment of likely demand for flexible employment spaces.	HBC/ Developer	HBC/ Developer. Specialist developer investment opportunity.	Employment space within stewardship vehicle – potential income generation.
31	Land uses to support flexible working within settlement.	NDSS for homes. Developer allocation of space in masterplan	Developer	Developer and/or stewardship vehicle to monitor changing need over time.
32	Settlement structure and connectivity between homes & workspaces	Developer	Developer	Developer and/or stewardship vehicle to monitor changing need over time.
33	Secure provision / space for variety of uses in settlement centre, including single and multi-use spaces for work, retail, community uses, leisure, transport.	Developer	Developer. Specialist developer investment opportunity.	Developer and/or stewardship vehicle to monitor changing need over time. Opportunity for community ownership.
34	Masterplan to demonstrate connectivity which prioritises sustainable modes	Developer	Developer	N/A

No.	Measure	Responsibility for delivery	Responsibility for funding	Stewardship links
35	Proposals to encourage smaller shops/ pop up space, including space for lower cost *"dark kitchens"* so long as they are consistent with good urban design principles.	Developer	Developer. Specialist developer or HBC investment opportunity.	Potential for stewardship vehicle to retain freehold of flexible spaces. Opportunity for community ownership.
36	Allow flexibility and evolution in uses due to long timescales	Developer	Developer	Potential role for stewardship vehicle to retain freehold of flexible spaces and to monitor changing need over time.
37	Climate Resilience Strategy which includes design measures to ensure buildings do not overheat	Developer responsible for Part O building regs and strategy. On plot developer to implement.	Developer	Potential role for stewardship vehicle to monitor
38	SuDS hierarchy: harvesting, infiltrating, slowing, storing, conveying and treating runoff on site	Developer	Potential for inclusion within an infrastructure in funding bid. If not Developer	Adoption and maintenance of features within stewardship vehicle.
39	Modal shift and parking restraint to create space to manage water, high temperatures, provide biodiversity and food growing opportunities.		N/A	Stewardship vehicle to monitor parking use and implement change.
40	Multifunctional green blue infrastructure to keep spaces cool and usable during extreme weather.	Developer and on plot developer	Potential for inclusion within an infrastructure in funding bid. If not Developer/ on plot developer	Adoption, monitoring and maintenance within stewardship vehicle.
41	Spaces and streets with year-round high-quality microclimates, including use of *"cool materials"* and shading.	Developer and on plot developer	Developer	Adoption, monitoring and maintenance within stewardship vehicle.
42	Publicly accessible *"cool buildings"* for respite.	Developer. Third Party.	Include within infrastructure in funding bid. If not Developer.	Included within stewardship vehicle.
43	Exemplary water use standards – smart infrastructure, rainwater harvesting, grey water recycling and efficient appliances	Developer and on plot developer.	Developer and on plot developer. Potential third party.	Maintenance of features within stewardship vehicle.

No.	Measure	Responsibility for delivery	Responsibility for funding	Stewardship links
44	Dwelling target water use of 110 l/person/ day. Potential to reduce to 80.	On plot developer	On plot developer	Monitoring of water use.
45	BREEAM *"Excellent"* for water for non-domestic developments	Developer / on plot developer	Developer / on plot developer	Monitoring of performance.
46	Water sensitive landscapes and public spaces that do not require potable water beyond establishment	Developer	Potential for inclusion within an infrastructure in funding bid. If not Developer	Adoption & maintenance of features within stewardship vehicle.
47	Rainwater harvesting systems to be incorporated in landscapes and public spaces, and commercial or public buildings to provide for irrigation and other non-potable needs for all spaces. Explore options for strategic greywater recycling as alternative to plot level provision.	Developer. Third party.	Potential for inclusion within an infrastructure in funding bid. If not Developer	Adoption and maintenance of features within stewardship vehicle.
48	Public spaces and streets to incorporate rain gardens	Developer, where feasible	Potential for inclusion within an infrastructure in funding bid. If not Developer	Adoption & maintenance of features within stewardship vehicle.

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