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|----------------------------|--|
| Council name               | Cotswold District Council  |
| Name and date of Committee | CABINET - 13 <sup>th</sup> March 2023  |
| Subject                    | Sustainable Transport – Decarbonisation trajectory   |
| Wards affected             | All  |
| Accountable member         | Cllr Rachel Coxcoon Cabinet Member Planning Policy, Climate Change and Energy Tel: 01285 623000 Email: Rachel.coxcoon@cotswold.gov.uk  |
| Accountable officer        | Hannah Fountain, Sustainable Development Lead<br>Tel: 01285 623000 Email: hannah.fountain@cotswold.gov.uk  |
| Report author              | Hannah Fountain, Sustainable Development Lead  |
| Summary/Purpose            | To set out a proposed trajectory for transport decarbonisation in Cotswold to meet target of net zero carbon emissions by 2045.  |
| Annexes                    | Annex 1: Baseline carbon assessment and forecasts<br>Annex 2: Emissions reductions scenarios evaluated in studies<br>Annex 3: Place type assessments<br>Annex 4: Interventions generated and evaluation methodology<br>Annex 5: Carbon reduction evaluation of Top 30 interventions    |
| Recommendation(s)          | <i>That Cabinet resolves to agree to proceed with the development of the Sustainable Transport Strategy using the proposed high level framework for transport carbon reduction in Cotswold, comprising targets to avoid, shift and improve vehicle journeys as set out in Table 1.</i> |
| Corporate priorities       | <ul style="list-style-type: none"><li>• Respond to the climate crisis</li><li>• Make our local plan green to the core</li></ul>  |
| Key Decision               | No   |
| Exempt                     | No   |



## 1. BACKGROUND

- 1.1 The Council's Climate Emergency Strategy 2020 – 2030, adopted in September 2020, identifies a number of actions, including the development of a Sustainable Transport Strategy for the district. This Strategy will inform the partial update to the Local Plan, to make it “green to the core” and contribute to the Council's commitment to reach net zero carbon emissions by 2045 by identifying a trajectory for transport decarbonisation.
- 1.2 In parallel, Gloucestershire County Council has been developing a county wide Decarbonisation Plan (which is well aligned with the District's work). In January 2023, Cotswold District Council signed up to a shared Statement of Intent with the County Council and other District Councils in Gloucestershire to work together to reduce emissions from transport in line with our stated net zero ambitions.
- 1.3 This report summarises the activity the Council has undertaken to-date to assess the level of action that is needed to achieve its net carbon zero emission targets (Annex 1 provides baseline data and Annex 2 provides emission reduction scenarios). It seeks agreement to the broad framework for activity which is needed to avoid the need to travel, shift to more sustainable travel and improve the efficiency of residual travel. It recommends work proceeds to identify specific plans, strategies and policy changes which will be needed to bring about the above changes.

## 2. MAIN POINTS

- 2.1 Work on the Cotswold Sustainable Transport Strategy is proceeding in two stages. The first stage comprises three phases:
  - 1) identifying future carbon emissions from transport under a “do nothing” scenario and the scale of the “gap” to be closed to reach net zero emissions by 2045;
  - 2) evaluating different scenario options for closing that gap, differentiated by three place typologies within Cotswold (based on access to services, which reflects rural/urban distinctions);
  - 3) Identifying and prioritising broad interventions within each place type that are able to deliver the changes required.

This stage was completed in December 2022 and the results shared with Local Management Team and Councillors from all parties between December 2022 and February 2023.

- 2.2 The second stage of the Strategy development, which will commence this month, will seek to develop specific plans, strategies and policy changes to implement the priority options identified in Stage 1 against the overall framework of target reductions.
- 2.3 The emissions reduction trajectory developed in Stage 1 identifies changes to be made against a nationally recognised hierarchy based on:
  - a) Avoiding the need to travel;



- b) Shifting from vehicle travel to more sustainable modes, e.g. walking, cycling, public transport;
- c) Improving the efficiency of residual vehicle travel, e.g. by shifting to low-carbon fuels

**2.4** The assessment methodology (Annex 4) generated 60 potential interventions, which are actions that could be taken to reduce transport related carbon, drawn from infrastructure, legal, economic, political, service improvement and behavioural change options. These were then assessed for relevance to the three different place types (which reflect more urban and rural locations across the district, See Annex 3) and then scored against a weighted matrix of criteria:

- Scale of carbon impact (30%)
- Cost (30%)
- Public acceptability (20%)
- Ability to support sustainable economic growth (10%)
- Ability to promote community health and wellbeing (10%)

**2.5** The Top 30 interventions (Annex 5) in each place type were then assessed in greater detail to establish the likely level of carbon reduction, and the results aggregated to form the following high level framework of target changes to 2045 under the Avoid/Shift/Improve hierarchy.

**2.6** This broad Framework identifies where activity needs to be focused and enables actions to then be identified and assessed that would, for example achieve a 25% reduction in overall annual mileage for each person. The next stage of this project will seek to identify specific strategies or policy changes that would support that reduction in mileage, bring about a shift to more sustainable transport and convert vehicles to zero emission fuels.

Table I

|         |   |
|---------|---|
| Avoid   | Reduce annual per capita mileage by 25%   |
| Shift   | Reduce car mode share by approx. one third (from 84% to 56%)<br>Reduce car mode share by approx. one third (from 84% to 56%)<br>Triple annual walking and cycling mileage<br>Triple annual public transport mileage |
| Improve | Convert vehicles to zero emission fuels at the following rate:<br>2030: 40% cars, 30% buses, 20% HGV/LGV<br>2045: 100% of all vehicles  |



### **3. ALTERNATIVE OPTIONS**

- 3.1** The Council could decide not to accept the target framework for transport decarbonisation proposed. An alternative framework could be investigated, with more focus on avoidance, on shift or on improving to achieve the desired reduction in emissions. However other options were considered and discounted in the development of the recommended option as the research and modelling indicated this was the optimum solution.
- 3.2** The Council could decide to rescind (or partially rescind) the commitment to achieve net zero carbon by 2045 in the transport sector. However, the statutory objective to achieve net zero carbon just 5 years later would still apply, suggesting that Cotswold District would still need to prepare for transition to zero carbon transport within a comparable timeframe.

### **4. CONCLUSIONS**

- 4.1** The framework targets outlined above indicate our best assessment of the optimum pathway for transition to transport decarbonisation in Cotswold District by 2045. The carbon reduction potential and acceptability/deliverability of each option has been assessed by an experienced and competent consultant with reference to the geographical composition of Cotswold in terms of place type and access to facilities and services. It has been cross-referenced and validated against similar emerging work at County and Regional transport level.
- 4.2** We recommend Council approve these high level targets and the further development of a strategic plan to meet these targets and deliver on our Corporate Priorities to respond to the climate crisis and deliver a Local Plan that is green to the core.

### **5. FINANCIAL IMPLICATIONS**

- 5.1** At this stage (accepting the results of Stage 1 of the Strategy and moving towards the development of Stage 2) there are no direct financial implications for the Council identified, as funding to develop the Sustainable Transport Strategy has already been approved and allocated as part of the Local Plan budget.
- 5.2** Committing to progressing this work, is not a commitment to fund delivery but it should be noted that, if accepted, the targets in 2.4 above are likely to require significant investment at both District and County level if these shifts in vehicle usage are to be facilitated. It is too early in the process to quantify these costs at this stage.

### **6. LEGAL IMPLICATIONS**

- 6.1** None identified.



## **7. RISK ASSESSMENT**

- 7.1** The target changes identified above are for the Cotswolds are in line with the targets that will need to be achieved in all other similar local authority areas if we are to align with national targets set out in the Climate Change Act 2008. Transport emissions reductions are undoubtedly challenging and a degree of resistance to change is to be expected. Depending on the means by which the Council seeks to deliver them, some measures are likely to be unpopular with a proportion of residents, visitors and businesses, which could lead to negative press or political pressure. Conversely, they should prove popular with residents concerned with climate change, accessibility, clean air, improvements to the public realm and road safety. Regulation 18 public consultation on the Local Plan update revealed broad support for measures and policies to generate a shift to sustainable transport.
- 7.2** The high level measures identified in the framework cannot all be delivered by Cotswold District Council in isolation – many require cooperative working with other local, regional and national authorities, as well as participation by individuals and businesses. However, Sphere of Influence analysis undertaken in Stage I identifies that the Council has a significant role to play in the large majority of identified interventions and can achieve good progress in many areas unilaterally if needed. However, as authorities at all levels are aligned behind similar trajectories, we should all be pulling in the same direction.
- 7.3** Overall, this report presents the reality of delivering on the Council’s stated objective of achieving net zero carbon by 2045 in the transport sector in Cotswold. It is well grounded in the available evidence and aligned with targets at the County level and with those emerging in national policy. Achieving decarbonisation by 2050 is a statutory requirement (Climate Change Act 2008, and revisions), meaning that changes of this nature will, by law, have to be pursued in the very near future.

## **8. EQUALITIES IMPACT**

- 8.1** The final Sustainable Transport Strategy will be subject to an Equalities Impact Assessment as part of the partial update to the Local Plan. In general terms, the Strategy seeks to improve access for all by sustainable modes, while also allowing for a proportion of car travel where needed. It is envisaged that vehicle travel (albeit by zero emissions vehicle) will remain the dominant mode of transport (in terms of mileage) in Cotswold in all future projections.

## **9. CLIMATE AND ECOLOGICAL EMERGENCIES IMPLICATIONS**

- 9.1** This Strategy will deliver directly against the Climate Emergency strategy, as it charts the path to achieve our stated aim of reaching decarbonisation by 2045 in the case of transport. This strategy is of central importance in the Council’s emissions reduction ambitions, since road transport accounts for more than a third of district-wide emissions.



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## **10. BACKGROUND PAPERS**

**10.1** None appended due to document size, but key excerpts from the three studies are provided in Annexes 1-5.

**10.2** The following documents have been identified by the author of the report in accordance with section 100D.5(a) of the Local Government Act 1972 and are listed in accordance with section 100 D.1(a) for inspection by members of the public:

- None

(END)



### Annex I: Baseline carbon assessment and forecasts

Figure Error! No text of specified style in document.-1 displays two indicative Road and Rail Emissions pathways for Cotswold District and compares these against the Do Nothing forecast. The Do Nothing scenario leads to annual emissions which are substantially greater than the two net zero aligning pathways, highlighting the importance of timely action to decarbonisation transport within the District.

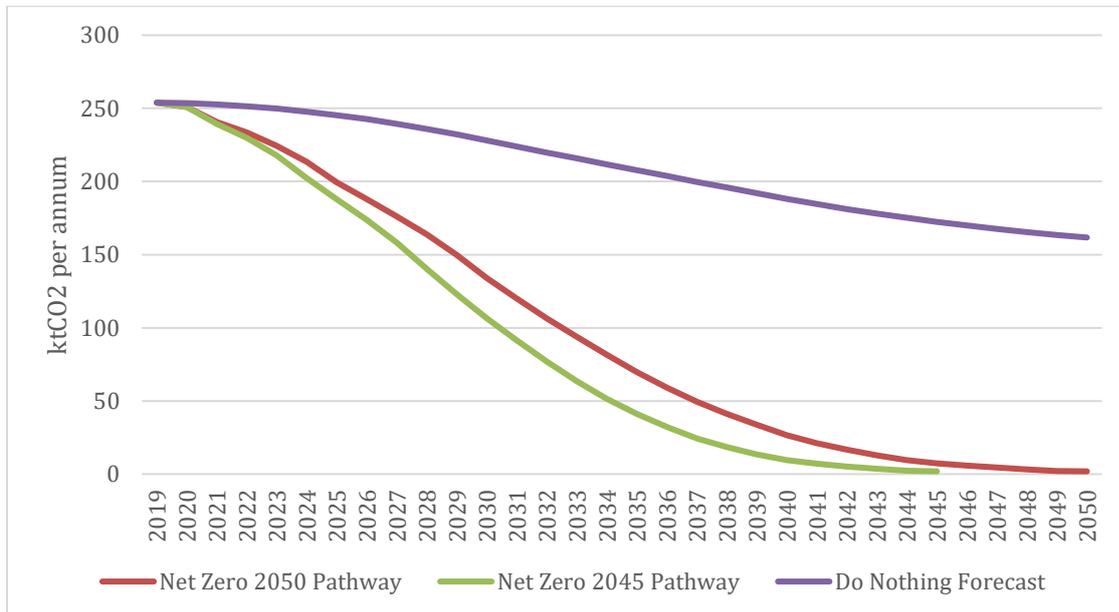


Figure Error! No text of specified style in document.-1: Indicative net zero aligning pathways for Road and Rail Emissions within Cotswold District. The Do Nothing forecast is included for comparison (Source: City Science Own Analysis)

Further to this, Figure Error! No text of specified style in document.-2 shows the annual difference between the Do Nothing forecast and the Net Zero 2045 pathway (which aligns with the ambitions of CDC and has therefore been adopted as the indicative target pathway for the District for the purposes of this Study).

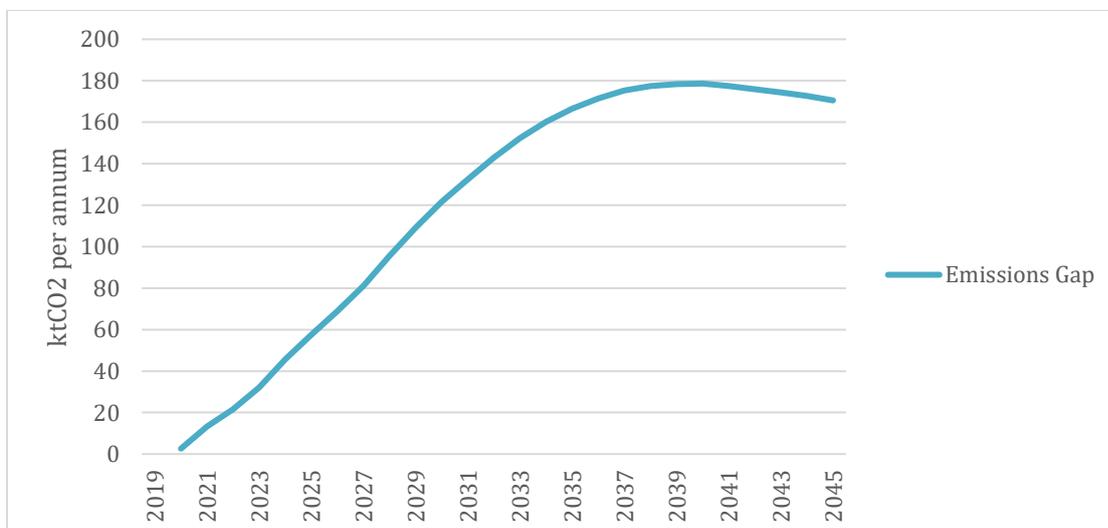


Figure Error! No text of specified style in document.-2: The year-on-year difference between the Do Nothing forecast and the Net Zero 2045 pathway (Source: City Science Own Analysis)



## Annex 2: Emissions reductions scenarios evaluated in studies

Given the future uncertainty in travel behaviour when looking forward (to 2030 and 2045) we have developed a range of scenarios which support different plausible futures, taking into consideration a range of external factors. The four scenarios are outlined in Table Error! No text of specified style in document.-1.

| Scenario                            | Description   |
|-------------------------------------|---|
| 1. High Zero Emission Vehicle (ZEV) | Demand management and mode shift interventions are implemented at the maximum level observed historically. Emissions remaining are eliminated through high levels of uptake of ZEVs. This scenario aligns with both; 80% reduction in emissions by 2030 <sup>1</sup> , and CDC's ambition of net zero by 2045 |
| 2. Lifestyle Change                 | Demand management and mode shift interventions are implemented at a more ambitious level so that lesser uptake of ZEVs is required. This scenario aligns with both; 80% reduction in emissions by 2030 <sup>1</sup> , and CDC's ambition of net zero by 2045  |
| 3. Balanced                         | A mixture between High ZEV and Lifestyle Change. This scenario aligns with both; 80% reduction in emissions by 2030 <sup>1</sup> , and CDC's ambition of net zero by 2045   |
| 4. Likely Best Case Ambition        | The outcome if currently proposed strategy and objectives are implemented. This scenario does not align with an 80% reduction in emissions by 2030 <sup>1</sup> , but does align with CDC's ambition of net zero by 2045  |

Table Error! No text of specified style in document.-1: Future Emissions Reduction Scenarios

The methodology applied in the RTPi's Net Zero Transport publication has been utilised to develop the key scenario assumptions. Table Error! No text of specified style in document.-2 lists the three types of indicators, and how these relate to intervention themes and the transport hierarchy. Where applicable we have developed separate assumptions for each of the place types e.g. assuming a higher public transport share of journeys in Cirencester Central and Local Hubs. The emissions reduction associated with the combined set of indicators is then calculated.

| Key Scenario Assumptions                                     | Hierarchy | Intervention Theme   |
|--|-----------|--|
| Distance travelled for different journey purposes            | Avoid     | <ul style="list-style-type: none"> <li>• Homeworking</li> <li>• Co-working hubs</li> <li>• Digital Services</li> <li>• Local Amenities</li> <li>• Micro Consolidation</li> </ul> |
| Percentage of trip miles by active travel & public transport | Shift     | Active travel and public transport   |
| Percentage of vehicle miles by ZEV vehicles                  | Improve   | Fleet transition to ZEV cars, light goods vehicles (LGVs), heavy goods vehicles (HGVs), and Buses  |

Table Error! No text of specified style in document.-2: Indicators Describing the Emissions Reductions Scenarios

<sup>1</sup> Compared to forecast emissions for 2030



## Calculating the Emissions Reduction of a Scenario

To determine the emissions reductions associated with different scenarios, we use the emissions by vehicle type, emissions by journey purpose, and emissions by mode data for each place type. These are then scaled according to reduction factors associated with each scenario. Figure Error! No text of specified style in document.-3 illustrates our method for calculating the emissions by journey purpose, mode and vehicle type within each place type. The key sources of emissions within Cotswold District were calculated using National Travel Survey data (DfT, 2021). The data was disaggregated to provide the emissions by vehicle type for each place type, taking into account the place-type specific travel patterns.

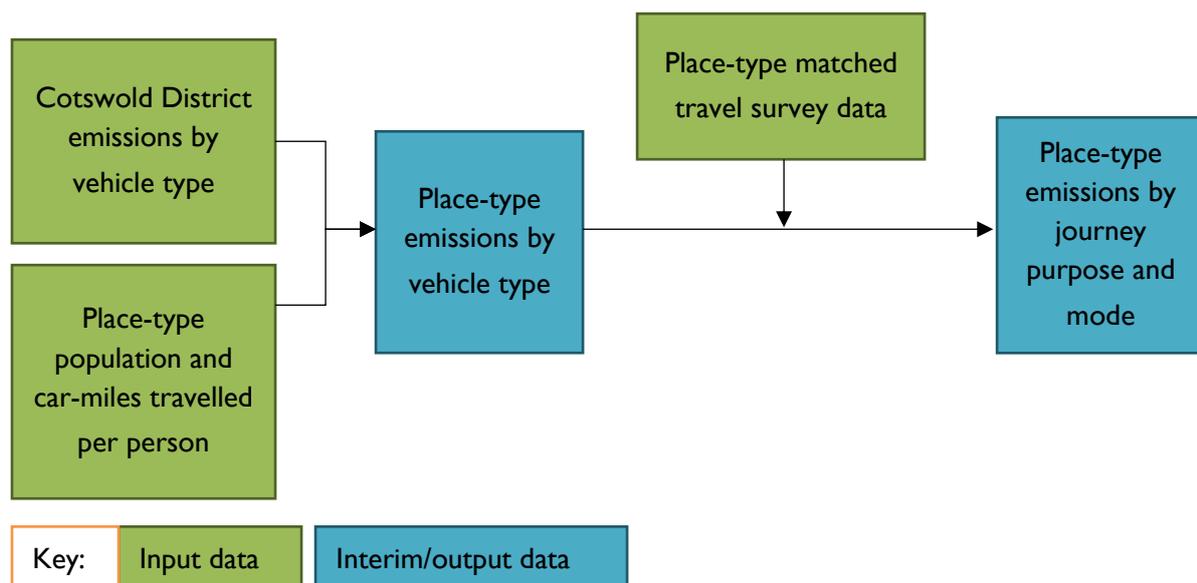


Figure Error! No text of specified style in document.-3: Method for Determining Emissions by Vehicle Type, Journey Purpose & Mode

The table below shows the carbon reduction evaluation for each scenario:



| Intervention Theme            |                     | Scenario Indicator                               | 2030       |                  |            |                  | 2045        |                  |             |                  | Notes  |
|-------------------------------|---------------------|--|------------|------------------|------------|------------------|-------------|------------------|-------------|------------------|--|
|                               |                     |  | High ZEV   | Lifestyle Change | Balanced   | Likely Best Case | High ZEV    | Lifestyle Change | Balanced    | Likely Best Case |  |
| Avoid                         | Home working        | Reduction in commuting trips                     | 30%        | 50%              | 30%        | 25%              | 30%         | 60%              | 35%         | 30%              | RTPI (2021) assumes 30%. Likely Best Case Ambition assumes later than 2030 to achieve this   |
|                               | Co-working          | Proportion of commuting trips affected           | 3%         | 10%              | 3%         | 3%               | 3%          | 20%              | 5%          | 3%               | RTPI (2021) assumes 3%. Lifestyle Change assumes more dramatic changes   |
|                               | Digital services    | Reduction in personal business trips             | 36%        | 50%              | 45%        | 25%              | 36%         | 60%              | 50%         | 30%              | Strong exploitation of digital services required to meet 2030 ambition   |
|                               |                     | Reduction in leisure trips                       | 3%         | 15%              | 3%         | 3%               | 3%          | 15%              | 5%          | 3%               | RTPI (2021) assumes 3%. Lifestyle Change assumes more dramatic changes   |
|                               | Local amenities     | Reduction in leisure and personal business trips | 10%        | 50%              | 20%        | 15%              | 15%         | 50%              | 20%         | 20%              | RTPI (2021) assumes 20%  |
|                               | Micro consolidation | Reduction in LGV (freight) miles                 | 30%        | 40%              | 40%        | 20%              | 30%         | 60%              | 50%         | 30%              | Assuming micro consolidation includes shared LGV usage as well as local delivery hubs in rural areas   |
| Shift                         | Active travel       | Short distance active travel mode share          | 20%        | 50%              | 35%        | 30%              | 20%         | 50%              | 30%         | 40%              | RTPI (2021) assumes 50%  |
|                               |                     | Long distance active travel mode share           | 11%        | 11%              | 11%        | 11%              | 11%         | 11%              | 11%         | 11%              | RTPI (2021) assumes 11%. The scenarios are consistent due to a limit on percentage of travellers willing to travel more than 10 miles by active travel. The assumed trips are 10 to 25 miles |
|                               | Public transport    | Short distance public transport mode share       | 30%        | 45%              | 40%        | 25%              | 30%         | 45%              | 35%         | 30%              | RTPI (2021) assumes 40%  |
|                               |                     | Long distance public transport mode share        | 35%        | 80%              | 40%        | 30%              | 35%         | 80%              | 50%         | 35%              | RTPI (2021) assumes 40%  |
| Improve                       | Car                 | Proportion of ZEV fleet                          | 80%        | 65%              | 70%        | 40%              | 100%        | 100%             | 100%        | 100%             | Climate Change Committee (2020) projections suggest 40%  |
|                               | LGV                 | Proportion of ZEV fleet                          | 80%        | 55%              | 55%        | 20%              | 100%        | 100%             | 100%        | 100%             | Current sales suggest slower uptake of electric vans than cars (Zap Map, 2022)   |
|                               | HGV                 | Proportion of ZEV fleet                          | 45%        | 30%              | 45%        | 10%              | 100%        | 100%             | 100%        | 100%             | Lack of widely available zero-emission HGV solutions means low likelihood of widespread roll out by 2030   |
|                               | Bus                 | Proportion of ZEV fleet                          | 100%       | 100%             | 100%       | 30%              | 100%        | 100%             | 100%        | 100%             | Precedents for fleet electrification, e.g. Commitment for all London buses to be electrified by 2034 (Mayor of London, 2022)   |
| <b>Total Carbon Reduction</b> |                     |  | <b>80%</b> | <b>80%</b>       | <b>80%</b> | <b>50%</b>       | <b>100%</b> | <b>100%</b>      | <b>100%</b> | <b>100%</b>      | <b>Rounded to nearest 5%</b>   |



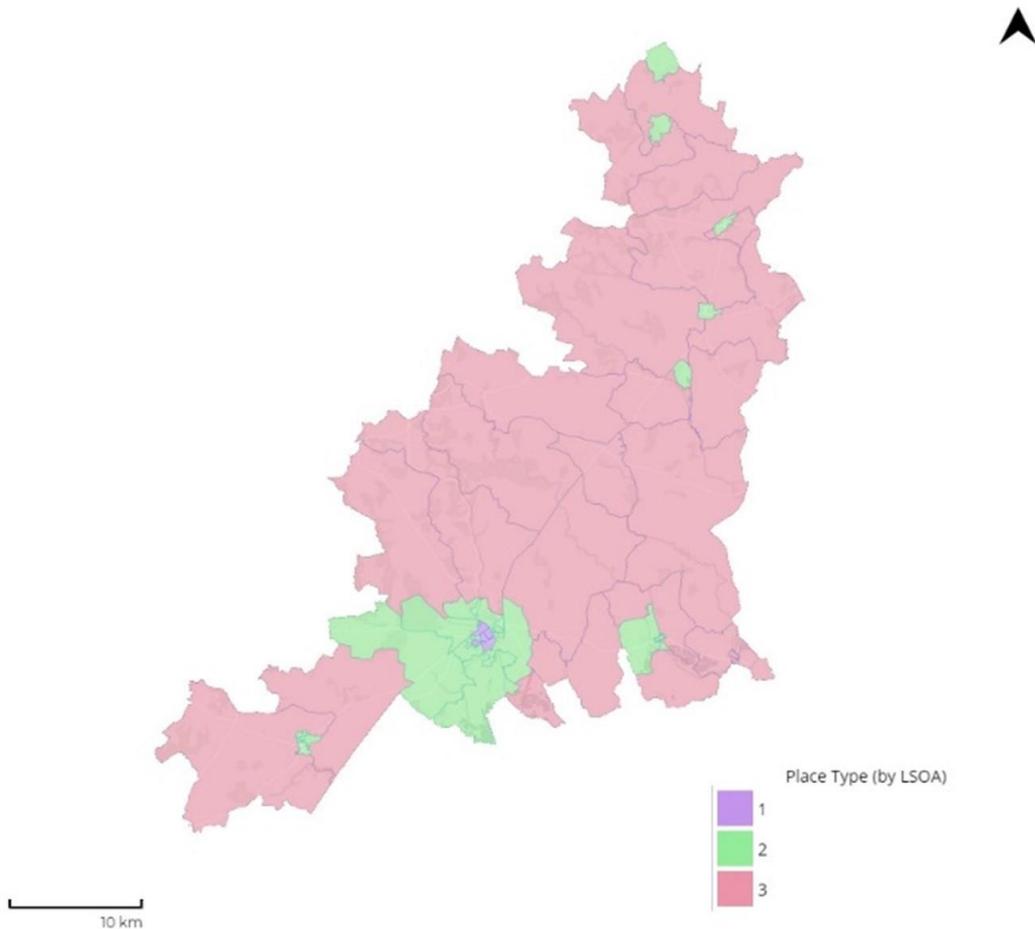
### Annex 3: Place type assessments

We have worked closely with CDC to define three place types which are representative of the different types of locations which make up Cotswold District. The purpose of developing the place types is to aid the development and analysis of a range of transport interventions relevant to CDC's context, recognising that different solutions may be appropriate for rural areas compared to better-connected urban areas. This is a key focus for the later stages of the Study.

The CDC Local Plan consultation focused on accessibility to key services as a driver for policy improvement. To support consistency in CDC's approach, we have used journey time to seven key services as a metric to differentiate each of the place types. The three place types are as follow:

- **Cirencester Central:** Lower Layer Super Output Areas (LSOAs) where access to all services is at least as good as the UK average. The only location in this category is central Cirencester
- **Local Hubs:** LSOAs with below-average accessibility to between two and five services, such as Tetbury, Moreton-in-Marsh, Fairford and South Cerney
- **Rural Settlements:** LSOAs with below-average accessibility to six or more services, which covers most of the district

**Error! Reference source not found.** shows the outcomes of the place type analysis. As we develop the Study, we will utilise the three place types to inform which interventions are relevant to each place type.



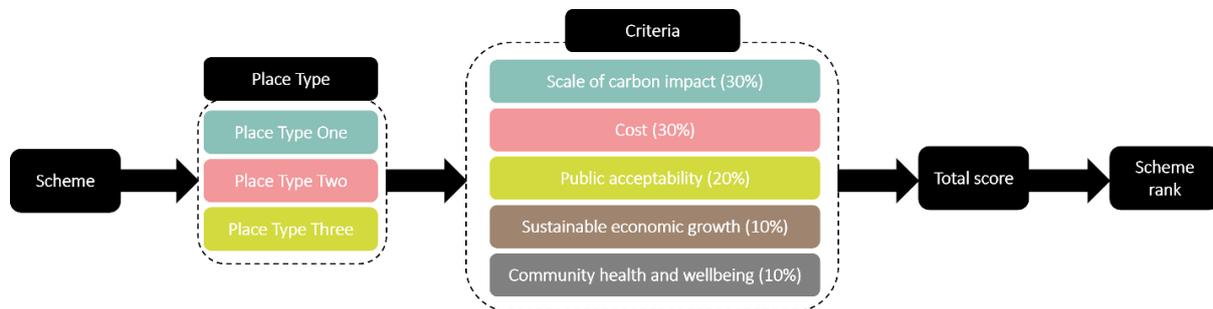


#### Annex 4: Interventions generated and evaluation methodology

A long list of 60 potential interventions was developed through background research and internal workshop, drawn from six different categories:

|                |                      |                    |
|----------------|----------------------|--------------------|
| Infrastructure | Legal                | Policy             |
| Economic       | Service improvements | Behavioural change |

Each intervention was then allocated to appropriate place type(s) and scored against the following weighted criteria:



The table below shows the ranked prioritisation of all 60 measures evaluated:

| Rank | Intervention  | Hierarchy |
|------|---|-----------|
| 1    | Increased sustainable transport standards at new developments   | Avoid     |
| 2    | Minimum accessibility standard for new developments   | Avoid     |
| 3    | School/workplace travel planning  | Shift     |
| 4    | On the go EV charge points (e.g. by shops)  | Improve   |
| 5    | Local service hubs  | Avoid     |
| 6    | Improvements to scheduled bus services  | Shift     |
| 7    | Mobile service provision  | Avoid     |
| 8    | Park and ride for Cirencester   | Shift     |
| 9    | Residential EV charge points  | Improve   |
| 10   | Increase in the number of rail services to all stations in the Cotswolds  | Shift     |
| 11   | Driver education sessions (e.g. eco driving, EV awareness, interacting with cyclists on rural roads)                            | Improve   |
| 12   | Create cycling links across the district, connecting up key locations   | Shift     |
| 13   | Create walking links between key locations  | Shift     |
| 14   | Micro freight consolidation centre (last mile deliveries)   | Avoid     |
| 15   | Promotional campaign for Cotswolds as a green destination promoting use of shared/low carbon transport options                  | Shift     |
| 16   | Support green travel initiatives within local businesses/tourist industries e.g. scoring system or green badge from the council | Shift     |
| 17   | Bike share/loan schemes   | Shift     |
| 18   | DRT for tourist attractions and other key locations   | Shift     |
| 19   | Personal Travel Planning  | Shift     |



| Rank | Intervention  | Hierarchy |
|------|---|-----------|
| 20   | Rail link via dedicated shuttle service to all stations   | Shift     |
| 21   | Signage and wayfinding improvements   | Shift     |
| 22   | Low Traffic Neighbourhoods  | Avoid     |
| 23   | Town centre pedestrianisation   | Shift     |
| 24   | Convert freight vehicles to EV  | Improve   |
| 25   | Technological literacy sessions at local community hubs   | Avoid     |
| 26   | Convert Public Transport vehicles to electric   | Improve   |
| 27   | Co-working hubs   | Avoid     |
| 28   | Bike storage infrastructure e.g. bike cages   | Shift     |
| 29   | District-wide liftshare scheme  | Shift     |
| 30   | Mobility hubs   | Shift     |
| 31   | 20mph zones   | Shift     |
| 32   | RTI at bus stops  | Shift     |
| 33   | Grants to trade in ICE vehicles to EV   | Improve   |
| 34   | New railway station at Chipping Campden   | Shift     |
| 35   | Reopen Cirencester Branch Line  | Shift     |
| 36   | Incentivise low/zero emissions taxis/PHVs   | Improve   |
| 37   | E-mobility/micromobility services and infrastructure  | Shift     |
| 38   | Road space reallocation e.g. pavement widening, reduction in on-street parking  | Shift     |
| 39   | Promote click and collect over home delivery  | Avoid     |
| 40   | Car free days (in town centres)   | Avoid     |
| 41   | Raising awareness of cycle to work schemes  | Shift     |
| 42   | Promote digital services e.g. GP online   | Avoid     |
| 43   | Working from home incentive for employers   | Avoid     |
| 44   | Changes to public parking provision (e.g. reviewing price structures, managing capacity on/off street, EV charging provision) | Avoid     |
| 45   | Incentivising multi-occupancy vehicles  | Shift     |
| 46   | Cycle skills and maintenance workshops  | Shift     |
| 47   | Support for local community transport groups e.g. dial-a-ride services  | Shift     |
| 48   | Carbon-based charging e.g. zero-emission zones  | Avoid     |
| 49   | Road pricing e.g. congestion charge zones   | Shift     |
| 50   | Freight consolidation centre  | Avoid     |
| 51   | MaaS app for all public transport services and other non-transport services   | Shift     |
| 52   | Introduce more CPZs   | Avoid     |
| 53   | Hydrogen fuel charging  | Improve   |
| 54   | Bus/active travel priority measures in urban areas  | Shift     |
| 55   | Incentives and discounts for non-drivers at local attractions   | Shift     |
| 56   | Rural road bus priority measures  | Shift     |
| 57   | Car clubs   | Avoid     |
| 58   | Coach services (e.g. tourism and commuting)   | Shift     |
| 59   | Workplace parking levy  | Shift     |

## Annex 5: Carbon reduction evaluation of Top 30 interventions

The top 30 intervention for each place type were then evaluated in detail to determine their potential to reduce transport related carbon (compared with the 2045 do nothing baseline scenario). The results are presented in the tables below. The interventions were then clustered under the Avoid/Shift/Improve hierarchy to generate the overall target framework for change.

### Methodology:

| Type          | Intervention  | Target Description   | Calculation method  |
|---------------|---|--|---|
| Land Use      | Mixed use developments                                    | Target proportion of new development residents who will have close amenities | Reduce the car emissions of new developments within the district, for journey types: commuting, shopping, sport, personal business, entertainment and education and escort                    |
|               | Minimum accessibility standard for new developments       | Target mode share of car use for residents of new developments               | Reduce the car emissions of new developments within the district  |
|               | Local service hubs  | Reduce distance required for local services to average of miles              | Reduce the car emissions for journey types: education, escort education, shopping, personal business, entertainment, and sport.   |
|               | Co-working hubs   | Average distance to nearest coworking space (miles)                          | Calculate the percentage change between the current average commuting distance and the target distance nearest Co-working hub. Multiply the emissions from cars on commuting journeys by this |
| Freight       | Micro freight consolidation centre (last mile deliveries) | Reduction in number of freight vehicles making similar rounds                | Estimate the LGV emissions associated with last-mile delivery. Scale these according to the target  |
| Active Travel | Create walking links between key locations                | Number of new connections  | Estimate the number of 'new' walking miles as a result of the intervention, and the corresponding reduction in car emissions  |



| Type                          | Intervention                                 | Target Description   | Calculation method  |
|-------------------------------|--|--|---|
|                               | Create cycling links between key locations   | Number of new connections                                    | Estimate the number of 'new' bicycle miles as a result of the intervention, and the corresponding reduction in car emissions  |
|                               | Bike share/loan schemes                      | Number of bikes available                                    |   |
|                               | Bike storage infrastructure e.g. bike cages  | Number of bike spaces  |   |
|                               | Cycle skills and maintenance workshops       | Increase in bike use   |   |
|                               | Signage and wayfinding improvements          | Number of signs  |   |
|                               | Personal Travel Planning                     | Users of planning service                                    | Estimate the number of trips shifted to active travel or public transport, and the associated mileage of these trips. Calculate the corresponding reduction in car mileage  |
|                               | School/workplace travel planning             | Users of planning service                                    | Estimate the number of trips shifted to active travel or public transport, and the associated mileage of these trips. Calculate the corresponding reduction in car mileage  |
| <b>Online/mobile services</b> | Promote click and collect over home delivery | Percentage of resident population reached                    | Reduce the LGV last mile delivery emissions. This is done according to the estimated number of residents who engage with the intervention, and the assumed reduction in LGV last mile emissions for each engaged resident |
|                               | Promote digital services                     | Percentage of resident population reached                    | Reduce car personal business and shopping emissions. This is done according to the estimated number of residents who engage with the intervention, and the assumed reduction in mileage for each engaged resident         |
|                               | Working from home incentive for employers    | Percentage of district's employers successfully engaged with | Reduce car commuting emissions by a proportion calculated from the percentage of the district's employers engaged with the intervention, and the reduction in commuting miles associated with each employer               |



| Type                           | Intervention  | Target Description                                  | Calculation method  |
|--------------------------------|---|---|---|
|                                | Mobile service provision  | Reduction in trips for services                     | Reduce the car mileage for shopping and personal business trips   |
| <b>Communications</b>          | Promotional campaign for Cotswolds as a green destination promoting use of shared/low carbon transport options                  | Audience reached per year (across district)         | Estimate the emissions from cars visiting Cotswold District. Reduce these according to the proportion of visitors engaged, and an estimate of the reduction in car miles per visitor engaged                  |
|                                | Support green travel initiatives within local businesses/tourist industries e.g. scoring system or green badge from the council | Percentage of businesses engaged with               | Reduce the emissions for business journeys within the district. This is done according to the number of businesses who engage with the intervention, and the assumed reduction in emissions for each business |
| <b>Modern Public Transport</b> | Park and ride for Cirencester   | Parking capacity                                    | Calculate the reduction car mileage   |
|                                | Increase the number of rail services to all stations in the Cotswolds   | Percentage increase in rail services                | Calculate the reduction car mileage for trips over 10 miles   |
|                                | DRT for tourist attractions and other key locations   | Number of DRT busses                                | Estimate the number of trips captured by the DRT service, and the associated reduction in car mileage   |
|                                | DRT service   |   |   |
|                                | Rail link via dedicated shuttle service to all stations   | Number of shuttle services per day                  | Estimate the number of extra rail trips encouraged and the associated reduction car mileage. Combine this effect with the reduction in car mileage owing to reduced use of cars to travel to station.         |
|                                | RTI at bus stops  | Percentage increase in bus ridership                | Estimate the decrease in car mode share of trips, and the associated reduction in mileage   |
|                                | MaaS app for all public transport and other services  |   |   |
| <b>Shared Mobility</b>         | E-mobility/micromobility services and infrastructure  | Reduce short distance (<10 miles) car mode share to | Calculate the reduction in car mileage  |



| Type                       | Intervention   | Target Description                        | Calculation method   |
|----------------------------|--|---|--|
|                            | District-wide lift share scheme  | Target average car occupancy              |  |
|                            | Coach services (e.g. tourism and commuting)                            | Number of coach services per day          | Estimate the number of trips captured by the service, and the associated reduction in car mileage                          |
|                            | Support for local community transport groups e.g. dial-a-ride services | Number of journeys provided per day       | Estimate the number of trips captured by the service, and the associated reduction in car mileage                          |
|                            | Mobility hubs  | Number of journeys touching a hub per day | Estimate the number of trips encouraged away from cars by the service, and the associated reduction in car mileage         |
| <b>Design &amp; Access</b> | Low Traffic Neighbourhoods   | Proportion of minor roads covered         | Estimate the reduction in emissions for the road network effected, assuming that no extra emissions are produced elsewhere |
|                            | 20mph zones  |   |  |
|                            | Town centre pedestrianisation  | All town centres are pedestrianised       | Remove the emissions from cars for trips for personal business, shopping, and entertainment                                |
|                            | Road space reallocation  | Reduce car mileage mode share to          | Calculate the change in car emissions assuming the difference in mileage mode share is transferred to sustainable modes    |



| Type                       | Intervention   | Target Description                                       | Calculation method  |
|----------------------------|--|--|---|
| EV Charging Infrastructure | Incentivise low/zero emissions taxis/PHVs  | Proportion of taxis and PHV's electrified                | Estimate the emissions from taxis and PHVs, and scale according to the proportion of electrified vehicles   |
|                            | Residential EV charge points   | Number of new EV charge points                           | Estimate the number of new EVs encouraged by a charge point. Scale car emissions according to the proportion of the fleet which is electrified        |
|                            | On the go EV charge points (e.g. by shops)   |  |   |
|                            | Grants to trade in ICE vehicles to switch to EV  | Proportion of fleet within Cotswold District electrified | Scale car emissions according to the proportion of the fleet which is electrified   |
|                            | Convert freight vehicles to EV   | Proportion of fleet within Cotswold District electrified | Scale LGV and HGV emissions according to the proportion of the fleet which is electrified   |
|                            | Convert public transport to EV   | Proportion of fleet within Cotswold District electrified | Scale bus emissions according to the proportion of the fleet which is electrified   |
| Education                  | Driver education sessions (e.g. eco driving, EV awareness, interacting with cyclists on rural roads) | Proportion of Place Type's driver's engaged with         | Scale car emissions according to the number of engaged drivers, and an estimate of the reduction in emissions for each driver following being engaged |

Table Error! No text of specified style in document.-3: Intervention Impact Calculation Methods

## Potential Carbon Reduction Impacts

Table Error! No text of specified style in document.-4 and Table Error! No text of specified style in document.-5 below display the interventions, targets and associated emissions reductions for the three place types. Since the interventions for Cirencester and Local Hubs align, they have been combined in Table Error! No text of specified style in document.-4. Table Error! No text of specified style in document.-5 relates to the Rural Settlements place type. Any intervention-specific assumptions are also outlined. The carbon reductions are expressed as a percentage of the place-type's 2045 emissions in the Do Nothing scenario. Whilst interventions should be implemented sooner, we required a common end date for equitable comparison. The effects of most interventions are calculated assuming that no other interventions have been implemented.



| Category             | Intervention   | Cirencester Central Target  | Cirencester Central Carbon Reduction <sup>2</sup> | Local Hubs Target   | Local Hubs Carbon Reduction <sup>2</sup> |
|----------------------|--|---|---|---|--|
| <b>Land Use</b>      | Mixed use developments   | 75% of residents have amenities close by                              | 1.96%   | 75% of residents have amenities close by                              | <b>2.39%</b>                             |
|                      | Minimum accessibility standard for new developments            | Car mode share is 20% for new developments                            | 5.82%   | Car mode share is 20% for new developments                            | 6.61%                                    |
|                      | Local service hubs   | Average distance to local services is 3 miles                         | 5.60%   | Average distance to local services is 5 miles                         | 3.39%                                    |
| <b>Freight</b>       | Micro freight consolidation centre (e.g. last mile deliveries) | 50% reduction in the number of freight vehicles making similar rounds | 0.96%   | 50% reduction in the number of freight vehicles making similar rounds | 0.96%                                    |
| <b>Active Travel</b> | Create walking links between key locations                     | 23 new connections  | 0.20%   | 100 new connections   | 0.19%                                    |
|                      | Create cycling links between key locations                     | 23 new connections  | 2.95%   | 100 new connections   | 2.20%                                    |
|                      | Bike storage infrastructure (e.g. bike cages)                  | 2000 new bike parking spaces  | 1.28%   | 4000 new bike parking spaces  | 0.44%                                    |
|                      | Bike share/loan schemes  | 500 bikes   | 1.93%   | 500 bikes   | 0.22%                                    |
|                      | School/workplace travel planning                               | 4,000 users of the planning service                                   | 0.76%   | 20,000 users of the planning service                                  | 0.73%                                    |
|                      | Personal Travel Planning                                       | 1,000 users of the planning service                                   | 0.49%   | 20,000 users of the planning service                                  | 2.08%                                    |

<sup>2</sup> (Relative to 2045 Do Nothing Scenario)



| Category                       | Intervention  | Cirencester Central Target                              | Cirencester Central Carbon Reduction <sup>2</sup> | Local Hubs Target                                       | Local Hubs Carbon Reduction <sup>2</sup> |
|--------------------------------|---|---|---|---|--|
|                                | Signage and wayfinding improvements   | 150 signs   | 0.06%   | 400 signs   | 0.03%                                    |
| <b>Communications</b>          | Promotional campaign for Cotswolds as a green destination promoting use of shared/low carbon transport options                    | 300,000 people reached per year                         | 1.78%   | 300,000 reached people per year                         | 1.95%                                    |
|                                | Support green travel initiatives within local businesses/tourist industries (e.g. scoring system or green badge from the council) | 15% of businesses engaged with                          | 0.85%   | 15% of businesses engaged with                          | 0.85%                                    |
| <b>Modern Public Transport</b> | Park and ride for Cirencester   | 1000 parking spaces                                     | 5.27%   | 1000 parking spaces                                     | 0.80%                                    |
|                                | Increase in the number of rail services to all stations in the Cotswolds  | 30% increase in rail services                           | 2.60%   | 30% increase in rail services                           | 2.84%                                    |
|                                | DRT for tourist attractions and other key locations   | 2 new DRT services                                      | 0.99%   | 8 new DRT services                                      | 0.90%                                    |
|                                | Rail link via dedicated shuttle service to all stations   | 20 shuttle services per day                             | 2.35%   | 40 shuttle services per day                             | 0.93%                                    |
| <b>Shared Mobility</b>         | E-mobility /micromobility services and infrastructure   | Reduce short distance (<10 miles) car mode share to 15% | 7.09%   | Reduce short distance (<10 miles) car mode share to 25% | 5.47%                                    |
|                                | District-wide lift share scheme   | Average car occupancy of 1.8                            | 7.60%   | Average car occupancy of 1.8                            | 8.32%                                    |
|                                | Coach services (e.g. tourism and commuting)   | 10 coach services per day                               | 1.32%   | 15 coach services per day                               | 0.30%                                    |



| Category                          | Intervention   | Cirencester Central Target                             | Cirencester Central Carbon Reduction <sup>2</sup> | Local Hubs Target                                      | Local Hubs Carbon Reduction <sup>2</sup> |
|-----------------------------------|--|--|---|--|--|
|                                   | Support for local community transport groups (e.g. dial-a-ride services)                             | 100 journeys provided per day                          | 0.39%   | 300 journeys provided per day                          | 0.25%                                    |
|                                   | Mobility hubs  | 300 journeys interact with a hub per day               | 0.64%   | 300 journeys interact with a hub per day               | 0.12%                                    |
| <b>Design &amp; Access</b>        | Low Traffic Neighbourhoods   | 10% of minor roads covered                             | 1.03%   | 10% of minor roads covered                             | 1.03%                                    |
|                                   | 20mph zones  | 10% of minor roads covered                             | 0.17%   | 10% of minor roads covered                             | 0.17%                                    |
|                                   | Town centre pedestrianisation  | All town centres are pedestrianised                    | 1.48%   | All town centres are pedestrianised                    | 1.94%                                    |
| <b>EV Charging Infrastructure</b> | Incentivise low/zero emissions taxis/PHVs  | 75% of taxis and private hire vehicles are electrified | 0.77%   | 75% of taxis and private hire vehicles are electrified | 0.45%                                    |
|                                   | Residential EV charge points   | 100 new EV charge points                               | 4.39%   | 300 new EV charge points                               | 2.77%                                    |
|                                   | On the go EV charge points (e.g. by shops)   |  |   |  |  |
| <b>Education</b>                  | Driver education sessions (e.g. eco driving, EV awareness, interacting with cyclists on rural roads) | 10% of drivers engaged with                            | 0.34%   | 10% of drivers engaged with                            | 0.37%                                    |

*Table Error! No text of specified style in document.-4: Potential Impacts of Measures in Cirencester Central & Local Hubs*



## Rural Settlements

Table Error! No text of specified style in document.-5 summarises the top 30 interventions for the Rural Settlements Place Type. It also outlines the level of decarbonisation which can be attributed to each intervention when the target is applied.

| Category                      | Intervention   | Rural Settlements Target                                       | Rural Settlements Carbon Reduction <sup>2</sup> |
|-------------------------------|--|--|---|
| <b>Land Use</b>               | Mixed use developments   | 50% of residents have amenities close by                       | 1.72%   |
|                               | Co-working hubs  | Average distance to nearest co-working space is 5 miles        | 2.11%   |
| <b>Active Travel</b>          | Create cycling links between key locations   | 200 new connections  | 5.21%   |
|                               | Bike share/loan schemes  | 500 bikes  | 0.26%   |
|                               | Bike storage infrastructure e.g. bike cages  | 8000 new bike parking spaces                                   | 1.04%   |
|                               | Cycle skills and maintenance workshops   | 2% increase in bike use  | 0.01%   |
|                               | Signage and wayfinding improvements  | 800 signs  | 0.06%   |
|                               | Personal Travel Planning   | 24,000 users of the planning service                           | 2.13%   |
|                               | School/workplace travel planning   | 24,000 users of the planning service                           | 0.80%   |
| <b>Online/Mobile Services</b> | Promote click and collect over home delivery   | 70% of resident population reached                             | 1.21%   |
|                               | Promote digital services   | 70% of resident population reached                             | 1.20%   |
|                               | Working from home incentive for employers  | 10% of Cotswold District's employers successfully engaged with | 0.30%   |
|                               | Mobile service provision   | 20% reduction in trips to access services                      | 2.30%   |
| <b>Communications</b>         | Promotional campaign for Cotswolds as a green destination promoting use of shared/low carbon transport options | 300,000 people reached per year                                | 2.03%   |



| Category                          | Intervention  | Rural Settlements Target                                | Rural Settlements Carbon Reduction <sup>2</sup> |
|-----------------------------------|---|---|---|
|                                   | Support green travel initiatives within local businesses/tourist industries (e.g. scoring system or green badge from the council) | 15% of businesses engaged with                          | 0.85%   |
| <b>Modern Public Transport</b>    | DRT service   | 10 new DRT services                                     | 0.90%   |
|                                   | RTI at bus stops  | 3% increase in bus patronage                            | 0.04%   |
|                                   | MaaS app for all public transport and other services  | 8% increase in bus patronage                            | 0.12%   |
| <b>Shared Mobility</b>            | E-mobility/micromobility services and infrastructure  | Reduce short distance (<10 miles) car mode share to 35% | 3.31%   |
|                                   | District-wide lift share scheme   | Average car occupancy of 1.8                            | 8.70%   |
|                                   | Support for local community transport groups (e.g. dial-a-ride services)  | 500 journeys provided per day                           | 0.37%   |
| <b>Design &amp; Access</b>        | Road space reallocation   | Car mode share is reduced to 70%                        | 14.67%  |
| <b>EV Charging Infrastructure</b> | Incentivise low/zero emissions taxis/PHVs   | 75% of taxis and private hire vehicles are electrified  | 0.58%   |
|                                   | Residential EV charge points  | 300 new EV charge points                                | 2.46%   |
|                                   | Grants to trade in ICE vehicles to switch to EV   | 80% of the fleet in the District is electrified         | 31.31%  |
|                                   | Convert freight vehicles to EV  | 80% of the fleet in the District is electrified         | 4.91%   |
|                                   | Convert public transport to EV  | 80% of the fleet in the District is electrified         | 1.53%   |



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| Category  | Intervention   | Rural Settlements Target    | Rural Settlements Carbon Reduction <sup>2</sup> |
|-----------|--|-----------------------------|---|
| Education | Driver education sessions (e.g. eco driving, EV awareness, interacting with cyclists on rural roads) | 10% of drivers engaged with | 0.39%   |

*Table Error! No text of specified style in document.-5: Potential Impact*