

GLOUCESTERSHIRE COUNTY COUNCIL

Draft Local Transport Plan 2027-2043

Integrated Impact Assessment

Draft Health Impact Assessment

DRY



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1. Introduction

The Gloucestershire County Council (GCC) area includes Gloucester City, Cheltenham Borough, Cotswold District, Stroud District, Tewkesbury District, and the Forest of Dean District.

As a Local Transport Authority, GCC is required to produce a Local Transport Plan (LTP) under the Transport Act 2000, as amended by the Local Transport Act 2008¹.

GCC is currently preparing a new fourth LTP. A Strategic Environmental Assessment (SEA) is being prepared alongside the LTP. This SEA represents the second stage of the SEA, following a Scoping Report which determined the issues to be included in the SEA.

One of the topics assessed within the SEA is human health, and the impacts the LTP is likely to have on the health of people in Gloucestershire.

In considering the effects on human health, a health impact assessment (HIA) has been undertaken to further consider the relationship between health and transport, and the likely significant effects of the draft LTP on human health.

¹ UK Government (2008) Local Transport Act 2008

2. Scope and Methodology

Introduction

A rapid desktop HIA was undertaken during May and June 2026.

The key tasks for this HIA were to:

Develop a summary health and wellbeing baseline and profile of the GCC authority;

Identify relevant scientific evidence from literature; and

Assess the potential health and wellbeing impacts of the LTP, and the nature and likelihood of such impacts.

Study Area

This is a rapid, desk-based HIA of the direct and indirect effects on local communities resulting from the proposed policies of the LTP. The geographic scope of this HIA is therefore GCC.

Study population

The population scope of this HIA includes residents within GCC:

- Gloucester City;
- Cheltenham Borough;
- Cotswold District;
- Stroud District;
- Tewkesbury District; and
- The Forest of Dean District.

The main vulnerable groups within the population that have been considered are:

- Children and young people;
- Older people;
- People with disabilities and mobility impairment;
- People with existing health conditions;
- Unemployed and low-income groups; and
- Socially excluded or isolated groups.

Determinants of health

The key determinants of health and wellbeing that were considered were:

- Air Quality;
- Noise;
- Physical Activity;
- Road safety;

- Economy and employment; and
- Access and accessibility.

Baseline assessment, community health profile and evidence

The baseline assessment, community profile and evidence base were developed from existing publicly available data including:

- Department of Health & Social Care – Local Authority Health Profiles (Fingertips)
- Public Health England – Public Health Outcomes Framework / Local Authority Profiles
- Office for National Statistics – Census 2021 and associated datasets (demographics, health, employment, travel)
- NHS Gloucestershire Integrated Care Board data (respiratory health indicators)
- Department of Health & Social Care – respiratory disease datasets
- England Noise and Air Quality Viewer
- Gloucestershire road safety needs assessment and Public Health England road safety data
- Relevant regional (South West) benchmarking datasets
- Supporting peer-reviewed literature and national guidance (e.g. COMEAP, WHO)

Appraisal of impacts

The LTP was assessed against each of the determinants of health (listed in 2.2.4), looking first at the baseline conditions of the determinant category within the study area, evidence of how each determinant impacts on human health and then the effect that the LTP policies could have on the health of the target population (short-term, temporary and permanent) via the determinant category.

A seven-point assessment scale that classifies the significance of the identified impacts (Table 2-1) is used to categorise the effects for the assessment. This approach has been adapted from that used by the Institute of Occupational Medicine (IOM), for the North Staffordshire 'Streetcar' Bus Rapid Transport Scheme Health Impact Assessment². Significance incorporates the intensity of the impact and its potential duration, shown in Table 2-1 below.

² Vohra, S., Chilaka, M., Ball, J. and Amo-Danso, G. (2009) North Staffordshire 'Streetcar' Bus Rapid Transport Scheme: Health Impact Assessment (Main HIA Report – Final). Edinburgh: Institute of Occupational Medicine (IOM)

Table 2-1 Significance definitions, including intensity and duration

Significance of Impact	Definition	Intensity [+/-]	Duration (SML) (TIP)
Major Adverse	Health effects are categorised as a major negative if they could lead directly to deaths, acute or chronic diseases or mental ill health. They can affect either or both physical and mental health either directly or through the wider determinants of health and wellbeing. These effects can be important local, district, regional and national considerations. Mitigation measures and detailed design work can reduce the level of negative effect though residual effects are likely to remain.	The exposures tend to be of high intensity, over a large geographical area or affect a large number of people or impact vulnerable groups. (- - - / + + +)	Long term duration (L) Intermittent (I) Temporary (T) or Permanent (P) in nature
Major Beneficial	Health effects are categorised as a major positive if they prevent deaths/prolong lives, reduce/prevent the occurrence of acute or chronic diseases or significantly enhance mental wellbeing would be a major positive.		

Significance of Impact	Definition	Intensity [+/-]	Duration (SML) (TIP)
Moderate Adverse	Health effects are categorised as a moderate negative if the effects are long term nuisance impacts, e.g. odours and noise, or may lead to exacerbations of existing illness. The negative impacts may be nuisance/quality of life impacts which may affect physical and mental health either directly or through the wider determinants of health. The cumulative effect of a set of moderate effects can lead to a major effect. These effects can be important local, district and regional considerations. Mitigation measures and detailed design work can reduce and in some/many cases remove the negative and enhance the positive effects though residual effects are likely to remain.	The exposures tend to be of moderate intensity and/or over a relatively localised area and/or likely to affect a moderate-large number of people e.g. between 100-500 and/or sensitive groups (- - / + +)	Medium term duration (M) Intermittent (I) Temporary (T) or Permanent (P) in nature
Moderate Beneficial	Health effects are categorised as a moderate positive if they enhance mental wellbeing significantly and/or reduce exacerbations to existing illness and reduce the occurrence of acute or chronic diseases.		

Significance of Impact	Definition	Intensity [+/-]	Duration (SML) (TIP)
Minor Adverse	Health effects are categorised as minor positive or negative, if they are generally lower level quality of life or wellbeing impacts. Increases or reductions in noise, odour, visual amenity, etc. are examples of such effects. These effects can be important local considerations. Mitigation measures and detailed design work can reduce the negative and enhance the positive effects such that there are only some residual effects remaining.	The exposures tend to be of low intensity and/or over a small area and/or affect a small number of people e.g. less than 100 (- / +)	Short term duration (S) Intermittent (I) Temporary (T) or Permanent (P) in nature
Minor Beneficial			
Neutral / No effect	No health effect or effects within the bounds of normal/accepted variation.	N/A	N/A

Recommendations

Recommendations may be identified where the assessment indicates the potential for adverse health and wellbeing effects, or where opportunities exist to further enhance positive outcomes. Any recommendations proposed are intended to help avoid, reduce or mitigate potential negative effects and maximise the health and wellbeing benefits of the LTP.

Assumptions and limitations

At this stage it is difficult to assess the specific localised populations (e.g. at Ward level) who are more or less likely to benefit from the proposed initiatives in the different policies.

Specific mitigation measures relating to health for each LTP policy have been made within the SEA Environmental Report and were informed by this HIA. Health and wellbeing indicators that can be used to monitor the LTP are reported in the Strategic Environmental Assessment (SEA) Environmental Report.

3. Health Impact Assessment

HIA is a systematic approach to identifying the differential health and wellbeing impacts, both positive and negative, of projects and plans.

HIA uses both qualitative and quantitative evidence, including public and other stakeholders' perceptions and experiences, as well as public health knowledge. It is particularly concerned with the distribution of effects within a population, as different groups are likely to be affected in different ways, and therefore looks at how health and social inequalities might be reduced or increased by a proposed project or plan.

The aim of a HIA is to support and add value to the decision-making process by providing a systematic analysis of the potential impacts, as well as recommending opportunities, where appropriate, to enhance positive impacts, mitigate negative impacts and reduce health inequalities.

Health has been defined as³:

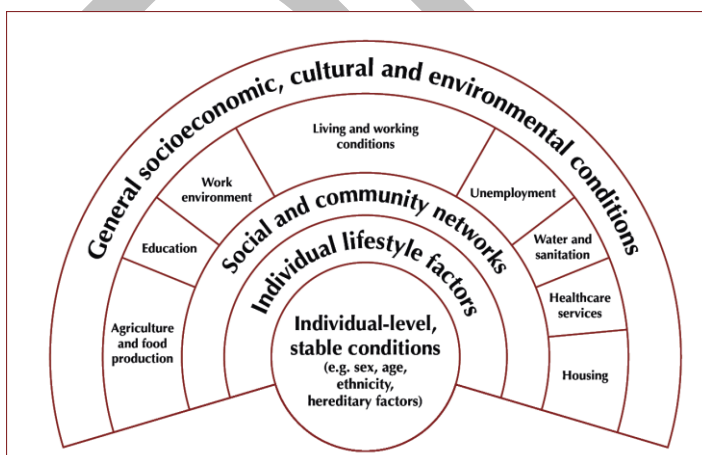
"... a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

Health determinants are the personal, social, cultural, economic and environmental factors that influence the health of individuals or populations. These include a range of factors such as income, employment, education and social support.

Health inequality can be defined as the difference in either health status, or the distribution of health determinants, between different population groups. Some health inequalities are unavoidable, others are not so, and may well be unjust and unfair.

HIA's apply a model of health determinants as developed by Göran Dahlgren and Margaret Whitehead (Figure 3-1). The socio-environmental model of wellbeing provides a visual framework illustrating how various social, economic, and environmental conditions interact to influence an individual's health and wellbeing.

Figure 3-1 Socio-economic model of wellbeing⁴



³ WHO-Euro (1999) Gothenburg Consensus Paper on Health Impact Assessment, European Centre for Health Policy, Brussels.

⁴ Dahlgren, G. and Whitehead, M. (1991) Rainbow model of health in Dahlgren, G. 1995 European Health Policy Conference: Opportunities for the Future. Vol 11 – Inter-sectoral Action for Health.

The overall aim of this HIA will be to identify the aspects of the LTP policies which have the potential to affect people's health, both directly and indirectly. Some effects may be positive, others could be negative. This HIA will include recommendations which will remove or mitigate as far as possible any potential negative impacts on people's health. It will also identify opportunities to maximise the potential benefits to people's health.

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4. Community Profile

A profile of the population most likely to be affected by the LTP policies has been prepared using relevant health and demographic indicators. Information is presented for each local authority within GCC, and where applicable, compared to the national (England) average.

Public Health Profile⁵

Cheltenham

The health of people in Cheltenham is generally similar to the England average. Cheltenham is the 2nd least deprived district in Gloucestershire and ranks as the 251st most deprived of the 296 districts in England. Cheltenham has the most deprived LSOA in the county for 'Income Deprivation Affecting Older People Index (IDAOPI)'. Life expectancy for men and women is similar to the England average.

Cotswold

The health of people in Cotswold is generally better than the England average. Cotswold is the 4th most deprived district in Gloucestershire and ranks as the 244th most deprived of the 296 districts in England. Cotswold has the least deprived LSOA in the county for 'Health Deprivation and Disability' and 'IDAOPI'. Life expectancy for men and women is slightly higher than the England average.

Forest of Dean

The health of people in the Forest of Dean is generally similar to the England average. Forest of Dean is the most deprived district in Gloucestershire and ranks as the 121st most deprived of the 296 districts in England. Forest of Dean has the most deprived LSOA in the county for 'Barriers to Housing and Services'. Life expectancy for men and women is similar to the England average.

Gloucester

The health of people in Gloucester is slightly worse than the England average. Gloucester is the 2nd most deprived district in Gloucestershire and ranks as the 142nd most deprived of the 296 districts in England. Gloucester has the most deprived LSOAs in the county for 'Multiple Deprivation', 'Income', and 'Employment', 'Education Skills & Training', 'Health Deprivation & Disability' and 'Crime'; and 'Income Deprivation Affecting Children Index (IDACI)'. Life expectancy for men and women is worse than the England average.

Stroud

The health of people in Stroud is better than the England average. Stroud is the 3rd most deprived district in Gloucestershire and ranks as the 234th most deprived of the 296 districts in England. None of Stroud's LSOAs fall within the most deprived 20% in England. Life expectancy for men and women is better than the England average.

⁵ Department of Health & Social Care (2025) Local Authority Health Profiles (Fingertips | Public health profiles)

Tewkesbury

The health of people in Tewkesbury is slightly better than the England average. Tewkesbury is the least deprived district in Gloucestershire and ranks as the 254th most deprived of the 296 districts in England. Tewkesbury has the least deprived LOSAs in the county for 'Crime' and 'Living Environment'. Life expectancy for men and women is slightly better than the England average.

The following tables provide details of specific indicators from the local authority Public Health Profiles which related to the policies of the draft LTP.

According to the specific indicator in the most recent Public Health Profile, the South West performs significantly better than the England average in terms of people who are killed and seriously injured on England's roads. In 2024, the South West averaged 65.3 (Crude rate – per billion vehicle miles), whilst England averaged 89.8.

The proportion of adults who are physically active is significantly higher in Cheltenham, Cotswold, Stroud and Tewkesbury, and is slightly higher than the England average in Forest of Dean and Gloucester.

Table 4-1 – Physically active adults aged 19+ (2024-25) (%)⁶

Area	England	Cheltenham	Cotswold	Forest of Dean	Gloucester	Stroud	Tewkesbury
%	68.0	72.0	76.7	66.9	68.4	72.3	72.0

The proportion of obese children is significantly better than the England average in Cheltenham, Cotswold and Stroud, is slightly better than the England average in Forest of Dean and Tewkesbury and is significantly worse than the England average in Gloucester.

Table 4-2 – Year 6 prevalence of obesity (including severe obesity) (10-11 years)

Area	England	Cheltenham	Cotswold	Forest of Dean	Gloucester	Stroud	Tewkesbury
%	22.2	16.1	18.3	20.4	25.5	18.1	19.0

Local Population indicators

Office of National Statistics local profile data for each local authority in GCC was analysed to determine how the region performs across a number of indicators which are related to the LTP. These were:

- Population Age Profile;

⁶ Public Health England Local Authority Profiles (2025)

- General Health;
- Deprivation; and
- Economic Activity.

The following information provides further details about the population and economic profile of the local authorities comprising GCC. This population will be most sensitive to the policies proposed within the LTP.

The age distribution of the population across the GCC region (Table 4-3) is generally similar to the England averages, apart from Cotswold, Forest of Dean and Stroud which have a larger proportion of residents over 65.

Table 4-3 Age Distributions of the Population⁷

	Population under 16 (%)	Population aged 16-24 (%)	Population aged 25-64 (%)	Population aged 65-84 (%)	Population aged 85 and over (%)
England	18.5	10.6	52.4	15.9	2.4
Cheltenham	17.2	16.6	52.3	16.1	3.1
Cotswold	16.0	8.2	49.8	22.5	3.6
Forest of Dean	16.1	9.4	49.5	22.1	3.0
Gloucester	19.2	11.0	53.0	14.4	2.3
Stroud	17.3	8.2	51.2	20.2	3.1
Tewkesbury	18.5	8.0	51.3	19.3	2.9

The self-reported general health of districts is largely similar to the England averages. The highest rate of people reporting to be in very bad health falls in the Forest of Dean (1.3%), and the highest rate of people reporting to be in very good health falls in Cheltenham (50.7%). Neither of these are significantly different from the England average.

⁷ Office for National Statistics (2021) 2021 Census Profile for areas in England and Wales

Table 4-4 General health profiles (self-reported)⁸

	Very good health (%)	Good health (%)	Fair health (%)	Bad health (%)	Very bad health (%)
England	48.5	33.7	12.7	4.0	1.2
Cheltenham	50.7	33.6	11.7	3.1	0.9
Cotswold	50.4	34.2	11.6	3.0	0.8
Forest of Dean	44.8	35.5	14.2	4.2	1.3
Gloucester	46.7	35.3	13.0	3.9	1.0
Stroud	48.6	34.7	12.5	3.3	0.8
Tewkesbury	49.8	34.3	12.0	3.1	0.8

Child poverty is significantly better in Cotswold, and employment rates are significantly better in Forest of Dean, Gloucester and Tewkesbury, than the England average. No districts within the GCC area have below average indicators for employment rates or rates of child poverty.

Table 4-5 Percentage of people in employment and Children in absolute low income families (2024/25)⁹

	Percentage of people in employment (%)	Percentage of people in employment: Difference to Avg for England	Children in absolute low income families (under 16s) (%)	Children in absolute low income families: Difference to Avg for England
England	75.7		19.8	
Cheltenham	80.1	Slightly better	14.4	Slightly better
Cotswold	76.2	No difference	10.9	Significantly better
Forest of Dean	82.0	Significantly better	19.1	No difference
Gloucester	87.6	Significantly better	19.0	No difference

⁸ Office for National Statistics (2021) 2021 Census Profile for areas in England and Wales

⁹ Office for National Statistics (2021) 2021 Census Profile for areas in England and Wales

	Percentage of people in employment (%)	Percentage of people in employment: Difference to Avg for England	Children in absolute low income families (under 16s) (%)	Children in absolute low income families: Difference to Avg for England
Stroud	77.2	Slightly better	12.9	Slightly better
Tewkesbury	85.4	Significantly better	13.1	Slightly better

5. Assessment of effects

The analysis of health impact has focused on the determinants identified in section 2.2 which fall into the following categories;

- Air Quality;
- Noise;
- Physical Activity;
- Road Safety;
- Economy and employment; and
- Access and accessibility.

The LTP has been assessed against each of the above, looking first at the baseline conditions of the determinant category within the study areas, evidence of how each determinant affects health, and then the potential effect that the LTP policies are anticipated to have on the health of the study area population (short-term, temporary and permanent) via the determinant category.

Air Quality

Evidence

The association between health effects and exposure to air pollutants including particulate matter (PM) and Nitrogen Dioxide (NO₂) is now well established, with distinct health risks associated with exposure to PM and NO₂ at a local level¹⁰. There is no known threshold concentration below which NO₂ or PM₁₀ have no effect on a population's health.

Links between the occurrence of NO₂ and health effects has strengthened substantially in recent years, though some of these are co-incident with PM, as noted by the Committee on the Medical Effects of Air Pollutants¹¹ (COMEAP). Some could be attributed to other co-existing pollutants, such as Poly Aromatic Hydrocarbons (PAH) and Volatile Organic Compounds (VOC).

There are reported to be between 28,000 and 36,000 deaths a year attributes to the long term exposure to air pollution¹⁴. Any increases in mortality are likely to be either as a result of cardiovascular and/or respiratory mortality, particularly with regards to an elevated short-term exposure to NO₂¹⁵.

Due to the correlation between differing airborne pollutants and similar health effects, one pollutant can often mask the effect of another and it is not always possible to discreetly isolate the health effects of a single pollutant. The causal mechanism, primarily cardiovascular and respiratory, leading to increased mortality with increased exposure to particulate matter is well-founded, though

¹⁰ COMEAP (2009) Long-Term Exposure to Air Pollution: Effect on Mortality.

¹¹ COMEAP (2010) The Mortality Effects of Long-Term Exposure to Particular Air Pollution in the United Kingdom. A report prepared by the Committee on the Medical Effects of Air Pollutants.

¹² COMEAP (2012) Statement on Estimating the Mortality Burden of Particulate Air Pollution at a Local Level.

¹³ COMEAP (2015) Statement on the Evidence of the Effects of Nitrogen Dioxide on Health.

¹⁴ Public Health England (2019) online at: <https://www.gov.uk/government/news/public-health-england-publishes-air-pollution-evidence-review>

¹⁵ BMJ Open (2015) Quantitative systematic review of the associations between short-term exposure to nitrogen dioxide and mortality and hospital admissions.

processes behind NO₂ contributing to cardiovascular damage, respiratory disease or cancer are less understood.

Studies have reported statistically significant associations between long-term exposure to NO₂ and lung function in children, respiratory infections in early childhood and effects on adult lung function. Though mortality, lung cancer, and cardiovascular and cerebrovascular effects in adults are predominantly weighted towards PM mass and not NO₂ (studies cited in COMEAP/2014/06 Annex B¹⁶). Similar rates of mortality per 10 µg/m³ of PM_{2.5} and NO₂ have been found in some studies¹⁷. Though a greater effect of NO₂ (6%) than PM_{2.5} (3%) was found on total mortality when the broader range of NO₂ concentrations over PM_{2.5} concentrations were taken into account. The US Environmental Protection Agency¹⁸ found that there was consistent evidence in single-city studies in diverse locations but inconsistent evidence among other large cohorts of multiple US locations.

A meta-analysis of available long-term studies on NO₂ data by Faustini et al¹⁷ concluded that the magnitude of the effect of long-term exposure to NO₂ on mortality is at least as important as that of PM_{2.5}.

Baseline

Air pollution has been estimated to affect local health, the fraction of mortality attributable to particulate air pollution in Gloucestershire (4.7%) is slightly lower than the England average of 5.3% but slightly higher than the South West average of 4.3%.

Table 5-1 – Fraction of mortality attributable to particulate air pollution¹⁹

Region	2024
England	5.3%
South West	4.3%
Gloucestershire	4.7%

Admissions for Chronic Obstructive Pulmonary Disease (COPD) in the NHS Gloucestershire Integrated Care Board is better than both the South West and England average (Table 5-2). The trends in both the South West and England have been increasing and getting worse, however, within Gloucestershire there has been no significant change.

¹⁶ COMEAP (2014)

¹⁷ Faustini A, Rapp R, Forastiere F (2014) Nitrogen dioxide and mortality: review and meta-analysis of long-term studies.

¹⁸ US EPA (2013) Integrated Science Assessment for Oxides of Nitrogen – Health Criteria (First External Review Draft).

¹⁹ Public Health England, Public Health Outcomes Framework accessed at: [Public Health Outcomes Framework - Data | Fingertips | Department of Health and Social Care](#)

Table 5-2 – Chronic Obstructive Pulmonary Disease (COPD) data, 2024/2025²⁰

	Total COPD admissions per 100,000 population	Recent Trend
England	201.1	Increasing and getting worse
South West NHS Region	164.6	Increasing and getting worse
NHS Gloucestershire Integrated Care Board	134.3	No significant change

Admissions for children (aged under 19) with asthma in the NHS Gloucestershire Integrated Care Board are better than both the England Average and the South West NHS Region Table 5-3). Whereas the recent trends in England and South West are increasing and getting worse, within Gloucestershire there is no significant change in recent trends.

Table 5-3 – Childhood asthma data, 2024/2025

	Hospital admissions for asthma (under 19 years), per 100,000	Recent Trend
England	138.8	Increasing and getting worse
South West NHS Region	126.5	Increasing and getting worse
NHS Gloucestershire Integrated Care Board	92.5	No significant change

Only one of the six districts that are covered by GCC currently have declared an Air Quality Management Area (AQMA) for elevated nitrogen dioxide (NO₂) concentrations, this is within Cotswold District Council at the Air Balloon Roundabout, Birdlip. Improvements works to the A417 Trunk Road, 'A417 Missing Link', are due to be completed in 2027, this will alleviate congestion and reduce pollutant concentrations at the Air Balloon Roundabout. All other districts and boroughs have seen an improvement in air pollution which has enabled them to revoke their AQMAs in recent years.

Assessment

The draft LTP includes Objective O6 '*Protecting and Enhancing our natural and built environment*' which will directly influence air quality across Gloucestershire. P28 relates to '*Reducing transport-related pollution and waste*', this will be achieved by protecting and making improvements to the environment through management of the transport network with the aim to reduce air pollution associated with transport.

Objective O7 '*Reducing transport carbon emissions*' is also likely to result in an indirect improvement in air quality through improvements to the electric vehicle charging infrastructure (P32) which will support and encourage the move to zero emission vehicles. Within this objective Policy P34 and P35 also see the transitioning to zero emission vehicles of the council's vehicle fleet and working with bus operator and partners to enable the acceleration of zero emission buses across the area.

²⁰ Department of Health & Social Care, Respiratory disease <https://fingertips.phe.org.uk/profile/respiratory-disease/data>

Objective O10 '*Enabling people to lead active and healthy lives*' includes a number of policies which promote and encourage active travel choices including an Active Travel Strategy (P44), delivering a high quality and attractive improved cycling infrastructure (P46) and a continued use of the 'Thinktravel' brand to influence travel behaviour change across Gloucestershire (P48). In addition, Policy P55 within Objective O13 looks to support car sharing and car clubs. Such measures proposed under these objectives are likely to indirectly result in a reduction in road congestion, through providing more attractive and reliable travel options with the aim to discourage and reduce private car journeys and promote more sustainable and active travel modes across Gloucestershire. For shorter journeys this would have a localised direct benefit to neighbourhood air quality in particular. Air quality improvements are likely to be seen in the more urban areas of Gloucestershire where improvements to cycle networks and the 'Thinktravel' campaigns could be more likely to result in a modal shift to active travel.

It is anticipated that these policies and proposals, which encourage a modal shift from private car use and promote active travel or more sustainable travel options, will have a **major long-term beneficial permanent effect on health outcomes** due to the reduction in adverse health effects from poor air quality. This is likely to result in a reduction in symptoms and health outcomes previously outlined in the evidence section above. These benefits are, however, likely to be both variable across the region and dependent upon the proximity of the vulnerable receptor to the road network from where modal shift is likely to be most influential, and local active travel interventions.

Improvements to the road network through working with the strategic road network (Policy P4) which aims to support travel to, from and within Gloucestershire, are unlikely to discourage private and commercial users unless combined with demand management measures. This policy, which seems to upgrade or add to the local or strategic network, is likely to result in additional emissions to air from both freight and other traffic and have a negative impact on health through degraded air quality. These potential impacts would be felt by populations located near the existing road network, though proposals leading to improvements in congestion will contribute to a beneficial impact.

This policy and proposal is likely to result in additional vehicle movements which could have a **moderate medium-term adverse permanent effect on health outcomes** due to increases in the health effects from poor air quality. These potential adverse effects are likely to be variable across the region and dependent upon the proximity of the vulnerable receptor to the road network from where modal shift is likely to be most influential, and local active travel interventions. Additional mitigation measures which promote exposure reduction and ensure that any new road links are isolated from vulnerable receptors, would reduce the harmful effects of this policy.

Noise

Evidence

The health impacts of environmental noise are widely acknowledged. A number of reviews of impacts have been published (for example, WHO 2011²¹) which highlight potential impacts on cardiovascular disease, cognitive impairment and sleep disturbance and annoyance.

WHO consider the health burden of environmental noise in terms of Disability-Adjusted Life Years (DALYs). One DALY can be thought of as one lost year of "healthy" life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap

²¹ WHO (2011) Burden of disease from environmental noise: quantification of healthy life years lost in Europe.

between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.

Therefore, any noise impacts resulting in one DALY lost can be thought of as one lost year of 'healthy life'. DALYs considers life expectancy and the incidence of disease, weighted by the severity of the disease (from zero to 1, where 0 is perfect health and 1 is year of life lost).

Years Lost due to Disability (YLD) are calculated by multiplying the incident cases by duration and disability weight for the condition. The assessment of health effects is based on the existing monetisation analysis²², which includes an assumed range of values for the 'disability weighting'²³ for annoyance, sleep disturbance and AMI effects, reflecting the expected uncertainty with regards to population health outcomes. The disability weighting values used for sleep disturbance were 0.04 (low), 0.07 (mid) and 0.1 (high). The weightings applied for annoyance were 0.01 (low), 0.02 (mid) and 0.12 (high). The weighting used for AMI was 0.405.

WHO estimate that, in EU Member States and other western European countries, DALYs lost are 61,000 years for ischaemic heart disease, 45,000 years for cognitive impairment of children, 903,000 years for sleep disturbance and 654,000 years for annoyance. Swift²⁴ provided a review of impacts (specifically relating to airports), focussing on sleep disturbance and stress as pathways leading to poor cardiovascular health and the potential mis-attribution of certain conditions, e.g. obesity and diabetes, as confounding factors whereas these conditions themselves may have resulted from sleep disturbance.

Children are vulnerable to a range of health outcomes associated with environmental noise, including road traffic noise²⁵. This includes demonstrating annoyance responses to noise as well as stress along with increased levels of adrenaline and noradrenaline. Though noise does not cause more serious mental health problems, there is growing evidence for an association with increased hyperactivity symptoms. Increased levels of noise have been associated with changes in cardiovascular functioning, as well as an effect on low birth weight^{26 27}. Clear evidence exists on the links between the effect of school noise exposure on children's cognitive skills such as reading and memory^{28 29 30}, as well as test scores^{31 32}.

Long term noise exposure is believed to have an influence on psychological health, although, with the exception of annoyance, there is not as strong a link as for other health outcomes.

²² Jacobs (2014) Noise: Local Assessment: Prepared for the Airports Commission

²³ WHO (2011) Burden of disease from environmental noise.

²⁴ Hales Swift, Purdue University (2010) A Review of the Literature Related to Potential Health Effects of Aircraft Noise.

²⁵ Van Kamp I, Davies H (2013) Noise and health in vulnerable groups: a review.

²⁶ Ristovska G, Laszlo HE, Hansell AL (2014) Reproductive outcomes associated with noise exposure – a systematic review of the literature.

²⁷ Hohmann C, Grabenhenrich L, De Kluizenaar Y, et al. (2013) Health effects of chronic noise exposure in pregnancy and childhood: a systematic review initiated by ENRIECO.

²⁸ Evans GW, Hygge S, Bullinger M (1995) Chronic noise and psychological stress.

²⁹ Evans GW, Bullinger M, Hygge S (1998) Chronic noise exposure and physiological response: a prospective study of children living under environmental stress.

³⁰ Hygge S, Evans GW, Bullinger M (2002) A prospective study of some effects of aircraft noise on cognitive performance in schoolchildren.

³¹ Stansfeld S, Clark C (2015) Health Effects of Noise Exposure in Children.

³² Kuh D, Ben-Shlomo Y (2004) A life course approach to chronic disease epidemiology.

Studies from adults suggest that repeated elevation of blood pressure in relation to noise exposure might have pathological effects on health in the long term³³.

Baseline

The noise effects of motorised traffic are particularly acute in the more urban areas of Gloucestershire. The Cotswolds, Wye Valley and Malvern Hills Areas of Outstanding Natural Beauty (AONB), which all lie within or part within Gloucestershire, are considered to be areas of tranquillity which will be affected by traffic in some places where they lie close to the larger urban areas of Gloucestershire (Cirencester, Stroud, Gloucester). In addition to noise resulting from road transport, other sources in the region include the major train stations of Gloucester and Cheltenham Spa.

There are a number of Noise Important Areas (NIAs) within Gloucestershire mainly along parts of the M5, M50 and 'A' roads within urban centres³⁴. These are the locations where noise levels are significantly higher than the national average.

Assessment

Transport policies and associated transport proposals which promote a shift to active travel modes such as walking and cycling (P31, P30, P44, P46, P48, P55) are likely to lead to a reduction in road transport generated noise. However, new sources of road transport noise is likely to occur as a consequence of promoting public transport improvements and use of new road transport links. However, the protection and improvement of the environment (P28) and the promotion and uptake of low emission vehicles (P31, P32, P34, P35) will go towards mitigating against increases in traffic noise.

Transport policies and associated proposals involving additional rail movements (Policies P1, P2 and P22) and new road links (Policy P4) are at risk of increasing adverse noise impacts upon sensitive receptors. Such impacts would be detrimental to health and permanent, though potentially abated through noise barriers, bunding, reduced speeds limits and renewal of carriageways where needed. There should be a commitment to work with the affected receptors to identify where appropriate such mitigation measures.

Policies P11 and P23 relate to freight movements in the area, Policy P11 highlights the need to work in partnership with freight operators to support the freight industry whilst Policy P23 focuses on inter-modal freight and the need to encourage the transfer of goods to non-highways means via rail and water. This may have some impact on reducing noise impacts on resident populations if freight is able to move to non-highway modes.

At this stage it is unclear what the overall impact the LTP will have on health outcomes as a consequence of transport related noise effects. Any health outcomes as a consequence of noise effects can only be reliably assessed on a local scale, as noise impacts are entirely dependent on a final individual scheme design. However, there are transport policies that are potentially adverse for health outcomes as a consequence of vulnerable receptors being exposed to new transport source noise, and the additional population likely to be affected. This will result in a **medium-term moderate adverse health outcome**, though this is likely to be temporary in nature due to likely improvements in technology such as the increased use of electric vehicles.

³³ Munzel T, Gori T, Babisch W, et al (2014) Cardiovascular effects of environmental noise exposure.

³⁴ England Noise and Air Quality Viewer. Available online at: <http://extrium.co.uk/noiseviewer.html> Accessed June 2026.

Physical activity

Evidence

Being physically active plays an essential role in ensuring health and wellbeing. It is known that physical activity benefits many parts of the body; the heart, skeletal muscles, bones, blood (for example cholesterol levels), the immune system and the nervous system. Exercise and physical activity can reduce some of the risk factors for non-communicable diseases (NCDs), including reducing blood pressure, improving blood cholesterol levels, and lowering body mass index (BMI)³⁵ (see Table 5-3).

Table 5-4 - Relationship between physical activity and health³⁶

Health indicator	Evidence of the effect of physical activity
Overall death rate	Approximately 30% risk reduction for the most active compared with the least active
Cardiovascular health	20% to 35% lower risk of cardiovascular disease, coronary heart disease and stroke
Metabolic health	30% to 40% lower risk of type 2 diabetes in at least moderately active people compared with those who are sedentary
SSMusculo-skeletal health	36% to 68% risk reduction of hip fracture at the highest level of physical activity
Falls	Older adults who participate in regular physical activity have an approximately 30% lower risk of falls
Cancer	Approximately 30% lower risk of colon cancer and 20% lower risk of breast cancer for adults participating in daily physical activity
Mental health	Approximately 20% to 30% lower risk for depression and dementia for adults participating in daily physical activity

Physical activity plays an important part in a number of diseases, such as type 2 diabetes, heart disease and some cancers. The WHO estimates that physical inactivity is the fourth leading risk factor for global mortality³⁷ and physical inactivity is responsible for 6% of deaths globally – around 3.2 million deaths per year, including 2.6 million in low and middle-income countries, and 670,000

³⁶ GOV.UK (2011) Start active, stay active: report on physical activity in the UK (updated 2016)

³⁷ WHO (2010) Global Recommendations on Physical Activity for Health

of these deaths are premature. Symptoms of depression in adolescents have also been linked to higher BMI and low levels of physical activity³⁸, particularly among young women³⁹.

It has been stated that the impact of physical inactivity on mortality could even rival tobacco use as a cause of death⁴⁰.

Walkable environments assist a population to achieve their physical activity targets, compared with less walkable area residents. Populations meet physical activity targets where safe places to walk exist within ten minutes of home. The presence or absence of walkable streets is related to longevity, even after adjustment for demographic and socioeconomic factors and baseline health status⁴¹.

Switching journeys from cars to walking, cycling and public transport not only has a large beneficial impact on the individual's health, but a wider benefit to the population health as there are corresponding decreases in overall air pollution levels.

Increasing levels of cycling and walking can reduce the risk of diseases such as cardiovascular disease, diabetes and dementia. Those that are most inactive will benefit the most.

Countries with the highest levels of active travel generally have the lowest obesity rates.

Baseline

As shown above in Table 4-1, the proportion of adults who are physically active in each region is slightly or significantly higher than the England average.

Table 5-4 shows proportions of adults undertaking varying levels of activity in the South West compared to the England average. The South West is statistically similar to the England average for observed activity levels.

Table 5-4 Proportion of adult's activity levels

Observed Activity Level	England (%)	South West (%)
Meets aerobic guidelines	64	64
Some activity	11	9
Low activity	4	5
Inactive	21	22

Assessment

The greater promotion of active travel modes, along with improved connectivity of transportation within the region, within the transport proposals, could lead to an increase in physical activity.

³⁸ Hill AJ, Draper E, Stack J (1994) A weight on children's minds: body shape dissatisfactions at 9-years old.

³⁹ Ball K, Burton NW, Brown WJ (2009) A prospective study of overweight, physical activity, and depressive symptoms in young women.

⁴⁰ Lee I-M et al (2012) Effect of physical activity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy'.

⁴¹ Takano T, Nakamura H, Watanabe N (2002) Urban residential environments and senior citizens' longevity in megacity areas: the importance of walkable green spaces.

While physical activity levels are high amongst the current population, the proportion of activity within the population is likely to increase as a result of more people gaining access to additional public or active transport options (including those living in more rural locations).

The transport objectives and associated proposals promoting active travel (O10, O11, and O14) and those that promote improvements to public transport and improved connectivity of transportation (O1, O2, O3, O4, O5, O7, O8, O11, and O13) within the region, could lead to an increase in physical activity amongst the region's population.

As summarised in the evidence section, where a population experiences an increase in physical activity and exercise, it can have a benefit to both mental and physical health.

The transport policies and associated proposals within the draft LTP are likely to have a **long term major beneficial permanent impact** on health outcomes due to the health benefits as a consequence of schemes containing both walking and cycling initiatives, both of which GCC is strongly committed to supporting in the region.

Road Safety

Evidence

Traffic collision casualty rates tend to decline as public transit travel increases in an area. Residents of public transport-oriented communities have only about a quarter of the per capita traffic fatality rate as residents of sprawled, private car-dependent communities⁴².

British roads are now among the safest in the world, but cyclists and pedestrians remain particularly vulnerable road users. Aside from the effect that casualties have on individuals and their families, pedestrian and cyclist casualties are a significant burden on local health services. Furthermore, safety concerns are often cited as a reason why people do not cycle or, for example, allow children to walk to school, meaning that they are missing the opportunity to do more physical activity and improve their health⁴³.

Whether children actively commute to school may be determined by parents' perception of safety of the mode of transport, lack of time in the morning and social factors such as no other children to walk with⁴⁴.

One of the most common causes of death for children aged 5-14 years is being hit by a vehicle, and 35% of all pedestrian fatalities are people over the age of 70⁴⁵.

Baseline

As shown in Table 5-5 below, the proportion of people killed and seriously injured (KSI) on England's roads (per 100,000) is significantly better than the England average, however worse than the South West value.

⁴² Victoria Transport Policy Institute (2020) Evaluating Public Transportation Health Benefits.

⁴³ Cambridgeshire County Council (2015) Transport and Health JSNA – Active Travel.

⁴⁴ Salmon J, Salmon L, Crawford D, Hume C, Timperio A (2007) Associations Among Individual, Social and Environmental Barriers and Children's Walking or Cycling to School.

⁴⁵ Sustainable Development Commissions (2011) Fairness in a Car Dependant Society

Table 5-5 Killed and seriously injured casualties on England's roads (2024)⁴⁶

Gloucestershire Value	South West Value	England Value
71.0	65.3	89.8

Gloucestershire's road safety needs assessment outlines road traffic collision (RTC) data and shows there has been a steady increase in the rate of total casualties for RTCs, however the rate of fatalities for RTCs has remained steady. The report also details the proportion of casualties representing different road user types in Gloucester and Cotswold. In Gloucester, the most prominent types of KSI road users were pedestrians (23.2%) and pedal cyclists (23.2%). In Cotswold, the most prominent types of KSI road users were car drivers (40.7%) and vehicle passengers (22.5%).

Assessment

Improving road safety for all users, through provision of safe and appropriate driver facilities (O9), and improvement to cycle routes (O10) and people-centred streets (O11), will have **long-term major beneficial permanent impacts** on health outcomes in terms of road safety.

There is an assumption that any improvements to the wider road network (O1) will also lead to improvements to road safety through design.

Economy and Employment

Evidence

In general, motorised road transport better serves those who are already more advantaged, with the richest 10% of the population receiving almost four times as much public spending on their transport needs as the poorest 10%, due to their overall higher level of travelling and greater use of cars and trains instead of buses⁴⁷.

Residents in deprived communities tend to travel less, but feel the impacts from travel, such as poorer air quality, higher noise levels and higher collision rates, due to having a higher density of main roads in their area⁴⁸. People experiencing higher levels of deprivation, particularly income deprivation, are also more likely to rely on the bus network as their primary mode of transport⁴⁹.

Employment is an important determinant of health; having a job or an occupation provides a vital link between an individual and society and enables people to contribute to society and achieve personal fulfilment^{50,51}.

The WHO identifies a number of ways in which employment benefits mental health⁵². These include the provision of structure time, social contact and satisfaction arising from involvement in a

⁴⁶ Public Health England (2025) Local Authority Profiles

⁴⁷ Sustainable Development Commissions (2011) Fairness in a Car Dependant Society.

⁴⁸ Faculty of Public Health (2024) Faculty of Public Health Transport Special Interest Group: Policy Brief.

⁴⁹ NatCen Social Research, 2019. Transport and inequality: An evidence review for the Department for Transport. Available online at: https://assets.publishing.service.gov.uk/media/60080f728fa8f50d8f210fbe/Transport_and_inequality_report_document.pdf

⁵⁰ Doyle C, Kavanagh P, Metcalfe O, Lavin T (2005) Health Impacts of Employment: A Review.

⁵¹ Sustainable Development Commissions (2011) Fairness in a Car Dependant Society.

⁵² WHO (2025) Mental Health Fact Sheet

collective effort. Therefore, the loss of a job or the threat of losing a job is considered detrimental to health⁵³.

Income is a key factor through which employment status affects health and wellbeing. The Department of Work and Pensions study found that:

“employment is generally the most important means of obtaining adequate economic resources, which are essential for material well-being and full participation in today’s society ... employment and socio-economic status are the main drivers of social gradients in physical and mental health and mortality”⁵⁴.

Children, particularly from low-income families, are more sensitive than adults to air pollution, noise and other environmental factors. Pregnant women in poverty and deprivation can lead to adverse health effects on unborn babies⁵⁵.

The Marmot Review was commissioned by the Department of Health to look into health inequalities in England. The Review identifies six policy objectives for reducing health inequalities, one of which is to ‘Create fair employment and good work for all’. The Review identifies the importance of work for health: ‘being in good employment is protective of health. Conversely, unemployment contributes to poor health’⁵⁶.

The London Health Commission’s report Health in London: Review of the London Health Strategy High Level Indicators describes unemployment as: ‘a significant risk factor for poor physical and mental health and a major determinant of health inequalities. It is associated with morbidity, injuries and premature mortality, especially through increased risk of coronary heart disease. It is also related to depression, anxiety, self-harm and suicide’⁵⁷.

The type of job a person has and the working conditions he or she is exposed to will also affect health. It is also important to consider the impact that employment has on other aspects of people’s lives that are important for health – for example, family life, social life and caring responsibilities for family members.

Baseline

As shown in Table 5-6, the level of unemployment in all six districts is below the England average, with Cotswold and Stroud showing the lowest rates. The percentage of the population who are economically inactive is largely similar to the England average, however, is slightly higher in Forest of Dean, and slightly lower in Gloucester.

In terms of employment by occupation, Cheltenham, Cotswold, Stroud and Tewkesbury had a greater proportion of the population employed as Managers and Professionals than the England average. Correspondingly, Forest of Dean and Gloucester had a greater proportion of the population employed in Plant and Machine Operatives, and Elementary Occupations than the England average.

⁵³ Marmot M, Wilkinson R (2003) The solid facts Geneva: World Health Organisation

⁵⁴ Waddell G, Burton A. K (2007) Is work good for your health and well-being?.

⁵⁵ Xu X, Sharma R, Talbott E (2011) PM₁₀ air pollution exposure during pregnancy and term low birth weight in Allegheny County, PA.

⁵⁶ Marmot M, Allen J, Goldblatt P, Boyce T, McNeish D, Grady M, Geddes I (2010) Fair society, healthy lives: Strategic review of health inequalities in England post-2010, The Marmot Review.

⁵⁷ Greater London Authority (2005) Health in London: Review of the London Health Strategy High Level Indicators, London Health Commission.

Table 5-6 Employment across GCC

Region	Economically active: unemployed (%)	Economically inactive populations (%)	Managers and Professionals (Soc 2010 Major Group 1-3) (%)	Administrative and Skilled Trades (Soc 2010 Major Group 4-5) (%)	Caring, Leisure, Sales and Customer service (Soc 2010 Major Group 6-7) (%)	Plant & Machine Operatives and Elementary Occupations (Soc 2010 Major Group 8-9) (%)
England	2.9	39.1	46.5	19.5	16.8	17.4
Cheltenham	2.2	37.1	51.2	19.9	15.1	13.7
Cotswold	1.8	40.2	51.6	20.9	14.6	12.9
Forest of Dean	2.1	42.8	40.6	24.0	17.6	17.9
Gloucester	2.5	35.5	38.2	21.9	20.2	19.7
Stroud	1.8	38.1	49.7	21.3	14.9	14.2
Tewkesbury	1.9	37.7	48.6	22.5	15.1	13.7

Assessment

Enabling goods and services to move freely around the region as a result of network improvements (O1, O3, O4, and O9) should contribute to the strength of the local economy, and in turn provide employment opportunities in the region.

Improving the ability of people to move around the region by road, public transport and other methods (O1, O2, O3, O4, O5, O8, O9, O11, O12, O13, and O14), will not only assist existing residents (particularly those without access to a car) to access employment and training opportunities, but also support the regions tourism industry. In particular, policies relating to the improvement of local bus services (P6), Bus Rapid Transit (P8), bus priority and punctuality measures (P13 and P14), demand management (P15), integrated ticketing (P20), transport interchange hubs (P21), network resilience (P19) and reducing transport poverty through reliable travel options (P53) are likely to improve the reliability and attractiveness of public transport. More reliable and predictable journey times can expand the range of employment opportunities that are realistically accessible by public transport, enabling people to access a wider labour market, particularly amongst lower-income groups and those without access to a private vehicle.

It is anticipated that the LTP will have a long-term moderate beneficial permanent impact on health outcomes in terms of economy and employment, particularly for those on low incomes, or unemployed. Although not under the responsibility or control of GCC, improved transport networks should help economic stability and growth within the region by enhancing competitiveness, improving connectivity, and providing greater resilience across the transport network.

Access and accessibility

Evidence

Transportation and access are known to promote social inclusion, as social exclusion can occur as a result of a community not being able to easily access transport options, amongst other things.

The Social Exclusion Unit states that ‘participation in social, cultural and leisure activities is very important to people’s quality of life and can play a major part in meeting policy goals like improving health, reducing crime and building cohesive communities’. Problems with transport and the location and delivery of services contribute to social exclusion by preventing people from participating in work or learning and from accessing healthcare, food shopping and other local activities. People in deprived communities also suffer the worst effects of road traffic through pollution and pedestrian accidents⁵⁸.

According to the Department for Transport, ‘over the course of a year over 1.4 million people miss, turn down or simply choose not to seek healthcare because of transport problems’⁵⁸. Capacity to reach healthcare services is affected by the accessibility of transport modes, availability of financial support for those on low incomes and the location of healthcare services⁵⁹. Groups impacted by disability and of certain ages may experience even greater barriers to health and social care services⁶⁰.

Community severance is separation of different areas within a community by the flow of traffic⁶¹. Social networks are susceptible to severance by physical barriers, such as roads and traffic, which can create both real and perceived barriers to social contact. For example, children may not be allowed to visit friends unaccompanied because of parental concern over RTCs.

A study illustrating the effect of traffic on social contacts in three streets was performed in San Francisco⁶². It was found that people living on the street with lightest traffic had twice as many acquaintances and three times as many friends as those people who lived on the street with the heaviest traffic.

Social capital was measured across different neighbourhoods and it was found that people in “car-dependent” localities were less likely to know and trust their neighbours and to participate in local organisations than people who lived in “walkable”, pedestrian orientated localities with less traffic and congestion⁶³.

A similar study in Bristol also demonstrated that the volume and speed of motorised traffic can reduce opportunities for positive interactions between residents in a neighbourhood and can contribute to increased social isolation⁶⁴.

⁵⁸ Social Exclusion Unit (2003) Making the connections: Final report of Transport and Social Exclusion.

⁵⁹ Randall C (2012) Measuring National Well-being – Where we Live

⁶⁰ Hamer L (2004) Improving patient access to health services: a national review and case studies of current approaches.

⁶¹ McCarthy M (1999) Transport and Health In: Marmot M, Wilkinson RG Social determinants of health.

⁶² Appleyard D, Lintell M (1972) The environmental quality of city streets: the resident’s viewpoint. Am Instit Planners J.

⁶³ Leyden KM (2003) Social capital and the built environment: the importance of walkable neighbourhoods. Am J Public Health.

⁶⁴ Hart, J & Parkhursts, G (2011) Driven to excess: Impacts of motor vehicles on the quality of life of residents of three streets in Bristol UK. World Transport Policy & Practice, 17 (2). Pp 12-30.

Baseline

The proportion of people who travelled to work by car (either driving or as a passenger) and by public transport in the six districts is shown in Table 5-7. The rates of drivers/passengers in a car or van are significantly higher than the England average in Forest of Dean, as in many rural communities, accessibility of jobs by public transport, cycling or walking is relatively low.

Table 5-7 Method of Travel to Work (%)⁶⁵

Method of travel	England (%)	Cheltenham (%)	Cotswold (%)	Forest of Dean (%)	Gloucester (%)	Stroud (%)	Tewkesbury (%)
Work mainly at or from home	31.5	36.7	39.1	28.1	24.2	35.0	33.4
Underground, metro, light rail, tram	1.9	0.0	0.1	0.0	0.0	0.0	0.0
Train	2.0	0.4	0.4	0.2	0.3	0.3	0.2
Bus, minibus or coach	4.3	2.9	0.5	1.2	4.2	1.1	2.2
Taxi	0.7	0.2	0.1	0.1	0.3	0.1	0.1
Motorcycle, scooter or moped	0.5	0.4	0.3	0.5	0.6	0.5	0.4
Driving or passenger in a car or van	48.4	42.1	48.7	62.6	57.1	54.7	55.3
Bicycle	2.1	4.0	1.2	0.7	3.3	1.4	2.3
On foot	7.6	12.4	8.7	5.7	9.0	6.1	5.4
Other method of travel to work	1.0	0.8	0.9	0.9	0.7	0.8	0.7

The distance travelled to work data highlights differences between rural and urban communities across GCC. Forest of Dean has the highest rate of people working mainly offshore, or in no fixed place, and of the distances travelled, has the highest rate of people travelling the furthest (6.6% of people travelling 10 - 20km). Cheltenham has the lowest rate of people working mainly offshore, or in no fixed place, and of the distances travelled, has the highest rate of people travelling the

⁶⁵ Office for National Statistics (2011) 2021 Census Profile for areas in England and Wales

shortest distance (8.4% of people travelling under 2km). The other districts fall between these values and follow similar trends for rural and urban communities.

Table 5-8 Distance travelled to work (%)⁶⁶

Distance travelled to work	England (%)	Cheltenham (%)	Cotswold (%)	Forest of Dean (%)	Gloucester (%)	Stroud (%)	Tewkesbury (%)
Does not apply	53.3	50.2	51.5	54.0	50.4	50.5	51.0
Less than 2km	5.1	8.4	5.2	4.3	7.9	4.7	4.5
2km to less than 5km	5.9	7.6	2.1	2.8	9.1	4.4	4.9
5km to less than 10km	5.5	2.8	3.3	4.5	5.7	5.6	7.3
10km to less than 20km	4.9	3.2	5.1	6.6	4.8	5.8	5.9
20km to less than 30km	1.9	1.4	3.4	3.9	0.9	2.3	1.6
30km to less than 40km	0.8	0.6	1.6	1.5	0.4	1.1	0.6
40km to less than 60km	0.6	0.6	0.9	0.7	0.9	0.5	0.8
60km and over	0.6	0.8	1.0	0.7	0.7	0.6	0.8
Works mainly from home	14.7	18.3	19.0	13.0	12.0	17.3	16.4
No fixed place or outside of the UK	6.8	6.1	7.0	8.0	7.2	7.2	6.4

⁶⁶ Office for National Statistics (2021) Census distance travelled to work datasets.

Assessment

Improved public transport provision and a wider range of transport options (O1, O2, O3, O4, O5, O8, O9, O11, O12, O13, and O14), and better connectivity between modes – particularly for those with reduced mobility – will enhance access to local facilities, including employment, education, and healthcare. Those without access to a car are likely to see the greatest benefit, particularly if they live more rurally and are at greater risk of isolation.

It is anticipated that the draft LTP will have a **long-term major beneficial permanent impact** on health outcomes in terms of access and accessibility for all population groups. A more resilient transport network should lead to improved and more reliable journeys, particularly for freight and commercial transport, but also for the local population, especially those with access to cars.

6. Conclusions

Summary

A summary of health impacts anticipated to arise from the LTP has been brought together in Table 6-1.

Table 6-1 Summary of GCC LTP Health Impacts

	Children & Young People	Older People	People with Disabilities	People with existing health conditions	Unemployed and low-income groups	Socially excluded or isolated groups	Commentary
Air Quality	L+++ P	L+++ P	L+++ P	L+++ P	L+++ P	L+++ P	Major beneficial health outcome for urban population as more likely to benefit from model shift to active travel, and specific policy to identify improvement opportunities.
	M-- P	M-- P	M-- P	M-- P	M-- P	M-- P	Moderate adverse health outcome for population in close proximity to strategic road network due to health effects from degradation in air quality.

Noise	M-- T	M-- T	M-- T	M-- T	M-- T	M-- T	Moderate adverse health outcomes from improvements to the road network and public transport. Likely to be a consequence of road derived noise effects. Longer term improvements in technology could see a reduction in noise impacts.
Physical Activity	L+++ P	L+++ P	L+++ P	L+++ P	L+++ P	L+++ P	Major beneficial health outcomes for urban population, as a result of increased levels of physical activity from active travel opportunities.
Road Safety	L+++ P	L+++ P	L+++ P	L+++ P	L+++ P	L+++ P	Major beneficial health outcome as a result of targeted specific policy to reduce road user casualties.
Economy and Employment	L++ P	Neutral	L++ P	L++ P	L++ P	L++ P	Moderate long term beneficial health outcome as a result of enhanced competitiveness and connectivity of the region, and potential

							employment opportunities resulting from a strong local economy
Access and Accessibility	L+++ P	L+++ P	L+++ P	L+++ P	L+++ P	L+++ P	Major beneficial impact across all populations with improvements to transport networks and a wider variety of travel options available to suit different needs.

DRAFT

Limitations

Many of the policies proposed within the LTP have a degree of uncertainty attached to them which means their assessment has been limited to a strategic level. Details relating to the specific planned activities or actions, timescales of implementation, location or funding of the proposed policies are not available at this time. Specific schemes are subject to the relevant consenting processes, as well as environmental legislation, such as an Environmental Impact Assessment, which will take into account individual scheme impacts upon Population and Human Health, proposing scheme-specific mitigations where adverse impacts arise.

Conclusions

The single greatest potential health outcome of the draft LTP has been assessed as the indirect health benefits from improved access to, and accessibility of, transport options. These benefits have been assessed as being of long-term, permanent, major benefit for all groups in the population.

In addition, the draft LTP has been assessed as providing indirect health benefits as a consequence of improving air quality in urban areas, encouraging greater physical activity through active travel, and providing economic and employment benefits in the districts.

In contrast to the beneficial impacts above, the LTP has been assessed as potentially contributing to adverse health outcomes as a consequence of potential noise impacts. Moderate adverse health outcomes were predicted as a result of the potential for increased transport-related noise arising from certain road and public transport improvements. Although the LTP is expected to deliver wider transport benefits, some schemes may increase noise exposure for nearby communities. These potential adverse effects would be scheme and location specific and the implementation of mitigation measures are likely to reduce their impact. These adverse health effects associated with noise are considered temporary, as improvements might be made through technological development.