Local Transport Plan 5 Quantifying Carbon Reduction

February 2026

Buckinghamshire Council

Document information

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Contents

Introduction

This document has been produced to support Buckinghamshire Council's Local Transport Plan 5 (LTP5). It provides further information about decarbonisation and the carbon impacts of the policies identified in LTP5.

The 2008 Climate Change Act requires the UK to reduce its carbon dioxide (CO_2) emissions and greenhouse gas emissions to reach net-zero emissions by 2050. Locally, our Climate Change and Air Quality Strategy targets net-zero Buckinghamshire Council carbon emissions by 2050 and objective 2 of LTP5 is to reduce transport emissions and ensure they are on track to reach net-zero by 2050.

In 2022 transport was estimated to be the largest source of greenhouse gas emissions in the UK, contributing 28% of net greenhouse gas emissions[1]. Similarly, transport is the second largest source of CO_2 emissions in Buckinghamshire, within scope of influence of local authorities, contributing 35% of CO_2 emissions in 2022[2]. Local authorities can therefore play an important role and contribute to carbon reduction by delivering relevant transport schemes.

Recognising the role Local Authorities can play, the government established that Local Transport Plans will need to set out how local areas will deliver ambitious quantifiable carbon reductions in transport in Decarbonising Transport: A Better Greener Britain. To support this, the government have produced Quantifiable Carbon Guidance to provide advice on how Local Authorities can prepare and use carbon analysis to inform development of their transport strategy and schemes.

We have conducted carbon analysis of the LTP5 policies, in line with the government guidance. This analysis is critical to ensure the carbon impacts of our transport policies are understood and that LTP5 will support delivery of both local and national transport decarbonisation. This document provides an overview of our methodology and results of our analysis.

[1] Department for Energy Security and Net Zero – 2022 UK Greenhouse Gas Emissions, Final Figures

[2] Department for Energy Security and Net Zero – 2022 UK Greenhouse Gas Emissions, Final Figures

Methodology

This section provides an overview of the methodology we have used for quantifying carbon reduction. We have used the governments Quantifiable Carbon Guidance to inform our approach and used tools developed by our sub-national transport body England's Economic Heartland (EEH) which are approved by the Department for Transport (DfT).

1. Baseline creation

In order to understand current carbon emissions in Buckinghamshire we conducted baseline analysis. This enabled understanding of the current situation, challenges and opportunities. The analysis was conducted using EEH's baseline emission dashboard. The dashboard is based on extensive local and national data including DfT statistics, local and regional transport models, factors from the TAG data book and other industry-recognised sources[3].

The baseline data used in the analysis is from 2019. Whilst this is from before the COVID-19 pandemic, it provides the most detail available and the overall trends are considered to still be representative.

2. Vision and objectives validation

The understanding gained from the baseline work was used to inform the validation of the LTP5 vision and objectives which were consulted on in spring 2023. This work was conducted to ensure the vision and objectives remain relevant and identify any changes required. Reducing transport emissions was previously included as an objective for LTP5. Some other minor changes were made as a result of this work, the updated vision and objectives can be found in the main LTP5 document.

3. Policy long list

Following the updates to the LTP5 vision and objectives, we identified a long list of potential policies. These were identified in a number of ways, including review of evidence, best practice, government strategy and existing Buckinghamshire Council Strategy. Policies were identified that support delivery of the vision and objectives or fulfil statutory responsibilities.

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[3] Carbon assessment playbook: Decarbonisation baseline report for Buckinghamshire

For decarbonisation specifically, the understanding gained from the baseline was used to help identify those policies which would support delivery of our objectives, support wider outcomes and target the largest emissions sources.

4. Policy short list

The policy long list was then refined to a short list. The appraisal process considered which policies best aligned with and would support delivery of the LTP5 vision and objectives. This included decarbonisation as it is LTP5 objective 2 and considerations about the deliverability of policies. As part of this process, we also conducted scenario testing using scenarios from the DfT Common Analytical Scenarios, to identify a policy package that would be robust to potential future changes.

5. Policy short list refinement

Once the policy short list was identified, we undertook further assessment and analysis. As part of this process, we conducted quantitative carbon assessment to provide evidence of the likely carbon impact of the policy package. To conduct the analysis we used the Carbon Assessment Playbook developed by EEH and England's other sub-national transport bodies. Full information about the sources of evidence used in the playbook tool can be found on its website.

We used the tool to test various scenarios with the short list of policies. This included applying different types of policy, such as active travel or public transport, in various ways to understand potential carbon impacts and which type of policy is most effective at decarbonisation in Buckinghamshire. This understanding was used to help refine and agree a final policy short list.

6. Final policy drafting

Following refinement, a final policy short list was finalised and draft policies were developed. The understanding about potential content and level of ambition from quantitative carbon assessment was used to help inform the draft policy. Draft policies were developed with subject matter experts and then shared with stakeholders to help further refine the content. Final draft policies are included in the full LTP5 document.

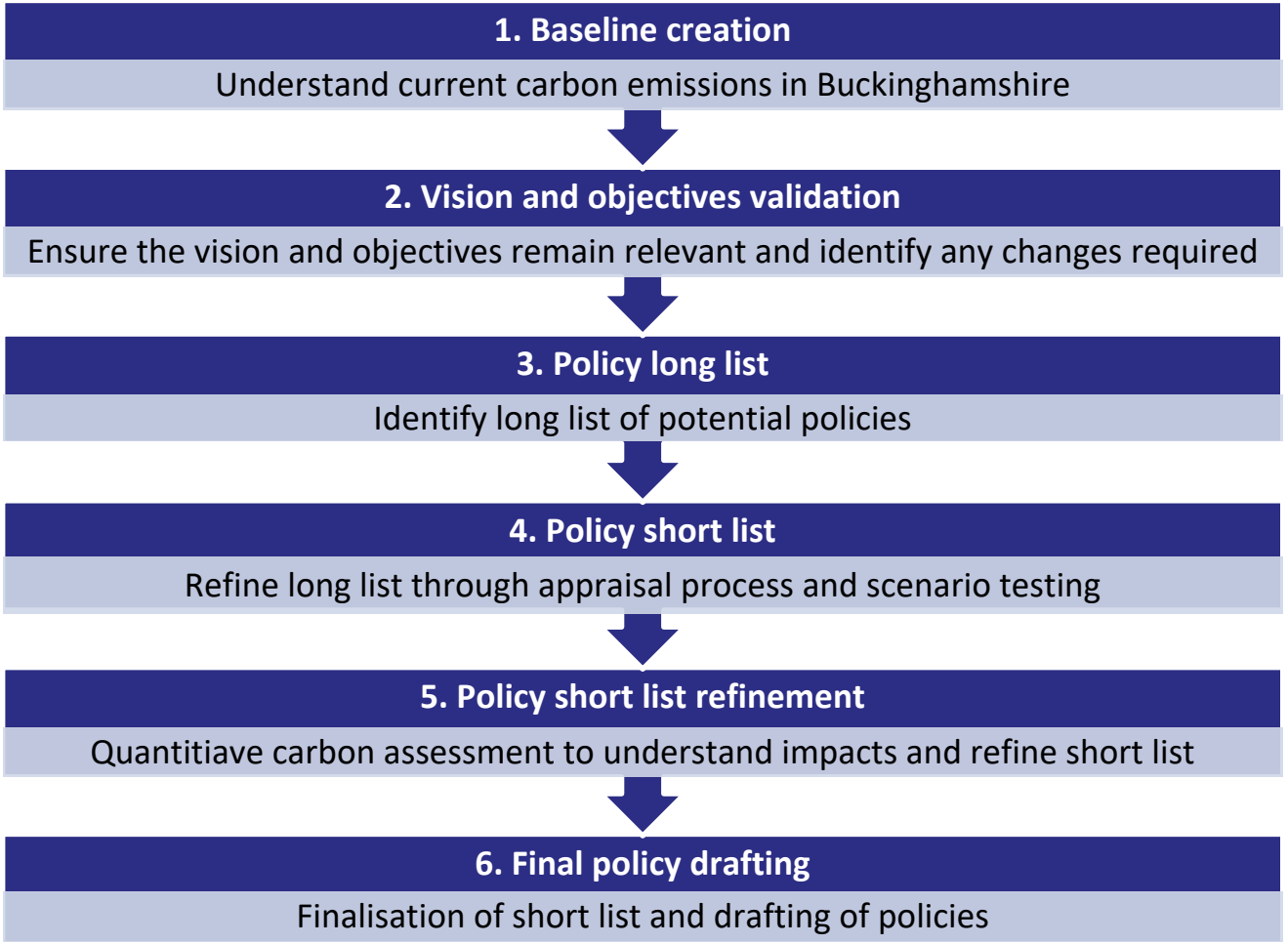

Figure 1 – Summary of methodology

Baseline

Background information climate change, impacts and greenhouse gas emission trends can be found in our Evidence Base Report published alongside LTP5. This section provides further information about baseline transport emissions in Buckinghamshire. The data in this section comes from EEH's baseline emissions dashboard. As previously outlined, this incorporates a range of local and national sources from 2019.

Vehicles

In 2019, the majority of CO_2 emissions in Buckinghamshire were from cars which produce 65% of emissions in Buckinghamshire. This was followed by Heavy Goods Vehicles (16%), Light Goods Vehicles (15%) and buses (4%).

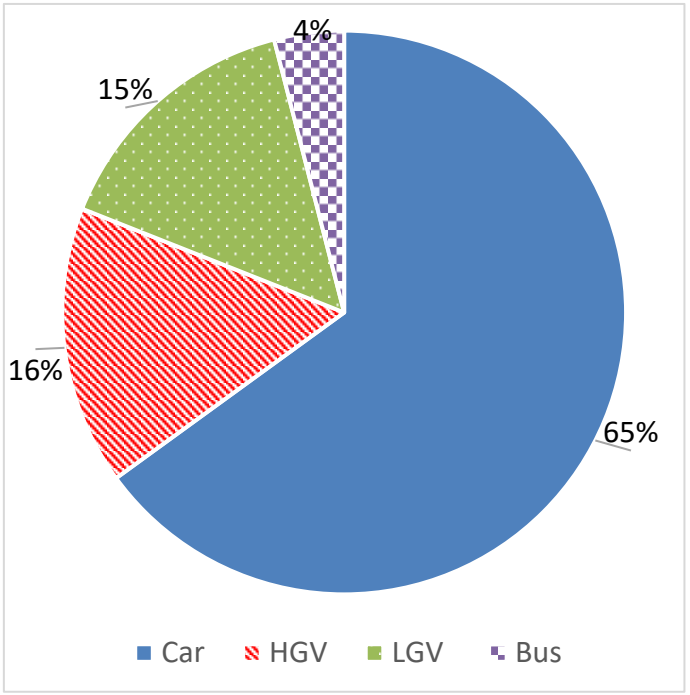

Figure 2 – Proportion of transport CO_2 emissions in Buckinghamshire by vehicle type

Journey purpose

The main journey purpose contributing to Buckinghamshire's transport carbon emissions in 2019 was business travel (45% of emissions). The other journey purposes that contributed were other (36%) and commuting (19%). The 'other' journey purpose category includes journeys such as for leisure or education.

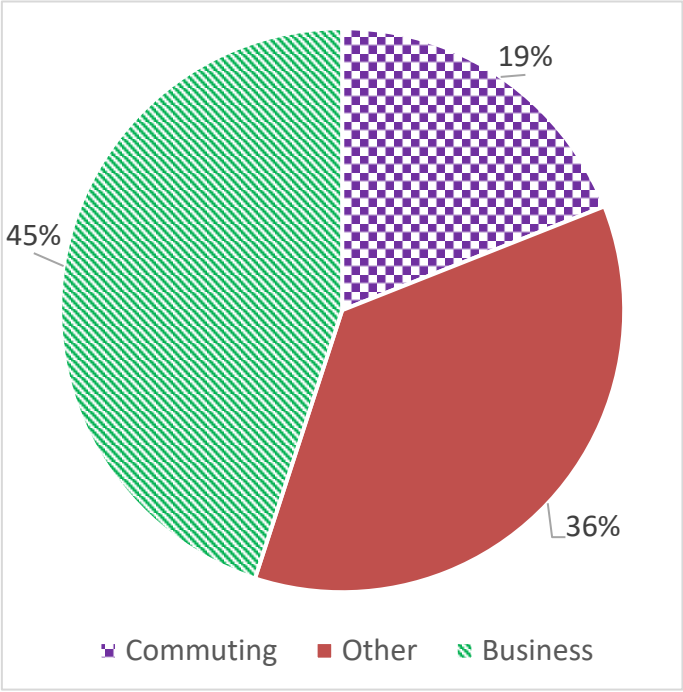

Figure 3 – Proportion of transport CO_2 emissions in Buckinghamshire by journey purpose

Trips

In 2019, around 50% of emissions were from trips starting or ending in Buckinghamshire, 25% from internal trips and 25% from through trips. This shows that Buckinghamshire Council are able to influence 75% of transport emissions due to the associated trips starting, ending or being wholly within Buckinghamshire.

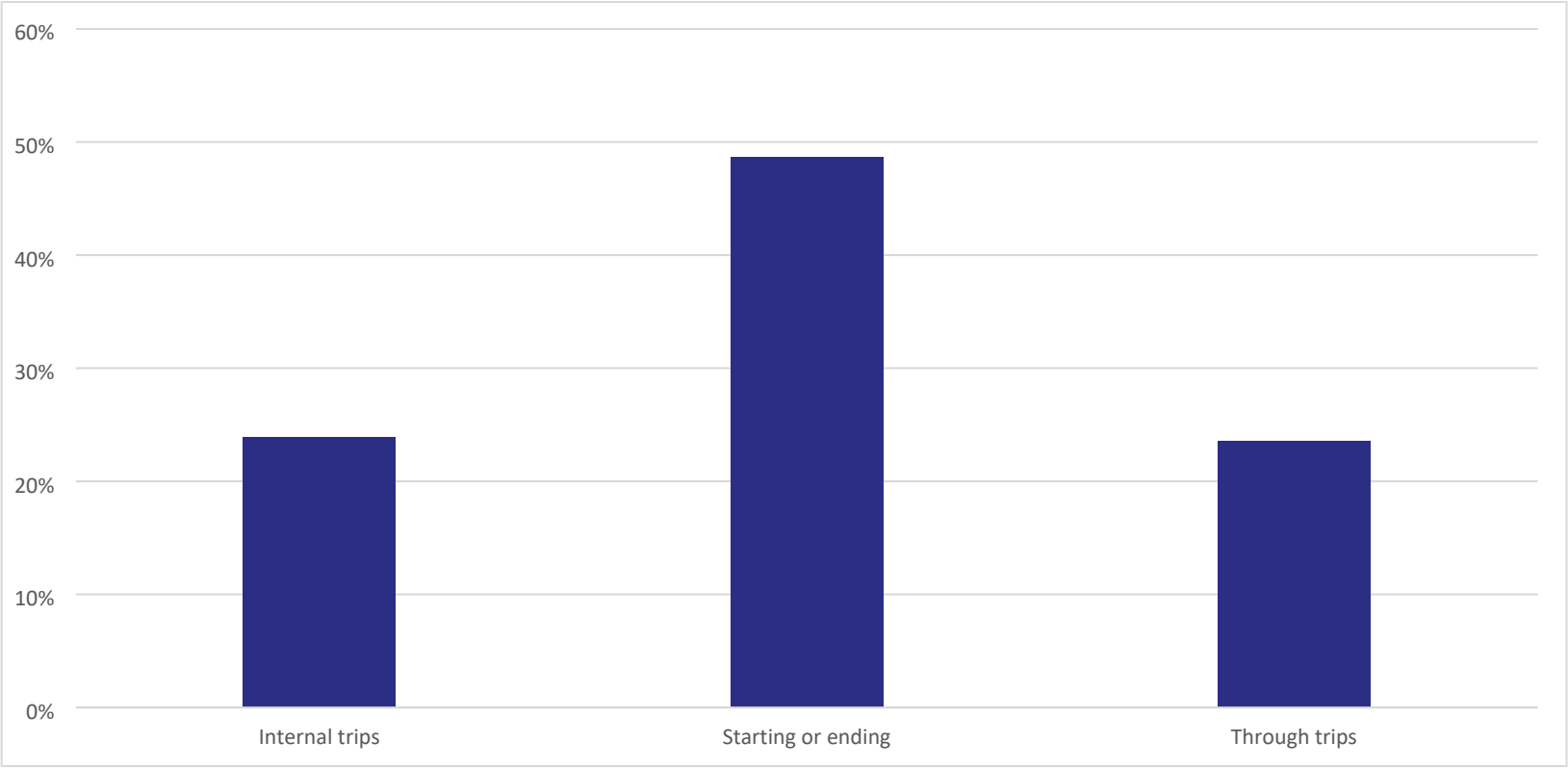

Figure 4 – Proportion of transport CO_2 emissions in Buckinghamshire by trip type

For trips that originated in Buckinghamshire in 2019, the largest proportion of emissions came from trips of 10 to 25 miles (41% of emissions). The next largest proportion came from trips of 5 to 10 miles (23%), followed by 1 to 5 miles (14%), 25 to 50 miles (13%), more than 50 miles (8%) and less than 1 mile (1%).

Overall trips of 10 miles or longer accounted for 62% of carbon emissions in Buckinghamshire and trips of 5 miles or longer accounted for 85% of carbon emissions in Buckinghamshire in 2019. Longer trips are more carbon intensive due to the reliance on more polluting transport modes such as cars and the higher fuel consumption.

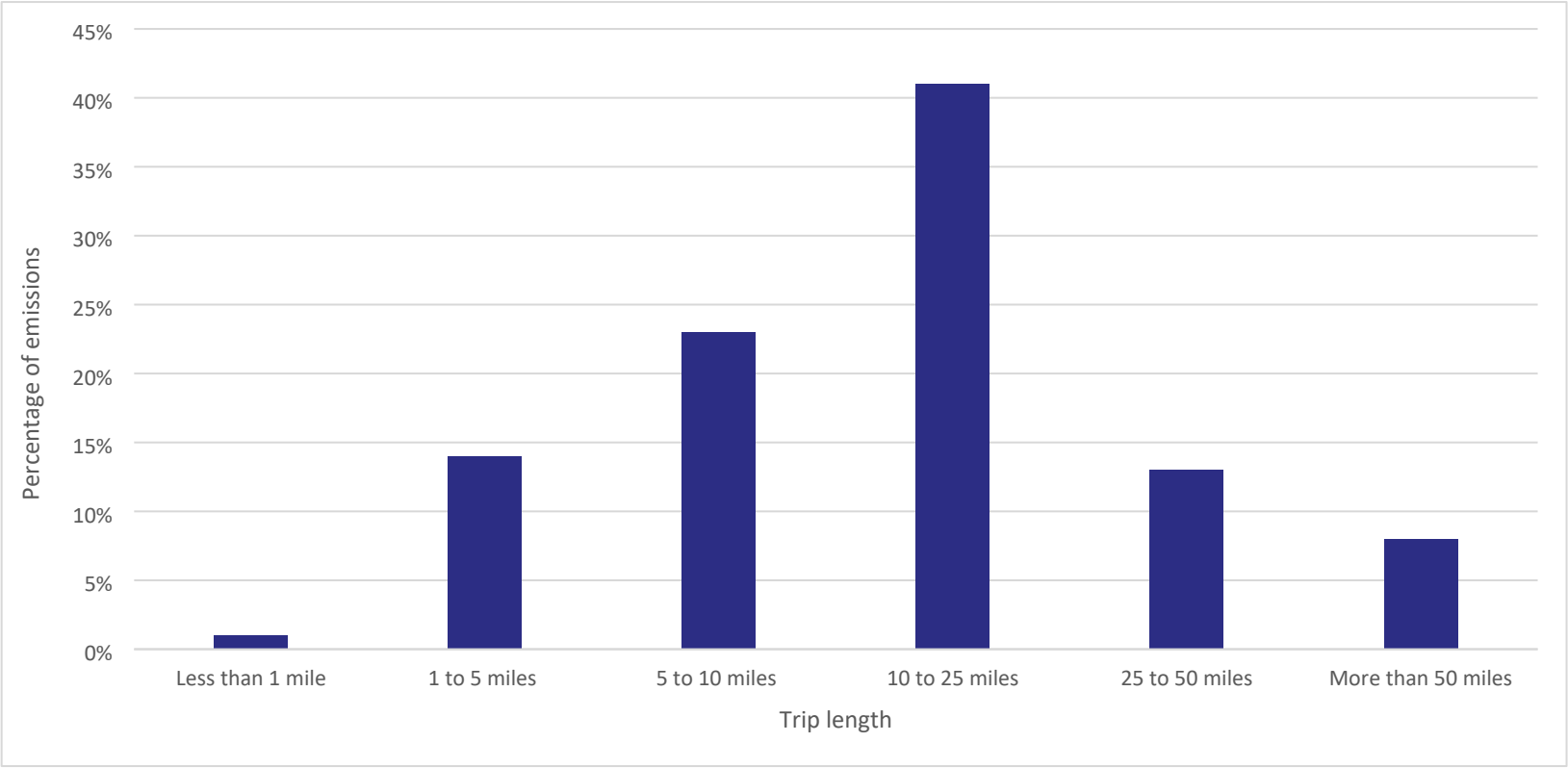

Figure 5 – Proportion of transport emissions in Buckinghamshire by trip length

Place type

The largest proportion of trips and emissions in Buckinghamshire in 2019 came from large urban areas (Aylesbury, High Wycombe, Amersham and Chesham). Large urban areas contributed 54.4% of trips and 48.2% of transport carbon emissions. The next highest proportion came from rural village and dispersed areas (north and south west Buckinghamshire). Rural village and dispersed areas contributed 16.5% of trips and 22.4% of emissions in the county. The greater proportion of emissions than trips from rural villages reflects the need for longer car journeys from these areas. The two largest trip and emission place types being large urban areas and rural villages shows the diversity of Buckinghamshire.

Place type	Proportion of trips	Proportion of emissions
Urban large	54.4%	48.2%
Urban medium	9.9%	11.8%
Urban small	5.3%	3.5%
Rural town and fringe	13.9%	14.1%
Rural village and dispersed	16.5%	22.4%

Figure 6 – Proportion of trips and transport CO_2 emissions in Buckinghamshire by place type

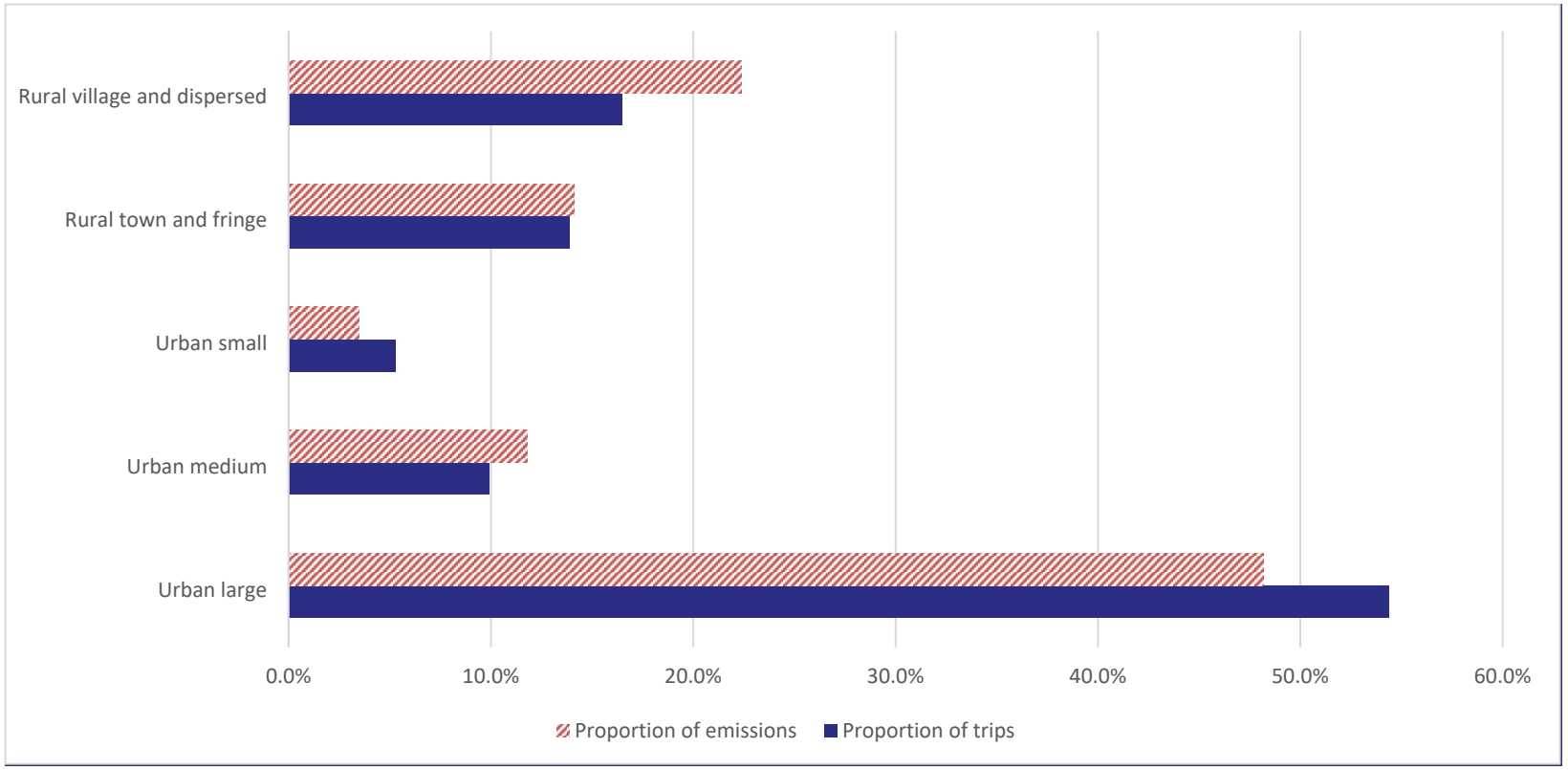

Figure 7 – Proportion of trips and transport CO_2 emissions in Buckinghamshire by place type

Key findings

Using the understanding gained from this section, we identified key findings to help identify the policies which would most effectively support decarbonisation in Buckinghamshire. The key findings and implications for policy identification are summarised below.

Cars are responsible for the majority of transport carbon emissions in Buckinghamshire (65%). Measures to encourage uptake of zero emission vehicles (ZEVs), such as electric vehicle (EV) charging or car clubs, would therefore help to target and reduce a significant proportion of emissions. Measures to encourage alternatives to the private car, such as active travel or public transport, would support emissions reduction. Measures to discourage use of private cars, such as cordon-based charges or tolls, would also support targeting this emission source.

Business travel is the main journey purpose contributing to Buckinghamshire's transport carbon emissions (45%) and commuting contributes a further 19%. Working with employers through the travel planning process, supporting the uptake of zero emission fleets and providing public transport or active travel routes to key economic hubs would help to target and reduce emission from these sources.

The largest proportion of emissions come from trips of 10 to 25 miles (41%) and the majority of emissions come from trips of 5 miles or longer (85%). As there are limited transport options for these longer journeys, measures to encourage uptake of ZEVs or encourage public transport would support emission reduction. Measures to discourage use of private cars for longer journeys, such as cordon-based charges or tolls, would also support targeting this emission source.

The largest proportion of trips (54%) and emissions (48%) come from large urban areas. For journeys within these areas active travel and public transport measures would help to target and reduce emissions. For trips that originate in a large urban area but travel elsewhere, measures to encourage uptake of ZEVs or encourage public transport would support emission reduction.

The second largest proportion of emissions comes from rural villages. Around 36% of transport carbon emissions in Buckinghamshire are from rural areas. Measures to encourage uptake of ZEVs will likely be most effective at reducing emissions from these areas due to the larger distances travelled and limited alternatives.

These findings were used to inform development of a long list of policies and refinement through the policy short listing process. However, it should be noted that this analysis only considers consider carbon reduction and does not address wider objectives such as congestion reduction, improved health and the creation of high-quality places. These wider objectives were also considered as part of the policy development process to ensure a balanced approach that addresses all transport challenges and supports all residents in the county.

Decarbonisation pathways

There are several potential pathways to reduce transport emissions depending on government support and the rate of change. These scenarios reflect market trends such as the ongoing adoption of ZEVs are built into the Carbon Assessment Playbook tool so that we can understand projected future transport emissions in Buckinghamshire. We are then able to understand the impact of LTP5 policy packages on top of projected future transport emissions.

Pathways

In the 'business as usual' pathway Buckinghamshire transport user emissions in 2050 are projected to be 0.666 $MtCO_2$. This is a 53% emission reduction compared to 2019 but remains significantly above zero. Business as usual assumptions are based on funded policies and don't consider the government's commitment to ban the sale of new petrol and diesel cars from 2030. It is considered the lower limit of potential ZEV uptake[4].

Other decarbonisation pathways include accelerated and local ZEV uptake. Local ZEV uptake considers ZEV sales in Buckinghamshire to date, propensity for uptake and current levels of local charging provision. In this pathway emissions are projected to reduce to 0.097 $MtCO_2$ by 2050 (93% reduction compared to 2019). With through trips excluded emissions are projected to reduce to 0.068 $MtCO_2$ (93% reduction compared to 2019).

Accelerated ZEV is considered the upper limit of potential ZEV uptake and would require additional government interventions to realise. In this pathway emissions are projected to reduce to 0.031 $MtCO_2$ by 2050 (98% reduction compared to 2019). With through trips excluded emissions are projected to reduce to 0.020 $MtCO_2$ (98% reduction compared to 2019).

The decarbonisation pathways show that business as usual will not deliver significant transport CO_2 emissions reductions in Buckinghamshire. The local ZEV uptake projection indicates that transport emissions will reduce significantly and be near net-zero by 2050. This is in line with the key findings from the baseline and indication that the uptake of EVs will address large emissions sources in the county.

[4] England's Economic Heartland Baseline Emissions Dashboard

Whilst EV uptake will significantly reduce transport emissions in Buckinghamshire, further work will be needed to reach net-zero or accelerate the reduction. As previously noted, these pathways and ZEV uptake does not consider or address wider issues in Buckinghamshire such as congestion and physical inactivity.

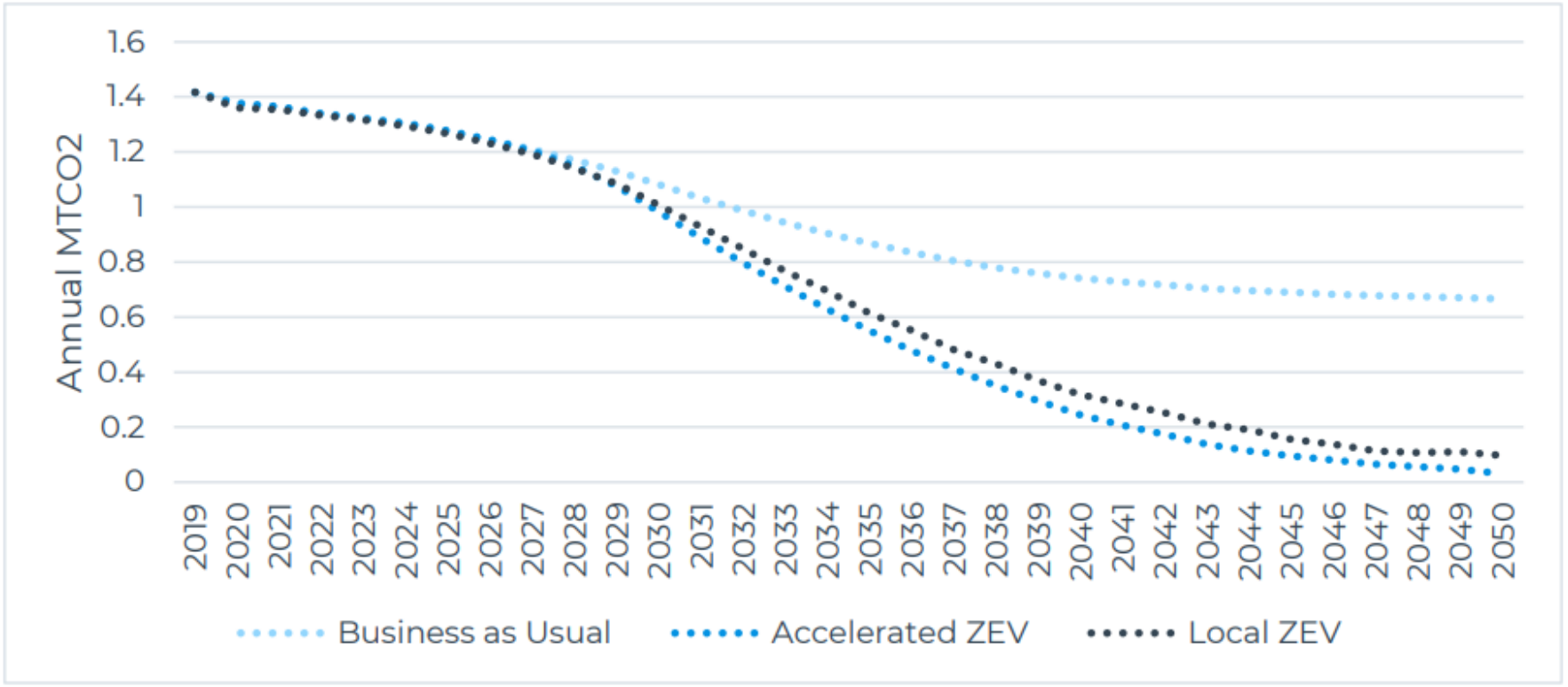

Figure 8 – Decarbonisation pathways in Buckinghamshire assuming different scenarios of ZEV uptake

LTP5 policy package

As outlined in the methodology section, using the understanding gained from the baseline analysis we identified a policy long list. This was refined into a short list through an appraisal process and scenario testing. Further quantitative analysis was carried out on the short list using the Carbon Assessment Playbook tool. The findings from our analysis are summarised in this section.

LTP5 policies

In order to test the LTP5 policies in the Carbon Assessment Playbook we had to match the policies to the interventions included in the Playbook. When adding each intervention to the tool we also had to identify the zones it applies to, the proportion of journeys in the zone that would be exposed to or affected by the intervention, the intensity at which the intervention is applied and the build profile.

Full information about the interventions and evidence behind them can be found here. The map of the 'zones' which interventions can be applied to in Buckinghamshire can be found here. The short listed LTP5 policy package that was tested in the Carbon Assessment Playbook is summarised in the table below. More detail about how policies were applied can be found in appendix 1.

Carbon Assessment Playbook Intervention	LTP5 Policy
Business travel plans	Workplace travel
Support for car sharing	Car clubs
20-minute neighbourhoods	Land use planning
High density developments	
Improved pedestrian infrastructure	Walking, wheeling and cycling
	Public rights of way
Improved cycling infrastructure	Walking, wheeling and cycling
	Public rights of way
Mobility hire schemes	New transport services
Area wide travel planning / mobility management	Information, education and promotion
	Supporting strategies

School travel plans	School travel
EV car clubs	Car clubs
	Zero emission vehicles
EV charging infrastructure	Zero emission vehicles
Bus priority measures	Bus and community transport
	Public space
	Network management
Improved bus / LRT frequency	Bus and community transport
Demand responsive transport	
Extended public transport network	
Integrated ticketing, information and MaaS	
Low emission public transport fleets	
Mobility hubs	Mobility hubs
New rail stations / line opening	Rail

Figure 9 – LTP5 policies and Carbon Assessment Playbook intervention

Playbook interventions not included in the LTP5 short-listed policy package are:

- Support EV uptake in corporate fleets
- Incentive based apps
- Road user charging / tolls
- Cordon based charges and restrictions
- Off-street parking measures
- On-street parking measures
- Workplace parking levy
- Low traffic neighbourhoods
- Reduced public transport fares
- Campaigns for switch to LEV fleets

Scenarios

Using the policy package / interventions outlined above, we developed several scenarios. In these scenarios interventions were applied to the same zones but the scope was changed to understand the impacts of greater investment or ambition for certain intervention types. We also developed additional scenarios including interventions not in the short-listed policy package to understand their impact. A final scenario was developed which included all policies applied to all zones at 100% scope to understand the maximum carbon reductions possible.

Scenario	Scenario name	Feature	Justification
1	Base	Blended package of LTP5 policies at a standard level of delivery	Understand impact of LTP5 policies at a standard level of delivery
2	Active Travel (AT)	Base policies but significantly increased level of delivery for active travel measures	Understand impact of increased delivery of active travel measures
3	Public transport (PT)	Base policies but significantly increased level of delivery for public transport measures	Understand impact of increased delivery of public transport measures
4	Active Travel and Public Transport (AT & PT)	Base policies but significantly increased level of delivery for active travel and public transport measures	Understand impact of increased delivery of active travel and public transport measures
5	Parking	Base policies but parking restrictions added at standard level of delivery	Understand impact of some restrictions on parking
6	Car disincentives (CD)	Base policies but car disincentives such as parking restrictions, workplace parking levy and charging cordon added. Increased level of delivery for car disincentive measures	Understand potential impact of car disincentive measures
7	EV	Base policies but significantly increased level of ambition for EV measures	Understand impact of increased delivery of EV measures

8	All	All interventions applied to all areas in county at maximum extent	Understand impact of maximum application and scale of reduction possible

Figure 10 – LTP5 policy scenarios tested in Carbon Assessment Playbook

Testing results

The 8 LTP5 policy scenarios were tested in the Carbon Assessment Playbook. The tests used the local ZEV and accelerated ZEV scenarios. This means that the LTP5 policies were tested on top of projected ZEV uptake and associated decarbonisation. We took this approach to reflect the ongoing uptake of electric vehicles and planned government bans to the sale of new petrol and diesel vehicles. We excluded through trips in the tests to focus on what is within Buckinghamshire Council's control and align with the LTP5 decarbonisation objective.

Local ZEV

We consider the Local ZEV scenario to be the most appropriate as it considers ZEV uptake based on local characteristics throughout the period. In all tests the LTP5 policies have limited decarbonisation impact on top of local ZEV uptake and the timescales for carbon reduction were similar in all scenarios. This reflects the previous findings about the majority of emissions being related to car use and longer journeys. Therefore, significant emissions reductions come from the uptake of ZEVs and there are limited decarbonisation impacts from other modes.

The overall emissions reduction was around 93% in all scenarios and full decarbonisation was not possible in any scenario. This includes in the 'all' scenario where all interventions were applied to everywhere in the county. This is partly due to emissions from vehicles such as HGVs which have a less clear route to decarbonisation and local authority interventions will not significantly influence.

Aside from ZEVs, public transport was the most effective intervention type from the base scenario (93.71% reduction). This is because public transport is a viable option for longer journeys between towns and from rural areas, both of which are large emissions sources. Large urban areas also have the highest proportion of public transport routes and are the place type with the highest proportion of trips and emissions.

Active travel is primarily viable for journeys of less than a mile which only make up 1% of emissions in Buckinghamshire. The decarbonisation impact of active travel policies is therefore limited.

Outside of ZEVs, car disincentives were the most effective intervention type (93.8% reduction). This is again due to the influence of these measures on the main emissions sources of long journeys and cars. They were only applied within large urban areas so able to impact on a high proportion of trips and emissions.

	Scenario								
	Local ZEV	**1 - Base**	**2 – AT**	**3 - PT**	**4 – AT & PT**	**5 – Parking**	**6 – CD**	**7 - EV**	**8 – All**
2019 (ktCO2e)	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452
2050 (ktCO2e)	68.2711	65.0593	65.0153	64.739	64.6958	64.8008	63.7866	65.0084	54.6121
2019 – 2050 Reduction (ktCO2e)	960.8741	964.0859	964.1299	964.4062	964.4494	964.3444	965.3586	964.1368	974.5331
2019 – 2050 Reduction (%)	-93.37%	-93.68%	-93.68%	-93.71%	-93.71%	-93.70%	-93.80%	-93.68%	-94.69%

Figure 11 – CO_2 reductions from different LTP5 policy scenarios in the local ZEV uptake scenario

'Other' was the journey purpose with largest emission reduction in all scenarios and 'commuting' had the second largest emissions reduction in all scenarios. Emissions reduced from 'business' travel are limited in all scenarios. 'Urban large' was the place type with the largest reduction in all scenarios reflecting the proportion of emissions from this place type and the impact of policies in urban areas.

25 – 50 miles was the trip length with the largest emissions reduction in all scenarios. This again reflects the proportion of emissions from long journeys and impact of ZEV uptake. From the LTP5 policy package active travel was the most effective intervention at reducing emissions from trips of 1-2 miles.

The majority of emission reductions come from cars in all scenarios, again in line with the overall proportion of emissions from cars. 'Car disincentives' and 'all' were the only scenarios that led to LGV and HGV emissions reductions. This is due to disincentives such as congestion charges or low emission zones being applied to all vehicles.

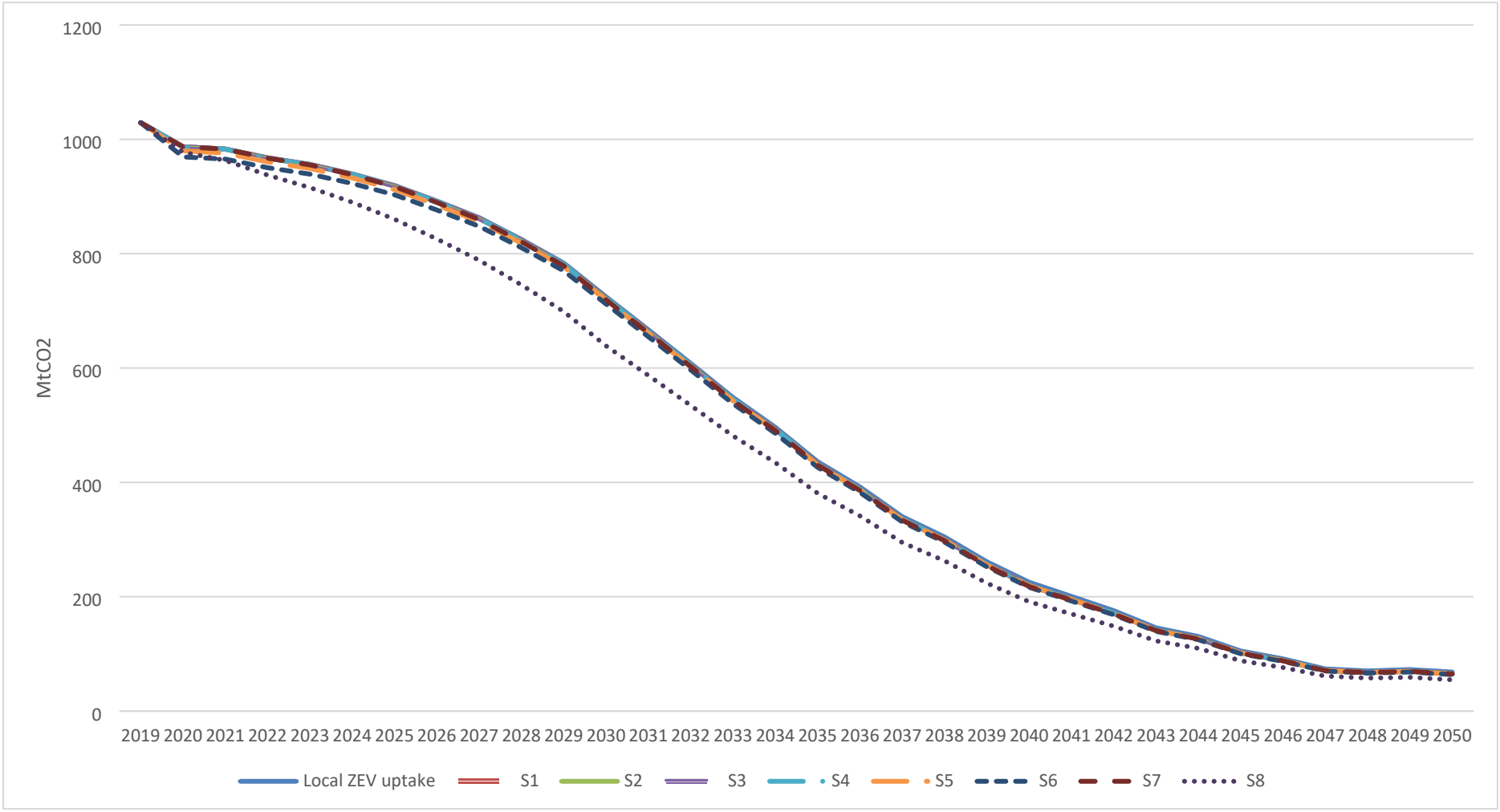

Figure 12 – CO_2 reductions from different LTP5 policy scenarios in the local ZEV uptake scenario

Accelerated ZEV

When testing policies in the accelerated ZEV scenario, the Carbon Assessment Playbook recommends that EV interventions are removed. This is to avoid double counting due to additional measures and ZEV uptake that are assumed to happen. We therefore removed the EV interventions and did not need to test the impact of enhanced LTP5 EV delivery (scenario 7).

The overall emissions reduction was around 98% in all scenarios and again full decarbonisation was not possible in any scenario. Once again, the LTP5 policies had limited decarbonisation impacts on top of accelerated ZEV uptake. The increased uptake of ZEVs led to increased carbon reduction due to the majority of emissions being related to car use and longer journeys.

Public transport and active travel had the same level of impact in this scenario. This is likely due to the accelerated uptake of ZEVs, particularly in the short term, negating the carbon reduction impacts of mode shift to public transport. Outside of ZEVs, car disincentives were again the most effective intervention type due to the influence of these measures on cars. However, disincentives had less decarbonisation impact in this scenario due to the accelerated uptake of ZEVs in the short term.

	Scenario							
	Accelerated ZEV	**1 - Base**	**2 – AT**	**3 - PT**	**4 – AT & PT**	**5 – Parking**	**6 – CD**	**8 – All**
2019 (ktCO2e)	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452	1029.1452
2050 (ktCO2e)	20.7869	19.7062	19.6962	19.6251	19.6153	19.6417	19.3542	16.8381
2019 – 2050 Reduction (ktCO2e)	1008.3583	1009.439	1009.449	1009.5201	1009.5299	1009.5035	1009.791	1012.3071
2019 – 2050 Reduction (%)	-97.98%	-98.09%	-98.09%	-98.09%	-98.09%	-98.09%	-98.12%	-98.36%

Figure 13 – CO_2 reductions from different LTP5 policy scenarios in the Accelerated ZEV uptake scenario

Emission reduction trends were generally in line with observations from the Local ZEV scenario. ‘Other’ was the journey purpose with largest emission reduction in all scenarios and ‘commuting’ had the second largest emissions reduction in all scenarios. ‘Urban large’ was again the place type with the largest reduction in all scenarios.

Trip length reductions varied slightly between scenarios. 25 – 50 miles was the trip length with the largest emissions reduction in most scenarios but the ‘public transport’ scenario had larger reductions from trips over 50 miles. The majority of emission reductions come from cars in all scenarios. As before, ‘car disincentives’ and ‘all’ were the only scenarios that led to LGV and HGV emissions reductions.

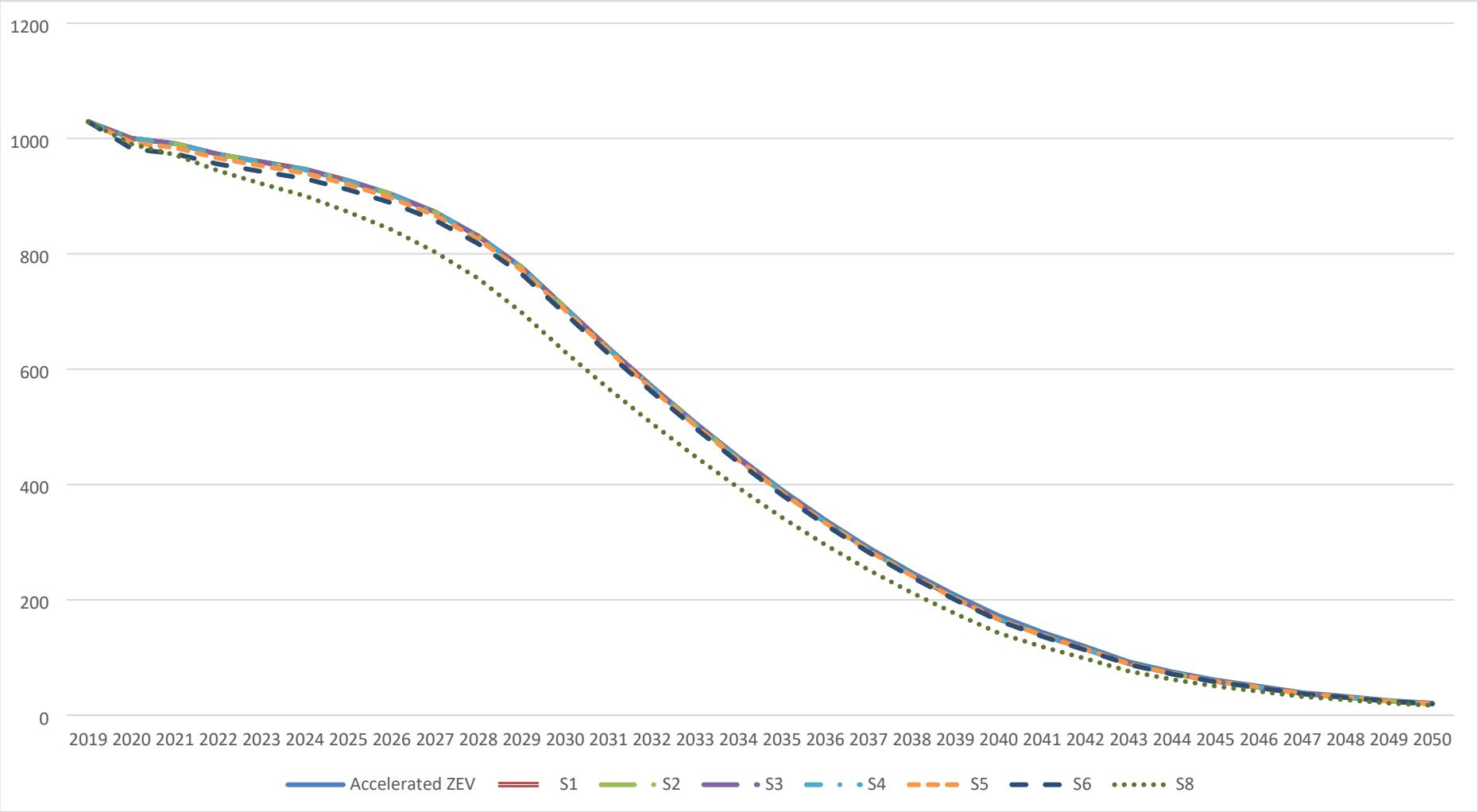

Figure 14 – CO_2 reductions from different LTP5 policy scenarios in the accelerated ZEV uptake scenario

Key findings

The quantitative carbon testing conducted using the Carbon Assessment Playbook has highlighted several clear findings. The main finding is that the uptake of ZEVs in Buckinghamshire will lead to a significant reduction in transport carbon emissions. This is due to the high proportion of emissions in the county that are from cars and longer journeys. The playbook analysis has reinforced findings from the baseline analysis and expectations that ZEV uptake would be the most effective measure to reduce emissions.

The analysis has also highlighted that the proposed LTP5 policy interventions have limited decarbonisation impacts on top of ZEV uptake. As previously outlined, this is due to the high proportion of emissions from cars and longer journeys. From the LTP5 policies identified enhanced delivery of public transport measures has potential to slightly increase carbon reductions. However, this is minimal and broadly in line with the blended approach in the LTP5 'base' scenario. Of all measures, car disincentives had the largest additional carbon reduction, but this was still minimal and broadly similar to the LTP5 'base' scenario.

The analysis shows that full decarbonisation was not possible in any scenario. This is likely due to HGV and LGV emissions which showed minimal reductions and were only impacted by car disincentive measures. Additional support from government to help decarbonise the freight industry is therefore required to truly deliver net-zero transport emissions in the county by 2050.

The analysis also consistently showed that the largest carbon reductions are anticipated from large urban areas and journeys of 25 miles or more. Delivery of measures to target these areas could help to enhance carbon emissions, particularly in the short term.

LTP5 policy short list refinement

The findings from this analysis have been used to refine the LTP5 policy short list and inform final policy drafting. Overall, we believe that the base LTP5 policy scenario represented a balanced and effective approach to decarbonisation, combined with ZEV uptake. The base combination of LTP5 policies has therefore been kept the same. Learnings about the ambition and intensity of delivery have been factored into final policy drafting.

The analysis highlighted the additional decarbonisation impacts of parking measures. These measures also align with and help to deliver wider objectives of LTP5. The addition of a parking policy and considerations about our approach to parking have therefore been made in the final policy drafting.

As previously highlighted, it is important to note that this analysis only considers decarbonisation. It does not consider wider transport issues such as congestion, non-exhaust air pollution and physical inactivity. Simply replacing internal combustion cars with ZEVs will not reduce congestion in the county and there is a risk people drive ZEVs more due to the lower cost and reduced environmental concerns. This could worsen congestion, journey time unreliability and increase non-exhaust air pollution which is particularly damaging to health.

Final refinement of the LTP5 policy short list has therefore considered a wide range of factors to ensure all of the LTP5 objectives are delivered. As a result, we believe it is important we take a balanced policy approach. This includes supporting ZEV uptake whilst also enabling more people to choose to walk, wheel, cycle or use public transport. It also requires considerations about how we adapt to the impacts of climate change, alongside attempts to limit it. It is considered that the LTP5 base policy scenario takes this approach and has therefore been kept broadly the same, with specific issues further refined through final policy drafting. The final draft policies can be found in the main LTP5 document.

Appendix 1 – Carbon Assessment Playbook Interventions

Scenario 1 – Base

QCR Interventions	Zone scope %	Intensity	Build profile	Justification
Business Travel Plans	30%	100%	2019 standard	Applied to zones with key employers. Assumed 30% of journeys and standard 100% intensity. Build profile 2019 standard as ongoing throughout period.
Support for car sharing	30%	100%	2030 standard	Applied in urban areas as more feasible to support a car club. 30% zone scope as per guidance and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
20-minute neighbourhoods	20%	100%	2030 standard	Applied in areas with potential for growth. 20% zone scope as only related to new development and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
High density developments	20%	100%	2030 standard	Applied in areas with potential for growth. 20% zone scope as only related to new development and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Improved pedestrian infrastructure	30%	100%	2019 standard	Applied in urban areas as more feasible and suitable to deliver pedestrian infrastructure. 30% zone scope as improvements likely to be focused on certain routes/corridors and standard 100% intensity. Build profile 2019 standard as ongoing throughout period.
Improved cycling infrastructure	30%	100%	2019 standard	Applied in urban areas as more feasible and suitable to deliver cycling infrastructure. 30% zone scope as improvements likely to be focused on certain routes/corridors and standard 100% intensity. Build profile 2019 standard as ongoing throughout period.
Mobility hire schemes	5%	100%	2019 standard	Applied in existing e-scooter trial areas. 5% zone scope as limited number of e-scooters, range and destinations available. Standard 100% intensity. Build profile 2019 standard as scheme in place and ongoing throughout period.
Area wide travel planning / mobility management	30%	80%	2019 standard	Applied in areas with existing transport strategy. 30% zone scope as strategy includes a range of measures that could influence car journeys across area. 80% intensity to reflect reduced likelihood of delivering all measures. Build profile 2019 standard as strategy in place and delivery ongoing throughout period.
School travel plans	20%	100%	2019 standard	Applied in all areas. Assumed there is a school in all zones. 20% zone scope as only affects trips to school and standard 100% intensity. Build profile 2019 standard to reflect ongoing school travel plan work.

EV car clubs	30%	100%	2030 standard	Applied in urban areas as more feasible to support car club. 30% zone scope to align with support for car sharing and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Bus priority measures	30%	100%	2030 standard	Applied in urban areas with existing bus priority as more feasible further bus priority measures are introduced. 30% zone scope as measures only likely to be on key corridors and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Improved bus/LRT frequency	30%	100%	2030 standard	Applied in urban areas as more feasible to increase bus service frequency. 30% zone scope as increased frequency only likely to be on key corridors and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Mobility hubs	10%	100%	2030 standard	Applied at existing train or bus stations as more feasible to deliver mobility hub. 10% zone scope as hub only in one location and user experience has limited potential impact. Standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Demand responsive transport	30%	100%	2019 standard	Applied in areas covered by existing DRT scheme. 30% zone scope as range of destinations covered within scheme area. Standard 100% intensity. Build profile 2019 standard as scheme in place and ongoing throughout period.
Extended public transport network	10%	100%	2030 standard	Applied in areas with potential for housing growth and provision of new public transport routes. 10% zone scope as only likely to be a limited number of new or extended bus routes. Standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
New rail stations / line opening	50%	80%	2040 standard	Applied in areas with potential for new rail stations. 50% zone scope as large proportion of car trips within 1km of potential stations. 80% intensity as limited destinations served by proposed stations. Build profile 2040 standard as unlikely to begin delivery until 2040.
Integrated ticketing, information and MaaS	30%	100%	2030 standard	Applied in areas named as ambition for multi operator ticketing in BSIP. 30% zone scope as ticketing only affects bus routes which are on key corridors. Standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Low emission public transport fleets	100%	100%	2030 standard	Applied in all areas as bus network is present in all zones. Ambition in BSIP to seek funding to convert diesel fleets to zero emission. 100% zone scope and intensity as per guidance. Build profile 2030 standard as unlikely to begin delivery until 2030.
EV charging infrastructure	20%	100%	2019 standard	Applied in UK power network tool identified areas requiring public or public-commercial support for EV chargers. 20% zone scope as chargers likely to be in one location. Standard 100% intensity. Build profile 2019 standard as delivery ongoing.

Scenario 2 – Active travel

QCR Interventions	Zone scope %	Intensity	Build profile	Justification
Business Travel Plans	As per S1	As per S1	As per S1	As per S1
Support for car sharing	As per S1	As per S1	As per S1	As per S1
High density developments	As per S1	As per S1	As per S1	As per S1
Improved pedestrian infrastructure	75%	100%	2019 standard	Applied in urban areas as more feasible and suitable to deliver pedestrian infrastructure. 75% zone scope to represent significant amount of improvements and standard 100% intensity. Build profile 2019 standard as ongoing throughout period.
Improved cycling infrastructure	75%	100%	2019 standard	Applied in urban areas as more feasible and suitable to deliver cycling infrastructure. 75% zone scope to represent significant amount of improvements and standard 100% intensity. Build profile 2019 standard as ongoing throughout period.
Mobility hire schemes	As per S1	As per S1	As per S1	As per S1
Area wide travel planning / mobility management	As per S1	As per S1	As per S1	As per S1
School travel plans	As per S1	As per S1	As per S1	As per S1
EV car clubs	As per S1	As per S1	As per S1	As per S1
Bus priority measures	As per S1	As per S1	As per S1	As per S1
Improved bus/LRT frequency	As per S1	As per S1	As per S1	As per S1
Mobility hubs	As per S1	As per S1	As per S1	As per S1

Demand responsive transport	As per S1	As per S1	As per S1	As per S1
Extended public transport network	As per S1	As per S1	As per S1	As per S1
New rail stations / line opening	As per S1	As per S1	As per S1	As per S1
Integrated ticketing, information and MaaS	As per S1	As per S1	As per S1	As per S1
Low emission public transport fleets	As per S1	As per S1	As per S1	As per S1
EV charging infrastructure	As per S1	As per S1	As per S1	As per S1

Scenario 3 – Public transport

QCR Interventions	Zone scope %	Intensity	Build profile	Justification
Business Travel Plans	As per S1	As per S1	As per S1	As per S1
Support for car sharing	As per S1	As per S1	As per S1	As per S1
20-minute neighbourhoods	As per S1	As per S1	As per S1	As per S1
High density developments	As per S1	As per S1	As per S1	As per S1

Improved pedestrian infrastructure	As per S1	As per S1	As per S1	As per S1
Improved cycling infrastructure	As per S1	As per S1	As per S1	As per S1
Mobility hire schemes	As per S1	As per S1	As per S1	As per S1
Area wide travel planning / mobility management	As per S1	As per S1	As per S1	As per S1
School travel plans	As per S1	As per S1	As per S1	As per S1
EV car clubs	As per S1	As per S1	As per S1	As per S1
Bus priority measures	75%	100%	2030 standard	Applied in urban areas with some existing bus priority as more feasible additional bus priority measures are introduced. 75% zone scope to reflect significant delivery and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Improved bus/LRT frequency	75%	100%	2030 standard	Applied in urban areas as more feasible to increase bus service frequency. 75% zone scope to represent significant increases to frequency across area and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Mobility hubs	30%	100%	2030 standard	Applied at existing train or bus stations as more feasible to deliver mobility hub. 30% zone scope as hub only in one location but represent significant investment in improved user experience. Standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Demand responsive transport	50%	100%	2019 standard	Applied in areas covered by existing DRT scheme. 50% zone scope to represent expanded scheme. Standard 100% intensity. Build profile 2019 standard as scheme in place and ongoing throughout period.
Extended public transport network	40%	100%	2030 standard	Applied in areas with potential for housing growth and provision of new public transport routes. 40% zone scope to represent significant number of new or extended bus routes. Standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.

New rail stations / line opening	75%	80%	2040 standard	Applied in areas with potential for new rail station. 75% zone scope to reflect increased attractiveness. 80% intensity as limited destinations served by potential new stations. Build profile 2040 standard as unlikely to begin delivery until 2040.
Integrated ticketing, information and MaaS	75%	100%	2030 standard	Applied in areas named as ambition for multi operator ticketing in BSIP. 75% zone scope to reflect significant improvements to number of bus services. Standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Low emission public transport fleets	As per S1	As per S1	As per S1	As per S1
EV charging infrastructure	As per S1	As per S1	As per S1	As per S1

Scenario 4 – Active travel and public transport

QCR Interventions	Zone scope %	Intensity	Build profile	Justification
Business Travel Plans	As per S1	As per S1	As per S1	As per S1
Support for car sharing	As per S1	As per S1	As per S1	As per S1
20-minute neighbourhoods	As per S1	As per S1	As per S1	As per S1
High density developments	As per S1	As per S1	As per S1	As per S1
Improved pedestrian infrastructure	As per S2	As per S2	As per S2	As per S2
Improved cycling infrastructure	As per S2	As per S2	As per S2	As per S2

Mobility hire schemes	As per S1	As per S1	As per S1	As per S1
Area wide travel planning / mobility management	As per S1	As per S1	As per S1	As per S1
School travel plans	As per S1	As per S1	As per S1	As per S1
EV car clubs	As per S1	As per S1	As per S1	As per S1
Bus priority measures	As per S3	As per S3	As per S3	As per S3
Improved bus/LRT frequency	As per S3	As per S3	As per S3	As per S3
Mobility hubs	As per S3	As per S3	As per S3	As per S3
Demand responsive transport	As per S3	As per S3	As per S3	As per S3
Extended public transport network	As per S3	As per S3	As per S3	As per S3
New rail stations / line opening	As per S3	As per S3	As per S3	As per S3
Integrated ticketing, information and MaaS	As per S3	As per S3	As per S3	As per S3

Low emission public transport fleets	As per S1	As per S1	As per S1	As per S1
EV charging infrastructure	As per S1	As per S1	As per S1	As per S1

Scenario 5 – Parking

QCR Interventions	Zone scope %	Intensity	Build profile	Justification
Business Travel Plans	As per S1	As per S1	As per S1	As per S1
Support for car sharing	As per S1	As per S1	As per S1	As per S1
20-minute neighbourhoods	As per S1	As per S1	As per S1	As per S1
High density developments	As per S1	As per S1	As per S1	As per S1
Improved pedestrian infrastructure	As per S1	As per S1	As per S1	As per S1
Improved cycling infrastructure	As per S1	As per S1	As per S1	As per S1
Mobility hire schemes	As per S1	As per S1	As per S1	As per S1
Area wide travel planning / mobility management	As per S1	As per S1	As per S1	As per S1

School travel plans	As per S1	As per S1	As per S1	As per S1
EV car clubs	As per S1	As per S1	As per S1	As per S1
Bus priority measures	As per S1	As per S1	As per S1	As per S1
Improved bus/LRT frequency	As per S1	As per S1	As per S1	As per S1
Mobility hubs	As per S1	As per S1	As per S1	As per S1
Demand responsive transport	As per S1	As per S1	As per S1	As per S1
Extended public transport network	As per S1	As per S1	As per S1	As per S1
New rail stations / line opening	As per S1	As per S1	As per S1	As per S1
Integrated ticketing, information and MaaS	As per S1	As per S1	As per S1	As per S1
Low emission public transport fleets	As per S1	As per S1	As per S1	As per S1
EV charging infrastructure	As per S1	As per S1	As per S1	As per S1
Off-street parking measures	30%	100%	2026 complete	Applied in urban areas as measure only intended for urban areas. 30% zone scope as restrictions likely to be focused on certain areas/car parks and standard 100% intensity. Build profile 2026 complete as can be implemented immediately.

On-street parking measures	30%	100%	2026 complete	Applied in urban areas as measure only intended for urban areas. 30% zone scope as restrictions likely to be focused on certain areas/car parks and standard 100% intensity. Build profile 2026 complete as can be implemented immediately.

Scenario 6 – Car disincentives

QCR Interventions	Zone scope %	Intensity	Build profile	Justification
Business Travel Plans	As per S1	As per S1	As per S1	As per S1
Support for car sharing	As per S1	As per S1	As per S1	As per S1
20-minute neighbourhoods	As per S1	As per S1	As per S1	As per S1
High density developments	As per S1	As per S1	As per S1	As per S1
Improved pedestrian infrastructure	As per S1	As per S1	As per S1	As per S1
Improved cycling infrastructure	As per S1	As per S1	As per S1	As per S1
Mobility hire schemes	As per S1	As per S1	As per S1	As per S1
Area wide travel planning / mobility management	As per S1	As per S1	As per S1	As per S1
School travel plans	As per S1	As per S1	As per S1	As per S1

EV car clubs	As per S1	As per S1	As per S1	As per S1
Bus priority measures	As per S1	As per S1	As per S1	As per S1
Improved bus/LRT frequency	As per S1	As per S1	As per S1	As per S1
Mobility hubs	As per S1	As per S1	As per S1	As per S1
Demand responsive transport	As per S1	As per S1	As per S1	As per S1
Extended public transport network	As per S1	As per S1	As per S1	As per S1
New rail stations / line opening	As per S1	As per S1	As per S1	As per S1
Integrated ticketing, information and MaaS	As per S1	As per S1	As per S1	As per S1
Low emission public transport fleets	As per S1	As per S1	As per S1	As per S1
EV charging infrastructure	As per S1	As per S1	As per S1	As per S1
Off-street parking measures	75%	100%	2026 complete	Applied in urban areas as measure only intended for urban areas. 75% zone scope to represent wide ranging restrictions and standard 100% intensity. Build profile 2026 complete as can be implemented immediately.

On-street parking measures	75%	100%	2026 complete	Applied in urban areas as measure only intended for urban areas. 75% zone scope to represent wide ranging restrictions and standard 100% intensity. Build profile 2026 complete as can be implemented immediately.
Cordon based charges and restrictions	75%	100%	2030 standard	Applied in large urban areas as most suitable potential area for restriction. 75% zone scope to reflect wide coverage and standard 100% intensity. Build profile 2030 standard as not feasible to begin delivery until 2030.
Workplace parking levy	30%	100%	2030 standard	Applied in areas with large employer. Assumed 30% of journeys and standard 100% intensity. Build profile 2030 standard as not feasible to begin delivery until 2030.

Scenario 7 – EV

QCR Interventions	Zone scope %	Intensity	Build profile	Justification
Business Travel Plans	As per S1	As per S1	As per S1	As per S1
Support for car sharing	As per S1	As per S1	As per S1	As per S1
20-minute neighbourhoods	As per S1	As per S1	As per S1	As per S1
High density developments	As per S1	As per S1	As per S1	As per S1
Improved pedestrian infrastructure	As per S1	As per S1	As per S1	As per S1
Improved cycling infrastructure	As per S1	As per S1	As per S1	As per S1
Mobility hire schemes	As per S1	As per S1	As per S1	As per S1

Area wide travel planning / mobility management	As per S1	As per S1	As per S1	As per S1
School travel plans	As per S1	As per S1	As per S1	As per S1
EV car clubs	75%	100%	2030 standard	Applied in urban areas as more feasible to support car club. 75% zone scope to represent significant investment in EV and standard 100% intensity. Build profile 2030 standard as unlikely to begin delivery until 2030.
Bus priority measures	As per S1	As per S1	As per S1	As per S1
Improved bus/LRT frequency	As per S1	As per S1	As per S1	As per S1
Mobility hubs	As per S1	As per S1	As per S1	As per S1
Demand responsive transport	As per S1	As per S1	As per S1	As per S1
Extended public transport network	As per S1	As per S1	As per S1	As per S1
New rail stations / line opening	As per S1	As per S1	As per S1	As per S1
Integrated ticketing, information and MaaS	As per S1	As per S1	As per S1	As per S1
Low emission public transport fleets	As per S1	As per S1	As per S1	As per S1

EV charging infrastructure	75%	100%	2019 standard	Applied in UK power network tool identified area requiring public or public-commercial support for EV chargers. 75% zone scope to represent significant investment in EV. Standard 100% intensity. Build profile 2019 standard as delivery ongoing.

Scenario 8 – All

QCR Interventions	Zone scope %	Intensity	Build profile	Justification
Business Travel Plans	100%	100%	2019 standard	Test of all zones and interventions.
Support for car sharing	100%	100%	2019 standard	Test of all zones and interventions.
20-minute neighbourhoods	100%	100%	2019 standard	Test of all zones and interventions.
High density developments	100%	100%	2019 standard	Test of all zones and interventions.
Improved pedestrian infrastructure	100%	100%	2019 standard	Test of all zones and interventions.
Improved cycling infrastructure	100%	100%	2019 standard	Test of all zones and interventions.
Mobility hire schemes	100%	100%	2019 standard	Test of all zones and interventions.
Area wide travel planning / mobility management	100%	100%	2019 standard	Test of all zones and interventions.
School travel plans	100%	100%	2019 standard	Test of all zones and interventions.
EV car clubs	100%	100%	2019 standard	Test of all zones and interventions.
Bus priority measures	100%	100%	2019 standard	Test of all zones and interventions.

Improved bus/LRT frequency	100%	100%	2019 standard	Test of all zones and interventions.
Mobility hubs	100%	100%	2019 standard	Test of all zones and interventions.
Demand responsive transport	100%	100%	2019 standard	Test of all zones and interventions.
Extended public transport network	100%	100%	2019 standard	Test of all zones and interventions.
New rail stations / line opening	100%	100%	2019 standard	Test of all zones and interventions.
Integrated ticketing, information and MaaS	100%	100%	2019 standard	Test of all zones and interventions.
Low emission public transport fleets	100%	100%	2019 standard	Test of all zones and interventions.
EV charging infrastructure	100%	100%	2019 standard	Test of all zones and interventions.
Incentive based apps	100%	100%	2019 standard	Test of all zones and interventions.
Road user charging / tolls	100%	100%	2019 standard	Test of all zones and interventions.
Cordon based charges and restrictions	100%	100%	2019 standard	Test of all zones and interventions.
Off-street parking measures	100%	100%	2019 standard	Test of all zones and interventions.

On-street parking measures	100%	100%	2019 standard	Test of all zones and interventions.
Workplace parking levy	100%	100%	2019 standard	Test of all zones and interventions.
Low traffic neighbourhoods	100%	100%	2019 standard	Test of all zones and interventions.
Reduced public transport fares	100%	100%	2019 standard	Test of all zones and interventions.
Campaigns for switch to LEV fleets	100%	100%	2019 standard	Test of all zones and interventions.
Support EV uptake in corporate fleets	100%	100%	2019 standard	Test of all zones and interventions.