Public Health England

INSTITUTE of HEALTH EQUITY

Healthy High Streets

Good place-making in an urban setting

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

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Executive summary

What is a healthy high street?

Healthy high streets can be considered an asset that promotes and improves the health of local residents and the wider local community. They feature good quality design and furniture, providing accessible, safe communal spaces that can be used to create healthier, safer and more cohesive local communities. For optimum health promotion, high streets should:

- be inclusive of people from all walks of life
- be easy to navigate, including crossings
- provide shade, shelter and places to stop and rest
- be walkable and provide options for cycling
- have low levels of noise and air pollution
- provide things to see and do
- have a health-promoting retail offer
- ensure people feel relaxed and safe
- consider the local context of the high street, its features and current use, and how all these factors interact with one another

How high streets can impact negatively on health

Less healthy high streets have high levels of air and noise pollution, cause users to feel or to be unsafe due to crime and degradation, and have non-inclusive design. These factors negatively impact on health directly and through psychosocial pathways (where social factors affect states of mind), leading to a loss of quality of life and to poorer health outcomes.

Specifically, high streets can become cluttered and difficult to navigate, leading to the exclusion of some groups and increasing risks to pedestrian safety. High levels of traffic, noise and air pollution on the high street have direct, negative impacts on health. The rise of out-of-town shopping centres, internet shopping, and car ownership has drawn people away from some high streets. All of these issues hinder successful place-making, have direct and in direct impacts on health, and are not evenly distributed: poor and disadvantaged communities are more likely to live in areas that have poor quality built environments, including local high streets. The unequal distribution of poor-quality built environments contributes to health inequalities in England.

These health inequalities are clearly demonstrated in significant differences in the total life expectancy and healthy life expectancy of the most and least well-off communities in England. Men in the most deprived ward can expect to live 16.5 more years in poor health and 7.4 fewer years overall than men in the least deprived ward. For women, the differences are 11.6 and 4.6 years respectively.

Features of an unhealthy high street are summarised in Table 1, alongside their direct and indirect impacts on health.

Table 1. Features of an unhealthy high street[1]

High street feature	Inequalities	Direct impacts on health	Indirect impacts on health
Lack of diversity in retail offer Section 1.2A	Higher density of payday loan, alcohol, gambling and fast food outlets in areas of deprivation. Impacts on less mobile populations disproportionately.	Increased risk of obesity, diabetes, cardiovascular disease and certain cancers. Higher levels of alcohol addiction and alcohol-related harm and an increased risk of depression, trauma, heart disease and stroke.	Increased likelihood of poor mental health, including depression, cognitive impairment and dementia linked to social isolation. Increased levels of stress and poor mental health associated with financial insecurity. Poor mental health of family members, associated with alcohol addiction and gambling addiction.
Lack of green infrastructure Section1.2B	Deprived inner-city areas have five times less good-quality green space and higher levels of pollution than other urban areas.	Increased vulnerability to heat island effects. Increased risk of cancer, childhood and adult asthma, heart disease and dementia. Lower levels of physical exercise leading to higher risk of obesity, diabetes and cardiovascular disease.	Poorer levels of social interaction, impacting on mental health.
Noise and air pollution[2] Section 1.2C & D	Areas of deprivation have a greater exposure to air pollution and noise than wealthier areas.	Noise pollution: increased stress hormones linked to cardiovascular disease, and increased blood pressure; impaired cognitive function in children; disrupted sleep. Air pollution: increased risk of cancer, childhood and adult asthma, heart disease and dementia; increased mortality and hospital admissions.	Noise pollution: impaired quality of life leading to poor mental health, physical stress, physical inactivity and behavioural and psychological effects. Air pollution: lower levels of physical exercise leading to higher risk of obesity, diabetes, cardiovascular disease and certain cancers.
Litter and area degradation Section 1.2E	Deprived areas experience poorer overall local environments including higher levels of graffiti, fly-tipped waste and litter, associated with low level crime and antisocial behaviour.	Poor mental health and stress-related illness from increased levels of antisocial behaviour, crime and fear of crime. Lower levels of physical activity linked to obesity, diabetes, cardiovascular disease and some cancers.	Poor mental health associated with increased risk of social isolation, including depression, cognitive impairment and dementia.
Road traffic accidents Section 1.2F	Rates of fatal and serious injuries for 5–9 year olds are nine times higher than average in the 20% most deprived areas. Cycling fatalities are higher in the 20% most deprived wards. Risk of injury varies depending on employment status and ethnicity of parents, creating inequalities.	Death and physical injury.	Poor mental health including post-traumatic stress disorder.
Crime and fear of crime Section 1.2G	Higher levels of crime are found in poorer areas and fear of crime in inner city areas. Greater fear of crime is found in black and minority ethnic communities, young people, older people and women. Disproportionate victimisation is experienced by young black men, people with disabilities, and LGBT people.	Substantial and long-lasting physical injury and psychological distress. Depression, anxiety and toxic stress associated with hypertension, cardiovascular disease, stroke, asthma, overweight and obesity. Increase in poor health behaviours linked to cancer, depressive disorders, heart disease, stroke and physical trauma.	All-cause mortality, coronary health disease, pre-term birth, low birth weight and poorer health behaviours such as lower levels of physical activity mediated through psychosocial pathways.
Cluttered pavements and non-inclusive design Section 1.3	Older people, people with physical disabilities, people with reduced mobility and parents with young children are affected the most by cluttered pavements and non-inclusive design reducing opportunities for physical exercise, social interaction and access to health promoting goods and services	Increased risk of obesity related diseases including diabetes, cardiovascular disease and some cancers. Poor mental health including loneliness, increasing the risk of depression, cognitive impairment and dementia, poor health behaviours, coronary heart disease and mortality. Increased risk of trips and falls, and road traffic injury or mortality.	Anxiety, depression and low self-esteem associated with childhood overweight and obesity linked to low levels of physical exercise.

[1] The Table summarises key messages and synthesises links and associations found in the evidence. For further details, including references, please see relevant chapters in the full report, highlighted in the table.

[2] Light pollution has also been highlighted by some planners as an issue, particularly in built-up urban areas, but this specific issue was not covered in our review.

Effective interventions on high streets have the potential to make communities more resilient and to deliver significant quality of life and health benefits to local populations, in particular those who are vulnerable and marginalised.

This report focuses on the following approaches that have been shown to have direct and indirect impacts on health:

1. High street diversity

A diverse offer on the high street can positively influence local populations' health by encouraging active travel (walking and cycling), improving access to healthy produce, and providing greater opportunities for social interaction.

2. Green and blue infrastructure

Green and blue infrastructure – such as street trees, parks and ponds – can have positive impacts in a number of ways, including: promoting biodiversity, removing particulate matter from the air, improving flood risk management, encouraging physical activity and benefiting mental health, providing shade and shelter, reducing the risk of heat island effects, and creating a sense of place.

3. Traffic calming

Streets need to be accessible, easy to cross and safe for people of all ages and of all physical abilities. Traffic calming schemes can reduce the number of accidents by around 15% and can provide a strong stimulus for economic growth through increased footfall, increased likelihood of shop visits, and greater levels of physical activity. Reductions in noise and pollution levels, and an increase in social interactions, also benefit health.

4. Street furniture

Decluttering streets by removing unnecessary street furniture, alongside introducing distinctive landmarks, accessible toilets, pedestrian crossings, seating areas and well-maintained pavements, can improve the experience for many high street users, particularly those who are vulnerable to exclusion. 'Play on the way' interventions, which introduce equipment and spaces designed for children, as well as sensitively used art and symbols, can also contribute to inclusion and community cohesion.

5. Crime prevention and security

Crime and fear of crime can significantly affect footfall and contribute to high street degradation. Crime Prevention through Environmental Design (CPTED) is an approach used to 'design out' crime. Its methods include: promoting local ownership, care and maintenance, improving natural surveillance, balancing access control with permeability (the ability to move freely), and maintaining local areas to prevent further destruction and criminal behaviour.

The evidence presented in this report demonstrates that 'healthy' high streets can support the reduction of health inequalities and promote other desirable outcomes including safety, prosperity and social interaction. However, a greater understanding of how place and people interact is needed, across a broader range of stakeholders, to ensure significant public health and economic gains are realised. The National Planning Policy Framework (NPPF) (2012) provides a useful lever for collaborative action and can help to address the gap between planning and design theory of the built environment, and its practical application.

Summary of recommendations

Directors of public health, and local authorities including planning authorities, should:

1. Work closely with local colleagues, who fund and drive built environment interventions, to ensure opportunities for improving population health are clearly understood and that appropriate action is taken to target areas most in need.

2. Consider how their teams can continue to develop persuasive, evidence-informed, cases that highlight the impacts of the high street on health and how these can be applied locally to inform and assess future health-promoting interventions.

3. Ensure that the regeneration and development of high streets focuses on inclusive design for all, and that opportunities to reduce health inequalities are maximised.

4. Use planning and licensing policies to influence the retail offer on the high street, protecting locally-owned retail stores and tackling over-concentration of certain shops, to conserve retail establishments that stock healthier, locally sourced, products.

5. Ensure plans and strategies for businesses, transport infrastructure and social and community services maximise opportunities for health improvement, particularly for those most vulnerable to health inequalities.

6. Consider how they might encourage and support community groups to be more resilient to change, and individuals more involved in planning, and implementing, health-promoting high street interventions.

Landscape architects, planners and urban designers should:

1. Consider how they can work together, developing a shared understanding of how the evidence base can be translated and applied in design terms, to promote healthier high streets.

2. Consider how the needs and preferences of excluded groups are taken into account, particularly prior to alterations or the redesign of the high street, giving attention to diversity within, as well as between, groups.

3. Work with the local police force, local authorities, businesses and community groups to consider how the Crime Prevention through Environmental Design (CPTED) approach can inform local environmental and high street strategies, in such a way as to also promote health and facilitate walkability.

4. Work with professional and educational design organisations (for example, the Royal Town Planning Institute, Royal Institute of British Architects and the Landscape Institute) to ensure the health impacts of design and landscape architecture are fully integrated into the curriculum.

5. Work with environmental public health specialists to improve air quality and the sound environment.

Introduction

Why focus on high streets?

High streets occupy a distinctive position within communities, operating as both ‘unplanned central places’ (1) and ‘routes for through movement.’ (1, 2) These positive shared characteristics (1, 2) make high streets both attractors of commercial activity, with the potential to positively affect the local economy, and attractors of community activity, shaping the high street’s unique sense of place. As such, high streets can be a critical instrument for economic growth, and the locus for some of the highest levels of social interaction and activity. (3) High streets therefore play an important role in the health of local communities, (4) having both direct and indirect impacts on health.

There is a clear relationship between the local economy and health, operating through a variety of material mechanisms, psychosocial pathways (relating to the way social factors affect states of mind) and behavioural pathways. (5) Improved local economies can provide access to employment, in turn facilitating access to better housing and environmental conditions. Secure financial circumstances also reduce the likelihood of stress and enable improved material conditions, including adequate food and heating. Secure employment and income provide the resources, and sometimes the impetus, to give up health-harming behaviours such as poor diet, smoking and excessive alcohol consumption. (5)

High streets can also enable and encourage people from different communities and backgrounds to meet and become more socially engaged and integrated. This leads to activating communities to create healthier environments in which to build social, environmental and economic capital. These are the building blocks of better health outcomes. Consequently, local high streets should be considered an existing community asset, which can be used to promote and improve health, helping to make the healthy choice the easiest choice.

What is the aim of this report and who is it for?

The aim of this report is to highlight the health impacts of poor-quality high street environments and present the strongest evidence for interventions that can improve them and thus positively influence the health outcomes of local communities. It is hoped that the report will enable a greater awareness and focus on health among built environment workforces, and a greater awareness and focus on built environment interventions among health workforces. It is also hoped that this will facilitate more collaborative working between different sectors and workforces.

The report is aimed at a wide variety of practitioners and disciplines that have an influence, interest or responsibility for the environment of the high street and the health outcomes of local communities. This includes local decision-makers, built environment professionals (for example, planners, urban designers, landscape architects), and public health professionals. We hope the report will also be of use to professionals from other disciplines involved in implementing street design principles with the aim to making high streets more inclusive, safe, and healthy, particularly in areas of high deprivation. We also hope that stakeholders such as

community and faith groups, retailers and businesses using and/or delivering goods and services in the high street, will be interested in this work.

Background: health inequalities

There are significant differences in life expectancy between the most and least well-off communities in England. (6) The latest Marmot Indicators (from 2015) demonstrate that healthy/disability-free life expectancy, or the number of expected years lived without disability, is 54.9 years for men in Blackpool (classified as the most deprived ward in England) and 71.4 years for men living in Wokingham (classified as the least deprived), a 16.5 year difference. For women, the difference in healthy life expectancy is 11.6 years between the same two wards.

There is also a clear difference in life expectancy overall for men and women from the same areas. Men in Blackpool can expect to live around 74.3 years in total, while men in Wokingham can expect to live to 81.7 years. For women, the difference in life expectancy between the two areas – the least and most deprived – is 4.6 years.

These differences in life expectancy and disability-free life expectancy impact on everyone across the social gradient, not just the most deprived, as demonstrated in Figures 1 and 2 below. Everyone below the very top suffers to some degree from unnecessary health inequality.

Figure 1. Life expectancy and disability-free life expectancy, males, based on 2011 Census

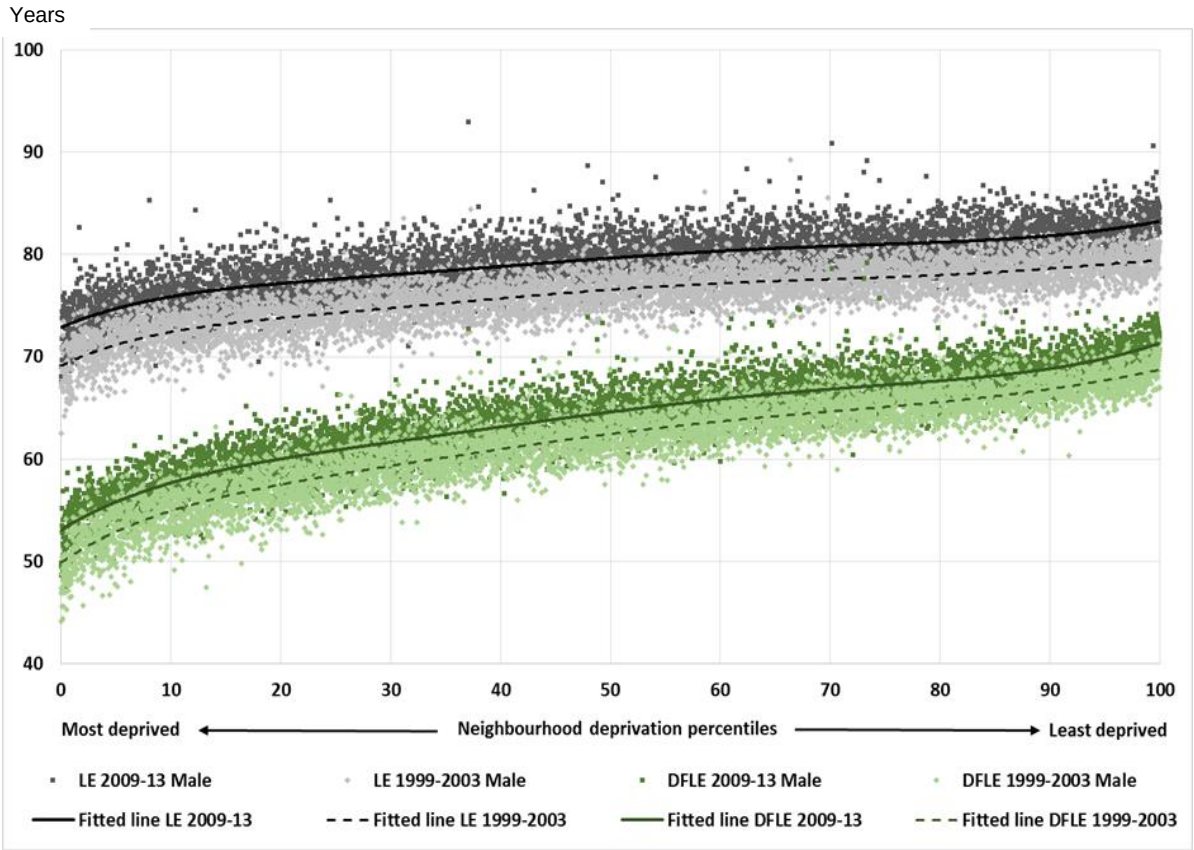
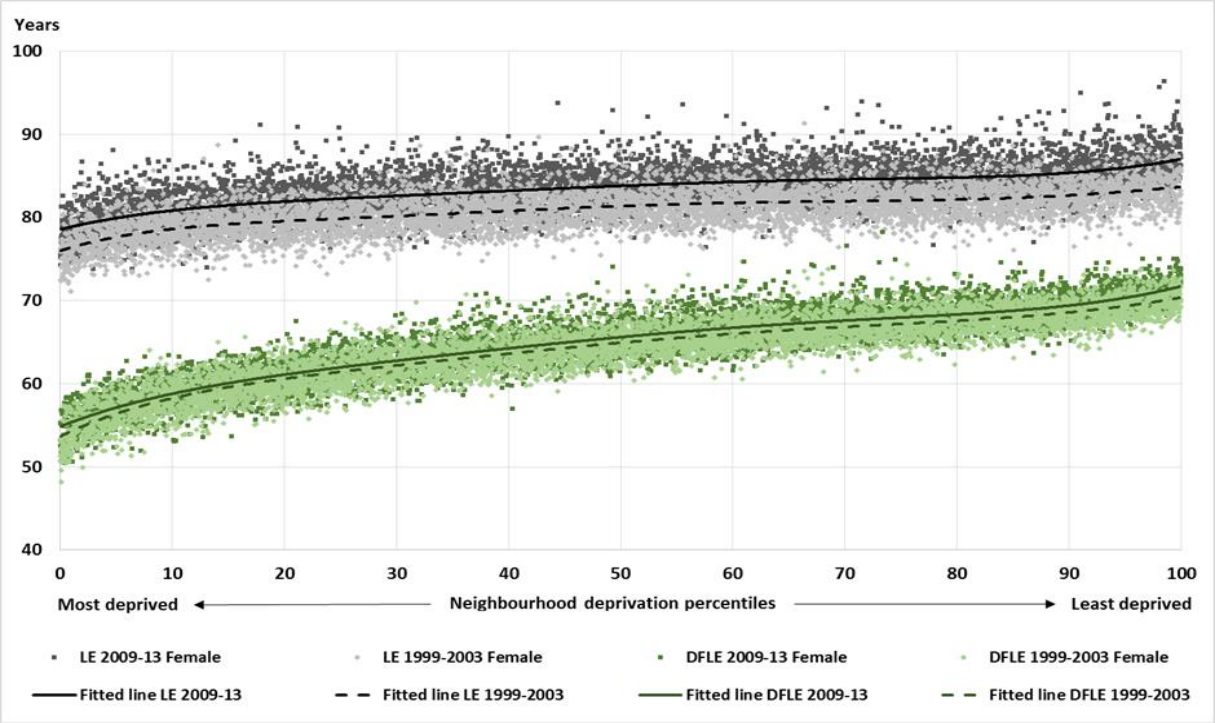


Figure 2. Life expectancy and disability-free life expectancy, females, based on 2011 Census



Addressing inequalities in the social determinants that drive these varying health outcomes would address inequalities in health experienced across the social gradient. This report examines how the high street can be used as an asset to improve the physical and mental health of local communities and reduce health inequalities. (7)

What is a healthy high street?

This report uses the term ‘high street’ to mean the ‘primary commercial street’, or streets, of towns and cities. (2) The report defines a ‘healthy high street’ as: a high street that incorporates aspects of the built environment and its uses which have been shown to be health-promoting, impact positively on physical or mental health outcomes of local populations, and promote easy, inclusive access to a wide range of users..

There has been significant economic and social change in recent years. Some high streets have demonstrated an ability to adapt to this change and remain economically and socially vibrant. (3) High streets that have adapted and are designed well can do much to support the wellbeing of local communities, including: improving the local economy, securing a diverse retail environment, promoting social cohesion, improving mental health, and protecting people from toxic levels of pollutants, risk of traffic accidents and crime. (8-10)

Good quality design and furniture in local high streets, as well as the provision of accessible, communal high street spaces, can be utilised to create healthier, safer, and more cohesive environments. (11) Introducing and enhancing street furniture and communal spaces on high streets, proven to improve the health outcomes of local communities, has the potential to

improve the quality of life for people living in deprived areas, disabled people, older people, and children.

The Royal Society for Public Health has described 10 features that a healthy street environment should include, (4) as follows:

- pedestrians from all walks of life
- easy to cross
- shade and shelter
- places to stop
- people choose to walk and cycle
- not too noisy
- people feel safe
- things to see and do
- people feel relaxed
- clean air

There are other frameworks and indicators, based on different methodologies, that can be useful when assessing local high streets. These include, but are not limited to, the Place Standard Tool, and the Healthy Street Check. (12) The latter, developed by Transport for London, maps and scores 50 indicators, taking a whole street approach, to assess the functioning of local streets and highlight areas for improvement that will impact on the health and wellbeing of the people who use them.

It is worth noting that none of the above indicators or tools considers diversity in the retail offer on the high street, such as having an adequate number of healthy and affordable food outlets and limiting the number of alcohol, betting and payday loan outlets. We feel these are important elements of a healthy high street and should also be considered. Additionally, high streets are not homogenous, and the different local contexts in which they are situated will influence the types of approach used to promote health.

Scope of the report

This report synthesises the latest and most relevant evidence for local decision-makers, planners, urban designers, landscape architects and other professionals involved in creating the high street. It provides street design principles that are effective in making high streets more inclusive, safe and healthy and that promote social integration, particularly in areas of high deprivation. Specifically, the report examines how three important features of the high street can positively impact on social cohesion, and on mental and physical health. These are: good quality street design, street furniture, and provision of communal spaces. High street space needs to be viewed as an existing community asset that has the potential to build and improve social networks, activate community activity and promote healthy activity. This will ensure that high streets can become ‘building blocks’ of good health and contribute to reducing health inequalities between, and within, communities.

With this in mind the report:

- describes inequalities in access to healthy high streets, communal areas and the impact that the differential access has on health outcomes

- presents the strongest evidence for the most effective street design and community space interventions, relating to local high streets, that promote social integration and address the health and wellbeing needs (as described above) of local residents
- provides recommendations aimed at town planners, urban designers, architects and local decision-makers and commissioners to enable them to work together, engage with communities, design, build, and create attractive high streets that have a positive impact on physical and mental health, promote social cohesion and support reductions in health inequalities

In scope

The report provides a rapid assessment of evidence relating to pedestrian-friendly, healthy high streets, in urban settings, with specific reference to design interventions and street furniture, including:

- traffic calming and management
- lighting
- seating
- crossings
- pavement width and quality
- shelters
- green space, infrastructure and street planting
- blue space and water features
- other street furniture that has been evidenced to have an impact on improved health outcomes
- communal areas
- pedestrianisation
- mixed uses

Evidence relating to both children and adults is considered, alongside groups that may have specific needs or preferences such as older people, younger people, disabled people (considering specific impairments where relevant) and different ethnic groups.

Out of scope

The report does not involve a systematic evidence review drawing on meta-analysis, reviews and individual studies. Assessment of the evidence relating to housing or residential-only streets has not been reviewed. Evidence relating to improved walkability and cyclability of high streets is assessed, but a full assessment of the health benefits of active travel has not been completed as there is already much evidence in existence. Similarly, there is a wide range of evidence relating to the retail and economic functions of the high street. Although this is relevant to the report, it is not the focus. However, issues relating to the importance of mixed use development in relation to the health of high streets is assessed. Evidence relating to parks, green space and communal areas that are not integrated into the high street has not been reviewed.

Assessment of evidence relating to rural areas and to low- and middle-income countries has not been included. Evidence relating to light pollution has not been assessed, and we recognise this as a limitation of the review.

For more information on the report's methodology, please see Annex 1.

Part 1. The high street as a determinant of health

The following sections (1.1 – 1.3F) examine inequalities in access to high streets that are inclusive and health-promoting, some of the direct and indirect mental and physical health impacts of specific aspects of the high street, and how these affect the social gradient in health.

1.1 Socioeconomic status, areas of deprivation and harmful environmental conditions

Inequalities in access to good-quality high streets

In England, people living in deprived urban areas are disproportionately affected by harmful environmental conditions. (13) These can include high streets that are badly designed, lack diversity, are under-resourced and do not promote improved health outcomes. The Commission for Architecture and the Built Environment (CABE) has noted that 'poor and disadvantaged people are far more likely to live in poor quality environments' where 'social, cultural and economic inequalities are still literally being built into new places.' (14)

In 2007, CABE conducted research (15) assessing the quality of the pedestrian environment on 10 high streets in London. The assessment used categories such as: security, inclusion of dropped kerbs, smooth, clean and well drained surfaces, sufficient and appropriately placed crossing points, a lack of graffiti and evidence of antisocial behaviour. Relatively high variations were demonstrated between the best and worst quality designed high streets. Three out of the four poorest quality designed high streets were found in some of the poorest boroughs and areas in London (Brent, Ealing, and Walworth in Southwark). (16)

Drivers of poor-quality high streets

High street conditions are influenced by the availability of funding and whether alterations to street design and furniture are made to consider the needs of all community members, including: the elderly and disabled, people from black and minority ethnic communities, families, children and young people.

However, high street design and management can lead to the exclusion of these groups if they are not consulted and considered. Pavements and walkways can lose aesthetic appeal and become cluttered with unnecessary and badly designed street furniture, if their use is not reviewed regularly for relevance to local context (17) and the needs of local people. (18, 19) The prioritisation of motorised transport over pedestrian needs can also make high streets difficult and unsafe to navigate.

Changing retail habits in recent years have compounded these issues. An increase in internet and city centre shopping, and the development of large out-of-town shopping malls, has resulted in the closure of many high street shops. This can lead to investment in high streets suffering in comparison with investment in out-of-town shopping centres. (2)

These environmental and social conditions can provide strong signals of social and economic problems. Lack of a relevant offer on the high street, fear of crime and unattractive and degraded streets and shop fronts, can all result in people withdrawing from local high streets. (20)

Poor-quality high streets and health

Poor design and a lack of diversity on high streets can have a direct influence on physical and mental health outcomes. High levels of traffic, crime and fear of crime, lack of access to health-promoting food and services, and inaccessible design can directly impact on health. Increased exposure to air pollutants, risk of trips and falls, injury and poor diet, also have a direct impact on health, leading to poorer health outcomes and higher mortality rates. (20) (21) (22) Poor neighbourhood conditions have also been associated with poor mental health, including feelings of 'misery, despair and hopelessness' that reduces overall wellbeing and self-efficacy. (23)

High street design can also affect health outcomes indirectly. Rundown or inadequate communal areas, shelters, seating and focal points, can deter people from visiting or spending time in high streets and prevent community activities that enable people to integrate socially. This can increase the risk of social isolation and reduce the likelihood of community cohesion. Social isolation and loneliness can impact negatively on mental health, increasing the risk of depression, anxiety, cognitive decline and dementia. (24) Neighbourhoods that are perceived to be less safe have lower levels of volunteering, socialising and trust in others. Communities with high levels of trust, social engagement and support are positively associated with health. This relationship appears to be interrelated: that is, good health predicts trust, and trust promotes good health. (25, 26) (11)

1.2 Unhealthy high streets – inequalities in exposure and direct and indirect impacts on health

1.2A Lack of variety and poor retail offer

This subsection focuses on retail, examining how a lack of variety within the retail component of the high street can impact on the economy and health of local communities, and the ability to create a unique sense of space.

Access to healthy food
In some areas, particularly those with high deprivation, there has been a rise in 'clone towns', where small, independent, local retail businesses are undermined by a proliferation of major chain stores, charity shops, 'pay day' loan outlets, and fast food outlets. (27-30) These factors can influence the health of local communities in a number of ways.

For instance, 'food deserts'[3] (31) are known to occur in some areas of deprivation where smaller independent food retailers have failed to flourish. This is, in part, due to supermarket

[3] Food deserts are defined as areas of poor access to the provision of healthy affordable food

competition which favours car-owning customers with stable incomes who complete larger shopping loads in a single trip away from the local high street. This undermines the potential success of smaller independent shops on the high street. The closure of smaller independent food retailers within walking distance of local residents impacts disproportionately on low-income, older and less mobile customers, (32) and can increase the risk of food poverty and of overweight and obesity. (20) There is also strong evidence that the density of fast food shops that sell produce that is high in fat, salt and sugar content increases by level of deprivation. (30)

Food poverty is the inability to afford, or have access to, food that makes up a healthy diet. The health impacts of food poverty are wide ranging and follow a social gradient. Food poverty and poor nutritional intake are significant risk factors for cancer, diabetes and coronary heart disease within the UK, and are estimated to represent 30% of life years lost to early mortality and disability. (33)

Food poverty can also increase the prevalence of dental caries in children, the risks of trips and falls in older people, the risk and incidence of low birthweight, and childhood morbidity and mortality. (33) Children from lower socioeconomic backgrounds are at a higher risk of becoming overweight and obese. (34) Obesity for women in social class V is twice that of women in social class I,[4] and diabetes is 1.5 times more likely to develop in those in the most deprived 20% of the population than in the rest of the population. (33)

Alcohol outlets

The density of some other retail outlets can also impact health. A number of studies have demonstrated links between a high number of alcohol outlets and higher levels of addiction (35) and harm. (36-38) Causal links have been demonstrated between patterns of drinking and the amount people drink; for example between regular binge-drinking and over 60 different medical conditions, including cancer, depressive disorders, heart disease, stroke, and physical trauma. (39)

Having a high density of alcohol outlets in areas of deprivation, in addition to a higher density of ‘pay day’ loan outlets and betting shops, has the potential to offset the benefits of creating more health-enhancing environments, such as walkable environments. (40)

Payday lenders and betting shops

Payday lenders, companies that provide small loans for short periods of time but with high repayment interest rates, favour disadvantaged inner city and urban areas for their premises. They often occupy empty premises left behind as other retailers either close down or move to out-of-town shopping centres. (41) The withdrawal of the main banks from the high street, (29) particularly in disadvantaged areas, has increased the risk of poorer communities using the services of pay day lenders and experiencing financial difficulties. (28)

Financial difficulties, including personal debt, independently predict an increased risk of depressive symptoms, including suicidal thoughts. (42) Poverty and debt are also linked to poorer physical health, including cardiovascular disease and all-cause mortality. However, the

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where the population is characterized by deprivation and compound social exclusion.

[4] Social class grades are described as follows: Class V: unskilled occupation. Class IV: partly skilled. Class III M: skilled manual. Class III N: skilled non-manual. Class II: managerial. Class I: professional.

level of harm is mediated by several factors including age, gender, income, family structure and type and size of the debt. (43-45)

Similarly, betting shops tend to cluster in some of the most deprived areas and in recent years there has been a significant increase in the number of B2 gambling machines (by 51%, from 16,380 in 2006/07 to 32,000 in 2011). (46) These machines allow high stakes (up to £100) to be placed on bets that take 20 seconds to provide a result, enabling people to lose large amounts of money quickly. (47)

Evidence has also demonstrated that B2 gambling machines have a 'statistically significant' association with problem gambling. (48) Specific groups are more vulnerable to gambling and these include young people aged 16–24, Asian and black British communities, people who are unemployed, people whose parents are regular gamblers, smokers, those who are already heavily engaged in gambling, and those who rate their general health as bad or very bad. (49)

Harm from gambling occurs either sequentially or in parallel. Harm includes financial harm, harm to family relationships (including intimate partner violence), emotional or psychological distress, reduced performance at work or study, increased risk of criminal activity, feelings of lack of control around behaviour or circumstances, feelings of insecurity or lack of safety, and feelings of shame and stigma. These issues can create mechanisms or pathways for poor health behaviours, including poor sleep practices and non-compliance with medication routines. This is in addition to the more sedentary lifestyle that excessive gambling can promote. Short-term impacts include headaches from excessive screen time, and longer-term impacts include increased blood pressure, diabetes and depression. (50) (46)

Night-time economy

Over the past 20 years a striking aspect of many British cities has been the rise of the night-time economy, which has provided business and leisure opportunities, as well as local employment. This can create a vibrant night-time scene which is attractive to many local residents. However, an over-proliferation of pubs, night clubs and bars can raise noise levels, increasing stress and disturbing sleep (51, 52) (see section 1.2D).

Reduction in residential use

Another changing feature of the high street has been a reduction in residential use. A lack of residential use within predominantly commercial streets can raise concerns for safety, particularly when they are not in use at night, and there is a lack of natural vigilance on the street. Community safety and levels of perceived and real crime also have direct and indirect impacts on population health (see section 1.2G).

1.2B Green infrastructure

Green infrastructure refers to multifunctional green space in both urban and rural areas. It can include open spaces, parks and playing fields, woodlands, allotments, private gardens, street trees, and wall and roof planting. (53) Green infrastructure has the dual, and interlinked, potential to contribute to the health of local populations and the environment.

Urban green space declined between 2001 and 2016 from 63% to 56% of urban areas in England. (54) People living in deprived inner city areas have access to five times less good-

quality green space (55) than people living in affluent areas, who are more likely to have access to green space and to be physically active. (20)

A lack of green infrastructure in deprived urban areas leaves local populations vulnerable to environmental risks, such as 'heat island' effects, flooding, intense microclimates and high concentrations of air pollution (see section 1.2C), (56) in addition to increasing the risk of physical inactivity.

1.2C Air pollution

Poorer communities and their high streets experience higher levels of pollution, (57) as a result of industrial and traffic pollution, than more affluent communities. In England, higher air pollution levels are found in the most deprived 20% of neighbourhoods, specifically 1.5 µg per cubic metre[5] more PM10[6] and 4.4 µg per cubic metre more nitrogen dioxide (NO_2) after adjusting for other factors. Some of the biggest differences related to socioeconomic status are found in London. (58)

Further research has found geographical variation in expected exceedance of recommended levels of NO_2 and PM10. A study analysing the relationship between air quality and area deprivation in five pilot areas (London – all boroughs, Birmingham City District, Glasgow City District, Belfast and surrounding districts, and Neath Port Talbot District) found that there was a correlation between exceeding levels of NO_2 and PM10 and areas of deprivation in all the pilot areas apart from Glasgow, which had an inverse relationship. (59)

Air pollution has a detrimental impact on health, particularly cardio-respiratory mortality and morbidity, (60, 61) and has been linked to cancer, childhood and adult asthma and heart disease. Emerging outcomes include obesity, diabetes (62) and an increased risk of dementia. (63) However, more research is needed in those areas. Public Health England estimates that 25,000 deaths every year are attributable to fine particulate matter in England. (64)

1.2D Noise pollution

Guidelines established by the World Health Organisation (WHO) recommend people are exposed to less than 55 A-weighted decibels (dB(A)) to avoid high annoyance in outdoor living spaces, and less than 30 dB(A) in bedrooms during the night for good quality sleep. The same guidelines also recommend less than 35 dB(A) in classrooms, to enable good teaching and learning conditions. (65-67)

A considerable number of people live in areas where the noise levels exceed those guidelines. (68) Around 10% of the UK population live in neighbourhoods where daytime sound levels exceed 65 dB. About 30% of the UK population express dissatisfaction with the noise levels in their environment. [64] Recent studies have shown that deprived populations are more likely to

[5] The European Environment Agency explains that the concentration of an air pollutant such as ozone is given in micrograms (one-millionth of a gram) per cubic metre of air, or µg/m^3. (See http://www.eea.europa.eu/themes/air/air-quality/resources/glossary/g-m3)
[6] PM10 is particulate matter measuring 10 micrometers (microns) or less in diameter.

be exposed to high levels of pollution and experience worse effects, possibly due to increased vulnerabilities, such as long-term health conditions or poorer housing. (69) Some studies have shown that black ethnic groups tend to live in areas with 'higher than average exposure to noise'. (70) Some inequalities were also found in 'noise exposure associated with deprivation'. (70)

Exposure to noise pollution, including traffic noise, results in a range of poor health outcomes, including increased levels of stress hormones, which have been linked to long-term negative effects on cardiovascular disease and blood pressure. (71, 72)
Excessive environmental noise has also been linked to impaired cognitive performance in children (73) and some studies have found that children in schools close to noise had higher mean blood pressure and lower mean heart rate than children in schools in quiet areas. (74)

Noise can also result in disrupted sleep. (73, 75, 76) Other effects of excessive noise on health are mediated through psychosocial pathways and include: loss of quality of life, impaired mental health, and health effects related to psychological, behavioural and physical stress. (77) There is a growing body of evidence that noise pollution exposure may be linked to metabolic health (78-81) and decreased physical activity (73) (76).

1.2E Litter

There are differences in levels of cleanliness between the most and least wealthy streets in England (including high streets). (82) Deprived areas experience worse overall local environments, including higher levels of graffiti, fly-tipped waste, and litter. (83, 84) Areas with high levels of property abandonment increase risk of ill health by encouraging the dumping of hazardous waste. (85) Cuts to local authority budgets in 2011/12 resulted in cuts in services, including local street cleaning, and there has been a 3% increase in areas considered to be in an unacceptable condition. It is thought that this trend will continue. (86)

Litter is harmful to communities, their economies, and local residents' health. Litter has been found to be associated with antisocial behaviour. Evidence has also demonstrated an increase in trespassing, dropping litter, stealing and other low level crime and disorder in areas that are poorly managed and neglected. (86-88)

Litter can have direct and indirect impacts on mental health. Increased levels of local area crime associated with litter and degradation impact negatively on local residents' mental health. (89)

Additionally, people avoid visiting and spending time in areas that are strewn with litter, resulting in lower levels of physical activity and an increased risk of health issues associated with obesity. (90)

Excess litter also contributes to rat populations, increasing the risk of various diseases including Leptospirosis, Weil's disease, Salmonella and Listeria. (91) (86)

1.2F Road traffic accidents

From 1960 to 2009 deaths from road traffic accidents decreased by 41%, despite car ownership increasing 3% every year during the same time period. (92) However, pedestrian fatalities increased in the UK from 2013 to 2014 by 12%, serious injury by 1.3% and minor

injuries by 3.2%. (93) The number of injuries and fatalities on built-up roads increased by 9.1%, to a total of 783 deaths. (93)

Both international and English data show that there is a social gradient to the risk of pedestrian road casualties, with deprived urban areas often bearing the consequences of the prioritisation of car use as a form of transport. (20) Evidence from France has shown that pedestrian adults under the age of 25 from deprived areas are twice as likely to experience a road casualty than those in more affluent neighbourhoods. (94)

In England some of the latest data (2008 – 2012) shows that for 5–9 year olds, the rate of fatal and serious injuries in the 20% most deprived areas is nine times higher than in the 20% least deprived. Among 10–14 year olds there is a 3.7 times greater rate. There are inequalities in rates of injuries and fatalities for cyclists aged 10–14. Ten cyclists out of 100,000 were killed or seriously injured in the 20% most deprived areas, compared with four out of 100,000 in the least deprived. (95) Further research has demonstrated that inequalities in risk of injury for children depend on the employment status of parents, (96) and family ethnicity. (97, 98)

1.2G Crime and fear of crime

Deprived towns and cities experience more crime than rural areas. (99) Crime rates are also higher in poorer neighbourhoods as there are fewer resources available to protect against crime. (100) (101) Other studies have shown that adults in poor health, on low incomes, and living in inner city areas, are more likely than other adults to be ‘very worried’ about being a victim of crime. (102)

The ‘broken window theory’ (103) suggests that places that are dark and desolate are linked to increased levels of fear, (104) and vacant premises can become ‘crime magnets’. (105) Vacant buildings also attract illegal dumping, littering and vandalism. (106) Community deterioration is also known to make violence more likely. (107)

Crime and fear of crime have direct and indirect impacts on health. Violent crime can result in substantial and long-lasting physical injury, leading to temporary or permanent physical or mental disability, and mortality. Victims of and witnesses to violent crime can experience severe psychological distress, which can also be long-lasting. This can include crime-related post-traumatic stress disorder, depression, anxiety, suicidal ideation and attempts, and substance misuse.

Additionally, fear of crime can have mental health impacts including depression, anxiety and difficulties sleeping. (108) Other research has found that crimes, such as street robbery, can have an impact on mental health and on victims’ social behaviour, including limiting their social activity to minimise the risk of becoming a crime victim again. (109)

Neighbourhood crime has been found to have various indirect impacts on health, mediated through psychosocial pathways, with impacts including all-cause mortality, (110) coronary heart disease, (111) pre-term birth, and low birth weight. (112) Neighbourhood crime can also negatively affect health behaviours by reducing the level of physical activity, including walking, for example. Studies have demonstrated that this is particularly true for black and minority ethnic communities, young people, older people and women. (113-116)

1.3 Unequal access to high streets by groups with protected characteristics and the impacts on their health outcomes

The design, ambience, management and use of the built environment, including high streets, are more likely to have an impact on groups that experience exclusion in other areas of life. They also determine whether disadvantaged people or groups with 'protected' characteristics (for example in terms of age, ethnicity or gender) experience public space as inclusive and welcoming or excluding and threatening. (14)

The factors that contribute to exclusion within communities are complex, multiple and interconnected, including social, economic, environmental and political factors. However, poverty is a key factor that can contribute to the inaccessibility of local high streets to certain groups. In some cases poverty can prevent people from getting to the high street, from identifying with or accessing the high street retail offer. This issue will impact disproportionately on groups who are more likely to experience poverty, including: households led by women, black and minority ethnic communities, and disabled and elderly people. (14)

Additionally, people with disabilities, parents with young children, and older people can find it difficult to access their local high streets, or to navigate the high street once they are there.

These factors increase the risk of social isolation and associated impacts on health outcomes, including: increasing the risk of cognitive impairment and dementia, and levels of stress, anxiety and depression, and reducing levels of physical exercise. The experience of discrimination in the public realm also has a direct impact on health outcomes.

Sections 1.3A–F examine the levels and experience of inclusion or exclusion on the high street for a variety of minority and protected groups, and the relationships with high streets public spaces they have when they are there. In order to ensure high streets are reimagined and developed as inclusive and health-promoting public spaces, planners, architects and policy-makers must first understand the biographies and histories of people and places, and the relationship between the physical, social and political environments that impact on health.

1.3A Black and minority ethnic communities

People from black and minority ethnic (BME) backgrounds tend to reside in greater densities in areas affected by poverty and deprivation. (117) Once settled in an area, ethnic minorities are also less likely to move. While this can provide and sustain access to culturally appropriate social networks and services, religious buildings and common languages, (117) it can also maintain exposure to unhealthy environments found in areas of deprivation, including badly designed high streets and poor air quality.

BME communities and individuals accessing public spaces such as high streets, can experience a range of issues that can result in exclusion from public spaces and result in inequalities in physical and mental health outcomes. For example, 82% of all hate crime recorded is racially motivated and the recorded levels of hate crime based on race has increased recently, rising from 35,944 incidences in 2011/12 to 42,930 in 2014/15. (118) In particular, young black men are more likely to be victims of street crime and more likely not to report crime when it occurs. (109) Toxic stress, or the constant release of 'fight or flight'

hormones which can result from such experiences, has been associated with chronic diseases such as hypertension, cardiovascular disease, stroke, asthma, overweight, obesity, and other poor health outcomes. (119, 120)

1.3B Gender

Women are more likely to take on the bulk of care-giving responsibilities for children, elderly or disabled spouses, and other relatives. This factor can reduce their use and access to public spaces, including high streets. (121) Inaccessible high streets can further limit their opportunities for physical exercise and increase the risk of social isolation and associated health outcomes. (122-124)

Women's experience as victims of crime, including rape, domestic violence and sexual harassment, changes their perceptions of safety in public spaces. (14) (125) This can have an impact on their access to the high street, as women are more likely to restrict their activities due to fear of actual and perceived crime. (126)

Older men between the ages of 65 and 74 are more likely to have worse health than women of the same age, (127) and poor quality design and deterioration of the high street will affect their levels of mobility and access. This is particularly important in relation to opportunities for social interaction. Men are more likely than women to experience social isolation in later years. (127) In this respect, good access to the high street is an important driver for reducing the risk of social isolation and resulting health issues.

1.3C Disabilities

Over 13 million people in the UK have some form of disability.(128) People with disabilities experience multiple causes of exclusion from public spaces, including high streets, and many pedestrian environments do not meet their needs. (129) People with disabilities, including wheelchair users and people who are blind or partially sighted, experience multiple barriers to moving safely and easily through high streets, including poverty and physical barriers. (130-132)

The recorded number of hate crimes against people with disabilities in the UK increased from 1,748 incidents in 2011/12 to 2,508 incidents in 2014/15. (118) A survey carried out with 100 victims of disability hate crime found that 57% stated that they had been attacked on the street. (133) This factor is likely to deter some disabled people from visiting their local high street.

People with disabilities also experience higher rates of health issues that are not directly related to their disabilities, including obesity, diabetes, and poorer mental health. (134) (135, 136)

1.3D Lesbian, gay, bisexual and transgender (LGBT) people

LGBT communities and individuals have specific experiences of public space linked to homophobic and gender identity discrimination. Significant numbers of lesbian and gay people have experienced homophobic hate crime. Nineteen per cent of transgender people have been

physically attacked and 38% have been physically threatened because of their gender identity. (137)

The discrimination experienced by LGBT communities has a significant impact on their health and wellbeing, (138) creating health disparities. Research suggests that these health disparities are linked to discrimination, societal stigma and denial of civil and human rights. (139) Discrimination experienced by LGBT communities has been associated with higher rates of psychiatric disorders, substance misuse and suicide than in non-LGBT people. (140-142) Higher rates of physical and emotional bullying, self-harm, smoking and binge drinking, isolation and extreme vulnerability in older age (143) have also been recorded, particularly for black and Hispanic LGBT groups and individuals. (144) (39) (See section 1.2A on the links between high levels of alcohol consumption and over 60 different medical conditions.) Experience of violence, and victimisation in both public and private space are common for LGBT communities which can also have long-lasting effects on health. (139) (119, 120)

1.3E Older people

The risk of becoming socially excluded increases with age and impairment, as does the proportion of people excluded from essential shops and services. (145) Geographic mobility reduces with age, and so local neighbourhood conditions will have a greater impact on older people as they feel bound to reduce the distance they travel from their home. (127)

Personal safety concerns among older people can act as a deterrent to walking and using public transport in neighbourhoods, particularly at night. Conditions of pavements can also act as a barrier to older people being socially connected, remaining physically active and accessing essential goods and services, such as health care, healthier food, advice and advocacy. This can exacerbate existing health, economic and environmental problems that older people may have, such as poor housing, poverty and social isolation.

Loneliness is a significant issue for a large proportion of older people. Sixty-three per cent of people over the age of 52 who are widowed, and 59% of adults aged over 52 and in poor health, say they feel lonely some of the time or often. (146) Loneliness can have a significant impact on the health of older people, including increasing the risk of cognitive decline, mild cognitive impairment and dementia. (24)

1.3F Children and younger people

There can be a tendency to meet the needs of children and young people in public space separately from those of the wider population, by providing playgrounds surrounded by railings and neglecting to engage young people and children in design and planning. (147) This has resulted in a range of issues for these groups, including a decline in physical activity, reduced sense of security in public spaces, increased fear of danger and a lack of access to amenities. (147)

Declining physical activity can result in an increase in obesity and overweight in children. In 2014, 31.2% of children between the ages of 2 and 15 were classed as either overweight or obese, putting them at an increased risk of developing health problems and increasing the likelihood that they will be overweight as adults. (148)

Type-2 diabetes is now increasing in childhood, as well as other health risks, including: eating disorders in later life, skin infections, asthma and other respiratory problems, and early puberty. (149) The emotional and psychological effects of childhood overweight and obesity include anxiety and depression, low self-esteem and teasing or bullying from peers. Other possible consequences are disturbed sleep and fatigue.

Young people from BME communities congregating in groups or gangs also tend to be stigmatised, within communities and in the media. This has been shown to compound values and attitudes that exclude group members from mainstream society and public spaces. In turn, this can impact on self-esteem, increase the likelihood of involvement in criminal behaviour, and the likelihood of becoming victims of crime, (150) all of which can lead to reduced life chances, and impact significantly on health.

Part 1 In Summary

Part 1 of this review examines some of the direct and indirect mental and physical health impacts of specific aspects of the high street and how these affect the social gradient in health.

In the following section - Part 2, the review will examine the role of UK policy and practice in the design, planning, architecture and use of high streets, and assess evidence for built environment interventions that can have a positive effect on local community health outcomes.

Part 2. Building health into the high street – improving health outcomes through better urban planning, design and street furniture

In this section we examine the role of UK policy and practice in the design, planning, architecture and use of high streets, and assess evidence for built environment interventions that can have a positive effect on local community health outcomes.

2.1. UK policy and practice in urban design, town planning and architecture

Key messages: UK policy and practice

Multiple social, economic and environmental factors have contributed to the demise of some local high streets. Therefore, interventions that focus solely on retail to address the issue of failing high streets will struggle to succeed.

Negative factors include: the rise of out-of-town shopping centres; internet shopping and car ownership has drawn people away from high streets; the price of retail floor space on the high street has risen significantly; perceptions of high streets have changed – they are no longer seen as places to visit and socialise in. (2)

Local motorised transport routes have been prioritised over pedestrians and place-making, increasing levels of traffic, noise and air pollution on high streets. (2) This can also put off would-be visitors, reducing footfall.

A wide range of practitioners and users, as depicted in Figure 3, will need to work together to influence the design, development, use and ongoing maintenance of high streets, to ensure they are reimagined into vibrant community spaces.

The National Planning Policy Framework (2012) will also help to providing leverage for collaborative action. (151) However, there is a gap between planning and design theory of the built environment, and its practical application. Developing better working relationships between the multiple disciplines, departments and practitioners that influence the design, maintenance and use of high streets will help to address this.

Involving a wide range of groups and individuals in the planning and design process of high streets, especially those from more isolated and disadvantaged groups, will contribute to community ownership and cohesion, as well as to ensuring a better overall outcome for high streets. (14)

Focusing on interventions that promote safety, social interaction and cohesion, and develop a sense of identifiable community space, will contribute to the health and wellbeing of local communities.

Many issues can be addressed through smaller changes, rather than wholesale regeneration, helping to retain high streets' familiarity and influence social interaction and cohesion.

It is important to understand the drivers for differences between high streets before addressing the issues that have led to the high streets' demise. This will help inform the development and implementation of built environment policies and interventions aimed at improving high streets and their impact on health. (151)

Local and national policy changes and multiple social, economic and technological factors have driven significant challenges to the traditional local high street. These include the rise of out-of-town shopping centres and prices in retail floor space, online and mobile shopping, the demise of small independent retail outlets and an increase in car ownership. Although the National Planning Policy Framework (described in more detail below) presumes in favour of sustainability and investment in local rather than out-of-town developments, existing out-of-town developments are still drawing communities away from their local high streets. There has also been a changing perception of the high street, which is no longer seen, necessarily, as a place where people socialise and shop. (2)

Findings of and responses to the Portas Review

In the face of the significant changes described above, the Coalition Government of 2011 commissioned the Portas Review, 'An independent review into the future of our highstreets'. (152) The Review noted that, between 2009 and 2011, town centre vacancy rates doubled and over 50% of consumer spending moved away from the high street. The Review went on to describe how high streets can be 'lively, exciting and social places', with the ability to foster a

sense of community, ‘belonging and trust’. The importance of investment in the ‘social capital’ of the high street, and the benefits of looking beyond the ‘purely … commercial mix of retail … to sustainability and wellbeing’ were also noted. (152)

The Review has been criticised for focusing too much on the retail and economic aspects of the high street, (2) and out of 28 recommendations none explicitly addresses the need for good, inclusive design of the built environment. However, one recommendation does advocate that Town Teams should focus on making high streets accessible, attractive and safe.

Recommendations from the Portas Review that refer to the National Planning Policy Framework relate to the need for more stringent regulation of out-of-town developments, in favour of in-town retail provision. The Review also advocates more options for car use and free parking opportunities and for the reduction of business rates for small business. (152) These are all important issues. However, Carmona (2015) (2) argues that the Review ‘missed the point’ and that the complex interaction between the social, economic and physical aspects of the high street cannot be addressed through focusing on reinvigorating the retail aspect alone.

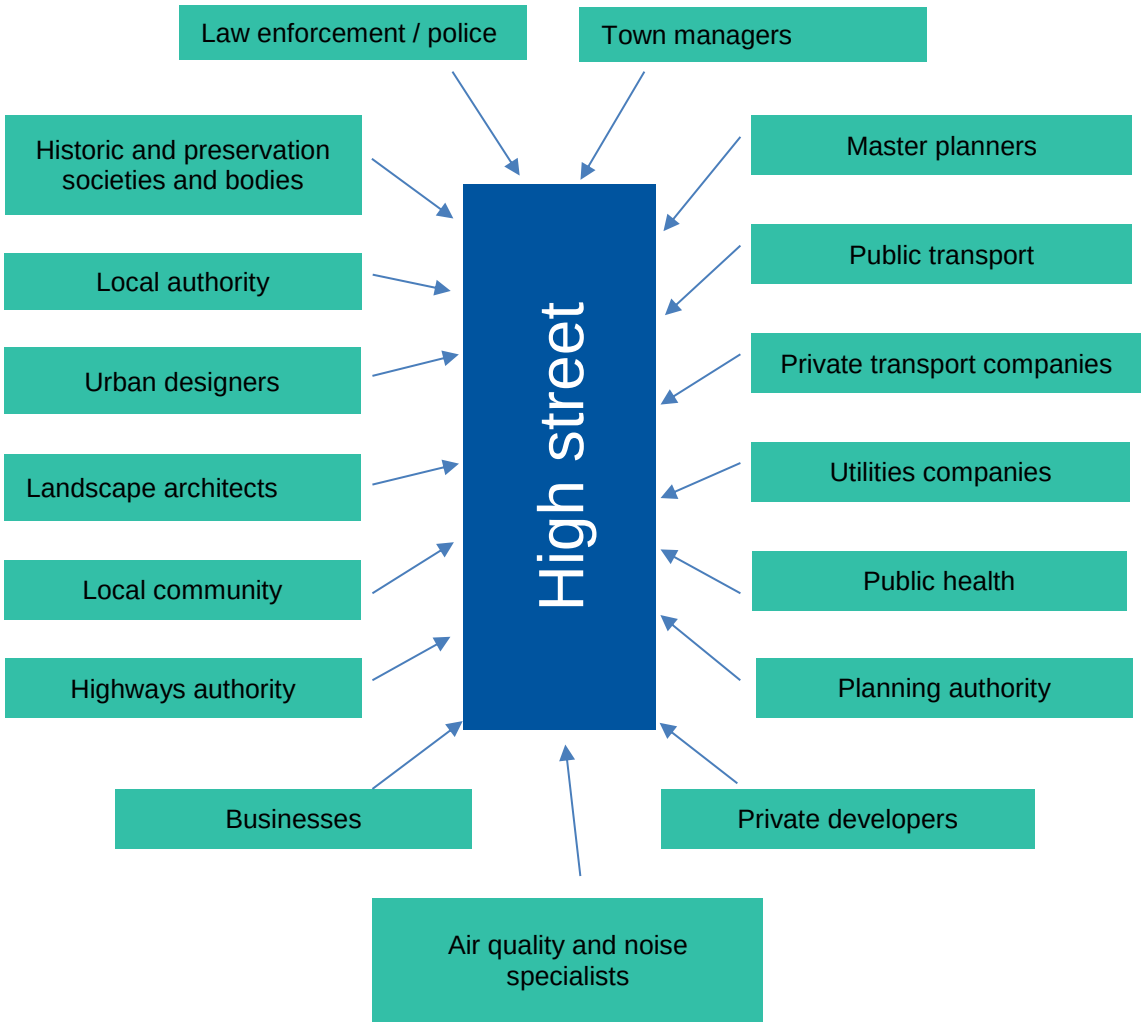
The Government responded to the Portas Review in 2012, acknowledging that high streets were in a ‘fragile state’ and that the closure of just one store could have widespread ramifications for entire towns. The Government accepted and committed to the majority of the Review’s recommendations, but acknowledged that high streets could not rely on retail alone. There was a clear need to ‘go further’. High streets should be less polluted and cleaner, with greener transport and better access for walking and cycling to reduce congestion and improve air quality. The amount of advertising, signs and railings that add to the clutter and difficult navigation of streets should also be reviewed. Consideration should now be given to how town centres look, with high streets reimagined and creatively designed to provide a shared public space that can support both day- and night-time economies. However, local high streets will be familiar to most, if not all of the local community, and it is this familiarity that is important for potential social interaction. Therefore wholesale regeneration is not always the answer. Small-scale changes to improve accessibility can have a substantial impact as well. (153)

There are also wider issues to consider when attempting to reimagine the high street. For example, people who are poor and who have protected characteristics linked to age, ethnicity or disability, are more likely to be affected disproportionately by the issues described above. Within these groups, different people experience the built environment differently, (14) dependent on their needs and how these change through life. Consulting with local groups, and assessing their use of the high street and its built environment, is important to ensure that built environment interventions meet the needs of all members of the community. (14)

The need for collaboration between stakeholders

A wide range of practitioners’ work impacts on high streets, as shown in Figure 3. There is a need for effective collaboration between stakeholders involved in high street design and use, and a need to ensure that local contexts are not overlooked in planning and development. (154)

Figure 3. Diversity in high street design, development, management and use



Source: Adapted from Carmona (2015) (2)

The responsibilities of each of these stakeholders are detailed in the following table.

High street practitioner/user	**Responsibilities**
Town managers	Coordinating initiatives that ensure town centres are desirable and attractive, including those focused on transport, safety and economic growth.
Master planners and town planners	Creation of a framework in which developments are realised, including the relationships of buildings and streets, and potential outcomes of design.
Law enforcement/ police	Crime prevention and community safety, including early intervention and liaison with community groups.
Public and private transport companies	Transport emissions and ensuring transport is inclusive to all passengers in line with the Equality Duty.
Utilities companies	Providing electricity, telephone, internet and gas supply to

	local residents and businesses. Can impact on transport through high streets for pedestrians, bicycles and motorised transport.
Public health directors and other departments	Health outcomes of local communities and implementing interventions that will have an impact on health and health inequalities.
Planning authority	Deciding if new developments, large and small, should go ahead.
Highways authority	Maintaining and protecting public rights of way, including high streets, including removing obstructions. Creating rights of way improvement plans. Duties to consider the needs of users with disabilities.
Landscape architects	Overseeing the design of regeneration schemes, pedestrian schemes and road and retail schemes and coordinating consultation with local residents.
Urban designers	Developing a clear vision for a place and prioritising place-making within urban regeneration plans. Researching and analysing local communities and places.
Local authority	Public safety, waste management and trading standards.
Historic and preservation societies and bodies	Preservation of historic sites and buildings of historic significance. Can act as expert advisers in the development of historic sites.
Businesses	Responsibilities as employers under Employment Law, as service providers under Equalities duties, and environmentally under the EU Waste Framework Directive. Can provide significant investment and influence the design of high streets and contribute to infrastructure support.
Private developers	Developing buildings and private/public spaces for business and residential use.

Best practice in design is an iterative process based on evidence, which should include the designer testing emerging scenarios with individuals and communities. However, this does not always happen. Some street design practice can start with intervention designs and proposals based on practice guidance and assumptions regarding the behaviour of street users. Once the design is complete a consultation process may, or may not, be carried out with local communities. This should include those with specific built environment needs, such as people with disabilities.

This process can mean that crucial information about the current use of the street, or exclusion from it, is sought after the designs have already been drawn up. When this happens, major changes are difficult to implement. (155) Additionally, the potential to promote positive health outcomes during the design of the high street can be lost due to the often fragmented nature of design, planning, policy and use. (156)

The National Planning Policy Framework (NPPF) (2012), and its accompanying guidance, provides a useful lever and framework for collaborative action to address the health and wellbeing needs of local populations. It is underpinned by local policy and provides a useful ‘hook’ to secure funding streams from a broader range of funders, including private developers.

It also enables local authority representatives, or other stakeholders, to legitimately enquire about the health impacts of new developments, proposed built environment or retail changes on the high street.

The NPPF includes specific reference to 'promoting healthy communities' and states in Paragraph 69 that:

> Local planning authorities should create a shared vision with communities of the residential environment and facilities they wish to see. To support this, local planning authorities should aim to involve all sections of the community in the development of Local Plans and in planning decisions, and should facilitate neighbourhood planning. Planning policies and decisions, in turn, should aim to achieve places which promote:
> - opportunities for meetings between members of the community who might not otherwise come into contact with each other, including through mixed-use developments, strong neighbourhood centres and active street frontages which bring together those who work, live and play in the vicinity;
> - safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion; and
> - safe and accessible developments, containing clear and legible pedestrian routes, and high quality public space, which encourage the active and continual use of public areas.

Paragraph 171 states that:

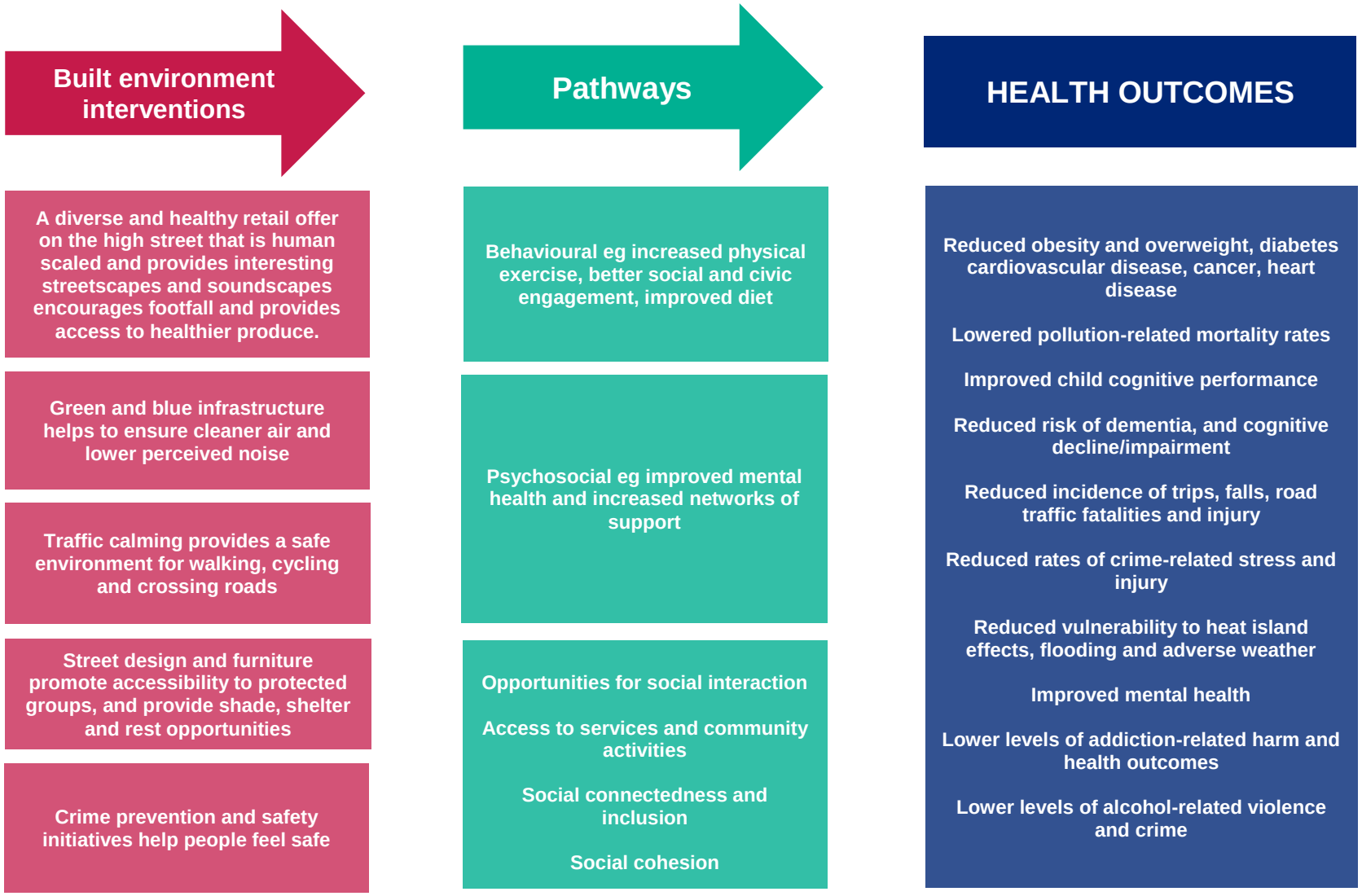
> Local planning authorities should work with public health leads and health organisations to understand and take account of the health status and needs of the local population.

Source: National Planning Policy Framework (2012)

The following sections, 2.2 – 2.4C, provide evidence for high street interventions that are known to have both direct and indirect positive impacts on health, as seen in Figure 4 below. The interventions examined are:

2.2 Developing a healthier retail offer – the benefits of diversity on high streets
2.3 Greening high streets for environmental and community health
2.4 Creating inclusive high street environments through design
    2.4A Traffic calming
    2.4B Street furniture
    2.4C Crime prevention and safety

Figure 4. The positive health outcomes that can result from different built environment interventions



Source: Street features adapted from indicators provided by the Royal Society of Public Health.

Each section examining individual interventions also provides a list of useful resources to support their implementation, including relevant case studies, and links the interventions to relevant Public Health Outcomes Framework indicators.

Useful resources – Assessment and planning of healthy high streets

Spatial Planning for Health – A resource for planning and designing healthier places, published by Public Health England (PHE). An evidence tool based on the findings from an umbrella literature review of the impacts of the built environment on health, which includes practical diagrams that illustrate the linkages, and strength of evidence, between spatial planning and health issues. Available at: https://www.gov.uk/government/publications/spatial-planning-for-health-evidence-review

Re-imagining Urban Spaces to Help Revitalise our High Streets – Focuses on high streets, their potential as urban spaces and how they can be developed to become a destination of choice. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/5987/2185491.pdf

Place Standard tool – Developed by the Scottish Government to facilitate place evaluation. Can be used to evaluate places that are well established, newly developed or undergoing change. It aims to enable conversations about place that focus on both the physical and social aspects of environments, identify community assets and provide a practical framework by which to structure conversations. Available at: http://www.placestandard.scot/#/home

Healthy Streets for London - Sets out how TfL will put people and their health at the centre of our decision making, helping people to use cars less and to walk, cycle and use public transport more. It is also accompanied by the Healthy Streets Toollkit, which is a resource developed to help put the Healthy Streets Approach into practice and which covers the whole process from initial assessment, through implementation, to evaluation. Available at: https://tfl.gov.uk/corporate/about-tfl/how-we-work/p lanning-for-the-future/healthy-streets

People Make Places – A publication from Demos designed to identify the shared spaces of interaction and exchange, the value that such spaces generate and how that value is created. Available at: https://www.demos.co.uk/files/Demos_PMP_Final_02.pdf

Public Health in Planning Good Practice Guide – Developed by the Town and Country Planning Association. A toolbox aimed at local government planning and health officers that provides guidance on how to use the Public Health Guidance Framework to link planning and health at an operational level. Provides a list of key national and London guidance and references. Available at: http://www.housinglin.org.uk/_library/Resources/Housing/OtherOrganisation/TCPA_Public_Health_in_Planning_Good_Practice_Guide.pdf

National Planning Practice Guidance – Provides guidance on how to implement the National Planning Policy Framework. Available at: http://planningguidance.communities.gov.uk/

Manual for Streets 2: Digested Read – Provides case studies and guidance for how the Manual for Streets 1 can be extended to most urban and rural contexts. Available at:

http://www.sustrans.org.uk/sites/default/files/images/files/migrated-pdfs/TIN%2024%20-%20MfS2.pdf

Community Street Audits – Describes how the organisation Living Streets can help carry out community street audits. Available at: https://www.livingstreets.org.uk/what-we-do/projects/community-street-audits

2.2 Developing a healthier retail offer – the benefits of diversity on high streets

Key messages: Diversity on high streets

Mixed-use streets (with a combination of commercial, residential, cultural, leisure and service industries) have been shown to encourage active travel (walking and cycling) (157-159) and social interaction (17, 160-162) by providing a diverse range of amenities clustered in one area. (3)

It is estimated that for every pound spent in a local independent shop that sources local produce, twice as much money is generated for the local economy compared with money spent in a large national or international company. (27)

Mixed-use streets also have the potential to improve diet-related health inequalities by providing access to a range of convenient healthy food outlets and grocery stores. (163) (164)

Principles for implementing mixed-use developments include ensuring building height is on a human scale, enhances the streetscape and creates varied shop frontages that are aesthetically pleasing. This provides visual stimulation and encourages visitors. (165) (166)

High streets can diversify their existing mix of uses through temporary installations such as pop-up cafes, art galleries or parks, to add visual interest, improve ambience and soundscapes (167, 168) and provide a more varied range of uses.

Appropriate planning and design that reflect the needs of local communities can help to promote diversity on the high street. Using the right mix of commercial, residential, cultural, leisure and service industries can promote health through improved local economies, active travel, and better mental health. The following subsections examine some of the evidence relating to diversifying the offer on the high street and its connections to health.

High street diversity and the local economy

Diversifying the offer on local high streets can help them to survive and flourish in times of economic hardship or significant social change (3) by supporting their neighbourhoods economically and providing employment opportunities. Independent, locally-stocked retailers can also help: for every pound spent by customers in locally-stocked retailers, around twice as much is invested back into the local economy. (27) (3)

High street diversity and active travel

High streets with a diverse offer have been shown to encourage mobility through ease of access to clustered and diverse amenities within walking distance of residential developments.

(157-159) Encouraging mobility also has the added benefit of reducing car use and local pollution levels (159) (169-171) and has been shown to be beneficial for mental health. (172)

For adults, the recommended weekly levels of physical activity start at 150 minutes to maintain health, and 300 minutes to prevent weight gain. (173) The right mix of local amenities could help ensure these recommendations are met through a 10-minute walk to and from shops and services, employment, educational or other destinations each day. (174)

High street diversity and diet

A good mix of food 'spaces' within a local community can offer opportunities for local populations to access healthy foods. Diet-related inequalities could be reduced through providing access to a range of convenient healthy food outlets and grocery stores. This helps to support the consumption of the five portions of fruit and vegetables a day, advocated as a mean of reducing the risk of obesity, some cancers and heart disease. (163) (164)

High street diversity and social inclusion

There is strong evidence (17, 160-162) to suggest that diversity in the retail offer encourages social inclusion (3) as local residents meet while shopping, accessing services and leisure activities. Retail outlets that reflect the diverse nature of local populations can contribute to a sense of belonging, improving local identity and social inclusion. (3) Having a diverse retail offer often proves to be more resilient to the economic and social change that has driven some of the demise of the high street. Evidence also demonstrates that promoting and supporting the longevity of culturally-relevant retail establishments helps to build and maintain social relationships with and among retail proprietors. (175) There is also emerging evidence that soundscapes can be used to change behaviour and promote social inclusion. (168) For example, research has found that music can increase the time spent in public spaces, and thus the likelihood of social interaction. (167) Increased social interaction can reduce the risk of cognitive decline, mild cognitive impairment and dementia. (24)

High street diversity and safety

A good mix of space, incorporating residential accommodation above commercial buildings, also has the potential to provide almost 24-hour surveillance, or 'eyes on the street', contributing to feelings of safety. (176) This is examined in more depth in section 2.4C. A diverse range of services on the high street can also provide opportunities for civic activities, increasing social cohesion and community trust. (177)

Diversity can also be introduced by way of temporary installations such as pop-up restaurants, street markets, and pop-up parks, which can also serve to attract more visitors, increase the time spent on high streets, and encourage greater social interaction. Other interventions that enhance community identity are explored in greater detail in section 2.4B.

Useful resource – Diversity on the high street

Rediscovering mixed use streets: The contribution of local high streets to sustainable communities. Available at: https://www.jrf.org.uk/sites/default/files/jrf/migrated/files/2018-mixed-use-streets.pdf

Relevant Public Health Outcomes Indicators (178)

Wider determinants of health
Percentage of people age 16–64 in employment
Social isolation

Health improvement
Proportion of the population consuming the recommended five portions of fruit and vegetables on a usual day
Average number of portions of fruit consumed daily
Average number of portions of vegetables consumed daily
Percentage of physically-active and inactive adults
Admissions to hospital due to alcohol
Self-reported wellbeing
Under-75 mortality rate from cardiovascular and respiratory disease
Successful treatment of alcohol treatment
Admission episodes for alcohol-related treatments
Health-related quality of life for older people

Intervention example 1. Bristol Independents Campaign

Bristol has around 180 specialist independent food shops that are owned by 140 businesses. Around 10 out of 35 of Bristol's wards have no greengrocer, and half of Bristol's wards have no independent food retailers. In recent years many specialist small independent shops have been disappearing despite the fact that they offer competitive prices, do not charge a premium for small volumes purchased, and can cater for individual requests. Many of the small independent shops buy from local suppliers who therefore also have suffered.

In 2011, the Bristol Food Network, Bristol Food Policy Council, Bristol Green Capital and Destination Bristol launched a campaign highlighting the history of independent and diverse high street and shopping centres. This campaign built on initiatives developed by the Food Policy Council and acted on recommendations of the 'Who Feeds Bristol' report, commissioned by Bristol Green Capital, NHS Bristol and Bristol City Council. A clear recommendation of the report was to safeguard the diversity of food retail in the city. A pilot project was launched in eight local shopping centres, which included recipe cards that could be purchased in local independent shops.

In September 2011 the Bristol Independents campaign was launched, encouraging local Bristol residents to support the city's independent traders and businesses by buying, trying and engaging with something local throughout the year. Businesses joining the campaign are locally owned and operated, are run from the individual shop, stall or farm and not from a centralised head office and must demonstrate that products are sourced locally. (179)

Intervention example 2. Pop-up park, Cookridge Street, Leeds

A pop-up park was installed in Leeds city centre during the summer of 2016 using artificial grass, planters, benches and deckchairs to encourage and facilitate families and other users into the town centre for four weeks during the school summer holidays. It increased footfall in the area, particularly at lunch time and in the evenings. Streets leading into the centre were closed to traffic. The park was installed following the successful introduction of a new temporary play space in St Johns Courtyard, including climbable sculptures, benches and plants, and the part-time pedestrianisation of nearby Greek Street. (180)

2.3 Greening high streets for environmental and community health

Key messages: Green and blue infrastructure

The introduction of green infrastructure has multiple economic, health and environmental benefits, including promoting biodiversity, addressing issues relating to climate change, enhancing the aesthetics of environments, and improving the economic value of local areas. (181, 182)

Coniferous trees, planted close to streets and spaced appropriately, have been found to be the most effective in absorbing particulate matter all year round, offering continuous protection throughout the winter months when particulate matter levels can rise. This reduces the risk of respiratory and cardiovascular disease, cancer, asthma and pollution-related mortality. (183) (184)

Urban street planting also provides shade and shelter and reduces the risk of heat island effects. (185-187) (188) (189) This reduces the risk of health issues related to these environmental conditions, including heat exhaustion. (184)

Access to green space encourages greater levels of physical activity as streets become more attractive and inviting to walk, run and cycle in. Access to green space can also stimulate positive psychological and physiological responses, positively impacting on mental health, including better moderation of stress, and reduced hospital admissions for mental health. (190) (191) (192)

Street planting community programmes can contribute to the development of a greater sense of community integration and civic pride. (193-195) (196) (197) Planting can be used to visually

represent different cultures and ethnicities and has the potential to promote social inclusion through introducing relevant symbols into the public realm. (198)

Engaging local groups in the maintenance and protection of street trees is effective for increasing the survival rates of trees and plants. It can also strengthen neighbourhood bonds, and promote social cohesion and capital and a sense of ownership and pride in local neighbourhoods. (199) (200)

Careful planning and consultation is needed to ensure street planting complements the existing street character, is relevant to local groups and has a high survival rate. (201)

Introducing blue space such as ponds is also beneficial to health. Blue space has a restorative effect on health and wellbeing, and contributes to creating a sense of place, encouraging social interaction through focal points and points of visual interest. (202) (203) (204) (205)

Developing or maintaining urban green and blue infrastructure has become more challenging as competition for land use has intensified. Additionally, financial constraints, lack of knowledge about maintenance of urban green space, and the complexities of engaging with multiple stakeholders, have meant that green infrastructure can be an after-thought rather than an integral part of urban infrastructure policy and design. (181, 206)

However, green infrastructure offers an opportunity to positively influence a range of issues relating to the high street, as it is possible to build both green and blue space into existing and future developments. (181) These interventions add value, both aesthetically and economically, to local communities. They also stimulate positive psychological and physiological responses, address issues relating to climate change, and improve biodiversity through providing habitats for rare plants and animal species. (181, 182)

Within the scope of this review we will focus on two elements of green and blue infrastructure that are relevant for the planning and development of high streets:
1. Green space – street trees and other planting, including wall and roof planting
2. Blue space – including ponds and fountains

Green space: urban street planting

Various studies have demonstrated that the availability of more green space within urban areas has both direct and indirect impacts on health. (Section 1.2B described the inequalities in access to green space in urban areas.)

Direct impacts on health:

- **Urban heat island** Around 35,000 deaths in Europe were linked to the summer heatwave of 2003 (207) but deaths in such numbers are avoidable. Studies have shown that adding just 10% more green cover to town centres and high density residential areas reduces surface temperatures. (184) Adding green roofs has been found to have a ‘dramatic effect’ on surface temperatures. (184) Moderate tree shading coverage of around 60% can offset the heat effects of heavy traffic, and can combat heat exhaustion and heat stroke in children and older adults. (188) (189)
- **Particulates** Urban trees can play a significant part in removing particulate matter from the air. (185-187) Coniferous trees, planted close to streets and appropriately spaced,

have been found to be the most effective in absorbing particulate matter all year round, offering continuous protection throughout the winter months, when particulate matter levels can rise. (183) However, if tree canopies are too dense, particulate matter can get trapped. (183) Careful consideration is needed to ensure that size, spacing and species of street trees and planting are considered in relation to the distribution and travel of pollution in the air. (201) Interventions to reduce particulate matter from the air will contribute to reducing the risk and incidence of poorer health outcomes linked to air pollution including cardio-respiratory mortality and morbidity, (60, 61) cancer, childhood and adult asthma, heart disease, obesity, diabetes, (62) and an increased risk of dementia. (63)

- **Flooding** Urban trees can protect from flooding, increasing the rate of rain water runoff through creating channels in the soil from growing roots, while tree canopies intercept rain on their leaves, some of which is then lost back to the atmosphere rather than reaching the ground. Urban trees can increase rain water runoff by up to 60% (208) and can also increase levels in retail or town centres with high building cover by between 11.8 and 14.1%. (184)

- **Wellbeing and physical activity** Access to green space has been shown to offer opportunities for moderating or coping with stress, (190) in addition to reduced hospital admissions for mental health, even when controlling for deprivation and population density. (191) Indirect interactions with nature, for example viewing green space and trees through windows, have been associated with lower blood pressure. (209) (210)

  Street planting also increases the likelihood of walking, cycling and running as environments become more attractive and less polluted. This has direct impacts on levels of obesity, overweight and other health outcomes linked to lack of physical exercise. (192) Walkable green space has been shown to positively influence longevity, even when controlling for age, socioeconomic, marital and baseline functional status. (211) Children who live in neighbourhoods with more green space have lower body mass index (BMI). (20) Links between access to urban green space, improved immunity and reduced incidence of inflammatory conditions such as hay fever, have also been found. The same organisms and processes that support the immune system to cope with inflammation also help to modulate brain development, mood and cognition. (212) Populations living in the greenest environments have been shown to have the lowest levels of health inequality related to income deprivation. (213)

Indirect impacts on health:

- Some studies (193-195) have shown that urban green space, and in particular tree planting, can lead to enhanced social interactions, through provision of attractive community spaces in which to meet and interact. (196) Increased social interactions in public spaces reduce the risk of crime (194) (see section 2.4C).

- Other studies have shown that green infrastructure, in particular the planting of trees, can have the biggest impact on those who are less mobile. This includes those with young families and those who are elderly or disabled. These groups can face the most

barriers to creating and maintaining social ties and as such would experience the most benefit from the introduction of green infrastructure. (199)

- Planting can also be used to bring visual representations of different cultures and ethnicities into the high street, with the potential for promoting social inclusion. (214)

- Consultation with community groups and their participation in planting and after-care engages local communities, encourages involvement in design, and increases the likelihood that plants and trees will survive. (199) Participation has also been found to increase the sense of civic pride and to strengthen neighbourhood bonds. (197, 200)

- There are important caveats to tree and other planting that need to be considered. Careful consultation and planning are needed to avoid working against the original character of the high street or creating stereotypical caricatures of specific groups. (198) Additionally, loss of vegetation through lack of irrigation and care leads to loss of investment, costly reinvestment and several years' delay before trees are mature and provide full benefit.

- Tree roots can pose a risk to the structure of buildings and sidewalks, and there is a risk of subsidence that needs to be balanced with tree planting plans. However, there is evidence to suggest that the cost of pruning trees, and, if necessary, felling to prevent issues of subsidence and subsidence insurance claims, far outweighs the cost of repairs to damaged buildings should they occur. (215)

Blue space

There is a wide range of evidence (216) (217) (202) that demonstrates that urban blue space, including fountains, ponds, canals and rivers, contribute positively to the health and wellbeing of local communities. Water is considered to be one of the most important 'aesthetic landscape elements' (218) and studies have shown that water is a strong predictor for 'preference and positive perception of experience of places'. (205) Blue space also contributes to a unique sense of place and people use blue space to meet and socialise, (219) and find the clarity and sounds of moving water calming and restorative. (203) (202) (204)

There is also strong evidence of the temperature cooling effects of blue space, but from research that focused on ponds, lakes and rivers and other bodies of water not necessarily, or usually, integrated into the high street environment, such as water fountains, pools and urban rivers. (220)

Intervention example 3. Tree carers and tree champions, Hackney

During November 2007 and March 2008 over 500 trees were planted across 28 roads in the London Borough of Hackney. (221) Embedded in the street tree planting programme were initiatives to encourage local communities to collaborate in the selection, management and care of street trees after they were planted.

The programme aims also included reducing air pollution, transforming harsh urban landscapes (over 50% of streets in Hackney had no trees), and increasing the biodiversity of the area through creating green chains for wildlife, habitats and food sources.

The programme consulted informally and through consultation forms with local residents. A leaflet, translated into many languages, advertised for volunteer Tree Champions. Over 180 different species of trees were planted, providing a large variety of native and exotic trees. Turkish community members who became involved in the scheme opted to plant almond trees due to their 'long cultural and emotional connection with Turkey'. (222)

Although the overall management responsibility remained with the local authority, Tree Champions and Carers were encouraged to care for the trees after planting. Stickers asking residents and passers-by to water the trees were installed and watering cans provided, along with information on how and when to water the trees. In some areas it was found that additional planting was initiated by local residents in the newly available planted tree sites, and to date there has been minimal loss (less than 1%) of trees due to damage and disease. (223) (224)

Ashwin Street, Hackney, before and after new trees were planted

Images used with permission of Rupert Bentley Walls.

Example intervention 4: Hemel Hempstead High Street

As part of a £4 million regeneration programme, Dacorum Council in northwest Hertfordshire created a central feature in the main shopping area of Hemel Hempstead consisting of 24 ground-level water jets surrounding a bronze waterplay sculpture. Jets spout in patterns, synchronised to music and colour changing lights. (225) The aim was to attract a broader range of shoppers into the town centre. (More detail can be found on the impact of the wider regeneration programme in Example 8 below.)

Useful resources – green and blue infrastructure

Green Infrastructure Guidance – From Natural England. Available at: http://publications.naturalengland.org.uk/publication/35033

Green infrastructure: Design and place making – Produced for the Scottish government. Available at: http://www.gov.scot/resource/doc/362219/0122541.pdf

Trees in Hard Landscapes: A Guide for Delivery – Examines the practical challenges and solutions to integrating trees in streets, civic spaces and surface car parks. Available at: http://www.tdag.org.uk/trees-in-hard-landscapes.html

Trees in the Townscape: A Guide for Decision Makers – Provides 12 principles of best practice for local decision-makers to establish maximum economic, social and environmental returns. Available at: http://www.tdag.org.uk/trees-in-the-townscape.html

Relevant Public Health Outcomes Indicators (178)

Overarching
Healthy life expectancy and reduced differences in life expectancy and health life expectancy between communities

Wider determinants of health
Social isolation – percentage of adult social care users who have as much social contact as they would like
Social isolation – percentage of adult carers who have as much social contact as they would like

Health improvement

Percentage of physically active and inactive adults Proportion of adults who do 150 minutes of physical activity per week Self-reported wellbeing Percentage of population exposed to road, rail or air transport noise during the night and day Utilisation of outdoor health for exercise and health reasons Fraction of mortality attributable to particulate air pollution Mortality rate from causes considered preventable Under-75 mortality rate from all cardiovascular and respiratory disease Under-75 mortality rate from all cardiovascular and respiratory disease considered preventable Under-75 mortality rate from cancer considered preventable Health-related quality of life for older people

2.4. Creating inclusive high street environments through design

The term ‘pedestrian’ refers to anyone walking, running, standing, or in a wheelchair in the public realm and includes older people, people with disabilities such as partial sight, hearing impairments, or learning disabilities, and people with push chairs and young children. (226) For the purpose of this report we are also including cyclists in this section. Pedestrians and cyclists see, hear, smell and feel much more of their surrounding environment than people inside vehicles or buildings. Therefore urban design and form have both direct and indirect impacts on the health of pedestrians and on the likelihood that people will walk, travel through, and potentially linger, in streetscapes. (227)

Direct health impacts:

- Street design can protect pedestrians from road traffic injuries and fatalities, encourage physical activity, modify the behaviour of pedestrians, and improve or worsen levels of comfort and activity on the high street. (228-230)

- Ensuring high streets encourage walking also contributes to reducing congestion, noise and pollution levels, in turn reducing environmental impacts and the risk of health conditions associated with high levels of noise and air pollution (see sections 1.2C and 1.2D). (226) (231)

Indirect health impacts:

- Pedestrians tend to congregate in areas that have safe walking environments. (232) (233) (226) (227) Walkable neighbourhoods have higher levels of ‘social capital’, trust and social cohesion, and lower levels of antisocial behaviour. (227, 234) (235) These features of more walkable streets are likely to positively influence mental health, reducing the risk of social isolation and its associated health outcomes noted above.

- Streets that are easy to cross and are safe for people of all ages and of all abilities, that are attractive and engaging to be in, and that have coherent but varied built form, enable place-making and attachment. Various interventions can improve the experience of the

pedestrian on the high street. The following sections will examine the roles of traffic calming, street design and furniture, and crime reduction on improved walkability and accessibility.

2.4A Traffic calming

Key messages: Traffic calming

Traffic calming is one way to contribute towards inclusion and local population health. (236) Traffic calming schemes can reduce the number of accidents by around 15%, (237, 238) increasing feelings of safety on the road, and reducing the number of casualties and deaths.

Traffic calming has been shown to provide a strong stimulus for economic growth through increased footfall, increased likelihood of shop visits, greater levels of physical activity, a reduction in noise and pollution levels, and an increase in social interactions. (236)

Reducing the noise impacts of motor traffic directly benefits health, improves the ambience of street environments, and encourages active travel and human interaction. (239) (240)

Reducing the speed and amount of traffic on high streets is essential for ensuring safety. Evidence demonstrates that reducing speeds increases the proportion of drivers that give way to pedestrians. (241) 'Safe space' streetscapes incorporate elements of shared space, alongside interventions that aid the navigation of blind and partially sighted people. (242) (243)

Shared and 'safe space' initiatives are an effective means of creating a more flexible environment for multiple street uses, catering for through traffic, community events, street fairs, markets and cafes. Consultation with a wide range of street users over such initiatives is essential, including bus and emergency services, community groups, and local traders and businesses. (236)

A detailed assessment of the local street environment, its characteristics and its current uses is needed to ensure the most appropriate traffic calming measures are introduced. (241)

Traffic calming interventions make the road safer and more attractive to cyclists as the speed and volume of traffic reduce. However, cyclists are vulnerable to poor street design alterations that do not pay sufficient attention to their needs. (241)

Street design that incorporates and promotes the needs of cyclists will do much to encourage cycling to, from and through local high streets.

Previous built environment and transport policy focused on automotive travel and has resulted in many high streets becoming routes to travel through, rather than safe and comfortable places to visit. (2) In 2000, the Department for Transport highlighted that UK high streets were some of the least safe for pedestrians, and that careful design was needed to reflect the differing needs of pedestrians and traffic. (2, 244)

Pedestrians on roads that are busy and accommodate traffic travelling at high speeds are more vulnerable to injury and death than those walking on quieter roads. For example, a pedestrian

hit by a car that is travelling at 40 miles per hour has only a 15% chance of survival. If the car is travelling at 20 miles per hour, there is an 85% chance of survival. (245) (234) Reducing the speed of traffic has been shown to reduce the number of accidents by around 15% and can reduce the number of road traffic injuries and deaths. (238) (237)

Traffic calming and economic growth

One of the main objectives of traffic calming is to reduce the likelihood of casualties on the road, particularly of vulnerable road users. However, traffic calming in towns can also be a strong stimulus for economic growth and be beneficial for local trade. (236) Traffic calmed areas make people feel more relaxed with an inclination to walk more and to visit more shops. (236) Traffic calming measures can also include improving environmental aspects of high streets, reducing noise and air pollution and creating an environment more conducive to social interaction and cohesion. Reducing the noise impacts of motor traffic directly benefits health, improves the ambience of street environments and encourages active travel and human interaction.(239) (240)

Involving stakeholders

Traffic calming measures are most effective if they meet local objectives, including local authority strategic objectives, and the needs of relevant stakeholders, including local residents, and local emergency services and bus companies, who will be impacted by interventions. Impact assessments should be conducted that include the likely effects on vehicle-generated noise, vibration, exhaust emissions and air quality. (236)

Local Transport Note 1/07 on Traffic Calming provides a range of recommendations for good practice when consulting with local residents regarding traffic calming interventions. It suggests using SafeNET (Burrow, 1999) to assess the potential impact of traffic calming schemes, and the Royal Society for the Prevention of Accidents (RoSPA) manual (2002) to evaluate measures. It also suggests contributing information to the MOLASSES (Monitoring Of Local Authority Safety SchemES) database project, to build information regarding the effectiveness of different types of schemes implemented nationally. (236)

Speed control techniques

There are a number of speed control techniques that can be utilised to control the travelling speed of cars. These include: speed bumps and humps, traffic circles/roundabouts, lane-narrowing techniques at intersections (neckdowns), midblock crossings (chokers), and centre-island narrowings. Techniques to achieve a lower rate of traffic flow through streets include closing roads to all traffic and reducing two-way streets to one way. These interventions have been demonstrated to reduce traffic by 30–45%. Qualitative research has shown that almost 80% of respondents are in favour of interventions to reduce the volume of traffic. (237)

Shared space

Other evidence (231) focuses on the concept of ‘shared space’. The shared space approach seeks to alter the operation of the street by reducing the dominance of motor vehicles. It does this by lowering the speeds of through traffic (to 15–20 miles per hour) and prioritising pedestrians. As vehicle speeds decrease, the proportion of drivers giving way to pedestrians increases. Improved accommodation of pedestrians through shared space enables greater

freedom of pedestrian movement, which can also contribute to an enhanced sense of place, while continuing to allow for the movement of traffic. It is important that the movement of traffic is retained to ensure that the space is truly shared. (241)

Simple designs and landscaping measures that deliberately reduce the number and prominence of highway measures such as road markings, signs, chicanes and road humps have been shown to reduce traffic speeds by up to 40%, compared with conventional interventions achieving around a 10% reduction. Focusing on particular landmarks, preferred pedestrian routes through traffic, or desire lines, and a closer relationship with the distinctive spatial quality of streets, encourages safe traffic movement. (231) Shared space utilising a level surface between road and pavement also enables more flexible use of the space. Street cafes, street markets and other occasional events such as street theatre can be better accommodated. (241)

There is strong opposition to the use of shared space schemes from some blind and partially sighted community and advocacy groups. (246) Qualitative and observational research reports a less positive experience for older people and those who are either blind or partially sighted. (247) (248) (246) Although shared space can remove barriers, such as kerbs and railings, that wheelchair and scooter users find obstructive, other street users who are blind, partially sighted or those with cognitive decline, can find the lack of demarcation difficult. Additionally, interventions relying on eye contact between drivers and pedestrians will exclude those who are partially sighted or blind. However, there is little evidence to demonstrate that eye contact is used between drivers and pedestrians to cross the street. The majority of drivers slow down if they believe a pedestrian is about to cross the road, even if the pedestrian has not indicated that they are about to do so. (241)

Safe space

Safe space implements shared space principles but only in the centre of the road, reintroducing kerbs or tactile walkways that are easily identifiable by blind or partially sighted pedestrians. (242) Shared spaces approaches can be adopted that retain kerbs and dropped kerbs to aid navigation. (243) These issues are dealt with in more detail in Section 2.4B.

There is no definitive shared space design; the characteristics and interaction of individual high street features will need to be assessed and interventions designed appropriately. (241)

Chapter 2 of the Government's Manual for Streets provides guidance on issues of risk and liability. Shared space should not be implemented for its own sake and consultation with street users is important throughout the design, implementation and use of any new scheme. Sufficient time should be allocated after the alterations to allow for longer-term responses to be assessed, and to address any further alterations that would improve the scheme. (241)

Other traffic calming measures include making pedestrian crossings more visible, providing pedestrian refuge islands and turn lanes, and introducing traffic lights instead of other signals. (249) Other research advocates improving sight lines, the provision of informal crossings relating to the 'desire lines' of pedestrians, alongside the reduction of speeds, and rationalisation of parking and loading facilities, to reduce the number and severity of crashes on the road and to improve the pedestrian experience. (250)

NICE guidelines (201) make further recommendations regarding reducing air pollution through traffic calming measures, and these include: considering fuel-efficient driving initiatives such as bylaws to support 'no vehicle idling' areas, particularly in areas where exposure to air pollution is high, or high numbers of vulnerable road users congregate, or implementing congestion charging zones.

Accommodating cyclists

One specific benefit of implementing traffic calming interventions is that it can make the road safer and more attractive to cyclists, as there will be less traffic on the road. However, care should be taken to ensure that cyclists are not endangered through traffic calming design. (241) Physical alterations used to slow traffic can create problems for cyclists as they aresusceptible to poor design that lacks attention to detail. For example, narrowings in the road to slow traffic speed constitute a serious safety issue as the distance between motorised transport and bicycles decreases significantly. (241) Street design that incorporates and promotes the needs of cyclists will do much to encourage cycling to, from and through local high streets.

Bicycles should be considered as legitimate road-using vehicles, with specific consideration given to their manoeuvring and speed in all infrastructure, not just in designated cycle lanes. Space for cycle lanes should be taken from the carriageway, rather than from footpaths and pavements. Reallocating carriageway space to cyclists also serves to deliver a strong and clear message regarding the de-prioritisation of motorised traffic, and will also help to reduce levels of car use. (236)

However, cyclists can be accommodated in the pedestrian environment too. Shared pedestrian and cyclist space is implemented to improve the cycle environment. However, it is important that necessary weight is given to the needs of pedestrians and their comfort and ease of movement through spaces, individually and in groups. (251) Shared pedestrian and cycle paths also contribute to minimising maintenance and street clutter.

Careful consideration must be given to the needs of shops, businesses and other outlets on the high street, as well as the impact on delivery and parking bays, or on the current use of pavements for seating, when planning the introduction of cycle lanes or the reallocation of footpaths to cycle lanes or to shared cycle and footpaths. (251) Consultation with different users, including older people, or those who are blind or partially sighted, may produce locally specific data that can help determine whether cycle lanes should be segregated or shared.

The **Sustrans Design Manual** 'Handbook for Cycle Friendly Design' and **Local Transport Note 1/12** Shared Use Routes for Pedestrians and Cyclists provide detailed design guidance and a range of tips and ideas for implementing cycle routes into urban and other areas.

Example intervention 5: Main shopping street in Haren, Netherlands

In 2002 the main shopping street in the town of Haren (near Groningen) was redesigned using shared space principles. The street is 800 metres long and carries between 8,500 and 12,000 vehicles per day through the main shopping and civic area. The redesign saw the removal of former centre line road markings, traffic signals, separate bicycle lanes and high kerbs. A simple six-metre-wide carriageway was installed, providing a link to major civic spaces. Trees

are used to blur the distinction between the road and public realm, and drainage details and low kerbs demarcate pedestrian and vehicle space. Pedestrians are free to cross the street diagonally to engage in social activities within cafes and shops that merge with the street. (231)

Evaluations report that the redesign of the public space is 'greatly appreciated by involved parties' and that the environment has become more attractive. Traffic speeds have reduced by around 5%, and local bus companies report more reliable journey times. The number of road traffic accidents has reduced. However, feedback regarding the lack of cycle lanes has been predominantly negative. Pedestrians, cyclists and car users would all prefer separate cycle lanes. (252)

Useful resources – Traffic calming

Local Transport Note 1/11 – Provides detailed guidance around introducing shared space schemes into local high streets. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3873/ltn-1-11.pdf

A Review of Simplified Streetscape Schemes – From Transport for London. Available at: http://content.tfl.gov.uk/review-of-simplified-streetscape-schemes.pdf

Public Realm Information and Advice Network (PRIAN): Design and Management of the Public Realm. A not for profit organisation that provides expert advice on the public realm, including street scapes. https://publicrealm.org/

Shared Space. Safe Space. Meeting the requirements of blind and partially sighted people in a shared space – Report prepared for the Guide Dogs for the Blind Association. Available at: https://www.guidedogs.org.uk/media/1497826/Shared_space_-_safe_space_Ramboll_Nyvig_report.pdf

Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure – From the Department for Transport. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3695/inclusive-mobility.pdf

Manual for Streets – Chapter 2 provides guidance on issues of risk and liability. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341513/pdfmanforstreets.pdf

Sustrans Design Manual Handbook for Cycle Friendly Design and Local Transport Note 1/12 Shared Use Routes for Pedestrians and Cyclists – Two reports that provide detailed design guidance and a range of tips and ideas for implementing cycle routes into urban and other areas. Available at: http://www.sustrans.org.uk/sites/default/files/file_content_type/sustrans_handbook_for_cycle-friendly_design_11_04_14.pdf and https://www.gov.uk/government/publications/shared-use

Emergency services traffic calming schemes: A code of practice (TAL 1/07) – Traffic advisory leaflet

Cyclists at Road Narrowings (TAL 01/97) – Traffic advisory leaflet

Planning Policy Guidance Note 15 (PPG15) – From the Department of the Environment, offering specific advice on reconciling transport and townscape issues

Streets for All manuals and TAL 01/96 Traffic Management in Historic Areas – From English Heritage, giving general advice on the introduction of traffic engineering measures in historic areas

Air pollution: outdoor air quality and health – NICE guidelines. Available at: https://www.nice.org.uk/guidance/ng70

Working Together to Promote Active Travel – A briefing from PHE for local authorities. Available at: https://www.gov.uk/government/publications/active-travel-a-briefing-for-local-authorities

2.4B Street furniture

Key messages: Street furniture

Street furniture can either aid or hinder safe and comfortable passage through high streets. Well-designed street furniture can promote increased length of stay and social interaction. However, accommodating the needs of all street users is challenging, as interventions to promote the safety of one user can increase the risks of another. (129)

Decluttering streets by reducing the amount of street furniture can improve the experience of many high street users, particularly those with small children and buggies, and wheelchair users. (129) (214) (200) (253)

Appropriate street furniture can serve as important navigational aids and create a unique sense of place. The provision of seating areas is important to many street users, particularly older people and those with health conditions. Distinctive landmarks promote mental-map-making, which is particularly important for older people and people with dementia. Conversely, mental-map-making can be confused by unnecessary, bright advertising that changes regularly. (200, 253, 254) (129) (214)

Pedestrian crossing signals are important for older street users and those with restricted mobility. Studies have shown that most older people are unable to cross pedestrian crossings in the time allocated, resulting in ‘limited independence, and reduced opportunities for physical activity and social interaction’. (255)

Adequate and accessible toilets, seating and shelters, including bus shelters, are needed to promote the inclusion of older people, people with disabilities and young families. (129)

Pavement quality and design can have a significant impact on mobility. Older people, wheelchair and mobility scooter users, and those with other mobility disabilities, prefer well maintained, smooth pavements with dropped or no kerb. (214)

Blister pavements to aid the navigation of blind or partially sighted people pose a particular dilemma for urban designers and local authorities. They are considered problematic for some older people, wheelchair and scooter users. However, the risks to blind and partially sighted people associated with their removal are considered to outweigh the difficulties for other users. Ongoing research and development of guidance is underway to address these issues. (214) (256) (257)

Use of retail space, and relevant art and symbols, if introduced sensitively, can be used to encourage and acknowledge the presence of a variety of groups, including those from black and minority ethnic (BME) backgrounds and those who are lesbian, gay, bisexual and transgender (LGBT). This can promote social cohesion, trust, and the health of protected groups. (198) (175) (258-260)

'Play on the way' interventions, which introduce play equipment and spaces specifically designed for children, have been shown to increase footfall and the length of stay on the high street, as well as to increase time spent outside and physical exercise for families. (261)

Adolescents are often not catered for in public space. This can create conflict between adults and young people. However, young people need to occupy public space, as this supports the transition from childhood to adulthood. Creating, in consultation with young people, spaces that provide opportunities in which to congregate and be active safely, will promote their health and wellbeing and aid social integration and community cohesion. (262)

Older and disabled people

Buildings, pavements, physical design and layout of streets can confront people with hazards. In particular they can make the built environment unsafe, inconvenient and uncomfortable to use for older people and people with mental and physical disabilities. However, well designed environments do have the potential to be therapeutic rather than disabling, and can promote the mental and physical health of older people and those with disabilities. (129) Ensuring accessibility will also increase the opportunities for inclusion of the wider community, including parents with children and babies, and those with temporary mobility disabilities. (129)

People with disabilities are not a homogenous group, and include, but are not limited to, wheelchair users and people with other mobility restrictions, the blind and visually impaired, the hearing impaired, and people with learning disabilities, cognitive impairment and dementia. Within these groups there is also a wide range of variations and co-morbidities. However, there are some general principles that can be incorporated into the design of high streets that will make them more accessible, comfortable and safe for all.

General principles for designing street furniture with older and disabled people in mind:

- **Way finding** In general, street scenes that enable mental-map-making and prevent people getting lost are preferable. Distinctive landmarks are important to facilitate this. Large printed signs and maps, that are simple and easily visible, street name signs on

both sides of the road, direction signs with pointers, and diversity in the styles and ages of buildings, will also enhance way finding. (214) Conversely, highly visible, big, bright advertising containing non-essential information, that changes regularly, can be distracting and confusing, preventing mental-map-making and contributing to mental fatigue. (200) (253) Way finding strongly relates to the ways in which people interact with each other. Installing, utilising and maintaining distinctive landmarks will therefore also contribute to establishing a strong sense of place and greater social integration. (253) (200)

- **Accessible toilets** A key issue for many people, and particularly for some disabled and older street users, is being able to access toilets outside the home. A lack of accessible toilets limits the amount of time spent away from home, and prevents non-essential social trips and activities on the high street. Currently, the design of many public toilets does not offer privacy, comfort, cleanliness, convenience or dignity to people with mobility restrictions, other disabilities, and parents with children in buggies. (129) Additionally, some crime reduction initiatives, such as installing blue lights in disabled toilets to deter intravenous drug users, impact negatively on visually impaired users. (129)

- **Seating and bus stops** The opportunity to sit and rest while walking is important for older people, people with mobility restrictions, breast-feeding mothers and parents with young children. Seating that feels warm, safe, comfortable, is well maintained and supportive is preferred. This includes seats that are made out of wood and have arm rests that support ease of movement from standing to seating and vice versa. Benches and seating provided at bus stops and on streets should be at least 19 inches high to aid movement from sitting to standing. Bus stops can also be used as sheltered, incidental rest stops and should be semi-enclosed with a clear form to enable natural surveillance. Enclosures should be accessible to scooters and wheelchairs, but also provide enough space around them to allow safe passing. (214)

- **Pavement design and quality** Older people and people with disabilities are more susceptible than others to barriers within the environment. Good pavement design and quality are fundamental to enabling older people, and people with disabilities, to access high street services and social activities. Well maintained, firm, flat and wide footways are easier to navigate and safer to use.

  Tarmac, rather than paving stones, reduces the risk of uneven surfaces and trips and falls, and makes the use of mobility scooters more comfortable and efficient. Dropped kerbs are especially useful for scooters and wheelchairs. (214)

  Over 2 million people in the UK experience some form of sight loss. This number is predicted to rise by 2020 due to increases in obesity and diabetes. (263) The Commission for Architecture and the Built Environment (CABE) recommends the following interventions that support blind or partially sighted street users: ensuring paving and streets are free from obstruction; using colour contrast to define space use; avoiding meaningless or arbitrary colour contrast; wide and spacious pavements that prevent crowding. Blind and partially sighted people also use building lines, railings, kerbs, poles and landmarks to navigate. Decluttering or removing these features can

have a negative impact on blind and partially sighted people. Simple alterations, for example numbering street poles, can help reorientation. (155) This is also likely to support people with cognitive impairment and dementia. (155)

Tactile, blister paving, used to aid the navigation of people who are blind and partially sighted, can be challenging to older people, people with mobility restrictions, and wheelchair and scooter users, and can increase the risk of trips and falls. (214) This is a difficult challenge for planners and urban designers trying to accommodate the needs of a variety of users. Specific guidance and interim guidance (256) has been published on the use of tactile paving. Although it has been recognised that it may increase the risk of harm to those with mobility issues, the risk to those who are blind or partially sighted is far greater when either blister paving is removed or the guidance is not adhered to. Some local authorities have been subject to judicial review regarding their use of tactile paving and their departure from the guidelines. (257)

- **Safe road crossings** For those with visual impairment, tactile and rotating cones on the left and right side of crossings are preferred to crossing signals that rely solely on audible signals that can be drowned out by heavy traffic. Augmenting the carriageway at crossing points, so that cars make a distinctive sound when passing, can also alert blind and visually impaired people to crossing points. (155)

  The majority of pedestrian crossings that force traffic to stop do not provide enough time for older people to cross the road safely. This can limit independence, restricting physical activity and social interaction. Older people with slower walking speeds prefer controlled crossings that force traffic to stop, provide visual and audible signals, with shortened crossing distances and sufficient time to cross once traffic had stopped. Walking speeds for older adults should be lower than the current assumed speeds. (255)

  Small informal crossing islands do not fully accommodate scooters and can feel unsafe in fast-moving traffic. Shared paths with bicycles have been found to make older people feel less safe, particularly those who are hearing impaired.

Black and minority ethnic communities
Section 1.3A noted the specific experiences of black and minority ethnic communities in public spaces, resulting in social exclusion and poorer access to health-promoting environments. Built environment interventions can be used to ensure that local high streets are welcoming, accessible, and health-promoting for BME groups, including those who were born outside the UK. (198)

Art and design
Spaces and landscapes can be designed to have cultural and spatial resonance. There are clear links between familiarity and landscape preference, (258, 259) although some also prefer the ‘exotic’. (198) Inclusive design can include appropriate signage in different languages and ensuring rules on the use of public space do not exclude specific cultural practices. (260) Mosaics, murals, sculptures and other artwork can represent diverse cultural backgrounds of local communities, and as noted in section 2.2, planting a wide variety of trees and plants that represent different countries can acknowledge diversity within public space. (198)

Intervention example 6: Stockton High Street regeneration

Stockton had been experiencing a decline in the use of its town centre and high street due to the success of out-of-town shopping centres, high rateable values of commercial units, and lower investment in the area. The number of empty retail spaces had increased, with a resultant decline in the local economy, reduced footfall on the high street, and increased negative perceptions of the area.

In 2010/11 Stockton Borough Council (SBC) formulated a strategy focusing on a place-making agenda for the town centre and high street with an estimated cost of £40m. SBC approved £26m, and further funding was secured from the Big Lottery. Consultations were held with local street user groups, including market traders, retail establishments, disability groups, and bus operators, establishing ownership and responsibility for specific elements of the programme.

A new central square was designed and installed to act as a focal point for events and specialist markets. It contained a colour changing concrete wall and water feature, lighting columns with dimming technologies, and the installation of artist-designed seating and 20,000 square metres of high-quality paving. On-street short-stay parking spaces were reintroduced; road and public transport to and from the high street was improved; and historic buildings were invested in, leading to the reuse of vacant commercial properties. A new Enterprise Arcade was established for test trading of new businesses. A Rediscover Stockton brand was developed and used to provide the regeneration programme with a distinct identity. (264)

To date the number of empty units has decreased, there has been a growth in independent retailing, the markets in historic settings have begun to attract visitors from areas outside the immediate locality, and footfall has increased. Surveys were carried out prior to the programme (2011) and post-regeneration (2015). Favourable ratings were noted for the newly developed town square and improved cleanliness. The average length of stay in the high street increased from 76 minutes to 104 minutes. The short-term net impact in terms of economic output has been valued at more than £18m. This could rise to £264m over 30 years, alongside the potential for 860 new jobs and 81 new businesses setting up as a result of the regeneration programme. (264)

Photographs reprinted with permission of Stockton Borough Council

Intervention example 7: Kensington High Street and Exhibition Road

West London's Kensington High Street underwent complete redevelopment over the course of six stages, completed in 2003. This included simplified road markings, and a recalculation and coordination of traffic signals to ensure that traffic flows but does not have time to build up speed. Additional pedestrian crossings have been introduced that enable pedestrians to cross the road in a single movement rather than stopping at islands with guard rails half way. Pavements have been widened and realigned to match original building lines. Trees and cycle parking have been introduced, and much of the street clutter has been removed, including guard railing.

Before and after studies of the high street showed that pedestrian flows increased by 7%, cycle flows increased overall and by 30% at peak morning times, and traffic flows decreased (although this may be partly due to a congestion charge introduced during the same period). Importantly, traffic casualties decreased by almost 49%, almost 11% more than the borough average decrease, after the redesign and alterations were implemented. Surveyed users including wheelchair users, the partially sighted, parents, and those aged 65-plus were positive about the changes made, and considered the area more attractive, cleaner and safer. (265)

On Exhibition Road, some shared space principles were used to pedestrianise the area. However, pedestrian areas were distinguished from vehicle areas by black iron drainage covers, and raised and ribbed 'corduroy effect' strips, signalling to blind and partially sighted people the demarcation between pedestrian and car use of the street.

Left: Kensington High Street; right: Exhibition Road

Intervention example 8: Walker Road, Newcastle upon Tyne

A new creative enterprise, Unit 44, operates from the basement of a building in Walker Road, Newcastle upon Tyne. As the shop above the basement premises was empty, there were concerns that the premises would attract either antisocial or criminal behaviour, or not enough footfall and attention from passers-by. The owner of the new creative enterprise decided to install an eye-catching art installation that was dynamic both in the day and night. The art installation created much needed street visibility, promoting the venture, and a point of interest. Increased footfall to the new business was experienced with multiple enquiries regarding the installed artwork. (266)


Photo Credit Unit 44.

Children and families – public play spaces

Seeing and hearing children and young people within the public realm provides signs of a vital community life. (261) This can be facilitated through both integrating specifically designed interventions, such as play apparatus, onto the high street, and ensuring that the public realm is designed to promote and withstand playful use. Encouraging children and families onto the high street in this way will also increase much needed footfall and improve social interaction and cohesion. Play areas can provide important community social spaces where parents and carers can avail of support from other parents and carers. (261)

Children and young people's mental and physical health and development are positively influenced by opportunities to play outside. Impacts include social and cognitive development, improved problem solving, language and interpersonal skills, development of emotional responses, flexible and creative thinking, a sense of wellbeing and freedom, and opportunities to take risks and increase physical exercise. (261)

Equipment that is non-prescriptive and that can be used flexibly is likely to be interesting to a large range of age groups and abilities, including children with disabilities, and should offer opportunities for movement, sense stimulation, social interactions, challenges and material manipulation. (261)

Adolescents have specific needs within the public realm, as their focus shifts from parents and family to peers. Congregating in groups becomes important, making adolescents feel safer, and enabling the development and maintenance of social bonds, important for personal and social identity. However, there is little specific provision for doing so for older children and teenagers within the public realm and this influences the perception that the public realm is an exclusively adult space. (262) Acts of loitering, graffiti and boisterousness can help adolescents create 'micro geographies' of their own, while symbolically distancing themselves from the adult sphere. This can lead to public space being used in ways not anticipated by adults, and to clashes. Thinking about and incorporating the needs of adolescents into the design and planning of high streets will support transitions to adulthood.

Meaningful consultation with younger age groups is needed, and will aid the design and planning process alongside encouraging commitment, maintenance and the survival of built environment interventions. (261) (267) Landscaping, art installations and street planting can all be used to incorporate the needs of children and young people into the high street. (261) Examples 7 and 8 below demonstrate how skate parks and play equipment can be incorporated onto the high street.

Intervention example 9: Buszy Plaza Skate Park, Milton Keynes

Buszy Plaza Skate Park is a concrete and marble plaza-style skate park created out of a disused bus station in central Milton Keynes in 2003. The project was set up to address the issue of adolescents using other areas of the town as skate facilities and causing damage to other built environment features. SK8MK was formed with various stakeholders including young skaters, city architects and community groups. The project was funded through Milton Keynes Council, English Partnerships and Environment Body MK and cost £115,000.

The area includes a series of marble and concrete blocks, steps and plinths of different shapes and sizes and utilises good quality materials that blend well with its original environment and the original architecture of the town. The whole area is under cover, providing an all-weather environment for skating and congregating in groups. Buszy Plaza Skate Park won the Local Government Chronicle Award for Community Involvement in 2006.

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Intervention example 10: 'Play on the way' at Marlowe Shopping Zone, Hemel Hempstead

As part of a broader, ongoing, £30m regeneration project, Dacorum Borough Council has introduced 'play on the way' initiatives in Hemel Hempstead's main shopping street to

encourage increased footfall and dwell times by a broader range of high street users, including families. The interventions include five new play areas along the high street, including a tightrope, water play, balancing balls, slides and trampolines. Other interventions to improve the pedestrian experience include improved paving, seating and traffic control measures. Water and power points were also included along the street to improve provision for market stalls, which were reintroduced after regeneration, and a spine of planting and green areas down the centre of the street. The town square has been refurbished to incorporate a central entertainment space, including a stage, and a big screen that is used to advertise local business and voluntary services. The town square also includes a newly refurbished water play statue, popular in summer, and switched off in the winter months. (268)

Since the regeneration project the number of empty shops and units in the town centre has reduced by about two thirds (64%), with most recent figures showing that just 6% of units were empty in the town centre, compared with a 10.1% average, and 16.5% recorded for the area in 2014. (269)




Photographs reproduced with the permission of Dacorum Borough Council and Broadway Malyan

Useful resources – Street furniture

Inclusive Mobility – Government best practice guidance to ensure more inclusive access to those with disabilities within transport and pedestrian environments. Available at: https://www.gov.uk/government/publications/inclusive-mobility

British Standard 8300 (BSI, 2009) and guidance from the Department for Transport on inclusive mobility (2002) – Specific design guidance on designing physical environments for disabled people. Disabled people's needs have been incorporated into mainstream guidance such as the Department for Transport's Manual for Streets (2007)

Sight Line: Designing better streets for people with low vision – Guidance developed by CABE from in-depth interviews and observational data regarding current uses of built environment interventions, with recommendations for improvements

Design for Play – Developed by Play England, providing guidance around the design and implementation of play areas in both urban and rural settings. Available at: http://www.playengland.org.uk/media/70684/design-for-play.pdf

2.4C Crime prevention and security

Key messages: Crime prevention and security

Green infrastructure that does not block sightlines has been demonstrated to reduce levels of violent crime, and promote social cohesion and feelings of safety.(270, 271) (194, 272-275) (273-275)

Crime Prevention through Environmental Design (CPTED) is an approach to designing out crime and advocates the following four approaches as effective ways of preventing crime: (105)

1) Territoriality, which encourages ownership, care and maintenance of local areas, while also discouraging illegitimate uses, through the use of symbolic and actual barriers. (105, 276-279)

2) Surveillance, which is facilitated in a number of ways. A good mix of uses including commercial and residential properties, glazed windows and doors, and transparent shop fronts enable more 'eyes on the street' and people feel safer when overlooked by spaces that are active and well-lit at night. Linear integrated spaces, with some through movement, strong inter-visibility, and several entrances, are needed to develop the safest places. (105) (280) (9, 281) (227)

3) Access control and 'target hardening', which utilise barriers in the forms of high walls, locks, and 'anti-personnel' features. These interventions need to be balanced with the need for promoting and encouraging activity on the high street as well as fostering a sense of public space ownership, or they can lead to an excluding mentality, contravening CPTED principles. (105) (14) The 'permeability' of high streets and their surrounding street networks (the ability to move freely to and from destinations) is important for encouraging more journeys by foot, and increased footfall on the high street. (282, 283)

4) Maintenance and upkeep of local areas, which decreases crime and the fear of crime (the broken window theory). Even minor signs of deterioration can lead to further destruction and criminal behaviour that will accelerate the decline. Neglected spaces that have been repurposed have been shown to improve perceptions of safety and to create economic and job opportunities. (103) (104) (105) (107)

Design alone will not prevent crime. It is essential that residents are encouraged to participate in, engage in and manage local public space. (284)

Feelings of safety are critical for community wellbeing and for the health of the high street. (285) Crime, and fear of crime, significantly affect levels of footfall, the experience of high street visitors, and the likelihood of return visits. Crime and fear of crime also contribute to high street degradation and the potential for increasing the number of vacant properties, (286) (287) adding further to the degradation of shop fronts, decreasing the value of surrounding shops and increasing the risk of vandalism and fear of crime. (152) (104)

Built environment interventions that successfully address issues of crime and fear of crime will thus address the direct and indirect health outcomes related to these issues, as noted in section 1.2G. These positive impacts include: reducing the likelihood of temporary or permanent physical or mental disability, and mortality, long-lasting psychological distress,

depression and anxiety, sleep deprivation, and social isolation, (108, 109) in addition to reducing the risks for all-cause mortality, (110) coronary heart disease, (111) pre-term birth and low birth weight, (112) and positively affecting health behaviours such a physical exercise through improved walkability. (113-116) Local areas that are known to have high crime rates, or high fear of crime, are also associated with a lack of neighbourhood cohesion. (288, 289) (199)

Crime and green space

There is strong evidence showing the ability of built environment interventions to impact on levels of crime, and fear of crime. However, built environment decisions are often made without crime prevention in mind. It is important that 'hot spots' of crime are identified and that diagnostic surveys of specific crime areas are completed to assess the types and levels of crime prior to deciding on built environment interventions. (284, 285)

In section 2.2 we noted the impact of proximity to green space on levels of crime, in particular violent crime. A number of studies have shown a reduction in violent crime and increased feelings of safety when green space is installed and maintained outside buildings. (270, 271) (194, 272-275)However, planning, consultation, and context reviews are important as blocked views can make residents feel less safe. Maintaining sightlines and promoting a sense of openness can be facilitated through a good mix of planting, for example planting low shrubs alongside taller trees. (194, 272-275)

Crime Prevention through Environmental Design (CPTED)

A key approach to the prevention of crime in local areas is Crime prevention through Environmental Design (CPTED). In 2005 (105) CPTED was found to be a pragmatic and effective method of addressing crime and fear of crime in local areas. Appropriate design and effective use of the built environment can lead to reductions in crime and fear of crime, and an increase in quality of life. (105)

CPTED theory is based on four main principals: territoriality, surveillance, access control and image maintenance. These principles provide opportunities for managing and discouraging offending behaviour, (105) as described below.

- **Territoriality** Territoriality encourages ownership, care and maintenance of local areas, and discourages illegitimate uses, through the use of symbolic and actual barriers. These barriers help to define acceptable micro-level use of public space and encourage natural surveillance as a result of increased activity on the street. There are a number of studies that have linked territoriality with reduced levels of recorded crime and fear of crime. (105, 276-279) For example, a project in California facilitated the collaboration of young people and local artists to paint utility boxes that were frequently 'tagged' and graffitied. The Pre-Columbian-style designs that were used have become symbols of community pride, helping to promote a sense of place and ownership. (290)

- **Surveillance** Surveillance has been demonstrated to prevent a wide range of crimes, and the fear of crime. (105) Increasing the numbers of 'eyes on the street' increases the number of available witnesses to crime or threats of crime, and makes it more difficult for people to commit crimes with impunity. (280)

A good mix of land uses, including commercial and residential properties, facilitated through re-zoning space over shops and service outlets as flats and apartments, creates the potential to provide 24-hour surveillance. It can also promote a sense of ownership over local public space. (9, 281) Glazed windows and doors, including trasparent shop fronts, deter crime and people feel safer when overlooked by spaces that are active. (281) (227) Additionally, high walls and fences, thick trees and shrubbery all provide concealment for potential criminal activity. Reducing this cover would have to be balanced with the need to incorporate green infrastructure into high streets (see section 2.2).

The UCL Space Syntax Lab and other design professionals advocate that 'linear integrated spaces, with some through movement, and strong intervisibility, with a good number of entrances' are needed to develop the safest places. (291) Studies examining the efficacy of more formal and mechanical techniques of surveillance, such as CCTV, have had mixed results, ranging from a 5% reduction in crime to no reduction in crimes of violence. This is thought to be due to the links between violent crime and alcohol and drug use. There is also a wide range of CCTV systems and operations and a lack of scientific analysis of efficacy. (105)

Adequate lighting has been shown to contribute to feelings of safety, (227) while inadequate lighting is known to provide concealment for potential offenders. (105) Research (292) has found a substantial and significant decrease in the incidence of all crime after improved street lighting. A recent review of UK studies on lighting and crime noted a 30% overall reduction in reported crime. Reductions in crime recorded during the day suggest that the installation of contextually appropriate and good quality lighting also influences community pride, contributing to informal social control. (105, 293) Lighting that is pedestrian scaled, or human proportioned and clearly orientated towards pedestrian rather than motorised activity, has also been shown to enhance night-time walking. (227)

- **Access control** Access control refers to the process of denying access and creating a heightened perception of risk for those considering or engaged in criminal behaviour. Several studies show a reduction in crimes through creating barriers to access routes to known areas of criminality. (294-296) However, creating barriers to access should be balanced with promoting and encouraging activity on the high street. This will help promote natural surveillance, territoriality and a sense of public ownership.

  Target hardening techniques, including fences, bolts, gates, locks and other security measures to protect from and deter criminal behaviour, can contribute to a 'fortress' mentality and can prevent disadvantaged or excluded people from being able to use and be included in public space. This can result in a general reduction in social activity on streets. (105) Urban landscapes that lack permeability – the ability to move freely, to and from destinations – can discourage movement on foot, and encourage longer journeys by private transport, and so can be detrimental to health. (282, 283)

  Additionally, although specific groups of people, such as assertive teenagers, street drinkers, and the homeless, may be seen as undesirable to the majority of street users, and can impact on other disadvantaged groups disproportionately, they do have a right to use public spaces, within the limits of socially acceptable behaviour. (14) Although

these issues can be difficult to address, approaching crime prevention, particularly on the high street, from a basis of exclusion rather than inclusion, has been argued to contravene the general CPTED principles. (105)

- **Maintenance** There is consistent and strong evidence demonstrating that maintenance and upkeep of local areas decreases crime, and the fear of crime. Neighbourhood incivilities increase fear of crime, and the environmental image that criminals have of an area is associated with the extent to which the area is victimised. (105) Therefore, it is important that even minor signs of deterioration are remediated to prevent further destruction and criminal behaviour that will accelerate decline. (103) Clear relationships have been shown between the remediation of urban environments, and vacant buildings in particular, and reductions in violent crime. (285) Repurposed neglected spaces have been shown to improve perceptions of safety and create economic and job opportunities. (106)

The benefits of CPTED interventions have been found to outweigh the cost, and lead to increased revenue, higher occupancy rates and shorter vacancy periods on high streets. (105) In addition to CPTED evaluations, evaluations in other fields such as policing have concluded that making alterations to the built environment is a good way to prevent crime. (105)

The most success has been found when local residents have been educated about the interventions and their effects. Resident participation, particularly of young people, and other groups vulnerable to exclusion, is essential. Design alone will not prevent crime. People should be encouraged to participate in, engage with, manage and maintain their communities. (284) Creating public spaces where people can gather and feel safe and included is vital for high street success.

Intervention example 11: Chula Vista, San Diego

As part of the Western Chula Vista Preventing Violence-Healthy Eating and Active Living Report (PV-HEAL Report), a needs assessment was carried out by youth and community members in early 2010 focusing on issues of graffiti and poor maintenance. Feelings and perceptions of a lack of safety were clearly identified within the area. Utility boxes were vandalised and graffitied, lighting was insufficient, and bushes in public spaces were overgrown, preventing clear sight lines.

The Chula Vista Redevelopment Agency funded and supported the Chula Vista Utility Box Programme, which engaged young people in redecorating neglected and vandalised utility boxes. The boxes were painted with art that was culturally reflective of the young people's community. Lighting was increased and green infrastructure better maintained by the Public Works Department. Utility boxes that have been decorated have remained free of graffiti and tagging, and in areas where the project was focused there has been a reduction in violent activity. (297)

Intervention example 12: Hammersmith Broadway, London

Hammersmith Police and Design Against Crime Research Centre (DACRC) collaborated to address an identified problem of cash point crime, including pickpocketing and fraud. These issues can be particular problems in busy, crowded areas where cash point users are distracted by the movement of the pickpocket and the crowds around them. 'Shoulder surfing' describes how individuals note the cash point user's pin number prior to pickpocketing wallets and purses and withdrawing cash.

Rather than utilising the usual preventative measures of drawing exclusion zones around cash points with yellow and white lines, artist Steve Russell developed a more 'pleasing aesthetic approach', designed to gently nudge people's behaviour, in contrast to previous signs warning of pickpockets and crime in the area, which could lead to the 'attachment of crime to the locality' or fear of crime. The artwork was commissioned and funded by Hammersmith Business Improvement District (298) in 2010 and was monitored by the Metropolitan Police until January 2011. Reports demonstrate 'considerable success' in the reduction of crime associated with cash point use. (299)
Image: Russell 2010. Project conceptualised by Design Against Crime Research Centre/Hammersmith Police/Steve Russell 2010.

Useful resource – Crime prevention and security

Home Office toolkits – Available at www.crimereduction.gov.uk/toolkits/index.htm

Relevant Public Health Outcomes Indicators

Overarching
Healthy life expectancy and reduced differences in life expectancy and healthy life expectancy between communities

Wider determinants of health
Numbers killed and seriously injured on England's roads
Violent crime (including sexual violence)
Levels of offending and reoffending
Percentage of the population affected by noise
Social isolation
Utilisation of outdoor health for exercise and health reasons

Health improvement
Breast feeding
Child development at 2–2.5 years
Child excess weight in 4–5 and 10–11 year olds
Excess weight in adults
Percentage of physically active and inactive adults
Proportion of adults doing 150 minutes of physical activity per week
Self-reported wellbeing
Percentage of the population exposed to road, rail or air transport noise during the night and day
Fraction of mortality attributable to particulate air pollution
Mortality rate from causes considered preventable
Under-75 mortality rate from all cardiovascular and respiratory disease
Under-75 mortality rate from all cardiovascular and respiratory disease considered preventable
Under-75 mortality rate from cancer considered preventable
Health-related quality of life for older people
Hip fractures in people aged 65 and over

Part 3. Conclusions and recommendations

High streets that have high levels of air and noise pollution, unsafe levels of crime and degradation, and non-inclusive design, affect users' health directly and through psychosocial pathways, leading to a lessening in quality of life, and poorer health outcomes. However, health professionals and other stakeholders should view local high streets as existing community assets that can make communities more resilient, and be used to promote and improve the health of local residents. 'Healthy' high streets can support the reduction of health inequalities and promote other desirable outcomes including safety, prosperity and social interaction. In short, high streets can help make healthy choices easier choices.

A healthy high street is a significant community asset if it:

- is accessible to all members of the community
- has clean air
- is safe to cross
- has a retail offer that is supportive of health
- makes people feel safe and comfortable

This report has provided clear and strong evidence that demonstrates the design and built environment interventions needed to improve local high streets and the health and quality of life of local communities and marginalised groups, and to contribute to improving public health indicators. It has also demonstrated in a number of areas that these are cost-effective measures: interventions to improve local high streets and local population health make good economic sense. For example, as we noted in section 2.2, every pound spent in a local independent shop that sources local produce generates twice that for the local economy.

Further, built environment interventions on the high street that support health can contribute to local economies, encouraging footfall, increasing the time people spend on the high street, and promoting the development and sustainability of local businesses. Improved local economies impact on local health outcomes through a variety of mechanisms – increasing access to employment, raising incomes, and improving housing and environmental conditions and health-promoting goods and services. In turn this reduces the stress associated with lower economic status and reduces the likelihood of poor health behaviours. (5) Therefore, the high street represents a much-needed community asset that, if designed well, can create an environment to activate communities and provide them with clear 'building blocks' for health.

However, the value of high-quality built environment interventions, especially in terms of their impact on health and the local economy, is not fully understood by the general population, policy-makers, (300) or the varied and numerous users who impact on the design, development and maintenance of the high street. There is now a need to ensure that the evidence presented in this report is made widely available so that a broad coalition of local and national stakeholders gain a better understanding of how people interact in designed spaces and places. Doing so will ensure that the significant public health, environmental and economic gains afforded by good-quality high street design are realised.

Built environment disciplines need a greater awareness and focus on health, while the health workforce needs a greater awareness and focus on built environment interventions, in order to

facilitate more and better collaboration between public health, planning, design, and, crucially, communities, to support the development of high streets that are ‘health enhancing’. (301)

Recommendations

Directors of public health, and local authorities including planning authorities, should:

1. Work closely with local colleagues who fund and drive built environment interventions to ensure opportunities for improving population health are clearly understood and that appropriate action is taken to target areas most in need.

2. Consider how their teams can continue to develop persuasive, evidence-informed cases that highlight the impacts of the high street on health and how these can be applied locally to inform and assess future health-promoting interventions.

3. Ensure that the regeneration and development of high streets focuses on inclusive design for all, and that opportunities to reduce health inequalities are maximised.

4. Use planning and licensing policies to influence the retail offer on the high street, protecting locally-owned retail stores and tackling over-concentration of certain shops, to conserve retail establishments that stock healthier, locally sourced products.

5. Ensure plans and strategies for businesses, transport infrastructure and social and community services maximise opportunities for health improvement, particularly for those most vulnerable to health inequalities.

6. Consider how they might encourage and support community groups to be more resilient to change, and individuals more involved in planning and implementing health-promoting high street interventions.

Landscape architects, planners and urban designers should:

1. Consider how they can work together, developing a shared understanding of how the evidence base can be translated and applied in design terms to promote healthier high streets.

2. Consider how the needs and preferences of excluded groups are taken into account, particularly prior to alterations or redesign of high streets, giving attention to diversity within, as well as between, groups.

3. Work with the local police force, local authorities, businesses and community groups to consider how the Crime Prevention through Environmental Design approach can inform local environmental and high street strategies, in such a way as to also promote health and facilitate walkability.

4. Work with professional and educational design organisations (for example, the Royal Town Planning Institute, Royal Institute of British Architects and the Landscape Institute) to ensure the health impacts of design and landscape architecture are fully integrated into the curriculum.

5. Work with environmental public health specialists to improve air quality and the sound environment.

Annex 1. Methodology

Following Cabinet Office guidance, (302) the authors of this report searched and synthesised the most recent available evidence regarding aspects of the high street that have been shown to be health promoting, and to impact positively on physical and mental health. Inclusion criteria, specified search words and Boolean search terms and phrases were established and agreed upon. Search terms used included:

*Health, *street and *design and:

street furniture
traffic calming and traffic management
lighting
seating
crossing and pedestrians
pavements
shelters
street planting
water features
communal areas not parks
(social connections or inclusion or capital or interactions or exclusion or community cohesion or social cohesion)
children and (health or physical health or mental health)
adults and (health or physical health or mental health)
older people and (health or physical health or mental health or dementia)
disabilities and (health or physical health or mental health)
families and (health or physical health or mental health)
lesbian or gay or bisexual or transgender or (LGBT)
(Black or minority or ethnic or BME* and (design* or furniture) and physical health or mental health
(health or health gradient) and (poverty or deprivation or multiple deprivation or socio economic status)
Wellbeing or well being and health* high street* and (design* or furniture)
Health street* and (pedestrianisation or mixed use) and (design* or furniture)
Health* and street* and grey open space and design*

University College London's Online Library Service was utilised to access online journals, papers and reports, including social science, community health, planning, epidemiological, environmental, medical and psychology journals. Google and Google Scholar were also used to search for relevant journals, articles and papers. Relevant papers were assessed for relevance and quality. Desk-based research also included a review of relevant grey material including expert papers, policy analysis, journals and other data from key representatives within the planning, architectural and environmental sectors.

Articles were excluded on the basis of quality, whether or not the source was reputable, and if the article was relevant to the agreed scope of the project.

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