Appendix D

<u>Health Impact Assessment</u>

<u>Leicestershire Highway Design Guide</u>

<u>2024</u>

Health Impact Assessment on the Leicestershire's Highway Design Guide 2024

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This document will delve into the health impact considerations concerning Leicestershire's Highway Design Guide (LHDG). It will present evidence and commentary on local population health in relation to the LHDG and the potential impacts on the health of Leicestershire residents.

Leicestershire's transport system enables people, materials and goods to move around for economic, social and leisure purposes, via personal or public travel options. It is important that health and wellbeing have been considered as part of the transport and highways system to ensure that all travel movements are safe, factor in accessibility and do not exacerbate inequalities or poor health.

1. Leicestershire's Highway Design Guide

Leicestershire County Council (LCC) as the Local Highway Authority (LHA) has a duty of care to maintain the safety and functionality of all publicly maintained highways in Leicestershire, with the exception of the M1, M6, M42, M62 motorways, and the A1, A5, A42, A46 and A50 west of M1 Junction 24 which are the responsibility of National Highways.

The LHDG provides guidance regarding highways infrastructure for new developments in areas for which LCC is the LHA. The principal intention of having the LHDG is to have a consistent approach to highways development across Leicestershire. The LHDG provides the basis for which LCC provides its observations on the highway aspects of planning applications to the district councils as local planning authority. The LHDG applies to all developers, including LCC itself.

The LHDG requires an update to ensure it accords with changes to national policy and guidance. A full refresh project is now underway with an expectation that new guidance will place a greater emphasis on healthy, sustainable highway environments.

2. What is a Health Impact Assessment?

A Health Impact Assessment (HIA) can be described as:

"A practical method used to assess the potential health effects of a policy, program, or project on a population, particularly vulnerable or disadvantaged groups. Recommendations are formulated for decision-makers and stakeholders, with the aim of maximising positive health impacts and minimising negative ones." (WHO, 2021)

HIAs are systematic and unbiased, considering how the impacts of a policy, program, or project may be distributed across the population, affecting potential and existing health inequalities.

The evidence-based recommendations can serve as decision-making aids to foster healthy environments and truly prioritise people in decision-making processes.

Furthermore, HIAs can uncover opportunities for mutual benefits among various stakeholders. For instance, recommendations may influence the location and quality of housing, enhance active travel infrastructure, reduce air pollution, and improve access to services. Outcomes can extend beyond mere health impacts and reductions in health inequality, making this tool a means of capturing broader benefits.

The Public Health Department (PH) at Leicestershire County Council (LCC) is committed to ensuring that health, and health equity considerations are integrated into all policies, programmes and infrastructure projects, acknowledging the potential impact said work has on the wider determinants of health.

3.   The Wider Determinants of Health

The wider determinants of health encompass a broad spectrum of interconnected social, economic, and environmental elements that influence health and well-being. These factors affect individuals' abilities to meet their needs, identify and achieve objectives, and adapt to changes in their circumstances (OHID, 2021), all of which contribute to health disparities.
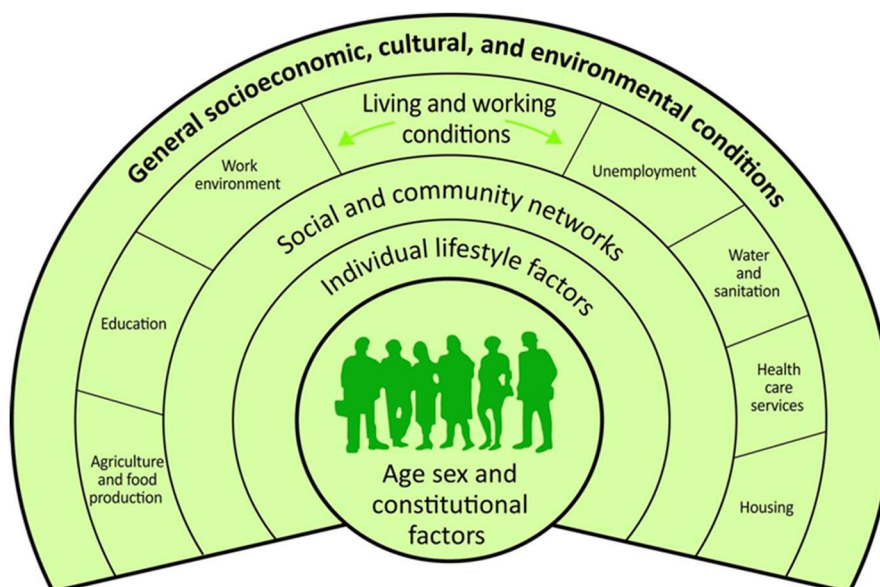

Figure 1: Dahlgren and Whitehead model of health determinants (1991)

Dahlgren and Whitehead devised a clear and informative visual representation illustrating the broader determinants of health and their impacts on the health and well-being of populations, with the individual positioned at the core of these various layers of determinants. These areas inform considerations within this HIA, due to its wide reach into communities and how they are structured through highway design.

The Marmot Review (2010) highlighted the significant role of broader determinants of health by "emphasising the robust and enduring connection between social disparities and variations in health outcomes" (OHID, 2021). Marmot (2010) advocates for comprehensive action across all social determinants of health, involving governmental departments at both central and local levels, as well as the third and private sectors. Marmot revisited the issue of health equity in England in 2020, concluding that ten years later, health outcomes were deteriorating for individuals residing in more deprived districts and regions in England, with health inequalities on the rise and overall population health declining. These inequalities were identified as unjust and preventable.
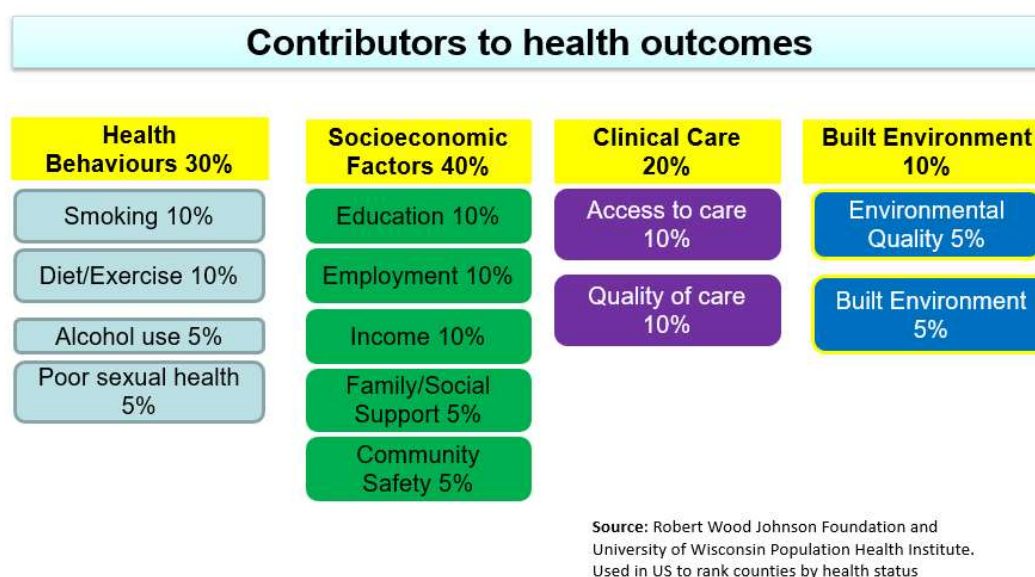
Figure 2: Robert Wood Johnson Foundation, contributors to health outcomes (LGA, 2016)

Figure 2 summarises the main contributors and influences on individuals' health outcomes. The highway design guide has the potential to influence across all four domains, hence consideration within this HIA is crucial for supporting healthier lifestyles. Health Outcomes aren't solely specific to access to NHS and clinical services, they are broader and nuanced across the life course and different population groups, with all factors needing careful consideration, so that we can prevent ill health at the earliest possible opportunity.

The following document has been prepared using the Leicestershire County Council Health Impact assessment template, which takes into consideration best practice when assessing health impacts of policy changes and developments.

4. Health Inequalities

Health inequalities are avoidable, unfair, and systemic differences in health between different groups of people. Health inequalities are pervasive, shaped by individuals' life experiences, the risks they encounter and the environments they inhabit, along with their access to services, social networks, family and community support.

Certain groups face disproportionately worse outcomes due to health inequalities. To address these disparities across our population, attention must be directed towards those with the poorest outcomes, thus improving their health experience. By doing so, we begin to narrow the gap between the healthiest and least healthy individuals.

Within Leicestershire there are certain groups which face higher risk of experiencing health inequality. These are covered within the Leicestershire Health Inequalities Joint Strategic Needs Assessment (JSNA) (https://www.lsr-online.org/uploads/health-inequalities-chapter.pdf?v=1687257011), thus will not be repeated in full here, however they include:

- People with a disability
- People who are homeless
- People with severe mental illness
- People living in poverty/deprivation
- Gypsy or Irish Travellers

When looking at health inequalities, the JSNA examined differences that exist in neighbourhoods. On a whole County scale, Leicestershire is a relatively healthy and wealthy neighbour to the City of Leicester. However, this masks wide variation at a neighbourhood level with some communities experiencing the best health outcomes and others the worst.

The neighbourhoods (middle layer super output areas) identified as high risk in terms of potential health inequalities are:

- **Charnwood**: Loughborough Lemyngton & Hastings, Storer and Queens Park, University, Shelthorpe & Woodthorpe, Syston West and Shepshed East
- **Harborough**: Market Harborough Central
- **Hinckley and Bosworth**: Barwell, Hinckley Central and Hinckley Clarendon Park
- **Melton**: Melton Mowbray West
- **North West Leicestershire**: Agar Nook, Coalville
- **Oadby and Wigston**: Wigston Town, South Wigston

Throughout this HIA inequalities will be discussed and how different aspects of health and highways impact on different groups. The LHDG has the potential to reduce and mitigate some areas of health inequalities and support the groups at greatest risk of experiencing them. Developers must have an appreciation of health inequalities and look at ways to minimise and mitigate against them.

5. Demographics of Leicestershire

This section will provide a brief overview of the demographics of the population of Leicestershire. Some sections are more pertinent to the LHDG and these have been discussed.

The sections provide a context for which the HIA has been built upon. The information is largely taken from the Leicestershire Joint Strategic Needs Assessment 2022 – 2025 (https://www.lsr-online.org/uploads/demography-2023.pdf?v=1699449913).

5.1 Population Overview

Leicestershire has a growing population, with numbers rising by 9.5% between 2011 and 2021 to a resident population of 712,300, with a slightly higher number of females (360,600) compared to males (351,700). Compared with England, the population of Leicestershire is older, with higher proportions of the population aged 40-64 (33% in the county compared with 32.1% in England) and 65 and over (20.7% compared with 18.4% for England). The population is projected to increase by 23.3% to 860,618 in 2043, which is notably different to the projected increase for the East Midlands (14.3%) and England (10.3%). The greatest projected increase is anticipated to be within the 65+ age group, with an extra 71,888 older adults, and there is a projected percentage increase of 113% in the 75-79 age band.

Leicestershire is comprised of seven districts, varying in their own demographics, each with an urban centre, and elements of rurality. In 2021 Charnwood had the largest population (183,971) of Leicestershire districts, followed by Hinckley and Bosworth (113,640). Melton has the smallest population (51,752). All districts have also seen population increases since 2011.

Figure 3 below summaries the population of Leicestershire, by age bands and gender.
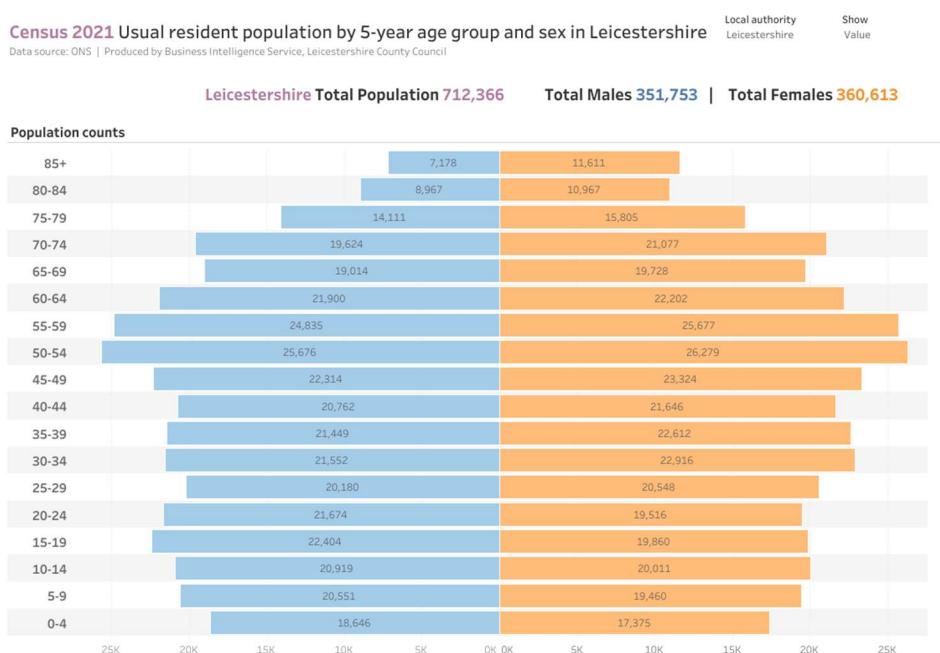

Figure 3 – Leicestershire population by 5-year age bands and gender

5.2 Population Distribution and Density

Charnwood is the most populous district in Leicestershire, with 183,971 residents, followed by Hinckley and Bosworth with 113,640. Melton has the smallest population, at 51,752. All

districts in Leicestershire experienced population growth between 2011 and 2021. Earl Shilton and Hinckley De Montfort wards have the highest populations, while Wymondham ward in Melton has the lowest. Population density varies significantly, with Loughborough Oxford Street having the highest density at over 12,800 people per km², and Greater Wymondham in Melton the lowest, at just 20 people per km². Figure 4 below demonstrates the population density across Leicestershire, as well as showing the rural nature of the County, with large areas having very low population density. Figure 5 further demonstrates this rurality of Leicestershire through output area classification.
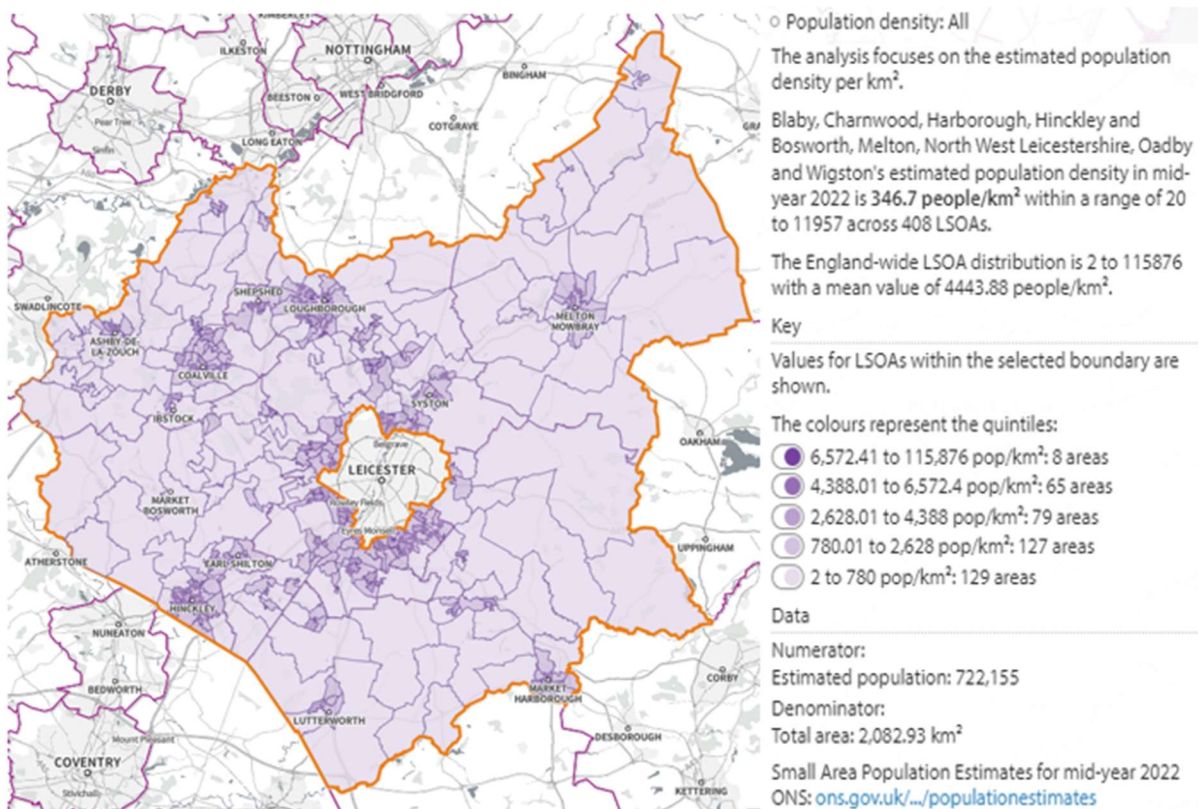
Figure 4 Population density across Leicestershire
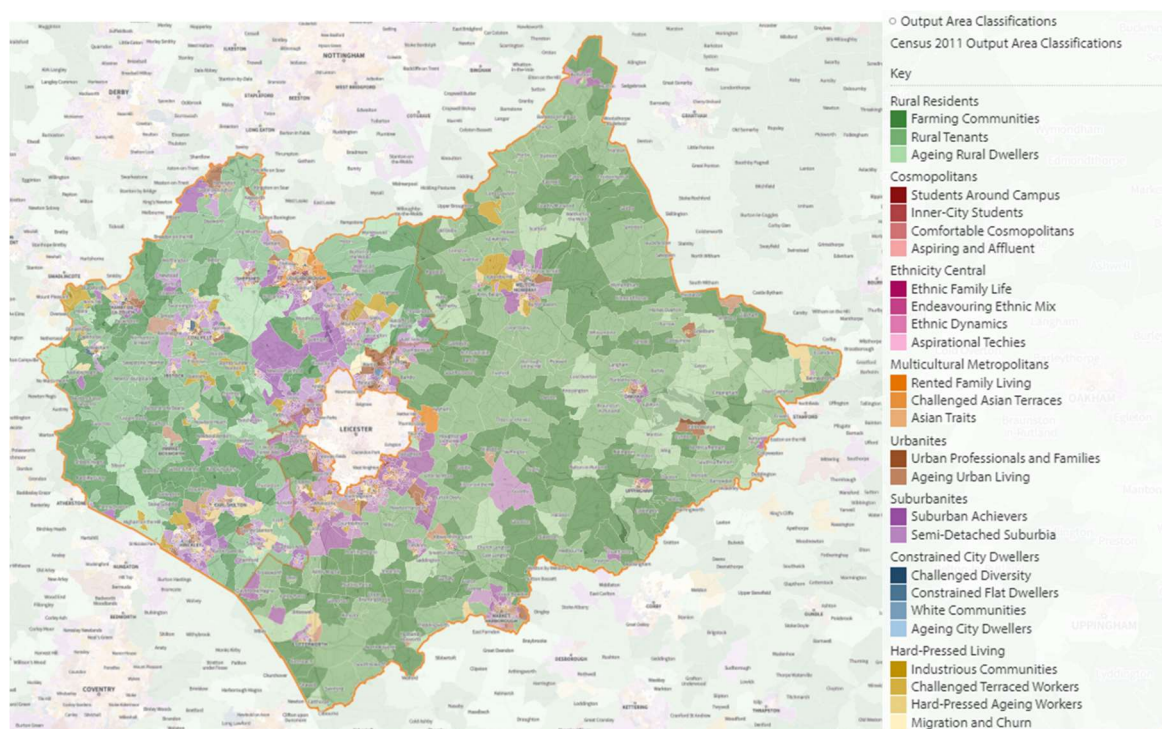
Figure 5 Output Area Classifications of Leicestershire

5.3 Projected Population Change (2018-2043)

Leicestershire's population is projected to grow by 23.3% to 860,618 by 2043, a higher increase than both the East Midlands and England (figure 6). The most significant growth is expected in the 65+ age group, which will see an additional 71,888 people, with the 75-79 age band experiencing the greatest actual and percentage increase. North West Leicestershire is projected to see the highest population growth at 34.4%. All districts except Melton and Oadby and Wigston are expected to grow faster than the regional and national averages (figure 7). Ensuring highways are built with consideration of the growing and changing demographics of the County is critical to ensure adequate, sustainable and accessible highway usage.
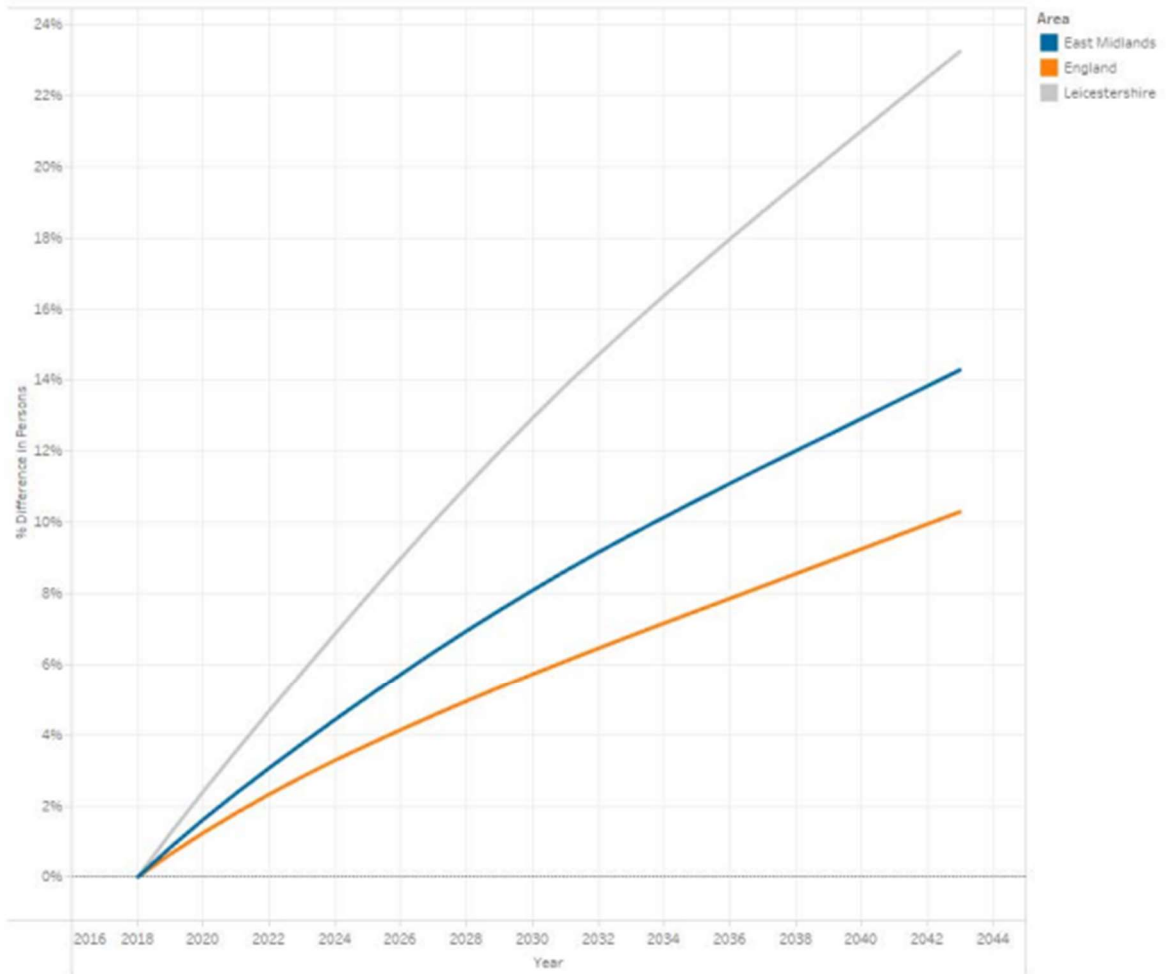
Source: 2018-based Subnational Population Projections, Office for National Statistics, 2020

Figure 6 Population Projection to 2043

Area	Year		Change	
	2018	2043	Persons	Percent
Blaby	100,421	129,291	28,870	28.8%
Charnwood	182,643	224,710	42,067	23.0%
Harborough	92,499	113,759	21,260	23.0%
Hinckley and Bosworth	112,423	139,637	27,214	24.2%
Melton	51,100	53,877	2,777	5.4%
North West Leicestershire	102,126	137,240	35,114	34.4%
Oadby and Wigston	57,056	62,104	5,048	8.9%
Leicestershire	**698,268**	**860,618**	**162,350**	**23.3%**
East Midlands	**4,804,149**	**5,490,799**	**686,650**	**14.3%**
England	**55,977,178**	**61,744,098**	**5,766,920**	**10.3%**

Source: 2018-based Subnational Population Projections, Office for National Statistics, 2020

Figure 7 Population Projection, Leicestershire Districts and Comparators, 2018 – 2043

5.4 Ethnicity, Religion, and Language

The majority of Leicestershire's population identifies as white (87.5%), with the Asian ethnic group making up 8.1% (figure 8). Christianity is the largest religion, followed by Hinduism, Islam, and Sikhism. A significant portion of the population (40.3%) reports having no religion. Most residents (95.2%) speak English as their main language, with Polish, Gujarati, Panjabi, and Romanian being the next most common languages.
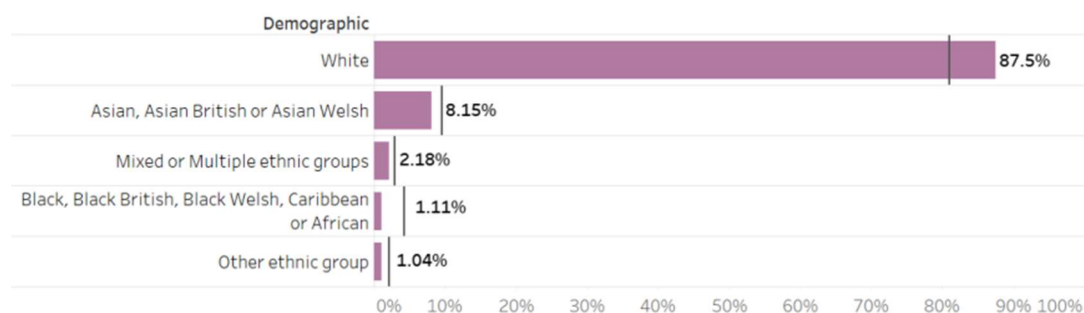
Source: 2021 Census, Office for National Statistics

Figure 8: Leicestershire Population by Ethnic Group, 2021

5.5 Gypsy and Traveller Population

Leicestershire has 61 recognised gypsy and traveller sites, with around 400 gypsy and traveller children enrolled in county schools. Education remains a challenge for this community, with few children continuing past Year 6. Health concerns, including diet, smoking, and mental health issues like depression, are prevalent. Many families also face challenges related to fuel poverty, housing, and benefits.

5.6 Deprivation

Leicestershire is among the least deprived counties in England, ranking 137th out of 152 upper-tier authorities. However, pockets of significant deprivation exist, particularly in Loughborough and Coalville. Overall, 57% of the population live in the least deprived areas.
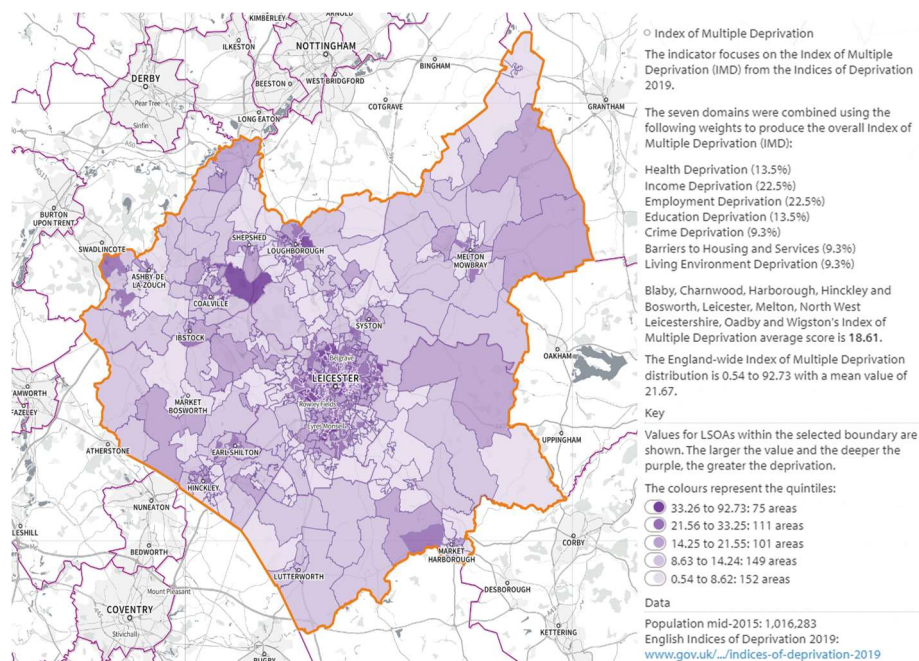
Figure 9: Index of Multiple Deprivation

5.7 Employment and NEETs

Leicestershire has a lower rate of economic inactivity than the national average, with a higher proportion of retirees and people in employment (figure 10) and fewer long-term sick individuals. The county also has one of the lowest NEET (Not in Education, Employment, or Training) rates in England. Good transport and road access is important to all people to travel around and across Leicestershire to access employment opportunities.
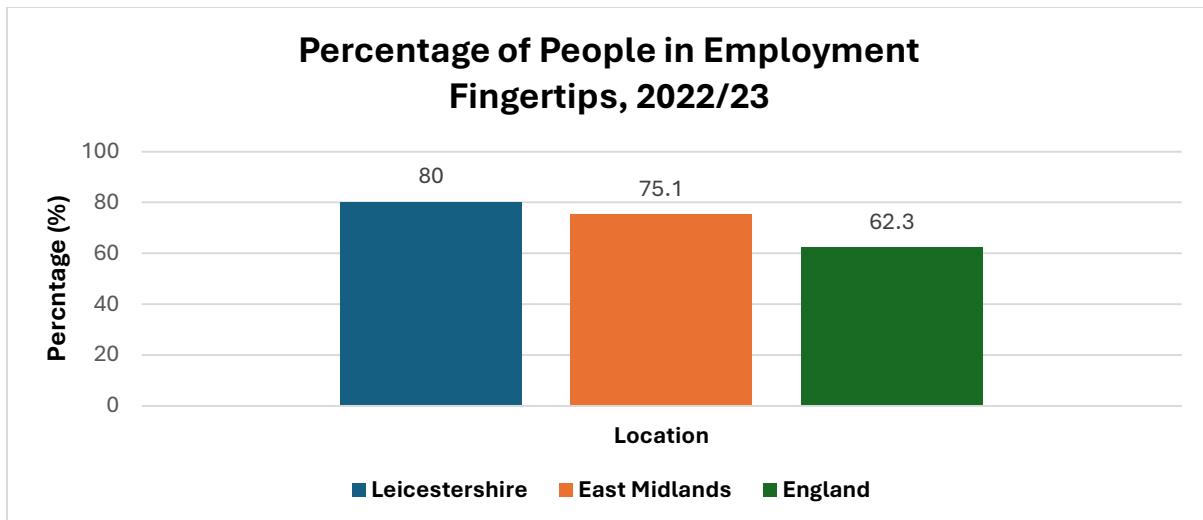
Figure 10 - People in employment (taken from Fingertips)

5.8 Travel to Work

Leicestershire workers are more likely to work from home and but also have longer commutes compared to other regions, with 23% of the County travelling over 10KM to work. Car travel is the most common mode of transport, with lower rates of public transport use and walking, possibly due to the rural nature of the county and accessibility issues in terms of walking and public transport access.

5.9 Business and Economic Overview

Manufacturing is the largest employment sector in Leicestershire, followed by professional, scientific, and technical sectors. The county saw significant growth in Transport and Storage during the pandemic. The majority of businesses in Leicestershire are small or micro-sized, and business survival rates are strong for three-year periods but lower for five-year periods. Good access on road and foot is important for economic prosperity, but also that as a largely rural County, ensuring considered highway design is important to support local businesses.

5.10 Qualifications

Leicestershire has a lower proportion of residents with Level 4 qualifications compared to national levels but higher than the regional average. The county outperforms both national and regional levels for qualifications at Levels 2 and 3.

6. Health Impacts of the LHDG

The following sections describe the potential health impacts of the LHDG, considerations and recommendations for each theme. They are themed upon the Health Impact Assessment approach that Leicestershire County Council has adopted. Considerations and themes are in no particular order and are of equal importance.

Each section will provide context and high-level insight into how the theme areas impacts on health locally where possible, and nationally where local information is not available. The impact of the LHDG will be discussed in relation to the theme, and then recommendations put forwards on how further work could be progressed to mitigate any potential issues or build upon current strengths and successes.
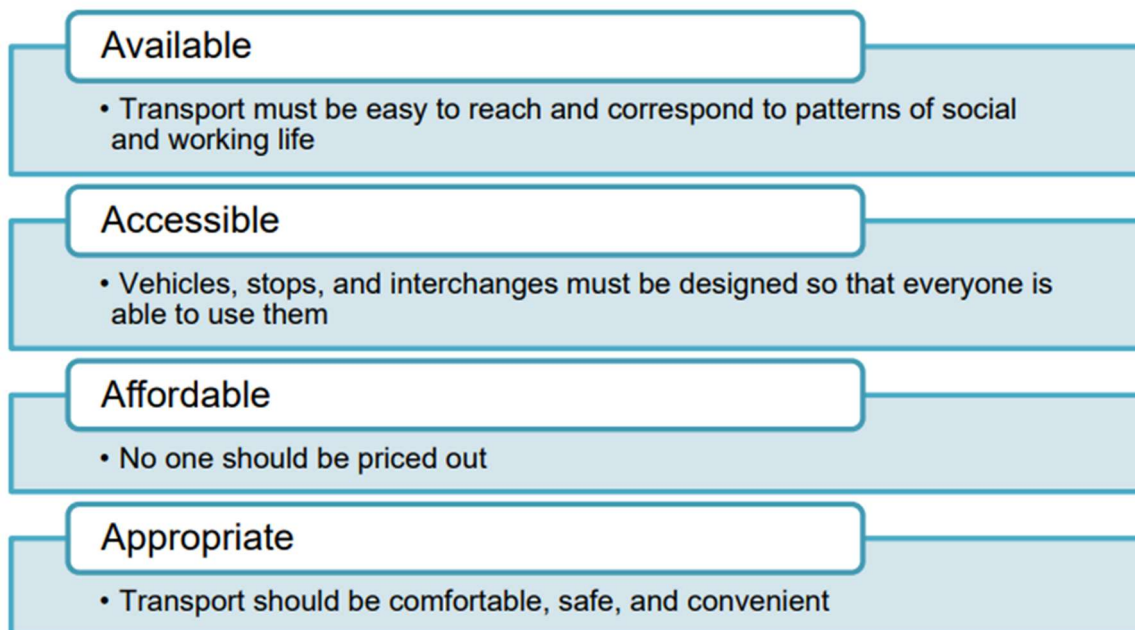
6.1 Social Cohesion and Community

Social Cohesion and Community considers how the LHDG can encourage social interactions in the community, helping to install a sense of neighbourliness and local pride in the area. It will look at how the proposal encourages community.

Description of Impact

The county is largely rural in nature, with the population count and density projected to increase above regional and national levels over the next 20 years. This will put pressure on housing developments, and access improvements will be required. It will be important to retain the sense of community within growing communities, which could pose challenging. Stronger community belonging is associated with better physical and mental health, across different ages, hence the key importance. Highways need to build and bring communities together, connecting residents, not causing community severance.

As described above, the county has a large proportion of people aged over 60 (higher than national average), with this figure projected to increase dramatically over the next 20 years. Many older people also live in more rural areas, have less access to immediate transport and may suffer rural isolation as a result.

Figure 11 below highlights the four main factors in which transport can promote social inclusion. This is closely linked to the transport section further below; however, the evidence argues that in order for public transport to promote social inclusion there are four key factors: it must be available, accessible, affordable, and appropriate. If transport does not meet these thresholds, then people can become stranded, and cut-off from their communities, making them vulnerable to social isolation. The evidence also explains that people without access to cars, those on lower incomes, those living in more deprived areas, those with disabilities, older and young people and those living in remote, rural areas are most at risk of being isolated due to transport.

Available
• Transport must be easy to reach and correspond to patterns of social and working life

Accessible
• Vehicles, stops, and interchanges must be designed so that everyone is able to use them

Affordable
• No one should be priced out

Appropriate
• Transport should be comfortable, safe, and convenient

Source: Authors, informed by pteg (2010)

Figure 11 – Four factors of how transport can support social inclusion

Loneliness and social isolation in older adults are serious public health risks. Older adults are at increased risk for loneliness and social isolation because they are more likely to face factors such as living alone, the loss of family or friends, chronic illness, and hearing loss. Rurality can compound these due to lack of transport and access to services, however conversely, rural communities can also support each other. Although measurability of social isolation and loneliness can be difficult, studies have demonstrated the health impacts including:

- Increased risk of premature death from all causes
- There are associations with dementia
- Increased risk of heart disease and stroke
- Higher rates of depression, anxiety and suicide

The revised LHDG has the potential to encourage social interactions by defining how new developments should consider issues of accessibility for all highway users through provision of highway infrastructure. A set of principles have been developed that set out how the LHDG will support the delivery of active travel and green infrastructure as part of high-quality transport infrastructure, creating attractive environments where people can spend time together, thus building up social cohesion and community. The LHDG has the potential to support developers to create highways and green space which residents can enjoy and be proud of, as well as feel safe to access. There is the potential for a general impact on social cohesion through engagement of the population with active travel modes of transport and environmental improvements that encourage experiencing the street scene away from their cars.

Principle 6 "Supporting Inclusive highway" sets out the LHDG's approach to community cohesion. The refreshed LHDG also has the potential to impact on accessibility for disability and age-related groups, ensuring social cohesion and community is considered for all residents. Principle 5 also accounts for active travel in rural areas, stating that the infrastructure must reflect the context of Leicestershire as significantly rural in areas.

Through engagement with the Leicestershire youth forum, CYCLe, their views were captured on the issues young people face when using the highway. In relation to social cohesion and community several issues were raised including the need for increased safety, in particular around speeding.

Recommendations

Through the HIA process the project has already identified several recommended amendments to guidance including:

- To emphasise the requirement for developers to provide high quality active travel opportunities with new development.
  - This is achieved through Principle 5 "Encouraging Active and Sustainable Travel" and new detailed guidance on the design and construction of active travel facilities. This will provide a range of affordable opportunities for people to travel.
- To facilitate the creation of attractive environments that are safe and feel safe by signposting to best practice national guidance and providing guidance on the provision of green infrastructure.

As part of the HIA, the following recommendations have been put forwards:

1. Encourage developers to consider social cohesion at the earliest stages of design. This should include the use of green infrastructure and modes of travel that increases the ability and willingness for communities to engage with the highway.
2. LHDG should highlight that developers need to understand the demographics of the community during the design process, particularly where facilities for older, younger and disabled people exist.
3. The LHDG references best practice national guidance relating to designing out crime. In future reviews of guidance, advancements in designs that reduce the opportunities and fear of crime in the highway environment should be considered.
4. LHDG Policy 1 states that Development must be accessible for all highway users and maximise the uptake of sustainable travel choices. In practice LCC would advise refusal of planning applications where there is a lack of sustainable travel choices, it is recommended that this practice continues.
5. Where upgrades are made to crossings due to a maintenance programme or developer contributions, consideration should be given to ensuring appropriate facilities are provided for communities.

6. Consideration should be given to the four key transport factors which influence social cohesion; available, accessible, affordable, and appropriate, and provide guidance on how developers can ensure these are factored into future highways planning.

6.2 Employment and the Economy

Health inequalities are driven by structural determinants – including the economic and environmental conditions in which people age and work. This section will therefore look at how the LHDG could contribute to the local economy. It will look at how the proposal could potentially reduce unemployment and increase economic activity, improve workplace conditions or offer access to gaining new skills.

Description of Impact

Leicestershire is largely rural in nature and has 11 Lower layer Super Output Areas (LSOAs) within the national 20% most deprived. These are largely located in pockets including Loughborough, Coalville, Hinckley and South Wigston. Income and employment deprivation are a key aspect in categorising areas by deprivation. Information on Index of Multiple Deprivation across Leicestershire at LSOA level can be seen in figure 12. The deeper the purple, the more deprived an area is.
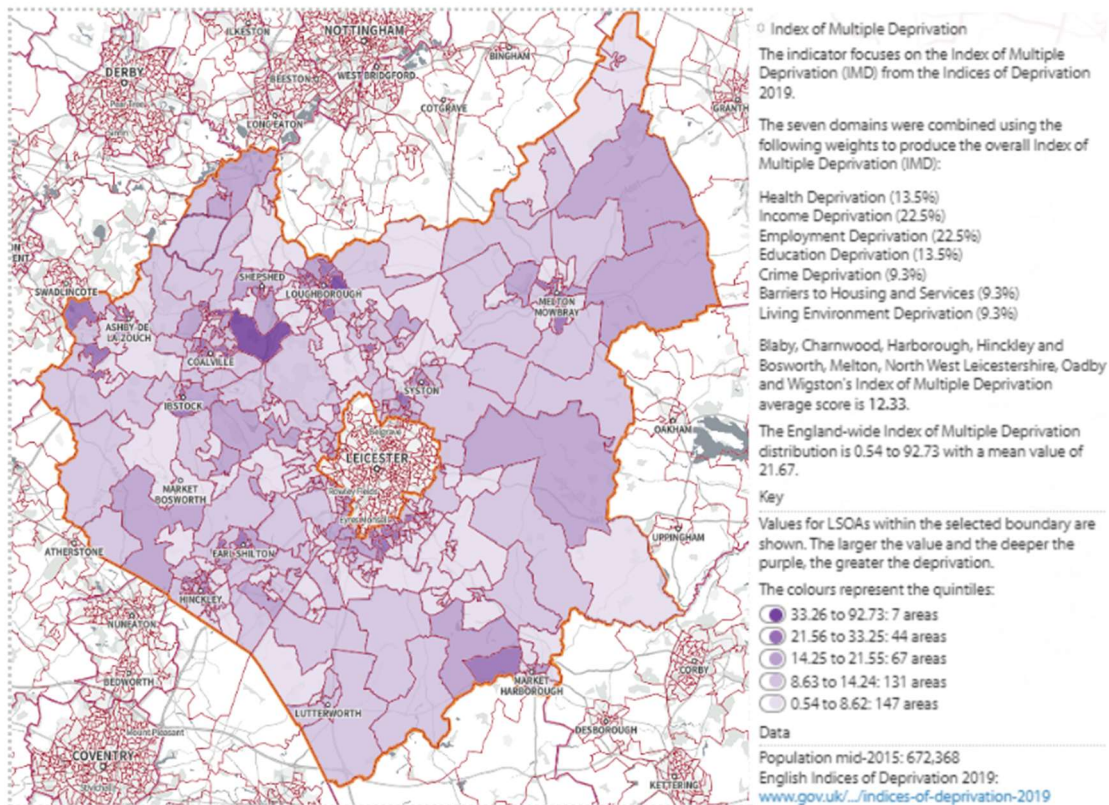

Figure 12: Leicestershire shaded based on Index of Multiple Deprivation

Employment levels vary by district, as seen in table 1 below. The table highlights the different employment rates and the varying percentages of residents claiming unemployment benefits, ranging from 1.7 in Harborough, up to 2.8% in Melton, which is still lower than the East Midlands which sits at 3.9%. Economic inactivity is variable across the districts, with areas where there are higher percentages likely to have higher populations of retired adults.

	Employment Rate (%)	Unemployment Rate (%) (People looking for work)	Claimant Count (%) (% people claiming unemployment related benefits)	Economic Inactivity (%) (People who are neither employed nor seeking work)
East Midlands	75.5	3.7	3.9	21.6
Blaby	85.3	3	2	13.1
Charnwood	82.2	3.1	2.2	16
Harborough	80	3	1.7	17
Hinckley and Bosworth	82.3	3.4	2.3	15.1
Melton	78.1	3.9	2.8	21.9
North West Leicestershire	80.1	3.1	2.1	19
Oadby and Wigston	79.8	3.8	2.7	15.7

Table 1 Employment rates (%) by district within Leicestershire

In terms of health implications, unemployed people are more than five times as likely to have poor health than employees. Also, only 28% of unemployed people report their health is either good or excellent, compared to 49% of people in employment. Ensuring adequate highways to provide easy access to employment is important, as well as ensuring access supports active travel and public transport measures.

Cost is a key obstacle to the use of transport. Policies that make transport more affordable (such as concessionary fares/subsidies) can be an effective way to help people living in poverty to access and maintain work. However, careful consideration is needed to ensure these help those most in need. This is possibly outside the full scope of the LHDG, however links between the LHDG and other planning policy are important to ensure join-up and equal considerations on how policies and guides can impact on employment and the economy.

Within the LHDG, several principles could address employment and the economy. Provision of inclusive cycling and walking infrastructure is recommended, which will enable those without private vehicles to access employment opportunities. The refreshed guidance also ensures that developers must consider how residents can have opportunities to access public transport network, which would further support access to employment.

There are also opportunities for developers to utilise local businesses and local people, ensuring that the local economy benefits further from increased development. This would also support climate change considerations, as materials and people would have less distance to travel by car or commercial vehicles, therefore potentially improving air quality.

Recommendations

As part of the HIA, the following recommendations have been put forwards:

1. It is recommended that guidance is developed that aligns with Local Transport Note 1/20 regarding inclusive active travel infrastructure that will help communities access facilities and open up employment sites. Developers should be encouraged to think strategically about the location of active modes of travel.
2. Through the creation of a palette of materials investigate the opportunities to encourage developers to use locally sourced materials. Continue to develop this approach alongside developers and the wider industry.
3. Principle 5 aims to achieve a greater uptake of active travel and provide appropriate forms of passenger transport. Passenger transport provision is delivered through the Passenger Transport Policy & Strategy and LCCs Bus Service Improvement Plan which helps deliver the National Bus Strategy. These policies help to ensure services are commercially viable and accessible over the long term. Principle 5 also accounts for active travel in rural areas stating that the infrastructure must reflect the context of Leicestershire as significantly rural in areas.
4. LHDG Policy 1 states that development must be accessible for all highway users and maximise the uptake of sustainable travel choices. In practice the LCC would advise refusal of planning applications where there is a lack of sustainable travel choices
5. Developers should be encouraged to employ local people where needed, with an appreciation that this is an added value activity, and not necessarily within the specific scope of the LHDG.

6.3 Transport

This section will look at how the LHDG will impact on road safety, active travel, cycling and walking facilities and infrastructure. It will address whether or not the LHDG will impact on accessing public transport, and how it does or does not support people to use more active modes of transport.

Description of Impact

Ensuring access to various methods of transport, provision of accessible highways, creating road types for all and encouraging active and sustainable travel are crucial considerations (and have been provided within the LHDG as Principles for developers to adhere to). There are three main mechanisms that link transport with health and wellbeing:

- **Transport and access**: Transport plays a key role in improving access to health services, particularly for vulnerable groups like older people. Transport also supports access to employment.

- **Mode of transport**: Mode of transport affects physical and mental health, via

mechanisms including physical activity and commuting time.

- **Wider effects of transport and infrastructure**: Transport can facilitate social interactions and promote social inclusion (covered within 5.1)

With Leicestershire being largely rural and having a considerable proportion of people aged over 60 (higher than national average), it is important to consider how transport supports connectedness, improves access to essential facilities and services, and allows residents to adequately travel for work, as well as pleasure.

Older populations are more likely to have an age-related health condition or disability meaning access to emergency services and the maintenance and preservation of access routes to medical facilities and amenities could be more significant. Figures 13-15 shows information on access to GPs by public transport or walking, cycling and cars across Leicestershire. The darker purple areas indicate where a higher percentage is able to access a GP via 15 minute journey on that mode of transport. The majority of areas can access a GP practice by car within 15 minutes, however not all areas can. Also, those experiencing higher levels of deprivation are less likely to have car access, thus potentially widening inequalities, if other access opportunities aren't available.
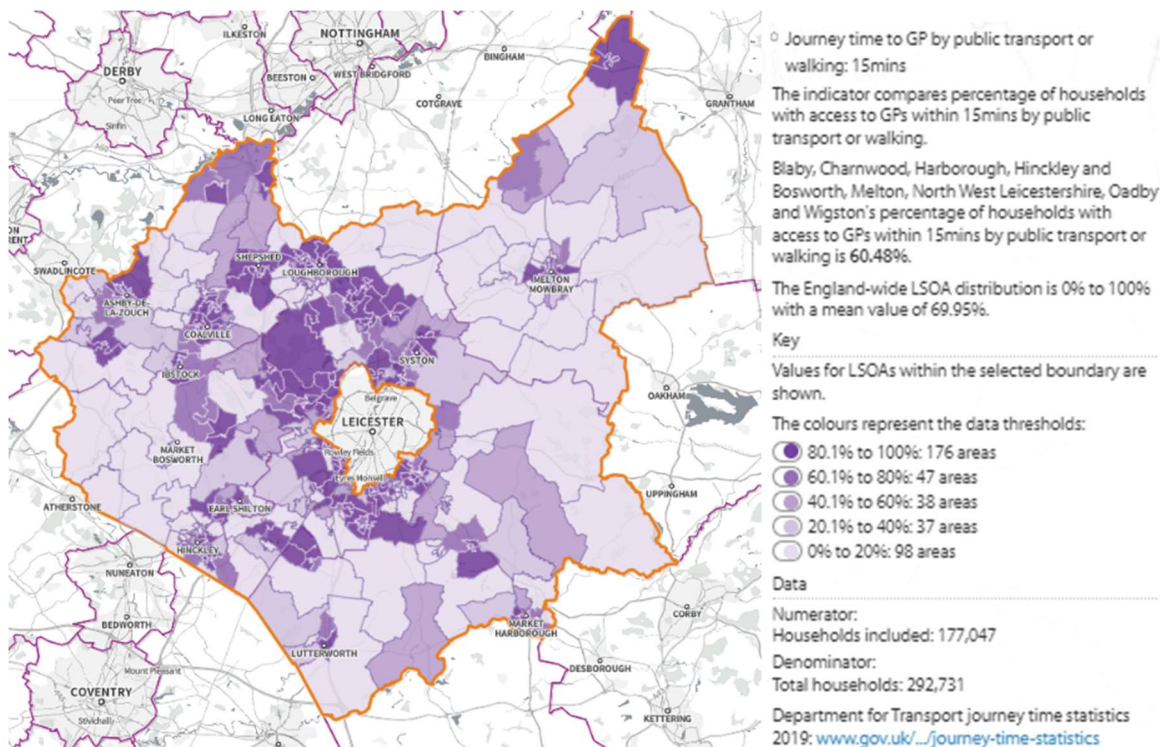

Figure 13 - Access to GPs by public transport or walking in Leicestershire
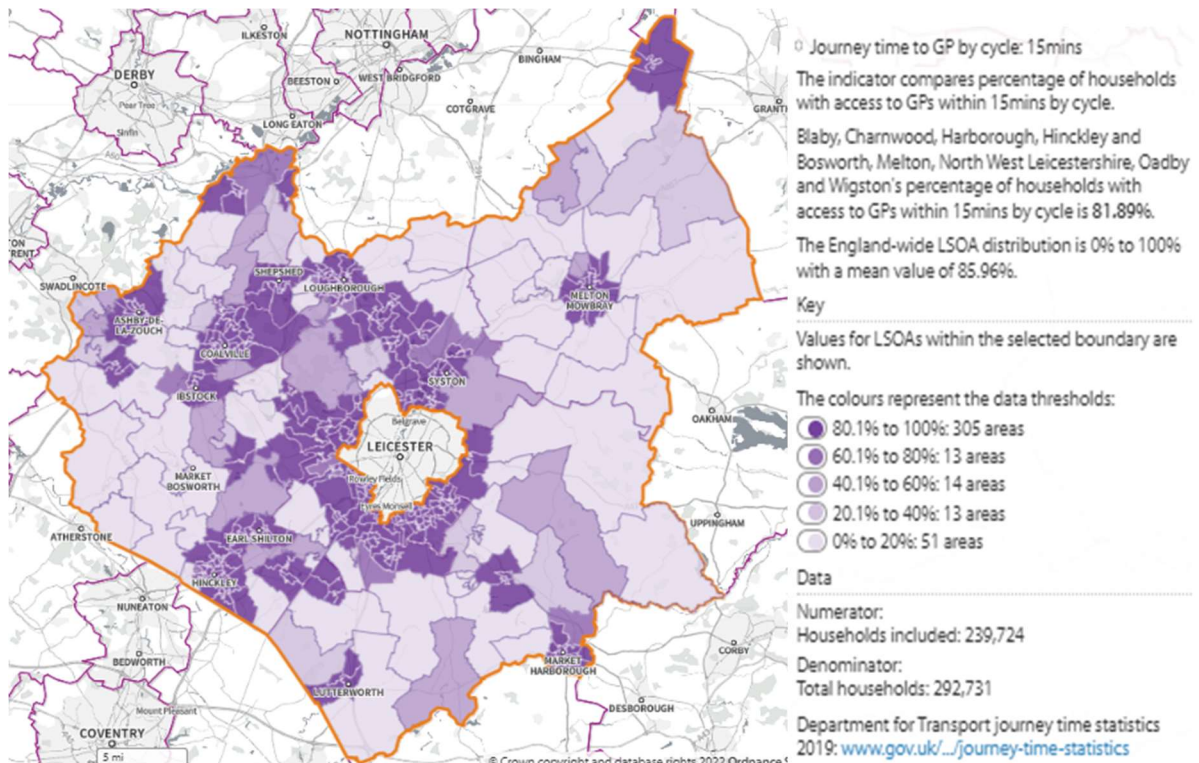
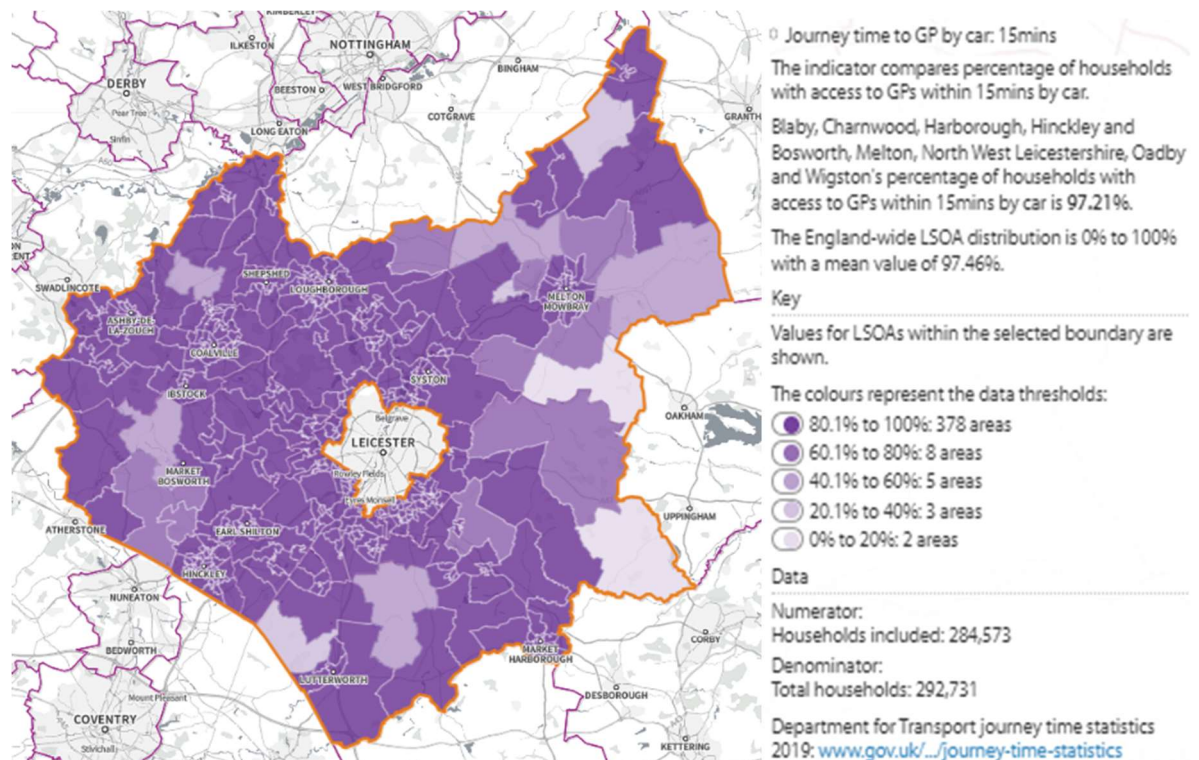**Figure 14 - Access to GPs by cycling in Leicestershire**

Figure 15 - Access to GPs by car in Leicestershire

Carefully considered highways, factoring in road types for all users and supporting access requirements for all is crucial for prevention and mitigation of the 'inverse care law', where

facilities and care are not where they are needed the most. Ensuring clinical services can be accessible by road, public transport and foot is critical for population health, and to reduce health inequalities.

The LHDG helps to mitigate these issues by providing guidance to developers on the consideration of active transport methods, facilitating easy access to public transportation and ensuring space is adequate for emergency vehicular access.

Within Leicestershire there is a reliance on travel by car or van to work. Nearly 70% of the adult population does not walk at least five times per week and only 7.9% of adults cycle. The county has one of the lowest levels of public transport patronage in the region.

A need exists for highways to retain, enhance, and contribute to improved access to public health and recreational facilities, including green spaces. Open green spaces and access points can be seen in figure 16. Although a rural county in nature, provision of suitable green space within urban centres is important. Walking and cycling provision would also provide benefits. From a health perspective, as well as providing opportunities to exercise and socialise in, people living in areas with greater access to green space tend to have higher life expectancy, which can be seen across all deprivation scores.
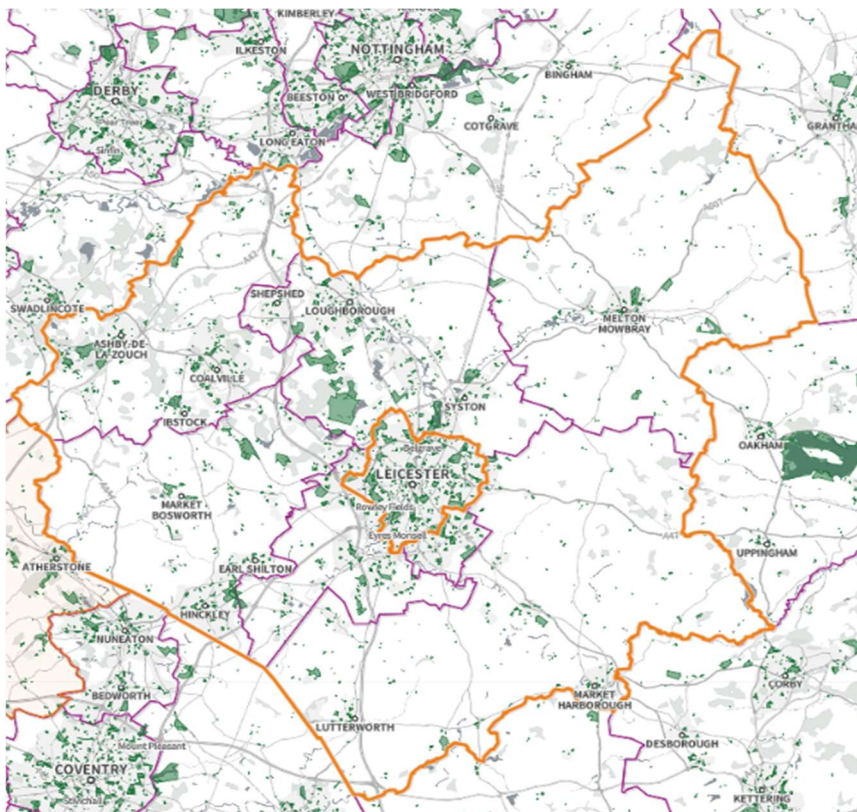

Figure 16 Green space availability in Leicestershire

The concept of food deserts also needs to be factored in when considering transport implications. Food deserts can be described as geographic areas where residents' access to affordable, healthy food options (especially fresh fruits and vegetables) is restricted or non-

existent due to the absence of shops selling adequate food, within convenient traveling distance. Food deserts will be more prevalent in rural areas and areas of higher deprivation, where residents do not have car access, easy access to public transport or the means to pay for public transport. Food deserts contribute to food insecurity, which has a raft of health implications including obesity, malnutrition and cardiovascular diseases. The map in figure 17 below taken from the E-food Desert Index, highlights areas which exhibit characteristics associated with food deserts. The areas in red show the greatest issues around food deserts. The map shows large areas within the county scoring the highest food desert index score. Although the LHDG cannot directly address food deserts, as this is clearly out of scope, ensuring the LHDG enforces its policies and supports developers to adhere to principles concerning access to public transport and considerations on active travel measures is a critical component to help address the implications from food deserts.
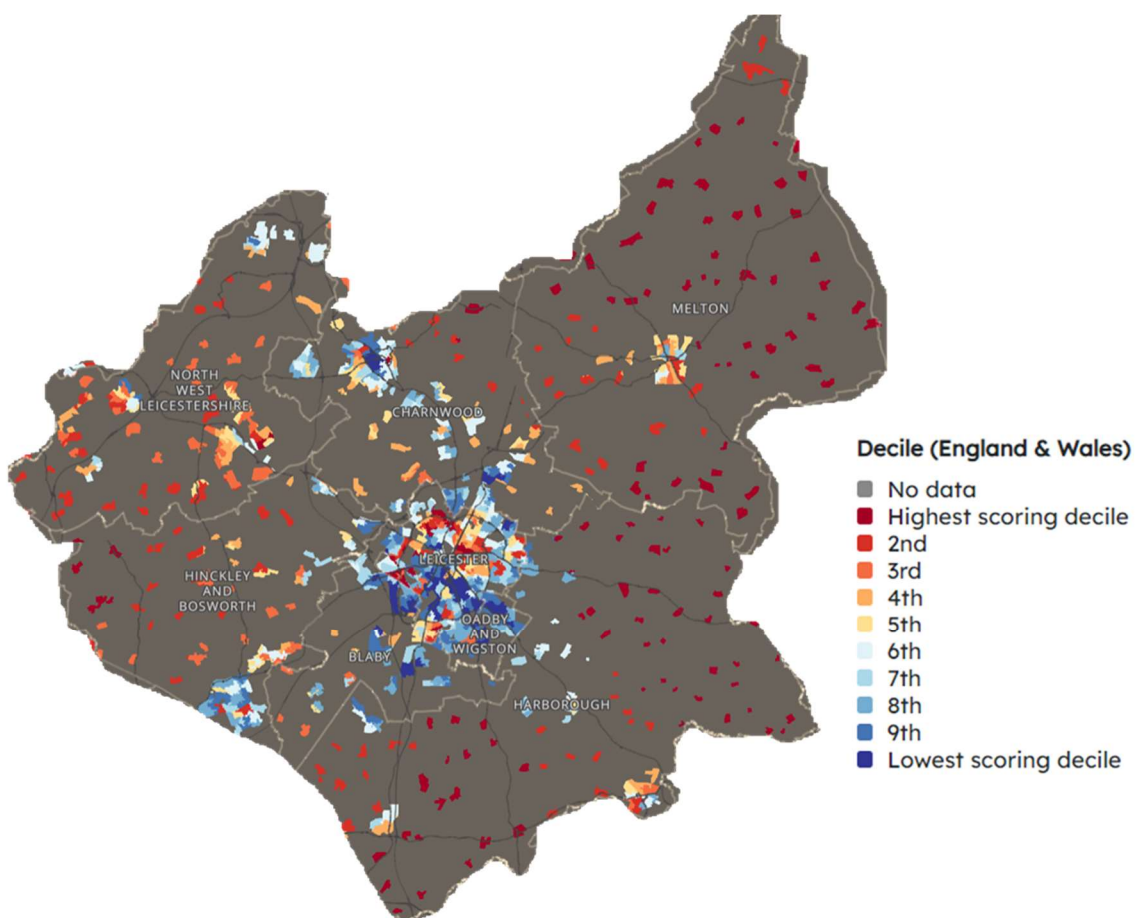
Figure 17 Visual representation of food deserts across Leicestershire

The Government is encouraging the enhanced provision of active travel infrastructure through it's "Gear Change" document and Local Transport Note 1/20. The revised LHDG has the potential to encourage active travel by defining how new development should consider issues of accessibility for all highway users through provision of highway infrastructure. A set of principles have been developed that set out how the LHDG will support the delivery of active travel and green infrastructure as part of high-quality transport infrastructure, creating attractive environments where people can spend time.

The new LHDG will set out its guidance regarding the provision of opportunities for accessing passenger transport as part of new development. Delivery of viable passenger transport opportunities is a complex matter and is partly reliant on willingness of companies to run services and the ability of local authorities to subsidise. The council has opportunities to influence the quality of infrastructure provision for passenger transport and the nature of the services being delivered.

Highway infrastructure has the potential to cause community severance when thought is not given to the needs of those within the community.

The developed LHDG principles send out positive messages regarding provision of active travel facilities. However, funding the maintenance of enhanced provision has already been raised as a concern during project delivery.

The refreshed LHDG has the potential to impact on accessibility for disability and age-related groups. Highway design needs to consider local population needs. For active transport purposes aspects such as dropped kerbs, high quality pavement surfacing and speeding restrictions and deterrents, are important to ensure more vulnerable groups such as older adults, children and young people and disabled, are able to use highways actively. Other aspects such as seating on pedestrian routes and bus stop designs e.g. does it provide seating/shelter, are also supportive of accessible highway usage.

Principle 5 aims to achieve a greater uptake of active travel and provide appropriate forms of passenger transport. Passenger transport provision is delivered through the Passenger Transport Policy & Strategy and LCCs Bus Service Improvement Plan which helps deliver the National Bus Strategy. These policies help to ensure services are commercially viable and accessible over the long term. Principle 5 also accounts for active travel in rural areas stating that the infrastructure must reflect the context of Leicestershire as significantly rural in areas.

Research has suggested a framework for transport and mobility needs for an aging society (Figure 18), which builds on the four keys factors, featured in section 5.1 (figure 11). The framework considers different aspects which should be considered when looking at transport provision for ageing society.
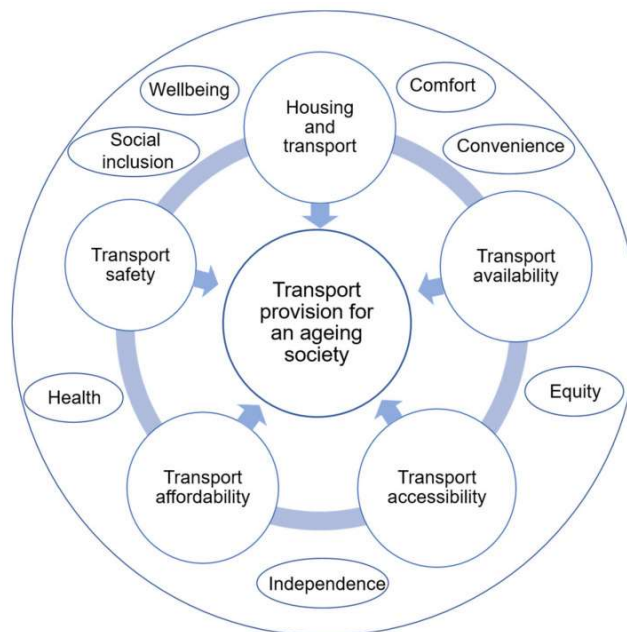
Figure 18 - A framework for the review of transport and mobility needs for an ageing society

It is also important to consider other highway users, such as individuals with visual impairment. Guide Dogs for the Blind Association states that "Implementation of parking controls and effective enforcement of illegal pavement parking will help to ensure that pedestrians with a vision impairment can more safely navigate highway." This should be mitigated by ensuring new carriageway is sufficiently wide to accommodate parked vehicles, without the need for pavement parking, and still allow passage of moving vehicles. However, regarding the existing highway network, pavement parking can present particular issues relating to historic design standards. There are however opportunities to consider design in future highway development and for any future maintenance.

Another aspect for consideration is the use of 'shared surfaces', where there is no clear demarcation e.g. a kerb, between pedestrian and vehicle use areas, allowing both to share spaces. Although the aim of these areas is to encourage low vehicle usage and slower speed, to aid free movement of pedestrians and encourage social interaction, some more vulnerable groups may feel disadvantaged at their inclusion in highway design, such as those with disabilities e.g. people with blindness and visual impairments, as they may find the environment difficult to interpret and navigate. Careful considerations need to be factored in when planning for future shared surfaces.

Recommendations

1. Active travel - draft guidance that delivers on the principles and standards set out in national guidance, whilst considering opportunities to reduce future maintenance costs through encouraging use of durable and low maintenance materials. Look for opportunities for the council to raise income through sponsorship or other means.

2. Opportunities to innovate in the delivery of active travel should be considered through national and international case studies. LCC should continue to review and consider national guidance on a regular basis to ensure designs meet the latest standards.

3. Design of highway should reduce the impacts on severance by providing high quality active travel facilities that allow for easy navigation of roads, for all user types.

4. Passenger transport - consider alternative provision of passenger transport options where bus services are judged to not be viable (although actual provision may be outside of the remit of the LHDG). Ensure that any provision of infrastructure is designed with accessibility in mind through LHDG guidance.

5. Continue to assess what communities want to see in terms of passenger travel in the future.

6. Guidance should make greater reference to the Bus Service Improvement Plan, particularly with refence to the youth offer.

7. LHDG Policy 1 states that Development must be accessible for all highway users and maximise the uptake of sustainable travel choices. In practice the LCC would advise refusal of planning applications where there is a lack of sustainable travel choices. It is recommended for this approach to continue.

8. Pavement Parking: Where upgrades are made to carriageway as a result of a maintenance programme or developer contributions, consideration should be given to how problem parking can be eliminated or reduced, where possible.

9. Reference should be made to the principle of 'hierarchy of users'. The 'hierarchy of road users' is a concept that places those road users most at risk in the event of a collision at the top of the hierarchy. The road users most likely to be injured in the event of a collision are pedestrians, cyclists, horse riders and motorcyclists, with children, older adults and disabled people being more at risk. Developers should consider this prioritisation during the design phase of the scheme and as part of their road safety audits and this responsibility should be highlighted within future LHDG guidance.

10. LCC should ensure that during reviews consideration is given to change in guidance relating to protected groups. For example, Guide Dogs for the Blind Association, in partnership with University College London, is currently undertaking research into interactions between pedestrians and cyclists in several active travel infrastructure settings.

11. A monitoring programme should be established to ensure minimisation of negative impacts.

12. Older adults transport needs should be carefully considered, and approaches adopted to ensure they are able to access different modes of transport, which suit their needs, are accessible, safe and affordable. Some of this sits out with the LHDG specifically, however the LHDG could ensure specific highways elements are

addressed, with other planning policies supportive.

13. Further consider design options that mitigate issues relating to safety for communities.

14. Guidance related to street design, produced by organisations representing disabled groups should be considered during reviews of the LHDG.

https://www.guidedogs.org.uk/-/media/project/guidedogs/guidedogsdotorg/files/about-us/what-we-do/research/road-and-street-crossings.pdf

https://gd-prod.azureedge.net/-/media/project/guidedogs/guidedogsdotorg/files/about-us/what-we-do/research/making-the-built-environment-inclusive-2023.pdf

15. People with a vision impairment can experience problems with street clutter, such as shop advertising signs (A-Boards). Guidance should ensure that where facilities such as cafes are to be provided that sufficient pavement space is considered to mitigate issues such as this.

16. Further work should be undertaken to review LCC's expectations regarding the design of shared surfaces. This should include:
    - Desktop study of existing research and guidance
    - Collaboration with disability groups, including but not limited to those representing people with visual impairments.
    - Review of best practice delivered elsewhere and engagement with industry experts.
    - In the short term include text in the LHDG stating that developers must consider the safety and perception of safety for those with visual impairments

6.4 Physical Activity

Physical activity is a crucial behaviour and important for all to lead healthy lives. This section will look at how the LHDG could impact on people being physically active and how they participate in active play or active travel.

Description of Impact

70.1% of Leicestershire adults, and 50.7% of children and young people are classed as physically active. While physical activity in the county is higher than the national average, Leicestershire has a higher rate of adults classed as overweight or obese than the national average (65.9%).

The benefits of physical activity are plentiful, including:

- Combating health conditions and diseases, including cardiovascular diseases, cancers and diabetes

- Supports positive mental health

- Support weight control

- In children and adolescents, physical activity promotes bone health, encourages healthy growth and development of muscle, and improves motor and cognitive development.

Physical inactivity is associated with 1 in 6 deaths in the UK and is estimated to cost the UK £7.4 billion annually (including £0.9 billion to the NHS alone).

However, encouraging people to be physically active can often be difficult. Approaches where physical activity is the easiest option often work better than when it is prescribed or simply offered, therefore ensuring opportunities to be physically active are built into developments and highways is extremely important. Physical activity should be the easiest choice for residents, such as for commuting, transport and even for socialising.

Physical activity rates tend to be lower in the most deprived, the elderly, disabled, unemployed, less educated and those not classed as white British, thus highlighting its importance in reducing inequalities.

Within Leicestershire there is a reliance on travel by car or van to work. Nearly 70% of the adult population does not walk at least five times per week and only 7.9% of adults cycle.

Increased evidence that providing access to natural green space has benefits including improved health and well-being.

With the government's target of making 50% of all journeys in towns and cities by active travel modes by 2030, the LHDG should play a crucial role in facilitating this shift. By making walking and cycling more attractive through well-designed infrastructure, it should address concerns about safety, comfort, and navigation for all users, including vulnerable groups such as older people, children, and those with disabilities. This approach could not only helps to decarbonise transport but also provide economic benefits by relieving congestion, improving public health, and connecting people with their communities and amenities.

The revised LHDG has the potential to encourage active travel by defining how new development should consider issues of accessibility for all highway users through provision of highway infrastructure. A set of principles have been developed that set out how the LHDG will support the delivery of active travel and green infrastructure as part of high-quality transport infrastructure, creating attractive environments where people can spend time.

Creating attractive environments in the public realm is one way of encouraging people to leave their cars behind and adopt active travel to move around the highway network, as well as being active for pleasure and socialisation. The council is in a position to encourage the provision of green infrastructure within new highway creating attractive environments that also offer ecosystem services such as shading that creates cool microclimates, reduced air pollution and flooding.

The delivery of active travel and green infrastructure elements of highway schemes must be supported by funding that ensures they are maintained in the future. The current financial climate is not conducive to accommodation of increased maintenance liabilities.

For disabled people and older adults, the design of green spaces is as important as being in close proximity to them. Structural barriers in the design of street furniture, provision of amenities and the accessibility of wayfinding (the use of colour, signage and other design elements to help people find their way around) can all contribute to exclusion; therefore the design of green and blue spaces must be considered with these communities in mind.

The refreshed LHDG has the potential to positively impact on accessibility for disability and age-related groups be factoring their diverse needs into planning decisions and ensuring highways are accessible for all.

Policy 1 and Principle 5 encourage the use of sustainable modes of transport including cycling and walking and passenger transport services. Accessibility considerations are accounted for within the Gear Change and LTN1/20 Cycling Infrastructure Design guidance for active travel and the National Bus Strategy and Bus Service Improvement Plan for passenger transport.

This consideration is also accounted for within Principle 1 consideration of those with additional accessibility needs when accessing active travel and principle 6s ensuring development layouts ensure passenger transport access.

Principle 5 aims to achieve a greater uptake of active travel and provide appropriate forms of passenger transport. Passenger transport provision is delivered through the Passenger Transport Policy & Strategy and LCCs Bus Service Improvement Plan which helps deliver the National Bus Strategy. These policies help to ensure services are commercially viable and accessible over the long term. Locally there are also the Local Cycling and walking Infrastructure Plans (LCWIPS), which support sustainable active travel that is convenient and practical therefore create further opportunities for residents to engage in physical activity.

Recommendations

1. Consider how maintenance of active travel and green infrastructure in new development can be facilitated through innovative approaches to funding maintenance.

2. Measures should be put in place to monitor the impact of the changing approach on the number highway users adopting active modes of travel.

3. The provision of a range of active travel options that are affordable opportunities for people to travel are facilitated through Principle 5 "Encouraging Active and Sustainable Travel" and new detailed guidance on the design and construction of active travel facilities. Ensure that developers are delivering high quality infrastructure that is durable and follows best practice, for example following the Value of Trees approach to delivering tree planting within highway.

4. Consideration should be given to whether changes can be made to the LHDG that will facilitate positive outcomes for vulnerable groups. There is potential to positively impact on low-income groups who do not have access to a private car as a primary mode of transport.

5. Opportunities to innovate in the delivery of active travel should be considered through national and international case studies. LCC should continue to review and consider national guidance on a regular basis to ensure designs meet the latest standards. A partnership approach should be adopted, ensuring system partners are part of any activity and change, and to support ongoing Active Travel interventions.

6. The Design Layouts and Materials and Construction parts of the proposed guidance identify appropriate design and use of materials for new highway so that it supports access for disabled members of the communities. Recommendations are to ensure these are adhered to in a consistent and considered manner for all developments.

7. New active travel provision should adhere to LCC's Cycling and Walking Strategy. Where development is within or near to an LCWIP area developer contributions may be sought for improving the local active travel network in accordance with the Plan's goals.

6.5 Housing

This section will look at any effects the LHDG may have on housing, as well as access to green and blue spaces. Health inequalities are driven by structural determinants – the economic and environmental condition in which people live, age and play. Quality housing acts as a wider determinant for good physical and mental health and wellbeing. Poor housing has a disproportional effect on the most vulnerable in society, therefore addressing housing aspects helps towards reducing health inequalities.

Description of Impact

As described, the population of Leicestershire is growing at a rate higher than national and regional averages. Although the LHDG is focussed on the design of highways, and not the bricks and mortar that people live within, it is still linked to housing in terms of people's access to green space, clean air, isolation and community connectedness. Roads and highways have the ability to bring communities together safely or push them apart through fracturing existing space and assets and putting barriers in the way.

There is strong academic evidence that providing access to natural green space has benefits including improved health and well-being (as mentioned in previous sections). A set of principles have been developed that set out how the LHDG will support the delivery of green infrastructure as part of high-quality transport infrastructure, creating attractive environments close to populations.

The delivery of green infrastructure elements of highway schemes must be supported by funding that ensures they are maintained in the future. The current financial climate is not conducive to accommodation of increased maintenance liabilities, creating a potential future problem if funding solutions cannot be found.

The council is able to encourage the provision of green infrastructure within new highway creating attractive environments that also offer ecosystem services such as shading that creates cool microclimates, reduced air pollution and flooding.

The other sections within this HIA are inextricably linked within housing, therefore other aspects will be covered in more detail within those sections such as impacts of air quality and noise, transport and social cohesion.

Recommendations

1. Proposed guidance facilitates the creation of attractive environments that are safe and feel safe by signposting to best practice national guidance and providing guidance on the provision of accessible green infrastructure. Recommendations are to ensure developers follow and adhere to best practice and policies are in place to support this.

2. LHDG proposed guidance supports the protection and enhancement of green and blue infrastructure in line with LCC's public duty. As above, the recommendations are to ensure that these aspects are adhered to by developers and procedures in place to ensure that.

6.6 Education and Skills

Educational attainment is linked to health behaviours and health outcomes, and is lower in groups with certain protected characteristics, as well as our most vulnerable residents and those experiencing higher levels of deprivation. This section will look at how the LHDG could either encourage or discourage people from improving their educational attainment. It may be that it could impact on opportunities to develop new skills, opportunities for volunteering or apprenticeships.

Description of Impact

Research shows that adults with higher educational attainment live longer, healthier lives, compared to their less educated peers. Education and health are deeply interconnected, with substantial evidence demonstrating that education serves as a critical determinant of health. Higher levels of education typically lead to longer life expectancy, lower morbidity and higher engagement with healthier behaviours. Educational attainment plays an important role in health by shaping opportunities, employment, and income. Ensuring any LCC policies and proposals enhance and promote educational attainment will enhance individual and societal

wellbeing, prevent the progression of poor health and ultimately contribute to long term financial savings.

LHDG supports education and skills through enabling provision of high-quality highway, providing safe and effective transport connectivity to education centres using different modes of travel e.g. bus, car, cycling, walking. There could also be scope, through developers' corporate social responsibility to offer skills, mentoring and even apprenticeships to those in most need and experiencing greatest inequality.

The LHDG project attended a CYCLe (youth forum) meeting to understand the issues that young people face when using highway. Attendees raised the following issues:

- Affordability of travel is an issue.

- Inconvenience of routes

- Overcrowded buses

- Highway environment is ok at best.

- More colour and trees along highway that are well maintained.

- Roads and paths should be wider so people can move around better.

- Better lighting

- Increase safety (speeding)

- Measures should be in place to ensure verges do not get damaged by cars.

- The majority do not feel safe in the highway environment.

- Lighting should be improved.

- Measures should be put in place to reduce speeding.

- More crossings should be provided

Addressing the above will support the younger generation to access places more efficiently and safely. Many of the above feature within the policies, principles and guidance of the LHDG, including:

- The requirement for large developments to be supported by a transport statement or plan that considers the requirement for sustainable travel options.
- Improving the highway environment through the facilitation of green infrastructure
- Design guidance that ensures that highway layouts conform to standards
- The provision of street lighting guidance
- Guidance that states that developers must design layouts that do not encourage pavement parking.
- Reference to Bus Service Improvement Plan
- The provision of design guidance related to inclusion of speed control measures.

Recommendations

Through the HIA process the project has already identified several recommended amendments to guidance including:

- To emphasise the requirement for developers to provide high quality active travel opportunities with new development.

  - This is achieved through Principle 5 "Encouraging Active and Sustainable Travel" and new detailed guidance on the design and construction of active travel facilities. This will provide a range of affordable opportunities for people to travel.

- To facilitate the creation of attractive environments that are safe and feel safe by signposting to best practice national guidance and providing guidance on the provision of green infrastructure.

1. Guidance should make greater reference to the Bus Service Improvement Plan, particularly with refence to the youth offer.

2. Where upgrades are made to crossings due to a maintenance programme or developer contributions, consideration should be given to ensuring appropriate facilities are provided for communities.

3. LHDG should highlight that developers need to understand the demographics of the community during the design process, particularly where facilities for older, younger and disabled people exist, and ensure their needs are factored in at the earliest possible opportunity.

4. Guidance should stress the importance of upskilling the local community and providing education and skills opportunities for those living nearby, especially those at greater risk of lesser educational attainment

6.7 Air Quality and Noise

This section will look at the impact the LHDG has on air pollution and how noise could be impacted by reducing car use, traffic congestion and reducing noise disturbances.

Description of Impact

The UK chief medical officer's report highlights the association between air quality and health outcomes emphasising that even low levels of air pollution can still contribute to significant health risks Numerous studies and research indicate that exposure to air pollution is associated with significant adverse effects on health, and increased mortality and morbidity.

Evidence strongly supports that connection between air pollution and adverse health outcomes highlighting the importance of addressing air quality to protect public health. Air pollution impacts on health outcomes in various ways impacting on respiratory conditions such as asthma, cardiovascular disease, cancer risk and emerging research linking air pollution to neurological impacts including cognitive decline and Dementia, low birth weight and Type 2 diabetes. The World Health Organisation estimates that the combined effects of ambient air pollution and household air pollution is associated with 7 million premature deaths annually. Within England research suggests this figure could be between 28,000 – 48,000 deaths.

Air pollutants are emitted from a range of both man-made and natural sources, including through many everyday activities such as transport. Local authorities have a statutory role in assessing and improving local air quality, and the cumulative effects of this local action are significant. Councils can:

- invest in infrastructure and public transport and promote active travel and cycle routes.
- implement measures to reduce air pollution caused by road traffic and other sources.
- design healthy environments, bringing in spatial planning, urban design, road and building layouts, and green spaces. (Health Matters: Air Pollution 2018)

Using currently available data, the areas within Leicestershire identified in table 19, 20 and 21 are exceeding safe limits for pollutants (PM10, PM2.5 and NO2).
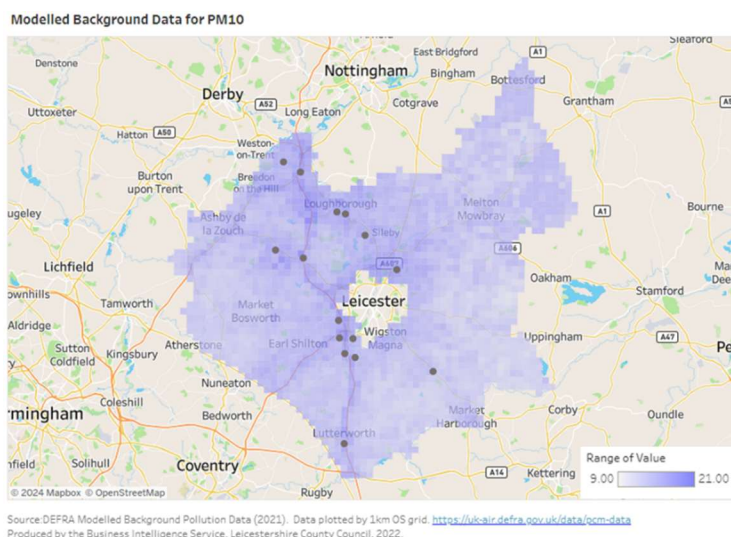
Figure 19: Background concentrations of PM10 in Leicestershire (2022
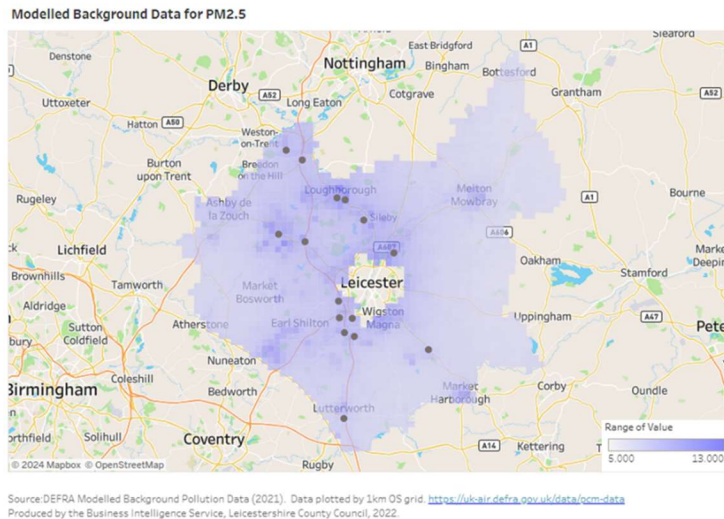
Figure 20: Background Concentrations of PM2.5 in Leicestershire (2022)
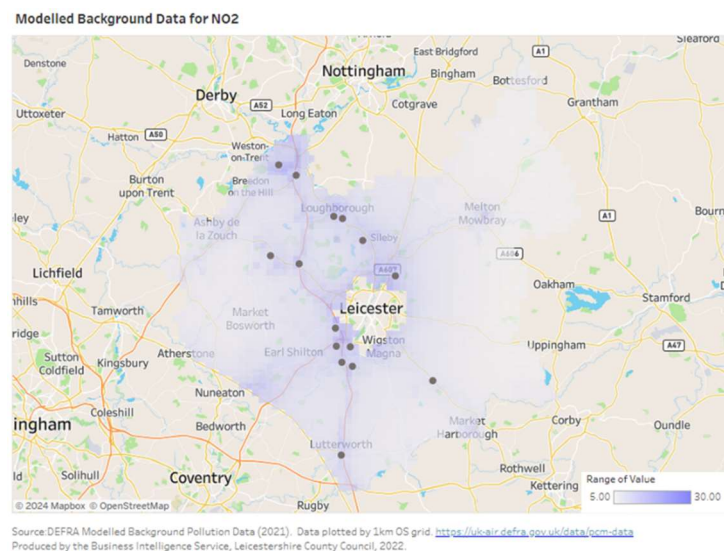
Figure 21: Background Concentrations of NO2 in Leicestershire (2022)

Concepts of vulnerability to the effects of air pollution.

There are recognised issues relating to those with existing health conditions such as asthma. People from low-income neighbourhoods may be at greater risk of developing health conditions that are exacerbated by air pollution. Children could also be at higher risk of developing lung conditions through high levels of air pollution.

Mental health conditions could also be intensified by delivery of road projects within residential areas, with increased noise and disturbance during and following construction. The impact of traffic noise on sleep is well documented, but there is also now evidence related to the impact on cardiovascular health and ischemic heart disease, such as heart attacks. Emerging evidence also suggest that noise from traffic can have an impact on metabolic disorders such as diabetes.

Figure 22 identifies areas exposed to high levels of noise from traffic.
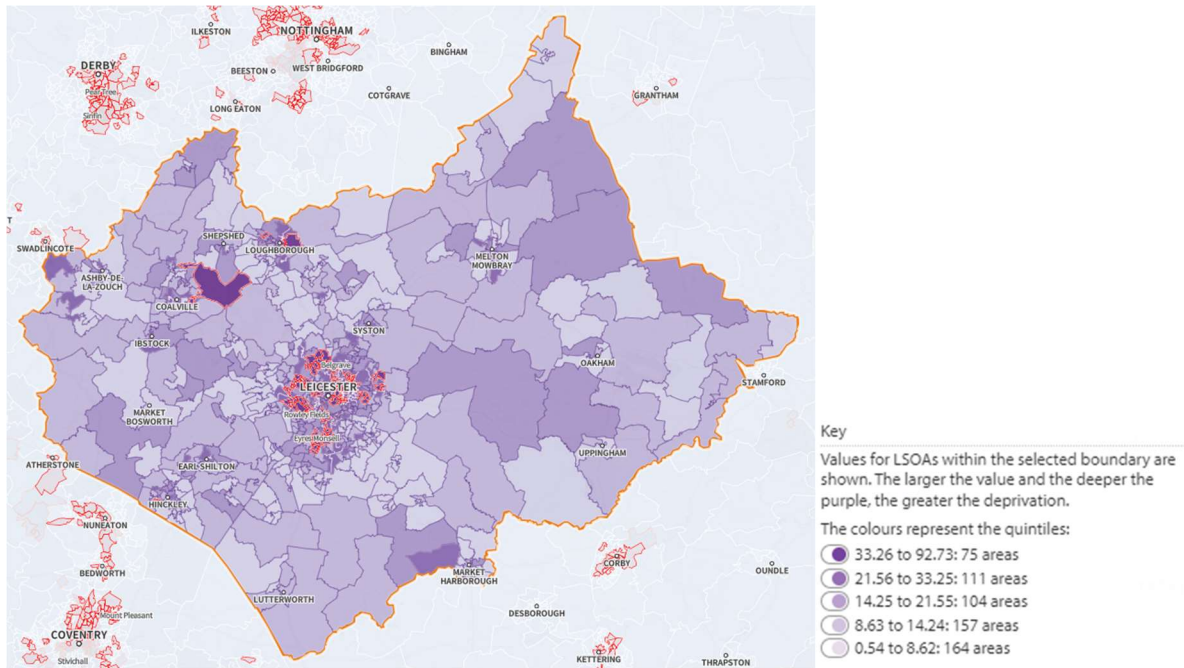
Figure 22 IMD: High 20%: Core20 Population – Road Traffic Noise: 24 Hour average

Principles have been developed that set out how the LHDG will support the delivery of green infrastructure as part of high-quality transport infrastructure, creating attractive environments close to populations, which also support more positive air quality, and create 'carbon sinks'. Tree planting within the extents of the highway can also reduce air pollution locally. As part of principle 7 developers are also encouraged to liaise with LCC regarding electric vehicle provision, which may also support air quality and reduced noise.

Recommendations

1. Issues regarding noise and air pollution should be factored into all new highways considerations and development and the impacts for the current and future population modelled to look for detrimental impacts.

2. Mitigation measures should be considered as part of the development of technical guidance for the LHDG. The LHDG should also signpost best practice regarding noise and air quality.

3. Where highway design can facilitate active travel and reduce car dependency this will reduce key pollutants. Therefore, active travel should be a key consideration for the LHDG.

4. As recommended above, facilitation of green infrastructure and the use of the Value of Trees toolkit during the design phase can also mitigate the impacts of air pollution on vulnerable populations.

5. Consideration should be given to how LHDG policy regarding new connections to the existing road network can reflect the potential for impacts on vulnerable members of the community on particulate air and noise pollution.

6. The LHDG should ensure that Air Quality Management Areas are considered in all decision regarding the location of new infrastructure.

6.8 Crime Reduction and Community Safety

Well considered highway design has the potential to design out crime and promote community safety. The LHDG has the potential to discourage crime and antisocial behaviour, reduce the fear of crime and promote a safe environment.

Description on Impact

Road schemes have the potential to design out crime and create a positive environment for the whole community. Crime, as well as the fear of crime, can negatively impact a person's lifestyle and overall quality of life. Planning and design are pivotal to ensuring new developments and infrastructure are designed with public safety in mind, ensuring the places where people live, work and play are safe.

Other studies have also found correlations between health, educational attainment and crime, with women who have lower levels of education reporting higher levels of fear of crime, as well as higher odds of poor health and anxiety, compared to those with a university education.

Figure 23 below, taken from Fingertips, highlights some of the key crime and safety statistics for Leicestershire.

Indicator	Period	Leics			England			
		Recent Trend	Count	Value	Value	Worst/ Lowest	Range	Best/ Highest
Violent crime - hospital admissions for violence (including sexual violence)	2020/21 - 22/23	–	355	17.1	34.3	122.3		12.5
Violent crime - violence offences per 1,000 population	2022/23	↑	21,032	29.5	34.4	15.1		133.2
Violent crime - sexual offences per 1,000 population	2022/23	↑	2,112	3.0	3.0	1.3		15.1
First time offenders	2022	↓	852	134	166	74		349
Crime deprivation: score	2019	–	-	-0.32	0.01	1.21		-1.66
Domestic abuse related incidents and crimes	2022/23	–	-	26.5*	30.6*	10.2		46.5

Figure 23 – Crime statistics for Leicestershire

When compared to Leicestershire's nearest statistical neighbours, the County is higher on the list for violent crime, for both violent offences and sexual offences, however better than the England average for violent crime hospital admissions.

Violent and sexual offences have remained the highest crime type across the county for over 10 years, though in the last year have seen a 5.5% decrease. Public order crime is at 144% of the national average.

Trend data on violent crime in Leicestershire can be seen in Figures 23 and 24, taken from Fingertips. It can be clearly seen that violence and sexual offences are on upwards trends.
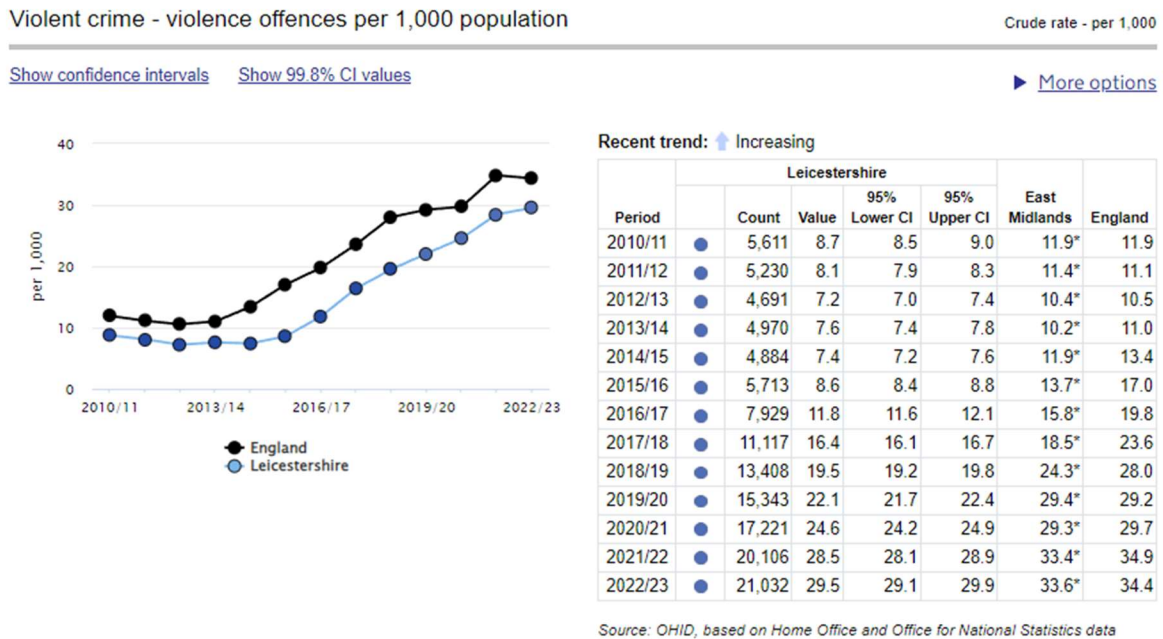
Violent crime - violence offences per 1,000 population | Crude rate - per 1,000

Show confidence intervals   Show 99.8% CI values   ▶ More options

Recent trend: ⬆ Increasing

		Leicestershire				East	
Period		Count	Value	95% Lower CI	95% Upper CI	Midlands	England
2010/11	●	5,611	8.7	8.5	9.0	11.9*	11.9
2011/12	●	5,230	8.1	7.9	8.3	11.4*	11.1
2012/13	●	4,691	7.2	7.0	7.4	10.4*	10.5
2013/14	●	4,970	7.6	7.4	7.8	10.2*	11.0
2014/15	●	4,884	7.4	7.2	7.6	11.9*	13.4
2015/16	●	5,713	8.6	8.4	8.8	13.7*	17.0
2016/17	●	7,929	11.8	11.6	12.1	15.8*	19.8
2017/18	●	11,117	16.4	16.1	16.7	18.5*	23.6
2018/19	●	13,408	19.5	19.2	19.8	24.3*	28.0
2019/20	●	15,343	22.1	21.7	22.4	29.4*	29.2
2020/21	●	17,221	24.6	24.2	24.9	29.3*	29.7
2021/22	●	20,106	28.5	28.1	28.9	33.4*	34.9
2022/23	●	21,032	29.5	29.1	29.9	33.6*	34.4

Source: OHID, based on Home Office and Office for National Statistics data

Figure 23 - Violent crime violet offence rates for Leicestershire 2010-2023.

Violent crime - sexual offences per 1,000 population | Crude rate - per 1,000

Show confidence intervals   Show 99.8% CI values   ▶ More options

Recent trend: ⬆ Increasing

		Leicestershire				East	
Period		Count	Value	95% Lower CI	95% Upper CI	Midlands	England
2010/11	●	410	0.6	0.6	0.7	0.9*	0.8
2011/12	●	361	0.6	0.5	0.6	0.8*	0.8
2012/13	●	412	0.6	0.6	0.7	0.8*	0.8
2013/14	●	486	0.7	0.7	0.8	0.9*	1.0
2014/15	●	585	0.9	0.8	1.0	1.3*	1.4
2015/16	●	644	1.0	0.9	1.0	1.6*	1.7
2016/17	●	880	1.3	1.2	1.4	1.8*	1.9
2017/18	●	1,144	1.7	1.6	1.8	2.2*	2.4
2018/19	●	1,350	2.0	1.9	2.1	2.5*	2.6
2019/20	●	1,468	2.1	2.0	2.2	2.7*	2.5
2020/21	●	1,588	2.3	2.2	2.4	2.5*	2.3
2021/22	●	2,165	3.1	2.9	3.2	3.2*	3.0
2022/23	●	2,112	3.0	2.8	3.1	3.2*	3.0

Source: OHID, based on Home Office and Office for National Statistics data
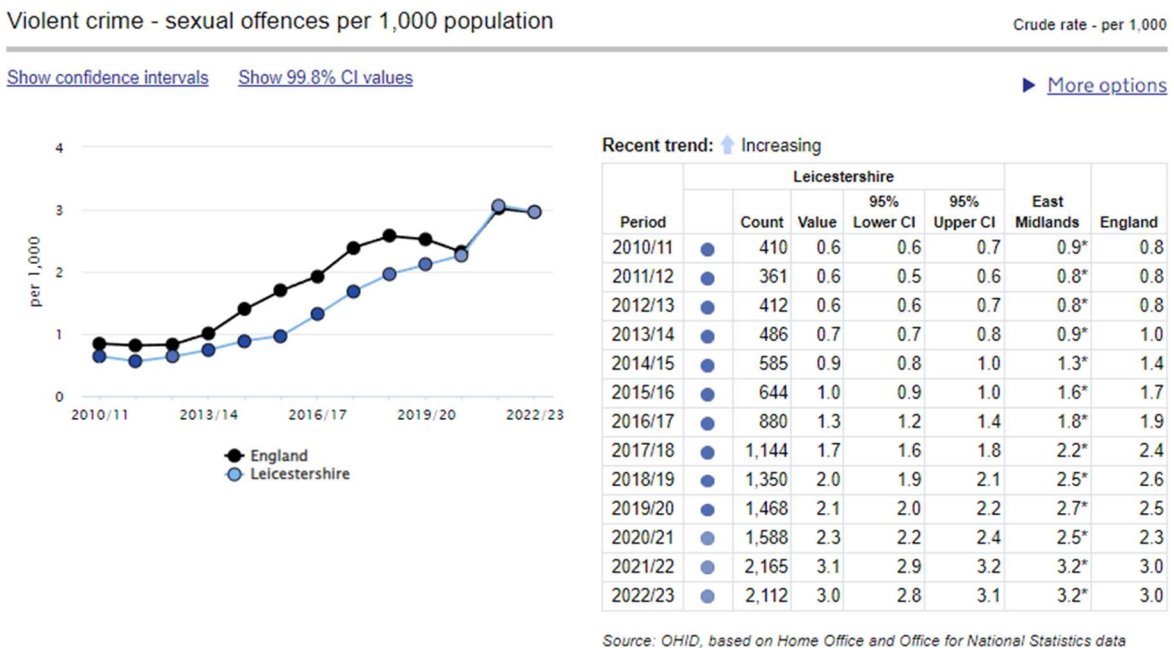
Figure 24 - Violent crime sexual offence rates for Leicestershire 2010-2023.

Risk of being the victim of crime and the fear of crime can be heightened depending on factors such as age, gender or sexuality. Delivery of spaces that are unattractive to highway users could increase the fear of crime.

In terms of highway fatalities, data from the Department for Transport shows that between 2018 and 2022, there were 118 deaths on Leicestershire highways (figure 25). The majority of these deaths occurred on rural roads (70.34%, figure 26), which is not surprising considering Leicestershire's predominance for rurality, however this does clearly demonstrate the need to consider new highway developments within the current wider highway network and infrastructure, and ensure new additions consider safety.

Whilst an overarching objective of the LHDG is to ensure optimum road safety and reduce the risk of road traffic accidents for all highway users, there should also be an awareness that those who live in areas of deprivation are disproportionately harmed by road traffic incidents, with socioeconomic status significantly influencing road safety outcomes adversely. Those living in in the most deprived neighbourhoods are three times more likely to be killed or seriously injured on the roads than their peers from the least deprived areas in England. With children living in the most deprived areas also facing this inequality, as they are nearly three times more likely to be killed or seriously injured as pedestrians than their peers in the least deprived areas.
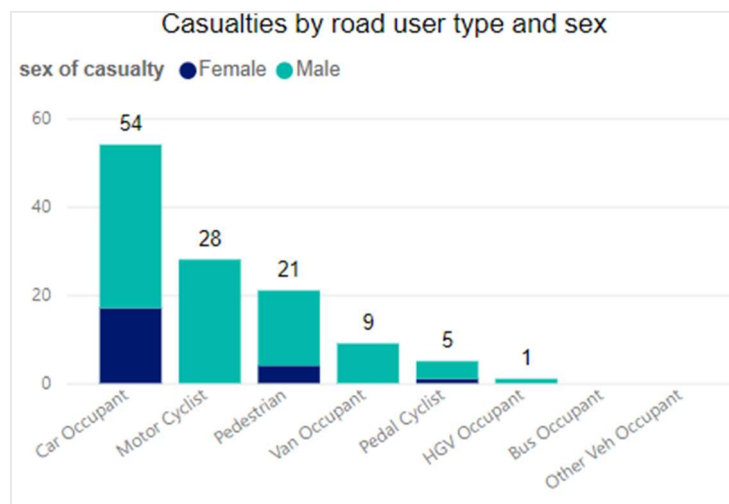

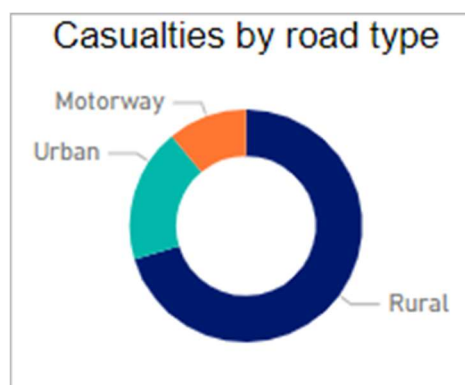**Figure 25 – Casualties by road user time (DfT)**

Figure 26 – Casualties by road type (DfT)

Figure 27 below shows that the proportion of those Killed Serious Injuries (KSI) casualties in the most deprived decile has increased over the last 10 years while the proportion of KSI casualties in the least deprived decile has dropped. Therefore, the gap between the most deprived and least deprived decile has increased over time, clearly demonstrating a widening inequality.
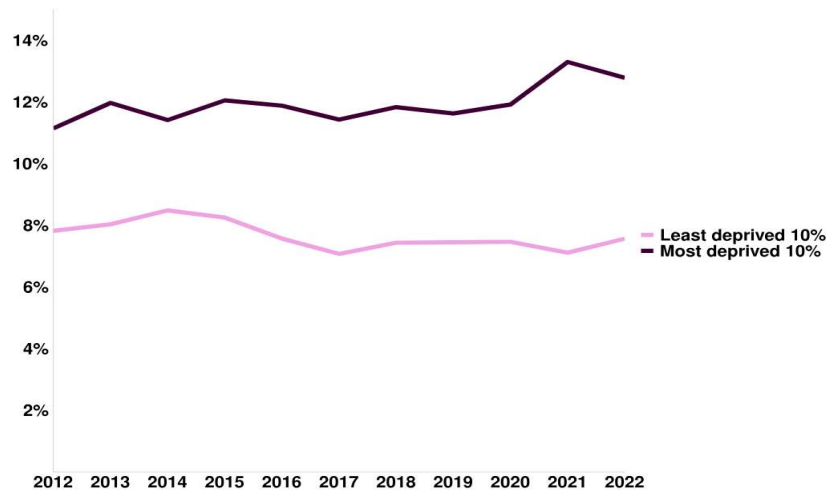

Figure 27 - Percentage of KSI casualties living within the least or most deprived IMD decile, 2012 to 2022 England only (Department for Transport 2022)

Road accidents are also disproportionately higher in deprived areas in comparison to less deprived areas. This highlights the need for targeted interventions and further considerations on infrastructure in more deprived areas. See figure 9, page 9, for areas of deprivation across Leicestershire.

Design factors relating to provision of green infrastructure or other built assets can provide opportunities for crime to take place. Areas such as communal car parks could present issues with regard to safety. However, factoring this into planning discussions early on, could help mitigate this though the addition of safety measures.

Principle 6 of the LHDG asks that designers consider designing out crime as part of a highway scheme and signposts to best practice and national guidance. It also directs designers to the current guidance documents "Designing out Crime" and "Safer Parks - Improving access for women and girls", showing a commitment to national best practice and a recognition of the needs of different groups.

Proposed guidance facilitates the creation of attractive environments that are safe, and feel safe, by signposting to best practice national guidance and providing guidance on the provision of green infrastructure. The delivery of highway design approaches that design out crime and create positive spaces is dependent on adoption of principles by designers. LCC's ability to influence design is largely restricted to roads we are being asked to adopt.

The primary role of highway street lighting is to ensure that the risk of accidents involving highway users is minimised and is not associated with personal safety. However, the provision of street lighting may improve perceptions of safety for communities. LHDG guidance ensures

that appropriate highway lighting is provided for the development and that the lighting meets the required standards. Additional lighting can be provided at the developer's cost to manage personal safety issues where this is considered to be appropriate.

Recommendations

1. Designers should reflect on issues relating to natural surveillance, access control (physical and symbolic barriers to opportunities for crime), territorial reinforcement (defensible space) and space management. Developers should be encouraged to refer to current best practice guidance documents such as "Designing out Crime" and "Safer Parks - Improving access for women and girls".

2. Proposed guidance must support the creation of attractive highway environments, including the provision of appropriate green infrastructure that do not create opportunities for crime.

3. It is recommended that the LHDG explicitly states that highways must be safe and functional and help contribute towards high quality development. Highways should be adaptable to prevent them from becoming unused in the future; spaces should be designed to be able to change to meet new requirements.

4. Developers must consider safety aspects for different protected characteristics, as crime and fear of crime have varying differences across specific groups.

5. Road traffic accidents and related outcomes are disproportionately higher in more deprived communities. This highlights the need for targeted interventions and further considerations on infrastructure in more deprived areas and should be considered within the LHDG.

6.9 Energy Use, Waste Minimisation and Climate Change

This section will look at how the LHDG will impact on energy use, energy efficiency and waste, as well as looking at the possibility of carbon emissions and waste minimisation.

Description of Impact

A comprehensive highway design guide has the potential to significantly impact energy use, energy efficiency, and waste management, while also addressing carbon emissions and waste minimisation. Environmental issues are inherently complex and interconnected, requiring a holistic and integrated approach, however by incorporating environmentally sustainable design principles, the guide can lead to positive outcomes in these areas.

National Highways state that the latest climate projections for the 2070s suggest that the UK may face several environmental challenges, including:

- Increased winter rainfall and more intense summer rainfall events.

- Summer temperatures could rise by 0.9 to 5.4℃ under a high emission scenario.

- Rising sea levels, particularly affecting the southeast of the UK.

- Potential increases in wind speed in the latter half of the century.

Climate change presents significant health challenges, making it a critical public health concern. Rising global temperatures contribute to more frequent heatwaves, leading to heat-related illnesses and increased mortality, particularly among vulnerable groups like the elderly and those with pre-existing health conditions. Extreme weather events, such as floods, disrupt food and water supplies, displace populations and heighten the risk of injuries and infectious diseases. Warmer temperatures also expand the habitats of disease-carrying vectors like mosquitoes, increasing the spread of malaria, dengue and Lyme disease.

Air pollution, worsened by climate change, impacts respiratory and cardiovascular health, contributing to conditions like asthma and heart disease. The mental health impacts, including anxiety and PTSD, are also linked to the stress from climate-related disasters.

In addressing these challenges, the influence of highway design becomes crucial. Sustainable highway design, as guided by policies like the Leicestershire Highway Design Guide, promotes active transport, reduces emissions and mitigates urban heat islands, contributing to healthier environments. Integrating climate resilience into infrastructure planning can therefore help reduce the health impacts of climate change.

A well-designed highway guide can significantly enhance active travel by improving the infrastructure for walking, cycling, and horse-riding along and across the road network, as described in sections above. By providing better facilities that connect seamlessly with other transport networks, the guide should ensure that active travel options are safe, convenient, and accessible to all users. This not only encourages healthy and sustainable travel but also boosts public health by improving access to green spaces and recreational areas. Working closely with organisations like Active Travel England, which oversees local active travel delivery, ensures that investments in active travel are maximised and that infrastructure is developed in a way that meets the needs of the public and stakeholders, whilst also helping with carbon and climate change mitigation.

Energy optimisation across the highway network should be a priority, and developers should strive to be resource-efficient with a comprehensive understanding of material flows throughout the lifecycle of its activities. Additionally, efforts should be made to minimise the environmental impact of material purchasing decisions.

Leicestershire County Council is firmly committed to achieving Net Zero Leicestershire by 2045, recognising that this ambitious target requires a collaborative effort involving residents, businesses and various sectors across the county. The council's strategy acknowledges the challenging yet feasible pathway to net zero, emphasising the urgency of swift and comprehensive action. Key focus areas include transport, building and energy, resources and waste, business and economy, community, and nature and land use.

The Leicestershire Highway Design Guide, which plays a crucial role in shaping sustainable transport infrastructure, will play a significant part in this Net Zero journey. By promoting low-carbon, affordable transport options, the guide supports the council's goal to reduce emissions in the transport sector. The guide's principles align with the broader net zero strategy by encouraging the development of pedestrian-friendly, bike-friendly and public transport-oriented communities, which help reduce reliance on fossil fuels.

The council's strategy also highlights the importance of integrating carbon reduction efforts with other environmental objectives, such as enhancing biodiversity and improving climate resilience. Investment and policy support from all sectors are essential, with a focus on reducing demand for energy, transitioning to low-carbon energy sources and fostering a circular economy. The action plan sets out specific initiatives to guide these efforts, with a strong preference for sustainable solutions that directly reduce emissions. Through comprehensive and coordinated efforts, the council aims to foster a safer, healthier, and more sustainable future for Leicestershire.

The mitigation or prevention of carbon impacts of transport projects across their lifecycle is incredibly complex. Knowledge about how this can be achieved, and the impacts of mitigation properly assessed is still in the early phases of development.

Transport infrastructure, particularly road building, significantly contributes to greenhouse gas emissions through various direct and indirect sources. These emissions arise from construction activities, including land preparation, the embodied carbon in materials like concrete, asphalt, and steel and the use of construction vehicles. Additionally, road projects often require tree felling, which reduces carbon capture, and ongoing maintenance, roadside lighting and increased traffic volumes further exacerbate the carbon footprint. The construction of new roads can induce additional traffic, leading to more carbon-emitting activities and car-dependent developments, such as manufacturing plants, housing estates and business parks, which are often located in areas inaccessible by public transport.

To mitigate the carbon impacts of road building, several strategies could be employed. These include the use of ultra-low emission or electric vehicles for maintenance and support work, reducing reliance on carbon-intensive equipment and incorporating emissions standards into supplier contracts. Energy-efficient lighting for roadsides, tunnels and signage, along with tree planting near major projects, can also help offset emissions. Additionally, the long-term shift to electric vehicles, coupled with integrating the Strategic Road Network with active travel and public transport options, is essential for reducing the overall carbon footprint of transport infrastructure. Principle 7 within the LHDG captures aspects in relation to climate change and green infrastructure, ensuring materials used in highways constructions are carefully considered for their carbon footprint and longevity. The LHDG also refers to best practice documents, road layout, construction vehicle usage and the inclusion of green infrastructure which will all to mitigate the effects of climate change, whilst also reducing waste.

Recommendations

1. In response to environmental challenges, it is recommended that the LHDG emphasise place-based, environmentally sustainable designs that are sensitive to their surroundings. This approach should be central to the objective review of road schemes, acknowledging that enhancing the environment through road investment requires close community engagement, careful assessment of the local context, robust decision-making processes and collaborative working practices.

2. When construction is necessary, it should be designed to minimise the environmental footprint, reduce resource use, waste generation and carbon emissions. LHDG principles should be reflective of this.

3. The LHDG should embed principles of circularity, promoting the reuse of materials for their highest value purpose and treating waste as a resource to achieve a more sustainable and resilient infrastructure.

4. Strategies like using ultra-low emission vehicles, reducing carbon-intensive equipment, and incorporating energy-efficient lighting are essential for minimizing emissions and should feature within the LHDG.

5. In line with Principle 7 of the LHDG, which focuses on tackling climate change and protecting the environment, several carbon-related considerations should be prioritised. These include promoting the use of low-carbon materials throughout their lifecycle, encouraging transport schemes that align with active travel principles, and facilitating the integration of green infrastructure within highway projects. To effectively implement these strategies, the guide should incorporate the latest research, work closely with industry experts, and develop comprehensive environmental assessments.

6. Within the LHDG, policies and principles should highlight the need and benefits to source local materials, ensure promotion of materials that are low carbon throughout their life cycle and promotion of low waste developments.

6.10 Access to Public Services

Health inequalities can be driven where there are differences in distribution of resources and services, therefore it should be considered how the LHDG may impact for local services, and the impact on accessing health or social care services.

Description of Impact

As already highlighted, Leicestershire is largely rural in nature. This brings with it challenges in access to public services. As highlighted in sections above, there are challenges around access

to GP services. Access issues also impact on the ability to travel to education sites including schools and further education establishments, secondary and emergency care centres, leisure facilities, libraries and town centres where residents can have their needs met e.g. access to supermarkets.

The move to online services has improved some levels of access to services, however there are certain groups where purely online services are not suitable and could exacerbate inequalities. These groups include older adults and those living in areas of deprivation, with lower educational attainment, who also are less likely to have car access. People living in poverty find it harder to live healthy lives, harder to access NHS services, live with greater illness and die earlier than the rest of the population. Other groups, such as certain disabilities and those where English is not the first language, may also be adversely affected if access to public services was prohibitive. The inverse care law, which has already been cited above, is an important consideration for access to public services, as those that need services the most often have the most difficulty accessing them. Greater illness and less access to care contribute to worse health outcomes – the mortality rate *in the lowest Index of Multiple Deprivation (IMD) decile is almost double that of the highest.*

The LHDG has the potential to influence transport projects that can improve accessibility to key services by providing new opportunities for those using active modes of travel such as cycling and more sustainable methods, such as passenger transport.

Through observations made on planning applications and the assessment of how new connections are made onto the existing highway network, the council can influence enhanced accessibility to key services, which is driven the LHDG.

Ensuring access to key facilities such as health services will be of particular relevance to those with heightened vulnerability to health conditions such as those with disabilities and older people.

Those with low incomes or who are not able to drive due to mobility issues may be limited regarding the travel options open to them. Ensuring access to key facilities such as health services will be of particular relevance to those with heightened vulnerability to health conditions such as those with disabilities and older people.

Benefits in terms of accessibility following delivery of transport schemes can be instant.

Recommendations

1. The development of new LHDG policy regarding the delivery of transport infrastructure should consider how it might impact on accessibility to key resources and services. This might be through the assessment of how new connections are made to the existing network.

2. Best practice technical guidance can help to improve accessibility for less mobile groups or those who do not have access to private cars and this should be considered during the development of the new LHDG.

3. Ensure an appreciation of the inverse care law is given to all new highway development, with developers understanding the local populations and the impact any highways development could have on specific protected characteristic and vulnerable groups.

6.11 Other Considerations

There are other areas which deserve consideration in relation to the LHDG, but which do not easily sit within one of the HIA Theme Areas above. This section shall discuss these specific areas further and provide recommendations.

6.11.1 Suicide Prevention

Suicides can be preventable. Several factors could be addressed through the LHDG to consider suicide mitigation factors. Suicide can often be an impulsive act, therefore putting barriers in place which delays or disrupts a suicidal act can save lives. Ensuring access to means is limited is also important, as this can provide extra time for people to consider their options and may also ensure extra time for help to come. Specific guidance on preventing suicide in public places is available.

Locally, suicide rates have fluctuated over time (figure 28), but in recent time periods there has been an increasing trend. Rates are also significantly higher in men, especially middle-aged men. Suicide rates are also higher in other protected characteristic groups such as disabled people, LGBTQ+ groups and care leavers.
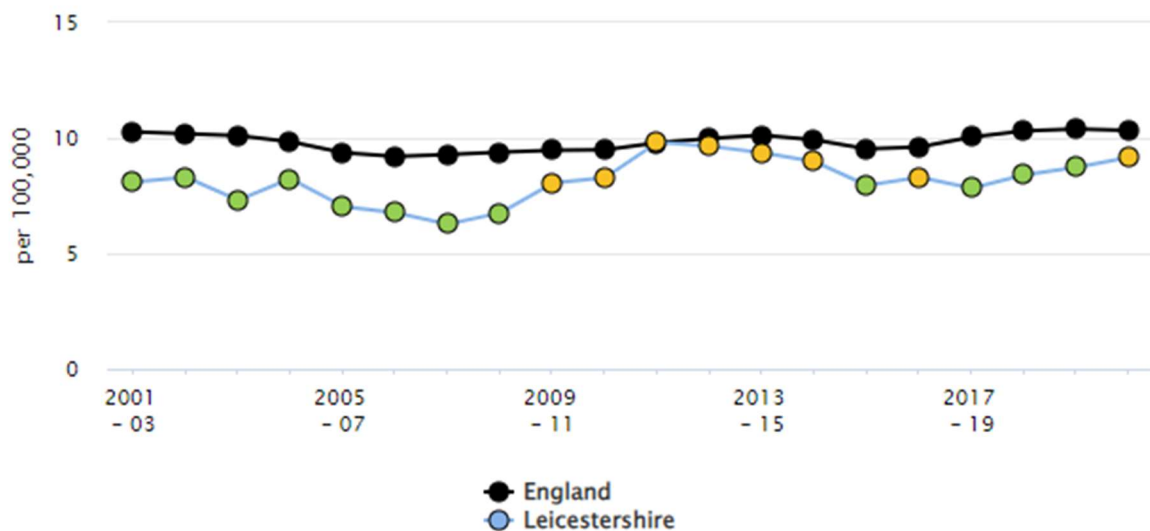

Figure 28 – Suicide rates 2001-2022 (Fingertips)

Although the most common method of death, but locally and nationally, is hanging, jumping from height and jumping or moving in front of a moving object account for around 3-5% and 4% of suicides. Around a third of suicides nationally, and a quarter of suspected Leicestershire suicides occur outside of the home. This therefore provides additional opportunities to intervene and put structural barriers in place to prevent suicides.

Incorporating suicide prevention measures into the design phase of infrastructure projects is not only crucial for public safety but also more cost-effective than implementing such initiatives retrospectively. There are critical design strategies that can help mitigate the risk of suicide at high-risk locations, which includes:

1. Restricting Access to Sites and Means of Suicide

Effective suicide prevention starts with restricting access to sites and methods commonly associated with suicide. Public Health England's 2015 guidance recommends specific interventions that can be integrated into the design of structures such as bridges and tall buildings:

- Raised Parapets: Parapets should be at least 2.5 meters high to deter climbing.

- Elimination of Toe or Foot Holds: Design elements should prevent the possibility of climbing.

- Inwardly Curving Tops: Parapets should curve inward, making it difficult to climb from the inside while allowing easier escape from the outside if needed.

- Barrier Design: Barriers should be designed to be more challenging to scale from the inside, ensuring that individuals can more easily climb back to safety from the outside if they change their minds.

2. Understanding High-Risk Locations

Certain locations are more prone to suicidal behaviour due to their characteristics. Understanding these traits can guide the design process:

- Local Accessibility: High-risk locations are often those that are easily accessible and part of daily life, such as roads and bridges. Suicidal thoughts and impulses can be triggered simply by proximity to these sites.

- Perception of Quick and Easy Lethality: Sites perceived as offering quick, lethal outcomes, particularly those that seem private, familiar, or personally meaningful, are more likely to be chosen.

- Minimal Perceived Harm to Others: Public places where the emotional and physical harm to families upon finding the body is perceived as minimal are also high-risk.

- Seclusion: Suicidal individuals may choose secluded locations to contemplate and carry out their actions.

- Reputation or Cultural Significance: Some sites attract individuals due to their reputation or cultural significance, often amplified by media coverage.

3. <u>Design Elements to Limit Suicidal Behaviour</u>

In addition to raising parapets, other design strategies can be employed to limit opportunities for suicidal behaviour:

- Visibility and Surveillance: Designs that reduce concealment opportunities, such as open layouts and the presence of surveillance cameras, can deter suicidal actions.

- Aesthetic Maintenance: Well-maintained areas, which appear cared for and monitored, can reduce the likelihood of suicides occurring at these locations.

Proactively addressing suicide prevention in the design phase of infrastructure projects is essential. By implementing strategies that restrict access to means of suicide, considering the behavioural patterns of at-risk individuals, and incorporating design elements that discourage suicidal actions, we can create safer public spaces. These measures not only protect individuals but also contribute to a more humane and thoughtful approach to public infrastructure development.

Recommendations

1. Provide developers with access to best practice documents on preventing suicides in public places

2. Ensure the design strategies outlined above feature within the LHDG, or future iterations and updates thereof.

6.11.2 Other groups for consideration

Highway design could significantly impact the lives of **Gypsy, Roma, and Traveller (GRT)** communities, particularly in terms of their ability to access essential services, green spaces and suitable parking facilities. It is crucial to ensure that GRT sites are well-integrated with their surroundings, providing safe and convenient access to local amenities while minimising disruption for both site residents and the broader community. Collaboration between housing associations, local authorities, and GRT communities is essential in this process, ensuring that sites are appropriately located to meet the unique needs of GRT residents while supporting their traditional lifestyles.

The location and design of GRT sites, particularly in relation to major roads and transportation infrastructure, must prioritise the safety and well-being of residents. Given the higher density

of children and the frequent movement of vehicles on these sites, careful consideration must be given to noise, air quality and the risk of accidents. This includes the use of noise barriers, traffic calming measures and appropriate fencing to protect residents from potential hazards. Additionally, parking facilities should be thoughtfully designed to accommodate the high levels of vehicle ownership typical within GRT communities, ensuring easy access and minimising disruption to both residents and the surrounding areas.

Access to green spaces is another vital aspect for GRT communities. Proximity to parks and natural areas not only enhances the well-being of residents but also provides essential recreational opportunities. Connectivity to these green spaces is important, avoiding barriers such as busy roads or industrial zones that could hinder access. By focusing on these aspects, highway design can play a pivotal role in improving the quality of life for GRT communities, fostering a more integrated and sustainable coexistence with the broader community while preserving their cultural identity.

Recommendations

1. Ensure the LHDG considers the range of groups who may be at risk of health inequalities, fully understanding their context and circumstances and working with them to mitigate any health risks.

2. Careful consideration should be given to highways within and joining to GRT sites, ensuring safety measures are factored in and issues concerning noise and are pollution mitigated against.

3. Include a section that promotes consideration of SP through possibly a risk assessment in the highway structures approval in principle document.

7. Conclusion

This Health Impact Assessment (HIA) has identified the potential health impacts relating to the principles within the LHDG. Recommendations and areas for consideration have been identified to reduce negative health impacts of highway design, particularly for vulnerable groups and populations. This will ensure that highway design does not further widen health inequalities and it would be beneficial for future versions of the LHDG to incorporate the findings of this HIA, with future changes being developed utilising up to date information about the local population.

This current HIA has shown that overall, the LHDG is successfully discharging its duty of care to maintain the safety and functionality of all publicly maintained highways in relation to health, and is unlikely to widen inequalities. However, there are some areas for consideration which would make the LHDG more robust in terms of improving health and reducing inequalities. The current HIA has identified several key recommendations to enhance the

health and well-being of communities while promoting sustainable development. Central to these recommendations is the emphasis on integrating high-quality active travel opportunities within new developments, aligning with Principle 5, "Encouraging Active and Sustainable Travel." This requires developers to prioritise the design and construction of durable, low-maintenance active travel facilities, ensuring accessibility for all, particularly for vulnerable groups such as the elderly, youth and disabled individuals.

Social cohesion and safety are also critical, with the HIA recommending that developers consider these factors from the earliest design stages. This includes the use of green infrastructure and designing out crime, referencing best practice national guidance. The LHDG should continue to support creating environments that feel safe and attractive, facilitating community engagement with the highway and ensuring that designs consider the demographics and needs of the local population.

The LHDG is also advised to integrate environmental sustainability into all aspects of highway design, promoting the use of low-carbon materials, energy-efficient solutions and nature-based approaches to mitigate climate impacts. Principles of circularity, such as reusing materials and minimising waste, should be embedded within the guide, reflecting a commitment to reducing the environmental footprint of highway construction.

Furthermore, accessibility and social equity should be at the forefront of highway planning, with a focus on ensuring that new infrastructure improves access to essential services, particularly for those in deprived or marginalised communities. The LHDG should include specific provisions to address the needs of less mobile groups and those without access to private transportation, enhancing overall mobility and reducing health inequalities.

The HIA emphasises that the LHDG should incorporate these recommendations to create a more inclusive, sustainable and health-promoting transport infrastructure in Leicestershire. By doing so, the guide will not only facilitate the development of resilient communities but also contribute to the broader goals of environmental protection, social equity and public health improvement.