

3.4 RESPIRATORY DISEASE

3.4.1 Evidence Base

There is strong evidence that short-term exposure to respirable particles (PM_{2.5}) in urban areas increases deaths and respiratory and cardiovascular hospital admissions. The primary source of PM_{2.5} in urban areas is motor traffic. Nitrogen dioxide modifies the effect of PM_{2.5}, such that daily mortality increases further when high concentrations of PM_{2.5} are in combination with high long-term concentrations of nitrogen dioxide. Nitrogen dioxide is also produced by motor vehicle exhausts.

Increases in ozone also lead to increases in deaths and respiratory hospital admissions. Ozone is created by the action of sunlight on nitrogen dioxide in the presence of volatile organic compounds (VOCs). Ozone may be transported over long distances giving rise to population exposure in both urban and rural areas.

It has been estimated that if actions are put in place to address respiratory problems associated with transport, it could save the NHS £1,400 - £2,500 per admission to hospital avoided⁸.

Spatial planning can modify the total volume of traffic as well as congestion of traffic at certain locations. This may have a preventative effect on population cardio-respiratory disease by reducing air pollution.

There is evidence that residents are more likely to report exacerbations of asthma, coughs and respiratory infections following exposure to flooding.

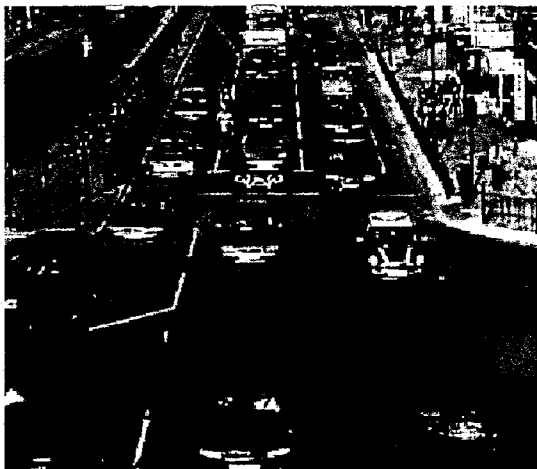
Spatial planning can minimise the risks of flooding through design and careful location of vulnerable land-uses.

Further information on the evidence base underpinning the links between respiratory disease and spatial planning is provided in Appendix 3.4.

3.4 RESPIRATORY DISEASE

3.4.2 Case studies

As indicated in the evidence base, measures to address respiratory disease focus around the improvement of air quality, specifically on reducing emissions from transport, and minimising exposure to flooding.



3.4.3 Tackling respiratory disease by improving air quality

Management of London's air quality is considered within the Mayor's Air Quality Strategy (2002)⁶⁶, with an aim "...to improve London's air quality to the point where it no longer poses a significant risk to human health."

A key planning intervention to address air pollution is the designation of Air Quality Management Areas (AQMAs). Local authorities have been assessing and reviewing air quality in their area since December 1997. This has involved measuring air pollution and trying to predict how it will change in the next few years in order to ensure that national air quality objectives will be achieved⁶⁷. If a local authority finds any locations where objectives are not likely to be achieved, it must declare an AQMA and prepare a plan to improve the air quality of this area, called a Local Air Quality Action Plan⁶⁸. Camden's Air Quality Action Plan is described below as an illustration of how such Action Plans can positively affect health.

Case Study 9: Camden's Air Quality Action Plan

The pollutants of most concern in Camden are PM₁₀ and nitrogen dioxide. Local road traffic emissions are the dominant source of PM₁₀ and nitrogen dioxide in the borough. Based on emissions data, Camden declared the whole borough an AQMA in September 2002. The Camden Air Quality Action Plan sets out both current and new actions to address air pollution and to meet national air quality objectives. These are considered below in terms of area wide schemes and promoting alternative modes of transport.

Area Wide Schemes

A major Area-Wide scheme to address air pollution is the London-wide Low Emission Zone (LEZ) which aims to move London closer to achieving national and EU air quality objectives for 2010, and to improve the health and quality of life of people who live and work in London⁴. The proposed LEZ will encourage vehicle operators to clean up their fleets. It would mean lorries, coaches and buses failing to meet a minimum pollution standard would pay a charge if they drive polluting vehicles into Greater London.

The anticipated health related benefits of the proposed LEZ in terms of PM₁₀ are summarised below:

Health statistic	Annual benefit (relative to 2005 baseline)
Fewer deaths brought forward ^a	11-18 deaths
Fewer respiratory hospital admissions ^a	11-17 admissions
Fewer cases of bronchitis ^b	29-45 cases
Fewer cases of chronic cough ^b	609-964 cases
Fewer cases of congestive heart failure ^b	26-36 cases

^a Committee on the Medical Effects of Air Pollution (1998).

^b Exnerl (I.C. 2000)

Promoting sustainable modes of transport

As set out under Case Study 8: Encouraging healthy travelling to healthcare facilities, promoting the use of walking, cycling and public transport encourages physical activity (public transport usually requires a walk at each end of the journey) which helps to address obesity and cardiovascular disease. It also reduces traffic volumes and congestion, having a positive effect on respiratory disease. The promotion of these sustainable modes of transport in Camden is primarily achieved through a number of initiatives, including the Camden Walking Plan, Cycling Plan, and Public Transport Plan.

3.4 RESPIRATORY DISEASE

Walking

The Camden Walking Plan sets out a series of practical actions being taken by the Council to encourage walking in the borough. In addition, the Mayor's Transport Strategy (2001)⁷⁶ has set out plans to create 'Streets for People' that seek to create or improve amenities including street lighting, seating and traffic calming.

Examples of some of the key actions already taken and still to be implemented to encourage walking in Camden include:

- Monthly inspections of footpaths especially those pavements with the highest number of trip complaints.
- Improving pavement surfaces and removing clutter.
- Tactile pavements and dropped kerbs at road crossings.
- Street lighting renewal and improvement programme.
- Seating and pedestrian signage.
- Camden and Islington Health Walks.

There are also a number of road safety projects which aim to make streets safer for pedestrians, particularly vulnerable users, and encourage walking. These include the implementation of 20mph limits outside schools⁷⁷, safer routes to schools programme, pedestrian skills training for older people.



How can neighbourhood 'walkability' be improved?

The Neighbourhood Environment Walkability Scale⁷⁸ can be used to assess residents' perceptions of what makes a neighbourhood conducive to walking. Typically they use data from geographic information systems and residents' responses to calculate and measure attributes such as:

- Residential density;
- Proximity to and ease of access to non-Residential facilities;
- Street connectivity;
- Walking facilities such as paths; and
- Road safety.

Studies show that residents in highly walkable neighbourhoods rate residential density, land use mix and street connectivity higher than residents in poorly walkable neighbourhoods⁷⁹. These attributes should be used in designing new developments or regeneration projects to encourage residents to walk rather than using the car.

A Home Zone is a residential street, or group of streets, designed for community use – i.e. for pedestrians and cyclists rather than for people in cars.

Cycling

The Camden Cycling Plan recognises the many barriers to cycling, including fear of injury, fear of theft and lack of good facilities. The Camden Cycling Plan, which stems from the National Cycling Strategy, aims to overcome such barriers. The Plan aims to go some way towards meeting one of the key targets of 10% of all journeys in London to be made by bicycle by 2012. Proposals in the Plan include new cycle routes and lanes, advanced stop lines to help cyclists through signalled junctions, signalled control cycle crossings, and more cycle parking stands.

Public transport

The Local Air Quality Action Plan recognises the role of public transport in reducing road traffic. The London Borough of Camden and Transport for London (TfL) plan to make public transport more efficient, reliable and quicker. The Mayor's Transport Strategy also sets out plans to tackle London's transport problems. The Mayor's core principles are to invest in increasing safety, reliability, capacity and comfort and to improve the infrastructure of public transport.

Win/wins:

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 In addition to reducing traffic volumes and congestion (thereby improving air quality and reducing respiratory disease), encouraging walking and cycling also helps to promote active lifestyles, positively addressing obesity and cardiovascular diseases.



3.4 RESPIRATORY DISEASE

For more information on minimising exposure to flooding see Section 3.2.7

Minimising exposure to flooding

Minimising exposure to flooding can help to reduce the risk of respiratory infections.

Recommendations: Planning for Respiratory Disease

Road Traffic Emissions

- Ensure LDFs encourage and promote walking and cycling rather than reliance on the private car for short journeys.
- Address existing barriers to or deficiencies in provision for walking and cycling.
- Promote improvements to walking and cycling facilities within and around new developments.
- Increase walking and cycling through developing green/active workplace and school travel plans.
- Provide high-quality, segregated pedestrian and cycle paths, which are direct and provide good connections to the existing patterns of streets, and to bus stops, stations and local amenities, as part of major new developments.

Flooding

Refer to recommendations set out under Recommendations: Planning for Mental Health.

3.5 EXCESS WINTER (COLD) AND SUMMER (HEAT) MORTALITY

3.5.1 Evidence Base

Urban areas generate a 'heat island' effect and London can be up to 8% warmer than rural areas and night temperatures in the city can remain above 19°C. Mortality increases in hot weather and elderly people are particularly vulnerable; in the 1995 heatwave in London there was a 16% excess in deaths for all ages and those aged over 85 had a 20% excess mortality. Climate change will further exacerbate this problem.

Spatial Planning can ensure that measures are incorporated into the layout of a development to reduce the heat island effect.

In England approximately a third of excess deaths in winter (18 excess deaths per 100,000 adults) are related to low indoor temperatures and 90% of these occur in those more than 65 years of age. Three thousand pensioners died in London in winter 2006 of cold related illnesses¹⁴.

Poor home insulation and fuel poverty contribute to the problem.

Spatial Planning can ensure that measures are incorporated into building design to improve insulation.

Further information on the evidence base underpinning the links between excess winter (cold) and summer (heat) mortality and spatial planning is provided in Appendix 3.5.

3.5 EXCESS WINTER (COLD) AND SUMMER (HEAT) MORTALITY

3.5.2 Case Studies

As indicated in the evidence base above, measures to effectively address excess summer (heat) mortality relate to the inclusion of measures in development layout to address overheating. Measures incorporated into building design to improve insulation can tackle excess winter (cold) mortality.

3.5.3 Excess Summer Heat Mortality

There is strong evidence linking the number of deaths and likelihood of deaths with hot weather, and elderly people are particularly vulnerable. This is a key issue in London due to the predicted impact of climate change and 'heat island effect'.

The Consultation Draft Supplementary PPS on Climate Change¹² recognises that the urban heat island effect may be more pronounced in those in low income households as they are more likely to live in high density social housing where ventilation cannot be easily retrofitted. This is also notable within the elderly community who have fixed incomes and are less able to pay for adaptation measures.

PPS 1¹³ Sustainable Development, PPS 11¹⁴ Regional Spatial Strategies and PPS 12¹⁵ Local Development Frameworks all require that development is located to take account of climate change impacts.

PPS 3¹⁶ Housing recommends that "...Local Planning Authorities should encourage applicants to bring forward sustainable and environmentally friendly new housing developments, including affordable housing developments, and in doing so should reflect the approach set out in the forthcoming PPS on climate change..."

The London Plan Further Alterations includes recommendations for strengthened climate change policies. For example, Policy 4A.2i Sustainable Design and Construction suggests that DPDs should include policies which incorporate measures to "...manage overheating..."

London Plan Policy 4A.5iv specifically relates to overheating and recommends encouraging development that "...avoids internal overheating and excessive heat generation and contributes to the prevention of further overheating especially where the urban heat island is most intense..."

It is recognised that dealing with excessive summer heat is largely a design issue, although DPD policies can be worded to include for adaptation measures. There are a number of interventions which could be included in new developments, both within site layout and at building scale. It is not the intention to illustrate all of these, as more detailed good practice examples are provided elsewhere, such as:

- Energy Efficient Best Practice in Housing: Reducing Overheating - a designer's guide. CE1 29, 2005. 17
- Adapting to Climate Change: A good practice guide for sustainable communities. 18
- Adapting to Climate Change: A Checklist for Development. 19

See www.energysavingtrust.org.uk/housingbuildings/publications

See www.landuse.co.uk/news

See www.climatesoutheast.org.uk/publications_reports.php

Site Layout

Green spaces

The inclusion of green spaces within site layout, provides an opportunity for people to sit outside during warmer weather (particularly if trees are provided for shading – deciduous species will also allow solar gain in winter) and help reduce local heat island effects.

Building Orientation

When considering building layout and orientation the opportunity for natural ventilation should be maximised. For example the top levels of buildings may be set back from street level to encourage natural ventilation. Buildings may also be orientated to face prevailing winds and hence maximise natural ventilation.

Building Scale

Green Roofs

Green roofs, can be planted with heat-absorbing species and provide an opportunity to reduce the effect of the urban heat island effect. These are of particular value in city centre locations where space is scarce and buildings tend to be high-rise and high density (these are also the hottest parts of the city).

Thermal Mass

Thermal mass can be used to store heat temporarily e.g. in structures or spaces (such as construction materials) and prevent internal areas heating up. Effective ventilation is required to release this stored heat at night.

The type of thermal mass will depend on the expected development use and occupancy.



Source: Marcus Lyon

3.5 EXCESS WINTER (COLD) AND SUMMER (HEAT) MORTALITY

Shading

Shading can be used to minimise heat gains. Shading can be permanent or movable and can be retrofitted into existing buildings. Shading can be provided by planting e.g. deciduous trees.

Awnings are a temporary form of shading which may be extended when required and can be easily retrofitted.

New developments should be designed to include permanent shading e.g. louvres or balconies which can be used to shade lower stories. Case study 10 provides an example of how building design can be adapted to take account of the effects of climate change.



Case study 10: Beddington Zero Energy Development (BedZED), London

The BedZED development in South London was designed to include a number of innovative, sustainable techniques including a thermally stable environment.

BedZED was developed by the Peabody Trust, in partnership with Bioregional Development Group and designed by Bill Dunster Architects.

Terraced houses are south facing and have triple storey conservatories to maximise heat gain from the sun. Large areas of exposed thermal mass e.g. ceilings and walls enable heat to be stored to avoid excessive heat gain in summer. Heat can escape through sunspaces (open windows provide a cool-down function) and ventilation "cowls" on the roofs.

The thermal mass and high building insulation also ensures heat gains are maximised in winter – reducing the likelihood of winter mortality. The buildings at BedZED have green roofs which provide an additional means to absorb heat.



Source: Marcus Lyon

Win/Wins:

- Thermal mass and ventilation provide a means to control temperatures in summer and hence reduce health effects arising from increased temperatures.
- Heat can be stored in winter reducing the health effects of lower temperatures.
- Green roofs provide green spaces encouraging biodiversity which can have indirect health benefits e.g. on mental health.
- Increased ventilation can help reduce the causes of asthma exacerbations (e.g. dust mites allergen, mould spores etc) reducing the likelihood of asthma attacks.

Conflicts/Constraints:

- It is difficult to control temperatures in prolonged hot periods – more likely under climate change scenarios.

3.5 EXCESS WINTER (COLD) AND SUMMER (HEAT) MORTALITY

The need to Retrofit

As described earlier, the urban heat island effect may be more pronounced in low income households, particularly high density, social housing where ventilation and other adaptation measures cannot be easily retrofitted.

To tackle the health impacts and inequalities arising from high summer temperatures, spatial planners should keep abreast of evolving research into retrofitting such as that recently commissioned by the London Climate Change Partnership (LCCP).

3.5.4 Excess Winter (Cold) Mortality

There is strong evidence in the literature linking winter mortality and home insulation, with the elderly being particularly vulnerable.

Reductions in winter mortality can be achieved in new developments and regeneration schemes through inclusion of some of the interventions described above e.g. high thermal mass in buildings (to store heat in winter) and ensuring buildings are orientated to maximise solar gain. Buildings should be well insulated to ensure they do not lose heat in winter.

Winter deaths (caused by lower winter temperatures in existing homes) are being partly addressed through the Government's Warm Front Initiative (©). This scheme aims to end Fuel Poverty by providing grants which offer a package of insulation and heating. The Mayor also supports the Winter Warmth Campaign providing advice to Londoners about how to stay warm in winter.

Local Area Agreements (LAAs) also provide a means to address fuel poverty. For example, Swindon's LAA partnership has set a target in the Healthier Communities and Older People block to increase energy efficiency in private sector and social housing occupied by vulnerable people. The target will be delivered by the Local Affordable Warmth Partnership.

Recommendations: Planning for Excess winter (cold) and summer (heat) mortality.

- Planners should work with PCTs to monitor mortality and illness from excess summer (heat) and excess winter (cold) within the borough on an annual basis. This should be used to identify which neighbourhoods and housing schemes require retrofitting measures or regeneration.

Excess summer (heat) mortality

- DPD policies should promote new developments and regeneration schemes which include measures to adapt to overheating.
- New developments/regeneration schemes should be adapted according to their specific location e.g. green roofs can be provided in city centres where space is limited.
- Planners and designers should have regard to existing standards e.g. Building Regulations, BREEAM and Code for Sustainable Homes.
- Planners and designers should be aware of potential conflicts arising from adaptation measures e.g. excessive planting to provide summer shade may increase fear of crime and create anxiety.
- Retrofitting for the effects of climate change is essential to tackle health impacts and inequalities in existing developments. Planners should recognise this within their DPDs and keep abreast of evolving research.

See Section 2 Why Plan for Health?

See <http://www.defra.gov.uk/environment/climatechange/uk/household/fuelpoverty/warmfront/index.htm>



3.6 INJURIES

3.6.1 Evidence Base

Injuries account for 3% of annual deaths in the UK. Injury is the greatest threat to life in children and young people and road traffic accidents (RTA) are the leading cause of death whereas falls cause 4.1% of injury deaths in older age groups. Increased vehicle speeds resulting from decreased traffic congestion (to address air pollution issues) may increase Road Traffic Accident (RTA) injuries. RTAs show substantial inequalities between groups of differing social class.

Annually, injuries lead to 720,000 admissions to hospital and 6 million emergency department visits.

Twelve month data from the Department for Transport (DfT)¹⁶ for the Metropolitan Police Force area reported a total of 29,775 road casualties in 2006 (of which 226 were fatalities). The cost burden of every fatality in London is £1.4 million.

There is good evidence that area-wide traffic calming reduces child pedestrian injury rates and also reduces the differential in rates based on inequalities in social groups.

There is evidence that bypasses decrease accident rates but the evidence for new major urban roads and their effect on local road networks and accidents is less strong.

Spatial planning can address road safety through the introduction of traffic calming.

Injuries in the home are common but the evidence of effects of environmental adaptation in the home is weak.

Injury rates associated with flooding are of the order of 0.4%.

Spatial planning can minimise the risks of flooding through design and careful location of vulnerable land-uses.

Further information on the evidence base underpinning the links between injuries and spatial planning is provided in Appendix 3.6.

3.6.2 Case Studies

Spatial planning can address road safety through the introduction of traffic calming (this is illustrated in Case Study 11 below). Spatial planning can prevent flood risk, and the design of flood resilient buildings can reduce the likelihood of injuries arising from flooding.

3.6.3 Road Layout and Traffic

As noted above, there is strong evidence demonstrating the use of traffic calming measures as a means to reduce road traffic deaths and injuries. Traffic calming aims to reduce traffic speed and volumes and hence road traffic related injuries.

Traffic calming measures take a variety of forms such as:

- Vertical and horizontal shifts in traffic (e.g. road humps, speed cushions, raised crosswalks, raised sections of road, chicanes, mini-roundabouts, road narrowing, channelised slip lanes etc).
- Optical measures (chevron road signs, road surface treatment, reduced horizontal visibility, audible measures such as rumble areas and alterations to road lighting).
- Redistribution of traffic or alteration to road hierarchy (e.g. permanent or temporary blocking of road, diagonal blocks, gateways, creation of one-way streets, re-introduction of two-way streets, four-way stops).
- Changes to road environment (increased vegetation along road, introduction of street furniture).

3.6 INJURIES

Case study 11: Home Zone West Ealing, London

A Home Zone is a residential street, or group of streets, designed for community use – i.e. for pedestrians and cyclists rather than for people in cars. (1) It is based on the Dutch 'woonerf' concept, where pedestrians and cyclist have legal priority over motorists.

Home Zones can be achieved by the modification of existing streets, or can be designed as part of a new housing development. There is currently no specific legislation supporting UK Home Zones. However, the UK DfT provided funding for 59 Local Authorities as well as nine pilot studies to promote Home Zones.

One of the pilot studies included a scheme in West Ealing, London comprising five roads: Hastings Road, Hartingdon Road, Broughton Road, Denmark Road and Arden Road.

The area became congested and dangerous, with the roads used as short-cuts to avoid traffic-lights on the A4020 Uxbridge Road and non-residents parking in the streets. RTAs were also a risk – a child resident was hit and injured by a non-resident car.

Residents from each of the roads formed a group, the Five Roads Forum, (2) to encourage Ealing Council to pilot a Home Zone in the area. The resident group was proactive, appointing a Chairperson, attending regular meetings, publishing a newsletter and designing and maintaining a webpage. Residents regularly liaised with the project officer from Ealing Council and provided input into plans for the neighbourhood.

Proposals took time to agree and implement (up to five years from establishment of the Home Zone) and included:

- Introduction of a Controlled Parking Zone (CPZ) (2001).
- Closure of a 'rat-run' at Hastings Road (2002).
- Changed road layout to incorporate 30-degree parking bays (2003).
- Speed bumps in Hastings Road (2003).
- Road markings to create chicanes (2003).
- Introduction of a 20mph zone (2003).
- Creation of a playspace in Arden Road (2003).

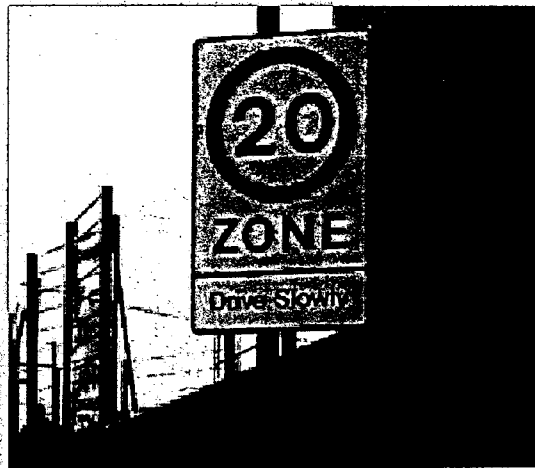
There have been no follow-up studies to measure the reduction in RTAs, or how perceptions of road safety have changed. However, discussions with the Chairperson of the Five Roads Forum indicated that generally the area is a much nicer place to live in, people considered their quality of life to have improved and the process engendered a sense of community spirit and neighbourliness.

Win/Wins:

- Traffic calming measures are a proven means to reduce injury rates.
- Homezones require well-organised and cohesive community participation. This may indirectly benefit mental health (e.g. by reducing isolation).
- Reducing traffic and congestion in selected streets may help address other public health issues such as cardio-respiratory disease from vehicle pollution.
- By reducing traffic within an area, residents will be encouraged to walk and cycle, promoting healthier lifestyles.

Conflicts/Constraints:

- Interventions may take a long time to agree and implement.
- A high level of independent community involvement and mobilisation required.
- There may be delayed response rates of emergency services to the streets within the Zone.
- Road closures may shift the problem elsewhere, i.e. not reducing traffic overall.



3.6 INJURIES

3.6.4 Inequalities in Child Pedestrian Injuries

Pedestrian injuries from traffic are a leading cause of death and disability in children and a major cause of health inequalities. Studies have shown that children from the most deprived areas are 4-5 times at greater risk of involvement in a pedestrian road traffic accident than more affluent children⁴¹.

A comparison was undertaken of two cities in Wales⁴², one where most traffic calming was concentrated in the most deprived parts of the city and one where traffic calming was more evenly distributed between areas.

An analysis of the results demonstrated a greater narrowing of the inequalities gap (in childhood pedestrian injury rates) in the city with the traffic calming concentrated in the deprived areas.



3.6.5 Designing for People instead of Cars

The Home Zones principle and case study above focus on the use of traffic calming measures and road closures to achieve a reduction in traffic speeds.

Another means to reduce road traffic accidents is to design cities for people instead of cars. This has been successfully implemented in the City of York where a hierarchy of transport users is applied when planning land use and transport. A similar hierarchy is promoted in the recent publication 'Manual for the Streets'.⁴³ This hierarchy should be considered by developers during scheme design.

User Hierarchy

Consider First

Pedestrians

Cyclists

Public Transport Users

Specialist Service Vehicles

Other motor traffic

Consider Last

Reproduced from Table 3.2: User Hierarchy, Manual for the Streets.



The Manual also provides a hierarchy to address road safety problems. This is reproduced in the table below. As noted, means to reduce overall traffic volume should be considered first.

	Pedestrians	Cyclists
	Traffic volume reduction	Traffic volume reduction
	Traffic speed reduction	Traffic speed reduction
	Reallocation of road space to pedestrians	Junction treatment, hazard site treatment, traffic management
	Provision of at-grade crossings, improved pedestrian routes on existing desire lines	Cycle tracks away from road
	New pedestrian alignment or grade separation	Conversion of footways/footpaths to adjacent or shared-use routes for pedestrians and cyclists

Adapted from Table 4.1: The hierarchies of provision for pedestrians and cyclists, Manual for the Streets.

Traffic calming (i.e. traffic speed reduction) sits high on the road safety hierarchy and provides an effective mechanism to reduce injury rates in existing areas. New schemes should aim to reduce traffic overall i.e. by designing firstly for the pedestrian and discouraging car use.

The Mayor of London has been making ongoing improvements to the existing environment in London to encourage more journeys on foot or by bike and discourage use of the car. This has included the introduction of the congestion charging scheme into central London in February 2003.

TfL's 4th Annual Monitoring published in 2006²³ noted that:

- Traffic patterns in and around the charging zone remained broadly stable during 2005.
- The changes to the scheme introduced in July 2005 were associated with small net reductions in traffic volumes.
- Reductions in congestion inside the charging zone over the whole scheme period now average 26%.
- 2004/2005 saw substantial further falls in the number of road accidents across Greater London, reflecting wider TfL and borough road safety initiatives – up to 40–70 fewer personal accidents directly due to congestion charging.
- An increase in cycling within the zone of 43%.

Other schemes include the London Cycle Network Plus (LCN+) which aims to improve London's infrastructure for cyclists in line with the Mayor's Cycling Action Plan by creating a well-designed cycle network that is fast, safe, convenient and easy to use. This will help promote cycling as a viable alternative to travel by car.

3.6 INJURIES

For more information on minimising exposure to flooding, see Section 3.2.7

Flooding

Minimising the risks of flooding can reduce the likelihood of flood-related injuries.

Recommendations: Planning to reduce Injuries

Road Safety

- Policies which reduce dependency on the car by encouraging walking, cycling and public transport use should be promoted at LDF level and/or within Local Implementation Plans for Transport.
- New schemes should design for pedestrians as a priority.
- Traffic calming measures provide a proven means to reduce accidents in existing streets/neighbourhoods and in regeneration schemes or new developments.
- Focusing traffic calming in deprived areas will help reduce inequalities in child pedestrian injury rates.

Designing to Reduce the Impacts of Flooding

Refer to recommendations set out under Recommendations: Planning for Mental Health.

