

Physical activity and the environment

NICE guideline

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Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the [Yellow Card Scheme](#).

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should [assess and reduce the environmental impact of implementing NICE recommendations](#) wherever possible.

Contents

Overview	6
Who is it for?	6
Recommendations.....	7
1.1 Strategies, policies and plans to increase physical activity in the local environment.....	7
1.2 Active travel	9
1.3 Public open spaces	13
1.4 Buildings.....	14
1.5 Schools	14
Terms used in this guideline.....	15
Putting this guideline into practice	17
Context.....	20
Key facts and figures	20
Current practice	20
Policy	21
The committee's discussion	22
The evidence – overall strengths and limitations.....	22
Cost effectiveness evidence.....	24
Strategies, policies and plans to increase physical activity in the local environment.....	25
Active travel	30
Public open spaces	42
Buildings.....	49
Schools.....	50
Issues beyond the scope of this guideline	50
Recommendations for research	51
1 Public transport provision and ticketing.....	51
2 Changes to public open spaces	52
3 Use of public open spaces by particular groups	52

4 People with limited mobility	53
5 Reducing car ownership	54
6 Interaction between behavioural and environmental interventions.....	55
Glossary.....	56
Active travel.....	56
Blue spaces.....	56
Built environment	56
Connectivity.....	56
Cycling.....	56
Footpaths	56
Footways.....	57
Green spaces.....	57
Greenways	57
Grey spaces	57
Home Zones.....	57
Inactivity.....	57
Land use mix.....	58
Metabolic equivalents or METs per unit of time.....	58
Natural environment	58
Pavement parking	58
Physical activity	58
Physical activity measurements	58
Public transport.....	59
Sedentary behaviour.....	59
Street furniture	59
Translational research.....	59
Vending boards	59
Finding more information and committee details.....	61

Update information 62

This guideline replaces PH8.

This guideline is the basis of QS181 and QS183.

This guideline should be read in conjunction with PH41.

Overview

This guideline covers how to improve the physical environment to encourage and support physical activity. The aim is to increase the general population's physical activity levels.

The recommendations in this guideline should be read alongside [NICE's guideline on physical activity: walking and cycling](#).

Who is it for?

- Local authorities and metro mayors, including agencies contracted to deliver environmental changes for local authorities
- Others responsible for open spaces used by the public such as in workplaces, community-owned gardens and playing fields
- Housing, local enterprise partnerships and others responsible for the built environment
- Public transport planners and providers
- Organisations working to ensure people with limited mobility can be physically active

It may also be relevant for members of the public.

Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in [NICE's information on making decisions about your care](#).

[Making decisions using NICE guidelines](#) explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

1.1 Strategies, policies and plans to increase physical activity in the local environment

- 1.1.1 Develop and use local strategies, policies and plans to encourage and enable people to be more physically active. Use information from sources such as the [joint strategic needs assessment](#) and local cycling and walking implementation plans. Follow established best practice to ensure everyone's needs are identified and addressed, including those of people with [limited mobility](#). **[2018]**
- 1.1.2 Use community engagement approaches to develop and review these local strategies, policies and plans:
- Take account of the views and needs of people who walk, cycle, drive or use public transport in the local area, particularly in relation to shared or [contested space](#). (For example, space shared by pedestrians and cyclists, or cyclists and motorists.)
 - Take account of the views and needs of people with limited mobility who may be adversely affected by the design and maintenance of streets, footways and footpaths and urban and rural public open spaces.
 - Take account of the views of voluntary and community sector organisations.

- Assess whether initiatives successfully adopted elsewhere are appropriate locally and, if they are, how they can be adapted to local needs. **[2018]**

For more information, see [NICE's guideline on community engagement](#).

1.1.3 Develop and put policies into place to ensure people with limited mobility can safely move along and across streets and in public open spaces:

- Adopt a consistent approach to permanent or temporary obstructions. This may include vegetation, vending boards, bins, parked cars, scaffolding and street furniture.
- Ensure that there are enough pedestrian-controlled [crossings](#), and that they all incorporate accessibility features. Also ensure that signal-controlled crossings give enough time to cross the road safely.
- Provide accessible temporary crossings during street and road works (see the [Department for Transport's Safety at street works and road works](#)).
- Use and maintain tactile paving and dropped kerbs correctly (see the [Department for Transport's guidance on the use of tactile paving surfaces](#)).
- Provide step-free access or, where this is not possible, clearly signposted accessible alternatives. **[2018]**

1.1.4 Ensure planning permissions always prioritise the need for people (including people with limited mobility) to be physically active as a routine part of their daily life, for example ensuring access on foot to local services such as shops and public transport stops.

For more information, see [Public Health England's Spatial planning for health report](#). **[2018]**

1.1.5 Ensure children, young people and their families and carers can be physically active, for example when playing and when travelling to school, college and early years settings. **[2018]**

1.1.6 Use existing health impact assessment tools to assess in advance what impact (both intended and unintended) any proposed changes are likely to have on physical activity levels. For example, will local services be

accessible on foot, by bike, and by people with limited mobility? Make the results publicly available and accessible. **[2018]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on strategies, policies and plans to increase physical activity in the local environment](#).

1.2 Active travel

- 1.2.1 Identify and prioritise local areas where there is a high potential to increase travel on foot, by bicycle, or by other forms of active travel. Base this on demographic data, travel surveys, land use mix and other sources of local information. Take into account views identified through community engagement (see recommendation 1.1.2). **[2018]**
- 1.2.2 Increase physical activity associated with using public transport services. This includes encouraging use of these services by:
- Ensuring available services are reliable, particularly in rural areas where public transport may be more limited.
 - Making information about public transport services accessible to people with visual and hearing impairments, for example provide spoken and visual announcements about destinations and stops on board services, and at stops and stations.
 - Making public transport physically accessible to everyone (see the [Department for Transport's guidance on inclusive mobility](#)).
 - Improving public transport to parks and other green and blue spaces. **[2018]**
- 1.2.3 Ensure new and refurbished footways, footpaths and cycle routes link to existing routes and improve the connectivity of the network as a whole. Aim to make it as easy as possible for people to walk, cycle or use other forms of active travel rather than making short journeys by car. This includes journeys between residential areas and:
- public transport stops and stations

- places of work
- public open spaces
- schools, colleges and early years settings
- healthcare services
- shops, and leisure sites. **[2018]**

1.2.4 Ensure footways, footpaths and cycle routes are convenient, safe and appealing to users, and are built and maintained to a high standard. For example, ensure:

- they are even and do not include any hazards, for example from tree roots, pot-holes, broken paving slabs or seasonal and weather-related obstructions
- they have enough lighting to make people feel secure
- they are free from permanent or temporary obstructions, where possible (see recommendation 1.1.3)
- they are not hidden by overgrown or poorly managed vegetation
- they have clear signs to help people find their way.

Work in association with relevant third sector organisations and volunteers to plan and carry out this work.

For more details, see the [Department for Transport's guidance on inclusive mobility](#) and the [Traffic signs manual](#). **[2018]**

1.2.5 Ensure pedestrians, cyclists and users of other modes of transport that involve physical activity are given the highest priority when developing or maintaining streets and roads. (This includes people with [limited mobility](#).) Use 1 or more of the following methods:

- Re-allocate road space to support physically active modes of transport (for example, by widening footways and introducing cycle lanes). For more detail on designing these routes, see the [recommendations on walking and cycling in NICE's guideline on air pollution: outdoor air quality and health](#), and the [Department for Transport's guidance on Shared use routes for pedestrians and cyclists](#).
- Restrict motor vehicle access (for example, by closing or narrowing roads to reduce capacity).
- Introduce road-user charging schemes. For more detail on charging schemes, see the [recommendations on clean air zones in NICE's guideline on air pollution: outdoor air quality and health](#).
- Introduce traffic-calming schemes to restrict vehicle speeds (using signage and changes to highway design). For more detail on traffic calming, see the [recommendations on smooth driving and speed reduction in NICE's guideline on air pollution: outdoor air quality and health](#), [measures to reduce speed in NICE's guideline on unintentional injuries on the road](#), and the [Department for Transport's guidance on Traffic calming](#). **[2018]**

1.2.6 Improve cycling infrastructure using information from people who walk, cycle, and drive in the local area, including those with limited mobility (see recommendation 1.1.2). Improvements may include:

- establishing cycle lanes, tracks and trails in line with best practice
- installing secure cycle parking facilities in public places, on public transport and at public transport stops. **[2018]**

For more details see [NICE's guideline on physical activity: walking and cycling](#), and other guidance such as [Transport for London's London cycling design standards](#) and [Highways England's Cycle traffic and the strategic road network](#).

1.2.7 Make it as easy as possible for people with limited mobility to move around their local area, and work with relevant third sector organisations to achieve this. For example:

- Ensure footways:
 - have even, non-reflective, anti-glare surfaces
 - are free from unauthorised and unnecessary obstructions (whether permanent or temporary) including being free from pavement parking (see recommendation 1.1.3)
 - are set back from traffic, if possible (for example, by a grass verge).
 - Ensure footways that have a kerb clearly define the kerb with a change in level (apart from pedestrian crossings).
 - Ensure pedestrian crossings have flush kerbs and tactile paving (see the Department for Transport's guidance on the use of tactile paving surfaces).
 - Ensure signal-controlled crossings have tactile rotating cones and, if appropriate, an audible beep, and give enough time to cross the road safely.
 - Ensure tactile paving is correctly installed and maintained where it is needed, for example at all crossing places, at the top and bottom of stairs, on the edge of railway platforms and on shared use routes (see the Department for Transport's guidance on tactile paving surfaces).
 - Ensure seating is provided at regular intervals along footways that are key walking routes (see the Department for Transport's guidance on inclusive mobility). **[2018]**
- 1.2.8 Improve routes that children, young people and their families and carers use, or could use, for active travel to school, college and early years settings. Focus on improving safety, accessibility, connectivity, sustainability and appeal to users. **[2018]**
- 1.2.9 Consider improving access routes to school, college and early years settings by:
- improving footways and pedestrian crossings (see recommendations 1.2.4 and 1.2.7)
 - introducing measures to reduce vehicle speed (see NICE's guidelines on air pollution: outdoor air quality and health and unintentional injuries on the road). **[2018]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on active travel](#).

1.3 Public open spaces

1.3.1 Consider ways to enhance the accessibility, quality and appeal to users of local open spaces, especially green and blue spaces, to increase their use. Focus particularly on communities who may not currently use them, for example those with low mobility, low income communities and some black and minority ethnic communities. Consider, for example, providing:

- facilities that help people of all cultures and backgrounds to feel safe and welcome, for example by providing safe areas in which children can play and picnic facilities
- lighting and other measures to prevent or reduce antisocial behaviour, such as maintaining vegetation
- clear signs that can be understood by everyone, including people with visual impairments and learning disabilities
- seats with arms and backrests, sited at frequent intervals
- shelter and shade
- accessible toilets that are clean, well maintained and unlocked during daylight hours
- footpaths with even, non-reflective, anti-glare surfaces and tactile paving
- access by public transport, on foot and by bike (including providing cycle parking)
- car parking for blue badge holders and other people with [limited mobility](#).
[2018]

1.3.2 Ensure open spaces and footpaths are maintained to a high standard.
[2018]

- 1.3.3 Involve community groups and volunteers in decisions on how to design and manage public open spaces, including trails, footpaths and towpaths. Encourage them to help maintain them, for example by reporting any problems affecting use and accessibility (see [NICE's guideline on community engagement](#)). **[2018]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on public open spaces](#).

1.4 Buildings

- 1.4.1 Ensure different parts of [campus](#) sites (including those in hospitals and universities) are linked by accessible walking and cycling routes. **[2008]**
- 1.4.2 Ensure new workplaces are linked to walking and cycling networks. Where possible, these links should improve the existing walking and cycling infrastructure by creating new through routes (and not just links to the new facility). **[2008]**
- 1.4.3 During building design or refurbishment, ensure staircases are designed and positioned to encourage people to use them. **[2008]**
- 1.4.4 Ensure staircases are clearly signposted and are attractive to use. For example, they should be well lit and well decorated. **[2008]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on buildings](#).

1.5 Schools

- 1.5.1 Ensure school playgrounds are designed to encourage varied, physically active play. **[2008]**
- 1.5.2 Primary schools should create areas (for instance, by using different

colours) to promote individual and group physical activities such as hopscotch and other games. [2008]

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on schools](#).

Terms used in this guideline

This section defines terms that have been used in a specific way for this guideline. For general definitions, please see the [glossary](#).

Campus

Two or more related buildings set together in the grounds of a defined site.

Crossings

Signal-controlled crossings: these include puffin, pelican and toucan crossings. They have traffic signals for both vehicles on the carriageway and people crossing it.

Pedestrian-controlled crossings: these include both signal-controlled crossings and zebra crossings.

Accessible crossings: these have dropped kerbs that are flush with the carriageway, and tactile paving. Those with signals also have tactile rotating cones and, if appropriate, an audible beep. These characteristics are accessibility features.

Although these are the definitions of crossings which are used in this guideline, various other definitions exist with more detailed technical specifications. For these, see [Schedule 1 of the Traffic Signs Regulations and General Directions 2016](#).

Contested space

A geographical space that is used for different purposes, potentially causing conflict because each type of user has differing priorities.

Limited mobility

People whose mobility is limited, either temporarily or in the long term, because their environment is not adapted to meet their needs. Examples may include:

- some disabled people, including people with sensory impairments or learning disabilities
- people using wheelchairs, cycles or other mobility aids, or those supporting people using these aids
- some older or frail people
- people using buggies, prams or cargo cycles for transporting children
- people with conditions such as chronic pain or neurological conditions
- some people with mental health conditions.

Putting this guideline into practice

NICE has produced [tools and resources to help you put this guideline into practice](#).

Some issues were highlighted that might need specific thought when implementing the recommendations. These were raised during the development of this guideline. They are:

- Training on the links between transport and health for council staff and elected members.
- Partnership working between local government authority departments responsible for public health, transport and planning and other departments that affect people's ability to be active in the built or natural environment.
- Public health knowledge and leadership in local transport departments, and in local authorities' parks and recreation departments.
- Access to examples of good practice on physical activity and the environment.
- Local links to academic centres for translational research.
- Whether and how behavioural interventions may be combined with the environmental interventions covered in this guideline (for more information, see [NICE's guidelines on physical activity: walking and cycling](#) and [behaviour change: individual approaches](#)).

Putting recommendations into practice can take time. How long may vary from guideline to guideline, and depends on how much change in practice or services is needed.

Implementing change is most effective when aligned with local priorities.

Changes should be implemented as soon as possible, unless there is a good reason for not doing so (for example, if it would be better value for money if a package of recommendations were all implemented at once).

Different organisations may need different approaches to implementation, depending on their size and function. Sometimes individual practitioners may be able to respond to recommendations to improve their practice more quickly than large organisations.

Here are some pointers to help organisations put NICE guidelines into practice:

1. **Raise awareness** through routine communication channels, such as email or newsletters, regular meetings, internal staff briefings and other communications with all relevant partner organisations. Identify things staff can include in their own practice straight away.
2. **Identify a lead** with an interest in the topic to champion the guideline and motivate others to support its use and make service changes, and to find out any significant issues locally.
3. **Carry out a baseline assessment** against the recommendations to find out whether there are gaps in current service provision.
4. **Think about what data you need to measure improvement** and plan how you will collect it. You may want to work with other health and social care organisations and specialist groups to compare current practice with the recommendations. This may also help identify local issues that will slow or prevent implementation.
5. **Develop an action plan**, with the steps needed to put the guideline into practice, and make sure it is ready as soon as possible. Big, complex changes may take longer to implement, but some may be quick and easy to do. An action plan will help in both cases.
6. **For very big changes** include milestones and a business case, which will set out additional costs, savings and possible areas for disinvestment. A small project group could develop the action plan. The group might include the guideline champion, a senior organisational sponsor, staff involved in the associated services, finance and information professionals.
7. **Implement the action plan** with oversight from the lead and the project group. Big projects may also need project management support.
8. **Review and monitor** how well the guideline is being implemented through the project group. Share progress with those involved in making improvements, as well as relevant boards and local partners.

NICE provides a comprehensive programme of support and resources to maximise uptake and use of evidence and guidance. See our [into practice](#) pages for more information.

Also see [Leng G, Moore V, Abraham S, editors \(2014\) Achieving high quality care –](#)

practical experience from NICE. Chichester: Wiley.

Context

Key facts and figures

Physical activity can help people to prevent and manage over 20 chronic health conditions ([Department of Health: Start active, stay active](#)). The benefits of physical activity vary across ages and include improvements to physical and mental development and functioning. ([Department of Health: Start active, stay active: infographics on physical activity](#)).

Physical inactivity costs the NHS in the UK around £1 billion per year ([The King's Fund: Making the case for public health interventions](#) and [Scarborough et al. 2011](#)). Including costs to wider society, this rises to around £7.4 billion a year ([Public Health England: Everybody active, every day: an evidence based approach to physical activity](#)).

Current practice

In 2015, 34% of men over 16 and 42% of women over 16 reported that they did not meet [UK guidelines on physical activity](#), and the number of people meeting the recommended levels decreased with age ([NHS Digital: Health Survey for England – 2016](#)). In 2015, only 23% of boys and 20% of girls aged 5 to 15, and in 2012 only 10% of boys and 9% of girls aged 2 to 4 met the UK Chief Medical Officer's guidelines on physical activity for their age group ([NHS Digital: Health Survey for England, 2016: children's health](#); [NHS Digital: Health Survey for England 2015: children's physical activity](#)). For children aged 5 to 15, figures exclude physical activity done during school lessons. When this is included, 24% of boys and 18% of girls who had attended school in the past week met the UK Chief Medical Officers' guidelines on physical activity for their age group. For both reports, data was collected from parental report for children aged 2 to 12. For 13 to 15 year olds, data was self-reported.

The environment can influence people's ability to be active ([Foster and Hillsdon 2004](#)). The design and layout of towns and cities can enable and encourage walking and cycling, and using public transport may also mean people build physical activity into their daily lives ([Beavis and Moodie 2014](#)).

For people with limited mobility, the environment can make it particularly difficult to be active. For example, they may not have easy access to public transport, or may find it difficult to cross roads if the crossings are not accessible.

Policy

The government's Sporting Future sets out a strategy for a healthy nation based on 5 outcomes, including physical and mental wellbeing. The government's Cycling and walking investment strategy aims to make cycling and walking the natural choices for shorter journeys, or as part of a longer journey. Objectives for these policies include:

- increasing the proportion of the population meeting the physical activity guidelines
- decreasing the proportion doing less than 30 minutes of physical activity a week
- increasing cycling and walking activity
- decreasing fatalities and serious injuries in cyclists.

Supporting people of all ages and abilities to be more physically active can help local authorities meet their public health responsibilities. Specifically, it will affect indicators identified in the Public Health Outcomes Framework 2016 to 2019 and the NHS Outcomes Framework 2016 to 2017.

The committee's discussion

Evidence statement numbers are given in square brackets. See 'The evidence' at the end of each section for details.

The evidence – overall strengths and limitations

The committee noted that the evidence as a whole indicated that the proposed environmental changes to open spaces and public transport provision appear to increase physical activity.

Of the 70 studies included in reviews 1, 2 and 3, only 2 (both qualitative) were rated as having no risk of bias [++] and 16 were rated as having low risk of bias [+]. The remaining 52 studies were rated as having high risk of bias [-]. No economic evaluations were included in review 1, 5 were included in review 2 and 2 studies in review 3 included a small amount of economic data.

All included studies were based on interventions used as natural experiments, in response to pre-planned infrastructure changes. For many interventions, this study design was deemed to be the most feasible and valid approach. However, individual studies had limitations. Many did not use objective measures of physical activity or report whether they were adequately powered. But the small sample sizes of some studies suggest that they would not have had the power to detect changes in physical activity behaviours. For several types of intervention, self-selection bias may have occurred.

Many studies did not use a control group. Control groups can help to minimise bias or confounding that could influence a study outcome. Of studies using a control, around half were thought to be sufficient to reduce confounding. Around half of the remaining studies did not include enough information to determine whether the control group was appropriate, for example how well it was matched to the intervention group or whether contamination occurred. Some used control groups that were unlikely to effectively reduce confounding. Normally this was because the intervention was geographically close to the control area or there was no buffer between them. Many interventions had behavioural elements that may have affected the outcomes reported but could not be separated from environmental aspects.

Many studies:

- were unclear about the length of follow-up periods and when they took place in relation to the intervention and baseline data collection
- had very short follow-up periods
- were at varying stages of completion when follow-up measures were taken.

The committee recognised that delays to completing infrastructure changes, over which the researchers would have little control, may have reduced follow-up periods. So they may have been too short to detect long-term changes in commuting decisions and physical activity behaviours. The committee also recognised that as follow-up times lengthen, the possibility of other factors influencing outcomes increases.

Finally, some studies report findings for those who are least active. However for those with limited mobility, which is a group distinct from the least active, there was a lack of reporting of the impact of interventions.

The quality of the evidence was also assessed using the Grading of Recommendations Assessment, Development and Evaluation process (GRADE). The committee noted that the complexity and scale of the interventions makes this an extremely challenging area of research.

It may not be possible, practical or ethical to undertake a randomised controlled trial for some interventions and natural experiments may be the most valid approach. So a modified version of GRADE was agreed by the committee and used. Outcomes from studies for which the natural experiment study design was the most feasible and valid approach started the GRADE process as 'high quality'. If a randomised controlled trial was feasible and optimal for answering the study aims but a natural experiment design was used, outcomes started the GRADE process as 'low quality'.

Strong recommendations may be made if there is clear evidence of benefit, and if it is cost effective. Evidence may be derived from published literature, from expert testimony (if sought) and from committee experience. Low and very low quality evidence from published literature may still support strong recommendations if there are transparent and strong rationales to do so, and if benefits and harms have been considered. The committee also noted that variations in the methodology used to evaluate the impact of interventions, in different groups, over different time points meant that the committee did

not feel comfortable pooling the heterogeneous outcome data.

Many of the studies were not carried out in the UK so the applicability of the findings to the UK needed to be taken into account. However, the committee agreed that most studies were conducted in a broadly similar context so the findings were likely to be transferable.

The committee agreed that the recommendations in this guideline should be applied to all new changes to the environment, and to existing features when they are being refurbished.

Cost effectiveness evidence

There was little published evidence on cost effectiveness, so NICE carried out a new economic analysis. Overall, the analysis showed that interventions could be cost effective if modest numbers of people increased their physical activity. For example, in a town with a population of 100,000 people, an intervention that cost £1,000,000 (the equivalent of £10 per person) would be beneficial if it motivated 1,000 people to cycle for an additional hour per week, or 2,500 people to walk for an extra 30 minutes per week.

It also assessed 8 case studies of interventions that were effective in increasing physical activity. It found 7 of these interventions to also be highly cost effective. But both the effect and cost of any intervention will depend on factors specific to the local setting, so this may differ from the case studies. The analysis focused on a limited number of health conditions and did not consider non-health benefits, suggesting that the overall benefits are likely to be greater than the estimates given. So the committee concluded that these types of interventions could offer good value for money.

The committee considered there is not enough evidence to apply a decay rate to the impact of environmental interventions. Because they involve structural changes to the environment, they are likely to remain in place for relatively long periods of time. The committee noted that this differs from the approach taken in previous guidelines on behavioural interventions to increase physical activity. These type of interventions are usually delivered over a finite period and their impact tends to diminish over time. In those guidelines the economic analysis typically used a range of annual decay rate rates from 0% (no decay) to 100% (no intervention effect beyond the first year).

The committee noted the importance of maintaining open spaces to encourage local

communities to use them to be physically active. They highlighted that some environmental interventions may need more regular, ongoing maintenance than others, particularly some interventions in open spaces. For example, if footpaths become overgrown with vegetation or become muddy because of poor drainage, they may become unusable relatively quickly. They agreed that ongoing maintenance should be factored into the costs of implementing such interventions. Provided they are adequately maintained, the committee thought their impact (for example, the use of footpaths and cycle paths) would be maintained and could possibly increase over time.

Strategies, policies and plans to increase physical activity in the local environment

Recommendations 1.1.1 to 1.1.6

Rationale and impact

Why the committee made the recommendations

Based on their experience and expertise, the committee agreed that increasing most people's physical activity levels is important. They also agreed that it is particularly important to help people who are the least active to be more physically active, because it will benefit their health and wellbeing the most. A well-designed local environment can help to encourage people to be more active. The committee agreed that local strategies, policies and plans which take account of local needs and follow best practice are an important way of creating such an environment.

Some evidence suggested that initiatives to help people be more active locally are more likely to be effective if local communities and groups are involved from the start. The committee recognised that different groups, for example people who walk, cycle or drive, or people with limited mobility, may have different views and needs. They also agreed that some people may use several modes of transport. For example, many adult cyclists may also drive, but not all drivers will be cyclists. The committee noted that it is important to be aware of the range of views and needs when aiming to increase physically active travel.

Experts suggested that initiatives that work well in one locality may not always work in another. In particular, different approaches may be needed in urban and rural areas. The evidence was uncertain. But the committee recognised the importance of seeking the

views of local people and voluntary and community organisations on local needs and priorities. They made a recommendation based on their expertise and [NICE's guideline on community engagement: improving health and wellbeing and reducing health inequalities](#).

The committee agreed that it is important for people with limited mobility to be able to move around their local area. Some experts suggested that both temporary and permanent obstructions on footways are not only inconvenient but can cause injuries. But some items, such as seating, may be needed to enable some groups to be physically active.

Even if there is a policy in place to address these issues, the way it is interpreted and put into practice may vary both between areas, and over time in the same area. Some experts also suggested that the number of [crossings](#) and their accessibility, for example whether they have tactile paving and (on signal-controlled crossings) rotating cones, may not always meet people's needs. Additionally, temporary street and road works may disrupt people's access, as can a lack of step-free routes. These types of obstructions and issues can put people off going out and about. This is particularly true for people with limited mobility, including those with sensory impairments.

Because several experts highlighted the importance of these issues and because the committee were conscious that everyone should be able to move around in their local environment as easily as possible, they felt there was a strong basis for this recommendation. They also made a [recommendation for research to find out more about what type of environmental changes can encourage this group to be more physically active](#).

These recommendations are taken from NICE's guideline PH8. Please see the [evidence](#) for details and why the recommendations were made. The committee examined new evidence and agreed that all planning permissions should prioritise people doing active travel, whether they are new developments or improvements to existing ones.

Why we need recommendations on this topic

A lack of physical activity increases the risk of developing conditions such as type 2 diabetes, coronary heart disease, stroke and some types of cancer. People whose mobility is limited may find it particularly difficult to be active and could spend more time being inactive. Strategies, policies and plans that help to create local environments that lead to people becoming more active will benefit everyone but, in particular, those who are least

active.

People have varying needs and it can be difficult to achieve a balance in meeting them all, particularly where space is shared between different types of user. For example, dropped kerbs that are flush with the carriageway are important for wheelchair users, but if they have no tactile paving they may prove a problem for people with a visual impairment.

Views and needs may vary depending on whether people walk, cycle or drive in the local area. Where there are conflicting needs, the space may become contested. So it is important to involve the community to ensure everyone's needs are considered and to try to resolve any potential conflicts.

Impact of the recommendations on practice

Developing and implementing strategies, policies and plans and consulting with communities is a core part of local authorities' work. So putting these recommendations into practice is not expected to cost more than is already spent in this area. An environment that encourages people to be more active will help prevent a range of chronic health conditions, leading to savings for the NHS, local authorities and society at large.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Physical activity is a broad concept that includes everyday activities such as housework, gardening and carrying shopping bags, as well as recreational or employment-related activities such as sports, manual work and active travel to work.

The committee were aware that various outcomes can be used to capture changes in physical activity levels. These include: total physical activity, total sedentary time and physical activity in daily life. These outcomes can be measured in different ways. For example, the proportion of participants meeting physical activity guidelines, the time spent in moderate to vigorous physical activity, or changes to 'metabolic equivalents' or METs per unit of time. However, the recommendations in this section are based on expert testimony rather than evidence from the reviews because little published evidence was identified in relation to these recommendations, meaning that expert testimony provided

the best available evidence.

The committee agreed that when considering the population as a whole, the objective is to increase the amount of moderate to vigorous activity most people do. However, they noted that there is a continuum of benefits from being physically active. For people who are least active, moving from being inactive to having low levels of activity, or replacing sedentary behaviour with physical activity, would bring the greatest health benefits. (Matthews et al. 2015, Department of Health's Start active, stay active: a report on physical activity in the UK and Kyu et al. 2016).

The quality of the evidence

A key limitation of the evidence from the reviews is that there was a dearth of information on changes to the environment to enable those with limited mobility to be more physically active. However, the committee heard expert testimony from a range of sources that supported these recommendations [Expert papers 2, 4, 6, 7]. Expert testimony is usually considered to be more susceptible to bias than the published evidence. But the committee thought that in this case the expert testimony gave valuable information about barriers or facilitators to physical activity among these groups, and they agreed with it. Likewise, the reviews did not provide any insight into identifying and addressing the needs of different groups, but expert testimony identified the importance of engaging with communities [Expert papers 1, 2, 6 and 9]. This is consistent with existing NICE guidance on community engagement.

Benefits and harms of strategies, policies and plans to increase physical activity

The whole local population is considered in these recommendations. But to reduce health inequalities there is a particular focus on those who could gain most benefit from increasing their physical activity. This includes people who are currently inactive or have very low levels of physical activity, particularly those for whom environmental factors are barriers to physical activity.

The committee also recognised that if resources are limited it is best to target areas and groups of people who are likely to benefit most – such as those with limited mobility or low levels of physical activity.

The committee recognised that people may use different modes of transport at different times, potentially being a 'walker', a 'cyclist', a 'motorist' and a 'public transport user' at

various points. They also recognised that the needs or preferences of people who are walking, cycling, using public transport, or driving may not always align. This can result in contested space, where one geographical space is used for different purposes, potentially causing conflict because of the different priorities for each type of user. They agreed that it is important to identify solutions that take account of the views of each of these groups, although solutions should aim to increase physical activity. Details about the road design user hierarchy can be found in the [government's Manual for streets](#) and [Manual for streets 2](#).

Cost effectiveness and resource use

No additional economic analysis was carried out for the review question underpinning this recommendation. However, the committee considered each of the case studies included in the economic analysis to be relevant to this recommendation.

Overall the committee considered the use of strategies, plans and policies to increase levels of physical activity good value for money. This is an integral part of most local authorities' work so would not be expected to need significant extra resources. Costs related to the content of these strategies are not expected to be significant, and may be spread over time as they are rolled out.

However, if the strategies, plans and policies lead to the creation of an environment that results in increased physical activity, then any additional investment would be expected to result in improved health outcomes in the longer term and potential future cost savings and benefits to the health and social care systems.

Other factors the committee took into account

The committee agreed that examples of effective interventions in other parts of the world, such as those proven to increase cycling in parts of northern Europe, should be assessed to determine whether they are likely to be effective locally ([Watts et al. 2011](#)).

The committee were aware that local providers are encouraged to monitor and evaluate the impact of interventions using standard tools if possible.

The committee recognised that there is an overlap between interventions to create green infrastructure and this guideline. This is because this guideline focuses on green, blue and grey spaces which, in turn, can be conducive to physical activity. Green infrastructure

interventions tend to focus on natural and ecological processes, which include urban drainage, climate change mitigation, biodiversity, air quality and other environmental factors. Although this guideline also focuses on open spaces it does so with the specific aim of encouraging physical activity.

Therefore interventions that could be defined as green infrastructure are embedded in this guideline because of their effects on physical activity, but green infrastructure is not discussed further. More information can be found in [Natural England's Green infrastructure guidance](#).

The evidence

The committee looked at [evidence](#) in:

- Expert testimony on active travel in London: [Expert paper 1](#)
- Expert testimony on disability and the built environment: [Expert paper 2](#)
- Expert testimony on environmental support for physical activity in older people, urban deprived populations and black and minority ethnic groups: [Expert paper 4](#)
- Expert testimony on improving the environment to encourage people to walk: [Expert paper 6](#)
- Expert testimony on learning from Paths for All: [Expert paper 7](#)
- Expert testimony on transport planning: [Expert paper 9](#)
- Physical activity and the environment: [Economic modelling report](#)

Active travel

[Recommendations 1.2.1 to 1.2.9](#)

Rationale and impact

Why the committee made the recommendations

Some evidence suggested that there is more potential to increase active travel – and more

benefit to be gained – in some areas than others. For example, interventions to increase active travel in areas where many short car journeys are made may be more effective than in areas where most destinations are much more easily reached by motor vehicle. The committee agreed that it was important to identify and prioritise these areas, along with ways to get more people using active modes of travel. The evidence was limited to expert opinion but the committee agreed that such an assessment was an important step towards a more active population.

Some evidence suggested that if public transport is improved more people may use it, particularly if they live close to the improvements. This may encourage those who are inactive, or who usually drive, to be more active because they will be walking to and from bus stops and stations. The committee agreed with an expert that both spoken and visual announcements on public transport could encourage people who have visual or hearing impairments to use services. They also agreed that public transport should be accessible to everyone, including people with limited mobility.

An expert told the committee that it should be as easy as possible for people to get to parks and other open spaces from where they live, to encourage them to be active. They noted that some open spaces, particularly green or blue spaces, may not be within walking distance and agreed that public transport to these locations should be available. But they also agreed that more evidence is needed to see whether improvements to the public transport system lead to a sustained increase in physical activity levels and made a recommendation for research.

Evidence suggested that if walking and cycling routes connect residential and commercial areas and other destinations, such as schools, then the number of people using them increases – as do their activity levels. The evidence also suggested that trails and footpaths that do not connect to transport links or a central hub were less likely to encourage people to walk or cycle. Regular points where people can get onto these routes are also important.

Experts confirmed that it was important to make it as easy as possible for people to take a short walk from where they live to parks and other local amenities. The committee agreed that ensuring people can walk or cycle to a range of local destinations is important to encourage them to be physically active.

They also agreed that the focus should be on networks of routes rather than looking at each route in isolation. Additionally, improvements should be made when existing routes

are refurbished, as well as being incorporated when planning new routes.

Several experts highlighted the importance of ensuring footways and footpaths are well maintained to avoid falls and to ensure people feel safe when using them. They also highlighted the need for clear signs to help people find their way. Although the evidence was uncertain and focused on the needs of older people or those with limited mobility, the committee agreed that well-maintained footways and footpaths are important for everyone. They also agreed that these issues apply equally to cycle routes and that it was important to work with third sector organisations to ensure the recommendation is implemented.

This recommendation is from the 2008 guideline. Some new evidence for this update reinforced that introducing congestion charging increased the number of people using public transport and cycling. The committee heard that traffic-calming schemes had mixed effects on physical activity, and they agreed that some methods of traffic calming can affect air quality. However, the committee also agreed that carefully implemented traffic-calming measures and restricted vehicle access were important ways to encourage active travel.

Some evidence suggested that improvements to cycling infrastructure do encourage more people to cycle regularly. If carefully implemented, they should also improve safety for cyclists and pedestrians.

But the committee were uncertain about how many people would benefit. They agreed that the needs of people who walk and drive in the local area need to be taken into account, as well as those of people who cycle. The views of people who do not cycle because of the current infrastructure and people with limited mobility also need to be taken into account. That is because there may be conflict when space is shared by people using different types of travel. An expert confirmed that it is important to do this when improving the local area for cycling. The committee were aware that there are various best practice guidelines that may be helpful when improving cycling infrastructure.

Some experts suggested that people with limited mobility find it easier to move around their local area if, for example, footways include features such as tactile paving and even surfaces. Non-reflective, anti-glare paving surfaces can make it easier for people with visual impairments to interpret their surroundings. Seating could make it easier for people who need to rest regularly. The committee agreed that sometimes audible beeps at crossings may not be appropriate, for example if several crossings are close to each other

audible beeps could cause confusion.

The committee agreed with experts that these actions should be recommended to encourage everyone, particularly people with limited mobility, to be physically active. But they also agreed that more evidence was needed on the effectiveness and cost effectiveness of environmental changes to increase physical activity among this group and made a recommendation for research.

Some evidence suggested that improving routes for active travel to school could increase the number of children who walk and cycle to school. Evidence about the best ways to do this was mixed [1.2.9]. But the committee agreed that safety improvements near schools, including measures to reduce vehicle speed and more pedestrian crossings, could perhaps help. Some evidence suggested that parents, teachers and bus drivers approve of these safety measures. And other evidence showed that it also helps if routes are connected and accessible.

Why we need recommendations on this topic

Experts told the committee that using public transport can help people build physical activity into their daily lives. But they also said that in some areas, particularly rural areas, public transport services may not be available or may be unreliable. Experts also said that some groups, especially those with limited mobility or with sensory impairments, may find it difficult to use services, particularly if they do not give spoken and visual announcements.

The environment can make it difficult for some groups to be active. For example, older people and others with limited mobility may find it difficult to cross the road in the time allowed. In addition, obstructions on footways can make it difficult to walk around an area and may cause injuries, particularly for those with visual impairments. For children, a lack of walking or cycling opportunities and fears of busy roads may stop them being physically active as part of their daily routine.

Impact of the recommendations on practice

Putting these recommendations into practice may involve additional costs for local authorities. Some changes – such as providing spoken and visual announcements about destinations and stops on public transport – may be more expensive than others. However, if these changes help to create an environment in which people are more active, it will help

to prevent a range of chronic health conditions. This, in turn, will lead to savings for the NHS and local authorities as well as society at large. Also, costs may be spread over time as they are rolled out.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Recommendations in this section aim to increase physical activity. Therefore, relevant outcomes include total physical activity, total sedentary time, physical activity in everyday life and active travel.

A wide range of outcomes was used in the studies included in the reviews. In addition to physical activity being measured in several different ways (for example, proportion of participants meeting physical activity guidelines, time spent in moderate to vigorous physical activity, and change to 'metabolic equivalents' or METs per unit of time), time spent on specific activities such as walking and cycling were also used as outcomes. Some studies reported changes in 'mode' share, for example whether people changed from using cars to walking or cycling.

Public transport use was also reported as an outcome measure. Because using public transport can increase incidental physical activity when walking or cycling to or between stops and stations, the committee agreed it could be considered a proxy measure for physical activity.

Each of the outcomes above were reported both as observed outcomes and as self-reported outcomes in the studies. Because of social desirability bias, recall bias and interpretation issues, the committee considered that observed outcomes were more reliable than self-reported measures.

The committee discussed which measure was most appropriate for considering the change to total physical activity. They agreed that when considering the population as a whole, the objective is to increase the amount of moderate to vigorous activity most people do. However, they noted that there is a continuum of benefits from being physically active and that for people who are least active, moving from being inactive to having low levels of activity, or replacing sedentary behaviour with physical activity would bring the

greatest health benefits. ([Matthews et al. 2015](#), [Department of Health's Start active, stay active: a report on physical activity in the UK](#) and [Kyu et al. 2016](#)).

The committee agreed that these small changes in physical activity are best captured by the use of METs. The [economic modelling](#) carried out to support this guidance also uses this approach.

Because the reviews used [GRADE](#) to assess the quality of the evidence, the committee identified which outcomes they considered to be critical or important. They considered all measures of physical activity, time spent in physical activity and public transport use to be critical outcomes. They also considered changes in transport mode share to be important.

The quality of the evidence

The certainty in the evidence base supporting this set of recommendations (29 evidence statements summarising evidence from 45 studies) was generally graded 'very low' or 'low', which means NICE has low confidence that the results would not change if more evidence became available.

In general the evidence showed that improvements to public transport may increase its use [ES1.3, ES1.5, ES1.7, ES1.9] particularly for those who live close-by [ES 1.2, ES 1.6, ES1.10]. Five studies suggested that public transport interventions increase participants' total physical activity. However, this increase depended on their existing travelling behaviour – new users of the intervention spent more time being moderately or vigorously active than existing or former users. But there was an exception. A small amount of evidence showed that those living near a new light rail line did not use it any more than anyone else and that it did not have an effect on moderate to vigorous physical activity [ES1.4]. However, this study may have used a control group that was located too close to the intervention and so its effect may have been underestimated.

Expert paper 8 considered public transport services in rural areas and highlighted that buses are considered the most flexible service in meeting the needs of more rural communities. Expert papers 2 and 8 included a focus on the use of spoken announcements on public transport and their importance for people with visual impairments. Although these papers did not provide evidence that directly linked such announcements to physical activity levels, it was clear that a lack of them in some areas is a barrier to people with visual impairments feeling able to use public transport.

Expert paper 3 noted that the incidental physical activity people accrue when using public transport can make a significant contribution to their overall physical activity levels. The committee felt that everyone should have an equal opportunity to increase their physical activity levels in this way and that such barriers should be addressed.

Some evidence suggested that connectivity between areas can help increase physical activity. Two studies examined the effect of introducing greenways between residential and commercial areas. One found an increase in the number of people who walked or cycled and the other an increase in the proportion of people who were being moderately or vigorously active [ES2.12].

Another study considered the effect of 'Liveable Neighbourhoods', which included interconnected street networks, public transport stops and a range of different destinations within a 15-minute walk. It found that an increased number and diversity of destinations within walking distance was associated with increased active travel [ES3.6].

Two studies noted the importance of routes connecting to central transport hubs [ES3.8] and another the importance of connecting to feeder routes [ES2.14]. Expert testimony also supported these findings [Expert papers 5, 6 and 7].

Some evidence suggested that congestion charging may increase use of public transport [ES1.1], although public transport services were also improved as part of the change. Some studies reported mixed evidence showing that traffic-calming measures along school routes may increase active travel to school [ES2.17] and that traffic-calming measures in neighbourhood areas may improve perceptions of street safety among older people [ES3.7]. The committee felt that design of traffic-calming measures, and parallel improvements to pedestrian and cycling infrastructure and public transport provision, should be carefully considered to ensure that active travel is not reduced.

The 2008 guideline included a recommendation on road-user charging schemes. The committee felt it was still relevant. The new evidence identified by this review and through expert testimony [Expert papers 1, 3, 4, 6 and 9] makes an additional contribution to the evidence base for that recommendation.

The evidence suggested that, in general, improvements to footways may increase walking [ES2.9, Expert papers 4, 6 and 7]. Some evidence showed no change in walking after extension of a greenway [ES2.8], but these studies used a threshold of 30 minutes of walking per day so did not capture smaller changes in activity that may still be valuable.

One study considering the general population found that introducing wayfinding signs on a trail had no impact on the number of people who used it [ES2.11]. But several expert papers highlighted the importance of clear, inclusive signs in both urban and rural areas [Expert papers 4, 5, 6 and 7], particularly for people with disabilities. The committee considered the equity aspects of this intervention and agreed that poor signage was a potential barrier to physical activity and so made a recommendation in this area, so that increased equality in outcomes might be achieved.

Experts also highlighted that lack of regular seating on streets could be a barrier to physical activity for older adults [Expert paper 4] and disabled people [Expert paper 6].

Another study found that lack of lighting was a concern for potential pedestrians and cyclists using an unlit footway and cycle path that ran parallel to a guided busway [ES1.10]. Expert paper 4 noted that lighting footways and ensuring they are not obscured by poorly-managed vegetation was important to ensure people feel secure when using them.

Evidence from the reviews suggested that improvements to cycling infrastructure can increase bicycle trips [ES2.10; ES2.13]. This includes the number of people who commute by bicycle [ES2.3] and the number who cycle regularly [ES2.4]. Improvements can also increase the proportion of all journeys that are made by bicycle [ES2.6]. Improvements included off-street cycle routes, motor-vehicle-free bridges and the provision of bicycle racks in public places and on public transport. The committee were aware of tools such as the [Propensity to Cycle tool](#) to assess potential for increasing cycling.

The committee recognised that flexible seating arrangements could be used when adding cycle parking to public transport, to help ensure that enough seating is retained for those who need it.

Four studies found that introducing on-street cycle lanes increased the number of cyclists counted each day. But the absolute numbers remained relatively small, with numbers at the beginning of the study ranging from 9 to 91 and at follow-up from 10 to 257 [ES2.15].

Four studies suggested that Safe Routes to Schools have mixed effects on children walking and cycling to school [ES2.17]. Two studies found active commuting to school increased, but 1 of these studies (which reported on total physical activity) found no overall increase in activity levels. One study found no effect on the proportion of children who cycled to school whereas 2 others found an increase in the proportion walking and cycling [ES2.17]. One qualitative study found that parents, students, school staff and

school bus operators approved of the improvements [ES2.18]. Interventions included improving footways and road crossings, speed reduction measures and drop-off zones.

The committee agreed that recommending drop-off zones may not be appropriate in the UK, because sometimes 'park and stride' or other drop-off methods are considered safer and may ease congestion. Some behavioural interventions were also included, which are beyond the scope of this guideline but it was not possible to separate the effects on outcomes [ES2.17].

Expert paper 6 included improvements to footways and pedestrian crossings used as part of walking routes to school and some behavioural interventions. Improvements led to an increase in walking that was more or less sustained at 1- and 2-year follow-up (22% increase at year 1 and 19% increase at year 2).

The committee decided not to make a recommendation about extending motorways because only 1 study was identified. This looked at both the beneficial and adverse effects on local residents of extending a motorway that bisected the local area [ES1.8]. The committee also decided that there was insufficient certainty in the evidence to make recommendations on temporary road closures to allow events to promote physical activity (including Ciclovía interventions) [ES2.1, ES2.2].

As with recommendations in section 1.1, a key limitation for section 1.2 is the lack of evidence specifically considering interventions that allow those with limited mobility to increase their active travel. So the committee sought expert testimony to address these gaps in the evidence. Expert paper 2 focused in particular on the experience of people with visual impairments. Expert papers 4, 6 and 7 all included a focus on older people or people with limited mobility. These 4 expert papers all raised similar barriers or facilitators to mobility for these groups, including footway surfaces, tactile paving and pedestrian crossings.

Despite generally low or very low quality evidence from the reviews, the committee noted that the evidence from reviews was consistent. Supplementary evidence from expert testimony was internally consistent. The committee considered that the available evidence combined with the fact that these recommendations address equity issues was sufficient to make some strong recommendations, so that increased equality in outcomes might be achieved.

Benefits and harms of active travel

The committee were mindful that some groups may benefit more than others from incidental physical activity accrued through the regular use of public transport. They noted, for example, that people of working age, in employment and living in urban areas may be more likely to benefit than older people or those living in rural areas where transport stops are less available and services may be less frequent.

The committee were aware that increasing active travel may have some unintended consequences or adverse effects. The previously discussed concept of shared or contested space (see benefits and harms in the section on 'strategies, policies and plans to increase physical activity in the local environment') is also relevant here. The committee recognised that interventions benefiting some have the potential to deter others, if not well implemented. They noted the need for carefully designed interventions, for example cycle routes that minimise the risk of creating contested space.

Contested space may create conflict that could affect some groups, such as older people, disproportionately. For roads with possible conflicts, the [WHO recommends a safe motor vehicle speed limit of 30 km/h or 20 mph](#).

A second potential harm is around road traffic collisions. Improving cycle infrastructure may increase the number of cyclists. That, in turn, could result in an increase in the absolute number of cyclists being involved in road traffic collisions. However, the committee did note evidence that dedicated infrastructure for cyclists – in 1 case a tarmacked cycle route with regular junctions – may reduce cyclist collisions in the area around the cycle route [ES2.7].

In addition, the committee were aware that increasing the amount of active travel people do may increase their exposure to outdoor air pollution. They were aware that the physical activity benefits generally outweigh the risk of increased exposure to air pollution. ([Cepeda et al. 2017](#) and [Tainio et al. 2016](#)). They also noted that a shift from motorised transport to walking and cycling could improve levels of air pollution. From a broader public health perspective, tackling outdoor air pollution is an important part of creating healthier environments in which people can be physically active. See [NICE's guideline on air pollution: outdoor air quality and health](#).

The committee also noted that increased active travel may generally increase the numbers of people on the streets. This could, in turn, strengthen a feeling of security.

Cost effectiveness and resource use

Some cost effectiveness evidence about interventions relevant to these recommendations was identified from the reviews. Overall, the evidence showed that interventions could be cost effective if modest numbers of people increased their physical activity.

One study with high risk of bias, found the [Department for Transport's Cycle Demonstration Towns](#) cost effective, with a benefit–cost ratio of between £2.60 and £3.50 for every £1 spent [ES2.5]. Another study, with high risk of bias, found [Living Streets' Fitter for Walking programmes](#) cost effective in most locations, with benefit–cost ratios larger than £1. Benefit–cost ratios were higher if initial costs were lower [ES2.16]. One study, with low risk of bias, found the World Health Organization's Safe Routes to School programmes to be cost effective by both creating savings and gaining quality-adjusted life years (QALYs) [ES2.19].

[Economic modelling](#) was also undertaken. Economic analysis of case studies on [Active living by Design](#), Cycle Demonstration Towns, the [Paths for All Smarter Choices, Smarter Places](#) and greenways found all 4 to be highly cost effective. The incremental cost effectiveness ratios (ICERs) were £1,397 for Active living by Design, £2,496 for Cycling Demonstration Towns, £4,423 for Paths for All Smarter Choices, Smarter Places and £7,652 for greenways. The analysis of Fitter for Walking found it could be cost effective up to a cost of £100 per person.

There may be additional resource implications for encouraging use of public transport by ensuring available services are reliable, providing information about public transport services, and ensuring footways, footpaths and off-road cycle routes are well maintained.

There are also resource implications for measures such as providing spoken and visual announcements about destinations and stops on bus services and at stops and stations. Guide Dogs for the Blind Association's Installing audio-visual equipment on buses – cost and practicality issues highlighted that installing audio-visual technology could cost £2,100 for a single-decker vehicle, or £2,550 for a double-decker. However, the committee noted that such technology need not be installed on all vehicles at once, but could be introduced as vehicles are replaced.

In addition, lower technology approaches such as spoken announcements by drivers were noted as being easily implementable with relatively small training costs. However, if such approaches create an environment that results in increased physical activity, then that will lead to improved health outcomes in the longer term and potential future cost savings to

the healthcare and social care systems.

Other factors the committee took into account

The committee did not make recommendations on car ownership or parking restrictions. They heard that, in London, car owners are 2 to 3 times less likely to do half an hour of active travel in a day than those who don't own cars [Expert paper 1]. They recognised the benefits of incidental physical activity accrued through using public transport [Expert paper 3; [Beavis and Moodie 2014](#)] and that some studies highlighted other potential benefits, for example drivers perceiving use of public transport as being less stressful than driving. [ES1.10].

Although 2 studies highlighted a lack of parking at work as being associated with increased use of public transport or increased active travel [ES 1.9], the committee were conscious that these studies also included other aspects, such as providing a subsidised travel pass and access to a new transit link or providing workplace travel plans, and so did not make recommendations on this intervention.

The committee were conscious that not all areas have the same level of public transport access as London or other urban areas. They noted that the studies that included parking were done in workplaces and that the findings may not be transferable to other settings. They were also aware that for certain groups, such as some older people, having access to a car and being able to park outside their home was a key factor in determining whether people could get out of the house. This in turn resulted in opportunities to be physically active at destinations reached by car [Expert paper 4].

The committee noted that although using public transport may help people to build physical activity into their daily lives, it incurs a cost for most people. They noted that certain groups, such as older people and children and young people, have access to free or discounted travel on some public transport services (although the age of eligibility varies). However, fiscal measures such as ticket pricing were beyond the scope of this guidance, so the committee have not made recommendations in this area.

The committee noted that some guidance on increasing active travel already exists. But this is often restricted to walking and cycling as the most common methods of active travel (for example, the [Chartered Institution of Highways and Transportation's guidance on Planning for walking and Planning for cycling](#)).

The evidence

The committee looked at [evidence](#) in:

- [Evidence review 1](#) on public transport interventions: ES1.1, ES1.2, ES1.3, ES1.4, ES1.5, ES1.6, ES1.7, ES1.8, ES1.9, ES1.10
- [Evidence review 2](#) on Ciclovia, trails and safe routes to school interventions: ES2.3; ES2.4; ES2.6, ES2.7; ES 2.8; ES2.9; ES2.10; ES2.11; ES2.12, ES2.13, ES2.14, ES2.15, ES2.16; ES2.17, ES 2.18; ES2.19
- [Evidence review 3](#) on parks, neighbourhood and multicomponent interventions: ES3.6, ES3.7, ES3.8
- Expert testimony on active travel in London: [Expert paper 1](#)
- Expert testimony on disability and the built environment: [Expert paper 2](#)
- Expert testimony on changes in scientific knowledge and transport practice since 2008: [Expert paper 3](#)
- Expert testimony on environmental support for physical activity in older people, urban deprived populations and black and minority ethnic groups: [Expert paper 4](#)
- Expert testimony on encouraging physical activity in the natural environment: [Expert paper 5](#)
- Expert testimony on improving the environment to encourage people to walk: [Expert paper 6](#)
- Expert testimony on learning from Paths for All: [Expert paper 7](#)
- Expert testimony on the Strathclyde Partnership for Transport: [Expert paper 8](#)
- Expert testimony on transport planning: [Expert paper 9](#)
- Physical activity and the environment: [Economic modelling report](#)

Public open spaces

[Recommendations 1.3.1 to 1.3.3](#)

Rationale and impact

Why the committee made the recommendations

The committee heard from an expert that the quality of green space is an important factor in encouraging people to use it, particularly in deprived urban areas. An expert told the committee that clear signs are important so that people know where they can walk, including where public access is allowed.

Some evidence suggested that people, including those with limited mobility, might use outdoor open spaces if the facilities are improved. For example, improving park facilities like toilets and lighting, and better landscape design may encourage people to use parks, and increase the amount of physical activity they do there. Experts told the committee that facilities such as toilets, seating and footpath surfaces are particularly important for encouraging older people and those with limited mobility to use these spaces. Parking for blue badge holders is also important for these groups along with access on foot, by bike and using public transport.

Despite little evidence on specific actions, the committee made suggestions based on their expertise. They also recommended research into how effective such changes are at creating and sustaining physical activity over the long term among the general population.

Recommendation 1.3.2 is from the 2008 guideline. The committee reviewed this in the light of new evidence for this update, and decided it was still relevant. Experts also highlighted how community groups and volunteers can help design and manage public open spaces, footpaths and trails, as well as support the authorities responsible for maintaining them.

Why we need recommendations on this topic

Good quality local open green or blue space that is attractive, feels safe and welcoming and is easy to access may encourage a range of different groups and ages to be physically active.

For most older people walking is by far the most important activity. Getting out of the house at all, even by car or public transport, helps people to do some activity, even if it is a small amount. It may also bring about benefits through improved social connectedness. Pleasant and well-maintained destinations that provide facilities such as accessible toilets and appropriate seating can encourage them to use public open spaces.

Some low income communities in the UK, including many black and minority ethnic communities, have less access to open green spaces than other groups, and the spaces available tend to be of poorer quality. People who don't have the use of a car may find green and blue spaces more difficult to access, particularly if there are no regular public transport services.

Impact of the recommendations on practice

Using routine maintenance and refurbishment of facilities such as toilets in parks, to increase their accessibility, would be an efficient way of ensuring that existing facilities are of a high standard.

Providing and maintaining facilities may cost money, but if they create an environment in which people are more active and their health improves as a result, this will lead to savings for the NHS and local authorities as well as society at large.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

The studies supporting this recommendation used various different outcomes. These included total physical activity, which was measured in different ways (for example, proportion of participants meeting physical activity guidelines, time spent in moderate to vigorous physical activity, and change in 'metabolic equivalents' or METs per unit of time); sedentary behaviour; and use of, or visits to, parks and open spaces. Some studies reported the views on and perceptions of factors such as personal safety and security, antisocial behaviour, ease of getting around, maintenance and appearance of open spaces.

Because the reviews used GRADE to assess the quality of the evidence, the committee considered which outcomes were critical or important. They considered all of the outcomes listed above to be critical.

The committee noted that perceptions of personal safety and security and concerns about antisocial behaviour were often commented on in the studies [ES3.2; ES3.8]. These could be a strong deterrent to people who might use or visit an area. The committee recognised

the importance of addressing these concerns but noted from their experience that in practice, if the area is attractive and the benefits outweigh the perceived risks, enthusiasm for an intervention may override such concerns.

Expert paper 4 reported on studies of the impact of the quality of open spaces on physical activity levels. It reported on a survey that compared physical activity levels of different black and minority ethnic households with access to similar amounts, but varying quality, of open green space. Respondents were asked to rate: how satisfied they were with the quality of the green space nearest to their home; how attractive and pleasant it was to use; and how safe and secure they felt using the space. It found that satisfaction with green space was significantly associated with physical activity levels.

The committee recognised that there is no national definition of 'quality' or 'high standard' in relation to green space. The committee noted that other studies on the quality of green space have used measures such as the number of parks per urban authority awarded Green Flags and Best Value Performance Indicators ([Commission for Architecture and the Built Environment's Urban green nation: building the evidence base](#)).

The quality of the evidence

The certainty in the evidence base supporting this set of recommendations (6 evidence statements summarising evidence from 15 studies) was generally graded 'very low' or 'low', which means NICE has low confidence that the results would not change if more evidence became available.

Three evidence statements summarised evidence from 12 studies on effectiveness of open space interventions [ES3.1, ES3.3, ES3.12]. Nine of these studies considered the effects of improvements to existing parks on total physical activity and physical activity in everyday life. They were graded 'very low' [ES3.1] but because there were a number of studies that generally showed similar effects, NICE can have a moderate level of confidence in the findings. Two studies graded low or very low, presented evidence about the creation of new parks [ES 3.3]. One study, graded very low, presented evidence from woodland projects [ES 3.12].

For existing parks, 9 studies showed that improvements had mixed effects on total physical activity. However, most showed either an increase or no effect. Of 9 studies, 6 reported an increase; 2 no effect; 1 a decrease in number or proportion of people engaging in moderate or vigorous physical activity. The 3 studies reporting change in MET hours

showed an increase. The 2 studies reporting on meeting the recommended amounts of physical activity showed no effect for children or adults [ES3.1]. Likewise, although the evidence on the effect of interventions on using or visiting parks was mixed, most found either an increase or no effect. Of the 9 studies, 8 reported on park use. Six of these reported an increase, the other 2 reported either no difference or a decrease [ES 3.1].

After creation of new parks, 1 study showed that reports by local survey participants of visiting any park once a week increased. A second study reported that after a new park was constructed on an undeveloped green space, visit frequency and energy expended during visits increased [ES 3.3].

After interventions to improve 3 woodland areas by improving facilities, 1 study found that visitor numbers increased, but the proportion of visitors who had blue badges did not change. The proportion of visitors from black and minority ethnic groups also increased [ES 3.12].

One study considering the general population suggested that removing seating and picnic tables reduced the amount of time people spent sitting down [ES 3.5]. But several expert papers suggested that providing appropriate seating is an important way to encourage some groups to use outdoor spaces [Expert papers 2, 4, 6 and 7], particularly those with limited mobility.

The committee considered the equity aspects of removing seating and agreed that it could be a barrier to some groups using open spaces. They also drew on evidence that it is particularly important to help people who are least active to be more physically active, because their health and wellbeing will benefit the most. They therefore made a recommendation that adequate seating be provided to make open spaces accessible, so that increased equality in outcomes might be achieved.

Two evidence statements summarised evidence from 3 studies providing qualitative information on people's views of parks or Home Zone interventions [ES 3.2, ES 3.8]. Of these studies, 1 had high risk of bias, and the remaining 2 had low risk of bias. The study reporting people's views of parks that had undergone improvements had high risk of bias, and reported that antisocial behaviour was still a concern after the interventions [ES3.2]. The 2 studies reporting people's views of a Home Zone intervention reported that residents did not consider increased opportunity for physical activity to be important and were more concerned about security of the area. Perceptions of personal physical activity levels did not change, but participants mentioned increased outdoor play by children.

Three evidence statements summarised evidence from 3 studies of multicomponent interventions [ES 3.9, ES 3.10, E3.11]. Two of these included renovating existing parks, or creating new ones [ES 3.9, ES3.10]. However, all 3 studies featured multiple changes to the local environment, for example improvements to public transport [ES3.11] and to paths and pedestrian crossings [ES 3.9] and 2 included a behavioural intervention [ES 3.9, ES 3.11]. Because both the nature and findings of these studies were mixed, the committee were unable to draw any clear conclusions from them and did not use them as a basis for their recommendations.

Most evidence from the reviews focused on interventions in parks as opposed to open green spaces more broadly. One UK study focused on woodlands and none considered blue space. The committee therefore sought expert testimony to address these gaps.

References cited in expert testimony [Expert paper 4] reported on associations between the quality of local green space and physical activity levels in deprived urban communities, which included a high proportion of people from black and minority ethnic groups. It also reported on a study of interventions in woodlands and their use for outdoor activity by deprived urban communities.

Expert paper 4 also reported on factors that encourage older people to walk and to use open spaces. The quality of footways to open spaces, and facilities such as seating and toilets were important. Expert papers 2, 6 and 7 highlighted similar issues. Expert papers 5 and 7 highlighted the importance of wayfinding signs in rural areas and Expert papers 4, 6 and 7 noted the importance of these being clear and inclusive.

Expert paper 5 provided a small amount of information about access to blue space, specifically coastal areas. Survey data showed that a third of the population would be more likely to visit the coast if access were improved. The paper noted that some areas of the coast are inaccessible to walkers and work is in progress to improve this with the construction of a coastal footpath around England.

Benefits and harms of creating or improving public open spaces

The committee considered that the benefits of improving public open space considerably outweigh any potential harms. Benefits may include mental as well as physical health, and also potential benefits to the ecosystem. For example, urban green spaces are thought to affect not only physical activity but also mental wellbeing, and to provide opportunities for social interactions. The potential for these interventions to disproportionately benefit

people in lower socioeconomic groups is important in terms of reducing health inequalities (World Health Organization's Urban green space interventions and health: A review of impacts and effectiveness).

Cost effectiveness and resource use

The reviews identified some cost effectiveness evidence about interventions relevant to these recommendations. One US study with high risk of bias found that, when cost effectiveness was defined as less than \$0.50 to \$1.00 per MET-hour gained, refurbishing parks was cost effective in a large and busy park but not in a small one. A second study with high risk of bias, using the same definition of cost effectiveness, found that introduction of new, small parks was cost effective if parks were very busy but not if they were quiet.

Economic modelling was also undertaken. Economic analysis of case studies on Active living by Design and greenways found both to be highly cost effective, with ICERs of £1,397 and £7,652 respectively. The analysis of a new greenway extension and Fitter for Walking found both could be cost effective up to a cost of £950 per person for the former, £100 per person for the latter.

A US-based park renovation intervention estimated to cost over £200 per person was not cost effective, with an ICER of £207,316 per QALY gained. The analysis reported that the intervention could be cost effective if the cost of the renovation could be reduced from £200 to £25 per person. The committee were aware that some interventions included both a physical and a social element, and some interventions may have combined these two elements without explicitly reporting it.

Increasing use of local public open spaces – especially green and blue spaces – by enhancing accessibility, quality and maintenance may have additional resource implications associated with providing, for example, clear signage, facilities, shelter and shade, or accessible toilets that are clean, well maintained and unlocked during daylight hours. However, if such approaches lead to the creation of an environment that results in increased physical activity, then that will lead to improved health outcomes in the longer term and potential future cost savings to the healthcare system.

Other factors the committee took into account

The committee discussed the importance of attracting people of all ages and cultural

backgrounds to open green spaces by providing a range of facilities to meet the needs of older people, and areas where children and their families can safely play.

Although there was no evidence on effectiveness from the reviews, they noted from experience that providing points of interest such as nature trails and sculptures, and facilities such as picnic areas, may attract people to use open green spaces.

The committee also noted the importance of identifying where access to green space could be increased. One way of doing this is using the Accessible Natural Greenspace Standard, although the committee recognised its limitations ([Natural England's Nature nearby: accessible natural greenspace guidance](#)).

The evidence

The committee looked at [evidence](#) in:

- [Evidence review 3](#) on parks, neighbourhood and multicomponent interventions: ES3.1, ES 3.2, ES3.3, ES 3.4, ES3.5, ES 3.8, ES 3.9, ES 3.10, ES 3.11, ES3.12
- Expert testimony on disability and the built environment: [Expert paper 2](#)
- Expert testimony on environmental support for physical activity in older people, urban deprived populations and black and minority ethnic groups: [Expert paper 4](#)
- Expert testimony on encouraging physical activity in the natural environment: [Expert paper 5](#)
- Expert testimony on improving the environment for people to walk in: [Expert paper 6](#)
- Expert testimony on learning from Paths for All: [Expert paper 7](#)
- Physical activity and the environment: [Economic modelling report](#)

Buildings

The [recommendations in the section on buildings](#) are taken from the 2008 guideline and the evidence has not been reviewed for this update. For details of the evidence they were based on please see the [evidence for PH8](#).

Schools

The [recommendations in the section on schools](#) are taken from the 2008 guideline and the evidence has not been reviewed for this update. For details of the evidence they were based on please see the [evidence for PH8](#).

Issues beyond the scope of this guideline

The committee were aware that, in practice, if behaviour change is to be achieved some environmental interventions to encourage people to be more physically active may also need to be accompanied by social interventions to encourage the use of green, blue and grey spaces.

Some studies included in the reviews reported that they included promotional activities and the committee were mindful that others may have done so but not specifically mentioned them. They were conscious that there is some evidence that environmental interventions alone may support existing physical activity behaviours, but not be sufficient to change behaviours ([Sugiyama et al. 2013](#)). Additionally, the same intervention may affect groups differently, changing behaviours in some but not others ([Panter and Ogilvie 2017](#)). But they noted for some groups, such as older people, maintaining existing activity levels is important.

The committee noted that an area for future research may be the relative effectiveness of interventions to change the environment alone, and interventions to change the environment that are supported by interventions to change people's behaviour. In the meantime they stressed the importance of these recommendations being implemented together with other NICE guidelines, for example those on [physical activity: walking and cycling](#) and [behaviour change: individual approaches](#).

Recommendations for research

The guideline committee has made the following recommendations for research.

1 Public transport provision and ticketing

How effective and cost effective are changes to public transport provision and ticketing in creating and sustaining an increase in physical activity at a population level?

Why this is important

Increased use of public transport increases physical activity at a population level, and use can be increased by interventions to improve provision and facilities. But there is little information on how effective changes to public transport provision or ticketing policies (such as age of eligibility for passes and fare integration) are at sustaining an increase, and whether this is cost effective.

Longitudinal research of public transport and ticketing interventions is needed, using objective measures of physical activity with a follow-up period of at least a year and preferably with a matched control group.

Research is also needed on the effects on physical activity of:

- location, such as rural or urban, and how easy it is for people to walk around the local area
- individual characteristics, such as mobility, health, age, ethnicity
- service characteristics, such as density and coverage, frequency, reliability, journey time
- accessibility of public transport, in terms of physical access, information, and affordability
- links with other forms of transport (cycling, walking, other modes of public transport)
- overall quality of service and infrastructure.

2 Changes to public open spaces

How effective and cost effective are environmental changes to public open spaces (including blue, green and grey spaces) in creating and sustaining an increase in physical activity at a population level?

Why this is important

There is evidence that open space that is accessible, well maintained, and engaging will be used more often by more people, and so could increase physical activity at a population level. But we found little information on how effective changes to public open spaces are at sustaining an increase, and whether this is cost effective.

Longitudinal research of interventions to increase the use of public open spaces, with a follow-up period of at least a year and preferably with a matched control group, is needed to provide a better understanding of how investment in public open space can best enable increases in physical activity at a population level. Objective measures of physical activity are valuable even if increasing activity is not a focus of the intervention.

Research is also needed on the effects on physical activity of:

- accessibility by active travel
- availability and quality of public transport to open space
- features and activities available
- involvement of local community in designing changes
- ongoing 'ownership' by local community
- management and maintenance.

3 Use of public open spaces by particular groups

How effective and cost effective are environmental changes to increase physical activity through use of public open spaces (including blue, green and grey spaces) by the following groups:

- black and minority ethnic groups
- groups with low socioeconomic status
- groups experiencing other forms of disadvantage, for example carers, people with severe mental health conditions?

Are effects maintained over time?

Why this is important

Some groups, such as those listed above, use open spaces less than others even when these are publicly available. However, we found very little good quality evidence on environmental interventions that influence physical activity in these groups. We also found no cost effectiveness data for interventions among these population groups.

Longitudinal research is needed of environmental interventions specifically targeting groups who use open spaces less than others, with a follow-up period of at least a year and preferably with a matched control group. This should provide a better understanding of how changes can best promote the use of public open spaces and so increase physical activity in these groups. Objective measures of physical activity are valuable even if increasing activity is not a focus of the intervention.

Research is also needed on the effects of cultural acceptability of environmental interventions to increase physical activity.

4 People with limited mobility

How effective and cost effective are environmental changes to increase physical activity among people with limited mobility because of either enduring or life-stage specific factors (for example, small children, parents with prams or buggies, disabled people including those with sensory impairments and learning disabilities, older people, people with dementia and their carers)? Are effects maintained over time?

Why this is important

People who do little physical activity benefit most from becoming more active, and this may include people with limited mobility. But we found very little evidence on interventions

specifically targeting them.

Longitudinal research is needed on environmental interventions specifically targeting those with limited mobility, with a follow-up period of at least a year, and preferably with a matched control group. Objective measures of physical activity are valuable even if increasing activity is not a focus of the intervention.

Research is also needed to determine other factors affecting the observed results. This includes variation in the effectiveness of interventions among people with different needs, for example those with sensory impairments and learning disabilities. Interventions might include:

- audio-visual announcements on public transport services and at stops or stations
- changes to the design of pedestrian crossings, for example increasing the length of time given for crossing
- solutions to allow comfortable use of contested space by various groups, including those with limited mobility.

5 Reducing car ownership

Does reducing car use or ownership change physical activity levels? Are effects maintained over time?

Why this is important

People who use more public transport can build physical activity into their daily lives through walking or cycling between stops and stations. There was some evidence from expert testimony that in London people who own cars are less likely to do half an hour of active travel in a day than those who don't own them. However, this evidence is limited and did not consider factors such as the effects on different groups, and in different areas. For example not all areas have ready access to public transport; and for some groups, such as some older people, having access to a car may provide an opportunity for incidental physical activity at destinations reached by car.

Longitudinal research on interventions to reduce car ownership or use, with a follow-up period of at least a year and a matched control group, is needed to understand how it

interacts with physical activity and, in the longer term, health status. An objective measure of physical activity is valuable even if that is not a focus of the intervention.

Research is needed on the effects of:

- the location – for example, rural or urban, and how easy it is for people to walk around their local area; and availability of public transport
- individual characteristics, such as baseline mobility, health, age, ethnicity.

6 Interaction between behavioural and environmental interventions

What is the effectiveness and cost effectiveness of interventions to change the environment alone, compared with interventions to change the environment that are supported by interventions to change people's behaviour?

Why this is important

Behavioural and environmental interventions are sometimes conducted in isolation. But there is some evidence that environmental interventions alone may support existing physical activity behaviours but may not be enough to change behaviour. Conversely, behavioural interventions implemented without any supporting environmental interventions may not be enough to change behaviours.

Longitudinal research is needed on the relative effectiveness and cost effectiveness of environmental interventions – that include system changes such as congestion charging and street closures – in isolation compared with those supported by behavioural interventions. Research should have a follow-up period of at least a year because there is currently little evidence on whether changes are sustained in the longer term.

Glossary

Active travel

Getting from place to place by a physically active means, such as walking or cycling, non-motorised scooters or rollerblades. This can be commuting, for example to work or school; a journey to other destinations, for example between home and shops and local amenities; or walking and cycling for leisure.

Blue spaces

These include the sea, rivers, lakes and canals.

Built environment

This includes roads (carriageways), pavements (footways), the external areas of buildings and open 'grey' space, such as urban squares and pedestrianised areas.

Connectivity

The extent to which routes connect with other routes and destinations to allow an unbroken journey.

Cycling

Using cycles for transport or leisure, including bikes, tricycles, tandems or hand cycles.

Footpaths

Paths that are separate from a road, over which the public have a right of way on foot only (see section 329(1) of the Highways Act 1980).

Footways

Paths that runs alongside a road, over which the public have a right of way on foot only (see section 329(1) of the Highways Act 1980). Commonly referred to as pavements.

Green spaces

These include urban parks, open green areas, woods and forests, coastland and countryside, and paths and routes connecting them.

Greenways

Some studies examined greenway interventions. These studies were conducted in the USA and, in this context, greenways referred to strips of land that form open-space corridors, usually connecting urban areas. They tended to be reserved for recreational use or environmental conservation.

Grey spaces

Areas of developed land, including urban squares and pedestrian areas.

Home Zones

Home Zones aim to improve the quality of life in residential roads by making them places for people, instead of just being thoroughfares for vehicles. The key elements to a Home Zone are: community involvement to encourage a change in user behaviour; and for the road to be designed in such a way as to allow it to be used for a range of activities and to encourage very slow vehicle speeds (usually involving sensitively designed traffic calming. ([The quiet lanes and home zones \(England\) regulations 2006](#)).

Inactivity

Low levels of physical activity, often quantified as less than 30 minutes of moderate-intensity activity per week.

Land use mix

The variety of uses for land in an area, and the degree to which these are balanced. This can include residential, commercial, employment, recreational, and open space.

Metabolic equivalents or METs per unit of time

Metabolic equivalents or METs per unit of time. METs are a measure used to estimate the energy expenditure of physical activity and can be used to categorise activities into different intensities – the higher the MET, the higher the intensity. The committee discussed which measure was most appropriate for considering the change to total physical activity.

Natural environment

All areas of land that would occur naturally and are not artificial. This includes areas of undeveloped land and water.

Pavement parking

Parking part, or the whole, of a motorised vehicle on a pavement.

Physical activity

Physical activity is: Any force exerted by skeletal muscle that results in energy expenditure above resting level ([Caspersen et al. 1985](#)). It includes the full range of human movement and can encompass everything from competitive sport and active hobbies to walking, cycling and the general activities involved in daily living (such as housework and gardening).

Physical activity measurements

Physical activity is measured in terms of:

- the time it takes (duration)

- how often it occurs (frequency)
- its intensity (the rate of energy expenditure – or rate at which calories are burnt).

The intensity of an activity is usually measured either in kcals per kg per minute or in METs (metabolic equivalents – multiples of resting metabolic rate). Depending on the intensity, the activity will be described as moderate intensity or vigorous intensity. Moderate-intensity activities increase the heart and breathing rates but, at the same time, allow someone to have a normal conversation. An example is brisk walking.

Public transport

Shared modes of transport that can be used by members of the public and are not owned by any individual member. They generally have fixed routes and schedules. This may include buses, coaches, trains, rapid transit systems, trams, and ferries.

Sedentary behaviour

'Activities that do not increase energy expenditure much above resting levels. There is a difference between sedentary and light physical activities. Activities considered sedentary include sitting, lying down and sleeping because they do not require any muscle recruitment. Associated activities, such as watching TV and reading, are also in the sedentary category. ([Department of Health's Start Active, Stay Active](#)).

Street furniture

Permanent or temporary items located on footways and pedestrianised areas. These may include chairs, hanging baskets and planters.

Translational research

Applies the findings of scientific research to practice to improve people's health and wellbeing.

Vending boards

Portable advertising boards placed on footways and in pedestrianised areas.

For other public health and social care terms see the [Think Local, Act Personal Care and Support Jargon Buster](#).

Finding more information and committee details

To find NICE guidance on related topics, including guidance in development, see the [NICE topic page on physical activity](#).

For full details of the evidence and the guideline committee's discussions, see the [evidence reviews](#). You can also find information about [how the guideline was developed](#), including [details of the committee](#).

NICE has produced [tools and resources to help you put this guideline into practice](#). For general help and advice on putting our guidelines into practice, see [resources to help you put NICE guidance into practice](#).

Update information

March 2018: This guideline is an update of NICE guideline PH8 (published January 2008) and replaces it.

New recommendations have been added on strategies, policies and plans to increase physical activity in the local environment (1.1.1 to 1.1.3); active travel (1.2.1 to 1.2.4 and 1.2.6 to 1.2.9); public open spaces (1.3.1 to 1.3.3). NICE has deleted some recommendations from the 2008 guideline because the evidence has been reviewed and the recommendations have been updated.

Recommendations are marked as **[2018]** if the recommendation is new or the evidence has been reviewed.

Recommendations are marked as **[2008]** if the evidence has not been reviewed since the original guideline.

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