Physical activity and the environment update

NICE guideline

Draft for consultation, August 2017

This guideline covers environmental changes to support people to be physically active. The recommendations in this guideline should be read alongside NICE's guideline on physical activity: walking and cycling.

Who is it for?

- Local government authorities, including local authority departments responsible for: public health, social care, planning and development, transport, sport, recreation and leisure, and public open spaces.
- Others responsible for open spaces used by the public. For example, public, private, community and voluntary sector organisations who manage open spaces in workplaces, NHS grounds, community-owned gardens and playing fields.
- Others responsible for developing or maintaining the built environment, such as housing planners, local enterprise partnerships, developers and builders, including those from the public, private and community organisations.
- Those who plan, provide and promote public transport.
- Public, private, voluntary and community organisations working to ensure people with limited mobility can access built and natural environments and use those environments to be physically active.

It may also be relevant for:

- Members of the public.

This guideline will update and replace NICE guideline PH8 (published January 2008).

You are invited to comment on the new and updated recommendations in this guideline. These are marked as **[2018]**.

You are also invited to comment on recommendations that NICE proposes to delete from the 2008 guideline.

We have not updated recommendations shaded in grey, and cannot accept comments on them. In some cases, we have made minor wording changes for clarification.

See Update information for a full explanation of what is being updated.

This guideline contains the draft recommendations, information about implementing the guideline, context, the guideline committee's discussions and recommendations for research. Information about how the guideline was developed is on the guideline's page on the NICE website. This includes the evidence reviews, the scope, and details of the committee and any declarations of interest.

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Recommendations

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 a joint strategic needs assessment and 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 throughout the development of local strategies, policies and plans to:

- Take account of the views and needs of people who walk, cycle, drive or use public transport in the local area, particularly on the use of shared or contested space (for example, space shared by pedestrians and cyclists, or cyclists and motorists). Bear in mind that people may sometimes walk, sometimes cycle and sometimes drive, and so may have varying views. Capture a range of views (for example, views from people who walk now and people who might walk in the future).
- 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.
- 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 use policies to ensure it is as easy as possible for people with limited mobility to move along and across streets and in public open spaces. **[2018]**

1.1.4 To enable people with limited mobility to move along and across streets, implement policies on:

- A consistent approach to permanent or temporary obstructions – this may include vending boards, bins, parked cars, and street furniture such as chairs and hanging baskets.
- Pedestrian crossings – ensuring that there are enough and that these are accessible crossings. Also ensuring that crossings with signals give people enough time to cross the road.
- The correct use and maintenance of tactile paving (see the Department for Transport's guidance on the use of tactile paving surfaces). **[2018]**

1.1.5 Ensure planning permissions for new developments always prioritise the need for people (including people with limited mobility) to be physically active as a routine part of their daily life. **[2018]**

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

1.1.7 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. Existing impact assessment tools could be used. **[2008]**

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 services are available and reliable, particularly in rural areas where public transport may be more limited.
- Ensuring information about public transport services is accessible to people with visual and hearing impairments, for example, by providing spoken and visual announcements about destinations and stops on board services, and at stops and stations.
- Ensuring public transport is 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 When planning new footways, footpaths and cycle routes, make sure they link to existing routes and transport links 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, shops and leisure sites. These new routes should be built and maintained to a high standard. **[2018]**

1.2.4 Ensure that 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).
- 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 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). **[2018]**

1.2.5 Ensure footways, footpaths and cycle routes are well maintained, for example ensure:

- they are even and do not present hazards, for example from tree roots, pot-holes or broken paving slabs
- 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. **[2018]**

1.2.6 Improve cycling infrastructure using information obtained from consulting with 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 storage facilities in public places and on public transport. **[2018]**

For more details see NICE's guideline on physical activity: walking and cycling.

1.2.7 Make it as easy as possible for people with limited mobility to move around their local area. For example:

- Ensure footways:
  - have even, non-reflective anti-glare surfaces with a clearly defined edge

  - are free from unauthorised and unnecessary obstructions (whether permanent or temporary) including being free from pavement parking where it is not permitted (see recommendation 1.1.3)
  - are set back from traffic if possible (for example, by a grass verge).
- Ensure all pedestrian crossings have flush kerbs and tactile paving (see the Department for Transport's guidance on the use of tactile paving surfaces).
- Ensure all crossings with signals have tactile rotating cones and an audible beep, and give people enough time to cross safely.
- Ensure tactile paving is correctly installed and maintained where it is needed, for example at the top and bottom of stairs and on the edge of railway platforms (see the Department for Transport's guidance on tactile paving surfaces). **[2018]**

1.2.8 Consider making improvements to routes that are, or could be, used for getting to school, college and early years settings by active travel. Focus on improving safety, accessibility, connectivity and sustainability. This could include:

- improving footways and pedestrian crossings (see recommendations 1.2.5 and 1.2.7)
- introducing speed reduction zones. (For more detail on speed reduction zones see NICE's guideline on air pollution: outdoor air quality and health.) **[2018]**

1.3 Public open spaces

1.3.1 Consider ways to enhance the accessibility and quality 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 low income communities and some black and minority ethnic communities. This may include 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

- measures to prevent or reduce antisocial behaviour, for example lighting
- 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
- access by public transport, on foot and by bike
- car parking for blue badge holders and people with limited mobility. **[2018]**

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

1.3.3 Encourage community groups and volunteers to support the maintenance and use of public open spaces, including trails and footpaths, for example by reporting any problems affecting use and accessibility. **[2018]**

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. (Campuses comprise 2 or more related buildings set together in the grounds of a defined site.) **[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]**

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]**

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.

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 include:

- impairments resulting from older age or frailty
- impairments due to a disability, including sensory impairments or learning disabilities
- use of a wheelchair or other mobility aids
- use of buggies or prams for transporting children.

Putting this guideline into practice

[This section will be finalised after consultation]

NICE has produced tools and resources [link to tools and resources tab] 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.

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 (Start active, stay active Department of Health). The benefits of physical activity vary across ages and include improvements to physical and mental development and functioning. (Start active, stay active: infographics on physical activity Department of Health).

Physical inactivity costs the NHS in the UK an estimated £1.1 billion per year (Making the case for public health interventions The King's Fund). Including costs to wider society, this rises to around £7.4 billion a year (Everybody active, every day: an evidence based approach to physical activity Public Health England).

Current practice

In 2012, 33% of men and 45% of women did not meet UK guidelines on physical activity, and the number of people meeting the recommended levels decreased with age[1] (Health Survey for England - 2012 Health and Social Care Information Centre). Only 23% of boys and 20% of girls aged 5 to 15, and 10% of boys and 9% of girls aged 2 to 4 met the Department of Health's UK guidelines on physical activity for their age group (Health Survey for England 2015: children's physical activity Health and Social Care Information Centre[2]).

The environment can influence people's ability to be active (Changing the environment to promote health-enhancing physical activity 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 (Incidental physical activity in Melbourne, Australia: health and economic impacts of mode of transport and suburban location Beavis and Moodie 2014).

[1] In the survey anyone over 16 was defined as an adult.

[2] 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 Department of Health's UK guidelines on physical activity for their age group.

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. Measures include increasing the proportion of the population meeting the physical activity guidelines and decreasing the proportion doing less than 30 minutes of physical activity a week.

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 2013 to 2016 and the NHS Outcomes Framework 2015 to 2016.

More information

To find out what NICE has said on topics related to this guideline, see our web page on physical activity pathway.

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 changes to the environment and public transport provision appear to increase physical activity. However, the individual studies have limitations. 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.

Many studies were natural experiments conducted opportunistically in response to pre-planned infrastructure changes. Many did not use direct measures of physical activity. Many of the studies in the 3 reviews did not 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 the effectiveness of the control group. 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, although some studies do report findings for those who are least active, there was a lack of reporting on the impact of interventions on those with limited mobility.

The quality of the evidence was also assessed using the Grading of Recommendations Assessment, Development and Evaluation process (GRADE). All

the studies were non-randomised and, therefore, ratings started the assessment process at 'low' for evidence derived from observational studies. 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 and natural experiments may be the most valid approach.

They also noted that variations in 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.

The committee also noted that many of the studies were not done 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.

Cost effectiveness evidence

There was little published evidence on cost effectiveness, so we carried out a new economic analysis. It 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. 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 £10 per person would be beneficial to fund 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. The analysis focused on a limited number of conditions and did not consider non-health benefits, suggesting that the overall benefits are likely to be greater than the figure 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 justify the use of a decay rate on environmental interventions. Because they involve structural changes to the environment, they are likely remain in place for relatively long periods of time. 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. The committee noted this differs from the approach taken in previous guidelines on behavioural interventions to increase physical activity. Behavioural change 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).

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

The discussion below explains how the committee made recommendations 1.1.1 to 1.1.7.

Recommendations

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 a joint strategic needs assessment and 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 throughout the development of local strategies, policies and plans to:

- Take account of the views and needs of people who walk, cycle, drive or use public transport in the local area, particularly on the use of shared or contested space (for example, space shared by pedestrians and cyclists, or cyclists and motorists). Bear in mind that people may sometimes walk, sometimes cycle and sometimes drive, and so may have varying views. Capture a range of views (for example, views of people who walk now and people who might walk in the future).
- 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.

- 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 use policies to ensure it is as easy as possible for people with limited mobility to move along and across streets and in public open spaces. **[2018]**

1.1.4 To enable people with limited mobility to move along and across streets, implement policies on:

- A consistent approach to permanent or temporary obstructions – this may include vending boards, bins, parked cars, and street furniture such as chairs and hanging baskets.
- Pedestrian crossings – ensuring that there are enough and that these are accessible crossings. Also ensuring that crossings with signals give people enough time to cross the road.
- The correct use and maintenance of tactile paving (see the Department for Transport's guidance on the use of tactile paving surfaces). **[2018]**

1.1.5 Ensure planning permissions for new developments always prioritise the need for people (including people with limited mobility) to be physically active as a routine part of their daily life. **[2018]**

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

1.1.7 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. Existing impact assessment tools could be used. **[2008]**

Rationale and impact

Why the committee made the recommendations

1.1.1

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.

1.1.2

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 recognised that some people may get around in several ways, whereas others may only use one mode, and views may differ between people using each form 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 active travel as a way of increasing people's physically activity levels. 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 when developing local strategies, policies and plans and made a recommendation based on their expertise and NICE's guideline on community engagement: improving health and wellbeing and reducing health inequalities.

1.1.3 and 1.1.4

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. 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 road crossings and how accessible they are, for example whether they have tactile paving and rotating cones, may not always meet people's needs. These things 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.

1.1.5 to 1.1.7

These recommendations are taken from NICE's guideline PH8. Please see the evidence for details and why the recommendations were made.

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 may be more sedentary as a result. People who currently do little physical activity will benefit most from becoming more active. 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 so it is important that these are considered when developing local strategies, policies and plans. It can be difficult to achieve a balance in meeting different people's needs, particularly where space is shared between different types of user. For example, dropped kerbs are important for wheelchair users, but if they have no tactile paving 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. If the strategies policies and plans help to create an environment in which people are more active it will help prevent a range of chronic health conditions, leading to savings for the NHS and society at large.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

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 and that for people who are least active, moving from being sedentary to having low levels of activity would bring the greatest health benefits[3,4].

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

[3] Mortality benefits for replacing sitting time with different activities Matthews et al. 2015; Start active, stay active: a report on physical activity in the UK Department of Health.

[4] Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke events: systematic review and dose-response meta-analysis for the Global Burden of Disease Study 2013. Kyu et al. 2016; BMJ. 354:i3857.

more physically active. However, the committee heard expert testimony from a range of sources that supported these recommendations [Expert papers 2, 4, 6, 7]. Although expert testimony is usually considered to be more susceptible to bias than the published evidence , the committee thought that in this case the expert testimony gave valuable information about barriers or facilitators to physical activity among these groups, and the committee agreed with the expert testimony. 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] and 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 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. To ensure that no group is disadvantaged in particular, it is important to identify solutions that take account of the views of each of these groups. Solutions should aim to increase physical activity.

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 when creating strategies, polices and plans to change the environment to enable people to be more physically active, they should be informed by the most up to date and relevant data sources available and by best practice. They were aware that local providers are encouraged to monitor and evaluate the impact of interventions and where possible to use standard tools to do so.

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

The discussion below explains how the committee made recommendations 1.2.1 to 1.2.8.

Recommendations

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 services are available and reliable, particularly in rural areas where public transport may be more limited.
- Ensuring information about public transport services is accessible to people with visual and hearing impairments, for example, by providing spoken and visual announcements about destinations and stops on board services, and at stops and stations.
- Ensuring public transport is 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 When planning new footways, footpaths and cycle routes, make sure they link to existing routes and transport links 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, shops and leisure sites. These new routes should be built and maintained to a high standard. **[2018]**

1.2.4 Ensure that 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).
- 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 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). **[2018]**

1.2.5 Ensure footways, footpaths and cycle routes are well maintained, for example ensure:

- they are even and do not present hazards, for example from tree roots, pot-holes or broken paving slabs
- 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. **[2018]**

1.2.6 Improve cycling infrastructure using information obtained from consulting with 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 storage facilities in public places and on public transport. **[2018]**

For more details see NICE's guideline on physical activity: walking and cycling.

1.2.7 Make it as easy as possible for people with limited mobility to move around their local area. For example:

- Ensure footways:

  - have even, non-reflective anti-glare surfaces with a clearly defined edge
  - are free from unauthorised and unnecessary obstructions (whether permanent or temporary) including being free from pavement parking where it is not permitted (see recommendation 1.1.3)
  - are set back from traffic if possible (for example, by a grass verge).
- Ensure all pedestrian crossings have flush kerbs and tactile paving (see the Department for Transport's guidance on the use of tactile paving surfaces).
- Ensure all crossings with signals have tactile rotating cones and an audible beep, and give people enough time to cross safely.
- Ensure tactile paving is correctly installed and maintained where it is needed, for example at the top and bottom of stairs and on the edge of railway platforms (see the Department for Transport's guidance on tactile paving surfaces). **[2018]**

1.2.8 Consider making improvements to routes that are, or could be, used for getting to school, college and early years settings by active travel. Focus on improving safety, accessibility, connectivity and sustainability. This could include:

- improving footways and pedestrian crossings (see recommendations 1.2.5 and 1.2.7)
- introducing speed reduction zones. (For more detail on speed reduction zones see NICE's guideline on air pollution: outdoor air quality and health.) **[2018]**

Rationale and impact

Why the committee made the recommendations

1.2.1

Some evidence suggested that there is more potential to increase active travel in some areas than others. The committee agreed that it was important to identify and prioritise areas with a high potential for increasing travel by foot, bicycle and using other forms of active travel, along with ways to achieve this. The evidence was limited to expert opinion but the committee agreed that such an assessment could be

an important step towards creating an environment which could help more people to be more physically active in their daily lives.

1.2.2

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 expert opinion that both spoken and visual announcements are needed on public transport to encourage people who have visual or hearing impairments to use services. They also noted that public transport should be accessible to everyone including people with limited mobility.

The committee also agreed with expert opinion 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. They agreed that public transport to these locations should be available.

1.2.3

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 also told the committee 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.

1.2.4

This recommendation is from PH8. The committee considered some new evidence for this update, which showed that introducing congestion charging increased numbers of people using public transport and cycling. Traffic-calming schemes had

mixed effects on physical activity, but the committee agreed that traffic-calming and restricting vehicle access were important ways to encourage active travel.

1.2.5

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.

1.2.6

Some evidence suggested that improvements to cycling infrastructure do encourage more people to cycle regularly. 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, because there may be conflict when space is shared by people using different types of travel. They agreed with an expert that it is important that the views of a range of users are taken into account when improving the local area for cycling. They were also aware that there are various best practice guidelines that may be helpful when improving cycling infrastructure.

1.2.7

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. The committee agreed with experts that these actions should be recommended to encourage everyone, particularly people with limited mobility, to be physically active.

1.2.8

Some evidence suggested that safety improvements near schools, including speed reduction zones and more pedestrian crossings, may increase the number of children who walk and cycle to school. Some evidence suggested that parents, teachers and bus drivers approve of these safety measures. Some evidence also

showed that if routes are connected and accessible this also helps. The evidence was mixed but the committee agreed it was important to enable and encourage walking and cycling to school.

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 by crossing signals. 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, and 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, leading to savings for the NHS and 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

774 studies included in the reviews. In addition to physical activity being measured in
775 several different ways (for example, proportion of participants meeting physical
776 activity guidelines, time spent in moderate to vigorous physical activity, and change
777 to 'metabolic equivalents' or METs per unit of time), time spent on specific activities
778 such as walking and cycling were also used as outcomes. Some studies reported
779 changes in 'mode' share, for example whether people changed from using cars to
780 walking or cycling. Public transport use was also reported as an outcome measure.
781 Because using public transport can increase incidental physical activity when
782 walking or cycling to or between stops and stations, the committee agreed it could be
783 considered a proxy measure for physical activity.

784 Each of the outcomes above were reported both as observed outcomes and as self-
785 reported outcomes in the studies. Observed outcomes were considered by the
786 committee to be more reliable than self-reported measures.

787 The committee discussed which measure was most appropriate for considering the
788 change to total physical activity. They agreed that when considering the population
789 as a whole, the objective is to increase the amount of moderate to vigorous activity
790 most people do. However, they noted that there is a continuum of benefits from
791 being physically active and that for people who are least active, moving from being
792 sedentary to having low levels of activity would bring the greatest health benefits[5,6].

793 The committee agreed that these small changes in physical activity are best
794 captured by the use of METs. The economic modelling carried out to support this
795 guidance also uses this approach.

796 Because the reviews used GRADE to assess the quality of the evidence, the
797 committee identified which outcomes they considered to be critical or important.
798 They considered all measures of physical activity, time spent in physical activity and
799 public transport use to be critical outcomes. They also considered changes in
800 transport mode share to be important.

[5] Mortality benefits for replacing sitting time with different activities Matthews et al. 2015; Start active, stay active: a report on physical activity in the UK Department of Health.

[6] Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke events: systematic review and dose-response meta-analysis for the Global Burden of Disease Study 2013. Kyu et al. 2016; BMJ. 354:i3857

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', which means we have low confidence that the results would not change if more evidence became available. The exceptions are: qualitative evidence about whether connected routes are more useful than unconnected routes (low risk of bias [ES2.14, ES3.8]); an evidence statement suggesting that cycling increased because of improved cycle infrastructure (low quality [ES2.15]); and an evidence statement suggesting an association between diversity of destinations and active travel by walking (low quality [ES3.6]).

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). PH8 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.

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 bicycle routes, traffic-free bridges and the provision of bicycle racks in public places and on public transport.

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, and the purpose of it was to investigate whether there were any adverse effects on physical activity of local residents after the new motorway bisected the 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 Ciclovia 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, and 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, which minimise the risk of creating contested space. Contested space may create conflict which could affect some groups, such as older people, disproportionately.

A second potential harm is around road traffic collisions. Improving cycle infrastructure may increase the number of cyclists, which could in turn result in an increase in the absolute number of cyclists being involved in road traffic incidents. However, the committee did note that some evidence suggested that providing dedicated infrastructure for cyclists – in 1 case a tarmacked cycle route specifically for bicycles with regular junctions to join and leave – may reduce incidents involving cyclists in the area around the cycle route [ES2.7].

In addition, the committee were aware that increasing people's amount of active travel may increase their exposure to outdoor air pollution. The committee were aware that the physical activity benefits of active travel generally outweigh the risk of increased exposure to air pollution[7].They also noted that 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. NICE has published a guideline on air pollution: outdoor air quality and health.

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

[7] Levels of ambient air pollution according to mode of transport: a systematic review Cepeda et al. 2017; Can air pollution negate the health benefits of cycling and walking? Tainio et al. 2016

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 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 services are available and 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. Installing audio-visual equipment on buses – cost and practicality issues (Guide Dogs for the Blind Association) 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; Incidental physical activity in Melbourne, Australia: health and economic impacts of mode of transport and suburban location 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 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

The discussion below explains how the committee made recommendations 1.3.1 to 1.3.3.

Recommendations

1.3.1 Consider ways to enhance the accessibility and quality 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 low income communities and some black and minority ethnic communities. This may include 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
- measures to prevent or reduce antisocial behaviour, for example lighting
- 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
- access by public transport, on foot and by bike
- car parking for blue badge holders and people with limited mobility. **[2018]**

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

1.3.3 Encourage community groups and volunteers to support the maintenance and use of public open spaces, including trails and footpaths, for example by reporting any problems affecting use and accessibility. **[2018]**

Rationale and impact

Why the committee made the recommendations

1.3.1

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. The committee agreed that some rural areas lack public open spaces and it is not always clear where public access is allowed. An expert told the committee that clear signs are important so that people know where they can walk.

Some evidence suggested that people might use outdoor open spaces if the facilities are improved. Evidence showed that improving park facilities, like toilets and lighting, and better landscape design may encourage people to use the park, 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.

1.3.2 and 1.3.3

Recommendation 1.3.2 is from PH8. The committee considered some new evidence for this update, which showed that people are more likely to use areas that are well kept. Experts highlighted how community groups and volunteers can help to ensure that public open spaces, footpaths and trails are well maintained and used. The committee recognised the valuable contribution these groups could make.

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. Pleasant and well-maintained destinations that provide facilities such as accessible toilets and appropriate seating can encourage them to use public open spaces.

The opportunity people have to use public open spaces is likely to be affected by what spaces are available, how easy they are to access and the acceptability of any facilities on offer. 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 in rural areas (such as regional or national parks and some coastal areas) more difficult to access, particularly if there are no regular public transport services.

Impact of the recommendations on practice

Providing and maintaining facilities such as these 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 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’ 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 (Urban green nation: building the evidence base Commission for Architecture and the Built Environment).

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', which means we have 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, we 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 (Urban green space interventions and health: A review of impacts and effectiveness World Health Organization).

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 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 committee also considered a further case study based on an unpublished academic in confidence study of interventions in open green spaces, which was also cost effective. The intervention in this case study included both a physical and a social element, a feature that the committee were mindful may also have applied to other studies, but may not always have been explicitly reported. 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.

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 noted the evidence that highlighted that deprived communities – including many black and minority ethnic communities – have less access to good

quality open green spaces [Expert paper 4]. They were conscious that it is important to ensure that open green space is attractive and feels welcoming to everyone. They discussed the importance of attracting people of all ages and cultural backgrounds to open green spaces by providing 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 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 and ongoing maintenance than others, particularly some interventions in open spaces. For example, if footpaths become overgrown with vegetation or become muddy due to poor drainage, they may become unusable relatively quickly. They noted therefore that ongoing maintenance should be factored into the costs of implementing such interventions.

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 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 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 and blue 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 (Initiating and maintaining recreational walking: A longitudinal study on the influence of neighborhood green space Sugiyami et al. 2013). 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, 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 and green spaces) in creating and sustaining an increase in physical activity at a population level?

Why this is important

Open space that is accessible, well maintained, and engaging will be used more often by more people, and so can 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 via 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 (green or blue) 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 due to 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. 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, how easy it is for people to walk around their local area; availability of public transport
- individual characteristics, such as baseline mobility, health, age, ethnicity.

Update information

This guideline is an update of NICE guideline PH8 (published January 2008) and will replace it.

New recommendations have been added on strategies, policies and plans to increase physical activity in the local environment (1.1.1 to 1.1.4 and 1.1.6); active travel (1.2.1 to 1.2.3 and 1.2.5 to 1.2.8); public open spaces (1.3.1 to 1.3.3).

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

NICE proposes to delete some recommendations from the 2008 guideline, because either the evidence has been reviewed and the recommendations have been updated, or NICE has updated other relevant guidance and has replaced the original recommendations. 'Recommendations that have been deleted or changed' sets out these recommendations and includes details of replacement recommendations. Where there is no replacement recommendation, an explanation for the proposed deletion is given.

Where recommendations are shaded in grey and end **[2008]**, the evidence has not been reviewed since the original guideline.

See the original NICE guideline and supporting documents.

Recommendations that have been deleted or changed

Recommendations to be deleted

Recommendation in 2008 guideline	Comment
Recommendation 1 (bullet point 1) • Involve all local communities and experts at all stages of the development to ensure the potential for physical activity is maximised.	Replaced and expanded on by recommendation 1.1.2. 1.1.2 Use community engagement approaches throughout the development of local strategies, policies and plans to: • Take account of the views and needs of people who walk, cycle, drive or use public transport in the local area, particularly on the use of shared or contested space (for example, space shared by pedestrians and cyclists, or cyclists and motorists). Bear in mind that people may sometimes walk, sometimes cycle and sometimes drive, and so may have varying views. Capture a range of views (for example, views of people who walk now and people who might walk in the future).

	• 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. • Assess whether initiatives successfully adopted elsewhere are appropriate for local people and, if they are, how they can be adapted to local needs. For more information see NICE's guideline on community engagement.
Recommendation 1 (bullet point 2, first sentence) • Ensure planning applications for new developments always prioritise the need for people (including those whose mobility is impaired) to be physically active as a routine part of their daily life.	Replaced in the new guideline by recommendation 1.1.5. The committee felt that a recommendation on planning 'permissions' as opposed to planning 'applications' was more realistic, because planners do not have control over what applications are submitted, and that this would ensure that the need to be physically active is prioritised. So this wording has been changed. 1.1.5 Ensure planning permissions for new developments always prioritise the need for people (including people with limited mobility) to be physically active as a routine part of their daily life.
Recommendation 1 (bullet point 2, second sentence) • Ensure local facilities and services are easily accessible on foot, by bicycle and by other modes of transport involving physical activity.	Replaced by recommendation 1.2.3, which is more comprehensive 1.2.3 When planning new footways, footpaths and cycle routes, make sure they link to existing routes and transport links to make it as easy as possible for people to walk or cycle or use other forms of active travel rather than making short journeys by car or public transport. This includes journeys between residential areas and public transport stops and stations, places of work, public open spaces, schools, colleges and early years settings, shops and leisure sites. These new routes should be built and maintained to a high standard
Recommendation 1 (bullet point 2, third sentence) • Ensure children can participate in physically active play.	In the original guideline this focused only on ensuring children could take part in active play. The committee were keen to ensure that children and their families could be active in other ways too, for example by being able to walk or cycle to school or nursery. 1.1.6 Ensure children, young people and their families can be physically active, for example when playing and when travelling to school, college and early years settings.
Recommendation 2 Ensure pedestrians, cyclists and users of other modes of transport that involve physical activity are given the highest priority when	Apart from the final bullet, this recommendation has been replaced in the new guideline by recommendation 1.2.4. The wording has been slightly updated to match terminology used in the new guideline.

developing or maintaining streets and roads. (This includes people whose mobility is impaired.) Use one or more of the following methods: • re-allocate road space to support physically active modes of transport (as an example, this could be achieved by widening pavements and introducing cycle lanes) • restrict motor vehicle access (for example, by closing or narrowing roads to reduce capacity) • introduce road-user charging schemes • introduce traffic-calming schemes to restrict vehicle speeds (using signage and changes to highway design) • create safe routes to schools (for example, by using traffic-calming measures near schools and by creating or improving walking and cycle routes to schools).	1.2.4 Ensure that 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). • 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 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).
Recommendation 2 (last bullet) • Create safe routes to schools (for example, by using traffic-calming measures near schools and by creating or improving walking and cycle routes to schools).	Replaced by a new recommendation, 1.2.8, which is more comprehensive. 1.2.8 Consider making improvements to routes that are, or could be, used for getting to school, college and early years settings by active travel. Focus on improving safety, accessibility, connectivity and sustainability. This could include: • improving footways and crossings (see recommendations 1.2.5 and 1.2.7) • introducing speed reduction zones (For more detail on speed reduction zones see NICE's guideline on air pollution: outdoor air quality and health.)
Recommendation 3 Plan and provide a comprehensive network of routes for walking, cycling and using other modes of transport involving physical activity. These routes should offer everyone (including people whose mobility is	Replaced by recommendations 1.1.3, 1.1.4 and 1.2.3 1.1.3 Develop and use policies to ensure it is as easy as possible for people with limited mobility to move along and across streets and in public open spaces. 1.1.4 To enable people with limited mobility to move along and across streets, implement policies on:

impaired) convenient, safe and attractive access to workplaces, homes, schools and other public facilities. (The latter includes shops, play and green areas and social destinations.) They should be built and maintained to a high standard.	• A consistent approach to permanent or temporary obstructions – this may include vending boards, bins, parked cars, and street furniture such as chairs and hanging baskets. • Pedestrian crossings – ensuring that there are enough and that these are accessible crossings. Also ensuring that crossings with signals give people enough time to cross the road. • The correct use and maintenance of tactile paving (see the Department for Transport's guidance on the use of tactile paving surfaces). 1.2.3 When planning new footways, footpaths and cycle routes, make sure they link to existing routes and transport links to make it as easy as possible for people to walk or 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, shops and leisure sites. These new routes should be built and maintained to a high standard .
Recommendation 4 (first bullet) • Ensure public open spaces and public paths can be reached on foot, by bicycle and using other modes of transport involving physical activity. They should also be accessible by public transport.	Replaced by recommendation 1.2.2. 1.2.2 Increase physical activity associated with using public transport services. This includes encouraging use of these services by: • Ensuring services are available and reliable, particularly in rural areas where public transport may be more limited. • Ensuring information about public transport services is accessible to people with visual and hearing impairments, for example, by providing spoken and visual announcements about destinations and stops on board services, and at stops and stations. • Ensuring public transport is accessible to everyone. (See the Department for Transport's guidance on inclusive mobility.) • Improving public transport to parks and other green and blue spaces.
Recommendation 4 (second bullet) • Ensure public open spaces and public paths are maintained to a high standard. They should be safe, attractive and welcoming to everyone.	Replaced by recommendations 1.3.1, 1.3.2 and 1.3.3. 1.3.1 Consider ways to enhance the accessibility and quality 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 low income communities and some black and minority ethnic communities. This may include 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 • measures to prevent or reduce antisocial behaviour, for example lighting • 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 • access by public transport, on foot and by bike • car parking for blue badge holders and people with limited mobility. 1.3.2 Ensure open spaces and footpaths are maintained to a high standard. 1.3.3 Encourage community groups and volunteers to support the maintenance and use of public open spaces, including trails and footpaths, for example by reporting any problems affecting use and accessibility.

Changes to recommendation wording for clarification only (no change to meaning)

Recommendation numbers in current guideline	Comment
1.4.1	This recommendation has been edited into the direct style (in line with current NICE style for recommendations in guidelines).
1.1.7	The wording has been slightly amended to bring it into line with the terminology used in the current guideline.

Glossary

Accessible crossings

Accessible crossings have dropped kerbs and tactile paving. Those with signals also have tactile rotating cones and an audible beep.

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, pavements, 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.

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.

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).

Green spaces

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

Greenways

Greenways are strips of land that form open-space corridors, usually connecting urban areas. They tend to be reserved for recreational use or environmental conservation.

Home Zones

In the included studies, Home Zones are used to mean street systems that prioritise pedestrians and cyclists. Usually in residential areas, they aim to calm traffic and make the environment more attractive for pedestrians and cyclists by introducing trees and planters, benches and play areas. They may also include shared space (areas with no separate raised pavements).

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

This includes areas of land and water.

Pavement parking

Parking of part of or the whole of a motorised vehicle on a pavement. This is permitted in some areas, and not in others.

Physical activity

Physical activity is: 'Any force exerted by skeletal muscle that results in energy expenditure above resting level' (Physical activity exercise and physical fitness: definitions and distinctions for health related research 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).

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

Public transport are modes of transport that can be used by members of the public and are not owned by any individual member. This may include buses, coaches, trains, rapid transit systems, trams, and ferries.

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.

ISBN: