

**BARNET**

**ANNUAL DIRECTOR OF PUBLIC HEALTH REPORT:**

**THE BUILT ENVIRONMENT AND HEALTH**



**2017**



## **Acknowledgements**

Barnet Public Health:

Building 2, North London Business Park, Oakleigh Road South, London N11 1NP

<https://www.barnet.gov.uk/citizen-home/public-health.html>

Rachel.Wells@harrow.gov.uk

Report prepared by:

Lisa Colledge, Senior Public Health Analyst

Rachel Hodge, Junior Public Health Analyst

Brian Johnstone, Senior Public Health Analyst

Saiyeshen Naidoo, Junior Public Health Analyst

Rachel Wells, Consultant in Public Health

Published:

July 2017

Front cover photograph:

Aerial view of Grahame Park regeneration area, from the *Barnet Annual Director of Public Health Report 2017* video

## Foreword

### Dr Andrew Howe, Barnet Director of Public Health



My report this year focusses on the built environment, an issue becoming more and more important in public health. Pressures on health and social care in local authorities and the NHS can dominate debates about future organisation and planning. I believe that delivering healthier communities and neighbourhoods, both new and regenerated, also demands our attention.

It's increasingly recognised that the built environment and 'place-based' approaches significantly affect health and wellbeing. Individual efforts to improve one's lifestyle or health status are greatly influenced by one's surroundings. The built environment is the structures and places where people work, live, learn and play. Connections between these places are important too: transport infrastructure, open and green space, and, increasingly, 'blue space' (rivers and canals). The built environment influences key determinants of health, including housing, neighbourhood conditions and transport. These key determinants shape our underlying social, economic and environmental circumstances, which influence our health outcomes enormously.

In urban areas, bringing built features and nature together creates valued environments which help people to stay healthy and make the most of their surroundings. Our colleagues in planning, growth and regeneration are essential to this process, as are our partners in development and our residents – creating healthier places and environments is collaborative work.

So much has been published recently on the built environment and health. My report allows us to reflect on what's working well in Barnet, where the evidence points, and what more we can do to create a built environment that helps Barnet residents realise their potential.

A handwritten signature in black ink, reading "A.D. Howe", with a horizontal line underneath.



# Contents

Introduction	5
Local picture	5
Deprivation in Barnet	5
Built environment and health	6
Housing and buildings	7
Green space	9
Access to open space	10
Allotments	10
Land use	12
Planning and design	13
Age-friendly cities	14
Social model of disability	15
Active design	15
Transport	15
Road safety	20
Air quality	21
Healthier environments and High Streets	22
Health on the High Street	22
Diet	22
Alcohol and licensed premises	23
Smoking and smoke-free environments	24
Public health strategy and policy on the built environment	24
Overview	24
Marmot Review	24
Healthy Lives, Healthy People	25
Town and Country Planning Association	25
London Plan	26
Barnet action on the built environment	26
Overview	26
‘Three Strands Approach’	27
Corporate Plan 2015–2020	27
Local Plan	27
Transport	28
Cycling	28
Entrepreneurial Barnet	28
Growth and regeneration programme	30
Brent Cross Cricklewood development	31
Open spaces, recreation and play	31
Sport and physical activity project	32
Town centres	32
Conclusions and recommendations	33
Neighbourhood spaces	33
Open spaces, recreation and play	34
Building design	35
Movement and access	37
Local economy	38
Food access	39
Video, Short Summary and Appendices	41

## Introduction

By 2030, over 90% of the UK population will live in cities.<sup>1</sup> Urbanisation brings many benefits, but it also poses numerous health challenges linked to the built environment.<sup>2,3</sup> There is therefore a clear need to promote health, and healthy choices, in urban areas.<sup>4,5</sup>

Well-designed neighbourhood environments can improve both physical and mental wellbeing. Beneficial elements include: diversity of land usage; well-maintained environments; affordable, efficient public transport; safe play areas; high quality green space; well-lit footpaths; and street layouts that encourage informal contact between residents.<sup>6,7</sup> The built environment can both facilitate and constrain health and activity.<sup>7-9</sup>

This report addresses the health-related challenges Barnet faces in relation to the built environment: the “buildings, spaces and products that are created or modified by people”.<sup>10</sup>

## Local picture

Barnet’s population is the largest of any London borough, and it is becoming more diverse as it grows. By 2018, over one-third of Barnet residents (36%) will be of black or minority ethnicity (BAME).<sup>11</sup> These residents are more likely to live in west Barnet: in 2011, over half the population of Colindale, Burnt Oak and West Hendon were of BAME ethnicity.<sup>12</sup>

By 2039, Barnet’s population will have increased by about 76,000. While this growth will affect all age groups, numbers of children and older people will increase significantly more, generating demand for housing that meets the needs of families and older people.<sup>13</sup> The greatest population expansion is expected in the south and west of the borough: over 100% growth in Golders Green and almost 80% growth in Colindale, by 2030.<sup>14</sup>

A 2014 housing needs assessment estimated that 27,350 new homes would be required in Barnet between 2015 and 2025. Barnet housing needs may have been under-estimated and may, over time, exceed capacity.<sup>13</sup>

Most Barnet growth will centre around Colindale, Brent Cross Cricklewood and Mill Hill East, where planned development will deliver up to 20,000 new homes by 2029/30.<sup>15</sup>

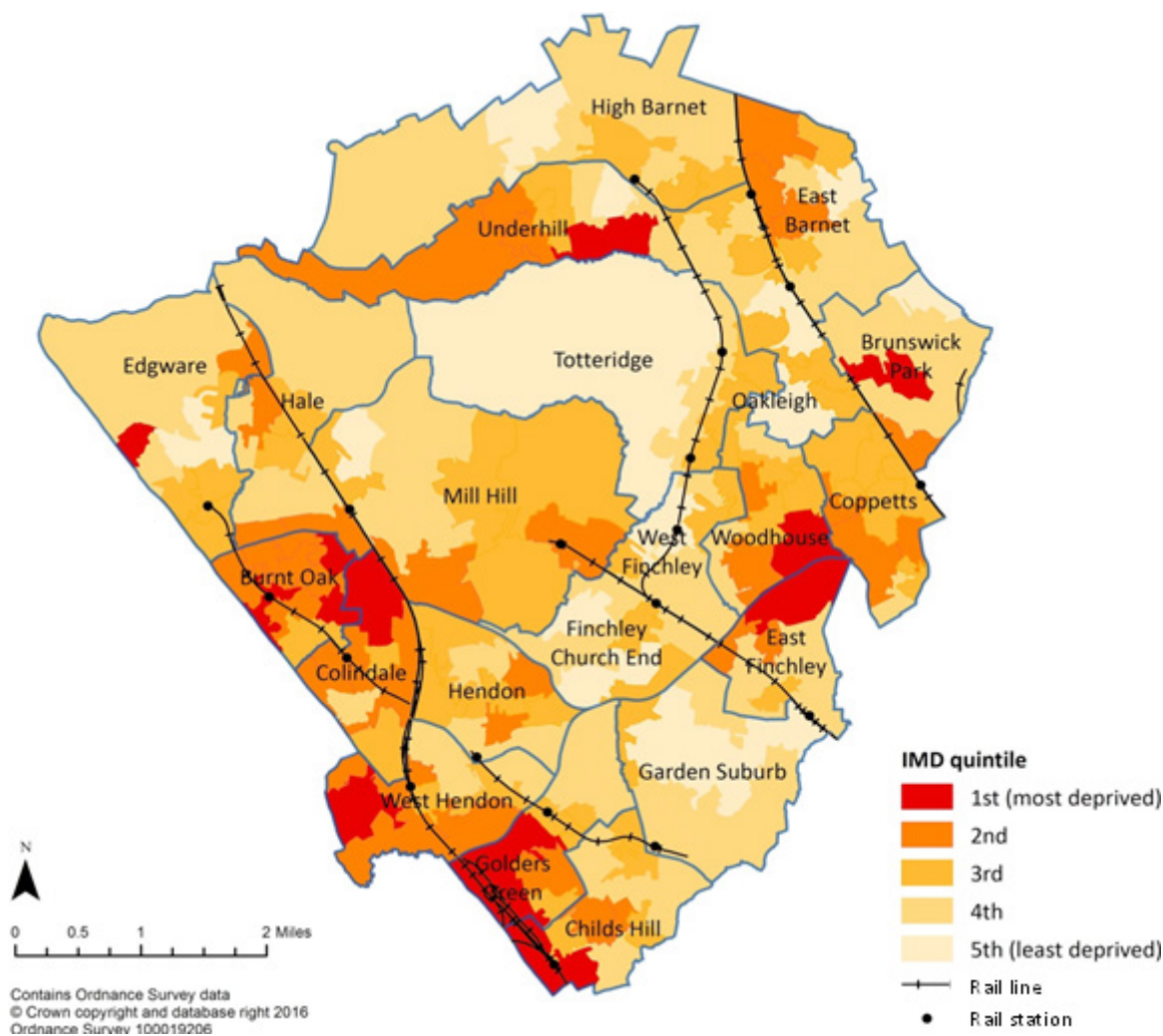
## Deprivation in Barnet

The Index of Multiple Deprivation (IMD)<sup>16</sup> gives a relative measure of local deprivation based on 37 indicators grouped into 7 domains: housing and services; living environment; crime; employment; income; education; skills and training; and health and disability. In 2015, Barnet was ranked the 157th most deprived local authority, of the 326 in England. Within London, Barnet is the 24th most deprived borough. Although Barnet’s London status has worsened slightly since 2010 (when it was the 25th most deprived borough), it still compares favourably with other boroughs (see Appendix A).

The most deprived wards are concentrated in west Barnet, with the most deprived neighbourhood ‘Lower Super Output Areas’ (LSOAs) situated in and around the West Hendon and Grahame Park estates in Colindale. Both these Colindale LSOAs fall within the 10% most deprived in England and the 5% most deprived in London. Garden Suburb is the least deprived ward in Barnet, and Burnt Oak the most deprived. Although the worst deprivation clusters in west Barnet, pockets of deprivation are found in other areas (see Figure 1).



**Figure 1: Barnet wards and Lower Super Output Areas, by 2015 Index of Multiple Deprivation (IMD) England quintile**



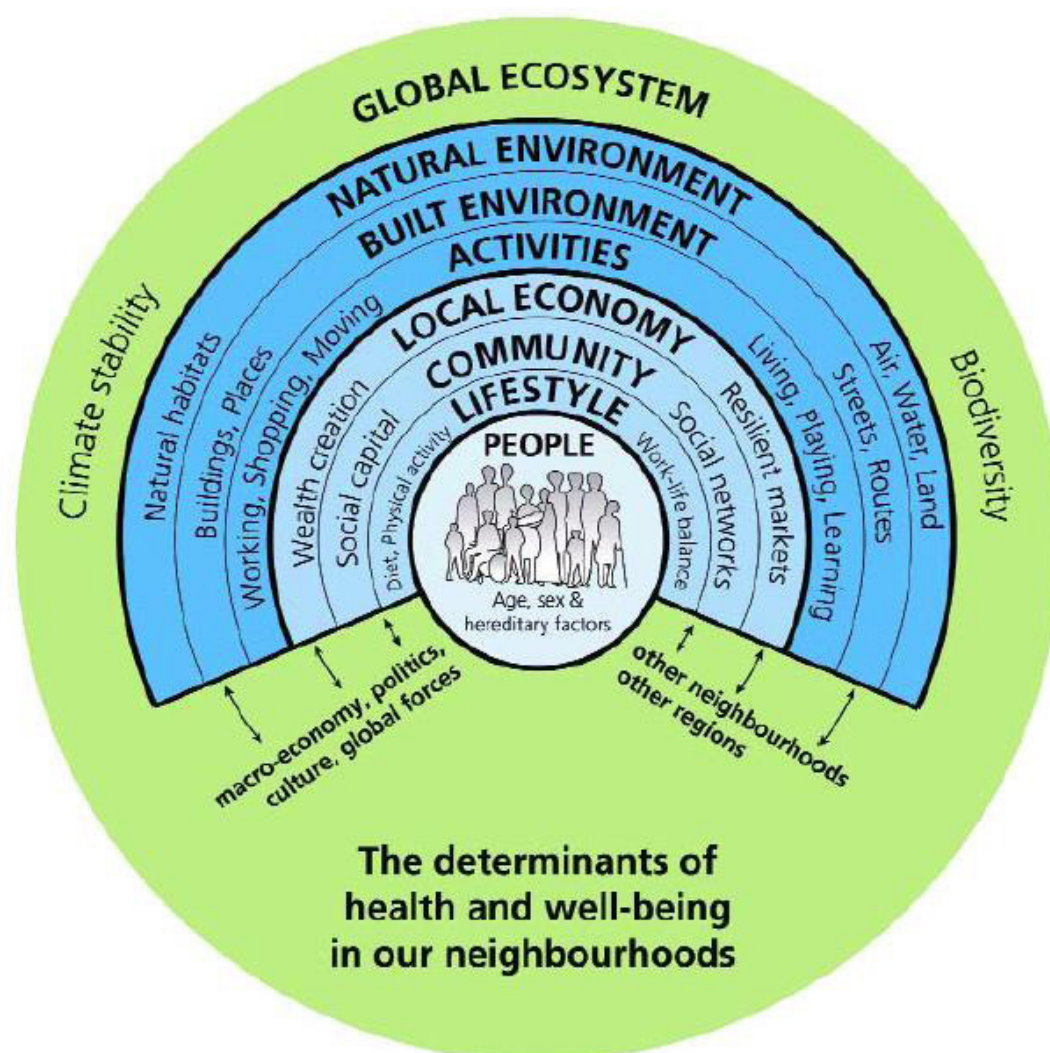
Sources: Ordnance Survey, Department for Communities and Local Government

**Built environment and health**

People’s health is shaped by their living conditions. Figure 2 demonstrates this relationship using concentric arcs representing health determinants: the outer determinants affect those within. In this model, the built environment shapes the activities, local economy, community and lifestyle factors affecting individuals’ health and wellbeing. Thus, the built environment is an important target for public health specialist intervention.<sup>17</sup> However, the built environment relationship is two-way: individuals are affected by, but also affect, their built environment.<sup>18</sup>



Figure 2: The Health Map: factors that influence health and wellbeing

Source: Barton and Grant<sup>18</sup>

The built environment directly influences people's behaviour, perceptions, ability to socialise, and access to physical activity, thus affecting their broader health and wellbeing.<sup>19,20</sup> The built environment also has significant indirect effects on health, for example via deprivation and isolation.<sup>21–30</sup> Six of the seven most common causes of ill health causing premature mortality – smoking, alcohol, air pollution, poor diet, high blood pressure and obesity – are amenable to built environment interventions.<sup>31</sup> Furthermore, the quality of the built environment varies greatly between areas of greater and lesser deprivation, affecting transport, pollution, green space, housing, community integration and social isolation.<sup>32</sup>

### Housing and buildings

People in Europe spend around 90% of their time indoors.<sup>33</sup> Poorly designed homes contribute to poor physical and mental health. For example, damp, cold, mouldy and overcrowded housing conditions are associated with respiratory infections,<sup>34–37</sup> tuberculosis transmission,<sup>38</sup> worse asthma<sup>39</sup> and poorer mental health.<sup>40,41</sup> Inadequate household heating also has a strong association with excess winter deaths.<sup>42</sup>



Adverse housing conditions significantly affect children’s wellbeing. Children living in cold, damp housing miss more school days,<sup>43</sup> experience more long-term ill health and disability, and are more likely to contract meningitis.<sup>44</sup> Poor housing quality during childhood generally correlates with slow physical growth and delayed cognitive development.<sup>45,46</sup>

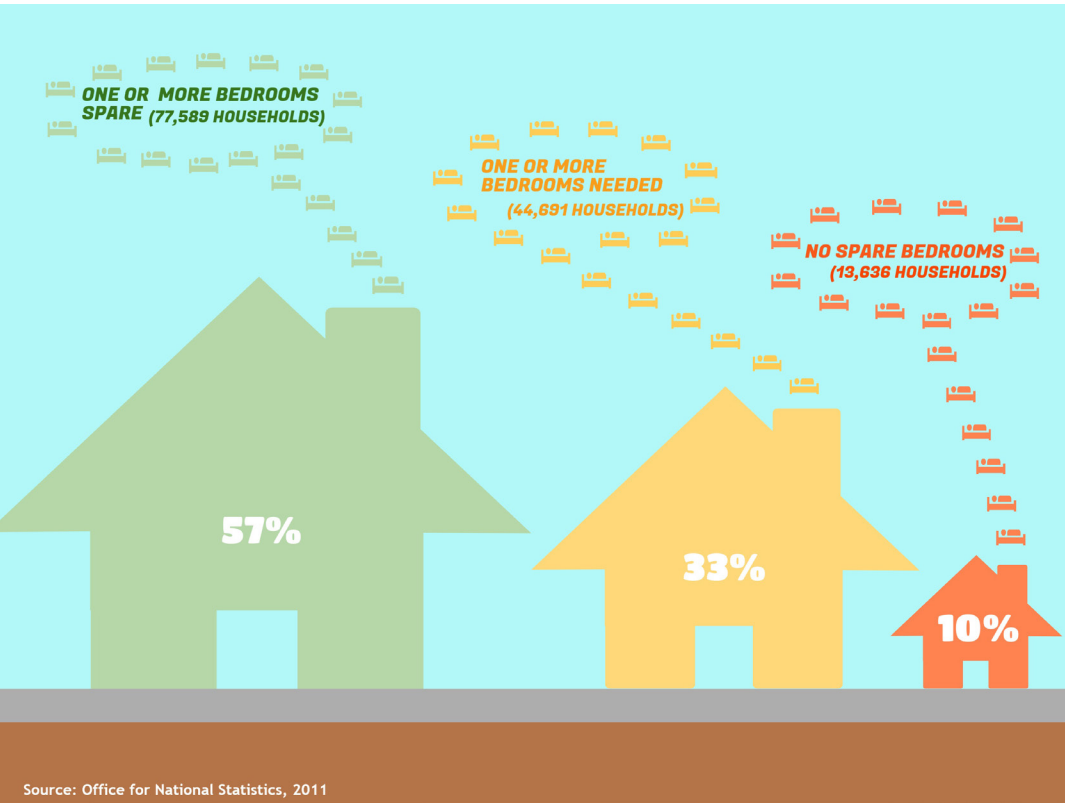
Barnet has a housing stock of about 133,000 units, mostly over 50 years old but generally in good condition. Sixty-two per cent of stock is houses (semi-detached, detached or terraced) and 38% is maisonettes and flats. Almost 60% of Barnet housing stock has three or more bedrooms, while a very small proportion is single bedroom accommodation.<sup>47</sup>

Barnet is similar to other outer London boroughs in having a strong private rented sector, a high percentage of owner-occupied housing (72%), a relatively small supply of social rented accommodation. However, unlike the rest of London, Barnet has more housing rented in the private sector (16%) than the social rented sector (13%).<sup>47</sup> If current trends continue, rates of owner-occupancy are likely to decrease and rates of private rental to increase.<sup>48</sup>

According to the Barnet Housing Needs Assessment,<sup>49</sup> 2,735 new homes are needed each year between 2015 and 2025. By 2025, over 27,000 new houses are expected to be built in Barnet.<sup>50</sup> Twenty-four per cent of these new properties will require three bedrooms or more, 15% will need to be affordably priced, and only 33% will be put on the market for sale<sup>51</sup> (compared with current owner-occupation rates of 72%).

Household overcrowding and under-occupancy rates in Barnet are shown in Figure 3. The wards with most overcrowding are Colindale (35% of households), Burnt Oak (29%) and West Hendon (28%), while the least overcrowded are Brunswick Park (10%), Totteridge (11%), Oakleigh (11%) and East Barnet (12%).<sup>52</sup>

Figure 3: Barnet 2011 household occupancy levels



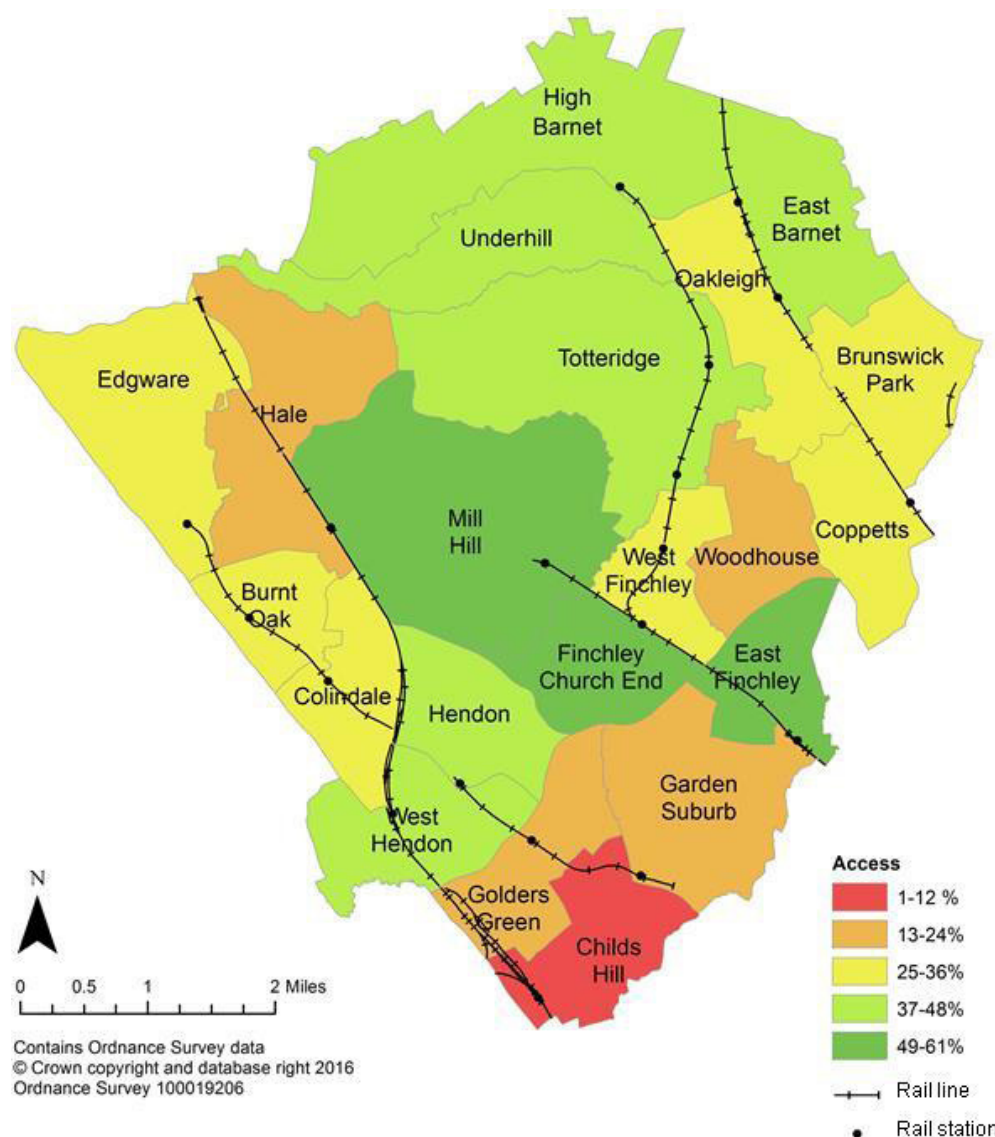
For all 21 wards in Barnet, overcrowding was significantly worse than the 2015 England average, but only 5 were significantly worse than the London average: Colindale, Burnt Oak, West Hendon, Childs Hill and Hendon.

For more information on housing and housing-related deprivation, see Appendix B.

## Green space

Proximity to green spaces (see Figure 4) is clearly associated with increased levels of physical activity,<sup>53–57</sup> enhancing cardiovascular benefits and reducing sedentary leisure time.<sup>58–60</sup> The health benefits of physical activity are well established and compelling.<sup>61</sup> Physical activity is important to maintaining healthy weight,<sup>62</sup> and increasing activity levels is key to reversing obesity trends.

**Figure 4: Barnet household access\* to open space, by ward, 2015**



\*Access = within 400 m walk

Sources: Greater London Authority, Ordnance Survey



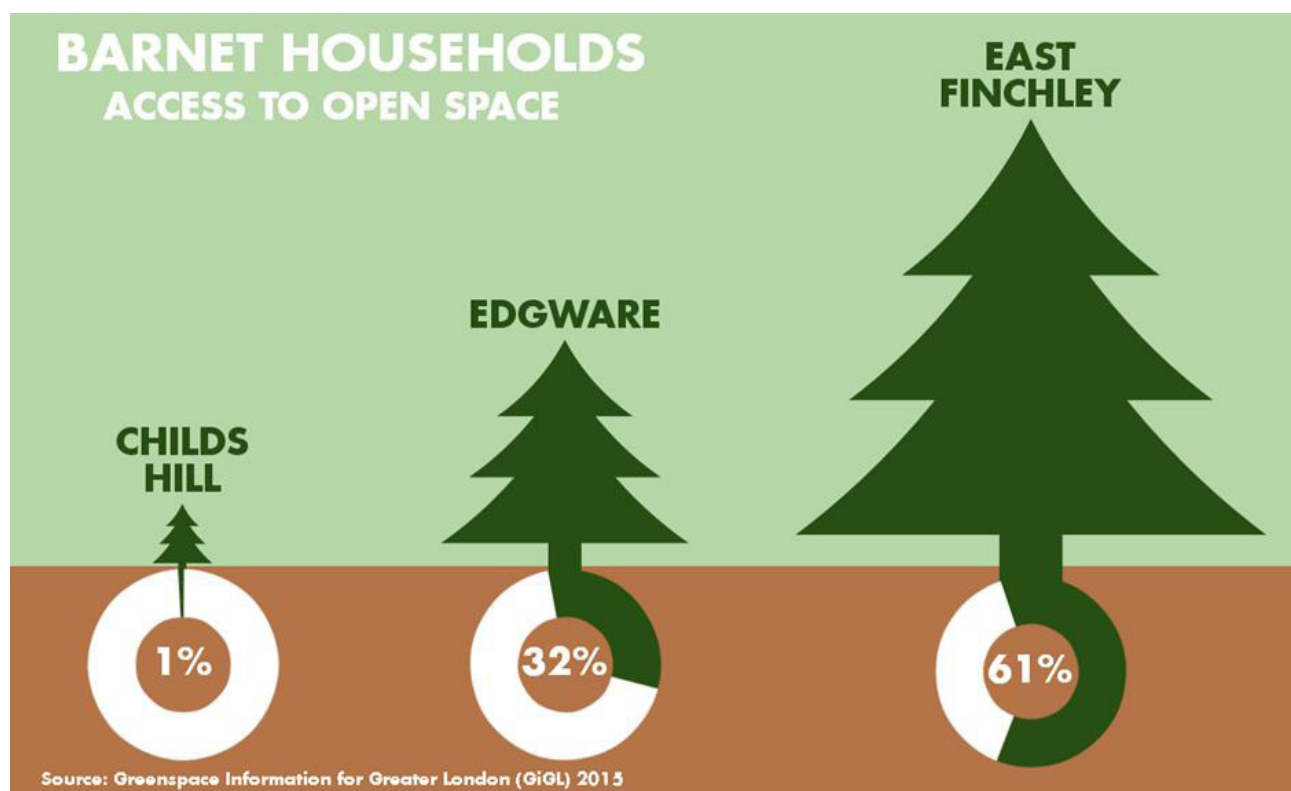
In Barnet, parks and green spaces are the most popular exercise locations, accounting for over 50% of exercise in the borough. This healthy trend (see below) is needed, however, as Barnet residents have a higher prevalence of mental health problems than the England average,<sup>63</sup> and it is predicted that by 2030 43,700 residents (17,200 men and 26,500 women) will be living with a mental health condition.<sup>64</sup>

Provision of high quality green space increases physical activity rates and improves physical,<sup>65</sup> cognitive,<sup>66</sup> and psychosocial<sup>67,68</sup> wellbeing in communities. Frequent park visits can reduce stress-related illness prevalence.<sup>69</sup> People with poor access to green space are more likely to experience weaker social connections<sup>70–73</sup> and mental illness.<sup>74–77</sup>

### Access to open space

Over half (52%) of London households are within a 400 m walk of open space (e.g. a local park), compared with 34% in Barnet. Wards with higher levels of access tend to be in central and east Barnet. There is also considerable variation in access, ranging from 61% in East Finchley to only 1% in Childs Hill (see Figure 5).

Figure 5: Range of household access to open space among Barnet wards, 2015

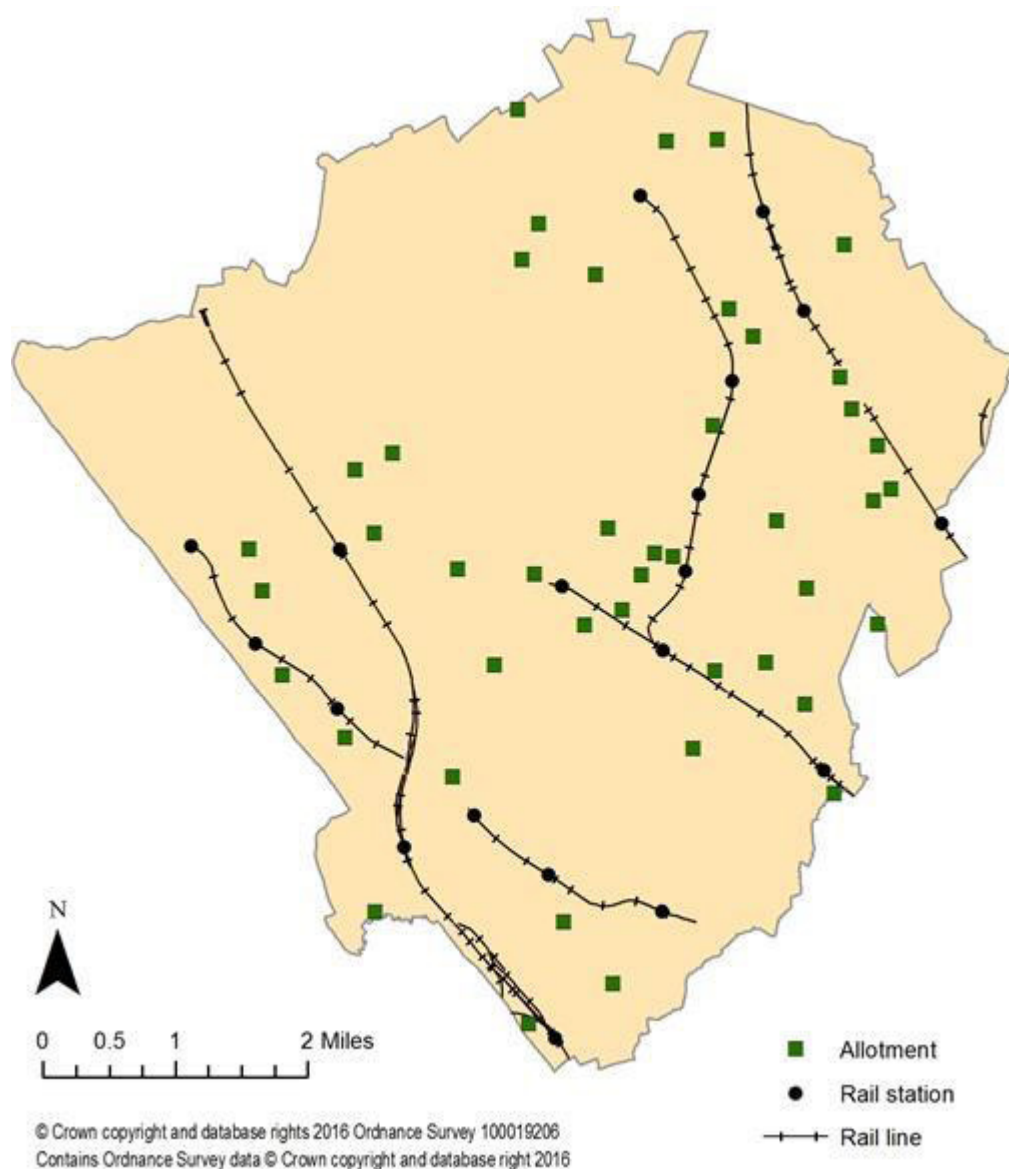


### Allotments

In addition to its parks and natural spaces, Barnet has the largest number of allotments per person of any London borough (see Appendix C).<sup>78</sup> There are 44 allotment sites distributed across the borough (see Figure 6).<sup>79</sup> In July 2015, there were 3,205 plot holders in Barnet and 461 people on waiting lists.



Figure 6: Barnet allotments in 2016



Sources: Barnet Allotment Federation, Ordnance Survey

Allotments provide both short- and long-term health benefits, including alleviation of stress, anxiety and depression. People of all abilities have the opportunity to be active<sup>80</sup> and create social connections<sup>81</sup> by using allotments, and this is reflected in the age range and diversity of participants in Barnet.<sup>82,83</sup>

Use of green spaces is largely dependent upon maintenance standards and the availability of appealing activities.<sup>84</sup> Individual-level interventions can be very successful in increasing activity levels<sup>85,86</sup> but results tend to be short-lived (often less than 12 weeks). Longer lasting changes in activity can be achieved through strategies which include environmental interventions, including the better provision of green space.



## Land use

Currently, 38% of Barnet is undeveloped, 28% is green belt, 8% is metropolitan open land and 26% is suburban.<sup>87</sup> The suburban development of Barnet was stimulated in the 1920s and 1930s by new arterial roads (particularly the North Circular) and the Edgware Tube extension.<sup>88</sup> Consequently, Barnet has larger pockets of low-density, segregated residential areas (e.g. in Totteridge ward) than London as a whole.

However, the population of Barnet is predicted to rise by 14% over the next 15 years, creating a demand for new housing.<sup>14</sup> This anticipated housing demand, both in Barnet and London-wide, will cause a shift in land use.<sup>89</sup> London First's strategic planning report demands increased development of new, high density residential areas<sup>90</sup> as well as regeneration of older, low density areas.<sup>91</sup> This will create new opportunities for the development of pedestrian-oriented neighbourhoods.

In this context of changing land use demands, public health specialists can play a vital role in creating health-promoting neighbourhoods, provided they are embedded at the centre of the planning process.

There is much evidence suggesting that more mixed land use (e.g. residential areas with integrated local amenities), rather than segregated land use, can increase neighbourhood 'walkability'.<sup>92–94</sup> Mixed land use is typically a combination of high density residential areas and local services, including grocery shops, health services and green spaces.<sup>73</sup> Such land use diversity enables residents to access the services they need without using private vehicles.<sup>95,96</sup> It also encourages social interaction, increasing social capital within local neighbourhoods.<sup>97</sup>

Mixed land use with pedestrian-oriented neighbourhoods also promotes physical activity. These environments are known to encourage healthier weight.<sup>98–100</sup> In contrast, segregated land use is associated with sedentary lifestyles and high commuting levels, which in turn are linked to increased obesity levels.<sup>101</sup>

The majority of Barnet residents commute into central London. Even with the expected local employment growth forecast in the *Entrepreneurial Barnet* plan (see p. 28),<sup>102</sup> this trend is expected to continue.

Figure 7 shows that the predominant land use within Barnet is currently 'segregated residential'. To protect community health, future new developments need to move to mixed land use.



Figure 7: Land use in Barnet, 2009



Source: London Borough of Barnet<sup>103</sup>

## Planning and design

Built environment design has a major impact on users' mobility, access to resources and services, social participation, independence, and quality of life. Transport for London (TfL) has identified 10 key indicators of healthy street environments (see Figure 8), which can be achieved by action such as: maintaining pavements and green spaces; improving street lighting; reducing noise pollution; and creating aesthetically pleasing surroundings.<sup>94,104,105</sup>



Figure 8: Transport for London’s 10 indicators of a healthy street environment



Yellow section reads ‘People choose to walk and cycle’. Source: Transport for London<sup>106</sup>

Everyone’s health is affected by planning and design, but the most vulnerable are affected greatest. It is important that all users of communities and town centres have equal opportunity to achieve health and wellbeing, rather than only those whose health is already good.

It is estimated that 30–40% of UK residents face ‘physical barriers’ when using the built environment.<sup>107</sup> This includes people with disabilities but also their carers, older people, those pushing prams or with luggage, and those with temporary mobility issues. Reducing access barriers has greater significance for boroughs such as Barnet because of predicted future demographic shifts. Encouraging active ageing through built environment interventions will reduce social isolation and increase disability-free life expectancy. Furthermore, as almost 25,000 residents are predicted to have moderate or severe physical disabilities by 2030,<sup>64</sup> it is critical that steps are taken now to reduce physical barriers in the environment.

Age-Friendly Cities

The World Health Organization (WHO) has identified eight elements of age-friendly cities.<sup>108</sup> Of particular importance to this report is the first element, ‘outdoor spaces and buildings’. In 2011, London signed the *Dublin Declaration of*



*Age-Friendly Cities*,<sup>109</sup> demonstrating its commitment to the initiative. In addition to supporting older people, many of the resulting recommendations will improve public space accessibility for people with disabilities and those with young children, increasing the mobility and social inclusion of all.

## Social model of disability

Barnet has adopted the 'social model' of disability and thus seeks to address the attitudes and social structures that cause the majority of everyday barriers experienced by disabled people.<sup>110</sup> Much of what is addressed in the social model of disability is also relevant to Age-Friendly Cities. When designing health-promoting environments, incorporating the recommendations of both the social model of disability and Age-Friendly Cities will help maximise effectiveness.

## Active design

Good design can improve the accessibility of services which promote health. However, built environment alterations can also improve the health of those unaffected by physical access barriers. 'Active design' governance aims to achieve this.<sup>84</sup> Active design guidelines help architects and builders ensure that their developments promote health. Specifically, active design principles help create environments which integrate physical activity into everyday life. For example, the New York City Departments of Design and Construction used public health specialist evidence to help local planners and school developers improve neighbourhood walkability.<sup>111</sup> Active design also promotes walking within buildings, e.g. by clearly labelling stairwells and making them safe and attractive. Providing office cycle bays and cyclists' showers is another example of active design.

## Transport

Transport increases access to people, products and services; thus, it can enhance health and increase quality of life. However, different types of transport have varying effects on people's health and wellbeing.

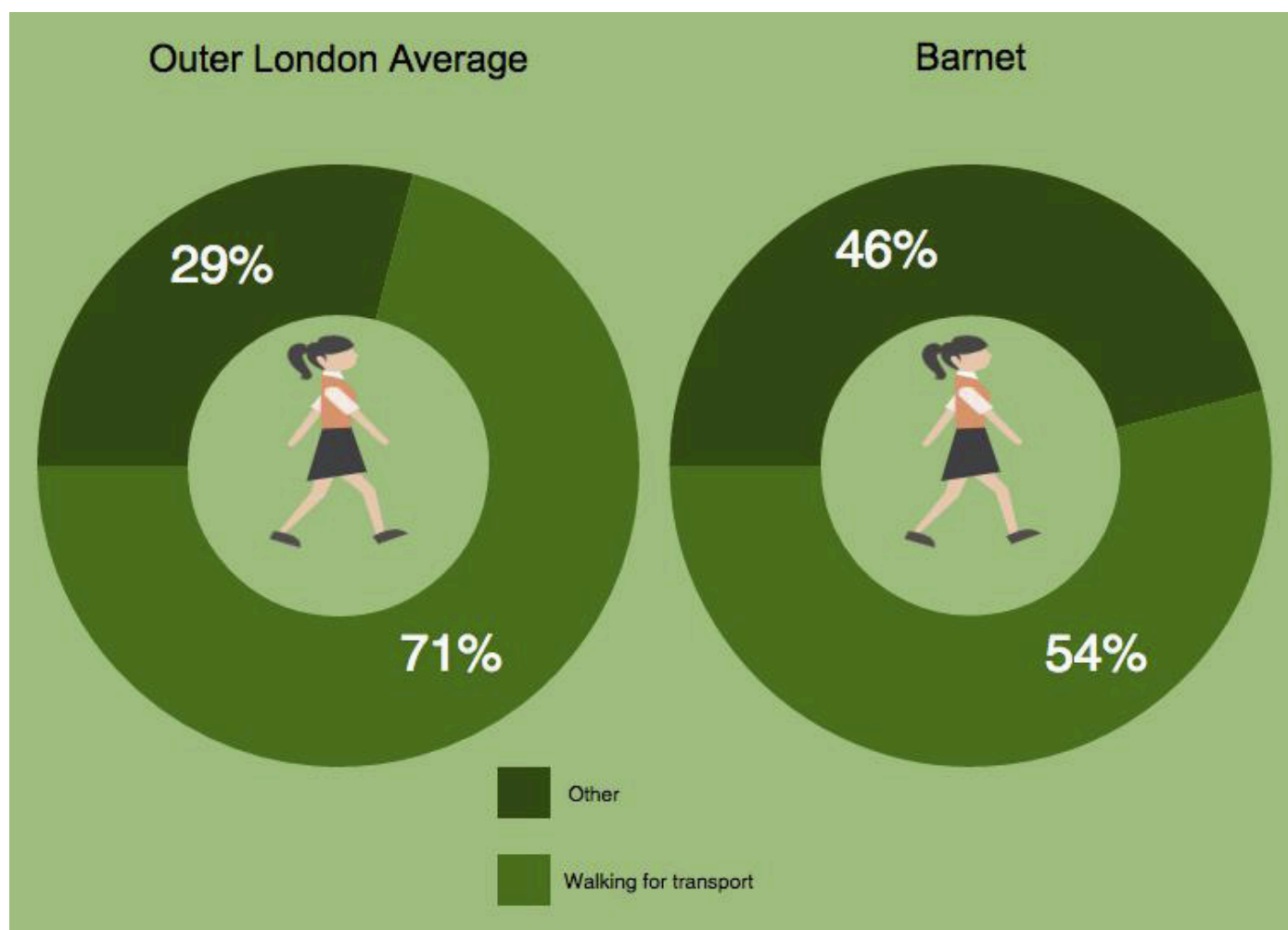
Using public transport increases people's level of 'active travel', as they walk and cycle more. In London, over two-thirds of public transport trips involve five minutes' walking or more, and half of all walking is done as part of public transport trips.<sup>112</sup>

People who are physically active have less risk of heart disease,<sup>113</sup> stroke,<sup>114,115</sup> type 2 diabetes,<sup>116,117</sup> colon cancer,<sup>118</sup> breast cancer,<sup>119,120</sup> hip fracture,<sup>121,122</sup> depression<sup>123,124</sup> and dementia.<sup>125</sup> Furthermore, increased active travel is associated with reduced road traffic injuries and air pollution, considerably reducing the burden of related diseases (e.g. asthma).<sup>126</sup>

In Barnet, 59% of adults get the recommended 150 minutes of physical activity per week; over one-quarter (28%) do so through walking.<sup>127</sup> Over half of this walking is done as part of transport, rather than for leisure or other purposes. However, as Figure 9 shows, this is well below the outer London average.<sup>127</sup> Active transport is one of the most sustainable ways for people to be sufficiently physically active across the lifespan.<sup>128</sup> More active travel opportunities in Barnet will improve health throughout the borough.



**Figure 9: Proportion of adults achieving recommended physical activity levels via walking for transport vs other reasons, in outer London and Barnet, 2014/15**



Source: Sport England<sup>127</sup>

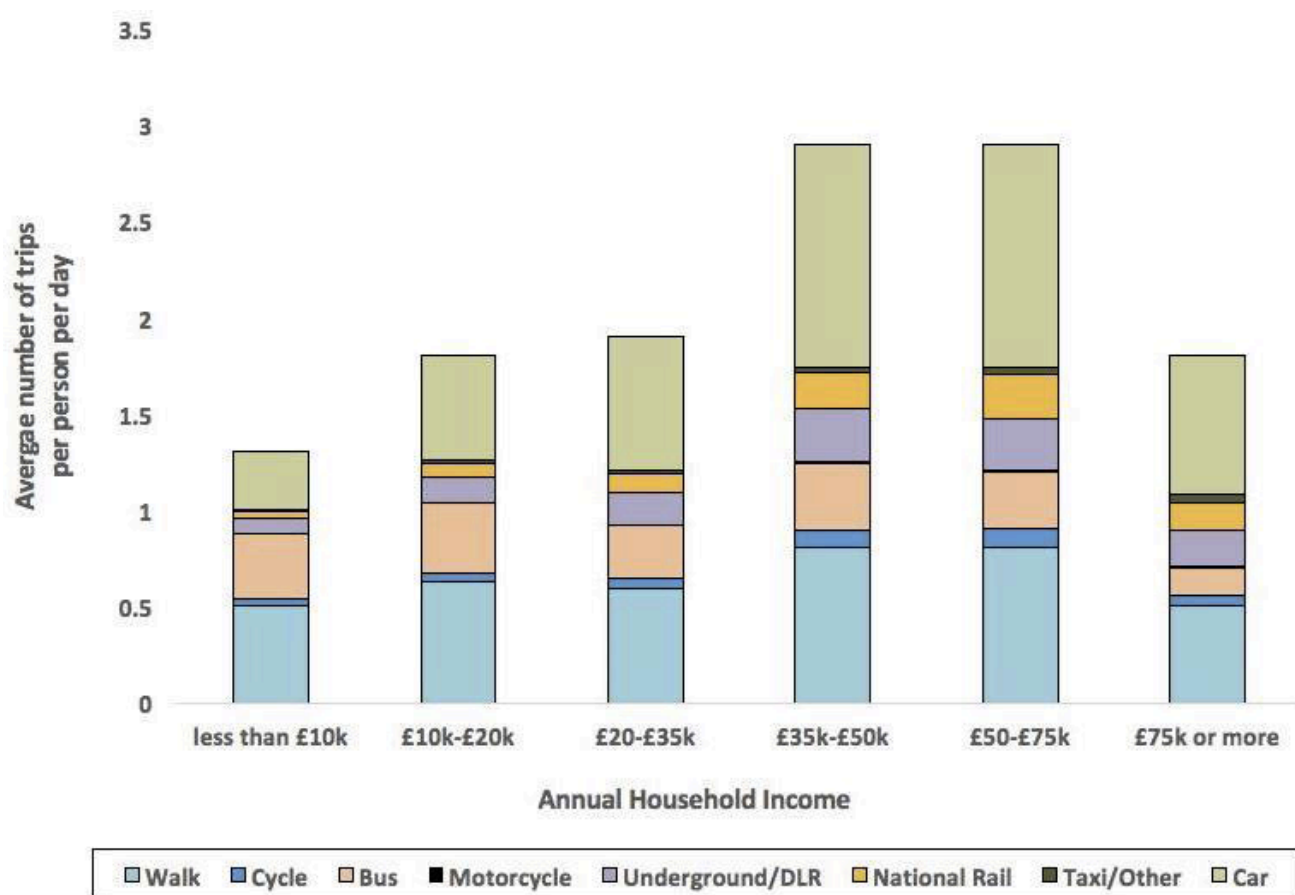
As well as improving individual health, increasing physical activity uptake via active travel has economic benefits due to reduced healthcare costs, less pollution and fewer traffic accidents (due to fewer vehicles).<sup>106</sup> Likely active travel related economic benefits can be measured using the WHO Health Economic Assessment for Transport (HEAT) tool.<sup>129,130</sup>

Cars enable greater access to health services and physical activity opportunities. While owning a car is associated with longer life expectancy,<sup>131,132</sup> this relationship is explained by the link between income and travel.<sup>133</sup> In Britain, total travel expenditure increases with income; high income groups purchase more cars and spend four times as much on train and tube travel. However, higher income earners also spend more time cycling.<sup>134</sup>

Walking is usually a common form of transport for people with low income. In London, however, walking trips are more frequent among higher earners (see Figure 10).<sup>131</sup> Thus, London higher earners travel more both by car and by active travel, compared with lower earners, widening the gap in transport-related health outcomes.<sup>135</sup>



Figure 10: Average trips per day per person, by mode and household income, London, 2014/15

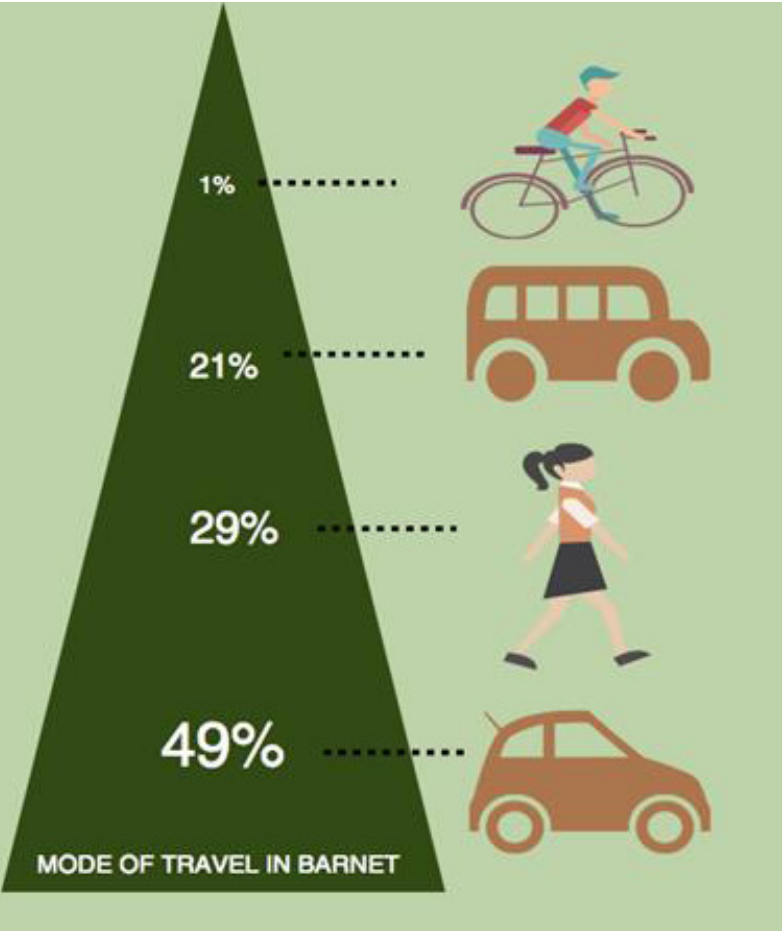


Source: Transport for London (personal communication, 2016)

Barnet is largely car-dependent, so inequalities in access and mode of transport are likely to be greater than the London average. Nearly half of all journeys in Barnet are made in private vehicles (see Figure 11), and about 80% of households have access to one or more cars, significantly more than the outer London average (60%).<sup>87</sup> If these patterns continue alongside predicted future population growth, car-related problems will escalate in Barnet. North London is currently forecast to have 40,000 extra cars, and 137,000 extra car trips per day, by 2030. At present, 89% of trips that could be walked (based on distance and journey type) are done by car; notably, around 40% of these trips are shorter than 1 km.<sup>88</sup>



Figure 11: Prevalence of travel modes in Barnet

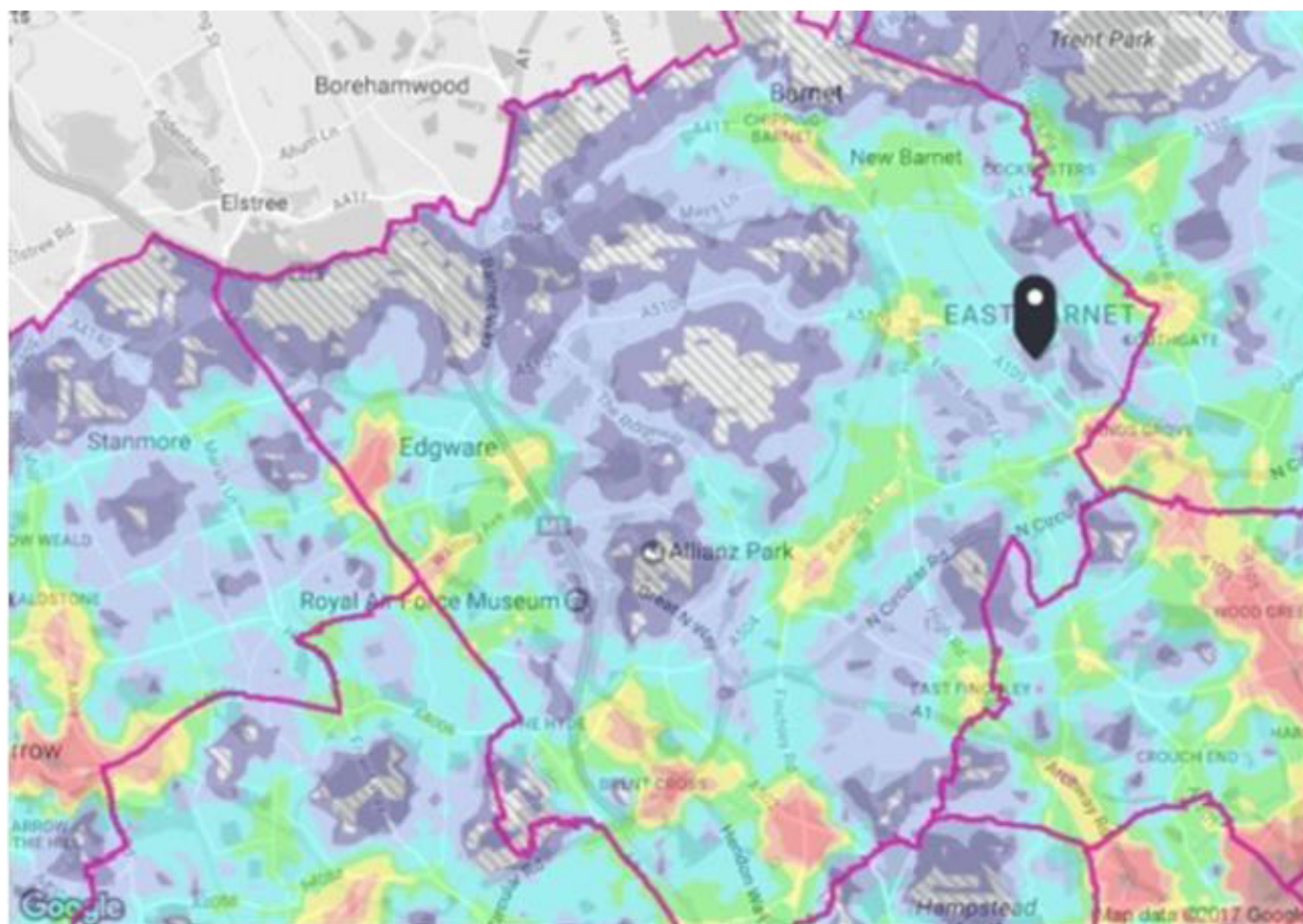


Source: Transport for London<sup>136</sup>

Car dependency is also high among children and young people. Barnet has the highest proportion of pupils travelling to school by car of any London borough,<sup>87</sup> so children are missing a prime opportunity for physical activity. This is a significant loss, as one-third of Barnet 11 year olds are overweight or obese<sup>137</sup> and one-quarter are inactive.<sup>127</sup> In children, walking burns the most calories of all transport modes.<sup>138</sup> Therefore, replacing car travel with active transport is critical to establishing healthy habits in future generations.

Current transport issues in Barnet can be addressed by analysing ‘public transport accessibility level’ units (PTALs), which measure connectivity to the public transport network (derived from walking distance to nearby stations and stops, and frequency of services at these stations and stops). Figure 12 maps PTALs in Barnet and identifies areas where public transport could be improved.



**Figure 12: Public Transport Accessibility Levels (PTALs) in Barnet, 2014**

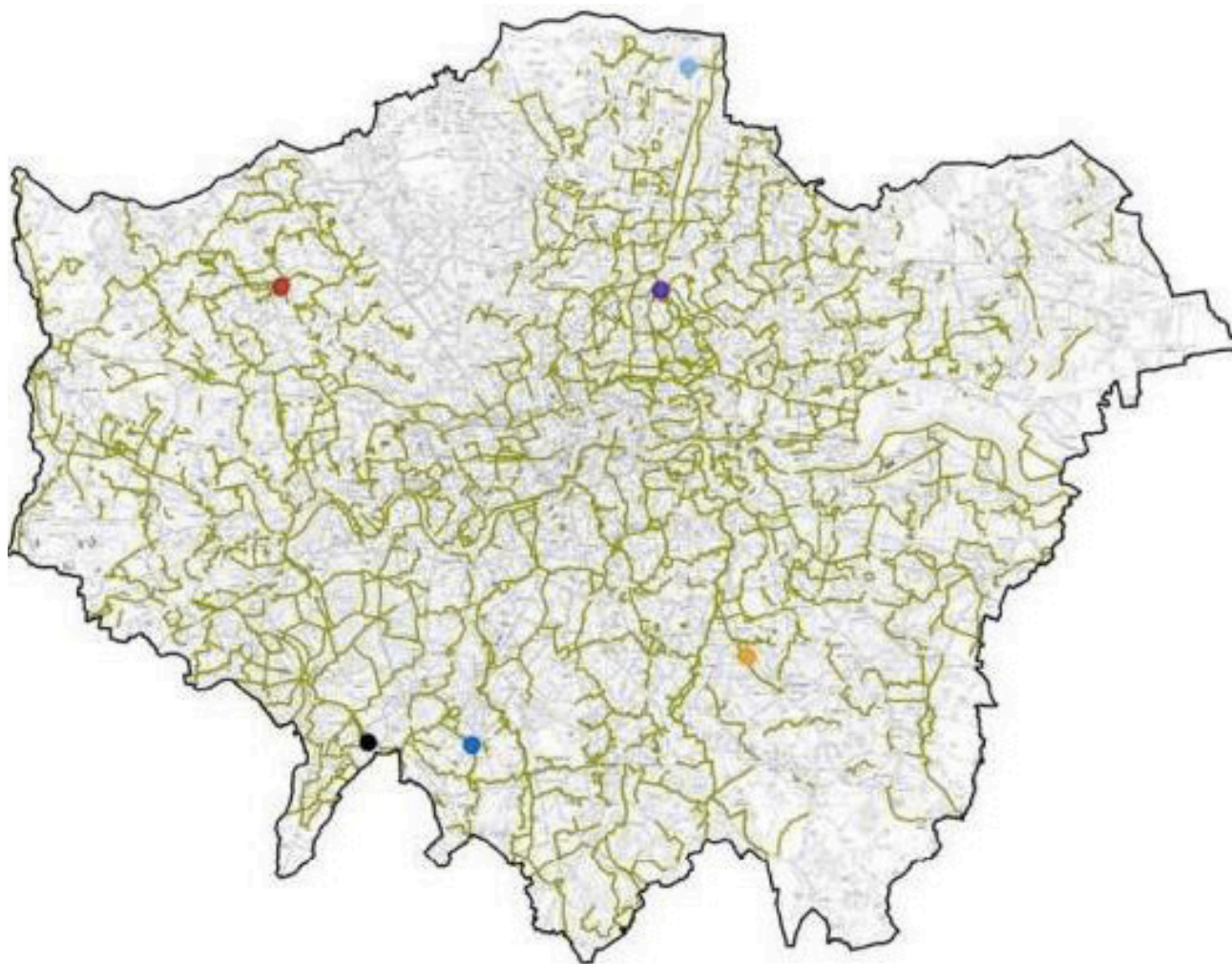
Map colouring indicates public transport accessibility level units (PTALs). Dark red = best connectivity; hatched purple = worst connectivity; pink border = borough boundaries. Disregard black pointer.  
Source: Transport for London<sup>139</sup>

Figure 12 shows a 'green belt' wedge in central Barnet, which blocks east–west public transport travel. At present, such travel is only possible by bus, but services run less frequently than services into central London. In 2014, TfL rated Barnet as 'poor' for public transport access (like most other outer London boroughs); London overall rated 'moderate'.<sup>140</sup> Barnet's more dispersed settlement patterns and less widespread public transport provision have made car ownership and use more necessary, but residents' health does not benefit.<sup>141</sup>

In contrast, TfL places Barnet in the top five outer boroughs for cycling potential:<sup>142</sup> a high proportion of trips currently completed by private vehicle or public transport could be cycled. However, cycling conditions are not currently conducive to increased uptake. Figure 13 shows London's cycle 'greenways' (i.e. safe, quiet routes through parks, green spaces and lightly trafficked streets); Barnet has far fewer cycle greenways than London overall.<sup>143</sup> Transport for London research indicates that most cyclists prefer to ride through green space than adjacent to roads, even if it makes their trip longer.<sup>144</sup> Thus, the lack of Barnet cycle greenways is a substantial barrier to increased uptake, and may partly explain why significantly fewer Barnet residents cycle, compared with London and England averages.<sup>133</sup>



**Figure 13: Cycle greenways in London, 2014**



Source: Transport for London<sup>143</sup>

Decreasing transport inequality is an effective way to reduce disparities in access to health services, supermarkets and leisure centres.<sup>145</sup> Increasing opportunities for, and changing perceptions of, active transport will encourage people of all income brackets to incorporate active travel into their everyday routine.<sup>146</sup> Improving public transport accessibility can also minimise access inequalities in car-dependent areas such as Barnet.<sup>135</sup>

### Road safety

Between 2009–11 and 2012–14, average rates of road death or serious injury declined in Barnet, London and England. Over this period, Barnet had similar rates to London, and in 2010-12 it had significantly lower levels than England.

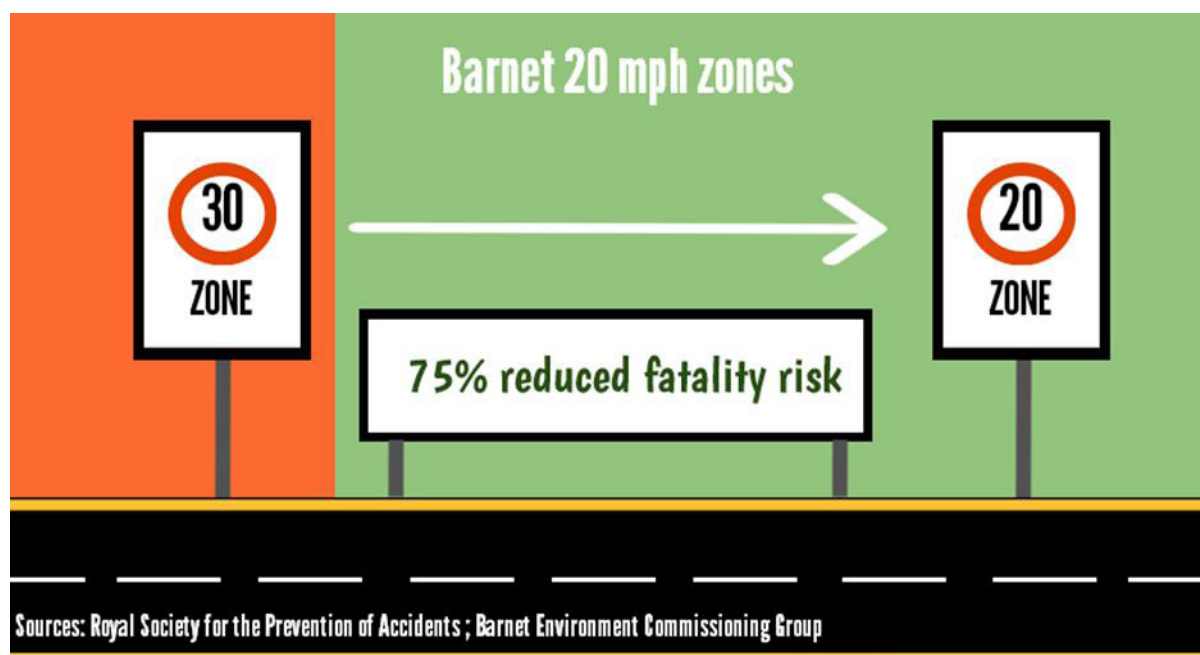
In 2016, 8 children were reported killed or seriously injured on Barnet roads, while 80 suffered less serious injuries (see Appendix D).<sup>147</sup>

Slowing traffic saves lives. The risk of a fatal child accident at 20 mph is less than one-quarter the risk at 30 mph (adult fatality risks are 1.5% and 8%, respectively) (see Figure 14).<sup>148</sup> Barnet currently has the second greatest length



of public road in London,<sup>149</sup> including eighty 20 mph zones each an average 297 m long (Regional Enterprise, personal communication, 2016).

**Figure 14: Reduction of child road fatality risk in 20 mph zones**



Twenty mile per hour zones were first introduced in London in 1990/91. Between 1986 and 2006, it is estimated they reduced road casualties by 42%, and deaths or serious injuries by 46%. Corresponding reductions for children (0–15 years) are 49% for all road casualties and 50% for deaths or serious injuries.<sup>150</sup>

## Air quality

In the UK, air quality is most affected by traffic and industrial emissions.<sup>151</sup> Exposure to air pollutants reduces life expectancy and exacerbates many health conditions.<sup>152</sup> The WHO has linked traffic-related air pollution to asthma, rhinitis, cardiovascular disease, cancer, reduced male fertility, poor birth outcomes and premature mortality.<sup>153</sup> Poor air quality is also associated with higher levels of deprivation, leaving people of lower socioeconomic status disproportionately at risk of harm.<sup>154</sup>

Especially potent health risks come from particulate matter of 10 micrometers or less in diameter (PM<sub>10</sub>), which penetrates deep into the lungs, and nitrogen dioxide (NO<sub>2</sub>, from fuel combustion), which also harms the respiratory system.<sup>155</sup>

Carbon dioxide (CO<sub>2</sub>) is another air pollutant causing global health problems. In 2012, Barnet produced 4.4 tonnes of CO<sub>2</sub> per person (down from 5.3 tonnes per person in 2005), ranking midway among London boroughs; the biggest Barnet CO<sub>2</sub> emitters were homes (51%), road transport (24%), and industry and commercial activity (24%).<sup>156</sup> In 2013, CO<sub>2</sub> emissions in Barnet fell to 4.2 tonnes per person.<sup>157</sup>



## Healthier environments and High Streets

### Health on the High Street

The built environment provides services which significantly affect health outcomes. In their *Health on the High Street Report*,<sup>158</sup> the Royal Society for Public Health used the prevalence of fast food outlets, bookmakers, tanning salons and payday lenders to indicate poor health on the High Street; in contrast, community pharmacies, health services, leisure centres, health clubs, libraries, pubs and bars indicated good health. Significantly for Barnet, three of the borough's High Streets were named among the 10 healthiest high streets in London, with Whetstone receiving the overall healthiest High Street award.

Barnet High Streets provide many services which improve residents' health. However, it is important to understand how access to, and availability of, these services affects health behaviours. This section focuses on the relationship between High Streets and diet, alcohol consumption and smoking.

### Diet

A poor quality diet is a major risk factor for many chronic diseases associated with premature mortality. An England-wide study found that the prevalence of unhealthy food outlets in neighbourhoods was linked to higher levels of excess child weight, whilst the opposite was true for healthy food outlets.<sup>159</sup> Access to affordable, nutritious food is further complicated by transport: a link between obesity and poor walking access to supermarkets (the cheapest source of fresh produce) has been found, but only for households with no access to a private vehicle.<sup>160–162</sup> Thus, poor access to fresh fruit and vegetables compounds the health inequalities afflicting the most vulnerable in society.

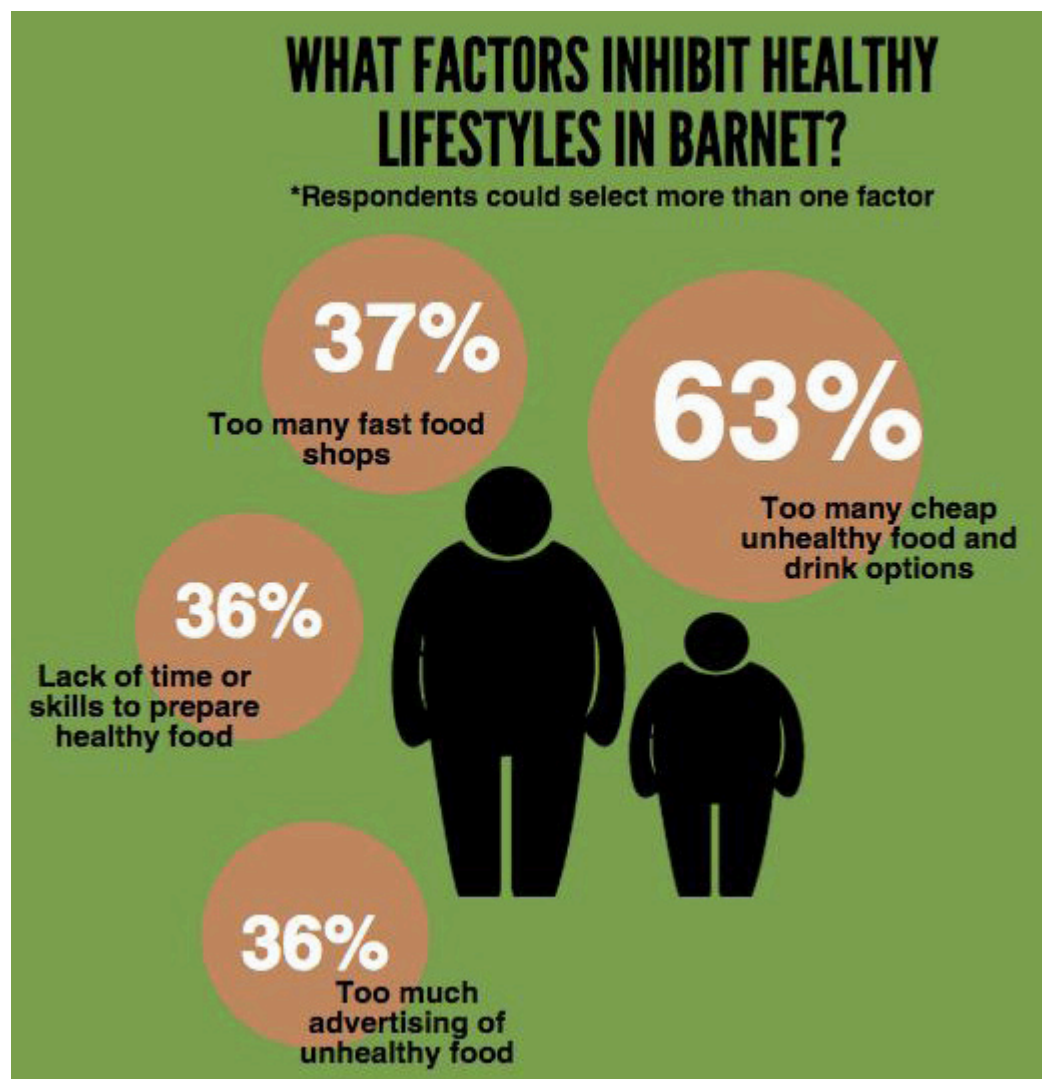
In Barnet, supermarket accessibility is changing. Between 1998 and 2008, the number of town centre supermarkets (i.e. high walkability and accessibility) fell by 31%, while numbers of out-of-centre supermarkets (with low walkability and accessibility) rose sharply.<sup>163</sup> However, there is currently at least one food shop within each of Barnet's 22 town centres, so residents' needs for affordable, fresh produce may already be met.

There is extensive evidence linking fast food outlets and obesity.<sup>164–166</sup> Furthermore, both child and adult obesity increases the risk of physical and mental ill health, including type 2 diabetes, asthma, musculoskeletal conditions, cardiovascular disease and depression, all of which can cause premature mortality.<sup>167</sup> Adult eating patterns are often established in adolescence; therefore, fast food outlets easily accessible from schools are a significant concern.<sup>168,169</sup>

These academic findings were echoed by non-specialist participants in the Great Weight Debate survey. Figure 15 shows factors which Barnet participants felt inhibited healthy lifestyles the most. Almost two-thirds (63%) agreed that "too many cheap, unhealthy food and drink options" (63%) was a main factor contributing to unhealthy lifestyles; 37% felt the same about "too many fast food shops".



Figure 15: Barnet participants' responses to "what factors inhibit healthy lifestyles?"



Source: Healthy London Partnership<sup>170</sup>

In 2016, there were an estimated 278 fast food outlets in Barnet: 74 for every 100,000 residents –Barnet was in the bottom (i.e. lowest prevalence) 4 London boroughs for this statistic.<sup>171</sup> However, distribution of fast food outlets across the borough is not equal: numbers are higher in more deprived areas (a pattern seen England-wide) (see Appendix E). Cardiovascular disease is by far the biggest reason for the worse life expectancy in more deprived Barnet neighbourhoods,<sup>172</sup> so the number of fast food outlets available in these areas is of great concern.

### Alcohol and licensed premises

Alcohol consumption affects all major body systems, although impact varies with consumer age, gender and body mass index, and with the volume, frequency and duration of alcohol consumption and the quality of the alcohol itself (see Appendix F). Alcohol can cause both short- and long-term harm, e.g. acute alcohol poisoning and



chronic liver cirrhosis, respectively. Excessive alcohol consumption also causes social harm, e.g. lost earnings and unemployment,<sup>173</sup> family and interpersonal conflict,<sup>174</sup> and criminal behaviour (see Appendix F).<sup>175,176</sup>

The concentration of pubs, bars and clubs within an area (e.g. a High Street) has been directly linked to public disorder and violence;<sup>177</sup> a higher concentration of such premises is associated with more frequent criminal behaviour.<sup>178</sup> Alcohol-related crime occurs at particular times of the day and week, particularly on weekend nights, when recorded violence levels are usually disproportionately higher.<sup>179</sup> Between 2008/09 and 2012/13, Barnet had a significantly higher alcohol-related crime rate (see Appendix F) than England; over 2,700 alcohol-related crimes were recorded in Barnet in 2012/13 alone.

Alcohol-related harm shows a 'dose-response' relationship (i.e. more alcohol causes more harm), both for health damage (e.g. increased consumption raises alcohol-related cancer risk) and for social harms (e.g. increased consumption can lead to job loss, and unemployment in turn may prompt more alcohol consumption). Although alcohol-related harm seems to be reducing in Barnet, alcohol-related hospital admissions and male mortality are increasing, and alcohol-related sexual offences show no reduction.<sup>180</sup>

Daily heavy drinking is linked to alcohol dependence;<sup>181</sup> however, a single excess drinking binge increases one's risk of physical injury and cardiovascular disease.<sup>182</sup> Twenty-six per cent of Barnet adult residents who drink alcohol are classified as either 'higher risk' or 'increasing risk', while 6% are estimated to have some form of alcohol dependence. An estimated 12% are binge drinkers, but this varies greatly, from 8% in Colindale to 15% in Garden Suburb.<sup>183</sup>

## Smoking and smoke-free environments

On 1<sup>st</sup> July 2007, England became a smoke-free country following implementation of the 2006 Health Act,<sup>184</sup> which prohibited smoking in virtually all enclosed or substantially enclosed public places.

Although there is no specific data on the impact of smoke-free environments on Barnet residents, a general health improvement can be justifiably expected (see Appendix G).

# Public health strategy and policy on the built environment

## Overview

Strong evidence has accumulated, over decades, supporting the relationship between the built environment and health. Recent national reports have translated this evidence into action. The 2010 Marmot Review publication *Fair Society, Health Lives*<sup>185</sup> and subsequent 2010 government policy paper *Healthy Lives, Healthy People*<sup>186</sup> are significant public health frameworks, and provide guidance on using the built environment as a tool to promote health and wellbeing. In 2015, built environment related health issues were addressed in *The London Plan*.<sup>187</sup>

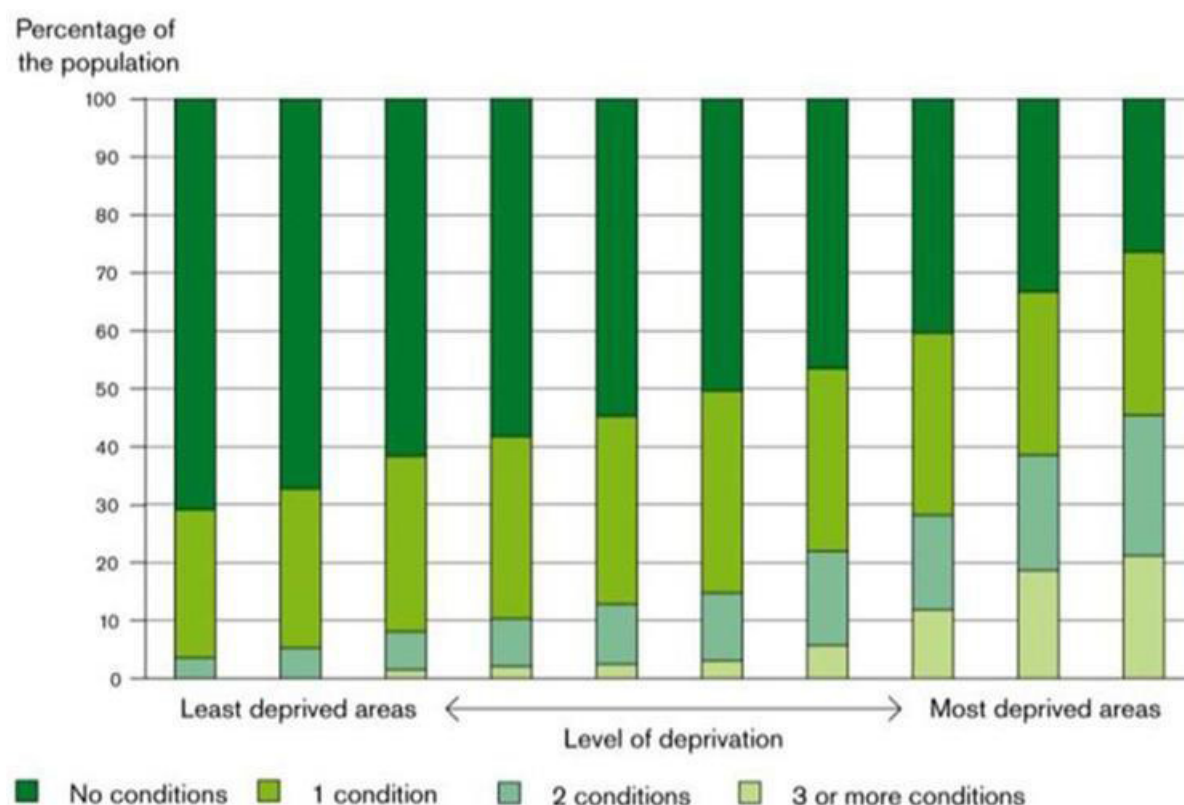
## Marmot Review

The 2010 Marmot Review publication identified six key policy objectives for reducing UK health inequalities, and singled out the 'wider determinants of health' (i.e. broader social factors such as the built environment) as the key focus of health promotion. The report's fifth objective, "create and develop healthy and sustainable places and communities", was based on overwhelming evidence that health and environmental inequalities are inexorably linked. Figure 16, from the supplementary report *Implications for Spatial Planning*,<sup>188</sup> illustrates this relationship: in



England, close to 50% of those living in the most deprived areas experience two or more unfavourable environmental conditions, compared with less than 5% in the least deprived areas.

**Figure 16: Proportion of the population affected by unfavourable environmental conditions, in less and more deprived areas, 2007**



Source: The Marmot Review

The *Implications for Spatial Planning* report identifies opportunities for further integration of health concerns within spatial planning processes. Factors with an especially significant impact on health inequalities are: pollution; transport; food; housing; green and open space; and community participation and social isolation.

## Healthy Lives, Healthy People

The Marmot Review has had a significant impact on reuniting UK town planning and public health. The national strategy for public health, *Healthy Lives, Healthy People*,<sup>186</sup> published in response, gave a commitment to stronger integration of health concerns within the planning system. In 2012, the National Planning Policy Framework<sup>189</sup> became the first national planning policy to specifically mention 'healthy communities' as a key aim.

## Town and Country Planning Association

The Town and Country Planning Association's 2013 report *Planning Healthier Places*<sup>190</sup> explored the link between place-based policies and public health objectives. It urged that health be considered at all stages of the development process, and that public health specialists work closely with planners, designers and developers. In this way, public health priorities and evidence can become an integral part of the planning process, addressing local health inequalities.



Against a background of budget cuts, collaboration between planning and public health departments on shared health and wellbeing priorities is seen as critical for progress. By taking this approach, sustainable community strategies and joint health and wellbeing strategies can combine to drive targeted interventions via the planning system, within an integrated work programme, to support health-promoting environments. Local authorities' Local Plans can also facilitate partnership working on local interventions, for example, health infrastructure changes, large-scale developments and programmes targeting specific health issues (e.g. obesity and physical inactivity), to deliver long-term health benefits.

### London Plan

The *London Plan* is London's overall strategic guide for development over the next 20 years, and incorporates geographic and locational aspects from other Mayoral strategies. It integrates economic, environmental, housing, transport and social frameworks. The *London Plan* is also mandated to address social issues such as health inequalities, population ageing and food security.

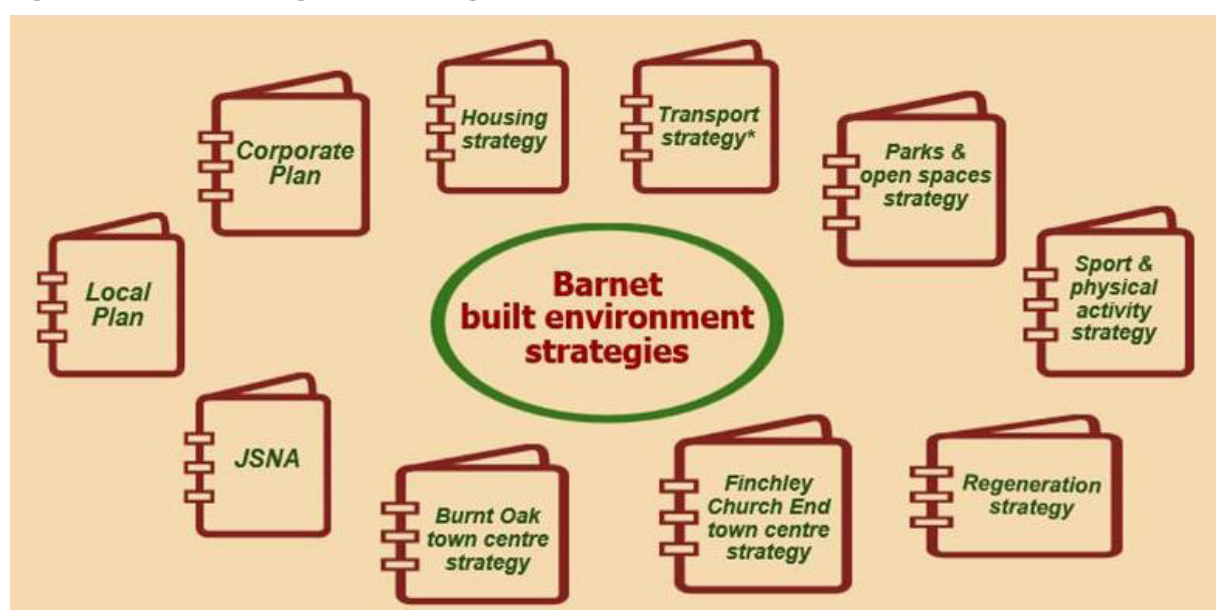
The current, 2015 *London Plan*<sup>187</sup> addresses built environment health issues within its 'shaping neighbourhoods' portfolio. Four supplementary planning guidance documents address social infrastructure, character and context, play and informal recreation, and accessibility. Local authorities are required to formulate their Local Plans accordingly, and encouraged to adopt a collaborative approach to shaping healthy environments, with public health specialists as key stakeholders.

## Barnet action on the built environment

### Overview

A number of Barnet Council policies and strategies link population health with the built environment, either directly or indirectly, and encourage healthy choices and behaviour through environmental planning and development. These documents include the *Corporate Plan*, *Local Plan* and *Joint Strategic Needs Assessment*, as well as the strategies for housing, transport, regeneration, specific town centres, parks and open spaces, and sport and physical activity (see Figure 17). Many of these documents are updated annually and comprehensively reviewed every five years. It has also been proposed that public health specialists review existing spatially related strategies and policies to identify key opportunities for the next few years.<sup>191</sup>

Figure 17: Barnet strategies addressing the built environment



\*In preparation. JSNA = Joint Strategic Needs Assessment. Source: London Borough of Barnet



The 'place-making' function of Barnet Council involves the approval of landscaping and building designs, town centre regeneration projects and proposals linked to high quality open spaces, as well as the design and commissioning of streetscape improvements. Within this work, small investments at the design stage can yield substantial population health benefits throughout the lifetime of a building. For example, public health specialist involvement in the design of the new Victoria Recreation Ground and Copthall leisure centres has maximised the health benefits of both developments.<sup>192</sup>

Public health specialists can also enhance borough regeneration by guiding 'meanwhile uses': temporary use of buildings or spaces for community-led, business or retail activities. Town centre regeneration can be facilitated by public health 'place-based' commissioning. Barnet Council needs to strengthen links with place-based, environmental, voluntary and community sector groups (e.g. residents' associations).<sup>193</sup> Taking a 'healthy town centre' approach will facilitate healthy lifestyle behaviours. Current proposals focus on the Burnt Oak and Finchley Church End town centres.<sup>194</sup>

### 'Three Strands Approach'

Alongside place-based commissioning, Barnet Council has also adopted a 'Three Strands Approach'<sup>195</sup> to ensure that wider community interests are considered at the planning stage. These Three Strands form the foundation for development of local, corporate and entrepreneurial planning documents, and comprise:

- Protection: preservation of Barnet's 'green lung', ensuring that all green spaces are maintained and left undeveloped,
- Enhancement: conservation of classic city suburbs while improving accessibility and environment, to improve community spirit, and
- Growth: creation of new communities within areas of development and regeneration, via integration of community centres, childcare facilities, healthcare services and small businesses.

### Corporate Plan 2015–2020

The Barnet Council *Corporate Plan 2015–2020* states that "Public Health will be integrated as a priority theme across all services".<sup>196</sup> Reducing health inequalities and improving health and wellbeing should be central to all council activities by 2020, due to the position of public health specialists within the council. Public health specialists have an important role in future regeneration schemes, helping to design Barnet's built environment to keep residents fit and active.

Public health specialists can also contribute to planning through health needs assessments (HNAs) and health impact assessments (HIAs), which assess population needs and the potential impact of development. Both HNAs and HIAs should be promoted as integral parts of the planning process.

### Local Plan

The Barnet Local Plan Core Strategy<sup>197</sup> provides the overarching policy framework for local development, regeneration and planning. This key document aims to balance the needs of residents, businesses and future generations, ensuring that the qualities that make Barnet an attractive place to live are maintained and enhanced.

No HIAs were included in the *Local Plan* preparation, limiting its ability to promote population health. However, the Plan does acknowledge built environment health issues: "[s]patial planning can address unhealthy lifestyles, such as being overweight [or] obese, particularly in children...".<sup>198</sup> It adds that one of its key aims is to create a health-supporting environment.

The main way that the *Local Plan* addresses health-supporting environments is through 'lifetime neighbourhoods': places where people are able to live and work in safe, healthy, supportive and inclusive environments, which will



continue to support independent living as residents age. They achieve this through inclusive, mixed land use. The *Local Plan* outlines Barnet's commitment to developing lifetime neighbourhoods within all regeneration areas (see Appendix H).

### Transport

Barnet's local transport implementation and delivery plans<sup>87,199</sup> set targets for long-term transport development. Aims include: walking uptake increased 32% by 2031; cycling increased 4.3% by 2026; carbon emissions reduced 46% by 2025; and a 33% reduction in road deaths and serious injuries by 2031. To achieve this, four objectives are identified:

- More efficient use of the local road network,
- A comprehensive approach to tackling the 'school run',
- High quality transport systems in regeneration areas, and
- More environmentally friendly transport networks.

Meeting these objectives will improve Barnet residents' health. Changes included in the transport delivery plan include: encouraging replacement of private vehicle transport with public or active transport; reliable, convenient bus services; alignment of school and transport needs; and mixed-use land development.<sup>199</sup> These changes will encourage integration of non-exercise physical activity into daily life, and will also increase the accessibility of services for residents without access to private vehicles.

### Cycling

Barnet Council does not currently have a cycling strategy, but a recent Environment Committee report outlines the direction of such a strategy.<sup>200</sup> This document recommends investment in cycling infrastructure (including cycle parking) as part of an incremental cycling plan aligned with the forthcoming transport strategy. The report also highlights the need for data on Barnet cycle trends, to guide formulation of the cycle strategy.

'Quietways' is a TfL-funded initiative which promotes cycling among less confident riders through the development of quieter, less trafficked routes. Barnet Council hopes to expand this network into the borough, working alongside TfL to enhance cycling infrastructure. An additional benefit of adopting Quietways is potential reduction in cycling road accidents. During 2015, five cyclists were killed or seriously injured on Barnet's roads, despite the fact that only 1% of residents cycle. The Environment Committee therefore recommends that a cycle safety plan be implemented alongside a future cycle strategy.

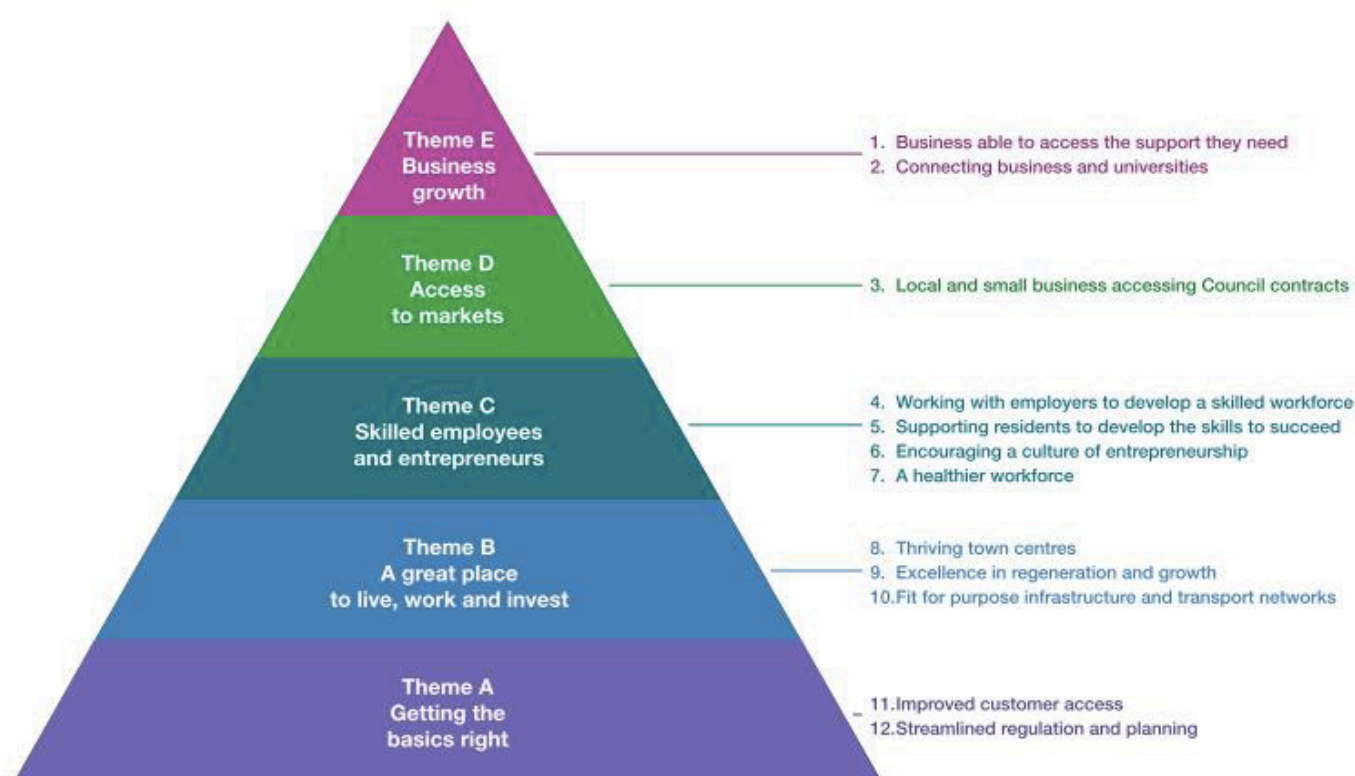
There is a growing demand for cycling in Barnet, reflected by three active cycling programmes: 'Balance Bike' (training primary school children to national 'Bikeability' cycling level); 'Bike It Plus' (encouraging children to cycle to school); and 'Dr Bike' (providing free bike checkups and minor repairs).

### Entrepreneurial Barnet

The purpose of *Entrepreneurial Barnet 2015–2020*<sup>102</sup> is to set out the Council's plan to encourage business growth; however, many of its strategies will directly or indirectly affect the built environment. The report outlines five themes which support businesses (see Figure 18). Themes A and B recognised the significant role of the built environment: without a supportive environment, it is harder to develop business skills, market access and business growth.



Figure 18: Entrepreneurial Barnet's hierarchy of business support themes



Source: London Borough of Barnet<sup>201</sup>

### Theme A: Getting the basics right

The report notes that local business regulation and planning facilitate built environments which support socially responsible development and growth. Assessing local residents' needs is central to this process. Although health is not a stated focus of these needs assessments, the importance of accessibility, noise pollution and safety is acknowledged. Resultant changes have the potential to improve community health.

### Theme B: A great place to live, work and invest

Barnet wants to create diverse, distinctive town centres with sustainable mixed land use. As discussed above (p. 12), mixed land use promotes better community health. The council's main action to achieve this is provision of accessible, sustainable transport services. Increasing footfall is essential to the survival of Barnet's High Streets, so investing in active transport is good for business. Furthermore, in London, shoppers who walk, cycle, or use public transport to access shopping centres spend more than car drivers.<sup>202</sup> These local benefits are in addition to the general economic benefits identified by the WHO HEAT tool (see p. 16). Clearly, Barnet will benefit from investment in sustainable transport. *Entrepreneurial Barnet* also gives a commitment to developing walkable, aesthetically pleasing commercial areas. Over three-quarters (77%) of London visitors to local shopping centres walk, cycle or use public transport. These shoppers state that traffic reduction and environmental enhancements would improve their shopping experience.<sup>202</sup>

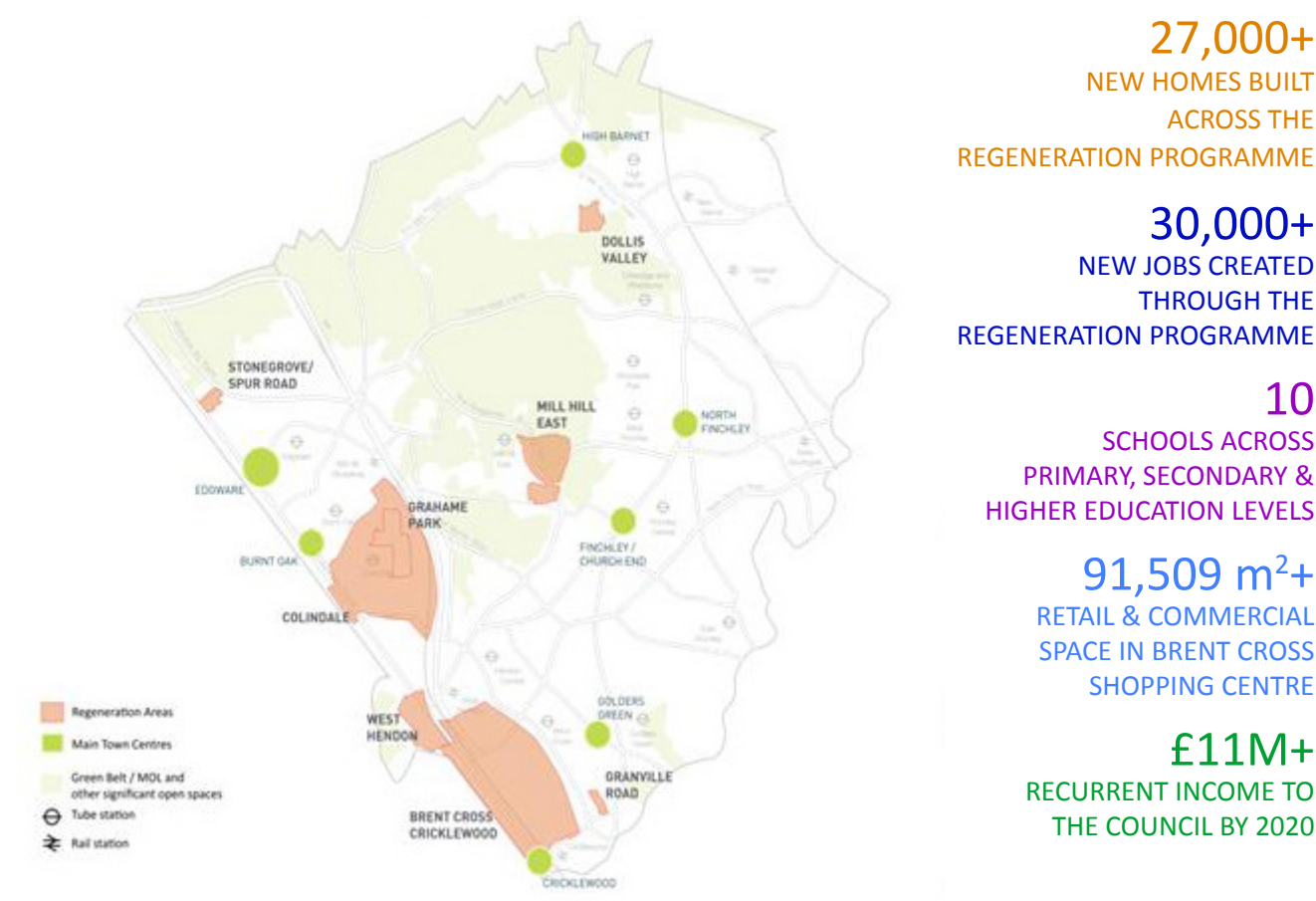


## Growth and regeneration programme

Barnet's growth and regeneration programme currently targets eight locations: Dollis Valley, Mill Hill East, Granville Road, West Hendon, Colindale, Grahame Park, Stonegrove Spur Road and Brent Cross Cricklewood. These developments will meet lifetime neighbourhood standards by mixing residential, commercial, social services, green space and transport uses. Well designed, high density neighbourhoods will promote accessibility and community cohesion, improving social capital and, consequently, mental wellbeing.

Figure 19 highlights key outputs. In addition, smaller-scale plans for new healthcare facilities, improved walking and cycling routes, and fully accessible homes will also improve health outcomes.

**Figure 19: Barnet regeneration programme: map and key outputs**



MOL = metropolitan open land

Source: London Borough of Barnet<sup>203</sup>

Housing provision is the main output of the regeneration programme. The 2015 *London Plan*<sup>187</sup> set Barnet's housing target at 2,349 units per year over the next 10 years. Type of housing tenure is also important (see p. XX). The 2016 *Residents' Perception Survey* indicates that housing affordability is the biggest concern for Barnet residents.<sup>204</sup> Lack of affordable housing is currently making some families move out of the borough, adversely affecting children's schooling and family support networks.<sup>205</sup> In 2015/16, almost 20 (19.9) of every 1000 Barnet households were in temporary accommodation, significantly worse than London (14.9/1000) and England (3.1/1000) levels.<sup>137</sup>



In 2015/16, 88 affordable homes were built in Barnet, compared with 451 private homes. Furthermore, some of this private housing replaced previously affordable homes. This has displaced half of all previous tenants. Displaced households have been rehoused in other areas within Barnet but also in areas outside the borough which are less expensive. Consequently, the regeneration programme's built environment improvements, such as more green space and better food access, will not improve the lives of the original residents. In this way, inequalities in Barnet residents' built environment standards and accessibility are perpetuated.

### Brent Cross Cricklewood development

The regeneration of Brent Cross shopping centre and the surrounding parts of Cricklewood is the largest growth and regeneration plan in Barnet<sup>50,206,207</sup> and represents a great opportunity to integrate healthy places within a large-scale development.

Completion is expected by 2026. The main outputs will be the expansion of the shopping centre, 7500 homes, redevelopment of the Thames Link station and bus station, a new school and playing field, and an improved highway system.

From a population health perspective, the best active design results will come from pedestrian walkways, new cycle lanes, pedestrian-focused store frontage, and increased quantity and quality of green spaces and other 'public realm' places. In addition, development of mixed-use areas (residential, commercial, social services and leisure) will also address some of the recommendations of the *Dublin Declaration of Age-Friendly Cities*.

These changes are predicted to cause a significant shift in transport use. Car journeys are forecast to decrease by almost one-third, and cycle trips are expected to rise to 4%. However, there may be negative effects too: the improved highway system may increase private vehicle use among some residents, and new cycle lanes adjacent to main roads are less likely to encourage cycling than the development of Quietways and greenways.

### Open spaces, recreation and play

Within the growth and regeneration programme, over £20 million is being invested in improving Barnet parks and open spaces between 2016 and 2026.<sup>208</sup> Some of the largest changes in open space provision will occur in Colindale. Open space in this area has high value but is currently low in quality. New projects include the Silkstream corridor and Montrose Park and Playing Fields. The Silkstream regeneration has integrated cycling and pedestrian paths, natural features, seating, and public toilet provision. This will support the aims of Age-Friendly Cities, creating healthy environments for all.

Provision of children's play areas in Colindale and Burnt Oak needs to address the predicted expansion in child and youth populations. To meet demand, all developers are required to help finance new children's play areas. Not only will this improve access to green space, it will also increase social capital by providing opportunities for neighbours to interact. The Montrose Park development aims to provide extensive formal and informal recreation for 11–19 year olds, including a new youth centre, outdoor gym, full size basketball court and BMX dirt track. Informal play burns the highest number of calories of all childhood activities,<sup>138</sup> so developments such as Montrose Park will play an important part in creating healthy weight environments.

In Burnt Oak Cricklewood, two large changes to green space provision are planned. The regeneration of Clitterhouse Fields aims to make the space safe and inviting for residents, while the creation of Brent Terrace Park will help address the current deficiency of green space.

Further information on future open space provision is provided in Barnet's *Parks and Open Spaces* strategy.<sup>209</sup>



## Sport and physical activity project

In 2002, Barnet Council entered into an agreement with Greenwich Leisure Limited (GLL) for the management of leisure facilities. A decade later, the council published a *Sport and Physical Activity Needs Assessment*<sup>210</sup> which examined local residents' health, activity levels and leisure facility usage. While the strategic importance of physical activity was recognised, this was not reflected in a "comprehensive strategic approach to physical activity which incorporates sports development, active travel, environmental measures, the use of leisure facilities and community buildings".<sup>211</sup>

In 2013, the council became responsible for public health. While there is a clear link between public health and the provision of leisure services, the existing contract did not require GLL to provide health-related services within its leisure provision.<sup>212</sup> As the GLL contract expires in December 2017, Barnet Council is currently selecting new management for its five leisure centres, including new facilities at Copthall and New Barnet (see Appendix I). Public health specialists have been at the heart of this process since its inception.

Public health is a high priority for Barnet, so it is important that council-owned leisure facilities help increase participation in physical activity. Leisure providers can play an essential role in improving health outcomes by supporting a variety of health and lifestyle interventions, including 'exercise on referral', weight management programmes, health checks, cardiac rehabilitation, smoking cessation and stroke rehabilitation. Barnet Council's view is that "[l]eisure facilities should be regarded as a central supporting component to the creation of a model... which supports residents in becoming more active through building activity into lifestyles and everyday activities".<sup>213</sup>

## Town centres

Barnet has 20 town centres which provide a range of commercial, retail and leisure facilities. Ninety-five per cent of residents still do their main shopping on the High Street. Consequently, town centres continue to play an integral role in maintaining residents' health.

The 2009 *Barnet Town Centres Floorspace Needs Assessment*<sup>163</sup> identified multiple sites needing regeneration. Local planning strategies targeted Chipping Barnet, Edgware, North Finchley and Finchley Church End as economic growth centres. Burnt Oak, Cricklewood and Colindale the Hyde were also identified as requiring regeneration. Unlike the four economic growth locations, there was felt to be little economic advantage to investing in expansion at the three latter sites. Rather, their strategies aim to increase town centre attractiveness and security, and thereby attract more shoppers.

### Finchley Church End

Finchley Church End is a mixed-use town centre. There is much potential for enhanced health promotion through improved design. The 2012 *Finchley Church End Town Centre Strategy*<sup>214</sup> was updated in 2017, with a greater focus on place-based commissioning. As a result, many outcomes are now conducive to healthy street environments. Changes will support mixed-use development, creating employment clusters (e.g. office premises), easing pedestrian and cycle movement, and introducing new 'soft' and 'hard' landscaping. Discussion on 'inclusive development' currently focuses on cohesion between office workers and local residents; however, inclusive development also needs to address Age-Friendly Cities and the social model of disability.

### Burnt Oak

The Burnt Oak town centre strategy<sup>215</sup> is an excellent example of place-based commissioning. Grounded in residents' feedback, it outlines plans to increase pavement size, improve waste management efficiency and develop "visual goods manners"<sup>216</sup> (i.e. tidier shop fronts and coherent service provision), in partnership with local businesses.



Residents wanted Burnt Oak to be cleaner, safer and more family-oriented. Therefore, the strategy sets out to improve pedestrian connections between the town centre, Silkstream Park and Watling Park, and to regenerate the old bingo hall into a 24-hour youth support centre. In this way, the strategy aims to improve residents' opinion of their environment.

## Conclusions and recommendations

### Neighbourhood spaces

#### Supporting documents

Regional guidance	Local strategies	Neighbourhood SPDs
<ul style="list-style-type: none"> <li>• <i>Health on the High Street</i><sup>158</sup></li> <li>• <i>Planning Healthy-weight Environments</i><sup>217</sup></li> <li>• <i>Improving the Health of Londoners: Transport Action Plan</i><sup>106</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>The Local Plan</i><sup>197</sup></li> <li>• <i>Annual Report: Growth and Regeneration Plan</i><sup>50</sup></li> <li>• <i>Delivery Plan: Delivering the Borough Transport Objectives</i><sup>199</sup></li> <li>• <i>Parks and Open Spaces</i><sup>209</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Brent Cross Cricklewood Framework and strategy</i><sup>206,207</sup></li> <li>• <i>Burnt Oak town centre strategy</i><sup>215</sup></li> <li>• <i>Grahame Park regeneration strategy</i><sup>218</sup></li> <li>• <i>Finchley Central Town Centre Strategy</i><sup>219</sup></li> </ul>

SPDs = supplementary planning documents

#### Local action

##### Burnt Oak town centre strategy

Although there are many documents which promote neighbourhood spaces, the Burnt Oak strategy provides an excellent example of place-based commissioning. All 10 TfL healthy street environment factors (see p. 13) were discussed during residents' consultations. Importantly, these needs are clearly addressed in the strategy itself. Continuing to adopt a place-based approach to neighbourhood development will create attractive environments.

##### Public realm improvements

Barnet now has the second largest number of street trees of any London borough.<sup>199</sup> This improvement gives residents an aesthetically pleasing environment which encourages them to go outside. Safety in the public realm is important, and most Barnet residents feel safe within their neighbourhoods (96% during daylight, 76% in the evening).<sup>11</sup> Street lighting improvements were completed in 2011 and may have boosted positive safety

perceptions. Continuing to make small investments in local streets helps make Barnet a 'people place'.

##### 'Lifetime neighbourhoods'

The *Local Plan* outlines Barnet's commitment to 'lifetime neighbourhoods' within regeneration areas.<sup>220</sup> All new developments and regeneration sites will be sustainable in terms of climate change. Additionally, housing, transport services, public services, civic spaces and amenities will be made more accessible to residents via mixed land use, enabling people of all ages and abilities to engage with their community.

#### Recommendations

##### Use TfL's Healthy Street Environment outcomes to guide development

Transport for London's Healthy Street Environment guidelines should be used when developing regeneration strategies,<sup>106</sup> to create accessible environments which prioritise pedestrian use.



## Enhance community empowerment in regeneration projects

In addition to gaining residents' feedback, regeneration projects should facilitate community participation at all stages of planning and implementation. This empowers communities, with long-term social, material and political benefits. Barriers to feedback should be removed, and residents and local businesses should know their input is an integral part of all processes.

## Improve pavement quality

To meet the needs of local residents, the perceived quality of pavements must be addressed. Although the transport implementation plan noted a relatively high quality of pavements in Barnet (compared with London levels),<sup>199</sup> the issue continues to be a major concern for residents.<sup>221</sup> Community engagement to understand reasons for people's beliefs (e.g. aesthetics or uneven paving stones) will help guide much-needed change.

## Implement mixed-use buildings and public spaces

To meet the infrastructural needs of communities, we recommend the development of multi-use buildings (in addition to mixed-use neighbourhoods). For example, using a high school sports hall to meet residents' evening leisure needs may be a cost-effective solution to accessibility issues. This is particularly valuable in areas where mixed land use is difficult to implement.<sup>222</sup>

## Invest in infrastructure which supports the social model of disability

Although Barnet has officially adopted the social model of disability, this commitment must be translated into action. All regenerated town centres should fully comply with the social model of disability.

## Open spaces, recreation and play

### Supporting documents

Regional guidance	Local documents	Neighbourhood SPDs
<ul style="list-style-type: none"> <li>• <i>The London Plan</i> chapter 7<sup>223</sup></li> <li>• <i>The London Plan Play and Informal Recreation</i> SPG<sup>224</sup></li> <li>• <i>Open Space Strategies: Best Practice Guidance</i><sup>225</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Parks and Open Spaces</i> strategy<sup>209</sup></li> <li>• <i>Barnet Sports and Physical Activity Consultation</i> and strategy<sup>226,227</sup></li> <li>• <i>The Local Plan</i><sup>197</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Brent Cross Cricklewood Framework</i><sup>207</sup></li> <li>• <i>Grahame Park</i> SPD<sup>218</sup></li> <li>• <i>Burnt Oak town centre</i> strategy<sup>215</sup></li> <li>• <i>Burnt Oak and Colindale parks</i> strategy<sup>228</sup></li> </ul>

SPG = supplementary planning guidance

### Local action

#### Heybourne Park

Each regeneration plan offers the opportunity to improve nearby parkland. In Colindale, this potential has been translated into action. Enhancement of Heybourne Park (formerly Grahame Park) has created a safe, welcoming space with new natural attractions (e.g. water features),<sup>50</sup> formerly a weakness of this green space. The *Barnet Open Space, Sports and Recreational Facilities Assessment*<sup>229</sup> identified Colindale green space

as high in value but low in quality. Regenerating spaces such as Heybourne Park, Silkstream Park, and Montrose Park and Playing Fields creates spaces of both high value and high quality.

#### Natural green space

The *Barnet Open Space, Sports and Recreational Facilities Assessment* states that Barnet has more than the recommended open space area per person, at 2.36 ha per 1,000 people (recommended: 2.05 ha per 1,000 people). Safeguarding this resource will ensure that



residents continue to have high quality natural green space as the population grows.

### Premier Parks

There are 16 'Premier Parks' in Barnet.<sup>197</sup> While these primarily support informal recreation, they contain provision for sport, children's play areas and cafes. Parks investment should focus on footpath improvements, entrance lighting (creating safer walking routes), accessibility, new equipment for young children, greenways and information boards. This will maintain the parks' 'premier' status.

### Outdoor sport provision

In the *Sports and Physical Activity Consultation*, residents were satisfied with the availability, quality and accessibility of Barnet sports fields.

## Recommendations

### Increase the quantity of play provision

To improve the physical and mental health of Barnet's children, we recommend increased opportunities for informal play. Enforcing the development regulations outlined in the *Local Plan*, which require all developers to assess need and provide (or help fund) play provision, will help achieve the necessary increase.

### Address accessibility of parks by active transport

The *Barnet Open Space, Sports and Recreational Facilities Assessment* found that: provision of cycle lanes to parks

was non-existent; 61% of children's play space was not on or adjacent to the Public Rights of Way Network; and 73% was not on or adjacent to cycle paths.<sup>229</sup> This significantly reduces the likelihood that children will access play areas from their home (even if accompanied by an adult), affecting levels of informal play and reducing positive perceptions of safety. We recommend increasing the connectivity of green spaces via pedestrian paths, and cycle greenways and Quietways.

### Provide online resources to support the use of open spaces and recreation

Although Barnet has a relatively large amount of open space, residents want to be more aware of this space.<sup>226</sup> Barnet's online directory currently provides the postcodes of green spaces, but greater information on facilities is needed. We recommend posting a user-friendly online list of play sites and parks with toilet facilities, cycle paths, shade shelter, picnic benches, parking and cafes.

### Support Age-Friendly Cities within open spaces

According to the *Active People Survey*, almost half (48%) of Barnet adults aged 65 year and over are inactive.<sup>127</sup> We recommend the provision of spaces which comply with the WHO Age-Friendly Cities guidelines.<sup>230</sup> These can support older people's uptake of physical activity while improving mental health and social capital.

## Building design

### Supporting documents

Regional guidance	Local strategies	Neighbourhood SPDs
<ul style="list-style-type: none"> <li>• <i>Lifetime Homes Standards</i><sup>231</sup></li> <li>• <i>Inclusion by Design</i><sup>232</sup></li> <li>• <i>Housing Standards: Minor Alterations to the London Plan (spatial development strategy)</i><sup>233</sup></li> <li>• <i>Homes for Londoners</i><sup>234</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>The Local Plan</i><sup>197</sup></li> <li>• <i>Annual Report: Growth and Regeneration Plan</i><sup>50</sup></li> <li>• <i>Barnet Housing Strategy 2015 to 2025</i><sup>51</sup></li> <li>• <i>Adopted Standards for Houses in Multiple Occupation</i><sup>235</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Brent Cross Cricklewood Framework</i><sup>207</sup></li> <li>• <i>Grahame Park SPD</i><sup>218</sup></li> <li>• <i>Mill Hill East AAP</i><sup>236</sup></li> <li>• <i>West Hendon SPD</i><sup>237</sup></li> </ul>

AAP = Area Action Plan



## Local action

### Lifetime Homes

Barnet's commitment to Lifetime Homes is essential for future provision of high quality housing. Ten per cent of new homes will be fully wheelchair accessible.<sup>51</sup> These changes will support Barnet's ageing population, allowing more residents to 'age in place', reducing the need for residential care.

### Winter Well programme

Barnet Council is committed to improving the quality of older housing. In 2015/16, 561 small items (e.g. thermos flasks) were distributed to those struggling to stay warm, 180 radiator panels were given out, and 21 vulnerable residents were provided with grants to repair broken heating systems or improve insulation.

### Houses in multiple occupation (HMO) standards

Barnet council released new HMO standards in July 2016, including guidance on housing quality<sup>235</sup> (e.g. all rooms must be equipped with an adequate means of fixed space heating capable of efficiently maintaining the room at 19°C). This promotes high quality housing provision across the borough.

### Regeneration of West Hendon Estate

Although all new Barnet homes satisfy Lifetime Homes standards, the West Hendon Estate housing development gives a good example of best practice. The development partners (Barratt Metropolitan Limited Liability Partnership; BM LLP) recognised the high pollution levels from the nearby A5 trunk road and incorporated air circulation systems into their building design to improve indoor air quality. Residents were able to discuss construction-related issues with BM LLP each month, and several measures were put in place to control air and dust pollution from the construction itself.

## Recommendations

### Adopt active design guidelines

Active design principles should be adopted.<sup>238</sup> Building inhabitants should be able to exercise through regular mobilisation (e.g. from their desk to the workplace

cafeteria). Incorporating stairs into a building's main circulation system will make them the principal access route. Staircases should be visibly appealing and located near building entrances.

### Ensure sufficient affordable homes within regeneration areas

House affordability is Barnet residents' biggest concern. With higher rental costs, the quality of private residential accommodation is often compromised for affordability. Barnet currently offers less social housing than the London average. The *Barnet Housing Needs Assessment*<sup>49</sup> specifies that each year 15% of new homes be made into affordable rental properties. We recommend that the housing provision in regeneration areas not only addresses this need but also takes into account the implications of higher rents following regeneration. For example, given the increased need for affordable housing (>15%) following development completions, demolition of existing affordable homes should be offset by a future provision greater than the minimum requirement outlined in the Housing Needs Assessment.

### Tackle overcrowding

As the number of families living in overcrowded conditions continues to rise, we recommend that Barnet council proactively helps families find appropriate accommodation. The five wards with significantly worse overcrowding than the London average are all areas of regeneration. It is important to recognise that if housing costs in these areas rise (due to regeneration), overcrowding will worsen. Building affordable family homes in these areas will help alleviate problems.

### Support families through Winter Well grants

At present, Winter Well grants for boiler repairs, radiators or improved insulation are only available to vulnerable adults aged 65 and over. However, poor quality housing impairs child development, with long-term repercussions. We recommend extending the Winter Well scheme to cover families with young children.



## Movement and access

### Supporting documents

Regional guidance	Local strategies	Neighbourhood SPDs
<ul style="list-style-type: none"> <li>• Mayor's Transport Strategy Sub-regional Transport Plan<sup>88</sup></li> <li>• <i>Delivering the Benefits of Cycling in Outer London</i><sup>142</sup></li> <li>• <i>Improving the Health of Londoners: Transport Action Plan</i><sup>106</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>The Local Plan</i><sup>197</sup></li> <li>• MTS Local Implementation Plan<sup>87</sup></li> <li>• <i>Delivering the Borough Transport Objectives</i><sup>199</sup></li> <li>• <i>Sustainable Modes of Transport Strategy</i><sup>141</sup></li> <li>• <i>Cycling in Barnet</i><sup>200</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Brent Cross Cricklewood Framework</i><sup>207</sup></li> <li>• Burnt Oak town centre strategy<sup>215</sup></li> <li>• <i>Finchley Central* Town Centre Strategy</i><sup>219</sup></li> </ul>

MTS = Mayor's Transport Strategy. \*Finchley Church End is also known as Finchley Central

### Local action

#### Electric charging points

Eight electric charging points have now been installed on borough roads and in council-owned car parks; there are also charging stations at High Barnet Underground station, Brent South retail park, Brent Cross shopping centre and some Waitrose supermarkets. These facilities may improve air quality, but they do not reduce road traffic injuries or improve public transport accessibility – factors that disproportionately affect disadvantaged populations.

#### Bus stop accessibility

In 2014, only 49% of bus stops in Barnet were wheelchair accessible.<sup>199</sup> The Transport Delivery Plan addressed this issue and investment (for main bus stations) was allocated. While bus stop accessibility is still lower than TfL's goal (95%), a more inclusive public transport environment has been created.

#### Cycling programmes

Balance Bike and Bike It Plus training continues to be run across the borough, increasing cycling uptake in participating schools. Demand for Dr Bike programmes (for residents of all ages) has grown, demonstrating increased interest in cycling.<sup>200</sup>

#### Open space provision

Although Barnet currently has limited cycle paths, its expansive green space network provides many opportunities for cycling and walking.

#### 20 mph zones

Barnet has eighty 20 mph zones, improving pedestrians' use of street space and reducing road traffic accident severity.

### Recommendations

#### Prioritise investment in active and public transport

Investment in active and public transport must be prioritised. All residents should be able to access services without using a car, including school and work. Existing barriers to use, and deficiencies in the provision of active and public transport, must be considered and addressed in the forthcoming transport strategy.

#### Renew the Sustainable Modes of Transport Strategy

By May 2017, two *Mayor's Transport Strategy* editions had been published since Barnet's most recent (2007) *Sustainable Modes of Transport Strategy*.<sup>141</sup> Seriously addressing active and public transport means complete renewal of this strategy, not just an updated summary.



## Built environment and health

We recommend that the new strategy focuses on well managed spaces for children (e.g. drop-off zones and high quality pavements), enabling safe walking and cycling to school.

### Complete the local cycling strategy

We recommend prioritising completion of Barnet's cycling strategy, to demonstrate the council's commitment to active travel. This strategy needs to address the unequal distribution of cycling across the social gradient, and develop schemes that focus on uptake in disadvantaged groups.

### Use stakeholder feedback when developing the transport strategy

We recommend that stakeholder feedback (especially from schools, hospitals and workplaces) be central to the development of active travel strategies. This can help identify local barriers to behaviour change.

### Support the uptake of active travel via online resources and communication campaigns

Barnet respondents to the Great Weight Debate survey were unaware of relevant services available in parks and leisure centres. To increase active travel uptake,

simple online guides to walking and cycling routes should be developed. We further recommend that sharing information on actual (versus perceived) safety levels for walking and cycling may improve attitudes, and thus active travel uptake.

### Routinely collect local data

The Environment Committee cycling report noted that, in order to implement appropriate infrastructure, we need to regularly collect data on Barnet travel habits.

### Use the WHO HEAT tool, the London walkability model and ATOS levels

To assess the economic benefits of active travel investment, we recommend using the WHO HEAT tool.<sup>129,130</sup> This can estimate gross and net savings due to campaigns and improved infrastructure. The London walkability model<sup>239</sup> can also help guide Barnet investment via data such as walking potential, local deprivation, car ownership and pedestrian density. Finally, using the Access To Opportunities and Services (ATOS)<sup>188</sup> tool can identify the ease of transport from an origin point to a service or destination point (e.g. food shops, workplaces and schools).

## Local economy

### Supporting documents

Regional guidance	Local strategies	Neighbourhood SPDs
<ul style="list-style-type: none"><li>• <i>The London Plan</i> town centre SPGs<sup>187</sup></li><li>• <i>The Future of London's Town Centres</i><sup>240</sup></li><li>• <i>Health on the High Street</i><sup>158</sup></li></ul>	<ul style="list-style-type: none"><li>• <i>Entrepreneurial Barnet</i><sup>102</sup></li><li>• <i>Annual Report: Growth and Regeneration Plan</i><sup>50</sup></li><li>• <i>The Local Plan</i><sup>197</sup></li></ul>	<ul style="list-style-type: none"><li>• <i>Brent Cross Cricklewood Framework</i><sup>207</sup></li><li>• <i>Finchley Central Town Centre Strategy</i><sup>219</sup></li><li>• <i>Chipping Barnet Town Centre Strategy</i><sup>241</sup></li><li>• <i>Edgware Town Centre Framework</i><sup>242</sup></li></ul>



## Local action

### Commercial development in regeneration sites

At present, most Barnet residents commute out of the borough for work.<sup>87</sup> The development of local commercial areas (with an extra 161,000 m<sup>2</sup> office space and an estimated 17,000 new jobs)<sup>50</sup> will cut travel distances for some people. With the necessary infrastructure, this means increased opportunities for active travel. Continuing to integrate commercial space into regeneration areas is an important part of mixed-use neighbourhoods.

### Investment in 'direction of travel'

*Entrepreneurial Barnet* recognises the value of increased footfall. Pedestrians who travel to shopping centres on public transport spend more per visit than those using private vehicles.<sup>102</sup> Town centre regeneration plans need to consider traffic calming and 'direction of travel' plans which prioritise pedestrians.

### 'Active frontage'

Town centre strategies propose 'active frontage' along High Streets.<sup>207</sup> This prioritises pedestrians and creates a safe, visually appealing walking environment.

### Barnet's employment support services

Barnet's support services are free and open to all unemployed Barnet residents who are claiming Employment Support Allowance, are suffering from mental health issues, or have other complex needs. Services currently operate at seven locations across the borough, and use case workers to robustly assess

people's barriers to work. Over 30 support areas are explored, including housing, finance, childcare and health. Strong links with local and national provision allow service providers to help clients to improve control of their lives and find meaningful, lasting employment.<sup>243</sup>

## Recommendations

### Include HIAs in planning applications

With the rapid growth of Barnet's town centres, it is important that economic success does not adversely affect residents' health. Stand-alone or integrated HIAs can identify important place-based health issues (e.g. fast food outlet density, and negative impacts of construction-related noise and air pollution).<sup>222</sup>

### Implement cycle parking in appropriate locations

Although already discussed in local documents, we reiterate the importance of well-placed cycle parking in town centres and transport hubs. Following TfL recommendations,<sup>244</sup> we recommend that cycle bays be a mandatory part of planning applications for both residential and commercial areas. These should be in highly visible areas and secure (i.e. near main entrances). They should ideally include shelter to protect bikes from adverse weather.<sup>245</sup>

### Increase accessible, affordable childcare

Alongside the increase in commercial spaces, we recommend that childcare facilities also be incorporated into mixed-use developments. This will make new job opportunities accessible to a wider range of people (e.g. single parents), and further encourage sustainable transport use.

## Food access

### Supporting documents

Regional guidance	Local strategies	Neighbourhood SPDs
<ul style="list-style-type: none"> <li>• <i>Good Food for London 2016</i><sup>246</sup></li> <li>• <i>Beyond the Food Bank: London's Food Poverty Profile 2016</i><sup>247</sup></li> <li>• <i>Cultivating the Capital: Food Growing and the Planning System in London</i><sup>248</sup></li> <li>• <i>Mayor's Food Strategy</i><sup>249</sup></li> <li>• <i>London's Allotments and Community Gardens</i><sup>250</sup></li> <li>• <i>Health on the High Street</i><sup>158</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>The Local Plan</i><sup>197</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Grahame Park regeneration</i><sup>218</sup></li> </ul>



### Local action

#### Food growing spaces

Barnet is home to 6% of all farms within London, and has the largest number of allotment sites per person of any London borough (44 sites).<sup>197</sup> These factors increase the sustainability and accessibility of locally sourced vegetables and fruit for residents.

#### Town centre food shop provision

According to the *Town Centres Floorspace Needs Assessment*, there is at least one food shop within each of Barnet's 20 town centres.<sup>163</sup> This is significant, as almost all (96%) Barnet residents visit town centres at least once a week.<sup>218</sup> Providing food shops within town centres improves the accessibility of nutrient-rich foods.

#### Healthier Catering Commitment

Barnet participates in the Healthier Catering Commitment (HCC) scheme, which recognises catering businesses that show a commitment to healthier food choices and cooking techniques. Continuing this business engagement will support the accessibility of nutrient-rich food. Year 7 and 8 students have now been introduced to the HCC scheme, and encouraged to look for HCC window stickers when buying food from fast food outlets.

### Recommendations

#### Collect data on food accessibility

We recommend that Barnet actively promotes access to sustainable, nutrient-rich foods. To achieve this, food accessibility must be mapped, taking into consideration transportation routes, income levels and health data. This information will identify 'food deserts' as

well as areas of fast-food saturation. Evidence-based interventions can then be developed. The opportunities offered by the London devolution agreements should also be explored to support these issues.

#### Integrate healthier catering commitments into pre-planning applications

Access to good food should be incorporated into the *Local Plan* and supplementary planning documents; for example, food outlet pre-planning applications (A3–A5 types) should require a commitment to healthier catering. Notably, other areas of London (e.g. Barking and Dagenham) require hot food takeaway developers to contribute £1,000 to fund local obesity initiatives.<sup>251</sup>

#### Develop and sustain relationships with 'third sector' organisations promoting food growth

To promote a sustainable food future, we recommend collaboration with allotment societies and third sector organisations already promoting food growing within Barnet. For example, participating in Capital Growth's 'Big Dig' can introduce new people to gardening, promoting a variety of health benefits while increasing the accessibility of affordable food.<sup>252</sup> Similarly, participating in the London Food Growing Schools scheme<sup>253</sup> will (along with HCC work) help create positive food cultures in schools, educate children about food production, and support young people's mental health (a growing concern).

#### Create food growing spaces in regeneration areas

Allotments are in great demand in Barnet. New allotment provision should be part of regeneration plans, to meet current and future demand.



## Video, Short Report and Appendices

This report is accompanied by:

- A video presenting health issues related to Barnet's built environment,
- A Short Report, and
- Appendices.

All are available on the Barnet Council public health webpages:

<https://www.barnet.gov.uk/citizen-home/public-health.html>



## References

- <sup>1</sup>Percentage of global population living in cities, by continent. The Guardian, 2016. <https://www.theguardian.com/news/datablog/2009/aug/18/percentage-population-living-cities>
- <sup>2</sup>Frumkin H. Urban sprawl and public health. *Public Health Rep* 2002;117:201–17
- <sup>3</sup>McMichael AJ. The urban environment and health in a world of increasing globalisation: Issues for developing countries. *Bull World Health Organ* 2000;78:1117–26
- <sup>4</sup>Kickbusch I. Healthy cities: A working project and a growing movement. *Health Promot* 1989;4:77–82
- <sup>5</sup>Flynn BC. Healthy cities: toward worldwide health promotion. *Annu Rev Public Health* 1996;17:299–309
- <sup>6</sup>Bearg DW. *Indoor Air Quality and HVAC Systems*. Chelsea, Michigan: Lewis Publishers, 1993
- <sup>7</sup>Frankish CJ, Green LW, Ratner PA et al. *Health Impact Assessment as a Tool for Health Promotion and Population Health*. Geneva: World Health Organization, 2001:405–37
- <sup>8</sup>McCarthy M. Social determinants and inequalities in urban health. *Rev Environ Health* 2000;15:97–108
- <sup>9</sup>Ohta M, Mizoue T, Mishima N et al. Effect of the physical activities in leisure time and commuting to work on mental health. *J Occup Health* 2007;49:46–52
- <sup>10</sup>Lavin T, Higgins C, Metcalfe O et al. *Health Impacts of the Built Environment: A Review*. Institute of Public Health in Ireland, 2006, p. 7. [http://publichealth.ie/files/file/Health\\_Impacts\\_of\\_the\\_Built\\_Environment\\_A\\_Review.pdf](http://publichealth.ie/files/file/Health_Impacts_of_the_Built_Environment_A_Review.pdf)
- <sup>11</sup>*The Local Plan (Core Strategy)*. London Borough of Barnet, 2012, p. 23. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/Adopted-Local-Plan---Core-Strategy-DPD.html>
- <sup>12</sup>*Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 36–8. <https://www.barnet.gov.uk/jsna-home>
- <sup>13</sup>*Barnet Housing Strategy 2015 to 2025*. London Borough of Barnet, 2015, p. 11. <https://www.barnet.gov.uk/dam/jcr:b49187f8-d93a-41c8-9f32-57e8f49a15ae/Approved%20Housing%20Strategy%202015%20to%202025.pdf>
- <sup>14</sup>*Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 24. <https://www.barnet.gov.uk/jsna-home>
- <sup>15</sup>*Barnet Housing Strategy 2015 to 2025*. London Borough of Barnet, 2015, p. 12. <https://www.barnet.gov.uk/dam/jcr:b49187f8-d93a-41c8-9f32-57e8f49a15ae/Approved%20Housing%20Strategy%202015%20to%202025.pdf>
- <sup>16</sup>*English Indices of Deprivation 2015*. Department for Communities & Local Government, 2015. <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>
- <sup>17</sup>Raphael D. *Social Determinants of Health*, 2nd edn. Toronto: Canadian Scholars, 2004
- <sup>18</sup>Barton H, Grant M. A health map for the local human habitat. *J Roy Soc Promot Health* 2006;126:252–3
- <sup>19</sup>Macintyre S, McKay L, Ellaway A. Lay concepts of the relative importance of different influences on health: Are there major socio-demographic variations? *Health Educ Res* 2006;21:731–9
- <sup>20</sup>Heath G, Brownson R, Kruger J et al. The effectiveness of urban design and land use and transport policies and practices to increase physical activity: A systematic review. *J Phys Activ Health* 2006;3(Suppl 1):S55–S76
- <sup>21</sup>Frumkin H, Frank L, Jackson R. *Urban Sprawl and Public Health. Designing, Planning and Building for Healthy Communities*. Washington DC: Island Press, 2004
- <sup>22</sup>McIntyre M. *A Literature Review of the Social, Economic and Environmental Impact of Architecture and Design*. Edinburgh: Scottish Government, 2006
- <sup>23</sup>Bonnefoy X, Annesi-Maesano I, Aznar L. *A Review of Evidence on Housing and Health. Background Document for the Fourth Ministerial Conference on Environment and Health*. Budapest: WHO Regional Office for Europe, 2004
- <sup>24</sup>Croucher K, Myers L, Jones R et al. *Health and the Physical Characteristics of Urban Neighbourhoods: A Critical Literature Review*. Glasgow: GCPH, 2007
- <sup>25</sup>Freudenberg N, Galea S, Vlahov D. *Cities and the Health of the Public*. Nashville: Vanderbilt University Press, 2006
- <sup>26</sup>Handy S. *Does the Built Environment Influence Physical Activity? Examining the Evidence*. Transportation Research Board, 2005, Special Report 282. <http://onlinepubs.trb.org/onlinepubs/sr/sr282.pdf>
- <sup>27</sup>Swanwick C, Dunnett N, Woolley H. Nature, role and value of greenspace in towns and cities: An overview. *Built Environment* 2003;29:94–106
- <sup>28</sup>Dempsey N. Quality of the built environment in urban neighbourhoods. *Planning Pract Res* 2008;23:249–64
- <sup>29</sup>National Institute for Clinical Excellence. *Promoting or Creating Built Environments that Encourage and Support Physical Activity*. NICE Public Health Guidance 8. Manchester: NICE, 2008
- <sup>30</sup>Dunton G, Kaplan J, Wolch J et al. Physical environmental correlates of childhood obesity: A systematic review. *Obesity Rev* 2009;10:393–402
- <sup>31</sup>*Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 92. <https://www.barnet.gov.uk/jsna-home>
- <sup>32</sup>*Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health*. World Health Organization, 2008. [http://www.who.int/social\\_determinants/final\\_report/csdh\\_finalreport\\_2008.pdf](http://www.who.int/social_determinants/final_report/csdh_finalreport_2008.pdf)
- <sup>33</sup>*Indoor Air Quality*. BRE, 2016. <https://www.bre.co.uk/page.jsp?id=720>.



- <sup>34</sup> Fonseca W, Kirkwood BR, Victora CG *et al.* Risk factors for childhood pneumonia among the urban poor in Fortaleza, Brazil: A case-control study. *Bull World Health Organ* 1996;74:199–208
- <sup>35</sup> Denny FW Jr. The clinical impact of human respiratory virus infections. *Am J Respir Crit Care Med* 1995;152(4 Pt 2):S4–12
- <sup>36</sup> Murtagh P, Cerqueiro C, Halac A *et al.* Acute lower respiratory infection in Argentinian children: A 40 month clinical and epidemiological study. *Pediatr Pulmonol* 1993;16:1–8
- <sup>37</sup> Graham NM. The epidemiology of acute respiratory infections in children and adults: A global perspective. *Epidemiol Rev* 1990;12:149–78
- <sup>38</sup> Stein L. A study of respiratory tuberculosis in relation to housing conditions in Edinburgh: The pre-war period. *Br J Soc Med* 1950;4:143–69
- <sup>39</sup> Evaluation Group of Good Places Better Health. *Good Places Better Health for Scotland's Children*. Edinburgh: Scottish Government, 2011. <http://www.gov.scot/resource/0039/00398236.pdf>
- <sup>40</sup> Gabe J, Williams P. Women, crowding and mental health. In: BurrIDGE R, Ormandy D, eds. *Unhealthy Housing: Research, Remedies and Reform*. New York: Spon Press, 1993:191–208
- <sup>41</sup> Hopton JL, Hunt SM. Housing conditions and mental health in a disadvantaged area in Scotland. *J Epidemiol Community Health* 1996;50:56–61
- <sup>42</sup> Wise J. Number of excess winter deaths is three times as high in the coldest homes as in the warmest. *BMJ* 2011;342:1046–7
- <sup>43</sup> Levine Coley R, Leventhal T, Doyle Lynch A *et al.* *Poor Quality Housing is Tied to Children's Emotional and Behavioral Problems*. MacArthur Foundation, 2013. [https://www.macfound.org/media/files/HHM\\_Research\\_Brief\\_-\\_September\\_2013.pdf](https://www.macfound.org/media/files/HHM_Research_Brief_-_September_2013.pdf)
- <sup>44</sup> Leventhal T, Newman S. Housing and child development. *Children Youth Services Rev* 2010;32:1165–74
- <sup>45</sup> Coulton C, Richter F, Kim S *et al.* Temporal effects of distressed housing on early childhood risk factors and kindergarten readiness. *Children Youth Services Rev* 2016;68:59–72
- <sup>46</sup> *Chance of a Lifetime: The Impact of Bad Housing on Children's Lives*. Shelter, 2006. [https://england.shelter.org.uk/\\_\\_data/assets/pdf\\_file/0016/39202/Chance\\_of\\_a\\_Lifetime.pdf](https://england.shelter.org.uk/__data/assets/pdf_file/0016/39202/Chance_of_a_Lifetime.pdf)
- <sup>47</sup> *The Local Plan (Core Strategy)*. London Borough of Barnet, 2012, p. 24. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/Adopted-Local-Plan---Core-Strategy-DPD.html>
- <sup>48</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 56–72. <https://www.barnet.gov.uk/jsna-home>
- <sup>49</sup> *Briefing on the Barnet Housing Needs Assessment*. London Borough of Barnet, 2015. <https://www.barnet.gov.uk/citizen-home/council-and-democracy/governance/Members-briefings.html>
- <sup>50</sup> *Appendix 1 Annual Report: Growth and Regeneration Plan*. London Borough of Barnet, 2016. <https://barnet.moderngov.co.uk/documents/s30496/Appendix%201%20Growth%20and%20Regeneration%20Programme%20Annual%20Report.pdf>
- <sup>51</sup> *Barnet Housing Strategy 2015 to 2025*. London Borough of Barnet, 2015. <https://www.barnet.gov.uk/dam/jcr:b49187f8-d93a-41c8-9f32-57e8f49a15ae/Approved%20Housing%20Strategy%202015%20to%202025.pdf>
- <sup>52</sup> *Occupancy rating (bedrooms)*. Office for National Statistics, 2011. <https://www.nomisweb.co.uk/census/2011/qs412ew>
- <sup>53</sup> Foster C, Hillsdon M, Thorogood M. Interventions for promoting physical activity. *Cochrane Database Syst Rev* 2005;(1):CD003180
- <sup>54</sup> Cohen DA, McKenzie TL, Sehgal A *et al.* Contribution of public parks to physical activity. *Am J Pub Health* 2007;97:509–14
- <sup>55</sup> Cervero R, Duncan M. Walking, bicycling, and urban landscapes: Evidence from the San Francisco Bay area. *Am J Pub Health* 2003;93:1478–83
- <sup>56</sup> Giles-Corti B, Broomhall MH, Knuijan M *et al.* Increasing walking – how important is distance to, attractiveness, and size of public open space? *Am J Prev Med* 2005;28(2 S2):169–76
- <sup>57</sup> Coombes E, Jones AP, Hillsdon M. The relationship of physical activity and overweight to objectively measured green space accessibility and use. *Soc Sci Med* 2010;70:816–22
- <sup>58</sup> Storgaard RL, Hansen HS, Aadahl M *et al.* Association between neighbourhood green space and sedentary leisure time in a Danish population. *Scand J Public Health* 2013;41:846–52
- <sup>59</sup> Kaczynski AT, Henderson KA. Environmental correlates of physical activity: A review of evidence about parks and recreation. *Leisure Sciences* 2007;29:315–54
- <sup>60</sup> Humpel N, Owen N, Leslie E. Environmental factors associated with adults' participation in physical activity: A review. *Am J Preventative Med* 2002;22:188–99
- <sup>61</sup> Department of Health. *At Least Five a Week: Evidence on the Impact of Physical Activity and its Relationship to Health*. London: Department of Health, 2004
- <sup>62</sup> Cutler DM, Glaeser EL, Shapiro JM. Why Have Americans Become More Obese? *J Econom Persp* 2003;17:93–118
- <sup>63</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 142. <https://www.barnet.gov.uk/jsna-home>
- <sup>64</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 47. <https://www.barnet.gov.uk/jsna-home>
- <sup>65</sup> Gascon M, Triguero-Mas M, Martinez D *et al.* Residential green spaces and mortality: A systematic review. *Environ Int* 2016;86:60–7
- <sup>66</sup> Wu Y-T, Prina AM, Brayne C. The association between community environment and cognitive function: A systematic review. *Soc Psychiatric*



*Epidemiol* 2015;50:351–62

<sup>67</sup> Dzhambov AM, Dimitrova DD. Urban green spaces' effectiveness as a psychological buffer for the negative health impact of noise pollution: A systematic review. *Noise Health* 2014;16:157–65

<sup>68</sup> Wood L, Shannon T, Bulsara M *et al.* The anatomy of the safe and social suburb: An exploratory study of the built environment, social capital and residents' perceptions of safety. *Health Place* 2008;14:15–31

<sup>69</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 66. <https://www.barnet.gov.uk/jsna-home>

<sup>70</sup> Kweon BS, Sullivan WC, Wiley AR. Green common spaces and the social integration of inner-city older adults. *Environ Behav* 1998;30:832–58

<sup>71</sup> Kuo FE, Sullivan WC, Coley RL *et al.* Fertile ground for community: inner-city neighbourhood common spaces. *Am J Community Psychol* 1998;26:823–51

<sup>72</sup> Maas J, van Dillen SM, Verheij RA *et al.* Social contacts as a possible mechanism behind the relation between green space and health. *Health Place* 2009;15:586–95

<sup>73</sup> Leyden KM. Social capital and the built environment: The importance of walkable neighborhoods. *Am J Public Health* 2003;93:1546–51

<sup>74</sup> Richardson EA, Pearce J, Mitchell R. Role of physical activity in the relationship between urban green space and health. *Public health* 2013;127:318–24

<sup>75</sup> Huynh Q, Craig W, Janssen I *et al.* Exposure to public natural space as a protective factor for emotional well-being among young people in Canada. *BMC Public Health* 2013;13:407

<sup>76</sup> Grahn P, Stigsdotter UA. Landscape planning and stress. *Urban Forestry Urban Greening* 2003;2:1–18

<sup>77</sup> Pretty J, Peacock J, Sellens M *et al.* The mental and physical health outcomes of green exercise. *Int J Environ Health Res* 2005;15:319–37

<sup>78</sup> Environment Committee. A Lot to Lose: London's Disappearing Allotments. London Assembly, 2006. [https://www.london.gov.uk/sites/default/files/gla\\_migrate\\_files\\_destination/archives/assembly-reports-environment-allotments.pdf](https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/archives/assembly-reports-environment-allotments.pdf)

<sup>79</sup> *Barnet Allotment Federation Sites*. Barnet Allotment Federation, 2015. <http://www.barnetallotments.org.uk/allotmentFinder.php>.

<sup>80</sup> Mackay G, Neill J. The effect of 'green exercise' on state anxiety and the role of exercise duration, intensity and greenness: A quasi-experimental study. *Psych Sport Exercise* 2010;11:238–45

<sup>81</sup> Ferres M, Townshend T. *The Social, Health, and Wellbeing Benefits of Allotments: Five Societies in Newcastle*. Newcastle University, 2012. <http://www.ncl.ac.uk/media/wwwnclacuk/globalurbanresearchunit/files/electronicworkingpapers/ewp47.pdf>

<sup>82</sup> *Gardening for Disabled People at Gordon Road Allotments*. Disability Action in the Borough of Barnet, 2010. <http://www.barnetallotments.org.uk/files/misc/FHS-DABB-Leaflet-Email.pdf>

<sup>83</sup> *Gordon Road*. Barnet Allotment Federation, 2015. <http://www.barnetallotments.org.uk/sitelist.php?site=Gordon%20Road>

<sup>84</sup> Morris N. *Black and Minority Ethnic Groups and Public Open Space: Literature review*. Open Space, 2003. <http://www.openspace.eca.ed.ac.uk/wp-content/uploads/2015/10/Black-and-Minority-Ethnic-Groups-and-Public-Open-Space-literature-review.pdf>

<sup>85</sup> Hillsdon M, Thorogood M, White I *et al.* Advising people to take more exercise is ineffective: A randomized controlled trial of physical activity promotion in primary care. *Int J Epidemiol* 2002;31:808–15

<sup>86</sup> Hillsdon M, Foster C, Cavill N *et al.* The Effectiveness of Public Health Interventions for Increasing Physical Activity among Adults: A Review of Reviews. London: Health Development Agency, 2005

<sup>87</sup> *Delegated Powers Report No. 1517*. London Borough of Barnet, 2011. <http://barnet.moderngov.co.uk/documents/s3511/DPR%201517%20-%20Local%20Implementation%20Plan%20submission%20for%20approval%20by.pdf>

<sup>88</sup> *Sub-regional Transport Plan: North*. Transport for London, 2011. <http://content.tfl.gov.uk/north-london-sub-regional-transport-plan.pdf>

<sup>89</sup> Adonis A, Davies B, Eds. *City Villages: More Homes, Better Communities*. IPPR, 2015. [http://www.ippr.org/files/publications/pdf/city-villages\\_Mar2015.pdf?noredirect=1](http://www.ippr.org/files/publications/pdf/city-villages_Mar2015.pdf?noredirect=1)

<sup>90</sup> *Redefining Density: Making the Best Use of London's Land to Build More and Better Homes*. London First, 2015

<sup>91</sup> London Assembly. *Knock It Down or Do It Up? The Challenge of Estate Regeneration*. Greater London Authority, 2015

<sup>92</sup> Plane J, Klodowsky F. Neighbourhood amenities and health: Examining the significance of a local park. *Social Sci Med* 2013;99:1–8

<sup>93</sup> King C, Satariano W, Marti J *et al.* Multilevel modelling of walking behavior: Advances in understand the interactions of people, place, and time. *Med Sci Sports Exercise* 2008;40:S584–93

<sup>94</sup> Commers M, Gottlieb N, Kok G. How to change environmental conditions for health. *Health Promotion Int* 2006;22:80–7

<sup>95</sup> Nagel CL, Carlson NE, Bosworth M *et al.* The relation between neighborhood built environment and walking activity among older adults. *Am J Epidemiol* 2008;168:461–8

<sup>96</sup> Clarke P, George LK. Understanding and addressing the challenges of disability: the role of the built environment in the disablement process. *Am J Public Health* 2005;95:1933–9

<sup>97</sup> Carpiano R. Actual or potential neighbourhood resources and access to them: testing hypotheses of social capital for the health of female caregivers. *Social Sci Med* 2008;67:568–82

<sup>98</sup> Heinrich KM, Lee RE, Regan GR *et al.* How does the built environment relate to body mass index and obesity prevalence among public housing residents? *Am J Health Promotion* 2008;22:187–94



- <sup>99</sup> Li F, Harmer PA, Cardinal BJ *et al.* Built environment, adiposity, and physical activity in adults aged 50–75. *Am J Preventative Med* 2008;35:38–46
- <sup>100</sup> Rundle A, Roux AV, Freeman LM *et al.* The urban built environment and obesity in New York City: a multilevel analysis. *Am J Health Promotion* 2007;21:326–34
- <sup>101</sup> Lopez-Zetina J, Lee H, Friis R. The link between obesity and the built environment: evidence from an ecological analysis of obesity and vehicle miles of travel in California. *Health Place* 2006;12:656–64
- <sup>102</sup> *Entrepreneurial Barnet: The Public Sector Contribution to Barnet's Economy, 2015–2020*. London Borough of Barnet, 2014. <https://www.barnet.gov.uk/citizen-home/business/Entrepreneurial-Barnet.html>
- <sup>103</sup> *Characterisation Study of London Borough of Barnet*. London Borough of Barnet, 2010, p. 28. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/ldf-evidence-and-supporting-documents/characterisation-study.html>
- <sup>104</sup> Brennan L, Hoehner C, Brownson R *et al.* Indicators of activity-friendly communities: an evidence-based consensus process. *Am J Preventive Med* 2006;31:515–24
- <sup>105</sup> Cleland V, Timperio A, Crawford D. Are perceptions of the physical and social environment associated with mothers' walking for leisure and for transport? A longitudinal study. *Preventive Med* 2008;47:188–93
- <sup>106</sup> *Improving the Health of Londoners: Transport Action Plan*. Transport for London, 2014. <http://content.tfl.gov.uk/improving-the-health-of-londoners-transport-action-plan.pdf>
- <sup>107</sup> Goodall B. *Disability and Inclusive Access to the Built Environment*. University of Reading, 2010. <http://www.reading.ac.uk/web/files/geographyandenvironmentalscience/GP193.pdf>
- <sup>108</sup> *Global Age-friendly Cities: A Guide*. World Health Organization, 2007. [http://www.who.int/ageing/publications/Global\\_age\\_friendly\\_cities\\_Guide\\_English.pdf?ua=1](http://www.who.int/ageing/publications/Global_age_friendly_cities_Guide_English.pdf?ua=1)
- <sup>109</sup> *The Dublin Declaration: Age-Friendly Cities and Communities*. World Health Organization, 2011. <http://www.emro.who.int/images/stories/elderly/documents/dublin20declaration.pdf>
- <sup>110</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 195. <https://www.barnet.gov.uk/jsna-home>
- <sup>111</sup> *Active Design Guidelines: Promoting Physical Activity and Health in Design*. New York City Departments of Design and Construction, 2010. <https://centerforactivedesign.org/dl/guidelines.pdf>
- <sup>112</sup> *Travel in London: Report 8*. Transport for London, 2015. <http://content.tfl.gov.uk/travel-in-london-report-8.pdf>
- <sup>113</sup> Kokkinos P, Narayan P, Pittaras A *et al.* (2016). The role of exercise and physical activity in the prevention of hypertensive heart disease. In *Hypertension and Cardiovascular Disease*. Springer, 2016;181–99, DOI: 10.1007/978-3-319-39599
- <sup>114</sup> Mozaffarian D, Benjamin EJ, Go AS *et al.* Executive summary: Heart disease and stroke statistics – 2015 update. *Circulation* 2015;131:434–41
- <sup>115</sup> Warburton DE, Nicol CW, Bredin S. Health benefits of physical activity: The evidence. *Can Med Assoc J* 2006;174:801–9
- <sup>116</sup> Sigal R, Armstrong M, Colby P *et al.* Physical activity and diabetes. *Can J Diabetes* 2013;37:S40–4
- <sup>117</sup> Shephard RJ. Diabetes and physical activity. *Appl Physiol Nutr Metab* 2015;40:103
- <sup>118</sup> Boyle T, Keegel T, Bull F *et al.* Physical activity and risks of proximal and distal colon cancers: A systematic review and meta-analysis. *J Nat Cancer Inst* 2012;104:1548–61
- <sup>119</sup> Wu Y, Zhang D, Kang S. Physical activity and risk of breast cancer: A meta-analysis of prospective studies. *Breast Cancer Res Treatment* 2013;137:869–82
- <sup>120</sup> Kyu H, Bachman V, Alexander L *et al.* Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke events: Systematic review and dose-response meta-analysis for the Global Burden of Disease Study. *BMJ* 2016;354:i3857
- <sup>121</sup> Kemmler W, von Stengel S, Bebenek K *et al.* Exercise and fractures in postmenopausal women: 12-year results of the Erlangen Fitness and Osteoporosis Prevention Study. *Osteoporosis Int* 2012;23:1267–76
- <sup>122</sup> Muir J, Ye C, Bhandari M *et al.* The effect of regular physical activity on bone mineral density in post-menopausal women aged 75 and over: A retrospective analysis from the Canadian multicentre osteoporosis study. *BMC Musculoskel Disord* 2013;14:253
- <sup>123</sup> Da Silva M, Singh-Manoux A, Brunner E *et al.* Bidirectional association between physical activity and symptoms of anxiety and depression: The Whitehall II study. *Europ J Epidemiol* 2012;27:537–46
- <sup>124</sup> Mammen G, Faulkner G. Physical activity and the prevention of depression: A systematic review of prospective studies. *Am J Preventive Med* 2013;45:649–57
- <sup>125</sup> Erickson KI, Weinstein AM, Lopez O. Physical activity, brain plasticity, and Alzheimer's disease. *Arch Med Res* 2012;43:615–21
- <sup>126</sup> Stevenson M, Thompson J, Herick de Sa H *et al.* Land use, transport, and population health: Estimating the health benefits of compact cities. *Lancet* 2016;388:2925–35
- <sup>127</sup> *Active People Interactive*. Sport England, 2015. <http://activepeople.sportengland.org>
- <sup>128</sup> Woodcock J, Givoni M, Morgan AS. Health impact modelling of active travel visions for England and Wales using an integrated transport and health impact modelling tool (ITHIM). *PLoS ONE* 2013;8:e51462



- <sup>129</sup> *Valuing the Health Benefits of Transport Schemes: Guidance for London*. Transport for London, 2015. <http://content.tfl.gov.uk/valuing-the-health-benefits-of-transport-schemes.pdf>
- <sup>130</sup> *HEAT Health Economic Assessment Tool*. World Health Organization, 2014. <http://www.heatwalkingcycling.org/>
- <sup>131</sup> Mackett RL. The health implications of inequalities in travel. *J Transport Health* 2014;1:202–9
- <sup>132</sup> Bostock L. (2001). Pathways of disadvantage? Walking as a mode of transport among low-income mothers. *Health Social Care Community* 2001;9:11–18
- <sup>133</sup> *National Travel Survey:2015*. Department for Transport, 2016. <https://www.gov.uk/government/statistics/national-travel-survey-2015>
- <sup>134</sup> *Transport: Social Trends 41*. Office for National Statistics, 2011. <http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/taxonomy/index.html?nscl=public%2Btransport>
- <sup>135</sup> *Fairness in a Car Dependent Society*. Sustainable Development Commission, 2010. [http://www.sd-commission.org.uk/data/files/publications/fairness\\_car\\_dependant.pdf](http://www.sd-commission.org.uk/data/files/publications/fairness_car_dependant.pdf)
- <sup>136</sup> *Travel in London 9 Supplementary Information: Borough Local Implementation Plan (LIP) Performance Indicators*. Transport for London, 2016, p. 3. <https://tfl.gov.uk/cdn/static/cms/documents/borough-lip-performance-indicators.pdf>
- <sup>137</sup> *Public Health Outcomes Framework*. Public Health England, 2017. <http://www.phoutcomes.info/>
- <sup>138</sup> Saunders L. *Mayor's Transport Strategy and Health*. Transport for London, 2017, p. 9. <http://iseh.co.uk/data/documents/MTS%20Health%20Sector%20Stakeholders%20engagement%20event%20Jan%202017.pdf>
- <sup>139</sup> *WebCAT*. Transport for London, 2017. <https://tfl.gov.uk/info-for/urban-planning-and-construction/planning-with-webcat/webcat>
- <sup>140</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 67. <https://www.barnet.gov.uk/jsna-home>
- <sup>141</sup> *Sustainable Modes of Transport Strategy (SMoTS)*. London Borough of Barnet, 2007. <https://www.barnet.gov.uk/citizen-home/schools-and-education/school-transport/sustainable-modes-of-travel-strategy-smots>
- <sup>142</sup> *Delivering the Benefits of Cycling in Outer London*. Transport for London, 2010. <http://content.tfl.gov.uk/benefits-of-cycling-report.pdf>
- <sup>143</sup> *London Greenways: Final Monitoring Report 2010–2014*. Transport for London, 2014. <http://content.tfl.gov.uk/greenways-final-annual-monitoring-report.pdf>
- <sup>144</sup> *Understanding Cycle Route Choices*. Transport for London, 2012. <http://content.tfl.gov.uk/understanding-cycle-route-choice.pdf>
- <sup>145</sup> *Travel and Transport Analysis for the NHS*. Transport for London, 2014. <http://content.tfl.gov.uk/travel-and-transport-analysis-in-the-nhs.pdf>
- <sup>146</sup> *Attitudes Towards Walking 2014*. Transport for London, 2014. <http://content.tfl.gov.uk/attitudes-to-walking-2014-report.pdf>
- <sup>147</sup> Department for Transport. *Reported Road Casualties Great Britain: 2015 Annual Report*. London: Department for Transport, 2016
- <sup>148</sup> Royal Society for the Prevention of Accidents. *Road Safety Factsheet: 20mph Zones and Speed Limits Factsheet*. London: RSPA, 2016
- <sup>149</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 68. <https://www.barnet.gov.uk/jsna-home>
- <sup>150</sup> Grundy C, Steinbach R, Edwards P et al. *20 mph Zones and Road Safety in London: A Report to the London Road Safety Unit*. London: London School of Hygiene & Tropical Medicine, 2008. <http://www.tfl.gov.uk/roadsafetyreports>
- <sup>151</sup> Environment Agency. *Better Environment, Healthier People*. Bristol: The Environment Agency, 2005
- <sup>152</sup> Grant M, Barton H, Coghill N et al. *Evidence Review on the Spatial Determinants of Health in Urban Settings*. Bonn: WHO European Centre for Environment and Health, 2009
- <sup>153</sup> Krzyzanowski M, Kuna-Dibbert B, Sneider J. *Health Effects of Transport-Related Air Pollution*. Geneva: WHO Regional Office for Europe, 2005
- <sup>154</sup> Deguen S, Zmirou-Navier D. Social inequalities resulting from health risks related to ambient air quality – a European review. *Eur J Public Health* 2010;20:27–35
- <sup>155</sup> *ObsAIRveYourBusiness*. European Mobile and Mobility Industries Alliance, 2016. <http://www.obsairveyourbusiness.eu/>
- <sup>156</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 64. <https://www.barnet.gov.uk/jsna-home>
- <sup>157</sup> *Local Authority Carbon Dioxide Emissions: 2013 Estimates*. National Statistics, 2015. <https://www.gov.uk/government/statistics/local-authority-carbon-dioxide-emissions-2013-estimates>
- <sup>158</sup> *Health on the High Street*. Royal Society for Public Health, 2016. <https://www.rsph.org.uk/our-work/campaigns/health-on-the-high-street.html>
- <sup>159</sup> Cetateanu A, Jones A. Understanding the relationship between food environments, deprivation and childhood overweight and obesity: Evidence from a cross sectional England-wide study. *Health Place* 2014;27:68–75
- <sup>160</sup> Coveney J, O'Dwyer LA. Effects of mobility and location on food access. *Health Place* 2009;15:45–55
- <sup>161</sup> Chen D, Jaenicke E, Volpe R. Food environments and obesity: Household diet expenditure versus food dessert. *Am J Public Health* 2016;106:881–8
- <sup>162</sup> Larsen K, Gilliland J. Mapping the evolution of 'food deserts' in a Canadian city: Supermarket accessibility in London, Ontario 1961–2005. *Int J Health Geographies* 2008;7:16
- <sup>163</sup> *Town Centres Floorspace Needs Assessment*. London Borough of Barnet, 2009. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/ldf-evidence-and-supporting-documents/town-centres-floorspace-needs-assessment.html>



- <sup>164</sup> Townshend T, Lake A. Obesogenic urban form: theory, policy and practice. *Health Place* 2009;15:909–16
- <sup>165</sup> Sallis J, Glanz K. The role of built environments in physical activity, eating, and obesity in childhood. *Future Children* 2006;16:89–108
- <sup>166</sup> Zenk SN, Schulz AJ, Odoms-Young A. How neighbourhood environments contribute to obesity. *Am J Nurs* 2009;109:61–4
- <sup>167</sup> Pi-Sunyer X. The medical risks of obesity. *Postgrad Med* 2009;121:21–33
- <sup>168</sup> Tyrell R, Greenhalgh F, Hodgson S *et al.* Food environments of young people: Linking individual behaviour to environmental context. *J Public Health* 2016;38:doi.org/10.1093/pubmed/fdw019
- <sup>169</sup> Jennings A, Welch A, Jones A *et al.* Local food outlets, weight status and dietary intake: Associations in children aged 9–10 years. *Am J Preventive Med* 2011;40:405–10
- <sup>170</sup> *The Great Weight Debate: A London Conversation on Childhood Obesity*. Healthy London Partnership, 2016. <http://gethealthy.london/great-weightdebate>
- <sup>171</sup> *Obesity Data and Tools*. Public Health England. 2016. <https://www.noo.org.uk/visualisation>
- <sup>172</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 91. <https://www.barnet.gov.uk/jsna-home>
- <sup>173</sup> Henkel D. Unemployment and substance use: a review of the literature (1990–2010). *Curr Drug Abuse Rev* 2011;4:4–27
- <sup>174</sup> Schou L, Moan IS. Alcohol use–sickness absence association and the moderating role of gender and socioeconomic status: A literature review. *Drug Alcohol Rev* 2015;35:158–69
- <sup>175</sup> Hope A. *Hidden Realities: Children's Exposure to Risks from Parental Drinking in Ireland*. North West Alcohol Forum, 2011. [http://www.drugs.ie/resourcesfiles/research/2011/NWAF\\_Realities\\_Report.pdf](http://www.drugs.ie/resourcesfiles/research/2011/NWAF_Realities_Report.pdf)
- <sup>176</sup> Boden JM, Fergusson DM, Horwood LJ. Alcohol misuse and violent behaviour: Findings from a 30-year longitudinal study. *Drug Alcohol Depend* 2012;122:135–41
- <sup>177</sup> Campbell CA, Hahn RA, Elder R, *et al.* The effectiveness of limiting alcohol outlet density as a means of reducing excessive alcohol consumption and alcohol-related harms. *Am J Prev Med* 2009;37:556–69
- <sup>178</sup> Livingston M, Chikritzhs T, Room R. Changing the density of alcohol outlets to reduce alcohol-related problems. *Drug Alcohol Rev* 2007;26:557–66
- <sup>179</sup> *Focus on Violent Crime and Sexual Offences: 2013/14*. Office for National Statistics, 2015. <https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/compendium/focusonviolentcrimeandsexualoffences/2015-02-12>
- <sup>180</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 121. <https://www.barnet.gov.uk/jsna-home>
- <sup>181</sup> Alcohol-use Disorders: Diagnosis, Assessment and Management of Harmful Drinking and Alcohol Dependence. National Institute of Health and Care Excellence, 2011. <https://www.nice.org.uk/guidance/CG115/chapter/Introduction>
- <sup>182</sup> Roerecke M, Rehm J. Irregular heavy drinking occasions and risk of ischemic heart disease: A systematic review and meta-analysis. *Am J Epidemiol* 2010;171:633–44
- <sup>183</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 120. <https://www.barnet.gov.uk/jsna-home>
- <sup>184</sup> *Health Act 2006*. UK Government, chapter 28. [http://www.legislation.gov.uk/ukpga/2006/28/pdfs/ukpga\\_20060028\\_en.pdf](http://www.legislation.gov.uk/ukpga/2006/28/pdfs/ukpga_20060028_en.pdf)
- <sup>185</sup> *Fair Society, Healthy Lives*. The Marmot Review, 2010. <http://www.instituteofhealthequity.org/projects/fair-society-healthy-lives-the-marmot-review/fair-society-healthy-lives-full-report>
- <sup>186</sup> *Healthy Lives, Healthy People: Our Strategy for Public Health in England*. HM Government, 2010. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/216096/dh\\_127424.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216096/dh_127424.pdf)
- <sup>187</sup> *The London Plan*. Mayor of London, 2015. <https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan>
- <sup>188</sup> Geddes I, Allen J, Allen M *et al.* *The Marmot Review: Implications for Spatial Planning*. UCL Institute of Health Equity, 2011. <http://www.instituteofhealthequity.org/projects/nice-spatial-planning-and-health>
- <sup>189</sup> *National Planning Policy Framework*. Department for Communities and Local Government, 2012. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/6077/2116950.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf)
- <sup>190</sup> Ross A, Chang M. *Planning Healthier Places – Report from the Reuniting Health With Planning Project*. Town and Country Planning Association, 2013. <https://www.tcpa.org.uk/Handlers/Download.ashx?IDMF=aa575f46-652d-4d21-b16f-a02332f4db92>
- <sup>191</sup> Wells R, Driscoll A, Eastman K. *Creating Healthy Places – Opportunities to Align Public Health Outcomes and Planning*. London Borough of Barnet, 2016, p. 3–4. <https://barnet.moderngov.co.uk/documents/s31732/Creating%20Healthy%20Places%20HWBB%20May%202016.pdf>
- <sup>192</sup> Wells R, Driscoll A, Eastman K. *Creating Healthy Places – Opportunities to Align Public Health Outcomes and Planning*. London Borough of Barnet, 2016, p. 4. <https://barnet.moderngov.co.uk/documents/s31732/Creating%20Healthy%20Places%20HWBB%20May%202016.pdf>
- <sup>193</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 237–8. <https://www.barnet.gov.uk/jsna-home>
- <sup>194</sup> Wells R, Driscoll A, Eastman K. *Creating Healthy Places – Opportunities to Align Public Health Outcomes and Planning*. London Borough of Barnet, 2016, p. 5–6. <https://barnet.moderngov.co.uk/documents/s31732/Creating%20Healthy%20Places%20HWBB%20May%202016.pdf>
- <sup>195</sup> *The Three Strands Approach: Protection Enhancement Growth*. London Borough of Barnet, 2006. [https://www.barnet.gov.uk/dam/jcr:63435bad-b39a-48e9-9025-d4d135d8147b/three\\_strands\\_strategy\\_summer08.pdf](https://www.barnet.gov.uk/dam/jcr:63435bad-b39a-48e9-9025-d4d135d8147b/three_strands_strategy_summer08.pdf)
- <sup>196</sup> *Corporate Plan 2015–2020: April 2015*. London Borough of Barnet, 2015, p.11. <https://www.barnet.gov.uk/dam/jcr:5770a615-5c17-4265->



9e37-f90ea46a12aa/CORPORATE%20PLAN.pdf

<sup>197</sup> *The Local Plan (Core Strategy)*. London Borough of Barnet, 2012. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/Adopted-Local-Plan---Core-Strategy-DPD.html>

<sup>198</sup> *The Local Plan (Core Strategy)*. London Borough of Barnet, 2012, p. 113. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/Adopted-Local-Plan---Core-Strategy-DPD.html>

<sup>199</sup> *Delivery Plan: Delivering the Borough Transport Objectives*. London Borough of Barnet, 2013. <http://barnet.moderngov.co.uk/documents/s17598/Appendix%202.pdf>

<sup>200</sup> Barnet Council Environment Committee. *Cycling in Barnet*. London Borough of Barnet, 2016. <https://barnet.moderngov.co.uk/documents/s34785/Cycling%20in%20Barnet.pdf>

<sup>201</sup> *Entrepreneurial Barnet: The Public Sector Contribution to Barnet's Economy, 2015–2020*. London Borough of Barnet, 2014, p. 7. <https://www.barnet.gov.uk/citizen-home/business/Entrepreneurial-Barnet.html>

<sup>202</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 69. <https://www.barnet.gov.uk/jsna-home>

<sup>203</sup> Appendix I Annual Regeneration Report (2015). London Borough of Barnet, p. 12. <https://www.barnet.gov.uk/dam/jcr:-be135c27-96a1-4883-8ab3-6deb9fcacce9/2015%20-%20Annual%20Regen%20Report.PDF>

<sup>204</sup> *Residents' Perception Survey Spring 2016 Headline Summary*. London Borough of Barnet, 2016. [https://engage.barnet.gov.uk/consultation-team/residents-perception-survey-spring-2016/user\\_uploads/residents--perception-survey-headline-summary-spring-2016.pdf](https://engage.barnet.gov.uk/consultation-team/residents-perception-survey-spring-2016/user_uploads/residents--perception-survey-headline-summary-spring-2016.pdf)

<sup>205</sup> *Barnet's Joint Strategic Needs Assessment 2015–2020*. London Borough of Barnet, 2015, p. 175. <https://www.barnet.gov.uk/jsna-home>

<sup>206</sup> *Brent Cross London NW4*. Hammerson, 2017. <http://www.brentcrosslondon.co.uk/>

<sup>207</sup> *Brent Cross Cricklewood Framework*. London Borough of Barnet, 2006. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/brent-cross-cricklewood-regeneration/brent-cross-cricklewood-framework.html>

<sup>208</sup> *An Open Spaces Strategy for Barnet 2016-2026*. London Borough of Barnet, 2016. <https://barnet.moderngov.co.uk/documents/s28481/Appendix%202%20Draft%20Parks%20and%20Open%20Spaces%20Strategy%20Summary.pdf>

<sup>209</sup> *Parks and Open Spaces: Our Strategy for Barnet 2016-2026*. London Borough of Barnet, 2016. <https://open.barnet.gov.uk/dataset/open-spaces-strategy/resource/94c1a991-560b-437b-ab1d-dfc1dc6f37ae>

<sup>210</sup> Wells R, Kayikci S, King E. *Sport and Physical Activity Needs Assessment*. London Borough of Barnet, 2012. <https://barnet.moderngov.co.uk/documents/s16260/Appendix%20C%20-%20SPA%20Needs%20Assessment.pdf>

<sup>211</sup> Wells R, Kayikci S, King E. *Sport and Physical Activity Needs Assessment*. London Borough of Barnet, 2012, p. 3–5. <https://barnet.moderngov.co.uk/documents/s16260/Appendix%20C%20-%20SPA%20Needs%20Assessment.pdf>

<sup>212</sup> Durand E. *Business Case: Sport and Physical Activity Review*. London Borough of Barnet, 2014, p. 26–7. <https://barnet.moderngov.co.uk/documents/s16256/Appendix%201%20-SPA%20Outline%20Business%20Case.pdf>

<sup>213</sup> Durand E. *Business Case: Sport and Physical Activity Review*. London Borough of Barnet, 2014, p. 7. <https://barnet.moderngov.co.uk/documents/s16256/Appendix%201%20-SPA%20Outline%20Business%20Case.pdf>

<sup>214</sup> *Finchley Church End Town Centre Strategy*. London Borough of Barnet, 2012.

[https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwj8l\\_Dek9HSAhXsKMAKHc4ECOMQFggc-MAA&url=https%3A%2F%2Fwww.barnet.gov.uk%2Fdam%2Fjcr%3A0e1ba3bf-ae75-4f26-8205-67cef8d6416d%2FThe\\_Adopted\\_Finchley\\_Church\\_TC\\_Strategy\\_June2012\\_v2.pdf&usg=AFQjCjNGGizWlXmHyn7OC6-oabF4BDo\\_VQ](https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwj8l_Dek9HSAhXsKMAKHc4ECOMQFggc-MAA&url=https%3A%2F%2Fwww.barnet.gov.uk%2Fdam%2Fjcr%3A0e1ba3bf-ae75-4f26-8205-67cef8d6416d%2FThe_Adopted_Finchley_Church_TC_Strategy_June2012_v2.pdf&usg=AFQjCjNGGizWlXmHyn7OC6-oabF4BDo_VQ)

<sup>215</sup> *Burnt Oak Looking Forward: A Plan for Burnt Oak Town Centre October 2016*. London Borough of Barnet, 2016. [https://engage.barnet.gov.uk/development-regulatory-services/burnt-oak-town-centre-project/user\\_uploads/094-burnt-oak\\_town-centre-plan\\_summary.pdf](https://engage.barnet.gov.uk/development-regulatory-services/burnt-oak-town-centre-project/user_uploads/094-burnt-oak_town-centre-plan_summary.pdf)

<sup>216</sup> *Burnt Oak Looking Forward: A Plan for Burnt Oak Town Centre October 2016*. London Borough of Barnet, 2016, p. 11. [https://engage.barnet.gov.uk/development-regulatory-services/burnt-oak-town-centre-project/user\\_uploads/094-burnt-oak\\_town-centre-plan\\_summary.pdf](https://engage.barnet.gov.uk/development-regulatory-services/burnt-oak-town-centre-project/user_uploads/094-burnt-oak_town-centre-plan_summary.pdf)

<sup>217</sup> Ross A, Change M. *Planning Healthy-weight Environments – A TCPA Reuniting Health with Planning Project*. Town and Country Planning Association, 2014. <https://www.tcpa.org.uk/Handlers/Download.ashx?IDMF=7166d749-288a-4306-bb74-10b6c4ffd460>

<sup>218</sup> *Grahame Park*. London Borough of Barnet, 2016. <https://www.barnet.gov.uk/citizen-home/regeneration/grahame-park.html>

<sup>219</sup> *Finchley Central Town Centre Strategy: Draft for Consultation 30-11-2016*. London Borough of Barnet, 2016. <https://engage.barnet.gov.uk/development-regulatory-services/finchley-central-draft-town-centre-strategy/>

<sup>220</sup> *The Local Plan (Core Strategy)*. London Borough of Barnet, 2012, p. 65. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/Adopted-Local-Plan---Core-Strategy-DPD.html>

<sup>221</sup> *Residents' Perception Survey Spring 2016 Headline Summary*. London Borough of Barnet, p. 17. [https://engage.barnet.gov.uk/consultation-team/residents-perception-survey-spring-2016/user\\_uploads/residents--perception-survey-headline-summary-spring-2016.pdf](https://engage.barnet.gov.uk/consultation-team/residents-perception-survey-spring-2016/user_uploads/residents--perception-survey-headline-summary-spring-2016.pdf)

<sup>222</sup> *Healthy Urban Planning Checklist*. London Healthy Urban Development Unit, 2015. <http://www.healthyurbandevelopment.nhs.uk/wp-content/uploads/2015/07/Healthy-Urban-Planning-Checklist-June-2015.pdf>

<sup>223</sup> *Chapter Seven: London's Living Spaces and Places*. Mayor of London, 2016. [https://www.london.gov.uk/sites/default/files/the\\_london\\_plan\\_malp\\_march\\_2016\\_-\\_chapter\\_7\\_-\\_londons\\_living\\_spaces\\_places.pdf](https://www.london.gov.uk/sites/default/files/the_london_plan_malp_march_2016_-_chapter_7_-_londons_living_spaces_places.pdf)

<sup>224</sup> *Shaping Neighbourhoods: Play and Informal Recreation Supplementary Planning Guidance*. Mayor of London, 2011. [https://www.london.gov.uk/file/5270/download?token=\\_LaKt0Dq](https://www.london.gov.uk/file/5270/download?token=_LaKt0Dq)

<sup>225</sup> *Open Space Strategies: Best Practice Guidance*. CABE Space, 2009. <https://www.designcouncil.org.uk/sites/default/files/asset/document/open-space-strategies.pdf>



- <sup>226</sup> *London Borough of Barnet Sports and Physical Activity Consultation*. London Borough of Barnet, 2014. <https://barnet.moderngov.co.uk/documents/s13723/Sport%20and%20Physical%20Activity-%20Appendix%202%20Summary%20of%20Consultation%20on%20Leisure%20Service.pdf>
- <sup>227</sup> *Barnet SPA Strategy 2013–18*. London Borough of Barnet, 2013. <https://barnet.moderngov.co.uk/documents/s13722/Sport%20and%20Physical%20Activity-%20Appendix%201%20Barnet%20SPA%20strategy%20statement.pdf>
- <sup>228</sup> *Silkstream and Montrose Park Redevelopment Update*. London Borough of Barnet, 2016. <https://barnet.moderngov.co.uk/documents/s34795/Appendix%201%20Silkstream%20and%20Montrose%20Park%20Redevelopment%20Update.pdf>
- <sup>229</sup> *Barnet Open Space, Sports and Recreational Facilities Assessment: Final Report*. London Borough of Barnet, 2009. [https://www.barnet.gov.uk/dam/jcr:8002391c-0fe0-4be1-8c41-531af53cd28d/open\\_space\\_assessment\\_dec09\\_4.pdf](https://www.barnet.gov.uk/dam/jcr:8002391c-0fe0-4be1-8c41-531af53cd28d/open_space_assessment_dec09_4.pdf)
- <sup>230</sup> *Checklist of Essential Features of Age-friendly Cities*. World Health Organization, 2007. [http://www.who.int/ageing/publications/Age\\_friendly\\_cities\\_checklist.pdf](http://www.who.int/ageing/publications/Age_friendly_cities_checklist.pdf)
- <sup>231</sup> *The Lifetime Homes Standard (From 5 July 2010)*. Lifetime Homes, 2010. <http://www.lifetimehomes.org.uk/pages/revised-design-criteria.html>
- <sup>232</sup> *Inclusion by Design: Equality, Diversity and the Built Environment*. Commission for Architecture and the Built Environment, 2008. <https://www.designcouncil.org.uk/sites/default/files/asset/document/inclusion-by-design.pdf>
- <sup>233</sup> *Housing Standards: Minor Alterations to the London Plan: The Spatial Development Strategy for Greater London Consolidated With Alterations Since 2011*. Mayor of London, 2016. [https://www.london.gov.uk/sites/default/files/housing\\_standards\\_malp\\_for\\_publication\\_7\\_april\\_2016.pdf](https://www.london.gov.uk/sites/default/files/housing_standards_malp_for_publication_7_april_2016.pdf)
- <sup>234</sup> *Homes for Londoners: Draft Affordable Housing and Viability Supplementary Planning Guidance 2016*. Mayor of London, 2016. [https://www.london.gov.uk/sites/default/files/draft\\_affordable\\_housing\\_and\\_viability\\_spg\\_2016.pdf](https://www.london.gov.uk/sites/default/files/draft_affordable_housing_and_viability_spg_2016.pdf)
- <sup>235</sup> *Adopted Standards for Houses in Multiple Occupation*. London Borough of Barnet, 2016. <https://www.barnet.gov.uk/dam/jcr:cb3f95f9-797f-4c32-b177-6b1bf3c66958/Adopted%20HMO%20Standards.pdf>
- <sup>236</sup> *Mill Hill East AAP*. London Borough of Barnet, 2009. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/mill-hill-east-aap.html>
- <sup>237</sup> *West Hendon*. London Borough of Barnet, 2015. <https://www.barnet.gov.uk/citizen-home/regeneration/west-hendon.html>
- <sup>238</sup> *Active Design*. Sport England, 2015. <https://www.sportengland.org/facilities-planning/planning-for-sport/planning-tools-and-guidance/active-design/>
- <sup>239</sup> Stockton JC, Duke-Williams O, Stamatakis E *et al*. Development of a novel walkability index for London, United Kingdom: cross-sectional application to the Whitehall II study. *BMC Public Health* 2016;16:416
- <sup>240</sup> London Assembly Planning Committee. *The Future of London's Town Centres*. Greater London Authority, 2013. <http://www.london.gov.uk/sites/default/files/Planning%20Committee%20Town%20Centres%20Report.pdf>
- <sup>241</sup> *Chipping Barnet Town Centre Strategy*. London Borough of Barnet, 2013. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/town-centre-frameworks/chipping-barnet-town-centre-strategy.html>
- <sup>242</sup> *Edgware Town Centre Framework*. London Borough of Barnet, 2013. <https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/town-centre-frameworks/edgware-town-centre-framework/documents-for-edgware-town-centre-framework.html>
- <sup>243</sup> *Future Path: Helping Others Choose Their Future*. London Borough of Barnet, 2017. <http://www.future-path.co.uk/>
- <sup>244</sup> *International Cycling Infrastructure Best Practice Study*. Transport for London, 2014. <http://content.tfl.gov.uk/international-cycling-infrastructure-best-practice-study.pdf>
- <sup>245</sup> *Workplace Cycle Parking Guide*. Transport for London, 2006. <http://content.tfl.gov.uk/Workplace-Cycle-Parking-Guide.pdf>
- <sup>246</sup> *Good Food for London 2016*. Sustain, 2016. [https://www.sustainweb.org/publications/good\\_food\\_for\\_london\\_2016/](https://www.sustainweb.org/publications/good_food_for_london_2016/)
- <sup>247</sup> *Beyond the Foodbank: London's Food Poverty Profile 2016*. Sustain, 2016. [https://www.sustainweb.org/publications/beyond\\_the\\_food\\_bank\\_2016/](https://www.sustainweb.org/publications/beyond_the_food_bank_2016/)
- <sup>248</sup> London Assembly Planning and Housing Committee. *Cultivating the Capital: Food Growing and the Planning System in London*. Greater London Assembly, 2010. [https://www.london.gov.uk/sites/default/files/gla\\_migrate\\_files\\_destination/archives/archive-assembly-reports-plansd-growing-food.pdf](https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/archives/archive-assembly-reports-plansd-growing-food.pdf)
- <sup>249</sup> London Development Agency. *Healthy and Sustainable Food for London: The Mayor's Food Strategy May 2006*. Mayor of London, 2006. [https://www.london.gov.uk/sites/default/files/the\\_mayors\\_food\\_strategy\\_2006.pdf](https://www.london.gov.uk/sites/default/files/the_mayors_food_strategy_2006.pdf)
- <sup>250</sup> *London's Allotments and Community Gardens*. CPRE London, 2012. <http://www.cprelondon.org.uk/resources/item/download/607>
- <sup>251</sup> *Good Food for London 2016*. Sustain, 2016, p. 22. [https://www.sustainweb.org/publications/good\\_food\\_for\\_london\\_2016/](https://www.sustainweb.org/publications/good_food_for_london_2016/)
- <sup>252</sup> *The Big Dig Saturday 22 April, 2017*. Capital Growth, 2017. <http://www.capitalgrowth.org/bigdig/>
- <sup>253</sup> *Get Support to Help Your School Grow*. Food Growing Schools London, 2017. [http://www.foodgrowingschools.org/get\\_involved/](http://www.foodgrowingschools.org/get_involved/)

