

Local Transport and Connectivity Plan - Monitoring Report 2023-2024

October 2024



Document information

Title	Local Transport and Connectivity Plan – Monitoring Report 2023 - 2024
First published	August 2024
Status	Draft
Enquiries	LTCP5@oxfordshire.gov.uk

Version control

Version	Date	Changes
Draft V1	August 2024	
Draft V2	September 2024	Updates following officer feedback

Contents

Executive Summary	4
Headline targets	11
Key Performance Indicators	23
Travel behaviour surveys	46
Delivery over the last year	52
Future delivery	57
Appendix 1 – Target and KPI data sources	59
Appendix 2 – LTCP car trip methodology	62
Appendix 3 – Causeway Active Travel Tranche 2 monitoring	66

Executive Summary

Introduction

This is the second annual monitoring report for Oxfordshire County Council's (OCC) Local Transport and Connectivity Plan (LTCP). The LTCP was adopted by the county council in July 2022. It sets out an overarching vision for transport in the county and the policies that will be required to deliver the vision.

In order to demonstrate progress on delivering the LTCP, progress made against the headline targets and performance against the key performance indicators (KPIs), we committed to publishing annual monitoring reports. This document is the second annual report. The first annual monitoring report from 2022–23 can be found on our website [here](#).

Baseline data

The baseline year for the data used in our monitoring is outlined for each target or KPI. We have used 2019 as the baseline year for our monitoring. This was identified in the LTCP as the baseline year due to the significant changes the COVID-19 lockdowns and restrictions had on travel in 2020 and 2021.

Headline targets

In order to track delivery of the vision and key themes we identified a set of headline targets in the LTCP. These were identified to help us quantify progress made on delivering the vision and ensure that we are on track to deliver our objectives.

There have been some recorded changes on the headline targets over the last year. This includes a 16% increase in the number of cycle trips between 2021 and 2022 and a 24% reduction in road fatalities and serious injuries in 2023 compared to 2022. Whilst this is a positive step, it is also important to consider longer term trends due to year to year variation, the target timescales and because it will take a number of years to significantly change travel patterns in the county.

Key performance indicators

The LTCP also identified a set of Key Performance Indicators (KPIs). The KPIs provide us with more detail about progress and identify potential areas for further work. There have been some observed changes to the KPIs over the last year. The majority of this data is from 2022 and therefore there is still work required to understand the impacts of the LTCP.

We also conducted a pilot countywide travel survey in Winter 2023 which is summarised in this report. The survey provides further insight into the LTCP headline targets and KPIs.

There continue to be some KPIs that do not have data in this report. This is because there are not currently data sources for some of the KPIs which were not previously monitored by OCC or because data sources have changed or not been updated since the LTCP was adopted. We are reviewing the inclusion of these KPIs and in some cases we have included data on similar topics.

Delivery over the last year

There has been a good level of delivery over the last year. Key work delivered includes:

- Strategic Active Travel Network approved in April 2024.
- Community Outreach Active Travel programme launched in November 2023 by partners, Active Oxfordshire (AO).
- Progressing Phase 2 School Streets at 5 schools.
- Vision Zero Strategy and Action Plan adopted in April 2024.
- Delivery of the Zero Emission Bus Regional Area (ZEBRA) in partnership with the bus operators.
- New Bus Service Improvement Plan adopted in June 2024.
- Launched a new countywide multi operator bus ticket scheme known as MyBus.
- Received £2,629,000 additional funding from the DfT for resurfacing and pothole repair. In 2023/24 this is delivering B4477 Kencot resurfacing and pre surface dressing patching at 33 sites.
- MultiCAV project successfully completed, piloting a self-driving bus between Milton Park and Didcot Railway station.
- Pilot countywide travel behaviour survey conducted.
- Ongoing work to deliver a Horizon Europe funded project (Green-log) for a freight consolidation pilot in Oxford, with demonstration commencing in Winter 2024.
- Central Oxfordshire Movement and Place Framework and development commenced.

Future delivery

Good progress has been made on delivering the LTCP however, we recognise that there is still a long way to go if we are to deliver our vision and targets for transport in Oxfordshire. Over the next year we will continue work in all of the LTCP policy areas. Some key areas of planned work include:

- Development of LCWIPs for Charlbury, Chipping Norton, Thame, Wantage & Grove and Woodstock.

- Development and adoption of updated Oxfordshire Cycle Design Standards (OCDS) and Walking Design Standards (OWDS).
- Phase 2 of the Strategic Active Travel Network (confirmation of preferred route alignments, feasibility and design work, costings) on an area-by-area basis.
- Development of the Oxford Greenways project with Oxford City Council and Oxford University.
- OxRail 2040: Plan for Rail Strategy targeting Cabinet consideration in December 2024.
- Development of an interim improvements programme for Oxford railway station with Great Western Railway and Network Rail.
- Design and engagement work on mobility hub pilot sites in Benson and Carterton.
- Conduct bus franchising and Demand Responsive Transport feasibility studies.
- Continued delivery of existing BSIP funded schemes, and development of new bus schemes as funding allows.
- Production of a suite of new public bus maps.

Introduction

This is the second annual monitoring report for Oxfordshire County Council's Local Transport and Connectivity Plan (LTCP). The LTCP was adopted by the county council in July 2022 following 3 rounds of public consultation. The LTCP sets out an overarching vision for transport in the county and the policies that will be required to deliver the vision.

The LTCP is supported by a number of more detailed strategies. These build on the high level principles in the LTCP but address complex topics in more detail. Supporting strategies for freight, active travel and innovation were adopted alongside the LTCP in July 2022. Following adoption, we have also adopted a Central Oxfordshire Travel Plan and a Mobility Hub Strategy. Further area travel plans and supporting strategies are under development.

In order to demonstrate progress on delivering the LTCP, progress made against the headline targets and performance against the KPIs we committed to publishing annual monitoring reports. This document is our second annual monitoring report.

Data availability

We have used 2019 as the baseline year for our monitoring. This was identified in the LTCP as the baseline year due to the significant changes the COVID-19 lockdowns and restrictions had on travel in 2020 and 2021.

It is important to highlight that the data included in this report comes from a wide range of different sources. The reporting periods covered for each data set varies and there is a lag associated with the majority of transport data. This due to the time taken for data to be collected, analysed and published. The majority of data included in this year's report is from 2022 which was the year of LTCPs adoption. Therefore, future monitoring and further work to monitor individual schemes is needed to understand the impacts of the LTCP.

Local Transport Plan guidance

The Department for Transport's decarbonisation plan published in 2021¹, strengthened the role of Local Transport Plans (LTPs). The plan set out a role for revitalised LTPs to set quantifiable targets in carbon reductions in transport for local areas. Guidance for designing sustainable transport solutions through LTPs was also due to be published by the Department for Transport.

¹ [Decarbonising Transport: A Better, Greener Britain \(2021\)](#)

At the time of writing, we are still awaiting publication of the LTP guidance which was originally scheduled to be published in the summer 2023 for public consultation. We will continue to monitor this situation and update the LTCP and the content of these monitoring reports accordingly.

Travel choices context

There are a wide range of factors that affect people's travel choices. Therefore, understanding the data and changes summarised in this report can be complex due to the international, national and local factors that can all affect residents travel choices. Some of these factors the county council can influence but others are beyond our control and may require action from the government or private sector to change.

We have provided an overview of key factors in this section for context. The factors have been identified from Oxfordshire Community Rail Partnership's residents survey, further details of which are included later in this report. We have included information for 2022 or 2023 in most cases as this aligns with the majority of data in this report.

Reliability

- The percentage of non-frequent bus services running on time in Oxfordshire was 85% in 2022 and 80% in 2023. This is higher than all years since 2008 apart from 2021 (88%) and above the national average (83.9% and 79.9% in 2022 and 2023 respectively)².
- In 2022 the percentage of trains running on time for the main operators in Oxfordshire was³:
 - Chiltern Railways – 71%
 - CrossCountry – 49.5%
 - Great Western railway – 63%
- Average delays on roads have been increasing since 2019.
 - Average delays on Local A roads in Oxfordshire were 36.7 seconds per vehicle mile (spvpm) in 2023, an increase from 34 spvpm in 2022⁴.
 - Average delays on the Strategic Road Network in the England's Economic Heartland Area was 9.5 spvpm in 2023, an increase from 8.9spvpm in 2022⁵.

² Department for Transport: Non-frequent bus services running on time by local authority: England, a annual from year ending March 2005

³ Office of Rail and Road: Passenger rail performance

⁴ Department for Transport: Average delay on local 'A' roads by local authority in England

⁵ Department for Transport: Travel time measures for the Strategic Road Network

Cost

- Petrol and diesel prices were high in the UK in 2022 averaging 164.6p per litre for petrol and 177.7p per litre for diesel across the year. This is compared to averages of 147.6p per litre for petrol and 158.1p per litre for diesel in 2023⁶.
 - In 2022, the average price of petrol and diesel in the UK reached record highs in the summer. The highest average price for petrol was 191.5p per litre on 2nd July and the highest average price for diesel was 199.09p per litre on 25th June.
 - Fuel prices in 2022 were affected by the Russia-Ukraine war and trade uncertainty which caused crude oil prices to rise.
- New rail fares were introduced in March 2022. Rail fares increased by 4.8% compared with a 9% increase in the Retail Prices Index (RPI) over the same period⁷.
- The local bus fares index decreased by 1.1% in England between September 2022 and September 2023. This likely reflects the £2 fare cap that came into effect in England outside London from January 2023 and will run until December 2024⁸.

Speed

- Average speeds on roads have been decreasing increasing since 2019.
 - Average speeds on Local A roads in Oxfordshire were 27.7mph in 2023, a decrease from 28.6mph in 2022 and below the 2019 pre-COVID average of 28.1mph⁹.
 - Average speeds on the Strategic Road Network in the England's Economic Heartland Area was 58.6mph in 2023, a decrease from 59.1mp in 2022¹⁰.

Comfort

- 2022 was the warmest year on record for the UK. All individual months except December were warmer than average¹¹.
 - Rainfall was mostly below average for the year with the months from January to August, and December, all being generally drier than average.

⁶ Department for Energy security and Net zero: Weekly road fuel prices

⁷ [Rail Fares Index 2022](#)

⁸ Department for Transport: Quarterly bus fares statistics: July to September 2023

⁹ Department for Transport: Average speed on local 'A' roads by local authority in England

¹⁰ Department for Transport: Travel time measures for the Strategic Road Network

¹¹ [Met Office Climate Summary 2022](#)

- Notable extreme events of 2022 included stormy weather during February, including storm Eunice. Extreme heatwaves in the summer months included temperatures in excess of 40 °C being recorded in the UK for the first time. There was a prolonged cold spell during the first half of December, one of the most significant cold spells to affect the UK since December 2010.
- 2023 was a very warm and wet year for the UK. The most notable features were record breaking temperatures in June, exceptional heatwave in early September and run of named storms through the autumn and early winter¹².
 - Two named storms in August were followed by a further six - from Agnes (late September) to Gerrit (late December). Several of these caused significant disruption from heavy rain and strong winds.

Convenience and flexibility

- The COVID-19 pandemic led to a change in working patterns with a significant increase in the number of residents work from home. The 2021 census found that around 40% of residents in Oxfordshire worked mainly at or from home¹³.
 - This has likely decreased since the end of COVID-19 pandemic restrictions, however hybrid working patterns have remained and are more common than before.
 - National data from the Office for National Statistics Opinions and Lifestyle Survey found that 28% of working adults worked from home and travelled to work between September 2022 and January 2023¹⁴.
 - The increased need for flexibility may not always be in line with travel options or fares. For example the share of revenue from rail season tickets has fallen from 20% pre-pandemic to 8.9% in 2022¹⁵.

¹² [Met Office Climate Summary 2023](#)

¹³ Office for National Statistics – Census 2021

¹⁴ Office for National Statistics - Characteristics of homeworkers, Great Britain: September 2022 to January 2023

¹⁵ [Rail Fares Index 2022](#)

Headline targets

Background

In order to track delivery of the vision and key themes we identified a set of headline targets in the LTCP. These were identified to help us quantify progress made on delivering the vision and ensure that we are on track to deliver our objectives. The LTCP headline targets are included below.

By 2030 our targets are to:

- Replace or remove 1 out of every 4 current car trips in Oxfordshire
- Increase the number of cycle trips in Oxfordshire from 600,000 to 1 million cycle trips per week
- Reduce road fatalities or serious injuries by 50%

By 2040 our targets are to:

- Deliver a net-zero transport network
- Replace or remove an additional 1 out of 3 car trips in Oxfordshire

By 2050 our targets are to:

- Deliver a transport network that contributes to a climate positive future
- Have zero, or as close as possible, road fatalities or serious injuries

Current progress

Progress made on delivering the headline targets is summarised in the following sections. We have provided some short analysis of the data and the trends observed which is grouped according to car trips, cycle trips, net-zero transport network and road safety to reflect the main target themes.

Data sources for all of the targets and KPIs can be found in appendix 1. The majority of the targets are using existing data sources. However, car trips were not previously monitored and there is not a readily available data source. Work was therefore conducted in 2023 to develop a bespoke monitoring mechanism.

It is important to note that the car trip monitoring uses a proxy and not an absolute measure of the number of car trips. It allows us to understand the percentage change from a sample of car trips but does not provide an overall countywide figure. Due to changes in data collection locations since 2019 we have also had to establish a new baseline year to enable statistically robust comparison to previous years. We have used 2024 data as it is the most up to date, we do not currently have access to 2023 data. Further technical information about the methodology can be found in appendix 2.

Target	2019 (Baseline)	2020 (COVID-19)	2021 (COVID-19)	2022	2023	2024	Change vs previous year (%)	Change vs baseline (%)
2030 targets								
Replace or remove 1 out of every 4 current car trips in Oxfordshire	N/A	N/A	N/A	+4.5% vs 2019	N/A	-2.3% vs 2022	N/A	-2.3%
Increase the number of cycle trips in Oxfordshire from 600,000 to 1 million cycle trips per week	630,000 per week	570,000 per week	460,000 per week	533,000 per week	N/A	N/A	+16%	-15%
Reduce road fatalities or serious injuries by 50%	233	225	246	306	233	N/A	-24%	0%
2040 targets								
Deliver a net-zero transport network	1322.9 kt CO ₂	1056.4 kt CO ₂	1,140.8 kt CO ₂	1,153.9 kt CO ₂	N/A	N/A	+1%	-13%
Replace or remove an additional 1 out of 3 car trips in Oxfordshire	See 2030 targets							
2050 targets								
Deliver a transport network that contributes to a climate positive future	See 2040 targets							
Have zero, or as close as possible, road fatalities or serious injuries	See 2030 targets							

Future trajectory

Having outlined the progress made on delivering the headline targets, this section provides a summary of the trajectories required to meet our targets. It should be noted that these trajectories have been calculated as an average annual percentage change required and are not forecasts or modelled predictions. Further information can be found in the analysis section.

Car trips

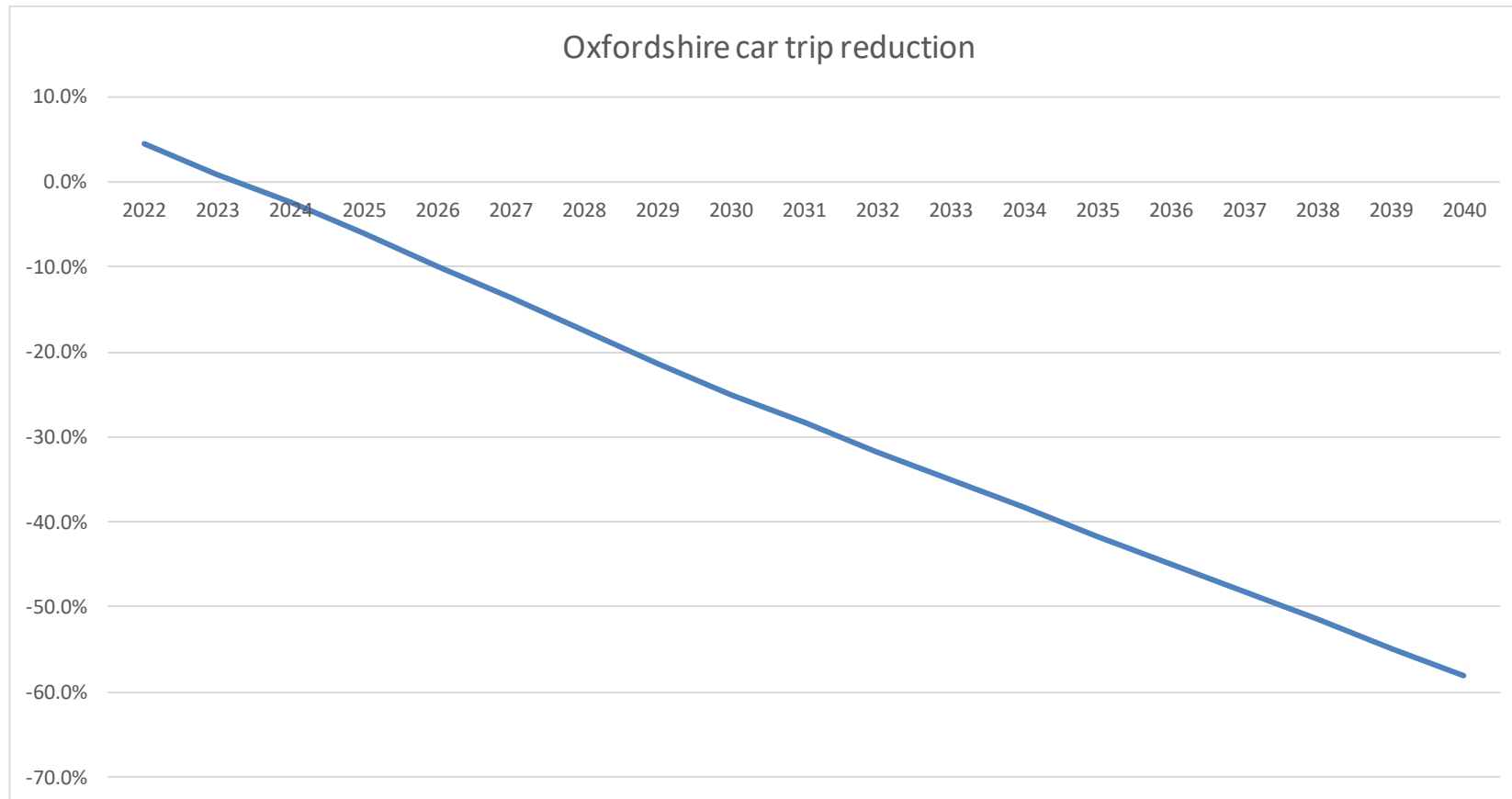


Figure 1 – Oxfordshire car trip reduction required per year to reach 2030 and 2040 targets from 2024 base

Cycle trips

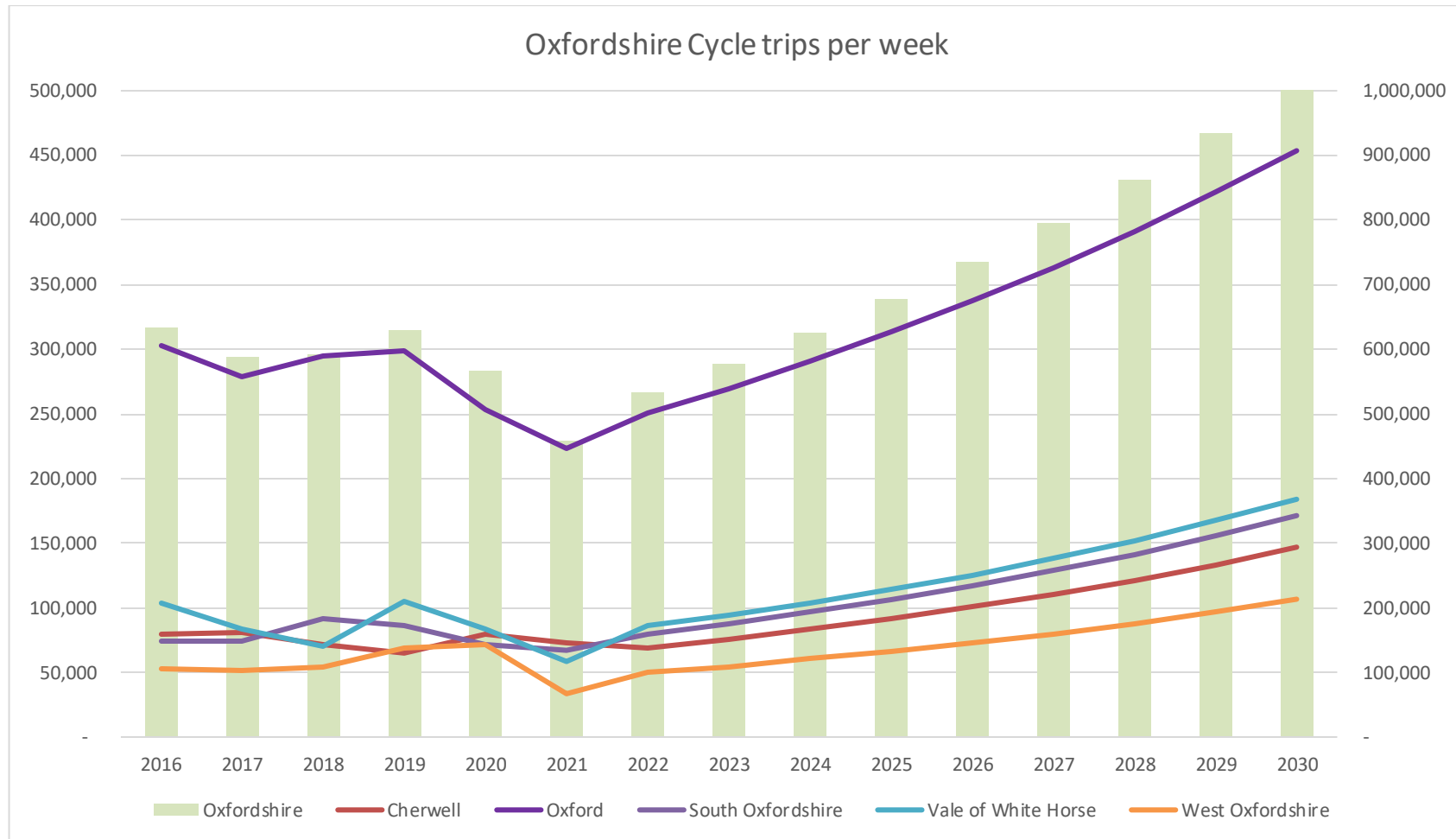


Figure 2 – Oxfordshire cycle trip data between 2016-2022 and cycle trip targets per week to reach 2030 target from 2022 base (Oxfordshire shown on right axis, districts on left axis)

Net-zero transport network

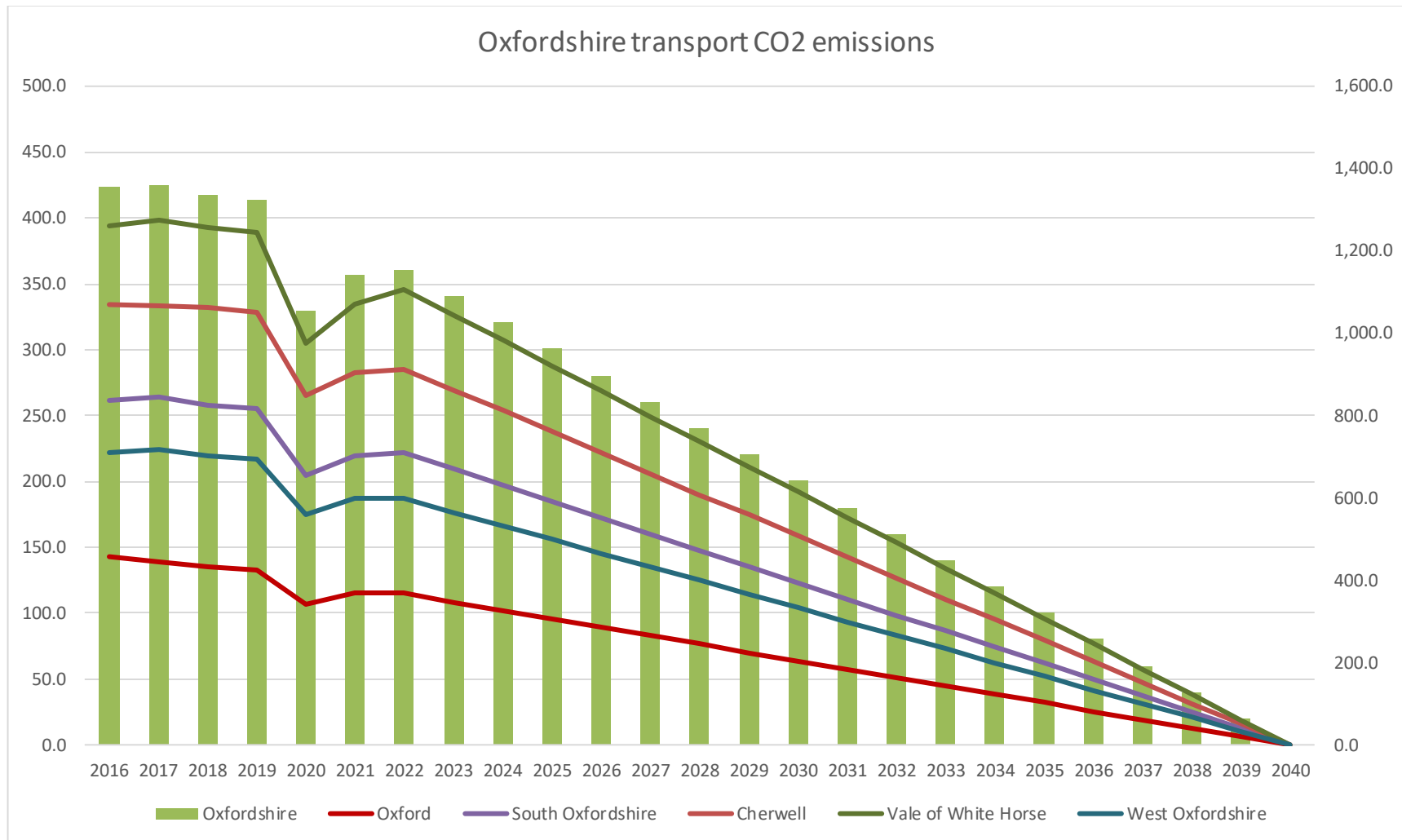


Figure 3 – Oxfordshire transport CO₂ emission data between 2016-2022 and yearly reduction targets to reach 2040 target from 2022 base (Oxfordshire on right axis, districts on left axis)

Road safety

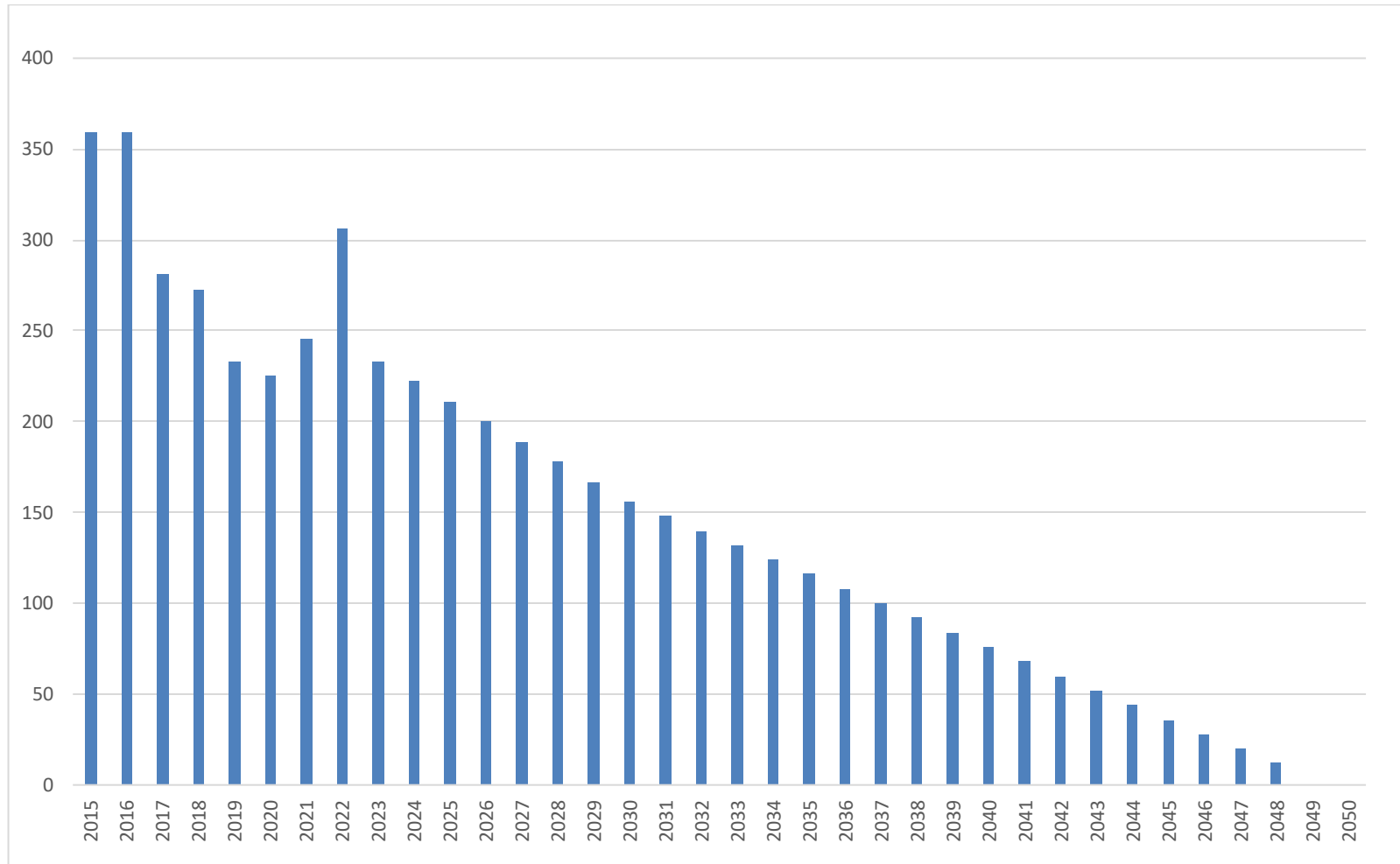


Figure 4 – Oxfordshire road traffic casualty (KSI) data between 2015-2023 and average yearly reduction required to reach 2030 and 2050 targets from 2023 baseline

Analysis

This section provides analysis of progress made on the headline targets and the future trajectories. The analysis is structured according to the main target themes of car trips, cycle trips, net-zero transport network and road safety.

Car trips

As previously highlighted, our car trip monitoring uses percentage change from a sample of car trips. Last year’s monitoring report showed that there was a 4.5% increase in car trips between 2019 and 2022. The 2024 data is from April and has been compared to data from the new baseline of April 2022 as outlined previously. In this time period, the number of car trips reduced by 2.3%. In order to reach the 2030 car trip reduction target (25% reduction) from 2024 levels there needs to be an annual average decrease of 3.8%.



Figure 5 – Car trip percentage change between 2022 and 2024

Cycle trips

The number of cycling trips per week is calculated using data from Sport England's Active Lives Survey. The most recent data available is from 2022. The data shows that the number of cycling trips per week in Oxfordshire in 2022 has decreased by 15% compared to the 2019 baseline. However, there has been a 16 percentage point increase in the number of cycling trips per week compared to the previous year (2021).

In order to achieve the 2030 targets from 2022 levels, there needs to be an average annual increase in cycling trips per week of 8% in Oxfordshire. Geographically this breaks down into an average annual increase of 7.5% in Oxford and 10% in the other Oxfordshire districts. As this data is primarily from prior to the LTCP's adoption and countywide it is challenging to understand the impact of LTCP interventions. Publication of 2023 data will assist with this understanding, and we are now also able to include results from the monitoring of individual schemes delivered by OCC to understand their impacts. The first example of this is the Bicester active travel tranche 2 scheme.

Weekly data on the total numbers of cyclists and other travellers along Causeway in Bicester have been collected via Vivacity sensors since February 2021. The implementation of the scheme has had a notable impact on cycling trends. The findings highlight a significant increase in both cyclist and pedestrian numbers over time, particularly evident during the summer months. The analysis also found a strong correlation between cyclist and pedestrian numbers, emphasising the interconnected nature of these modes of transport. Further detail about the statistical analysis undertaken can be found in appendix 3.

The following graphs compare cyclist and pedestrian numbers between equivalent months in different years. They demonstrate the seasonal trend of increased counts during summertime and decreased counts during wintertime. Notably, there is an overall increase in numbers following implementation of the scheme, particularly evident in 2023.

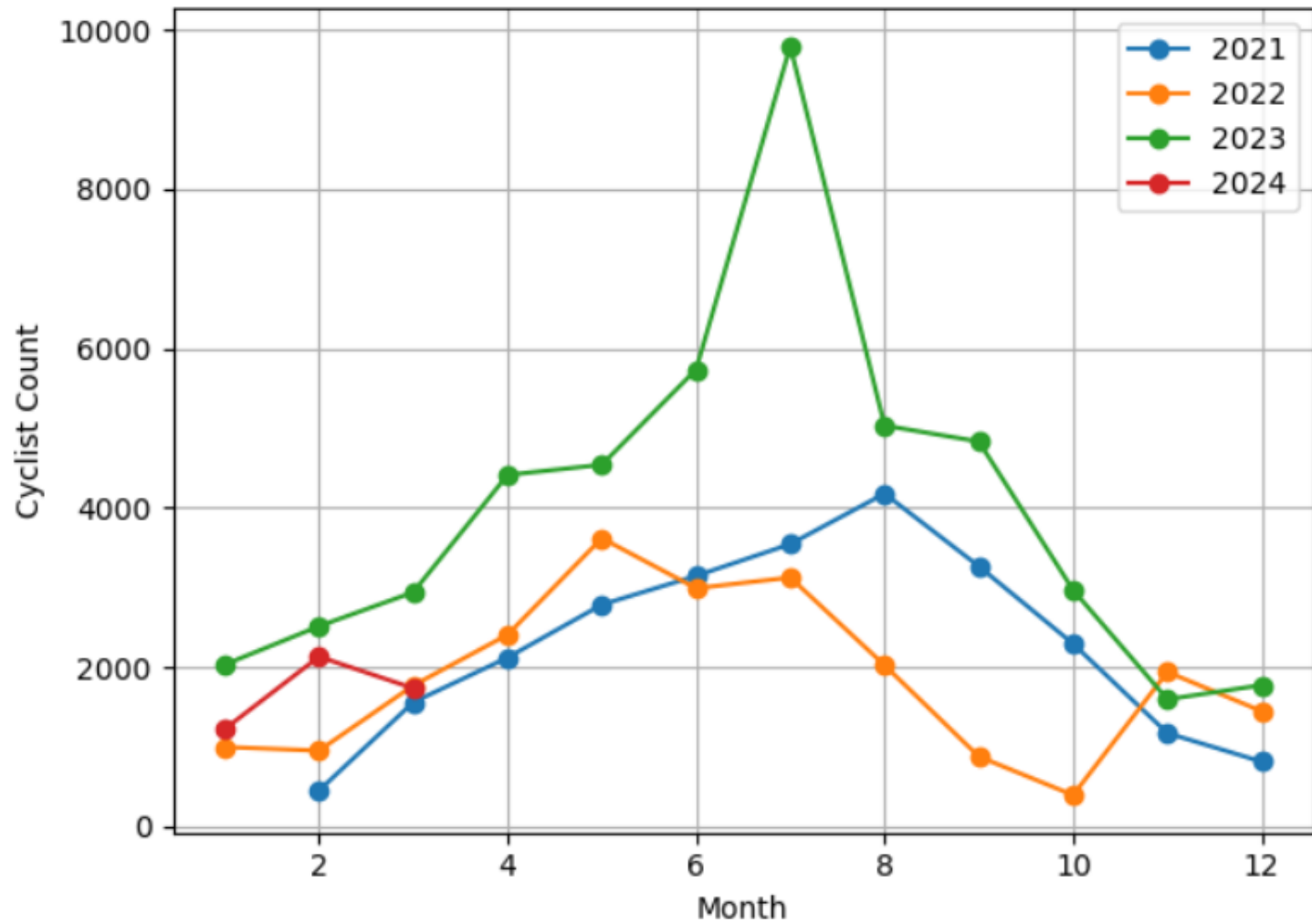


Figure 6 – Cyclist count comparison between similar months in different years on the Causeway, Bicester

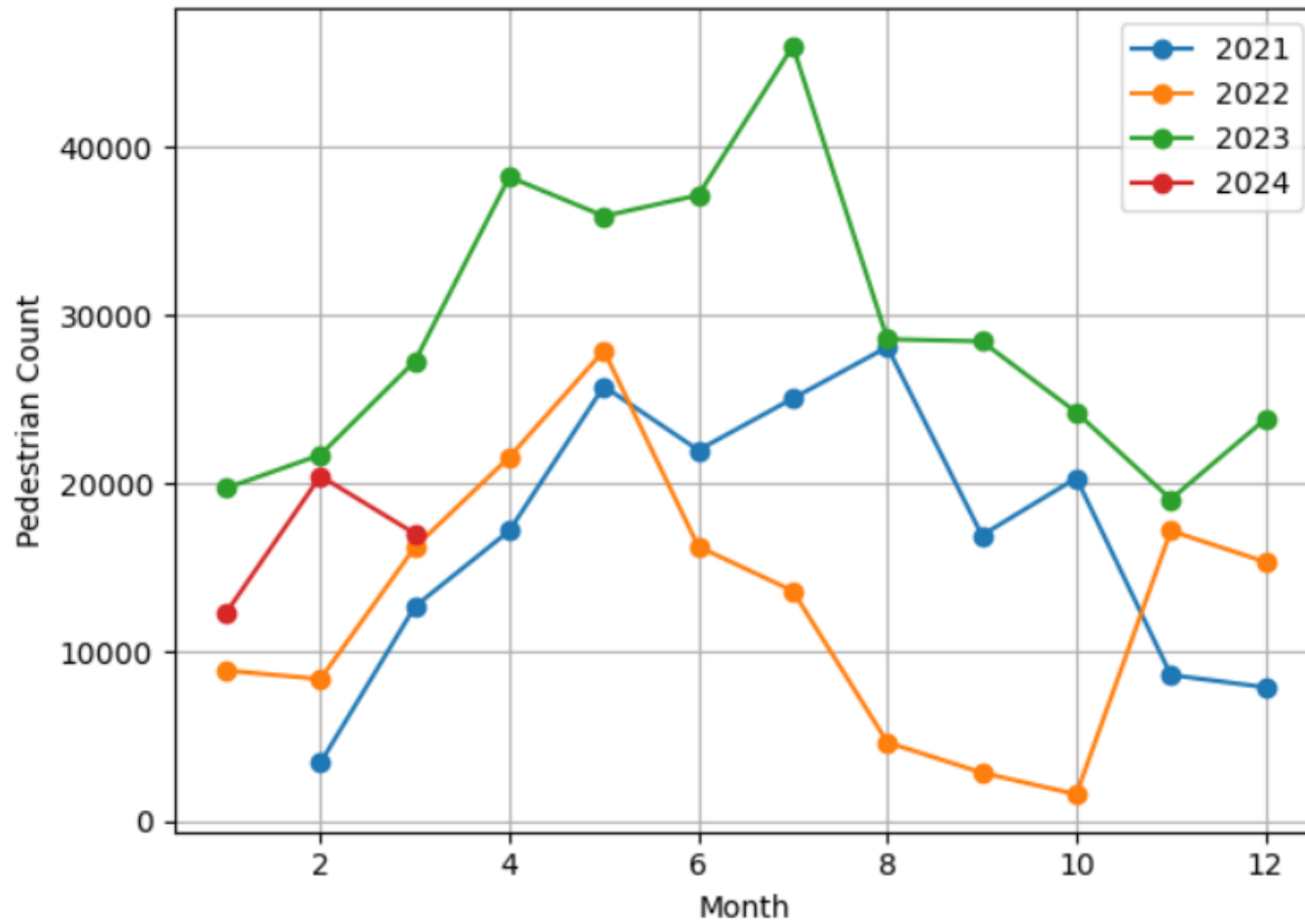


Figure 7 – Cyclist count comparison between similar months in different years on the Causeway, Bicester

Net-zero transport network

Data about CO₂ emissions from transport is provided by the government and covers emissions within the scope of influence of local authorities. For transport, railways and motorways are therefore excluded. Owing to the time taken to collect, analyse and validate the data, the most recent data is for 2022.

The data shows that there was a notable 20% decrease in CO₂ emissions from transport between 2019 and 2020 but this is likely due to reduced travel as a result of COVID-19. Emissions from transport have slowly increased since 2020 and there was a 1% increase between 2021 and 2022. The 1% increase in transport emissions between 2021 and 2022 is lower than the 12% increase in car vehicle miles over the same time period demonstrating the increased uptake and impact of lower emission vehicles. The 2022 transport emission figure is 13% lower than the 2019 baseline.

The graph in the future trajectory section shows that an annual average reduction of approximately 64.11 kt CO₂ is required to reach the 2040 net-zero transport network target. This is nearly triple the annual reduction achieved before COVID-19 (21.4 kt CO₂ reduction between 2018 and 2019) highlighting the need to accelerate transport decarbonisation work.

Road safety

Road safety data is compiled by the county council from reports submitted by the police for each road traffic collision resulting in a personal injury that they attend. In practice, it is known from various national studies using information from insurers and the NHS that quite a large number of injury collisions are not reported to the police. It is therefore acknowledged that the actual number of collisions and injuries on our roads is considerably higher than those analysed.

The proportion of collisions included in the police reports appears to be reasonably stable, and a very similar picture is found in other areas outside the county. The information therefore allows trends in road safety to be assessed with a good level of confidence. There has over the longer term been a downward trend in reported collisions and injuries, reflecting a very wide range of factors such as road improvement schemes, improved vehicle safety and national and local measures to improve the training and skills of road users.

The number of people killed or seriously injured (KSI) decreased from 306 to 233 between 2022 and 2023 (24% decrease). Compared to the 2019 baseline there is no change in the number of KSI (233 in 2019). Whilst the 24% decrease in the number of KSI between 2022 and 2023 is positive, it is important to note that this change is unlikely to be due to any local factor and instead a reflection of the variability in a relatively small set

of data when just looking at Oxfordshire. We will therefore continue to review longer term trends to understand the impacts of our Vision Zero road safety programme. More detailed analysis of KSI trends can be found in our [annual casualty report](#).

The future trajectory section shows that an average KSI reduction of 11 per year is required to meet the 2030 target from the 2023 figure. This is reduced from an average of 19 per year identified in last year's monitoring report from the 2022 figure. From 2030 there would then need to be an average KSI reduction of 8 per year to meet the 2050 vision zero target.

Key Performance Indicators

The following set of Key Performance Indicators were identified in the LTCP. We have not identified specific targets for all of the KPIs. Instead, all policies and schemes are working towards delivery of our headline targets.

The KPIs provide us with more detail about progress and identify potential areas for further work. Where applicable, national data has also been included to show Oxfordshire compared to national trends. This is helpful for highlighting where broader national trends and policy beyond the county council’s control may be affecting travel.

There is still not data for all KPIs in this annual monitoring report. This is because there are not currently data sources for some of the KPIs which were not previously monitored. There are some KPIs where sources have changed or measures have been amended therefore the KPI may no longer be applicable. We will review the inclusion of these KPIs and in some cases have included alternative data. The sources used for the KPIs in this report can be found in appendix 1.

Transport emissions

Indicator	Location	2019 (Baseline)	2020 (COVID-19)	2021 (COVID-19)	2022	2023 (Current)	Change vs previous year (%)	Change vs baseline (%)
Road transport emissions	Oxfordshire	1322.9 kt CO ₂	1056.4 kt CO ₂	1140.8 kt CO ₂	1153.9 kt CO ₂	N/A	+1%	-13%
	UK	98,878.3 kt CO ₂	80,316.7 kt CO ₂	87,586.1 kt CO ₂	87,998.5 kt CO ₂	N/A	0%	-11%

Analysis of the road transport emission data can be found in the headline target chapter. As shown on the table above, emissions from transport have slowly increased since 2020 and there was a 1% increase between 2021 and 2022. The 2022 transport emission figure is 13% lower than the 2019 baseline, a greater decrease than the national average.

Walking and cycling

Indicator	Location	2019 (Baseline)	2020 (COVID-19)	2021 (COVID-19)	2022	2023 (Current)	Change vs previous year (%)	Change vs baseline (%)
% of adults that do any walking at least once per week	Oxfordshire	76.8%	73.5%	76.1%	76.1%	N/A	0%	-0.7%
	England	71.1%	67.3%	69.7%	69.1%	N/A	-0.6%	-2%
% of adults that walk for leisure at least once per week	Oxfordshire	56%	61.6%	67.5%	64%	N/A	-3.5%	+8%
	England	50.9%	55.1%	59.8%	55.8%	N/A	-4%	+4.9%
% of adults that walk for travel at least once per week	Oxfordshire	45.4%	32.8%	28.4%	40%	N/A	+11.6%	-5.4%
	England	42.1%	30.5%	28%	35%	N/A	+7%	-7.1%
% of adults that do any cycling at least once per week	Oxfordshire	21.4%	20%	16.9%	18.5%	N/A	+1.6%	-2.9%
	England	11.2%	11.6%	9.1%	9.3%	N/A	+0.2%	-1.9%
% of adults that cycle for leisure at least once per week	Oxfordshire	11.3%	11.9%	8.4%	8.5%	N/A	+0.1%	-2.8%
	England	7.6%	8.5%	6%	5.4%	N/A	-0.6%	-2.2%
% of adults that cycle for travel at least once per week	Oxfordshire	14.4%	11.7%	11.2%	14%	N/A	+2.8%	-0.4%
	England	5.9%	5.1%	4.6%	5.6%	N/A	+1%	-0.3%
Number of walking trips	Oxfordshire	2,515,431 per week	2,479,388 per week	2,490,010 per week	2,510,444 per week	N/A	+1%	0%
	England	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of cycling trips	Oxfordshire	629,256 per week	566,539 per week	458,320 per week	532,957 per week	N/A	+16%	-15%
	England	N/A	N/A	N/A	N/A	N/A	N/A	N/A

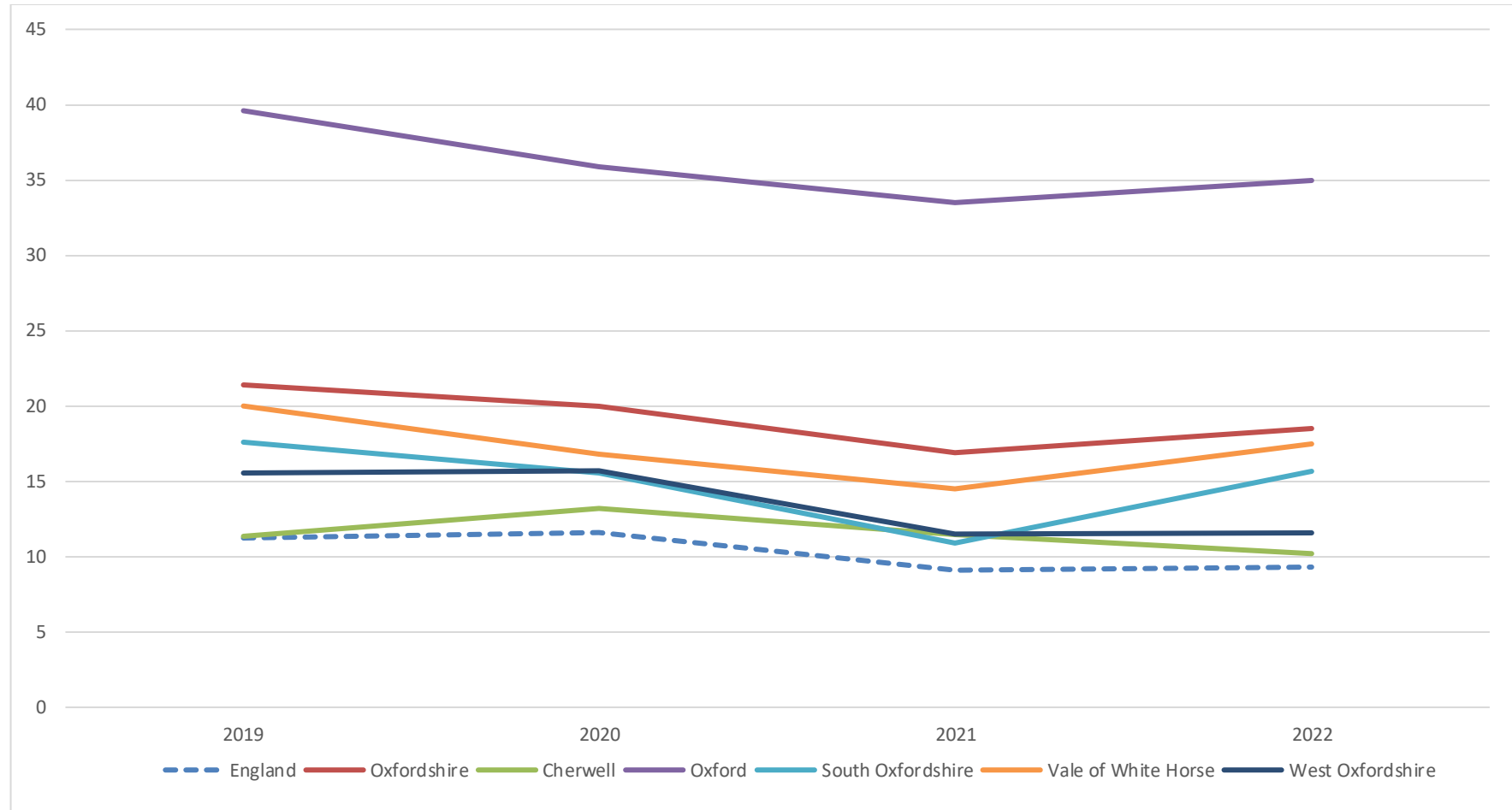


Figure 8 – Percentage of adults that cycle for any purpose at least once per week. Oxfordshire trends are shown with the solid lines, national trends with the dashed lines.

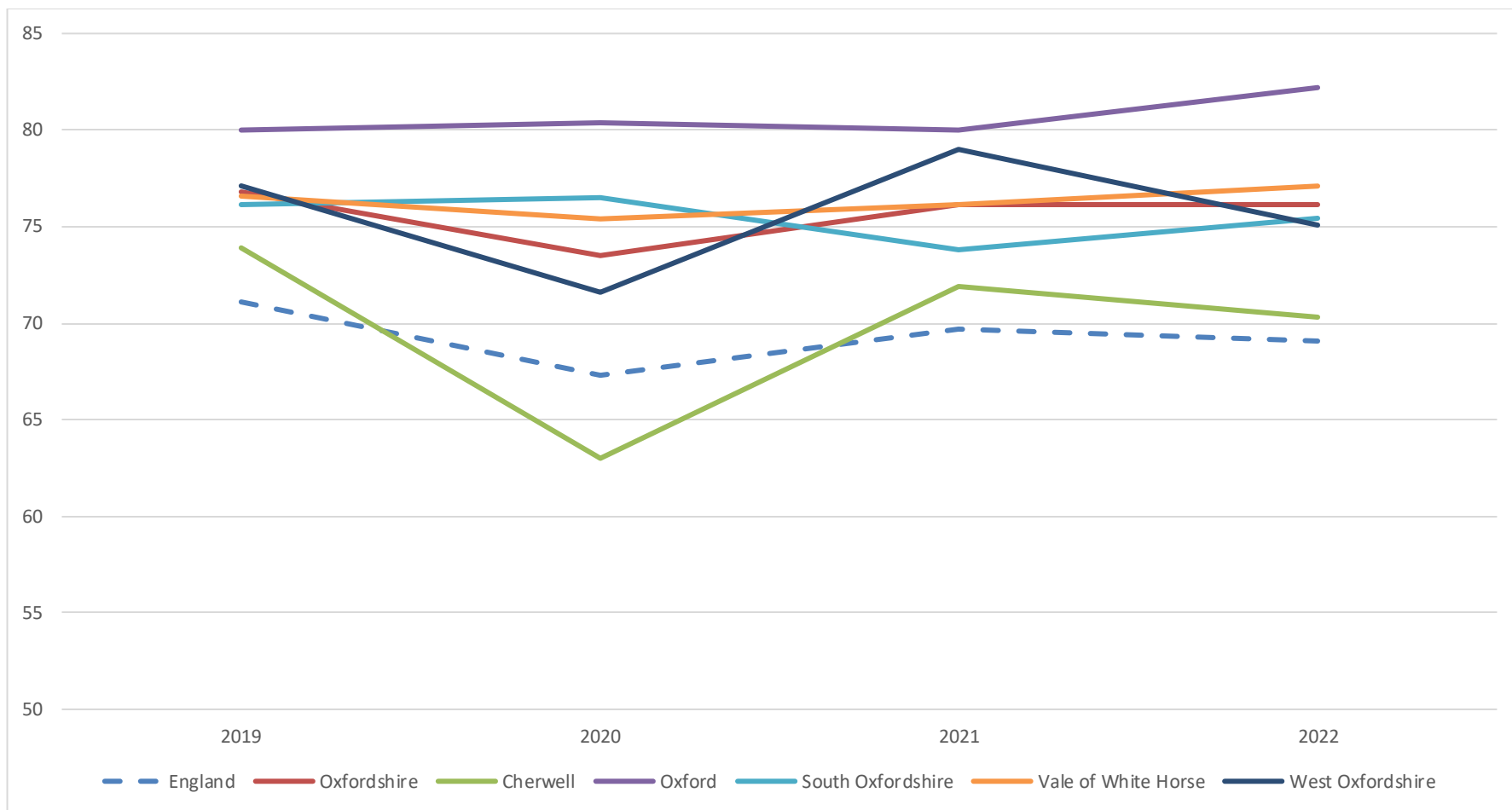


Figure 9 – Percentage of adults that walk for any purpose at least once per week. Oxfordshire trends are shown with the solid lines, national trends with the dashed lines.

The walking and cycling KPIs use data published by the Department for Transport (DfT) and Sport England. The most recent data available is for 2022 and provides us with further understanding about changes to cycle patterns covered in the headline target section. Due to the number of responses to the 2022 survey the DfT determined there was not a sufficient sample size to include data about the percentage of adults that cycle 3 times per week. Therefore, we have included data about the percentage of residents that walk and cycle at least once per week.

The percentage of adults that do any walking each week has generally remained the same between 2021 and 2022 and fallen slightly since 2019. The percentage of adults walking for leisure has fallen by 4 percentage points compared to the previous year but remains nearly 5 percentage points higher than the 2019 baseline (4.9 percentage point increase for adults walking for leisure once per week). Conversely, the percentage of adults walking for travel has increased compared to the previous year but remains lower than the 2019 baseline (7.1 percentage point decrease for adults walking for travel once per week).

The percentage of adults cycling has largely remained the same between 2021 and 2022. The percentage of adults that cycle at least once per week for any purpose or travel have increased by 0.2 and 1 percentage points respectively over the last year. Both remain slightly lower than the 2019 baseline (-1.9 and 0.3 percentage points respectively). The percentage of adults that cycle at least once per week for leisure has decreased by 0.6 percentage points over the last year and remains 2.2 percentage points lower than the 2019 baseline.

As outlined in the headline targets section, the number of cycling trips per week in Oxfordshire in 2022 has decreased by 15% compared to the 2019 baseline. However, there has been a 16% increase in the number of cycling trips per week compared to the previous year (2021). The increase in cycle trips between 2021 and 2022 is considerably higher than changes to the percentage of adults cycling over the same time. This suggests that current cyclists are making more trips rather than an increase in the number of people cycling. The number of walking trips has remained largely stable since 2019.

Physical activity

Indicator	Location	2019 (Baseline)	2020 (COVID-19)	2021 (COVID-19)	2022	2023 (Current)	Change vs previous year (%)	Change vs baseline (%)
% of adults meeting physical activity recommendations	Oxfordshire	73.6%	72.5%	73.4%	71.4%	N/A	-2.7%	-2.2%
	England	67.2%	65.9%	67.3%	67.1%	N/A	-0.2%	-0.1%

% of children meeting physical activity recommendations	Oxfordshire	58.4%	51.2%	46.6%	48.1%	N/A	+1.5%	-10.3%
	England	44.9%	46.4%	47.2%	47%	N/A	-0.2%	+2.1%

Further data and analysis of physical activity can be found in the [Oxfordshire Joint Strategic Needs Assessment 2023](#). Key points have been summarised in the following sections.

The percentage of adults meeting physical activity recommendations in Oxfordshire has largely remained the same since 2019, however the 2022 figure is 2.7 percentage points lower than the baseline and has declined by 2.2 percentage points compared to 2021. A higher percentage of Oxfordshire adults continue to meet the physical activity guideline than national figures (71.4% compared to 67.1%).

Nationally, the data shows that participation in physical activity is lower in older age groups, more deprived groups, unemployed or economically inactive groups, routine and manual workers, those who had never worked or were unemployed, and people with disability. Barriers to physical activity for those in more deprived areas include time, cost, lack of access to green space and safety concerns.

The percentage of children meeting physical activity recommendations has decreased in Oxfordshire since 2019. The 2022 figure is a 10.3 percentage point decrease compared to the 2019 baseline but there was a 1.5 percentage point increase compared to 2021. This ended the declining trend since 2019 in Oxfordshire and was in contrast to the national average.

Healthy place shaping

Indicator	Location	Baseline (2019)	2020 (COVID-19)	2021 (COVID-19)	2022	2023 (Current)	Change vs previous year (%)	Change vs baseline (%)
Average Healthy Streets score improvement	Oxfordshire	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	England	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20-minute neighbourhood index improvements	Oxfordshire	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	England	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Work is ongoing to embed use of the Healthy Streets Approach in County Council work and capture monitoring data. It is planned that the approach is piloted to score and monitor improvements delivered through the Vision Zero programme. There has not been sufficient progress made over the last year on this and so we will continue to work to capture this data for next year's monitoring report.

Following further work to assess the feasibility of using the 20-minute neighbourhood index, it is considered that this is not the most effective KPI. Work is required to update the data that supports our 20-minute neighbourhood dashboard which is not feasible to undertake on a regular basis. Therefore, we are investigating alternative KPIs for this section.

In 2019, Healthy Place Shaping (HPS) was adopted as a priority for the Health and Wellbeing Board and the Future Oxfordshire Partnership. In early 2020, the Public Health Consultancy PHAST was commissioned to carry out a system evaluation of HPS across Oxfordshire which led to the development of an initial set of indicators. The Oxfordshire JSNA June 2022 update included a restructured chapter on Wider Determinants of Health and HPS indicators where available. Following this, further work was carried out to agree the list of HPS indicators for the 2023 update. The HPS indicators are summarised below.

Built environment:

- Air pollution (NOx)
- Air pollution (particulates)
- Housing and health
- Local Cycling and Walking Infrastructure Plans
- Communities with 20 mph speed limit

Community activation:

- Sense of belonging
- Number of cycling and walking activation initiatives that promote inclusion
- Volunteering or community participation in the last 12 months
- Adults who feel lonely often or always or some of the time

New models of care:

- People supported by social prescribing
- People in contact with the Make Every Contact Count programme

Wellbeing outcomes:

- Wellbeing: people with a high anxiety score Oxfordshire trend
- Wellbeing: people with a low happiness score Oxfordshire trend
- Physically active children and young people Oxfordshire trend and District Comparison
- Physically inactive adults Oxfordshire trend and District Comparison
- Adults walking for travel at least 3 days per week Oxfordshire trend
- Adults cycling for travel at least 3 days per week Oxfordshire trend
- Adults (aged 16 plus) meeting the '5-a-day' fruit and vegetable consumption recommendations Oxfordshire trend
- Overweight children - reception (aged 4-5) prevalence of overweight (including obesity) Oxfordshire trend
- Overweight children - year 6 (aged 10-11) prevalence of overweight (including obesity) Oxfordshire trend
- Overweight adults - percentage of adults (aged 18 plus) classified as overweight or obese Oxfordshire trend

We have provided an overview of data for some of the more relevant HPS indicators below due to the lack of LTCP Healthy Place Shaping KPI data available. Some of the wellbeing KPIs are already included within this report as LTCP KPIs so have not been covered again. The full data on all HPS indicators can be found on our [Healthy Place Shaping website](#).

Sense of belonging

According to the Oxfordshire County Council 2022 residents survey, the majority of respondents were fairly or very satisfied with Oxfordshire as a place to live (78%), with 10% feeling fairly or very dissatisfied. The percentage of residents answering “Satisfied” in South Oxfordshire (85%) and West Oxfordshire (81%) was higher than the Oxfordshire average.

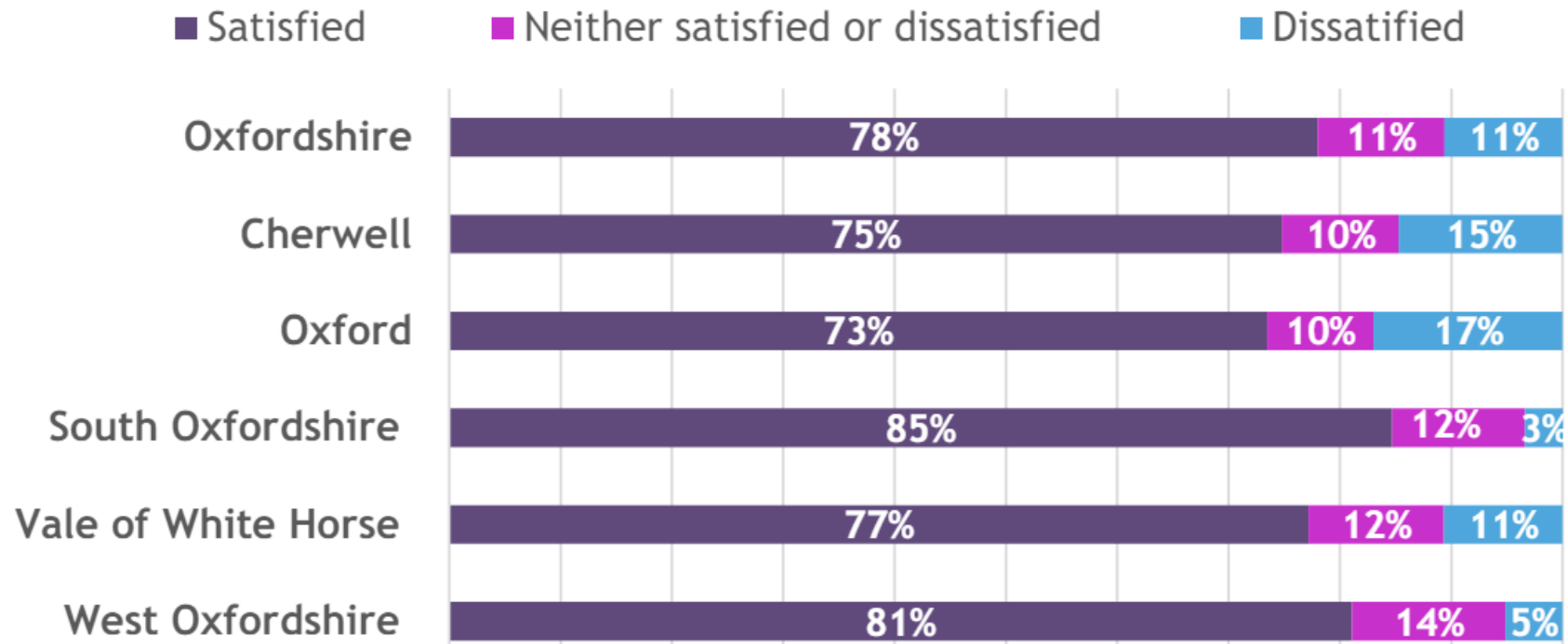


Figure 10 – The percentage of residents that responded to the question “How satisfied or dissatisfied are you with your local area as a place to live?” with “Satisfied”, “Neither satisfied or dissatisfied” or “Dissatisfied” (Oxfordshire County Council residents survey 2022)

Wellbeing – People with a high anxiety score

The latest data for 2021/22 shows the percentage of people in Oxfordshire reporting a high anxiety score has fallen slightly since the previous year. South Oxfordshire had the highest percentage of people with a high anxiety score (27.3%). Enabling connection to nature through easy access to green spaces with calm sensory places and spaces for social connections is important in reducing anxiety.

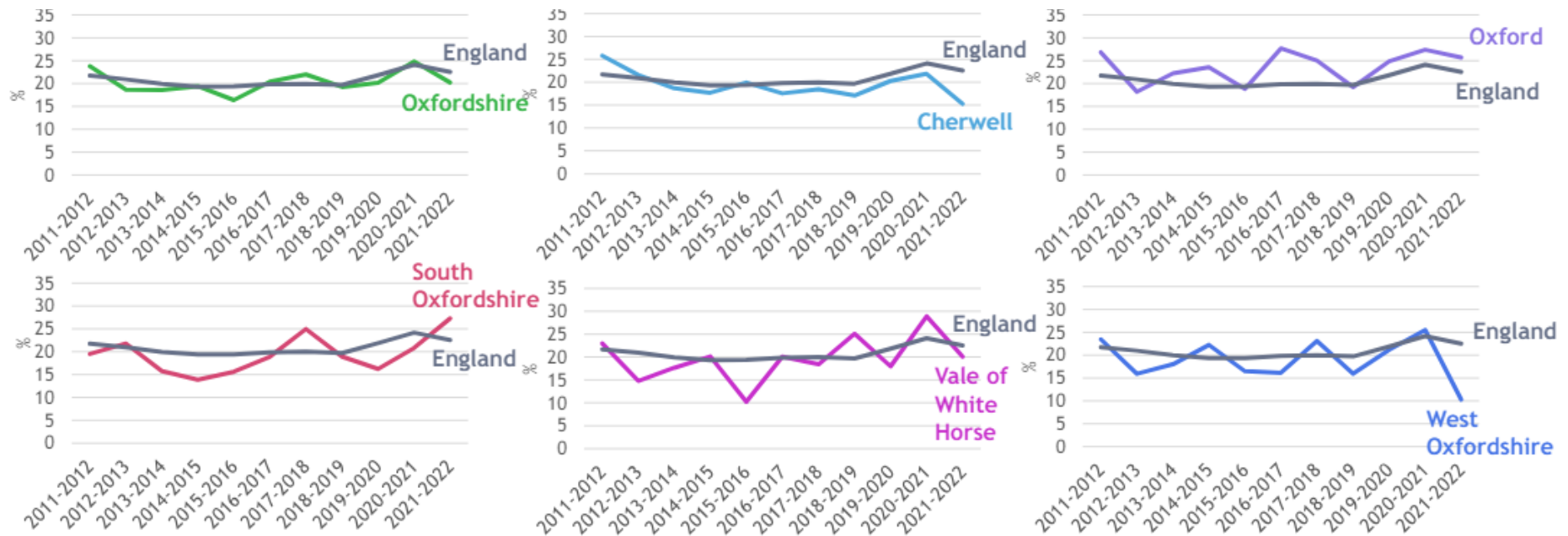


Figure 11 – Trend in the percentage of those with a high Anxiety score to year ending March 2022

Air pollution (particulates)

World Health Organisations (WHO) guidelines state that PM_{2.5}, fine particulate matter of 2.5 micrometres or less in diameter, is the most dangerous pollutant because it can penetrate the lung barrier and enter the blood system, increasing the risk of cardiovascular and respiratory disease and cancers¹⁶. It affects more people than other pollutants and has health impacts even at very low concentrations.

The updated WHO target is for annual average concentrations of PM_{2.5} not exceeding 5 µg/m³. The current UK target is to achieve annual average concentrations of PM_{2.5} of 10 µg/m³ by 2040. Around half of UK concentrations of PM comes from anthropogenic sources in the UK such as domestic wood burning and tyre and brake wear from vehicles.

¹⁶ [World Health Organisation Air Quality Guidelines](https://www.who.org/air-quality-guidelines)

As of 2021, the fraction of mortality attributable to particulate air pollution value for Oxfordshire was 5.5%, slightly above the South East average (5.4%) and similar to the England average (5.5%).

Road safety

Indicator	Location	2019 (Baseline)	2020 (COVID-19)	2021 (COVID-19)	2022	2023 (Current)	Change vs previous year (%)	Change vs baseline (%)
Total number of Killed or Seriously Injured (KSI)	Oxfordshire	233	225	246	306	233	-24%	0%
	Great Britain	31,539	26,589	27,450	29,795	29,429	-2%	-7%
Pedestrian KSI	Oxfordshire	32	23	31	45	TBC	TBC	TBC
	Great Britain	7,043	5,861	4,734	6,161	6,334	+3%	-10%
Pedal cycle KSI	Oxfordshire	45	45	52	63	TBC	TBC	TBC
	Great Britain	4,392	4,156	4,596	4,365	3,979	-9%	-9%
Two-wheel motor vehicle KSI	Oxfordshire	45	47	57	66	TBC	TBC	TBC
	Great Britain	6,395	5,130	5,125	6,021	5,829	-3%	-9%
Motor vehicle KSI	Oxfordshire	111	108	106	132	TBC	TBC	TBC
	Great Britain	12,158	10,274	9,193	11,473	11,471	0%	-6%

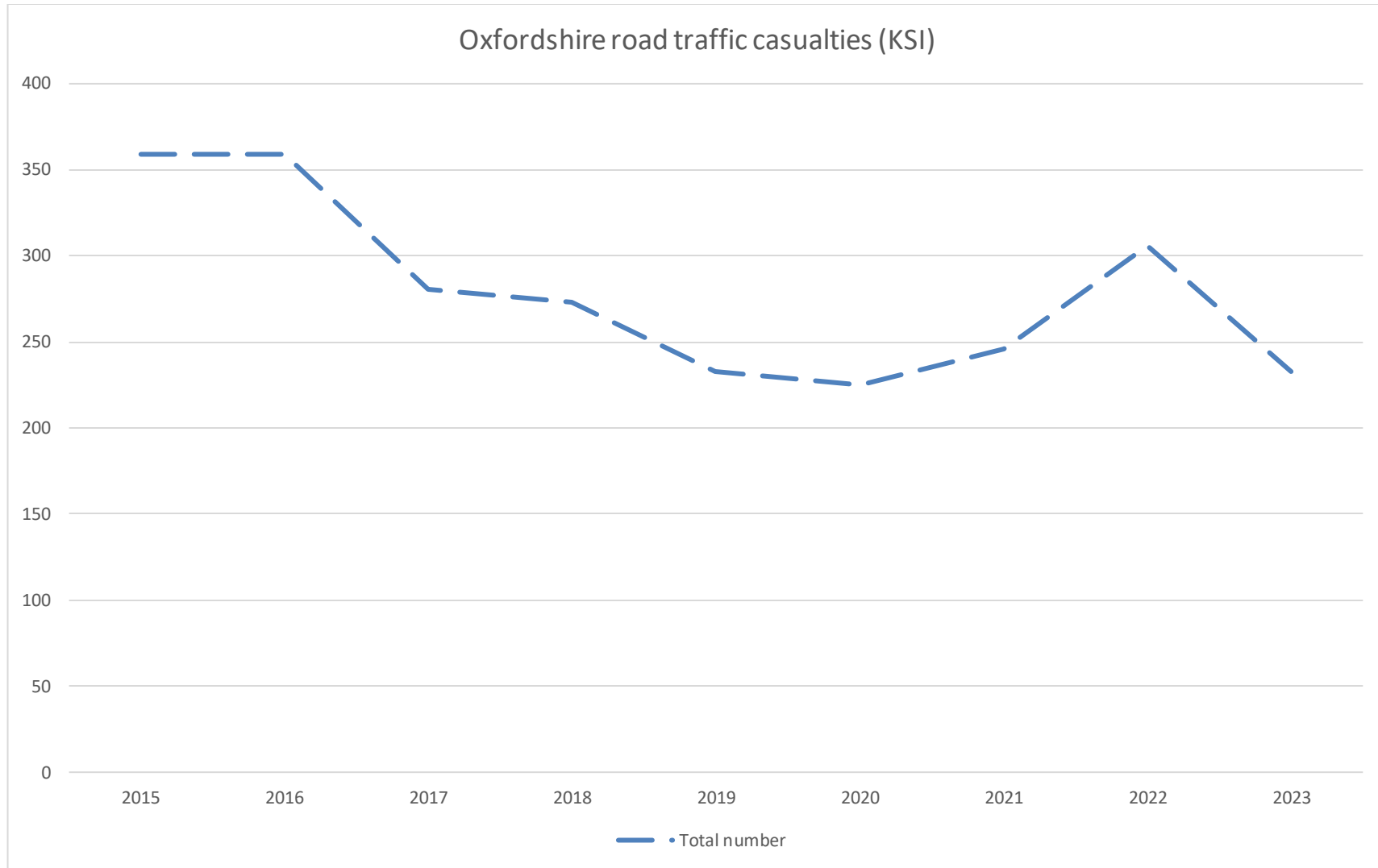


Figure 12 – Oxfordshire road traffic casualties (killed or seriously injured) since 2015

The number of people killed or seriously injured in Oxfordshire has decreased over the longer term. The number of people killed or seriously injured is lower for all modes than 2015. However, since 2019 there has been a slight increase in the number of KSI for all modes apart from pedestrians. Further analysis of the road safety data can be found in the headline target chapter.

It is important to note for national data that the Department for Transport make adjustments to casualty severity in their publications. This is to adjust for changes in how some police forces report serious and slight injuries since 2012. Further information about the national methodology can be found [here](#).

As highlighted in the headline target chapter, there was a decrease in the number of KSI for all modes between 2022 and 2023. However, it is important to note that this change is unlikely to be due to any local factor and instead a reflection of the variability in a relatively small set of data when just looking at Oxfordshire. We will therefore continue to review longer term trends to understand the impacts of our Vision Zero road safety programme. More detailed analysis of KSI trends can be found in our annual casualty report.

We are currently undertaking further analysis to help understand the data and once completed, we will publish more detailed analysis in our annual casualty report. Recognising the devastating impact of road casualties we adopted our Vision Zero Strategy and Action Plan on 23rd April 2024 and work is now underway to deliver the strategy.

Public transport

Indicator	Location	2019 (Baseline)	2020 (COVID-19)	2021 (COVID-19)	2022	2023 (Current)	Change vs previous year (%)	Change vs baseline (%)
Passenger journeys on local bus services	Oxfordshire	41,900,000	40,700,000	11,700,000	25,500,000	33,600,000	+32%	-20%
	England	4,310,700,000	4,072,600,000	1,580,000,000	2,835,300,000	3,383,200,000	+19%	-17%
Passenger journeys on local bus services per head of the population	Oxfordshire	60.9	58.8	16.8	35.1	46.2	+31%	-24%
	England	77.0	72.4	27.9	50.2	59.8	+19%	-17%

Number of rail passenger journeys (rail station entries and exits)	Oxfordshire	21,739,640	3,950,376	12,664,280	15,739,326	N/A	+25%	-27%
	England	3,007,144,054	678,732,800	1,788,478,136	2,462,181,212	N/A	+38%	-18%
Number of park and ride passenger journeys	Oxfordshire	N/A	N/A	-33% vs 2019-20	-20% vs 2019-20	N/A	+19%	-20%
	England	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Bus patronage fell significantly during the COVID-19 pandemic but is recovering. Bus patronage increased by 32% in Oxfordshire between 2022 and 2023 and passenger journeys per head of the population increased by 31% over the same time period. These increases are larger than the national average where both passenger journeys and passenger journeys per head of the population have increased by 19% between 2022 and 2023.

Despite the increase over the last year, passenger journeys and passenger journeys per head of the population remain lower than the 2019 baseline in Oxfordshire. Passenger journeys is 20% lower than the 2019 baseline and passenger journeys per head of the population 24% lower. This is broadly in line with national averages which are 17% lower than the 2019 baseline.

Similarly, rail passenger journeys fell significantly during the COVID-19 pandemic. As with bus patronage, the number of rail passenger journeys has been increasing since 2020 and there was a 25% increase in the number of rail passenger journeys in Oxfordshire between 2021 and 2022. This is slightly lower than the national average increase of 38% between 2021 and 2022. In Oxfordshire the 2022 figures are 27% lower than the 2019 baseline. This is a larger difference than the national average of 18% lower than the 2019 baseline.

The most used railway station in Oxfordshire remains Oxford with over 6.5 million passengers in 2022. There was a 31% increase in passengers at Oxford station between 2021 and 2022. Didcot is the second most used station in the county with 2.4 million passengers in 2022 followed by Banbury (1.8 million passengers) and Bicester Village (1.6 million passengers). Banbury was the only station in the county that had a decrease in passengers between 2021 and 2022 (4% decrease).

The stations with the largest percentage increase in passengers between 2021 and 2022 were Finstock (94% increase from 364 to 706), Shiplake (66% increase from 47,360 to 78,466) and Hanborough (47% increase from 178,368 to 262,498). The number of passengers using Hanborough was the third highest in its history, with only 2019-20 and 2015-16 having more passengers.

Following the COVID-19 pandemic leisure travel has become more popular and is now the most common reason for train travel nationally. The latest quarterly revenue data from October to December 2023 shows that there were 217 million leisure journeys accounting for £1,451 million revenue compared to 175 million commute journeys accounting for £955 million revenue.

We are not able to provide the overall number of journeys from park and ride sites due to it being commercially sensitive, but we are able to report on the aggregated percentage change. The data shows that there has been a 20% decrease in journeys from the park and ride sites between 2019-20 and 2022-23. However there has been an 19% increase between 2021-22 and 2022-23. This is broadly in line with the more general bus passenger trends but the increase in park and ride passengers observed between 2021-22 and 2022-23 is lower than overall patronage growth in the county.

Digital connectivity

Indicator	Location	2019 (Baseline)	2020	2021	2022	2023	2024 (Current)	Change vs previous year (%)	Change vs baseline (%)
Percentage of premises with superfast broadband	Oxfordshire	98%	97.7%	98.2%	98.4%	98.5%	98.9%	+0.4%	+0.9%
	England	96%	96.2%	97.3%	97.6%	97.9%	98.2%	+0.3%	+2.2%
Percentage of premises with full fibre broadband	Oxfordshire	10%	13.4%	17.4%	26.5%	39.9%	55.9%	+16%	+45.9%
	England	6%	7.4%	22%	35.1%	49.5%	65.3%	+15.8%	+59.6%

Digital connectivity data is updated monthly and so we have been able to include 2024 data for this KPI. As this data is regularly updated it is likely to have changed following production of this report. The 'current' data is accurate as of May 2024 and has been compared to data from May of previous years.

Oxfordshire has more premises with superfast broadband than the national average and it has increased since 2019. There has been a significant 45.9 percentage point increase in the percentage of premises with full fibre broadband since 2019 and a 16 percentage point increase over the last year. The number of full fibre premises in the county is growing at a steady rate but remains lower than the national average. This is because of three factors in Oxfordshire:

- Rurality - In general, the more rural the county is, the more widely dispersed the premises are outside of the city and major towns. This makes the cost per premise of building full fibre infrastructure much higher and attracts less commercial investment.
- Most cities have good full fibre access which helps raise the average of the county. However, until September 2022 Oxford had just 2% full fibre coverage. We have worked hard to secure investment in Oxford and building has commenced raising the level to 26%.
- Virgin Media has about 40% coverage across the county with their gigabit docsis network. This is patchy across Oxford and other market towns but typically disincentives alternative networks from investing in full fibre build.

The county council’s Digital Infrastructure Team have contributed to these changes by delivering projects such as Better Broadband for Oxfordshire which enabled over 90,000 premises to access superfast broadband. The team continue to engage with fibre broadband operators to encourage investment in Oxfordshire, whilst also working with the government on digital infrastructure interventions in areas of market failure.

Air quality

Indicator	Location	2019 (Baseline)	2020 (COVID-19)	2021 (COVID-19)	2022	2023 (Current)	Change vs previous year (%)	Change vs baseline (%)
Road transport emissions	Oxfordshire	1322.9 kt CO ₂	1056.4 kt CO ₂	1140.8 kt CO ₂	1153.9 kt CO ₂	N/A	+1%	-13%
	UK	98,878.3 kt CO ₂	80,316.7 kt CO ₂	87,586.1 kt CO ₂	87,998.5 kt CO ₂	N/A	0%	-11%
Years of healthy life lost (DALYs) due to ambient particulate matter	Oxfordshire	2,300	N/A	N/A	N/A	N/A	N/A	N/A

Analysis of road transport emissions has been covered previously. Years of healthy life lost due to ambient particulate matter is included in the [Joint Strategic Needs Assessment](#) using a methodology from Public Health England. The last calculation was made in 2019 and so there is not an

update for inclusion in this year's monitoring report. As covered in the Healthy Place Shaping section, the fraction of mortality attributable to particulate air pollution value for Oxfordshire in 2021 was 5.5%, slightly above the South East average (5.4%) and similar to the England average (5.5%).

It is worth highlighting that whilst transport contributes to particulate matter (PM) emissions it is not the largest source. Oxford City Council's most recent source apportionment study¹⁷ found that domestic combustion is by far the largest contributor to particulate matter emissions in Oxford, contributing approximately 66% of PM_{2.5} emissions. Road transport only accounts for approximately 10% of total local emissions of particulate matter.

Similarly, as part of the 2023 Air Quality Actions Plans for Chipping Norton and Witney¹⁸, some particulate matter source apportionment work has been conducted using modelled data from Defra and measurements from the monitoring site at Oxford St. Ebbes. This work found that approximately 11% of PM_{2.5} emissions in Chipping Norton are from transport and 10% in Witney. In both towns domestic combustion was the largest source of PM_{2.5} emissions with 52% in Chipping Norton and 49% in Witney.

Transport also contributes to the emissions of Nitrogen Dioxide. In Oxfordshire, the district and city councils are required to monitor air quality within their respective areas. Where air pollution levels have exceeded the national air quality objectives and these are not being met, they must identify and declare Air Quality Management Areas (AQMAs). Once declared, they must develop Air Quality Action Plans (AQAP) and produce annual air quality status reports (ASR) for Defra.

Monitoring data and the associated AQAPs and ASRs can be found on our new air quality website [Oxon Air](#). The latest monitoring data shows that nitrogen dioxide levels have generally been decreasing across the county year on year. The data from 2023 also included no exceedances of the UK legal limits in Oxford, South Oxfordshire, West Oxfordshire or Vale of White Horse. There was 1 AQMA in Cherwell that recorded an exceedance of the UK legal limits (Hennef way, Banbury). This decreasing trend is largely due to the introduction of cleaner vehicles and electric vehicles.

¹⁷ <https://www.oxford.gov.uk/downloads/file/841/oxford-source-apportionment-study>

¹⁸ <https://www.westoxon.gov.uk/environment/noise-pests-pollution-and-air-quality/air-quality/#:~:text=Areas%20within%20West%20Oxfordshire%20which,below%20National%20Air%20Quality%20Standards.>

Private car

Indicator	Location	2019 (Baseline)	2020 (COVID-19)	2021 (COVID-19)	2022	2023	2024	Change vs previous year (%)	Change vs baseline (%)
Car vehicle miles	Oxfordshire	3,800,000,000	2,710,000,000	3,085,000,000	3,449,000,000	3,562,000,000	N/A	+3%	-6%
	England	225,160,000,000	169,561,000,000	189,675,000,000	208,816,000,000	215,057,000,000	N/A	+3%	-4%
Number of car trips	Oxfordshire	N/A	N/A	N/A	+4.5% vs 2019	N/A	-2.3% vs 2022	N/A	-2.3%
	England	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of registered battery EVs	Oxfordshire	1,704	3,564	5,022	9,804	9,694	N/A	-1.1%	+469%
	UK	90,859	193,993	379,221	628,984	930,649	N/A	+48%	+924%
Car ownership	Oxfordshire	82% (2011)	N/A	84%	N/A	N/A	N/A	N/A	N/A
	England	74% (2011)	N/A	76%	N/A	N/A	N/A	N/A	N/A

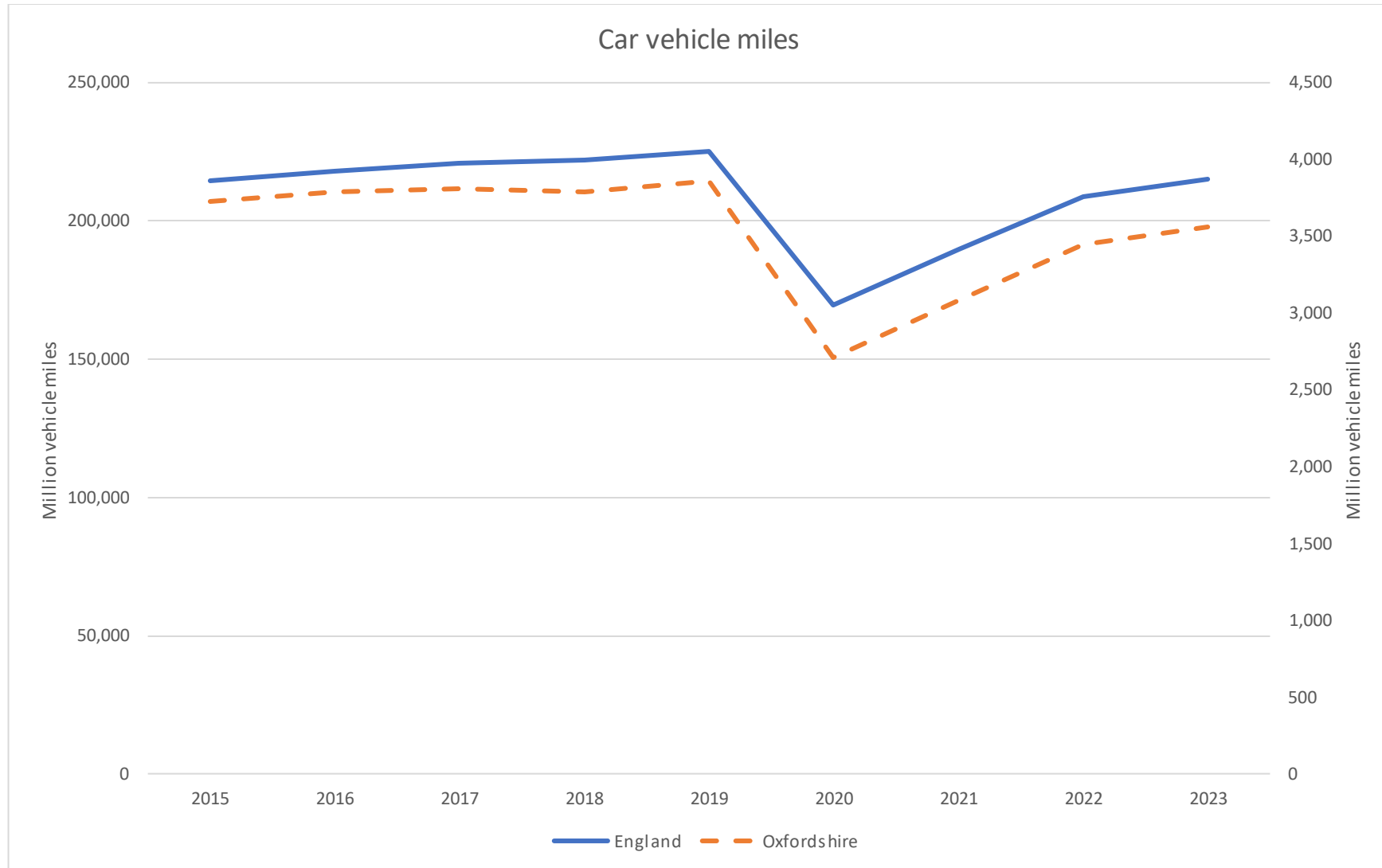


Figure 13 – Car vehicle mile trends in England (left axis) and Oxfordshire (right axis)

Car vehicle miles increased by 3% in Oxfordshire between 2022 and 2023 which is in line with the national average (3% increase). Total car vehicle miles in 2023 are 6% lower than the 2019 baseline which is broadly in line with the national trends (-4% compared to the 2019 baseline). Whilst vehicle miles are lower than the baseline they have been increasing year on year since the COVID-19 pandemic. The rate of growth in 2023 was lower than the previous year as seen on figure 13, but the increasing trend is still in contrast to net-zero targets. Reducing vehicle miles and the length of car trips is a key part of meeting our net-zero targets.

Car ownership at the Oxfordshire level is currently best measured through the census. Due to the census timescales, the latest available data is 2021 and this will be the case for a number of years. The 2021 data is the same as last year's monitoring report and shows that the percentage of households with access to 1 or more cars in Oxfordshire has increased by 2% compared to 2011 and car ownership remains higher in Oxfordshire than the national average. We will investigate alternative sources of data for this KPI that may allow for more regular monitoring.

Whilst we know that there are many opportunities to reduce the number of car journeys and the length of journey, we recognise that the car will still be a part of Oxfordshire's transport system. It is important to support the uptake of zero tailpipe emission vehicles so that where car journeys are made, they produce less emissions.

There has been a 1.1% decrease in the number of battery electric vehicles in Oxfordshire over the last year. This is in contrast to the national average (48% increase). We are working to understand why this change has occurred, it is primarily due to a decrease in the number of registered battery electric company vehicles in Cherwell district between 2022 and 2023, all other districts saw an increase during this time. Cherwell has historically and continues to have the largest number of registered battery electric vehicles in Oxfordshire. However, the number of registered battery electric vehicles has still increased by 469% compared to the 2019 baseline, this is lower than the national average (924% increase).

Battery electric vehicles represent approximately 2.52% of licensed cars in Oxfordshire and has increased from 0.38% of licensed cars in 2019. This figure has become lower than the national average for the first time as battery electric vehicles represent approximately 2.77% of licensed cars nationally. The county council continue to conduct a range of projects to support the uptake of electric vehicles, some of which are summarised later in this report.

Road highways maintenance condition

Indicator	Location	2018 (Baseline)	2023	2024 (Current)	Change vs previous year (%)	Change vs baseline (%)
Percentage of roads in good condition (green)	Oxfordshire	47%	50%	62%	+12%	+15%
	England	54%	50%	57%	+7%	+3%
Percentage of roads planned for investigation (amber)	Oxfordshire	43%	35%	32%	-3%	-12%
	England	28%	32%	32%	0%	+4%
Percentage of roads Planned for maintenance (red)	Oxfordshire	10%	15%	7%	-8%	-3%
	England	18%	18%	11%	-7%	-7%
Percentage of pavements / cycle ways in good condition	Oxfordshire	N/A	N/A	N/A	N/A	N/A
	England	N/A	N/A	N/A	N/A	N/A
Percentage of pavements / cycle ways in fair condition	Oxfordshire	N/A	N/A	N/A	N/A	N/A
	England	N/A	N/A	N/A	N/A	N/A
Percentage of pavements / cycle ways in poor condition	Oxfordshire	N/A	N/A	N/A	N/A	N/A
	England	N/A	N/A	N/A	N/A	N/A

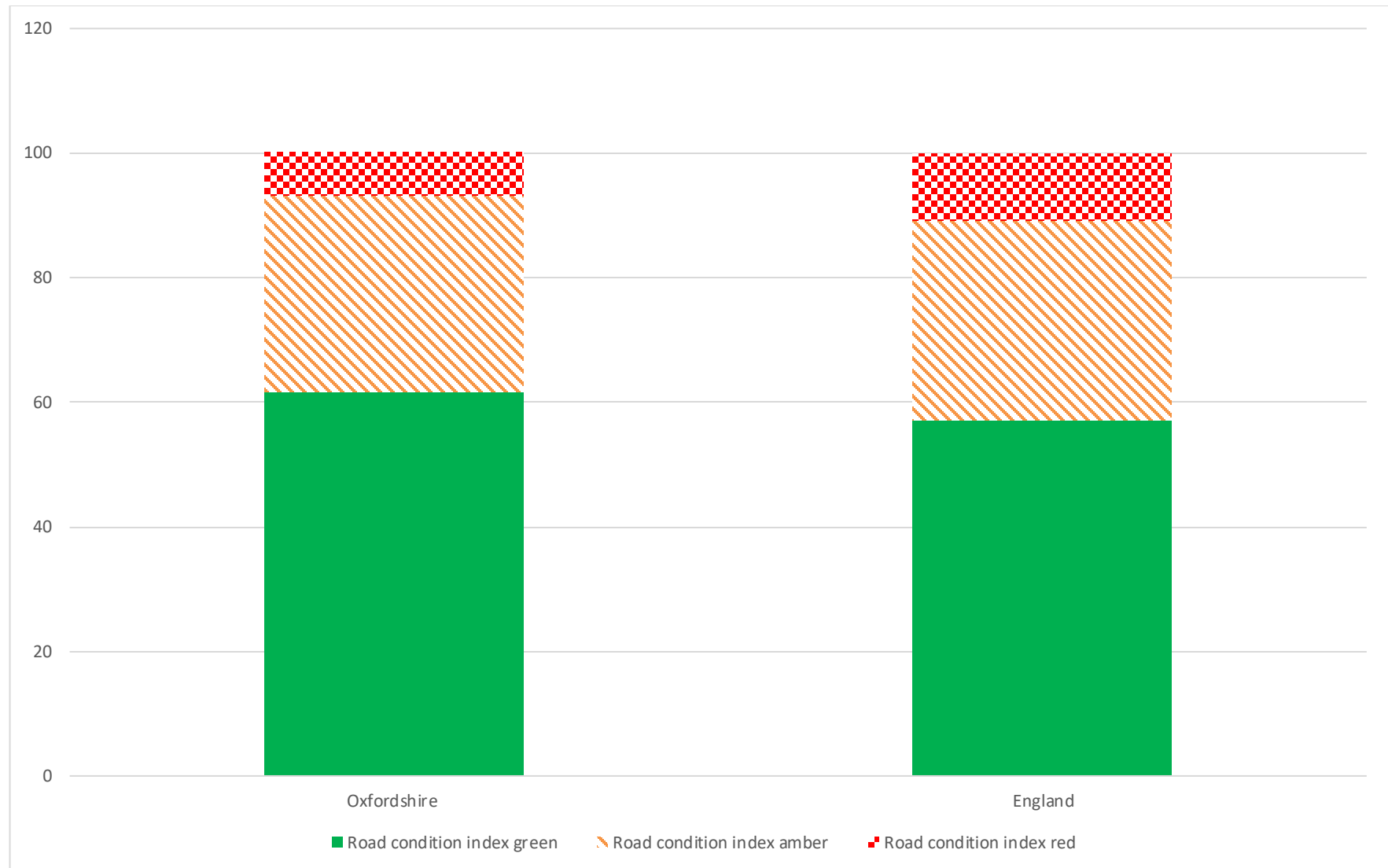


Figure 14 – 2024 road highways maintenance condition in England and Oxfordshire

The percentage of roads in 'Green' road condition index (good condition) has increased since 2017-18 both within Oxfordshire and nationally. The percentage of roads in green condition in Oxfordshire is higher than the national average and has increased by 12 percentage points over the last year compared to a 7 percentage point increase nationally.

Whilst the percentage of roads in 'Amber' road condition index has decreased (planned for investigation) by 12 percentage points compared to the baseline and by 3 percentage points over the last year, this is largely due to the corresponding increase of roads in green condition. Oxfordshire has the same percentage of roads in 'Amber' condition as the national average and a lower percentage of roads in 'Red' road condition index (planned for maintenance) than the national average (7% compared to 11% nationally).

There is not a readily available data source about the condition of cycle ways and footway data is not reliable enough to be used at this stage. We will continue to investigate potential data sources for these KPIs.

Travel behaviour surveys

The data collected to understand the LTCP targets and KPIs provides us with a high level overview of the key transport trends in the county. However, in some areas we do not have more granular local data and the data only provides us with limited understanding about the causes of change and what factors influence residents travel choices. Therefore, in order to better understand residents travel habits, the way residents get around and what influences transport choices we also need to collect travel behaviour information.

In order to do this we conducted a pilot countywide travel behaviour survey between November and December 2023. We also have data from the Oxfordshire Community Rail Partnership (OxCRP) who conducted a travel survey between February and March 2024. Findings from both of these surveys is summarised in the following sections.

Countywide travel behaviour survey

We conducted the survey as a pilot in order to test the concept and refine the questions before a potential wider roll out in the future. The survey was sent to residents who completed the LTCP consultation questionnaire and asked to be kept in touch with.

The survey was split into two main sections. These were:

- Your Regular Travel Habits – In this section, we asked about residents' typical travel routines on the most recent typical week, including destinations, modes of transport, factors influencing those choices and how these habits might have changed.
- About You and Your Travel Needs – Here, we asked about residents' individual circumstances and responsibilities like job, lifestyle and caring for dependents etc. This will help us further understand what impacts and influences residents' transportation decisions.

There were 151 respondents from 253 invited to participate across Oxfordshire, based on respondents that participated in the LTCP survey and indicated they were happy to be contacted. Responses covered views from across Oxfordshire, but the response sample was heavily weighted towards Oxford. As this was a pilot there were a limited number of responses and so the data is not statistically robust enough to conduct in depth analysis at this stage. However, we have reviewed the results and are able to provide some narrative based findings. This provides a helpful insight into travel behaviours, cycling trends and areas to explore in the future.

Travel habits and patterns

- The most common number of trips that respondents reported taking in a single day, during a typical week with the highest travel frequency, was 3-4 trips.

- The days with the highest number of trips were Monday, Tuesday, and Wednesday.

Public transport issues

- Connectivity problems: Difficulty in accessing certain areas due to lack of direct bus routes.
- Service reliability: Complaints about intermittent and unreliable bus services (mainly in Oxford but also reported in Witney, Wallingford, Thame, Abingdon and Banbury in order of most cited).
- Impact of road closures: Road closures, such as Botley Road, have impacted travel times and accessibility, causing frustration among residents.
- Availability and reliability: Many respondents highlight the lack of available public transport and its unreliability, making it difficult to visit friends or travel for essential activities.

Cycling infrastructure

- Personal safety concerns: Aggressive driving, high speeds, and poor cycling infrastructure deter people from cycling.
- Infrastructure quality: Issues like potholes and lack of maintenance make cycling difficult.
- Desire for improvement: Many respondents would cycle more if the infrastructure were improved.
- Concerns relating to property safety and facilities: There is a strong demand for more and safer cycling infrastructure, including secure bike sheds with CCTV and more cycle parking facilities.
- Positive feedback on LTNs: Some respondents find that Low Traffic Neighbourhoods (LTNs) have made cycling easier and reduced congestion in certain areas.

Personal circumstances

- Health and disabilities: Some respondents cannot cycle due to health issues or disabilities; public transport is also not a viable option for them.
- Family responsibilities: Caregivers for children -- including those with special needs -- and for elderly parents find it challenging to use public transport or cycle due to their responsibilities.
- Dependents activities: Some respondents noted additional car trips, especially on weekends, due to their dependents' activities such as parties and sports club matches.

General sentiments

- Frustration with traffic measures: Strong opposition to LTNs, Zero Emission Zones (ZEs), 15-minute city plans, and 20mph zones perceived as detrimental to car users, especially to those who rely on the car as the only viable option based on personal circumstances.
- Desire for Better Planning: Calls for better public transport, investment in light rail links, and improved road infrastructure to reduce congestion and environmental impact.

Summary of key insights

- Cycling trips increase: The increase in cycling trips is likely due to a subset of the population who are already cyclists making more frequent trips, possibly due to improved cycling routes or personal preferences.
- Constant/lack of increase in the number of cyclists:
 - The overall number of people cycling is likely to not have grown due to persistent barriers such as safety concerns, poor infrastructure, cycling facilities, and personal health or family responsibilities.
 - The reported lack of reliable public transport and the impact of road closures have significantly affected travel behaviours, leading to an increased reliance on cars and frustration among residents.

OxCRP travel survey

Oxfordshire Community Rail Partnership (OxCRP) are working with Great Western Railway (GWR) on the 'Connecting Communities' project. As part of that project a survey of residents was carried out, to understand experiences, perceptions and challenges of rail travel for local Oxfordshire people. An online survey was promoted across Oxfordshire via social media and through stakeholder networks. The survey ran from 6th February to 25th March 2024. A total of 955 people completed the survey. Findings from the survey are summarised below.

Travel choices and influences

- Overall, reliability is the most important factor in deciding how to travel, this will be a combination of both actual and perceived reliability. Those who travel by car are slightly more likely to say reliability is very important.
- Convenience is the second most important factor and may create a barrier for some to using public transport, unless integrated accessible services are available. 75% of those who commute by car say convenience is very important.
- Barriers to train travel are a mix of both actual and perceived ones. This illustrates the need for both an integrated transport offer and strong communication where perceptions are not felt to reflect the reality.
- 56% of residents say it is easy to get to a train station, rising to 73% of those who cycle to the station. People who need to travel by bus or car are least likely to say getting to the station is easy, reflecting the need for integrated solutions to enable easy access to stations.

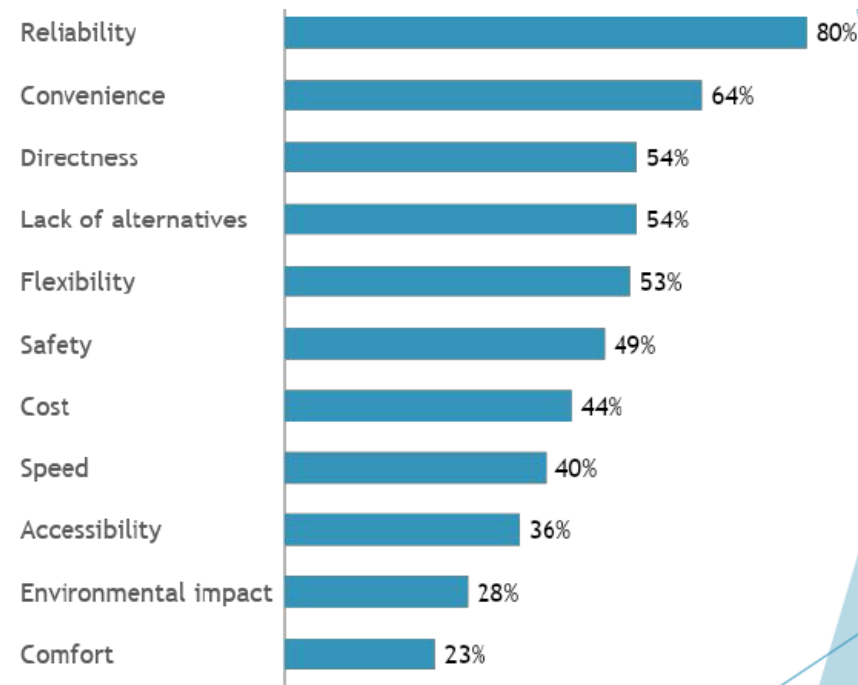


Figure 15 – Very important factors when deciding how to travel

Transport and community

- Residents note that transport links into and out of Oxfordshire are good, enabling good access to London in particular.
- In and around Oxford the view of transport connectivity is positive, but in other areas of the county there is more criticism of the lack of integrated transport options.

Community wellbeing

- There is considerable positivity around living in Oxfordshire, with the range of facilities/amenities, a sense of feeling safe and the environment in the county are all key drivers.
- The aspects that have the lowest satisfaction levels are access to healthcare and leisure facilities, with 29% and 20% respectively dissatisfied with these facilities/services. Linked to the split view of whether transport helps or hinders access to facilities, this suggests that whilst for some there may be a lack of healthcare and leisure facilities, for others it is the lack of transport accessibility to facilities.

Young people

- The survey method resulted in only a small number of under 25's taking part. Data should therefore be treated with caution.
- Being heard and inclusivity are considerably more important to young people than older people in supporting community wellbeing.
- Younger people are most positive about public transport supporting employment opportunities (31%).
- Cost is the biggest influencer of travel choices for young people.

Diversity and inclusion

- Being heard is considerably more important to under-represented ethnic groups and personal wellbeing scores are typically considerably lower.
- Travel behaviours are similar to those from other ethnic backgrounds. Some factors have greater importance (cost, convenience, comfort etc.) in decision-making processes.
- Those with impairments, health conditions and disabilities typically score lower for personal wellbeing, but have similar views of their community to those without impairments.
- This group is much less likely to travel by train, particularly if their impairments are physical. Barriers to train travel are around availability, access and cost. For some their impairments are seen as blockers to accessing stations and/or travelling by train.

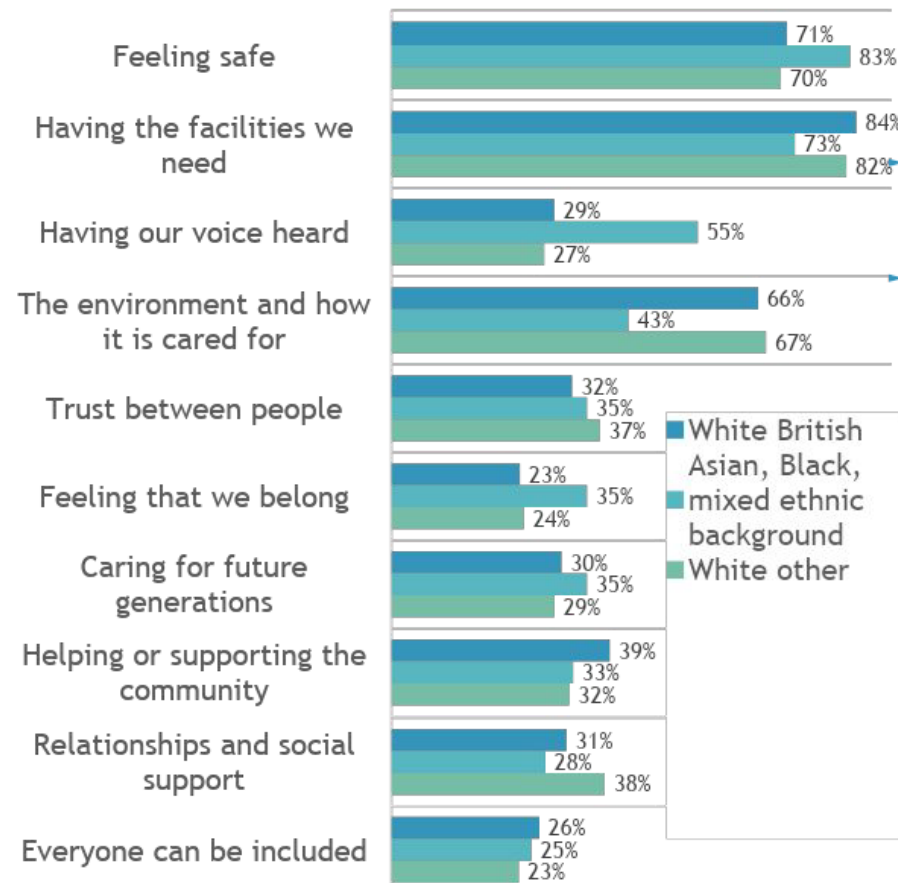


Figure 16 – Most important factors for the well-being of your community

Sustainability / carbon reduction

- 69% of people claim high awareness of sustainable transport, but this doesn't always translate to active consideration of using sustainable transport.
- Younger people are slightly more likely to consider sustainability in their transport choices.
- Those of minority ethnic backgrounds are less aware of sustainable transport and it has less influence on their travel choices.

Delivery over the last year

This section provides an overview of progress made on delivering the LTCP policies over the last year (July 2023 – July 2024). The section is structured according to the LTCP policy focus areas to highlight the progress made in each policy area.

As noted previously in this report, owing to the time it will take to significantly change travel patterns in the county, the impacts of this work will not immediately be seen in future monitoring reports. We will therefore continue to deliver programmes of improvements across the county and monitor the impacts of these alongside the annual monitoring of the broader LTCP targets and KPIs.

Walking and cycling

- Strategic Active Travel Network approved in April 2024.
- Initial consultation on Oxfordshire Cycle Design Standards (OCDS) in November and December 2023. Targeting approval by the end of 2024.
- Review of Oxford City cycle network including Queen Street and Cornmarket Street cycling ban.
- Community Outreach Active Travel programme launched in November by partners, Active Oxfordshire (AO).
- Several schemes delivered to improve the Oxford cycle network, particularly in support of the Active Travel Strategy priority to encourage children cycling:
 - Willow Walk Oxford Route 22 (OXR 22) resurfacing widening has substantially improved the link to Matthew Arnold School.
 - Boundary Brook Way Route (OXR E8) resurfacing, widening and new parallel crossing of Cowley Road have created a safe link to Oxford Spire.
 - The Cowley LTN has transformed the link to Greyfriars School via OXR 16 (Rymers Lane).
 - The East Oxford LTN has likewise transformed links to Cheney School via OXR E4 (Divinity Road) and E5 (Southfield Road) and via Quickways improvements along OXR 12 (Morrell Avenue-Warneford Lane).
- Monitoring of the East Oxford LTN found that cyclist counts have consistently increased across all boundary roads with similar changes in flows and impact percentages, meaning it is likely that the effect of the LTNs and other local changes are driving the increase.
- In July 2023, Oxfordshire showcased its active travel achievements to the rest of England in the hugely successful Oxfordshire Cycle County Active County Conference.

Healthy place shaping

- Sustainable School Travel Strategy approved in September 2024.
- Progressing Phase 2 School Streets at 5 schools:
 - Sandhills Primary School
 - Tyndal Primary School
 - New Hinksey Primary School
 - St Mary and St John Primary School
 - Manor Primary School
- Funding for a Phase 3 of School Street has been secured through Active Travel England's Active Travel Tranche 4 Extension Fund.
- Improved gateway features at Witney High Street and Market Square traffic restriction to aid awareness and improve crossing points.

Road safety

- Vision Zero Strategy and Action Plan adopted in April 2024.
- Delivered a range of road safety schemes including:
 - Bridleway enhancements at Windrush Place, Witney
 - Traffic Calming at The Leys Witney
 - Continued approval and delivery of 20mph zones across the County.

Public transport

- Business case approved for the delivery of Mobility Hub pilot sites in Benson and Carterton.
- Completion of major construction of Eynsham Park and Ride.
- OxRail 2040: Plan for Rail Strategy developed and consulted on in September 2024. Targeting Cabinet consideration in December 2024.
- Oxfordshire Community Rail Partnership established and delivered several projects including:
 - Mapping projects for Banbury and Didcot.
 - 'Getaways' - trips for younger residents from Oxfordshire's more deprived communities to the countryside.
- Ongoing development of a Strategic Outline Business Case for a potential new Grove and Wantage train station targeting outputs in early 2025.
- Delivery of the Zero Emission Bus Regional Area (ZEBRA) in partnership with the bus operators.
- New Bus Service Improvement Plan adopted in June 2024.

- Launched a new Oxfordshire bus partnership website (www.mybusoxfordshire.org.uk).
- Launched a new countywide multi operator bus ticket scheme known as MyBus.
- Offered £1 single journeys on bus throughout Oxfordshire in December 2023 (to be repeated in 2024).
- Installed over 100 new Real Time Passenger Information screens (RTPI).
- Major bus stop data capture exercise commenced in July 2024, to record non-geographic elements such as shelters, pole/flags/cases, accessibility, safety and RTI (Real Time Information) units.
- 50 Section 106 bus stop improvements either delivered or awaiting delivery.
- Study of Gloucester Green Bus Station completed to identify any 'quick wins' designed to improve the passenger waiting experience.

Digital connectivity

- Delivered or delivering a number of digital infrastructure projects:
 - Businesses in Rural Oxfordshire completed having provided full fibre broadband services to 1595 business and residential premises.
 - GigaHubs programme ongoing until Autumn 2024. Full fibre broadband services have been supplied to 193 public sector sites to date.
 - 5G Coverage – Collaboration with FreshWave to utilise existing street furniture to rollout of 5G across Oxford. Currently 17 sites have been utilised by FreshWave under this collaboration. OCC have also signed a second agreement with BT for use of existing street furniture.
 - Project Gigabit – Government funding of up to £114m to extend full-fibre coverage to over 68,000 hard-to-reach premises in Oxfordshire & West Berkshire. Contract awarded to Gigaclear who are beginning their build phase. The scope has been reduced in Oxfordshire due to significant commercial investment in the area.

Environment, carbon and air quality

- Update of baseline bus emissions requirements across Oxfordshire from 1st April 2025 approved in September 2024.
- Launch of the Oxfordshire website, Oxonair which enables data to be easily retrievable alongside Council reports and interventions and air quality related projects ongoing in Oxfordshire.
- Ongoing work to deliver OCC's Air Quality Strategy and Action Plan including:
 - Audits were carried out on Public Health planning consultation responses, including Health Impact Assessments which all included air quality impacts being raised.

- The University of Birmingham Air Quality Lifecourse Assessment Tool (AQ-LAT) has been procured and additional air quality modelling is being jointly funded with the Districts and City Councils to increase the power and value of the tool
- A webinar for residents was held by Oxfordshire Community Action Group about air quality, in partnership with District, City and County Councils.

Network, parking and congestion management

- Commenced procurement for new highway maintenance contract.
- Received £2,629,000 additional funding from the DfT for resurfacing and pothole repair. In 2023/24 this is delivering B4477 Kencot resurfacing and pre surface dressing patching at 33 sites.

Innovation

- MultiCAV project, funded through Innovate UK, successfully completed, piloting a self-driving bus between Milton Park and Didcot Rail station.
- Ongoing work to deliver the Horizon Europe funded project (Soteria) to test new methods of collecting road safety data for vulnerable road users and assess the impact of road safety interventions.
- Net Zero Mobility Innovate UK funded feasibility project commenced to improve network management for non-vehicular modes of transport and gather better data for scheme evaluation around road works.
- Project Skyway, Innovate UK funded project, ongoing to develop an inter-regional drone Superhighway.

Data

- LTCP monitoring report produced.
- Pilot countywide travel behaviour survey conducted.
- Smart Infrastructure Pilot Programme (SIPP), DSIT funded project commenced to deploy up to 15 smart lighting columns with 5G and Wi-Fi connectivity and the ability to integrate multiple sensors and other Internet of Things devices.

Freight and logistics

- HGV studies progressing in Henley-on-Thames and Windrush Valley.
- Ongoing work to deliver a Horizon Europe funded project (Green-log) for a freight consolidation pilot in Oxford, with demonstration commencing in Winter 2024.

Regional connectivity and cross-boundary working

- Ongoing engagement with neighbouring local authorities and sub-national transport bodies.

Local connectivity

- Central Oxfordshire Movement and Place Framework development commenced.
- First phase of a Didcot Area Travel plan completed.
- Science Vale Area Travel Plan development commenced.

Future delivery

We recognise that there is still a long way to go if we are to deliver our vision and targets for transport in Oxfordshire. We will therefore continue to work hard on delivering the LTCP over the next year. It is important to note that due to central government's funding approach, we have to work hard to identify funding sources and bid for every suitable opportunity.

Over the next year we will continue work in all of the LTCP policy areas. Some key areas of planned work include:

- Development of LTCP supporting strategies, see next section for further detail.
- Development of LCWIPs for Charlbury, Chipping Norton, Thame, Wallingford area, Wantage & Grove and Woodstock.
- Development and adoption of updated Oxfordshire Cycle Design Standards (OCDS) and Walking Design Standards (OWDS).
- Phase 2 of the Strategic Active Travel Network (confirmation of preferred route alignments, feasibility and design work, costings) on an area-by-area basis.
- Delivery of active travel tranche 3 and 4 schemes.
- Development of the Oxford Greenways project with Oxford City Council and Oxford University.
- Development of School Streets Phase 3.
- Development of updated travel plan guidance for new development.
- Development of an interim improvements programme for Oxford railway station with Great Western Railway and Network Rail.
- Working with Oxfordshire Community Rail Partnership to deliver projects. Includes a programme of work at Oxford station, including a 'Cotswold Calm Corner' to support those with neurodivergence needs.
- Hosting Rail in Oxfordshire and the Midlands Conference in January 2025.
- Design and engagement work on mobility hub pilot sites in Benson and Carterton.
- Conduct bus franchising and Demand Responsive Transport feasibility studies.
- Continued delivery of existing BSIP funded schemes, and development of new bus schemes as funding allows.
- Offering £1 single journeys on bus throughout Oxfordshire in December 2024.
- Production of a suite of new public bus maps.
- Cherwell Street, Banbury, project aimed at reducing bus transit time through the junction. On target for delivery September 2025.
- Additional 29 surface dressing schemes covering 340,000m² using additional funding from the DfT.

Supporting strategies

Following adoption of the LTCP, work has commenced on developing further supporting strategies. An update on progress with these strategies is provided below.

Strategy	Update
Area and Corridor Travel Plans	<ul style="list-style-type: none"> • Central Oxfordshire Travel Plan approved by cabinet in November 2022. • The first phase of a Didcot Area Travel plan was completed in 2023. • This will now be combined with a Science Vale Area Travel Plan, with a focus on Didcot. First draft expected end of this year. • Work is ongoing to develop a wider Area Travel Plan programme. To support this a new Area Travel Plans Team is being recruited.
Rail strategy	<ul style="list-style-type: none"> • OxRail 2040: Plan for Rail Strategy scheduled for cabinet consideration in December 2024.
Bus strategy	<ul style="list-style-type: none"> • Work planned to develop a bus strategy, including park and ride by March 2025.
Walking and cycling design guidance	<ul style="list-style-type: none"> • Targeting approval of both documents by the end of 2024.
EV infrastructure strategy	<ul style="list-style-type: none"> • Work planned to commence on updating the Oxfordshire Electric Vehicle Infrastructure Strategy.

Appendix 1 – Target and KPI data sources

Targets

Target	Source	Source name
2030		
Replace or remove 1 out of every 4 current car trips	OCC car trip monitoring framework	INRIX trips and pathways dataset, Vivacity sensors and Automatic Traffic Count Data
Increase the number of cycle trips in Oxfordshire from 600,000 to 1 million cycle trips per week	Sport England	Active Lives Survey
Increase the number of cycle trips in Oxford from 300,000 to 450,000 cycle trips per week	Sport England	Active Lives Survey
Reduce road fatalities or serious injuries by 50%	Compiled by OCC using Thames Valley Police reports	STATS-19
2040		
Deliver a net-zero transport network	Department for Business, Energy & Industrial Strategy	Local Authority territorial CO ₂ emissions estimates (kt CO ₂) within the scope of influence of Local Authorities
Replace or remove an additional 1 out of every 3 current car trips in Oxfordshire	OCC car trip monitoring framework	INRIX trips and pathways dataset, Vivacity sensors and Automatic Traffic Count Data
2050		
Deliver a transport network that contributes to a climate positive future	Department for Business, Energy & Industrial Strategy	Local Authority territorial CO ₂ emissions estimates (kt CO ₂) within the scope of influence of Local Authorities
Have zero, or as close as possible, road fatalities or serious injuries	Compiled by OCC using Thames Valley Police reports	STATS-19

Key Performance Indicators

KPI	Source	Source name
Transport emissions		
Road transport emissions	Department for Business, Energy & Industrial Strategy	Local Authority territorial CO ₂ emissions estimates (kt CO ₂) within the scope of influence of Local Authorities
Walking and cycling		
Percentage of adults that do any walking / walk for leisure / walk for travel once per week	Sport England	Active Lives Survey / DfT CW0303
Percentage of adults that do any cycling / cycle for leisure / cycle for travel once per week	Sport England	Active Lives Survey / DfT CW0302
Number of walking trips	Sport England	Active Lives Survey
Number of cycling trips	Sport England	Active Lives Survey
Physical activity		
Percentage of adults meeting physical activity recommendations	Public Health England	Public Health England Profiles - Physical Activity
Percentage of children meeting physical activity recommendations	Sport England	Active Lives Children and young people Survey
Healthy Place Shaping		
Average Healthy Streets score improvement	Lucy Saunders	Healthy streets design check tool
20 minute neighbourhood index improvements	OCC	20-minute neighbourhood mapping tool
Road safety		
Total number of KSI / KSI per mode	Compiled by OCC using Thames Valley Police reports	STATS-19
Public transport		
Passenger journeys on local bus services	Department for Transport	Passenger journeys on local bus services by local authority: England, from 2009/10
Passenger journeys on local bus services per head of the population	Department for Transport	Passenger journeys on local bus services per head by local authority: England, from 2009/10
Bus journey times	OCC / bus operators	N/A

Number of rail passenger journeys (rail station entries and exits)	Office of rail and road	Passenger entries and exits by station
Number of park and ride passenger journeys	OCC / bus operators	N/A
Digital connectivity		
Percentage of premises with superfast broadband	Think Broadband	Local broadband information
Percentage of premises with full fibre broadband	Think Broadband	Local broadband information
Air quality		
Road transport emissions	Department for Business, Energy & Industrial Strategy	Local Authority territorial CO ₂ emissions estimates (kt CO ₂) within the scope of influence of Local Authorities
Years of healthy life lost (DALYs) due to ambient particulate matter	Oxfordshire Health and Wellbeing Joint Strategic Needs Assessment	N/A
Private car		
Car vehicle miles in Oxfordshire	Department for Transport	Motor vehicle traffic (vehicle miles) by local authority and selected vehicle type in Great Britain, annual from 1993
Number of car trips	OCC car trip monitoring framework	INRIX trips and pathways dataset, Vivacity sensors and Automatic Traffic Count Data
Number of registered battery electric vehicles	Department for Transport	DVLA 'Licensed plug-in vehicles (PIVs) at the end of the quarter by body type, fuel type, keepership (private and company) and upper and lower tier local authority' VEH0142 (except total vehicle registrations VEH0105)
Car ownership	Office for national statistics	Census - car or van availability
Road highways maintenance condition		
Percentage of roads in good / fair / poor condition	OCC	N/A
Percentage of pavements / cycle ways in good / fair / poor condition	N/A	N/A

Appendix 2 – LTCP car trip methodology

1. Match Automatic Traffic Counter count sites to OpenStreetMap network

To match the Automatic Traffic Counter (ATC) count sites to the OpenStreetMap (OSM) network, we began by identifying the ATC count sites and obtaining their geographic coordinates. These coordinates serve as the reference points for locating the ATC sites within the OSM network.

Next, we utilised Open Street Map (OSM) network data, which provides a detailed representation of road networks, including nodes and edges. By leveraging this data, we matched each ATC count site to the nearest network nodes in the OSM data based on their geographic coordinates. This matching process allows us to associate each ATC site with the corresponding location on the OSM network.

2. Filter out ATC sites we don't need

To ensure that our analysis focuses only on relevant traffic locations, we filtered out ATC sites that are not essential for our purposes. For instance, we excluded ATC sites situated within car parks or other areas unrelated to traffic flow. By removing these unnecessary sites, we streamlined the subsequent analysis and ensured that our results accurately reflect the traffic patterns we intended to study.

3. Match trip trajectories to OSM network

To analyse the trips in relation to the OSM network, we obtained car trip trajectory data. These trajectories consist of sequences of GPS coordinates recorded during each car trip. The trajectory data is anonymously sent from consenting cars to summarise a route taken and provides trip summaries for a small number of trips (current INRIX telematics data includes approximately 2-10% of car trips in the county but we have only used personal car trips which are less than 1% of the sample).

By associating these GPS coordinates with the nearest network nodes in the OSM data, we matched the trip trajectories to the OSM network. This matching process allows us to establish a connection between the recorded trips and the road network represented in the OSM data. It enables us to precisely track the paths taken by the trips and determine their interaction with the road infrastructure.

4. Find trips that pass-through ATC sites

After matching the trip trajectories to the OSM network, we identified trips that intersect or pass through the ATC sites. By comparing the trip trajectories with the locations of the ATC sites, we were able to pinpoint the trips that directly interacted with these specific locations.

This step is crucial for our analysis as it helps us identify trips that contribute to the traffic counts recorded at the ATC sites. By isolating these trips, we can accurately measure their impact on the traffic flow and ensure that they are appropriately accounted for in our calculations.

5. Assign each trip to an appropriate ATC site

To avoid double-counting trips and ensure accurate attribution, we assigned each trip that passed through an ATC site to the appropriate location. This assignment process involved associating each trip with the specific ATC site it intersected or passed through during its trajectory.

By assigning each trip to its corresponding ATC site, we establish a clear relationship between the recorded trip and the location where it contributes to the traffic count. This step is essential for accurate analysis and prevents duplicate counting of trips, enabling precise calculations of trip volumes at each ATC site.

6. Scale trip count by ATC count

To accurately represent the total trip count passing through each ATC site, we scaled the trip count by the count recorded at that ATC site. This scaling factor accounts for the discrepancy in counts between the trip data and the actual count data obtained from the ATC sites.

By multiplying the number of trips assigned to each ATC site by the count recorded at that site, we ensure that the trip counts are proportionate and representative of the actual traffic volumes. This scaling process allows us to obtain reliable and meaningful trip count data for further analysis.

7. Cluster trip density to create 'virtual ATC' sites

For trips that do not pass through any ATC sites, we employed a clustering technique to identify areas with high trip densities. These areas, referred to as 'Virtual ATC' sites, represent regions where trip activity is concentrated despite the absence of an ATC site.

By clustering the trip density, we can identify spatial patterns and hotspots of trip activity. This approach allows us to create virtual representations of ATC sites in areas where they are not physically present, ensuring comprehensive coverage of trip data and capturing areas of significant trip concentration.

8. Repeat process to assign trips to 'virtual ATCs'

Like the assignment process for ATC sites, we repeated the process to assign the remaining trips to the 'Virtual ATC' sites. By comparing the trip trajectories with the locations of the virtual sites, we associated each trip with the nearest 'Virtual ATC' site.

This step ensures that all trips, including those that do not pass-through physical ATC sites, are appropriately accounted for in the analysis. Assigning these trips to the 'Virtual ATC' sites allows us to capture their contribution to the overall trip counts and accurately represent their impact on traffic volumes.

9. Scale trip count assigned to 'virtual ATCs'

To account for the density of trips in each cluster and ensure accurate representation, we applied a scaling factor to the trip count assigned to the 'Virtual ATC' sites. This scaling process adjusts the trip counts based on the concentration of trips within each cluster.

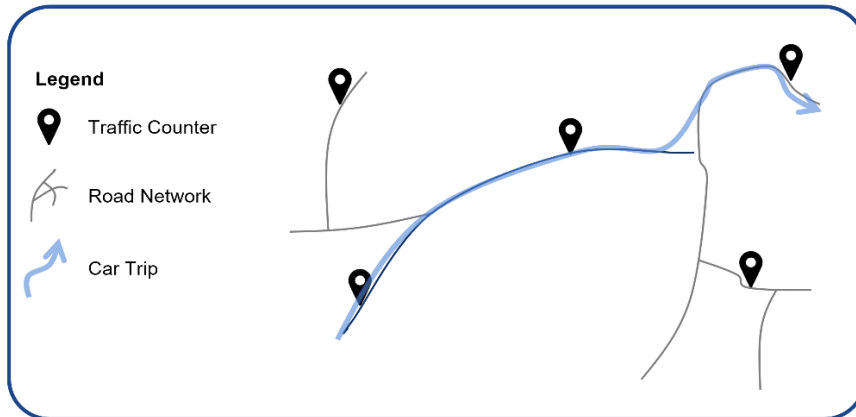
By scaling the trip counts assigned to the 'Virtual ATC' sites, we can accurately represent the trip activity in these areas. This step ensures that the virtual sites effectively capture the volume of trips they represent, providing reliable data for analysis and interpretation.

10. Collect total trip counts and standard deviations

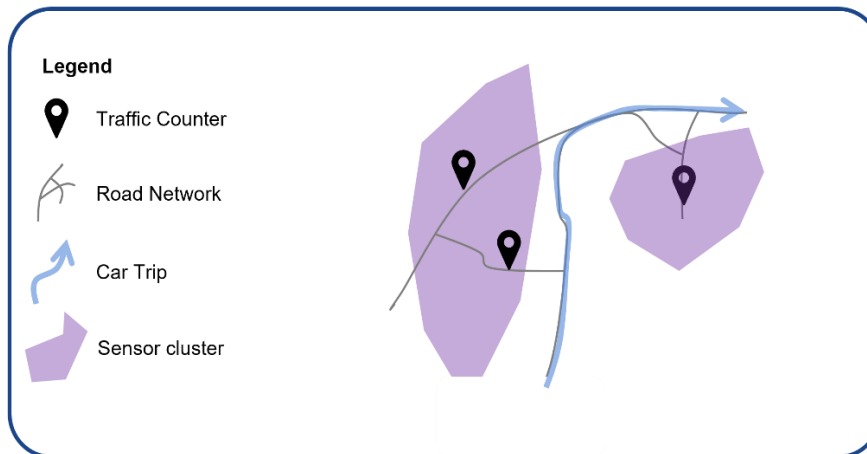
Finally, we collected the total trip counts and calculated standard deviations to provide an indication of variability and error bounds in the dataset. By summing the trip counts for all ATC sites and 'Virtual ATC' sites, we obtained the overall trip count for the study area.

Additionally, calculating the standard deviations allows us to understand the variability in the trip counts and assess the level of uncertainty in our measurements. These statistical measures provide valuable insights into the reliability and robustness of our dataset, enabling informed analysis and interpretation of the results.

Summary



- For each sensor, find the probability that a trip passes.
- Use this to weight each sensor.
- Use weighting to calculate how much of the sensors count should contribute to the trips count.



- Identify trips that don't pass a sensor or through a sensor cluster.
- Count these trips.
- Multiply up from the sample to reflect the statistical population.
- Add to the previous calculation.

Appendix 3 – Causeway Active Travel Tranche 2 monitoring

As outlined previously, we now have detailed scheme specific monitoring from delivery of the Active Travel Tranche 2 scheme in Causeway, Bicester. This monitoring helps us to understand the impacts of delivering individual active travel schemes in a specific town. Weekly data on the total numbers of cyclists and other travellers along the Causeway have been collected via Vivacity sensors since February 2021.

The graphs below shows the average weekly numbers of cyclists and pedestrians, along with the frequency distribution of these figures. The analysis shows average counts of 4,612 pedestrians and 627 cyclists per week. Furthermore, peak counts were observed during the summer months, with 10,315 pedestrians and 2,320 cyclists, while troughs were noted during the winter months, with figures dropping to 174 pedestrians and 31 cyclists.

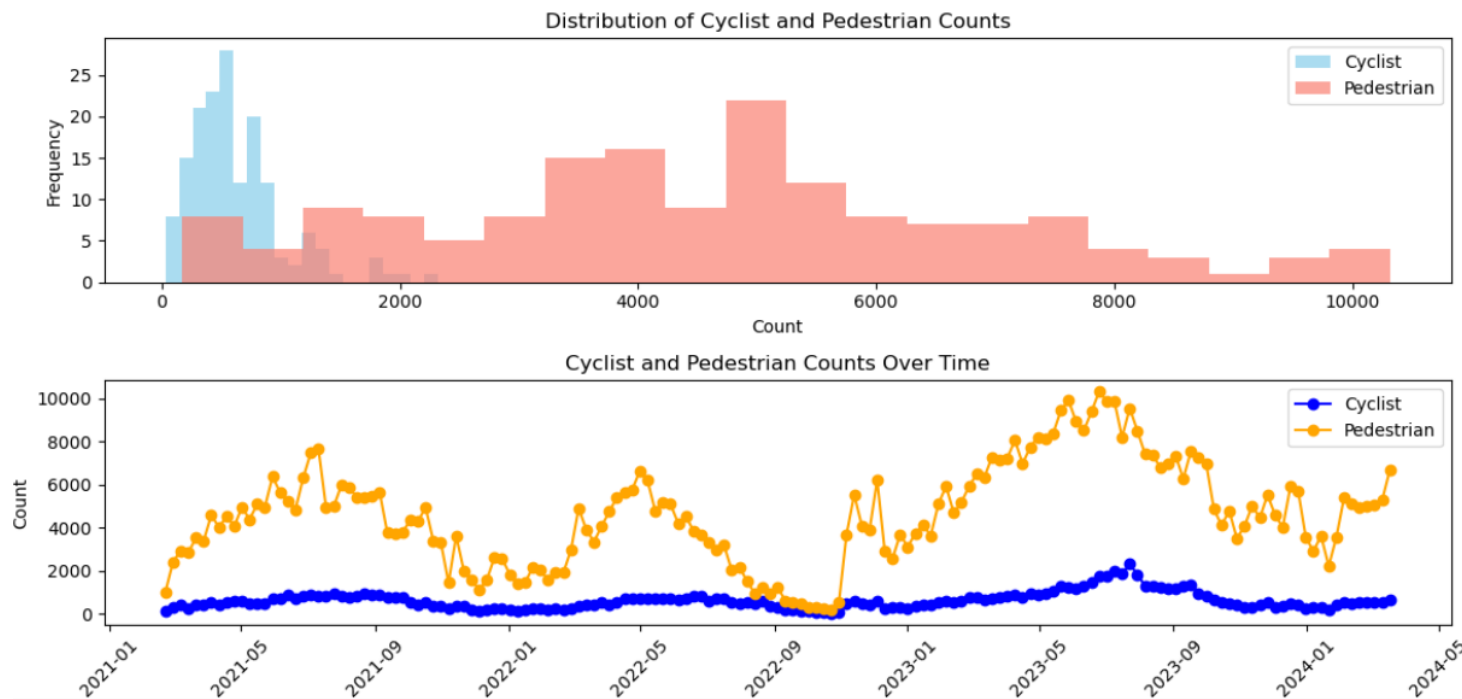


Figure 17 – Causeway cyclist and pedestrian trends and numbers over time

In addition to the individual analyses of cyclists and pedestrians, a linear regression was conducted to explore the relationship between the number of cyclists and pedestrians. The Pearson correlation coefficient ($r = 0.84$) revealed a strong positive linear relationship between the two variables, indicating that as the number of cyclists increases, there is a corresponding increase in the number of pedestrians, and vice versa.

The p-value associated with this correlation coefficient was extremely small ($p < 0.0001$), suggesting that the observed correlation is highly statistically significant. Furthermore, the coefficient of determination ($R^2 = 0.71$) indicated that approximately 71% of the variability in the number of pedestrians can be explained by changes in the number of cyclists, demonstrating a substantial level of association between the two groups. These findings highlight a significant interdependency between cyclists and pedestrians, with changes in one group strongly influencing the other.

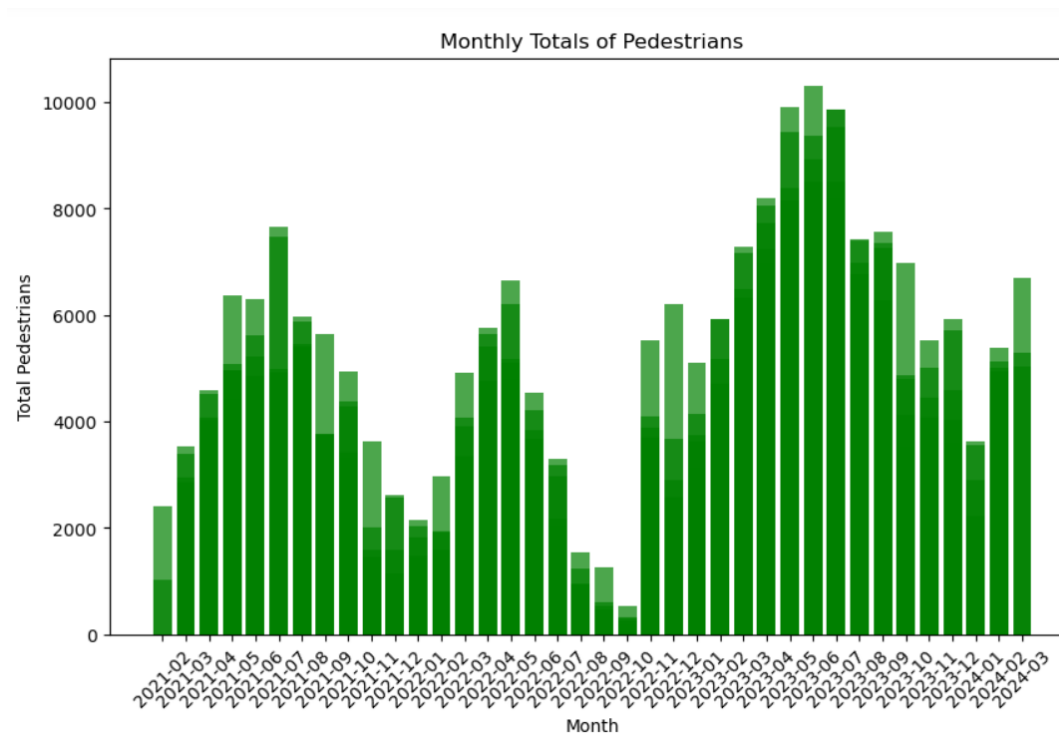


Figure 18 – Monthly pedestrian numbers

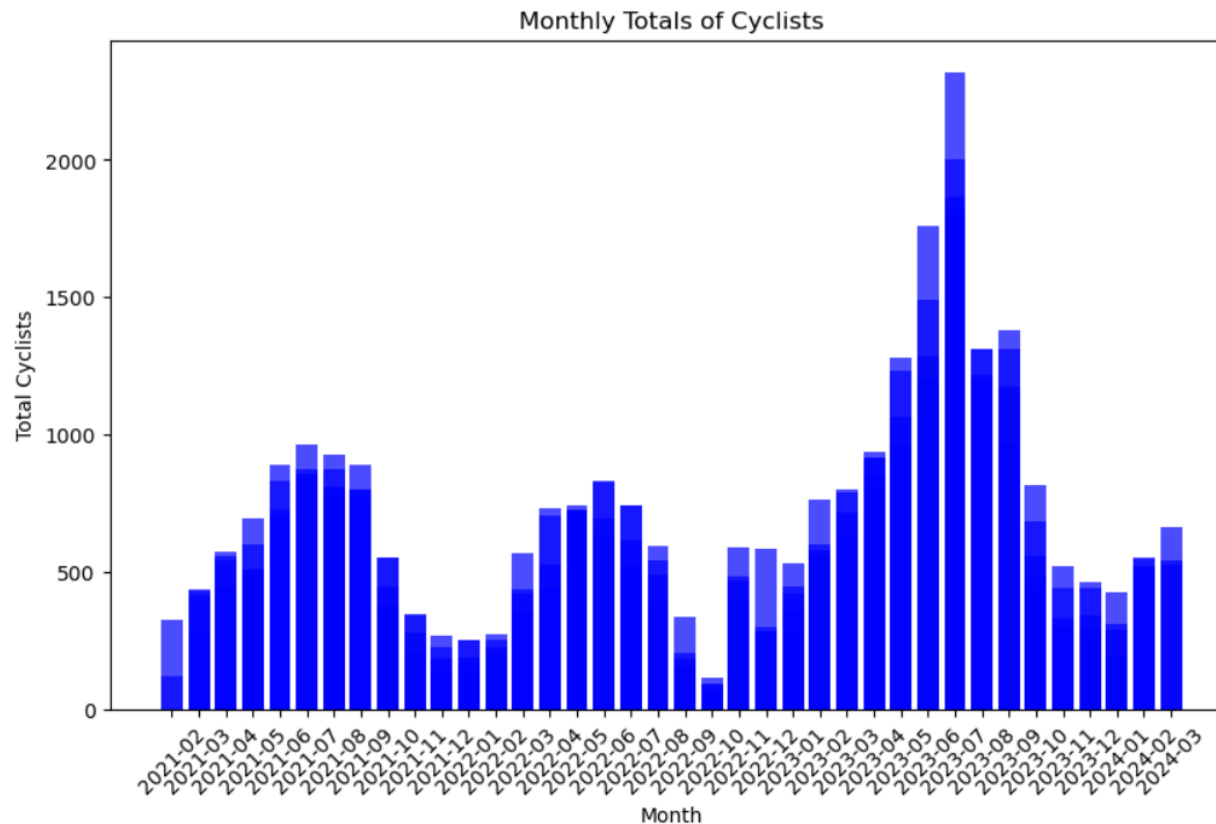


Figure 19 – Monthly cyclist numbers

Linear regression analysis was also conducted to examine the relationship between time and the number of cyclists and pedestrians. For cyclists, the Pearson correlation coefficient revealed a weak positive linear relationship ($r = 0.25$), which was statistically significant ($p = 0.0017$), indicating that as time increases, there is a tendency for the number of cyclists to also increase. The coefficient of determination suggested that approximately 6% of the variability in the number of cyclists can be explained by changes in time. Similarly, for pedestrians, the analysis showed a moderately positive linear relationship ($r = 0.33$), which was highly statistically significant ($p < 0.0001$). The R-squared value indicated that approximately 11% of the variability in the number of pedestrians can be explained by changes in time.

These findings suggest that both cyclists and pedestrians exhibit increasing trends over time, with pedestrians showing a stronger relationship with time compared to cyclists. However, it's important to note that while time explains a portion of the variability in both groups, other factors may also influence their numbers.

Overall, the implementation of Active Travel Tranche 2 schemes in Causeway, Bicester had a notable impact on cycling trends. The findings above highlight a significant increase in both cyclist and pedestrian numbers over time, particularly evident during the summer months. The strong correlation observed between cyclist and pedestrian numbers emphasises the interconnected nature of these modes of transport. Changes in cyclist numbers are found to strongly influence pedestrian counts and vice versa, indicating the importance of considering both modes of travel in urban planning and transportation management strategies.