steer davies gleave

Research into the impacts of 20mph speed limits and zones

Report
November 2014

London Borough of Merton on behalf of LEDNet

Our ref: 22709601
Client ref: E10217902RPP

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Executive summary

Steer Davies Gleave has undertaken a study into the impacts of 20mph limits and zones, for LB Merton on behalf of the London Environment Directors' Network (LEDNet). The purpose of this study has been to conduct desktop research, in order to examine the available evidence and inform future 20mph policy in London.

Legal, regulatory and policy context

The new version of the Traffic Signs Regulations and General Directions (TSRGD) (proposed for introduction next year) incorporates the relaxation in requirements for physical traffic calming introduced in 2011. It also makes the lighting of regulatory signs within 20mph zones optional.

Enforcement of 20mph speed limits is possible, and does take place (using both fixed speed cameras and mobile enforcement by police). However, the police's recently revised guidelines state that whilst enforcement of 20mph speed limits will be considered, it cannot take the place of proper engineering.

Recent London-wide policy documents and strategies support the continued roll-out of 20mph schemes, including by boroughs and (where appropriate) on Transport for London Road Network (TLRN) roads. The Roads Task Force identified 20mph as being a suitable speed limit for streets in certain movement and place categories. The contribution that 20mph schemes can make towards achieving reduction in casualties and improving road safety, including for pedestrians and cyclists, is also emphasised. 20mph schemes can also assist in improving public health, which is a responsibility that has recently been transferred to local authorities.

20mph zones and limits across London

A questionnaire was sent to all 33 local authorities in London with 15 responses received, and a number of key themes emerged. A borough-wide approach is becoming more widespread, especially in inner London. There is variability as to whether borough main roads are included or excluded from a blanket 20mph approach. Other boroughs implement 20mph schemes on an area-by-area basis, most commonly prioritising areas based on collision history, resident requests, and in some cases the presence of schools.

Using a 20mph limit (with signage and road markings only) is the most common approach that is now taken. This is because it is cheaper to implement than schemes involving physical traffic calming measures, and also avoids the opposition that physical measures often attract. In some cases, a budget is held back so that some targeted traffic calming can be implemented where high speeds persist. Whilst some ancillary publicity is usually undertaken alongside scheme implementation, behaviour change campaigns to encourage sustained driver compliance have generally not formed a core part of 20mph schemes.

Before and after vehicle speeds and collisions are generally monitored, along with traffic volumes in some cases. Reductions in collisions and vehicle speeds are generally achieved, although the effect is smaller for schemes without physical measures. One weakness is that monitoring often only takes places over a relatively short period (most usually a year); a longer monitoring period would provide more robust information.

Achieving compliance with 20mph schemes is an ongoing challenge. Whilst it seems that police are becoming more willing to enforce 20mph, their position remains that there should be no expectation for additional police resources.

Road safety rationale for 20mph speed limits

The available evidence shows a clear link between average vehicle speeds, and the number and severity of collisions that occur. A reduction in vehicle speeds would be expected to both reduce the number of collisions that occur, and decrease the severity of those that do occur.

Reducing speed limits is one way to lower vehicle speeds. The available evidence indicates that on average, the change in average vehicle speed is approximately 25% of the change in the speed limit. This would equate to a decrease of about 2.5mph for a 10mph reduction in the speed limit. However, this is heavily dependent on local circumstances.

There are a number of factors (apart from the legal speed limit itself) that influence the drivers' speeds. Physical measures can be put in place, but these are expensive to implement. Enforcement can also be used, and Intelligent Speed Adaptation (ISA) is an emerging technology that may prove useful. However, the key to achieving a sustainable decrease in vehicle speeds is via cultural change amongst drivers, such that driving at 20mph becomes the norm in urban areas.

Impacts of 20mph schemes

There is strong evidence that 20mph zones result in significant casualty reductions, although the available studies focus on zones with physical traffic calming. Such zones result in a decline in speeds on about 9mph on average. The evidence on vehicle emissions is mixed, with the effect dependent on fuel type and driving styles. Any impact on traffic noise is likely to be negligible. There is also some evidence that 20mph zones can reduce traffic volumes and increase the use of sustainable modes, such as walking and cycling, especially where 20mph is implemented as part of a wider package of measures.

Examples of policy in practice

A number of examples of 20mph policy in practice were examined. It was found that in the UK, signed-only 20mph schemes generally achieve relatively small speed reductions of 1–2mph, although early monitoring suggests that even this small change is translating into noticeable road safety benefits. This will need to be confirmed once further data is available. There may be some other positive impacts from these schemes, although there is currently little data available that is conclusive.

An examination of case studies from overseas has shown that many countries have followed a similar trajectory of relaxation in the requirements for physical measures as part of 30km/h schemes. The aim of this has been to facilitate more widespread implementation of such schemes. One of the most relevant overseas examples is from Graz in Austria, where a 30km/h city-wide limit was implemented primarily using signs, and in conjunction with a programme of police enforcement. Whilst there was only a minor reduction in average vehicle speeds, significant decreases in collisions and casualties was observed.

Research conducted by the University of the West of England suggests that it is crucial that an integral programme of 'soft' measures be included as part of any signed-only 20mph limit. The aim is to effect cultural change amongst drivers, so that driving at 20mph in urban areas becomes normal.

Lessons for future 20mph policy in London

Based on the evidence that has been compiled, the key conclusions of this study are that:

- The evidence is clear that **reducing vehicle speeds results in fewer and less severe collisions, particularly for vulnerable road users**.
- Historically, 20mph zones have been successful at reducing speeds by using physical traffic calming measures. Limited resources and relaxed regulations mean that signed-only 20mph limits are now preferred, however these tend to achieve **smaller decreases in vehicle speeds**.
- The challenge is to find ways to achieve reductions in vehicle speeds in signed-only 20mph limits, so that safety benefits are still achieved. Enforcement is only a partial solution, with **changed driver attitudes so that 20mph is seen as the appropriate speed in urban areas** being the key to achieving sustained reductions in vehicle speeds; although this will take time, there are precedents such as attitudes towards drink driving. This may be supported by new technologies, such as Intelligent Speed Adaptation (ISA).
- This suggests that **supporting measures that foster cultural change** need to be an integral part of all 20mph schemes.

Based on this, a recommended policy approach for London is outlined in the table below.

Item	Description
Overall approach	• Applying an area-wide approach has the benefit of providing greater consistency for drivers, improving awareness and supporting cultural change • There is already a nucleus of existing 20mph boroughs in central London, and this could be used as a starting point for outwards expansion • For boroughs further away from the centre, the continued rollout of 20mph schemes on a case-by-case basis is recommended until the area-wide expansion reaches them • 20mph limits supported primarily by signage and roadmarkings are more cost effective; however, a budget should be retained to implement targeted measures where high vehicle speeds persist • Whether borough main roads and TLRN roads are included in 20mph schemes should be decided based on the local context • At least 10% of the implementation budget should be set aside for a package of complementary 'soft' measures to foster cultural change
Costs and benefits	• Evaluation of scheme benefits should focus on road safety impacts, and test a range of scenarios given the difficulty of accurately predicting changes in vehicle speeds • More certainty on the impacts of 20mph limits will be available once the DfT study is complete in 2017 • Improved clarity on signage and roadmarking requirements for 20mph limits would provide greater certainty on scheme costs • LIP funding should continue to be available for 20mph schemes, and the possibility of using public health funding should also be examined
Monitoring and evaluation	• More comprehensive monitoring over at least a three year period (encompassing collisions, vehicle speeds, movement volumes and a comparison against control areas) should be undertaken to evaluate the effectiveness of 20mph schemes • There would be merit in creating a London-wide system for monitoring the effects of 20mph schemes
Compliance	• Police enforcement is limited by available resources and competing priorities; this could be alleviated by allowing local authorities to enforce speed, which would enable better responsiveness to local issues and priorities • Technology such as Intelligent Speed Adaptation (ISA) has a role to play in achieving compliance, and more widespread adoption should be promoted

1 Introduction

1.1 This report sets out the findings of a study into the impacts of 20mph speed limits and zones, which Steer Davies Gleave has been commissioned to undertake by the London Borough of Merton on behalf of the London Environment Directors' Network (LEDNet).

1.2 As stated in the project brief, the purpose of this project is to:

> '…understand the effectiveness and impact of 20mph zones or limits where they have been introduced as area / city / authority wide schemes.'

1.3 This research has been undertaken in two main stages:

- **Stage 1 Comparative study**: General review and comparative study, which includes a literature review and examination of examples from both the UK and abroad, as well as a survey of London local authorities. This stage provides useful context on the current state of 20mph limits and zones.
- **Stage 2 Detailed investigations**: More detailed investigation of four selected case studies, which have been selected in conjunction with LEDNet. This has enabled more in-depth insights to be gained.

1.4 Following this introduction, the report includes the following chapters:

- Chapter 2 Legal, regulatory and policy context
- Chapter 3 20mph zones and limits across London
- Chapter 4 Road safety rationale for 20mph speed limits
- Chapter 5 Impacts of 20mph schemes
- Chapter 6 Examples of policy in practice
- Chapter 7 Detailed case studies
- Chapter 8 Lessons for future 20mph policy in London

2 Legal, regulatory and policy context

Chapter summary

- The new version of the Traffic Signs Regulations and General Directions (TSRGD) (proposed for introduction next year) incorporates the relaxation in requirements for physical traffic calming introduced in 2011. It also makes the lighting of regulatory signs within 20mph zones optional.
- 20mph schemes can also assist in improving public health, which is a responsibility that has recently been transferred to local authorities.
- Enforcement of 20mph speed limits is possible, and does take place (using both fixed speed cameras and mobile enforcement by police). However, the police's recently revised guidelines state that whilst enforcement of 20mph speed limits will be considered, it cannot take the place of proper engineering.
- Recent London-wide policy documents and strategies support the continued roll-out of 20mph schemes, including by boroughs and (where appropriate) on Transport for London Road Network (TLRN) roads. The Roads Task Force identified 20mph as being a suitable speed limit for streets in certain movement and place categories. The contribution that 20mph schemes can make towards achieving reductions in casualties and improving road safety, including for pedestrians and cyclists, is also emphasised.

Introduction

2.1 The ability of highway authorities to introduce 20mph schemes is heavily influenced by the legal, regulatory and policy context. For example, legal requirements dictate the elements needed to implement such schemes, whilst the policy context has a bearing on whether the strategic fit of 20mph schemes can be demonstrated and hence the likelihood of obtaining funding for implementation.

Legal and regulatory context

2.2 There are a number of documents, including various pieces of legislation and regulations, that prescribe the requirements for 20mph zones and limits. The key documents of most relevance are:

- Road Traffic Regulation Act 1984
- Traffic Signs Regulations and General Directions (TSRGD) 2002 as amended
- Local Authorities' Traffic Orders (Procedure) (England and Wales) Regulations 1996
- DfT Circular 01/2013 Setting local speed limits
- Traffic Advisory Leaflet 9/99 20mph speed limits and zones
- Traffic Management Act 2004
- Health and Social Care Act 2012

Setting speed limits

2.3 DfT Circular 01/2013 *Setting local speed limits*[1] provides guidance to highway authorities who are considering setting local speed limits, including 20mph zones and limits.

2.4 The most important distinction to be made is the difference between 20mph zones and 20mph limits:

- **20mph zones** are supported by traffic calming and other features
- **20mph limits** are implemented using speed limit signage, and are not necessarily supported by traffic calming or other features

2.5 The features that are required in a 20mph zone are prescribed, and must generally be placed at intervals of no greater than 100m. Previously, only certain physical traffic calming features could be used to meet this requirement, but recently more flexibility has been allowed. The implication of this is that it may reduce the cost of implementing 20mph zones by reducing the number of physical traffic calming features required. The features that can be used are:

- A repeater speed sign (TSRGD diagram 670)
- A speed roundel road marking (TSRGD diagram 1065)
- A combination of both these signs
- Physical traffic calming features (note that at least one physical traffic calming feature must still be present in each 20mph zone)

2.6 On the other hand, as 20mph limits do not require any features (aside from the necessary regulatory signs), they are generally cheaper to implement compared to 20mph zones. However, the DfT circular states that 20mph limits are only suitable when mean speeds are already at or below 24mph.

2.7 In any case, it is also stated that both 20mph zones and limits should be self-enforcing, with no expectation for the police to enforce them. This is consistent with the previous position of the Association of Chief Police Officers (ACPO), however revised speed enforcement guidelines were published last year (and discussed below).

2.8 The DfT circular outlines the factors to be taken into account when considering 20mph zones and limits. It states that 20mph zones and limits may be appropriate in the following situations:

- 'Major streets where there are—or could be—significant numbers of journeys on foot, and/or where pedal cycle movements are an important consideration, and this outweighs the disadvantage of longer journey times for motorised traffic.'

[1] DfT (2013) *Setting local speed limits* [Circular 01/2013], DfT, London.

- 'Residential streets in cities, towns and villages, particularly where the streets are being used by people on foot and on bicycles, there is community support and the characteristics of the street are suitable.'

2.9 More generally, the circular also notes that it is 'important to consider the full range of options and their benefits'.

2.10 As part of the traffic order making process related to the implementation of a 20mph zone or limit, statutory consultation must be undertaken with a number of specified organisations. However, it is recommended that consultation not be limited to this minimum; the DfT circular states that 'comprehensive and early consultation of all those who may be affected' should be undertaken.

2.11 Accompanying the DfT circular is a Speed Limit Appraisal Tool, which is intended to assist highway authorities in assessing the impacts of setting a local speed limit. The impacts that this tool takes into account are:

- Safety
- Traffic speeds
- Emissions
- Noise
- Traffic volumes

2.12 These impacts, and the methodologies adopted to estimate these impacts, are discussed further in Chapter 5.

2.13 An older document relevant to 20mph zones and limits is Traffic Advisory Leaflet 9/99 *20mph speed limits and zones*[2]. Whilst some of the content of this document (in particular regarding regulations) is now out of date, it contains design advice that remains useful. This includes considerations such as the location and design of zone and limit boundaries, and the range of traffic calming measures available to moderate vehicle speeds.

2.14 Earlier this year, DfT ran a consultation on the revised TSRGD to be introduced in 2015. The consultation closed in mid-June and the feedback received is currently being analysed. The new TSRGD will incorporate the change in requirements for traffic calming measures within 20mph zones previously permitted under an Area-Wide Special Direction issued on 17 October 2011.

2.15 It is also proposed that the new TSRGD will provide traffic authorities with the option of not directly lighting regulatory signs within 20mph zones (although if not lit they must be reflectorised).

2.16 The DfT circular relating to this consultation states that:

> The Government recognises that 20 mph zones and 20 mph limits can be useful in the right locations, but that these are local decisions which should be made in consultation with local communities. It is hoped that the removal of the requirement for sign lighting within 20 mph zones and

[2] DfT (1999) *20mph speed limits and zones* [Traffic Advisory Leaflet 9/99], DfT, London.

> limits, and the relaxations in respect of traffic calming measures within 20 mph zones will incentivise traffic authorities to consider such measures.[3]

Network management duty

2.17 The Traffic Management Act 2004 contains various requirements on how highway authorities should manage their road networks. The act places a duty on an authority to secure the expeditious movement of traffic on their network, and to facilitate the same on the networks of other authorities. This can be perceived as a duty to secure the fast movement of motorised traffic and used as an argument against 20mph schemes. However, this narrow interpretation does not reflect the whole meaning of this requirement, as 'traffic' encompasses all modes of transport using roads, including pedestrians. The duty is essentially about balancing the needs of all road users, and also operates alongside other duties, including those in the area of road safety. This is made clear in the DfT's Network Management Duty Guidance:

> The overall aim of the "expeditious movement of traffic" implies a network that is working efficiently without unnecessary delay to those travelling on it. But the duty is also qualified in terms of practicability and other responsibilities of the authority. This means that the duty is placed alongside all the other things that an authority has to consider, and it does not take precedence. So, for example, securing the expeditious movement of vehicles should not be at the expense of an authority's road safety objectives. But, the statutory duty reflects the importance placed on making best use of existing road space for the benefit of all road users.[4]

2.18 In addition, experience has shown that whilst concerns are sometimes raised regarding increased journey times, there have generally been no noticeable impacts (on either general traffic or buses) once a scheme has been implemented. This is discussed later in this report.

Public health responsibilities

2.19 Under the Health and Social Care Act 2012, local authorities took on a number of public health responsibilities in April 2013. This is of relevance, given the strong links between road safety and public health, which has been recognised by a number of local authorities, and is discussed in a recent report from the Royal Society for the Prevention of Accidents (RoSPA)[5].

2.20 Specifically, the RoSPA report notes some direct links that road safety has with the Public Health Outcomes Framework:

- Domain 1 – Improving the wider determinants of health:
  - 1.10 Killed and seriously injured casualties on England's roads
- Domain 2 – Health improvement:

[3] DfT (2014) *DfT Circular: The Traffic Signs Regulations and General Directions 2015* [draft], DfT, London.
[4] DfT (2004) *Traffic Management Act 2004 Network Management Duty Guidance*, DfT, London.
[5] RoSPA (2014) *Road Safety and Public Health*, RoSPA, Birmingham.

- 2.7 Hospital admissions caused by unintentional and deliberate injuries in children and young people aged 0-14 and 15-24 years

- Domain 4 – Healthcare, public health and measuring premature mortality:
  - 4.1 Infant mortality
  - 4.3 Mortality rate from causes considered preventable

Enforcement

2.21 Enforcement is one tool that can be used to encourage compliance with speed limits, and this includes 20mph speed limits. This section begins by discussing the current police guidance on the enforcement of 20mph speed limits. A number of examples where 20mph are enforced in practice are then outlined.

Association of Chief Police Officers (ACPO) Guidelines

2.22 Prior to a revision of its speed enforcement policy guidelines in 2013, the Association of Chief Police Officers (ACPO) came under criticism for their approach to the enforcement of 20mph limits. The impression had been that the police took the view that 20mph zones should be largely 'self-enforcing' and that enforcement would be confined to taking action against motorists who persistently broke the law.

2.23 The new guidance[6], whilst still emphasising that 'enforcement cannot and must not take the place of proper engineering and/or clear signing', brings the enforcement of 20mph limits closer to the approach used in regard to other speed limits. The document recommends that, in 20mph areas, drivers caught at speeds between 24–31mph should be offered the option of attending a speed awareness course or receiving a fixed penalty notice fine. At speeds of 35mph+ a summons is issued.

2.24 The new guidance states that:

> Enforcement will be considered in all clearly posted limits… but limits are only one element of speed management and local speed limits should not be set in isolation. They should be part of a package with other measures to manage speeds which include engineering, visible interventions and landscaping standards that respect the needs of all road users and raise the driver's awareness of their environment, together with education, driver information, training and publicity.

2.25 The National Driver Offender Retraining Scheme (NDORS) has developed a speed awareness course tailored to 20mph zones. It was introduced in November 2013 and will run until 2016.

Examples of 20mph enforcement

2.26 The new guidance discussed above was only released last year, and there has been a perception that enforcement of 20mph speed limits was difficult. Nevertheless, there are a number of examples where these limits are being enforced.

[6] ACPO (2013) *ACPO Speed Enforcement Policy Guidelines 2011-2015: Joining Forces for Safer Roads*, ACPO, London.

2.27 A 20mph speed limit is enforced on Tower Bridge by the City of London Police to minimise damage to the bridge's structure. As outlined in Chapter 3, the City of London has introduced a 20mph limit on nearly all its roads in a bid to reduce collisions. Police have said they will actively enforce the limit[7]. Police enforcement of 20mph is now taking place in Islington, and this is discussed further in Chapter 7.

2.28 Average 20mph speed cameras have been in place along Southend-on-Sea's Marine Parade since 2011 to enforce a 20mph zone. The zone was created following the introduction of the £7.6m City Beach shared space area. It may be extended to Western Esplanade in future if plans for a new £35m museum become a reality.

2.29 In Edinburgh, traffic police with speed guns began patrolling residential streets in May 2014 to enforce 20mph limits. Officers were positioned at accident black-spots as Edinburgh headed towards becoming the first city in Scotland to introduce 20mph limits across all residential areas. Previously, 20mph speed limits had been controlled through speed bumps and traffic calming measures but not enforcement. Police had been unwilling to devote resources to 20mph enforcement but this changed under a deal struck with city leaders. The city council made enforcement of 20mph areas part of its "service level agreement" with Police Scotland which saw it provide £2.6 million to enhance community policing. The agreement gave city leaders the right to a refund if officers were switched from their community role without approval.

2.30 In London, Hackney Borough Council has called for councils to be given the power to enforce 20mph speed limits using mobile and average speed cameras[8].

2.31 These examples demonstrate that enforcement of 20mph speed limits has been taking place and is possible, using both speed cameras and police with speed guns.

Policy context

2.32 Apart from legislation, relevant policies also influence whether and how 20mph schemes can be implemented. This section discusses a number of London-wide policies, that make reference to 20mph schemes:

- Roads Task Force
- Safe Streets for London
- Pedestrian Safety Action Plan
- Cycle Safety Action Plan
- London Cycle Design Standards (LCDS)

Roads Task Force (RTF)

2.33 The establishment of the RTF was a Mayoral manifesto commitment. It was set up in 2012 to consider the challenges facing London's roads now and in the future.

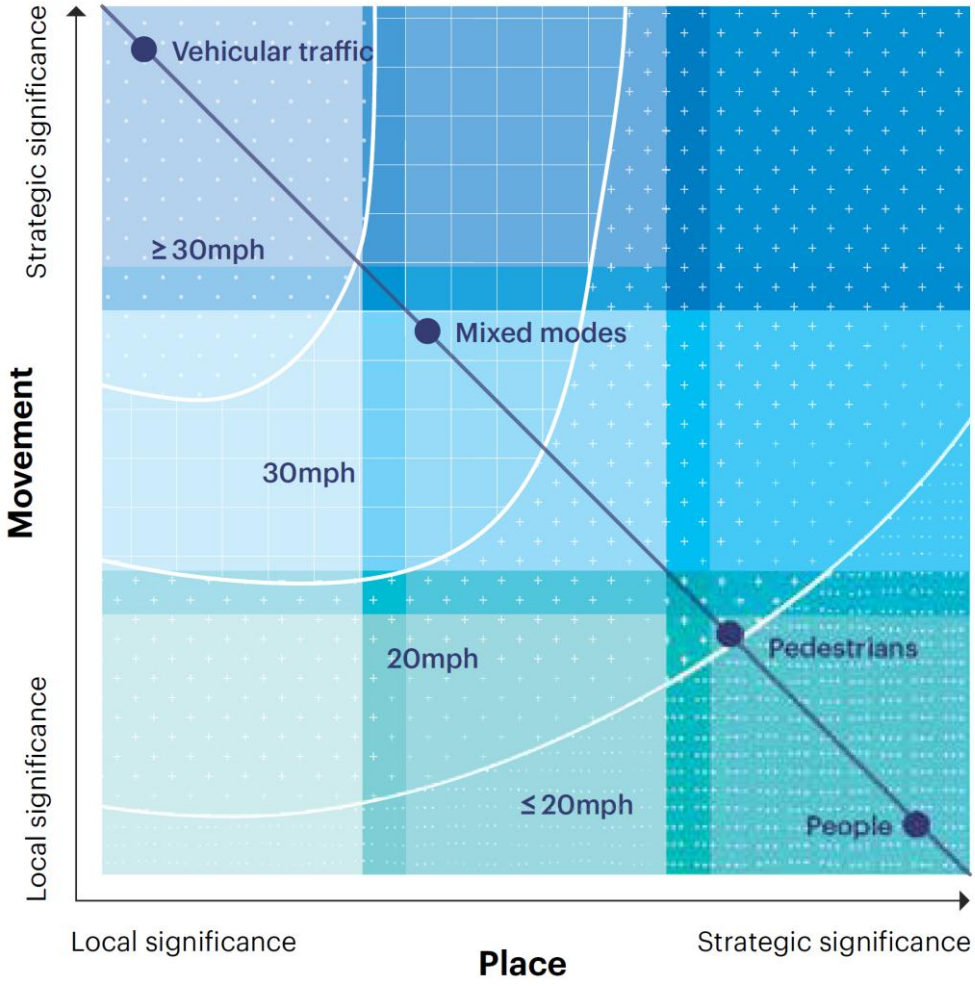
2.34 The RTF[9] notes that speed limits will play an important role where movement and place need to be more balanced, where there are high levels of pedestrian and cycling activity and where

[7] Rucki A (2014) *All roads in the City will have 20mph speed limit by the end of the month*, London Evening Standard. Available at http://www.standard.co.uk/news/transport/all-roads-in-the-city-will-have-20mph-speed-limit-by-the-end-of-the-month-9582113.html

[8] Local Transport Today (2014) *Give us power to enforce 20mph, says Hackney*. Available at **https://www.transportxtra.com/magazines/local_transport_today/news/?id=38575** [Accessed online 25 July 2014].

safety issues need to be tackled. One RTF recommendation was that the speed environment should be linked to different street types (based on movement and place) as shown in Figure 2.1.

Figure 2.1 The implications of street-types for the speed environment[10]



Source: Roads Task Force (2013) p95

2.35 The RTF has identified five toolbox 'compartments' which must all play a role if the vision for London is to be achieved. Each compartment contains tools that support the different functions, namely living, unlocking, functioning, protecting and sustaining – as well as moving.

2.36 Compartment 2, 'Making more efficient and flexible use of space', is about creating vibrant, safe and efficiently connected places which cater for the needs of all users, from business freight to pedestrians and cyclists. Tool 2b refers specifically to a 'Safe Speed Environment' and the particular importance of road design and speed limits for cyclist and pedestrian safety. The suggested application of Tool 2b is the implementation of a 20mph zone for central London (plus bridges), the roll out of 20mph limits on key street types (e.g. high roads/high

[9] Roads Task Force (2013) *The Vision and Direction for London's Streets and Roads*, London.
[10] The description of street types corresponding to the 9 tiles in this diagram range from *Arterial Road* (top left) to *City Place* (bottom right). An example of the former is the North Circular whilst an example of the latter is Covent Garden.

streets/city hubs) and the introduction of average speed cameras. It is deemed feasible that this tool can be implemented in the short-term i.e. by 2016.

2.37 In its response to the Roads Task Force[11], TfL outlined its work to date in improving and managing London's roads and how it will build on this success where there is immediate scope to put the RTF's recommendations into action. With particular reference to Tool 2b, TfL committed to:

- Continue to fund the roll-out of 20mph zones by boroughs through their LIPs, building on the 400 plus zones that have been funded by TfL and implemented by the boroughs to date;
- Trial 20mph speed limits at specific locations on the TLRN, such as the Waterloo Imax roundabout;
- Be open to a range of speed limits on main roads in London, including 20mph. Limits relevant to key arterial routes are different to those on routes where people live, work and shop, and TfL will consider variable speed limits and 20mph limits where appropriate and in line with DfT guidance;
- Work with London boroughs, such as Islington, Hackney, Camden and the City of London, which are all seeking to introduce borough-wide 20mph limits on borough roads and on parts of the TLRN, to understand the most effective means of implementation and compliance and the wider application in central London;
- Create a Road Fatalities Review Group to bring together road safety experts to learn lessons from fatal and serious collisions 2013 onwards, and develop new and coordinated responses to the issues; and
- From 2013 trial a Community Roadwatch scheme to help local communities in managing speeding in their neighbourhoods, and to raise awareness of the dangers of excessive speed and anti-social driving.

2.38 The prevailing message from both the Roads Task Force and TfL is that targeted reductions to speed limits will help to improve the environment for walking and cycling, contribute to revitalised urban destinations, reduce severance, increase community interaction and cohesion and improve general levels of road safety.

Safe Streets for London

2.39 *Safe Streets for London: The Road Safety Action Plan for London 2020* (June 2013) is TfL's overall road safety plan. It contains a number of actions organised under three headings: safe roads; safe vehicles; and safe people.

2.40 In general, the plan is supportive of 20mph limits and zones, supporting their expansion on both borough and Transport for London Road Network (TLRN) roads, subject to consideration of the function of each road taking into account Roads Task Force principles. The key actions in the plan of relevance are:

- **Safe Roads Action 11**: Building on the success of more than 400 20mph zone schemes in London, **TfL will support the installation of further 20mph zones and limits on borough roads** where compatible with the functions of the local road network. This will be delivered through:
  - Funding of new zones and limits through LIPs

[11] TfL (2013) *Delivering the Vision for London's Streets and Roads: Transport for London's Response to the Roads Task Force*, TfL, London.

  - Engaging with police and boroughs to establish effective methods of ensuring compliance and maximising casualty reduction impacts, including consideration of enforcement by cameras (2013 onwards)
  - Supporting boroughs in evaluating ways of ensuring casualty reduction through 20mph limits (2013 onwards)

- **Safe Roads Action 12: TfL will continue to be open to a range of speed limits on London's main roads, including 20mph where appropriate**, in light of the Roads Task Force's fundamental review identifying the need to manage the wide range of roads in London in different ways. Limits needed on key arterial routes are different from those on routes where people live, work and shop. In light of the Task Force's and DfT guidance, TfL will continue to consider variable speed limits and 20mph limits where appropriate, for example Camberwell and Waterloo, where cycle improvements are planned. TfL will also integrate international best practice to ensure the most effective use of 20mph (30kph) limits in city settings (2013).
- **Safe People Action 37: TfL will use its power and influence to seek amendments to legislation so that speed awareness courses can be offered to drivers as an alternative to prosecution** for exceeding a 20mph speed limit. This will reduce reoffending by drivers and will require working with central government and the police (2013 onwards).

2.41 In addition, the plan specifically notes locations where 20mph zones and limits are introduced as areas where research should be undertaken to understand their impact. It also states that consideration will be given to 20mph limits enforced by cameras.

Pedestrian Safety Action Plan

2.42 The draft *Pedestrian Safety Action Plan* (2014) sets out a strategy for improving the safety of pedestrians in London. It contains actions aimed at reducing pedestrian casualties ranging from design guidelines to speed enforcement.

2.43 The plan highlights how the likelihood of severe injury and death increases dramatically with speed; at 20mph most pedestrians will survive a collision but at 40mph the risk of fatal injury increases to 31%[12]. The key actions in the plan related to speed are:

- **Action 10**: TfL, alongside the City of London, will trial 20mph speed limits on two stretches of the TLRN across the City of London, including London Bridge and Blackfriars Bridge **to reduce casualties associated with speed**. The trials will be closely monitored with a view to rolling out similar schemes elsewhere on the TLRN in future. This action is due to be completed by 2015.
- **Action 11**: TfL will continue to encourage London boroughs to deliver more 20mph schemes through their Local Implementation Plan (LIP) programmes, in order **to create safer environments for pedestrians** in London. This action will start in 2014 and will then be ongoing throughout the draft plan to 2020.
- **Action 12**: TfL will **crack down on speeding vehicles** that threaten pedestrian safety by:
  - replacing around 350 obsolete wet film speed cameras with digital cameras across London;
  - installing approximately 250 digital red light cameras at around 200 junctions across London; and

[12] TfL (2014) *Draft Pedestrian Safety Action Plan*, TfL, London.

  - installing average speed camera system trials on stretches of the following four roads in the Capital: A406, A40, A2 and A316.
    This action is due to be completed by 2016.

- **Action 13**: Building on the success of Operation Safeway, TfL will issue the Metropolitan Police Service Roads Policing Unit with maps and data highlighting the location of high pedestrian risk, in order to **better target their enforcement activity**. They will also focus on issues such as cracking down on mobile phone use whilst driving and educating drivers about flashing amber signals at pedestrian crossings. This action is due to be completed by 2020.
- **Action 14**: The Mayor and TfL will work with the police to embed the use of **Speed Awareness Courses for motorists as an alternative to prosecution** in cases of minor speed infractions, with a focus on 20mph limits. Greater enforcement of 20mph limits will ensure the safety benefits of lower speeds limits for pedestrians are fully realised. This action is due to be completed by 2015.

Cycle Safety Action Plan

2.44 The draft *Cycle Safety Action Plan* (2014)[13] sets out a strategy for improving the safety of cyclists in London. It contains actions aimed at reducing cycling casualties ranging from junction improvements to driver awareness.

2.45 The *Designing safe streets for cycling* section sets out actions to improve the infrastructure of London's streets to make them safe places to cycle and places where Londoners feel safe to cycle. Action 5 essentially repeats Actions 10 and 11 from the Pedestrian Safety Action Plan but with a specific focus on cyclists:

- Action 5: TfL, alongside the City of London, will trial 20mph speed limits on two stretches of the TLRN in the City of London, including London Bridge and Blackfriars Bridge, **to create safer and more attractive environments for cycling**. The trials will be closely monitored to help understand the potential of 20mph limits at other locations on the TLRN. TfL will also continue to encourage London boroughs to deliver more 20mph schemes through their LIP programmes.

London Cycle Design Standards (LCDS)

2.46 TfL are currently consulting on a new version of the London Cycle Design Standards (LCDS)[14]. The consultation draft draws on Dutch experience, outlining a 'cycle street' treatment that may be appropriate for streets that have high cycle volumes relative to motor vehicle volumes. Such a treatment involves marking advisory cycle lanes and removing the centre line on quiet local streets with narrow carriageways. Whilst a type of cycle street is proposed for inclusion in the TSRGD 2015, in the interim the LCDS suggests that cycle streets could be implemented within 20mph zones, by using the lower panel of the 20mph zone signs to indicate that status of such streets.

2.47 In addition, the consultation document specifically refers to 20mph speed limits on cycle routes:

[13] TfL (2014) *Cycle Safety Action Plan* [draft], TfL, London.
[14] TfL (2014) *London Cycle Design Standards* [consultation draft], TfL, London.

> Wherever possible, 20mph should be the maximum speed limit on roads forming part of designated cycling routes off main roads, including local streets, town squares and city places. Locations where 20mph limits may be appropriate should be identified and assessed through the route assessment process… (p197)

3 20mph zones and limits across London

Chapter summary

- A borough-wide approach to 20mph is becoming more widespread, especially in inner London. Three central London boroughs have already implemented area-wide schemes, forming a 'nucleus' of 20mph areas. Other boroughs are planning a borough-wide approach, but there is variability as to whether borough main roads are included or excluded.
- Other boroughs implement 20mph schemes on an area-by-area basis, most commonly prioritising areas based on collision history, resident requests, and in some cases the presence of schools.
- Using a 20mph limit (with signage and road markings only) is the most common approach that is now taken. This is because it is cheaper to implement than schemes involving physical traffic calming measures, and also avoids the opposition that physical measures often attract. In some cases, a budget is held back so that some targeted traffic calming can be implemented where high speeds persist.
- Whilst some ancillary publicity is usually undertaken alongside scheme implementation, behaviour change campaigns to encourage sustained driver compliance have generally not formed a core part of 20mph schemes.
- Before and after vehicle speeds and collisions are generally monitored, along with traffic volumes in some cases. Reductions in collisions and vehicle speeds are generally achieved, although the effect is smaller for schemes without physical measures. One weakness is that monitoring often only takes places over a relatively short period (most usually a year); a longer monitoring period would provide more robust information.
- Achieving compliance with 20mph schemes is an ongoing challenge. Whilst it seems that police are becoming more willing to enforce 20mph, their position remains that there should be no expectation for additional police resources.

Introduction

3.1 In order to inform this study, it is important to understand the current situation regarding 20mph zones and limits throughout London, and the current policies and approaches various local authorities have towards 20mph schemes. To collect this information, a short questionnaire was developed, and supplied to LEDNet to be sent to each of the 33 local authorities in London (including those who are not LEDNet members).

3.2 A copy of this questionnaire is included in Appendix B. The questionnaire contained questions on the following topics:

- Current coverage of 20mph zones and limits
- Current policies
- Approach to implementation and prioritisation
- Reasoning
- Monitoring and evaluation
- Barriers and challenges

Responses

3.3 A total of 15 responses were received, which represents a response rate of 45%. A significantly higher response rate was achieved for inner London authorities (9 out of 13, or 69%) compared to outer London authorities (6 out of 20, or 30%). A summary of the boroughs that responded is included in Table 3.1 below.

Table 3.1 Responses received to borough questionnaire

Local authoritiy	LEDNet member	Response received?
INNER LONDON		
Camden	Yes	Yes
City of London	Yes	Yes
Greenwich	No	Yes
Hackney	Yes	No
Hammersmith and Fulham	Yes	Yes
Islington	Yes	Yes
Kensington and Chelsea	Yes	No
Lambeth	Yes	Yes
Lewisham	Yes	No
Southwark	Yes	Yes
Tower Hamlets	Yes	Yes
Wandsworth	Yes	Yes
Westminster	Yes	No
OUTER LONDON		
Barking and Dagenham	Yes	No
Barnet	Yes	No
Bexley	No	No
Brent	Yes	Yes
Bromley	Yes	No
Croydon	No	Yes
Ealing	Yes	Yes
Enfield	Yes	No
Haringey	Yes	Yes
Harrow	Yes	No
Havering	Yes	No
Hillingdon	No	No
Hounslow	Yes	No
Kingston upon Thames	Yes	Yes
Merton	Yes	Yes
Newham	Yes	No
Redbridge	Yes	No
Richmond upon Thames	Yes	No
Sutton	Yes	No
Waltham Forest	Yes	No

3.4 A summary of the key points made by each authority in their responses to the questionnaire is included in Table 3.2 below.

Table 3.2 Summary of responses to borough questionnaire

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges
		INNER LONDON		
Camden	All borough roads (mix of zones and limits) Short section of TLRN (Camden High Street)	• Long-standing commitment to introduce 20mph limits and zones to reduce casualties, and also encourage more walking and cycling; helps to achieve objectives and targets in Camden Transport Strategy and Camden Plan • Prior to borough-wide limit, zones prioritised based on number of casualties and severity; up until 2011 traffic calming was used, after this signage primarily used with targeted physical measures • Borough-wide limit implemented using signing and lining, together with publicity and promotional campaigns; will consider additional targeted signing and traffic calming based on results of monitoring • Case for 20mph limit primarily based on road safety benefits, in particular for vulnerable road users such as pedestrians and cyclists (which the council wants to encourage); this drew on existing research as well as UK case studies (including in Camden), and casualty savings (and associated cost savings) calculated based on Camden's three year average casualty data • Also looked at existing research on emissions, but not conclusive • Case was also made for efficiency savings of a borough-wide limit, given that much of the borough was already covered by 20mph, and that a borough-wide limit would be more cost effective and consistent • Did not undertake an assessment of traffic diversions, as the existing widespread 20mph in the borough meant that these would be occurring anyway • Cost of the scheme significantly lower than expected—funding drawn from the portion of annual LIP funding allocated for road safety	• Prior to borough-wide limit, speed and casualty monitoring undertaken on zones with traffic calming—results showed that casualties dropped by 53.4% • Too early to assess the impact of the borough-wide limit, but results of monitoring will be used to inform where additional measures are needed	• 20mph zones and borough-wide limit generally received wide-spread support; objections mainly in relation to traffic calming measures and from taxi drivers • TfL were supportive, but raised concerns about journey time impacts and bus reliability • Concerns regarding enforcement, with police expecting that all necessary measures will be implemented to make the 20mph limit clear to drivers • Some raised concerns that a 20mph limit would make roads more dangerous • Issues about road markings (particularly in conservation areas)—some want less but some want more

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges

City of London	All roads (except for A3211 and A1210)
	(previously 20mph on several minor streets)
		• City-wide 20mph policy adopted in response to increasing casualties, related to increased walking and cycling in the City (a trend which is expected to continue)
		• Predicted impacts:
		  ◦ Reduction in casualties by 8.6%
		  ◦ Up to a 10% increase in average journey times
		  ◦ Strongly positive impact on walking and cycling environment, and modal shift to cycling
		  ◦ Significant positive impact on air pollution due to reduced brake and tyre wear
		  ◦ Insignificant or neutral impact on modal shift to walking; air pollution (exhaust emissions); greenhouse gas emissions; emissions due to modal shift; noise pollution and vibration
		• Policy supported by City of London Police
			• Surveys across 59 sites indicated that the existing average spot mean speed in the City is 21.9mph	-

Greenwich	40% of borough roads (37 zones)
	45 potential zones identified for remaining area
		• Adopted policy of introducing 20mph limits on all residential roads
		• Approach to implementation includes:
		  ◦ Speed surveys on every road in zones to identify 85%ile speeds, where below 24mph will consider signs only, otherwise will introduce physical measures
		  ◦ Liaison with local schools to cover road safety, and school children provide sketches for use on signage
		  ◦ VAS used where appropriate
		• Prioritisation of remaining zones based on analysis of collision data, with a total score calculated based on weightings applied to various factors:
		  ◦ Collision severity
		  ◦ Collisions involving vulnerable road users (pedestrians, cyclists, P2Ws, children)
		  ◦ Journeys to/from school
		  ◦ Number of schools in each zone
			• Reviews of zones undertaken to asses effectiveness—looks typically at speeds and collision data (typically 12–18 months after implementation)	• Main issue is fairly low response rate to consultations, although a majority of participants tends to be supportive of measures

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges
Hammersmith & Fulham	About half of borough roads Mostly zones, one limit	• New administration has a manifesto pledge to make all residential streets (but not trunk roads) 20mph; case to be built in 2015/16 LIP funding cycle along with feasibility design and community engagement and consultation • Historic approach has been to implement based on casualties using LIP funding, with a few school specific zones delivered as part of school travel plans • All zones fully traffic calmed (mostly cushions), entry signs designed by local schools and accompanied with local publicity campaigns • Rolling programme of speed indicator devices that are moved around zones on a six monthly basis.	• Before and after casualty monitoring (both for three year periods) for various zones has shown a decrease in injuries of between 40% and 70%	• Most zones have received significant majority public support • Political opposition (to traffic calming measures) has been major barrier to extending the zonal programme, alongside decreasing rates of return (casualty savings) • Perception of poor compliance (responded to with speed indicator devices)
Islington	All borough roads	• The council supported the implementation of 20mph zones through the LIP between 2002 and 2009, when Islington decided to complete its programme through the use of 20mph limits using council funding • Between 2002 and 2009, 20mph zones implemented using physical measures, after consulting local residents; prioritisation was based on areas with concentrations of casualties • After 2009 20mph limits were implemented after consultation to complete the programme	• Surveys have shown a reduction in speeds and casualties in areas where 20mph zones have been implemented • Ongoing monitoring of 20mph limits shows a slight reduction in overall speeds; currently working with the police and lobbying for stronger enforcement	• Implementation of 20mph zones resulted in some concerns related to physical measures at the time; however, no significant calls for their removal post-implementation

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges
Lambeth	Approximately 1/3	• Lambeth Transport Plan supports borough-wide 20mph but would investigate further; a commitment to a 20mph zone was in the Lambeth Labour party manifesto and the borough is committed to delivering this over the next two years • Programme is currently being worked up, but is likely to initially roll-out signage with a publicity campaign, with follow-up physical measures where there is persistent speeding or local concerns • Also considering more intensive engagement with physical calming measures and other community street projects in some wards, but to be decided as part of overall programme • Evidence base will be assembled over next six months as part of making the case for borough-wide coverage—but there is already general political support • Evidence will focus on speed surveys, collision history, quality of life and related benefits such as supporting cycling and walking	-	• None yet (early stage of programme development)
Southwark	85% of borough roads All borough roads and most boundary roads by October 2014	• Long standing policy in favour of 20mph (Transport Plan 2011); Council Assembly passed formal motion in 2013 and subsequently a council budget was made available • Around 85% of roads already 20mph, remainder to be supported by signs and roundels only • Do not support use of vehicle activated signs • A budget to pay for physical interventions has been held back, but these will be concentrated in only those areas where a need is evidence once the signage-only approach has been monitored	• Full before and after monitoring is being undertaken, but results are not yet available • Evidence from earlier zones has concentrated on speed and volume data, although given the range of different approaches to implementation in previous years cross-comparison is difficult	• Formal objection from police on grounds that some roads have a mean speed above 24mph • Some challenges in design process to combine a mixture of existing 20mph zones and limits with a new borough-wide limits (as legislative and signage rules not always helpful)—for example, treatment of private roads, treatment of existing zone boundaries

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges
Tower Hamlets	85% of roads (23 zones)	• Plan to implement a borough-wide 20mph limit during the current year • 85% of the borough already covered has physical traffic calming throughout which will be reviewed for effectiveness, but borough-wide limit will be largely signage and roundels, with rearrangement of parking contributing to physical calming measures where appropriate • Intention is to include the whole borough, including the TLRN if TfL can be persuaded • Reasoning based on review of existing zones (70% reduction in collisions); residents' perceptions of road safety and requests for speed enforcement led to this becoming a Mayoral pledge at recent local elections	• Before and after road safety analysis	• Potential reluctance of TfL and police to cooperate • Cost of implementation of more traffic calming has stalled extension of zones to the rest of the borough
Wandsworth	Map supplied, appears to cover approximately 15%–25% of the borough's area	• Policy supports introducing 20mph schemes, and they are already considered as part of the Neighbourhood and Safer Routes to School programmes • New 20mph zones/limits are resident-led, with support from local members • Factors to be considered when prioritising schemes include traffic speeds; number of collisions; local demand; existing measures; removal of existing traffic calming; collisions involving vulnerable road users; schools; high number of vulnerable road users; cycle route or high number of cyclists; results of consultations; cost	• Monitoring of two schemes that did not involve additional physical traffic calming showed mixed results for changes in average speeds—the Dover House area had a reduction of 0.38mph, and the West Putney area had a reduction of 1.9mph • Road Safety Strategy states that traffic surveys (speed and flow) should be carried out one year after construction	• Main issue has been calls for schemes to be enforced—this is difficult to control as responsibility lies with the police, however there are regular liaison meetings with the police which Wandsworth use to influence enforcement schedules when police resources are available

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges
		OUTER LONDON		
Brent	Approximately 24%	• Current policy is to implement 20mph schemes where required (not adopting blanket approach) • Where zones are outside schools they have been engaged with, and a competition run to design a sign • All schemes have involved installing physical traffic calming measures • Only small number of vehicle activated signs—used where there are a very high number of collisions involving pedestrians • 20mph zones determined based on collision history, speed surveys, locations and other benefits to the area (such as air quality, rat-running, quality of life)	• Accident reduction	• Emergency services
Croydon	Few percent (introduced over ten years ago, mostly around schools)	• Looking to develop policy on 20mph zones/limits • Approach is to look at large areas of borough • Considering whether main roads should be included or not • Anticipate using signs-only, with physical measures where absolutely necessary • Reasoning and priority likely to be based on collision record and some form of cost benefit appraisal (as more difficult to judge quality of life improvements)	-	• Enforcement (or lack of it) • Cost of signage • Any need for physical measures • Monitoring / evaluation of collisions

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges
Ealing	Map supplied, appears to cover approximately 30%–40% of the borough's area	• 20mph zones/limits are included in Ealing's LIP as possible measure to improve road safety and improve quality of life • Approach selected on case by case basis to suit local circumstances, and both signage only and physical traffic calming schemes have been used • Vehicle activated signs have been used in some locations (for example on roads with large volumes of HGVs) • 20mph zones/limits are prioritised according to number of collisions and residents' complaints • Some 20mph limits included as integral elements of comprehensive road safety and urban realm improvement schemes • Currently no 'roll-out' of 20mph schemes across Ealing, rather they are included in the LIP delivery plan according to need (a borough-wide police is currently being considered)	• Before and after assessments of collisions in 20mph zones	• Generally significant barriers or challenges not experienced • Some complaints and negative response from certain road user groups and sections of the community • Overall experience is that the majority of residents support in public consultations
Haringey	Approximately 50% (all zones)	• Recently adopted policy is the implement a borough-wide 20mph limit, except for Principal Roads not in town centres, which will remain at 30mph • Approach will use signs and road markings only, with traffic calming considered where speeds remain high (particularly around schools) • Cost of limit estimated at £500–600k and take about 12 months to implement, compared to 20mph zones which would cost £20m and take 15–20 years to implement • Adoption of policy based on extensive consultation with stakeholders; neighbouring boroughs' policies; supporting sustainable transport; collision history; speed surveys; perception of safety • Results of consultation show mixed views—42% of respondents support and 46% oppose a borough-wide limit; this changes to 65% support and 35% oppose if 20mph only applies to residential roads and roads outside schools	• Before and after data for 20mph zones • Resident satisfaction	• Opposition, both political and through consultation • Cost (prior to relaxation of requirements)

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges

Kingston upon Thames	Approximately 45% of borough roads (zones and limits)
	Will approach 50% once 2014/15 schemes in development are implemented
		• LIP mentions implementing speed restrictions appropriate to the road environment and development of a borough-wide 20mph implementation plan
		• Recently carried out a review of all existing 20mph zones/limits for compliance with new guidance, which offered opportunity to consider areas where new schemes or extensions to existing schemes might be appropriate
		• Borough split into four neighbourhood areas, each responsible for their own highway network (therefore differing levels of coverage, due to differences in willingness to accept vertical deflection):
		  ◦ Kingston Town: virtually 100% coverage on non-principal roads, more generic approach in residential areas due to neighbourhood support for roll-out across the neighbourhood
		  ◦ Surbiton: more generic approach in residential areas due to neighbourhood support for roll-out across the neighbourhood led by officers
		  ◦ South of the Borough / Maldens and Coombe: demand-led approach, residents' groups have been driving force
		• Throughout all neighbourhoods, schemes supported by assessments of collision data and speed surveys
		• New schemes are generally including a minimum level of physical features (subject to existing average speeds ≤25mph), as schemes with minimal changes and no vertical deflections more likely to be accepted
		• Speed Indicator Display signs used where speeds are insufficiently low or have not reduced as much as anticipated
			• Before and after speed surveys
			• Before and after collision data
			• Currently reviewing all existing schemes, will undertake changes to bring into line with current guidance and remove potential police objections
				• Historically main challenges related to the inclusion and siting of physical measures (whilst residents generally supported schemes they did not support physical measures adjacent to their properties), members in some neighbourhoods would not agree to schemes with physical measures

Borough	Current coverage	Policies, approach and reasoning	Monitoring and evaluation	Barriers and challenges
Merton	Approximately 40% (zones and limits)	• Currently combination of 20 mph limits and zones, majority implemented during last 5 years • Existing policy (such as in LIP) focusses on need to reduce speeds and collision rates, but does not commit to a particular 20mph approach; however current administration has adopted an evidence-based approach to target areas that experience particular issues, until evidence is available to support an alternative approach • Existing approach generally about targeted interventions on case-by-case basis, depending on local circumstances; 'time' has also had an influence upon political thinking and overall approach • Both physical traffic calming and signage schemes have been used; vehicle activated signs have been used in some locations • Schemes generally prioritised according to numbers of collisions / complaints from residents • A borough-wide policy approach may be considered once monitoring work is finalised, and this research has been undertaken to determine effectiveness of schemes in other areas	• Monitoring analysis recently commissioned to influence future policy and to assess the effectiveness of current schemes • Focus on comparison of before and after accident data, traffic flows and vehicle speed data • Work is currently being finalised and will be reported in autumn	• Current approach has not resulted in significant barriers or challenges • Cost and budgetary pressures support a targeted approach at the current time • Political and stakeholder pressure to implement borough-wide 20mph limit, but borough will not adopt without further evidence

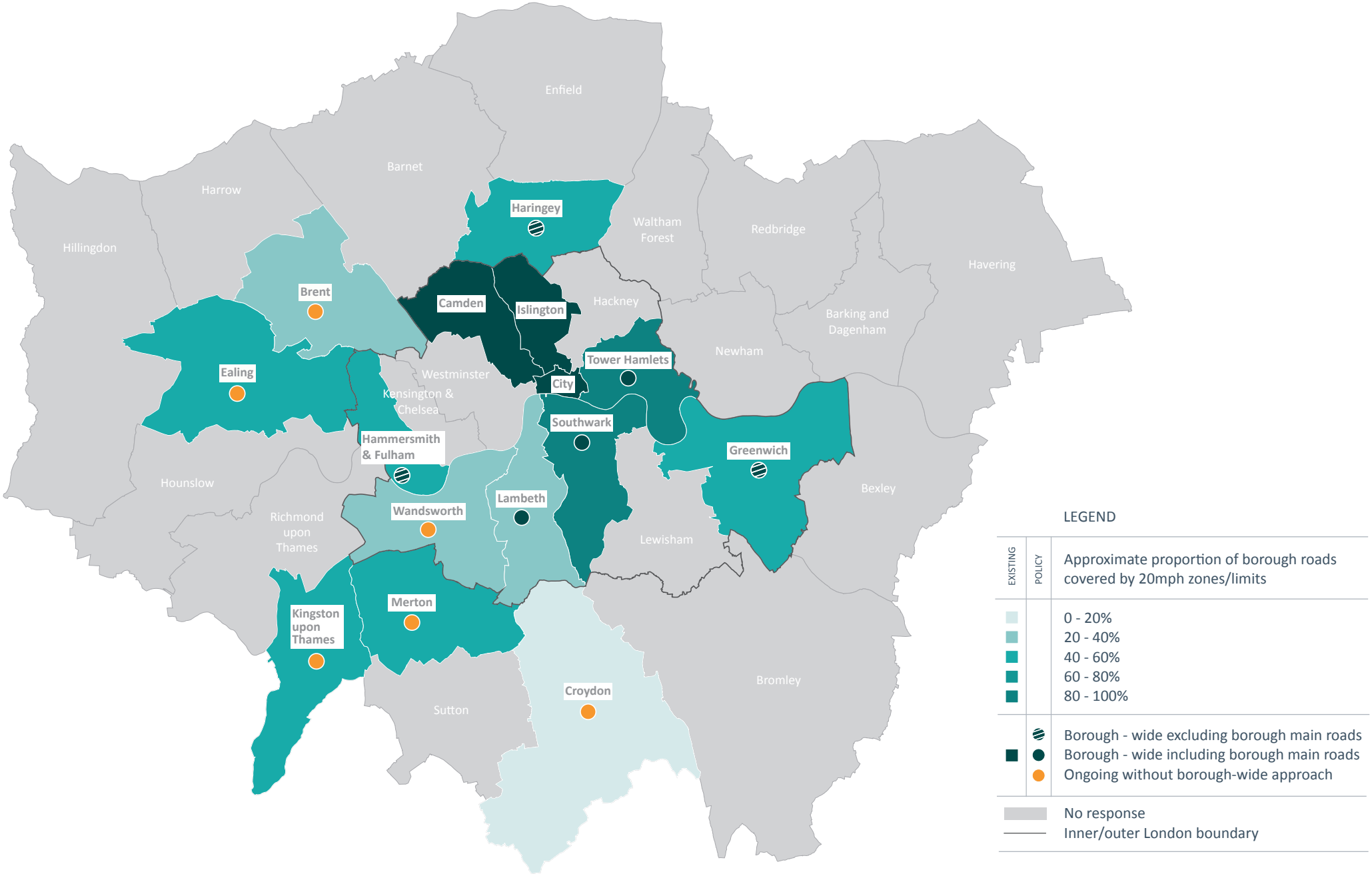
Analysis of questionnaire responses

3.5 This section discusses the survey responses that have been received, highlighting the main themes that have emerged along with useful lessons that are likely to be of relevance across London.

3.6 An important point to note is that the responses received are not likely to be representative of the policies and approaches to 20mph across London as a whole. This is because of the higher response rate in inner London compared to outer London, coupled with the lack of response from any boroughs with a policy position that is not favourable towards 20mph schemes.

3.7 The map included in Figure 3.1 below shows both the existing extent of 20mph coverage within each borough (for which a response was received), along with potential future coverage based on current borough policy.

Figure 3.1 Current and Future 20MPH Coverage in London by Borough



steer davies gleave

Source: Responses to boroughs questionnaire

Authorities with a borough-wide approach

3.8 The responses indicate that a borough-wide approach to 20mph is becoming increasingly prevalent, especially in inner London. Out of the responses received from the inner London boroughs, all except Wandsworth have implemented or have a policy to implement 20mph on a borough-wide basis. In addition to the inner London boroughs, Haringey is also adopting a borough-wide approach.

3.9 These boroughs are currently at different stages—some have completed implementation, others have obtained committee/cabinet approval for implementation, whilst others have a policy commitment to 20mph but are in the early stages of considering how this will be put into practice. In addition, some boroughs are including their main roads within their 20mph schemes, whilst others are excluding them.

- **Camden, Islington and the City** have implemented 20mph on all of their borough roads, including main roads. Islington was the first to do so, followed more recently by Camden and then the City. Together, these boroughs now form a nucleus of 20mph areas in central London.
- **Southwark and Haringey** have approval to implement a borough-wide approach. Southwark will include all of its borough roads, whilst Haringey is excluding sections of its borough main roads.
- **Greenwich** has adopted a policy of introducing 20mph limits on all residential roads. This is being implemented gradually on a zone-by-zone basis.
- **Tower Hamlets, Lambeth and Hammersmith & Fulham** all have a commitment to implement 20mph on a borough-wide basis, stemming from pledges made in political manifestos for the London local elections earlier this year.

Other authorities

3.10 The responses received from authorities that are not pursuing a borough-wide approach were all from outer London boroughs, plus Wandsworth. All of these boroughs, with the exception of Croydon, currently have between 20% and 60% of their borough roads covered by 20mph.

- In **Brent, Ealing, Merton and Wandsworth**, the need for new 20mph schemes is identified by what is best described as a case-by-case approach. Areas for new 20mph schemes in these boroughs are generally determined based on requests from residents and collision history.
- **Kingston** has a slightly different approach, due to its system where the borough is split into four neighbourhood areas, with each responsible for its own highway network. As such, the level of 20mph coverage in each neighbourhood area varies widely.
- **Croydon** is currently looking develop a policy on 20mph zones/limits. This follows a hiatus of over a decade, prior to which a small number of 20mph zones were installed.

General findings

3.11 Apart from the specifics of the current policies and approaches to 20mph discussed above, there are a number of more general findings that can be identified from the responses received.

Policies, approaches and reasoning

- Previously the most common approach adopted was to implement 20mph zones (with physical traffic calming) on a zone-by-zone basis. However, many boroughs are now

utilising 20mph limits (without physical traffic calming) in the first instance, reserving the use of traffic calming measures for areas with persistently high speeds. This has enabled the cost of implementing 20mph schemes to fall.

- The main rationale for implementing 20mph schemes has been to improve road safety, in particular for vulnerable road users such as children, pedestrians and cyclists.
- LIP funding is most commonly used to implement 20mph schemes.
- Where a blanket borough-wide approach has not been adopted, there are a number of different systems that have been used to prioritise areas for 20mph implementation. The most common factor taken into account is collision history, whilst the presence of schools and resident requests are also sometimes taken into account.
- There is generally some publicity or marketing accompanying the implementation of 20mph schemes. However, it appears that this has generally been as an ancillary element, rather than as a core part of each scheme.
- Many boroughs use vehicle activated signs which are rotated amongst different locations, in order to encourage slower vehicle speeds.

Monitoring and evaluation

- In terms of monitoring, before and after vehicle speeds and collisions are the most common variables monitored. Traffic volumes are also sometimes monitored. Reductions in collisions and vehicle speeds have generally been observed, although the results can vary widely by area, and the magnitude of reductions achieved is generally smaller for schemes without any physical traffic calming measures.
- Where specified, it appears that 'after' monitoring generally takes place over a relatively short period of time, sometimes only one year. This means that monitoring results can be susceptible to random variations, especially in terms of collisions given that the number of collisions in areas where 20mph has been implemented is relatively low.

Barriers and challenges

- The challenge mentioned most consistently amongst the responses received is opposition (both from residents and politicians) to physical traffic calming measures that were formerly required as part of 20mph zones. This requirement also limited the rate at which 20mph schemes could be introduced, due to the cost of installing traffic calming measures. This challenge has become less relevant due to the relaxation of requirements for traffic calming.
- Achieving compliance with 20mph limits is another widely mentioned challenge. Related to this has been obtaining police support for 20mph schemes. For some borough-wide schemes, formal objections have been received from the police, on the grounds that 20mph limits will not be self-enforcing. More recently, it appears that police are becoming more supportive of 20mph schemes. However, their position is that there should be no expectation on the police for extra resources to enforce 20mph limits.
- In most cases, boroughs have generally received public support for 20mph schemes, although there has been opposition from certain segments of the community.
- In some cases TfL has expressed concerns regarding journey times, in particular for buses. Emergency services sometimes also raise concerns about the impact on their response times.

4 Road safety rationale for 20mph speed limits

Chapter summary

- The available evidence shows a clear link between average vehicle speeds, and the number and severity of collisions that occur. A reduction in vehicle speeds would be expected to both reduce the number of collisions that occur, and decrease the severity of those that do occur.
- In particular, the chance of a pedestrian sustaining a fatal injury from a collisions decreases from approximately 55% at an impact speed of 30mph to 17% at an impact speed on 20mph.
- Reducing speed limits is one way to lower vehicle speeds. The available evidence indicates that on average, the change in average vehicle speed is approximately 25% of the change in the speed limit. This would equate to a decrease of about 2.5mph for a 10mph reduction in the speed limit. However, this is heavily dependent on local circumstances.
- There are a number of factors (apart from the legal speed limit itself) that influence the drivers' speeds. Physical measures can be used, but these are expensive to implement. Enforcement can also be used, and Intelligent Speed Adaptation (ISA) is an emerging technology that may prove useful. However, the key to achieving a sustainable decrease in vehicle speeds is via cultural change.

Introduction

4.1 The primary rationale for introducing 20mph speed limits is to improve road safety by reducing the number of collisions. Whilst the link between vehicle speed and road safety is generally well known and accepted, it is worth revisiting it here before proceeding further.

4.2 As such, this chapter discusses the road safety rationale for reducing speed limits to 20mph. In particular, the following three points are addressed:

- The relationship between vehicle speeds and collisions (both the number of collisions and collision severity)

- The relationship between speed limit changes and any resultant changes in actual vehicle speeds
- The factors that influence how drivers choose their speed

Speed and road safety

4.3 There are a number of different ways in which the relationship between changes in vehicle speeds and changes in the number of collisions can be quantified and modelled. One model that has been widely applied is the power model, which takes the following form:

$$\frac{Accidents\ after}{Accidents\ before} = \left(\frac{Speed\ after}{Speed\ before}\right)^{Exponent}$$

4.4 An analysis of numerous previous studies was undertaken by Elvik[15]. Based on this, estimates for the value of the exponent in the model above were obtained, as outlined in Table 4.1 below.

Table 4.1 Best estimates of exponents for the power model of the relationship between changes in speed and changes in road safety, urban / residential roads

Collision / injury severity	Best estimate of exponent
NUMBER OF COLLISIONS	
Fatal	2.6
Serious injury	1.5
Slight injury	1.0
All injury	1.2
Property damage only	0.8
NUMBER OF CASUALTIES	
Fatal	3.0
Serious injury	2.0
Slight injury	1.1
All injury	1.4

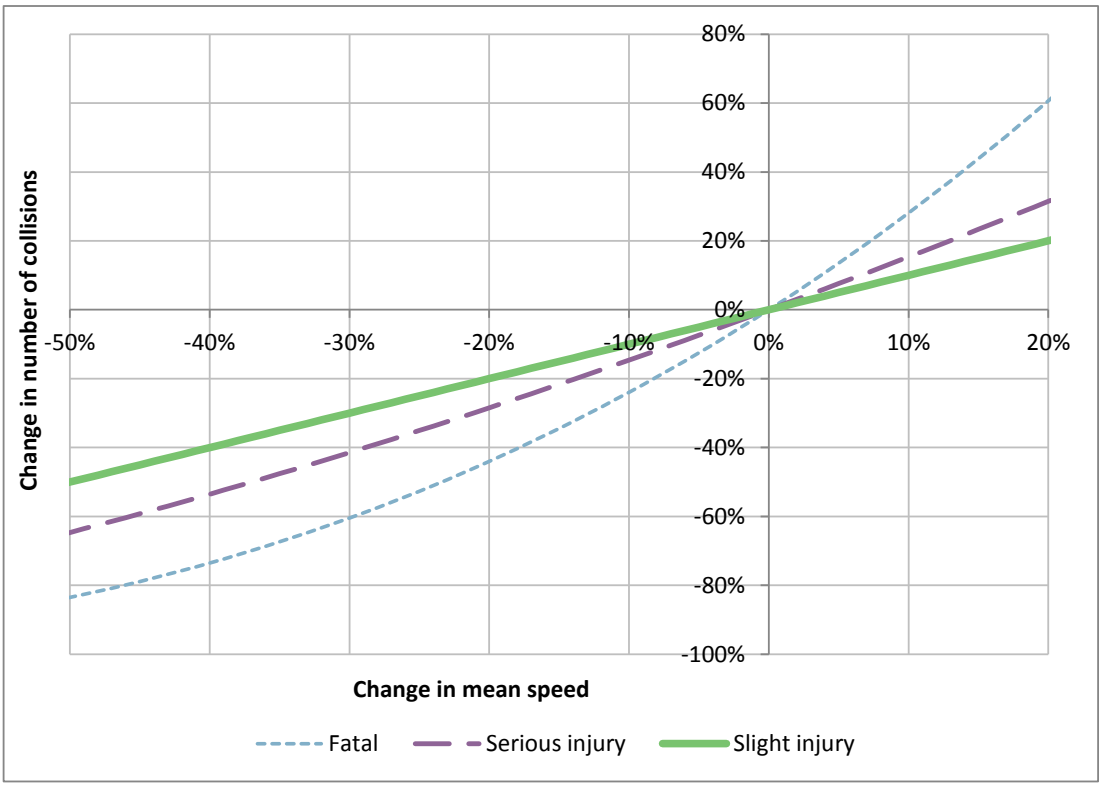
Source: Elvik (2009:58)

4.5 The relative values of these exponents mean that the model predicts that as speeds decline, the number of fatal collisions and casualties will decrease more than the number of serious injury collisions and casualties respectively. In turn, the number of serious injury collisions and casualties will decline faster than the number of slight injury collisions and casualties. Conversely, when means speeds increase it is expected that fatal collisions and casualties would rise at a faster rate than less severe collisions and collisions.

4.6 To illustrate these changes, the predictions that the model makes for changes in mean speed on urban / residential roads have been plotted. Figure 4.1 below shows the predicted change in the number of collisions (by severity) for various changes in mean speed, whilst Figure 4.2 below shows the predicted change in the number of casualties.

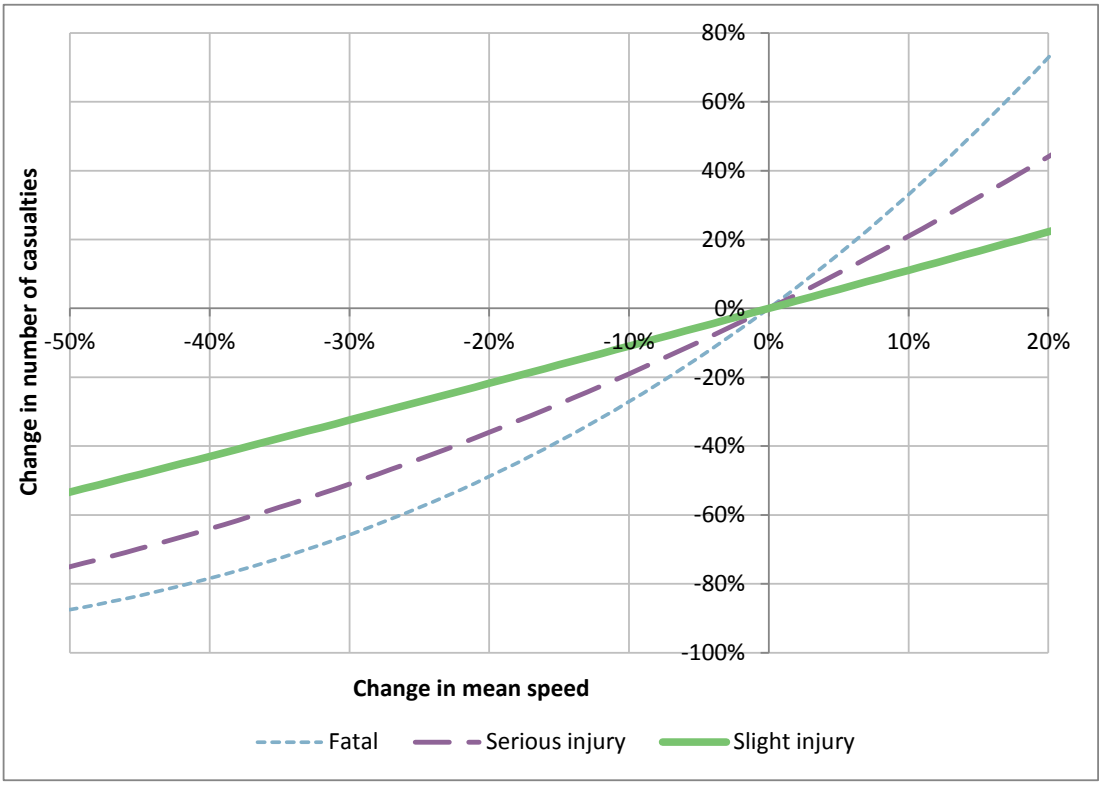
[15] Elvik R (2009) *The Power Model of the relationship between speed and road safety : Update and new analyses*. Institute of Transport Economics, Norwegian Centre for Transport Research, Norway.

Figure 4.1 Change in collisions as a function of change in mean speed for urban / residential roads



Source: Based on power model parameters in Elvik (2009)

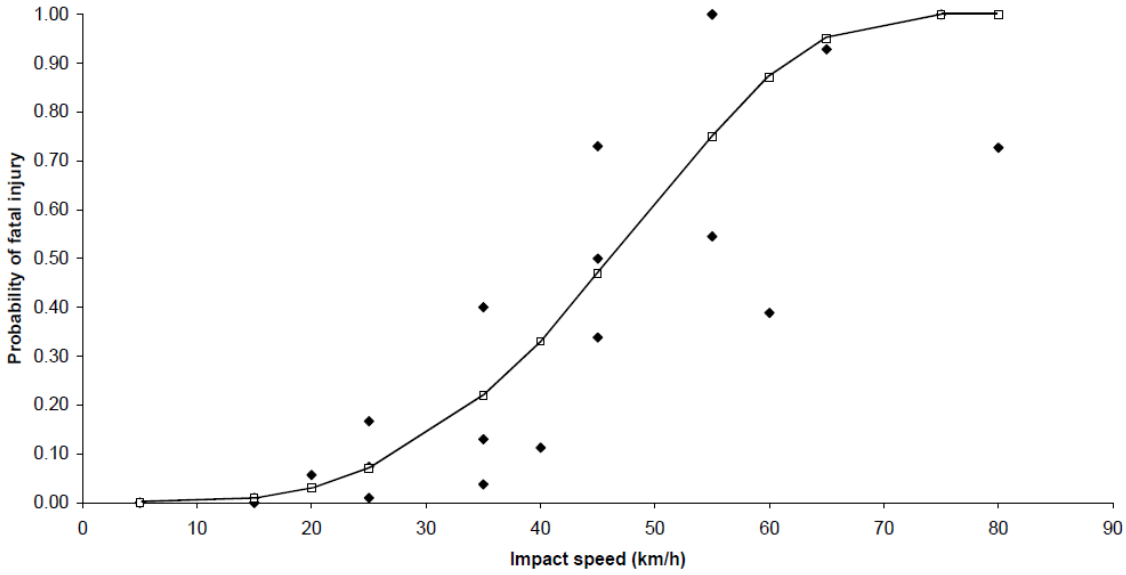
Figure 4.2 Change in casualties as a function of change in mean speed for urban / residential roads



Source: Based on power model parameters in Elvik (2009)

4.7 There are a number of reasons why the risk of collisions and casualties tends to decrease as vehicle speeds decline. At a basic level, a slower speed means that drivers have more time to react to events that could potentially lead to a collision. This means that there is a greater likelihood of a collision being avoided in the first place, and a lower impact speed for any collisions that do occur. This in turn is likely to reduce the severity of any injuries, particularly for vulnerable road users such as pedestrians and cyclists. For example, the probability of a fatal injury to a pedestrian as a function of impact speed is shown in Figure 4.3 below, based on a review of previous studies conducted by Elvik[16]. It can be seen that the chance of a fatal injury declines substantially between an impact speed of 30mph (48km/h) and 20mph (32km/h), from approximately 55% to 17%.

Figure 4.3 Probability of fatal injury to pedestrians as a function of impact speed



Source: Elvik (2004) p10

4.8 Child pedestrians in particular appear to be more vulnerable, as one study suggests that children do not perceive looming objects (such as an approaching vehicles) as an adult would[17]. It was found that under most viewing conditions, children could not reliably detect a vehicle approaching at speeds great than 25mph. As such, the study concludes that lower vehicle speeds reduce the risk and severity of child pedestrian casualties, not only because of lower impact speeds but also because there is a lower probability of a child stepping out in front of a vehicle in the first instance.

Impact of speed limit changes on speeds

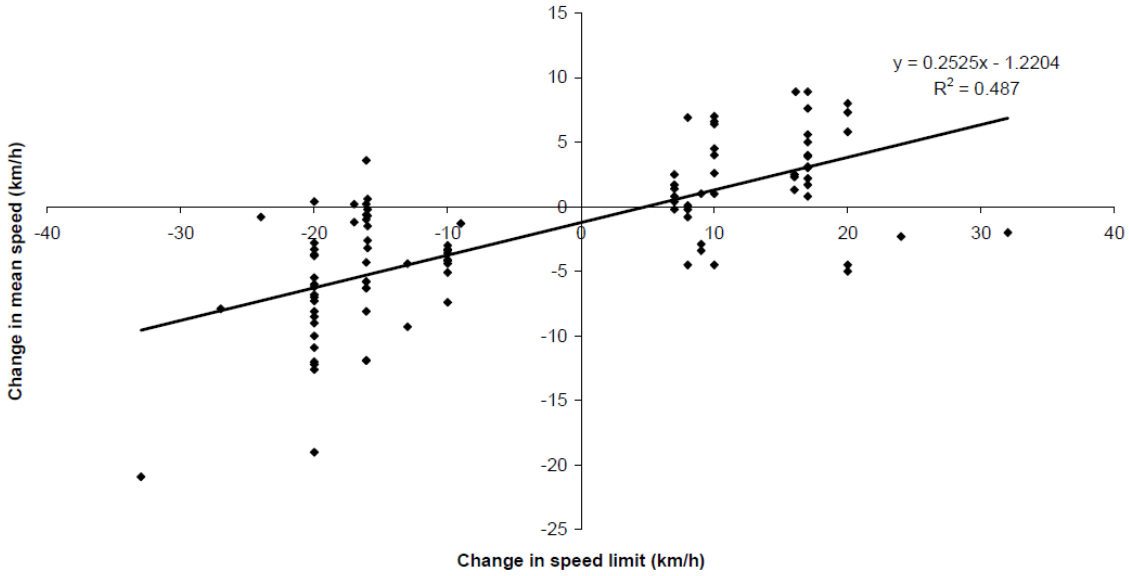
4.9 Based on the above, the evidence is clear that a reduction in mean speed on a road would be expected have a positive impact on road safety. Lower speed limits is one possible measure that can be employed to achieve a reduction in mean speed. However, given the autonomy that each driver has, it is obvious that there is unlikely to be a simple one-to-one relationship

[16] Elvik R, Christensen P & Amundsen A (2004) *Speed and road accidents : An evaluation of the Power Model*. Institute of Transport Economics, Norway.
[17] Wann JP et al (2011) Reduced Sensitivity to Visual Looming Inflates the Risk Posed by Speeding Vehicles When Children Try to Cross the Road in *Psychological Science*, 22(4), pp429–434.

between a change in the speed limit and the actual change in vehicle speeds. It is therefore also useful to understand how speed limit changes influence actual vehicle speeds.

4.10 Elvik examined the relationship between a change in speed limit and the resulting change in mean vehicle speed. The results of this analysis are shown in Figure 4.4 below. As would be expected, there is quite a high level of variability in this relationship, as the change in mean speed is influenced greatly by local factors. Nevertheless, a linear relationship was found using regression analysis. This relationship indicates that as a rule of thumb, the change in mean speed is a quarter of the change in the speed limit. For example, a reduction in the speed limit of 10mph could be expected to reduce the mean speed by about 2.5mph.

Figure 4.4 Relationship between changes in speed limit and changes in mean speed



Source: Elvik (2009)

Factors affecting driver speed choice

4.11 The above suggests that in general, the actual speed reduction achieved is generally smaller than the decrease in the speed limit. As such, it is useful to understand the factors that influence a driver's choice of speed, in addition to the speed limit itself. This will help to inform any actions that can be taken to encourage drivers to lower their speeds more, which will in turn assist in ensuring that the road safety benefits from 20mph schemes are maximised.

- **Physical measures**: As discussed elsewhere in this report, physical traffic calming measures generally result in greater decreases in speed compared to schemes that primarily rely on signage alone. However, their downside is that they are expensive to implement, which limits how quickly they can be rolled out. In addition, some types of traffic calming (in particular speed humps) can have negative effects on adjacent properties.
- **Enforcement**: Enforcement of 20mph limits is another tool that can be used to encourage compliance, and has been used in a number of locations. However, it is clear that with limited police resources and competing priorities, there is a limit to how much enforcement can take place.
- **Intelligent Speed Adaptation (ISA)**: This is an emerging technology, which can assist drivers in complying with speed limits, either on a mandatory basis (where the driver cannot drive faster than the speed limit), or a system where the driver has an 'override' button.

- **Driving culture**: The key to achieving lower vehicle speeds is to effect cultural change, so that driving at 20mph becomes normal. This means that 20mph schemes should include an integral package of supporting 'soft' measures, as discussed in Chapter 6.

5 Impacts of 20mph schemes

Chapter summary

- Strong evidence that 20mph zones result in significant casualty reductions, although the available studies focus on zones with physical traffic calming. Such zones result in a decline in speeds on about 9mph on average.
- The evidence on vehicle emissions is mixed, with the effect dependent on fuel type and driving styles. Any impact on traffic noise is likely to be negligible.
- There is some evidence that 20mph zones can reduce traffic volumes and increase the use of sustainable modes, such as walking and cycling, especially where 20mph is implemented as part of a wider package of measures.
- DfT have identified that there is currently an evidence gap regarding the impact of signed only 20mph limits. They have commissioned a study to address this, which is expected to report in 2017.

Introduction

5.1 As outlined in the previous chapter, the primary rationale for 20mph schemes is as a measure to improve road safety by reducing traffic speeds. However, there are also a number of other impacts that such schemes could also potentially have. Therefore, in addition to impacts on road safety and traffic speeds, five further broad categories of potential impacts have been identified, for a total of seven impact themes. These are described in Table 5.1 below.

Table 5.1 Descriptions of impact themes

Impact theme	Description
Road safety	Impacts on road safety, as measured by the numbers of collisions and casualties (both in the aggregate and disaggregated by road user group)
Traffic speeds	Impacts on traffic speeds
Environment and health	Impacts on emissions and consequently on human health
Amenity	Impacts on amenity, such as noise, vibration, vehicle dominance and severance, including in residential areas and town centres

Impact theme	Description
Inequality	Impacts on inequalities in road safety outcomes
Transport efficiency	Impacts on the efficiency of the road network, such as journey times for general traffic, buses and emergency services
Traffic volumes and sustainable modes	Impacts on traffic volumes and mode shift to sustainable modes (such as cycling and walking)

5.2 This chapter looks at existing evidence regarding these seven impact themes. Firstly, the findings of a number of general studies are reviewed, including the methodologies recommended in the Speed Limit Appraisal Tool released by DfT. Following this, evidence from a number of studies looking more specifically at particular impacts are discussed.

General studies

Key UK studies

5.3 A number of more general studies have been undertaken that investigate and analyse the impacts of 20mph zones and limits, both in London and throughout England. There are four main studies that are most relevant, and their key findings are summarised in Table 5.2. However, it should be noted that whilst these are useful at looking at a high number of schemes, the studies are now rapidly ageing. In particular, given the regulatory context at that time most schemes examined would have been 20mph zones that included physical traffic calming features.

5.4 The Department for Transport (DfT) has recently commissioned research into the effectiveness of 20mph limits (as opposed to 20mph zones). Whilst there is evidence on the effectiveness of 20mph zones in reducing collisions and speeds, the current evidence on 20mph limits is limited. Whilst some monitoring data from 20mph limit schemes in Portsmouth and Bristol is available, the DfT's view is that the evidence presented is inconclusive. As such, this has been identified as an evidence gap.

5.5 The purpose of the recently commissioned DfT research is to fill this gap, which aims to establish the effectiveness of 20mph limits. The findings are intended to inform future 20mph policy development. As outlined in the specification document, there are four objectives for this research:

'a. To evaluate the effectiveness of 20mph speed limits in terms of a range of outcomes and impacts including speed, collisions, injury severity, mode shift, quality of life, community, economic public health benefits, and air quality.

b. To examine drivers', riders' and residents' perceptions of 20mph speed limits and their outcomes and impacts.

c. To evaluate the processes and factors which contribute to the level of effectiveness of 20mph speed limit schemes

d. To assess the relative cost/benefits to specific vulnerable road user groups e.g. children, cyclists, the elderly.'

5.6 Correspondence with DfT has indicated that they are currently in the scoping phase of the research. The project will run for about three years, with the final report from the research anticipated to be available in 2017.

Table 5.2 Key findings from previous studies

Study	DfT report completed by TRL[18]	DfT report completed by TRL[19]	TfL report completed by Grundy et al[20]	TfL report completed by Grundy et al[21]
Scope	72 20mph zones in England	78 20mph zones in London	399 20mph zones in London	399 20mph zones in London
Method	Before and after analysis (before period of at least three years and after period of a least one year)	Before and after analysis (before period of five years, after period of three years)	Time series analysis	Time series analysis
Key findings	***Road safety*** 61% reduction in accidents and 70% reduction in KSI accidents (no adjustment for background trend) 63% reduction in pedestrian injury accidents, 29% reduction in pedal cyclist injury accidents, 73% reduction in motorcyclist injury accidents, 67% reduction in child (pedestrian and cyclist) injury accidents Ratio of KSI accidents to all accidents fell from 0.21 to 0.16 Reduction in accidents did not appear to be due to migration onto surrounding roads ***Traffic speeds*** Overall average reduction in mean speed from 25mph to 16 mph (reduction of 9mph) 6.2% reduction in accidents for each 1mph reduction in mean speed ***Traffic volumes and sustainable modes*** Limited traffic flows information, but reductions in flows within zones and increases around zones ***Implementation issues*** Generally favourable public reaction, although negative reaction to some specific features (e.g. chicanes, speed humps) Schemes generally cost £100k to £200k	***Road safety*** Adjusting for background changes, 45% reduction in casualties and 57% reduction in KSI casualties Adjusting for background changes, 45–60% reduction in child KSI casualties, 39–50% reduction in pedestrian KSI casualties, 30–50% reduction in pedal cyclist KSI casualties and 68–79% reduction in powered two wheeler casualties Ratio of KSI casualties to all casualties fell from 0.16 to 0.12 Reduction in accidents did not appear to be due to migration onto surrounding roads ***Traffic speeds*** Average speed reduction of 9mph (after mean traffic speeds of 17mph) ***Traffic volumes and sustainable modes*** Average reduction in traffic volumes of 15%	***Road safety*** 42% reduction in casualties in 20mph zones (taking into account background changes) Effects diminishing (zones implemented 2000–2006 show only a 22% reduction in casualties) Zones more cost effective in higher casualty areas, positive benefit in areas with >0.7 casualties/km/year (only taking into account casualty costs) ***Traffic volumes and sustainable modes*** 20mph zones appears to reduce rat-running (casualties closer to home in 20mph zones)	***Inequality*** 20mph zones historically targeted at high casualty, high deprivation areas, therefore helped to reduce inequality But limited future role as few areas left that have high levels of deprivation and eligible for 20mph zones Other measures needed to reduce road safety inequalities

[18] Webster DC & Mackie AM (1996) *Review of traffic calming schemes in 20 mph zones* [TRL Report 215], Transport Research Laboratory, Crowthorne.
[19] Webster DC & Layfield RE (2003) *Review of 20mph zones in London Boroughs* [TRL Report PPR243], Transport Research Laboratory, Crowthorne.
[20] Grundy et al (2008a) *20 mph zones and Road Safety in London*, London School of Hygiene and Tropical Medicine.
[21] Grundy et al (2008b) *The Effect of 20 mph zones on Inequalities in Road Casualties in London*, London School of Hygiene and Tropical Medicine.

Study	DfT report completed by TRL[18]	DfT report completed by TRL[19]	TfL report completed by Grundy et al[20]	TfL report completed by Grundy et al[21]
Areas identified for further research	None stated	Further work required to investigate how 20mph zones are chosen; obtain additional data to enable a more comprehensive evaluation to be undertaken; and investigate the effect of 20mph zones on powered two-wheelers	Need more research on how 20mph zones affect exposure to accidents through changed travel patterns	Data was not available on changes to risk exposure and to control for any other road safety interventions implemented at roughly the same time as 20mph zones

DfT Speed Limit Appraisal Tool

5.7 Accompanying DfT Circular 01/2013 is a Speed Limit Appraisal Tool, which is intended to assist local highway authorities in assessing the impacts of speed limit changes. The impact assessment methodologies that are implemented in the tool are outlined in Table 5.3.

Table 5.3 DfT Speed Limit Appraisal Tool methodologies

Impact theme	Methodology
Road safety	Uses a model, developed by Rune Elvik of the Norwegian Institute of Transport Economics, that adjusts before observed accidents to forecast after accidents, and also takes into account changes in accident severity.
Traffic speeds	The change in mean speed between the before and after scenarios (MSC) is estimated based on formulae that use the observed mean speed before the speed limit change (BMS) as a starting point: Urban 20mph without traffic calming: MSC = 4.4038 – 0.2265 * BMS Urban 20mph with traffic calming: MSC = 10.2891 – 0.7714 * BMS The after 85th percentile speed is estimated by multiplying the after mean speed (calculated using the formulae above) by the ratio of the before 85th percentile speed and before mean speed; this is because data suggests that a change in speed limit does not change the distribution of vehicle speeds.
Environment and health	Change in CO_2 emissions calculated using WebTAG 3.3.5D methodology. Change in NO_x emissions estimated by using a ratio to the estimated change in CO_2 emissions (although change in NO_x emission is likely to be extremely small).
Amenity	Noise impacts negligible, even in the most extreme cases. Noise impacts only likely to be material if there is a major diversion of traffic from one road to another.
Traffic volumes and sustainable modes	Reduction in traffic volumes of 5.3% for 20mph without traffic calming and 13.4% with traffic calming, although as these relationships are subject to high variability they have not been implemented in the tool.

Specific studies

5.8 In addition to the studies described above, there are also a number of studies examining 20mph zones / limits that focus on particular impact themes.

Walking and cycling

5.9 A literature review of the effects that 20mph zones have on walking and cycling was recently conducted by Par Hill Research for the City of London[22]. It noted that the propensity to cycle and walk is based on 'safety, perceptions of safety, the condition of the surfaces and the overall appearance of the urban environment', and that 20mph schemes may therefore encourage walking and cycling by positively affecting safety and perceptions of safety.

5.10 The review noted that evidence from Portsmouth, Barcelona and Brussels suggests that 20mph zones do encourage greater walking and cycling. However, it should be noted that in some cases, other measures (such as traffic calming measures, cycle lanes or bike hire schemes) have been implemented concurrently as part of a wider package. As such, it would be difficult to isolate the impact that 20mph schemes alone have on walking and cycling,

[22] Tovar MC & Kilbane-Dawe I (2013) *Effects of 20mph Zones on Cycling and Walking Behaviours in London*, Par Hill Research Ltd.

although it appears that they can have a positive impact on rates of walking and cycling when implemented together with other measures.

Environment and health

5.11 There are two broadly opposing views regarding the impact that slower speeds have on vehicle emissions and fuel use, suggesting the overall picture is inconclusive. On one hand, motor vehicles generally operate most efficiently at speeds higher than 20mph so decreasing vehicle speeds could result in higher emissions and fuel use. On the other hand, a lower speed limit in urban areas could possibly encourage smoother driving with reduced acceleration and braking, which would tend to reduce emissions and fuel use. In addition, it is possible that if there is mode shift towards sustainable modes, emissions could be reduced even further.

5.12 One discussion of the impact of lower speed limits on vehicle emissions can be found in a report from the Centre for Transport Studies at Imperial College London[23]. As shown in Table 5.4, the study found that NO_X emission factors are higher for petrol vehicles at 20mph compared to 30mph whilst for diesel vehicles they are lower. Given the higher contribution of diesel vehicles to NO_X emissions this is an important result. PM_{10} emission factors are lower for both petrol and diesel vehicles at 20mph compared to 30mph with the exception of vehicles with engines in excess of 2.0 litres. CO_2 emission factors follow the same pattern as NO_X showing increased fuel consumption when travelling at lower speeds.

Table 5.4 Impact of 20mph drive cycle on emission factors

Vehicle Type	Drive Cycle Speed Limit (mph)	NO_X (g/km)	PM_{10} (g/km)	CO_2 (g/km)
Petrol 1.4l-2.0l, EURO IV	20	0.0726	0.00218	271.95
Petrol 1.4l-2.0l, EURO IV	30	0.0673	0.00237	266.35
Impact of 20mph drive cycle		+7.9%	-8.3%	+2.1%
Diesel 1.4l-2.0l, EURO IV	20	0.7437	0.01758	201.58
Diesel 1.4l-2.0l, EURO IV	30	0.8104	0.01917	203.48
Impact of 20mph drive cycle		-8.2%	-8.3%	-0.9%

5.13 Whilst the study concludes that the effects on vehicle emissions are mixed, it does not account for potential associated impacts of speed restrictions, such as congestion or encouragements to shift mode to walking/cycling as a result of a more attractive environment for active travel.

5.14 With regard to driving styles, the same study observed that, across several routes in central London, a greater range of speeds occurred on 30mph segments compared to 20mph segments. Average speeds were higher on 30mph segments and, when restricted to speeds observed during cruising, were statistically significant. In addition, a larger proportion of time was spent accelerating and decelerating on 30mph segments suggesting that 20mph routes may facilitate smoother driving.

5.15 The study identified the need for further research into emissions resulting from non-exhaust sources including brake and tyre wear.

[23] Williams D & North R (2013) *An evaluation of the estimated impacts on vehicle emissions of a 20mph speed restriction in central London*, Imperial College London, London.

5.16 This is largely consistent with the findings of another study that was conducted in Madrid[24]. This study examined changes in fuel consumption and emissions for a light duty diesel vehicle, assuming a reduction in the speed limit from 50km/h to 30km/h. It was found that a reduction in the speed limit generally resulted in lower fuel consumption, and a decrease in carbon monoxide, nitrous oxide and particulate matter emissions, but an increase in hydrocarbon emissions. However, these results are highly dependent on the driving style adopted.

Overall findings

5.17 Based on the review in this chapter, the key points gleaned from the evidence on the impacts of 20mph limits and zones across the seven impact themes is summarised in Table 5.5 below.

Table 5.5 Summary of key findings

Impact theme	Evidence
Road safety	Strong evidence from that 20mph zones can result in significant reductions in casualties (over and above wider trends), although the evidence primarily pertains to zones with physical traffic calming.
Traffic speeds	20mph zones supported by physical traffic calming features generally result in a significant reduction in average speeds (of about 9mph on average).
Environment and health	Some evidence to suggest that lowering vehicle speeds may reduce vehicle emissions of some pollutants, but increase emissions of others. However, this is heavily dependent on fuel type and driving styles.
Amenity	May be some impact on traffic noise, although this is likely to be negligible.
Inequality	20mph zones have had some impact on inequality in the past, although their future role in reducing inequality may be limited.
Transport efficiency	-
Traffic volumes and sustainable modes	Traffic volumes generally decrease in 20mph zones, although this impact is highly variable and depends on the characteristics of a particular area. Some evidence that walking and cycling levels may increase, although this is primarily when 20mph is implemented as part of a package of wider measures.

[24] Casanova J & Fonseca N (2012) Environmental assessment of low speed policies for motor vehicle mobility in city centres in *Global NEST Journal* 14(2), pp192–201.

6 Examples of policy in practice

Chapter summary

- In the UK, signed-only 20mph schemes have achieved relatively small speed reductions of 1–2mph, although early monitoring suggests that even this small change is translating into noticeable road safety benefits. This will need to be confirmed once further data is available.
- There may be some other positive impacts from these schemes, although there is currently little data available that is conclusive.
- An examination of case studies from overseas has shown that many countries have followed a similar trajectory of relaxation in the requirements for physical measures as part of 30km/h schemes. The aim of this has been to facilitate more widespread implementation of such schemes.
- One of the most relevant overseas examples is from Graz in Austria, where a 30km/h city-wide limit was implemented primarily using signs, and in conjunction with a programme of police enforcement. Whilst there was only a minor reduction in average vehicle speeds, significant decreases in collisions and casualties was observed.
- Research conducted by the University of the West of England suggests that it is crucial that an integral programme of 'soft' measures be included as part of any signed-only 20mph limit. The aim is to effect cultural change amongst drivers, so that driving at 20mph in urban areas becomes perceived as normal.

Introduction

6.1 This chapter discusses how 20mph schemes have been implemented in practice, both in the UK and in other countries. The purpose of this is to compare past and current policies in these areas, as well as to look at evidence of the impacts of 20mph limits and zones, and lessons that have been learnt from their implementation.

United Kingdom

6.2 A search has been conducted to identify authorities across the UK that have either implemented or intend to adopt an area-wide approach to 20mph. These examples are listed

in Table 6.1 below. The level of detail provided for each example varies, due to the limited availability of information in some instances. It should also be noted that this is not intended to be a comprehensive survey of every authority in the UK, but rather aims to provide information for a representative sample.

6.3 Across many of the case studies, a distinction has been made between two categories of roads: 'main roads' and 'residential streets' / 'side streets'. The precise definition of these categories varies, and in some cases relates to the road hierarchy used by the relevant authority for each example. In general, however, the distinguishing feature of main roads is that facilitating the movement of through traffic is one of their key functions. Other roads, where this function is less pronounced, fall under the residential street / side street category.

6.4 The search has also identified a number of authorities where a blanket 20mph approach has recently been rejected, and these are listed in Table 6.2 below. These have been included, as it is useful to see the reasons why some authorities are not adopting an area-wide approach to 20mph.

Table 6.1 UK examples of 20mph schemes

Area / local authority	Current situation	Reasons	Outcomes
Portsmouth[25]	First area wide 20mph limit in the country: implementation commenced in March 2008 Applied on approximately 94% of roads in Portsmouth that previously had a 30mph limit (410km out of 438km). Cost of approximately £573k. Number of people killed or seriously injured rose for the first time in ten years in 2011. The majority (~80%) were on 30mph+ roads and suggest no connection to the city-wide 20mph limits on residential streets.	To address the high number of randomly located person injury accidents in residential streets. To ensure that the scheme was self-enforcing so as to avoid the need for extra Police enforcement. A great number of the city's residential streets form a closely packed network of terraced housing, developed in the 19th Century or earlier, with little or no off-street parking. The relatively low speeds before the scheme implementation on these roads are mainly the result of narrow carriageways and on-street parking, which reduces the effective carriageway width. The scheme was implemented partly to support the low driving speeds adopted previously by many motorists and partly to encourage less aggressive driving behaviour from those who drove at inappropriate speeds.	**Road safety** 22% reduction in total casualties (compared to 14% nationally). 16% reduction in pedestrian casualties (compared to 13% nationally). 6% increase in KSI casualties, although absolute increase only 1.2 per year. **Traffic speeds** Across the six sectors, average speeds declined by between 0.6mph and 1.8mph, with an overall average decline of 1.3mph (from 19.8mph to 18.5mph). Average reduction of 6.3mph for sites with a before average speed >24mph. **Amenity** 40% of survey respondents thought that car speeds had decreased, whilst 54% thought there was no change. Almost 40% of respondents thought driving had become less aggressive. Just under half of surveyed respondent satisfied with scheme. **Traffic volumes and sustainable modes** Small decrease in traffic volumes, but may be due to other factors. Survey suggests little mode shift, although some respondents reported increased walking, cycling and public transport use.

[25] DfT (2010) *Interim Evaluation of the Implementation of 20mph Speed Limits in Portsmouth*, DfT, London.

Area / local authority	Current situation	Reasons	Outcomes
Bristol[26]	20mph limits introduced in two pilot areas in 2010 (Inner East Pilot Area and Inner South Pilot Area). These schemes now have the backing of 82% of local residents[27]. Scheme primarily consisted of signage and painted roundels, supported by 8 vehicle activated signs and a communications campaign. From February 2014, the 20mph schemes are being implemented on a rolling basis, starting with the central area, and are planned to be completed by March 2015. The scheme is funded by the Local Sustainable Transport Fund and is expected to cost £2.3m. Drivers in Bristol will be among the first in the country to be offered a speed awareness course for exceeding 20mph limits, under plans being drawn up by the local police force.	To encourage more walking, more cycling, and more independent mobility for children and elderly in the City, to reduce risk and severity of road casualties and to help create pleasant people-centred streets and public space.	**Road safety** Small changes in accident numbers observed, but too early to draw any conclusions. **Traffic speeds** Average speed reduction of 0.9mph in the Inner South area (from 23.6mph to 22.7mph), and 0.9mph in the Inner East area (from 23.4mph to 22.9mph). **Environment and health** Negligible changes in emissions. **Amenity** Small (but negligible) decrease in traffic noise. Majority of survey respondents support 20mph limits, higher levels of support for residential roads compared to main roads. Survey responses indicate perception of traffic noise has decreased. **Transport efficiency** Bus operator reports no impact on bus journey times and service reliability. **Traffic volumes and sustainable modes** Increases in pedestrian activity and cycling levels of between 1.1% and 36.6%, although may not solely be due to 20mph limit.

[26] Bristol City Council (2012) *Monitoring Report: 20mph Speed Limit Pilot Areas*, Bristol City Council, Bristol.
[27] Local Transport Today (2014), *Bristol Council phasing in 20mph limits* [Issue 262]. [Accessed online 7 July 2014]

Area / local authority	Current situation	Reasons	Outcomes
Edinburgh[28]	A 20mph speed limit was introduced in a pilot area in South Edinburgh covering nearly 40 miles of residential roads in early 2012. In 2014 it was reported that 75% of Edinburgh residents support the extension of the pilot scheme to more residential streets in Edinburgh. 67% supported rolling out a 20mph limit on all city centre streets[29]. Plans by the council could result in a 20mph speed limit throughout Edinburgh by 2016/17. The cost of the proposals is £2.5m and will be subject to a two-year consultation process before the final extent of the speed limits are agreed.	To provide a low-cost option for increasing safety, reducing fatal and serious road collisions, increasing walking and cycling, and improving the urban realm for business and social interaction. The Council has a long-standing policy of introducing 20mph speed 'zones' in residential areas. Around 50% of the city's residential streets are now in a 20mph zone where road humps and other 'traffic calming' features ensure speeds stay low. They have a good track record of reducing road casualties but are fairly expensive to install.	**Road safety** With the modest reductions in average speed it is expected that the number and severity of collisions will also fall. This will be assessed after 3 years. **Traffic speeds** Average speed reduction of 1.9mph amongst 28 locations where the speed limit was changed from 30mph to 20mph. **Amenity** Majority of survey respondents support 20mph limits and higher levels of support for residential roads compared to main roads. The proportion of older primary school children allowed to play unsupervised outside their home, on the pavement, or in the street rose from 31% to 66%. **Traffic volumes and sustainable modes** Increase in overall number of vehicles on most streets but none were notable. Proportion of children walking to school increased marginally from 63% to 65%. Increases in walking and cycling levels of between 5-7%.

[28] City of Edinburgh Council (2013) *South Central Edinburgh 20mph Limit Pilot Evaluation*.
[29] City of Edinburgh Council (2013) *Transport and Environment Committee Full Meeting Papers: Part 1*, 27th August 2013.

Area / local authority	Current situation	Reasons	Outcomes
Brighton & Hove	In January 2013 the City Council's Transport Committee approved Phase 1 of a 20mph scheme which introduced a speed limit for all residential and shopping streets in the centre of Brighton. In March 2014, following consultation, the Environment, Transport and Sustainability Committee approved Phase 2 of the scheme which extends the 20mph speed limit further than the centre. The Council have decided to only introduce the speed limit in streets where the majority of respondents supported the proposals. Phase 1 was introduced in April 2013 whilst Phase 2 started in June 2014.	To reduce road collisions and the severity of casualties, improve the quality of life of local neighbourhoods and encourage more walking and cycling for local trips. This in turn would bring significant health benefits and reduce congestion. Following public consultation in 2012 and a growing number of petitions from local communities, the majority of residents across the city told the Council they were in favour of a reduced speed limit for residential and local shopping areas.	Early monitoring from the first six months of Phase 1 in the city centre shows there was: • A decrease in traffic speed on 74% on the roads; and • A significant reduction in the number and severity of collisions, and no fatal collisions since implementation. This includes a 20% decrease in the number of collisions and a 19% decrease in the number of casualties (based on five months of 2013 data compared with the three year average for the same five months in the previous three years.)
Hampshire	A pilot scheme for 20mph limits – "The Residential 20 Project" – was implemented in twelve residential areas across Hampshire between July 2013 and May 2014 following consultation with local residents to ascertain support. The anticipated cost at the start of the pilot was £200,000. Following the trials further consultation will be conducted with residents to decide whether the lower limit should be officially implemented.	The Residential 20 project was developed to take advantage of the Department of Transport's relaxations to the signing requirements associated with 20 mph limits. The pilot schemes are intended to test the effectiveness of this new approach.	The 20mph speed limits are indicated in the pilot areas using road side signs at the start of the limits and 20mph road marking 'roundels' on the road surface within the areas. Residents are encouraged to help promote awareness of their 20mph speed limit via a publicity campaign. 'Before' and 'After' speed monitoring will be carried out in a sample of roads in each area to assess the impact of the new speed limit.
Newcastle	20mph limits apply across residential roads (covering 75% of the city's roads) Cost of £1.4m Works carried out in six phases, over an 18 month period from June 2010 to December 2011	-	Initial monitoring suggests that there has been a significant reduction in casualties for some of the early phases of the scheme where 12 months of post-implementation data is available

Area / local authority	Current situation	Reasons	Outcomes
Bath & North East Somerset[30]	Plans for 20mph limits across all residential roads (except main traffic routes) approved in 2012, with implementation over two years at a cost of £500k Implementation is proceeding on an area-by-area basis, with informal consultation, following by formally advertising a proposal for a TRO, with a decision then made by the Cabinet Member for Transport One area has been withdrawn from the programme due to a negative response to consultation	-	-
Calderdale, West Yorkshire	Blanket 20mph limit for residential areas approved in 2014 Already has 140km of 20mph limit roads, which will be increased to 650km over next three years Funded by £520k of local transport plan funds and £500k of public health funds	Consultation attracted 1200 responses—48% favoured 20mph in all residential areas; 36% favoured 20mph outside schools only; 16% favoured 20mph in high casualty areas only	-

[30] Bath & North East Somerset Council (2014) *20mph Speed Limits on residential roads*. Available at http://www.bathnes.gov.uk/services/streets-and-highway-maintenance/road-safety/traffic-schemes/20mph-speed-limits-residential- [Access online 13/08/2014]

Area / local authority	Current situation	Reasons	Outcomes
Birmingham	Pilot 20mph scheme approved in 2014 Will include 20mph limits on residential street across one-third of the city (excluding A and B roads) Detailed consultation on the pilot will take place later in 2014 and implementation planned by March 2015 Funding for the pilot from £1.025m allocation from the Birmingham Cycle Revolution budget—£800,000 from the DfT's Cycle City Ambition Grant and £225,000 from the council's integrated transport block	One aim of the pilot is to build support for 20mph limits elsewhere in Birmingham, by demonstrating the benefits of such schemes Pilot area already has significant 20mph limits/zones, therefore pilot will join up existing 20mph schemes Consultation attracted 3565 responses—58% opposed the plans and 39% in favour; support rose to 44% in relation to 20mph in residential areas, 49% on high streets and other shopping areas, and 91% near schools Implementation of 20mph limits on residential streets in inner Birmingham was a key component of Birmingham's successful Cycle City Ambition Fund bid, which the DfT granted £17m to last year	Decision on whether to extend 20mph limits to other areas will be made in 2016/17
Nottingham[31]	All roads (except for A and B roads) are being considered for 20mph limits, on an area-by-area basis, as part of Nottingham's 20:20 vision First area scheme implemented in 2012, with more following	-	-

[31] Nottingham City Council (2014) *Nottingham's 20:20 vision*. Available at http://www.nottinghamcity.gov.uk/article/26332/Nottinghams-2020-vision [Accessed online 13 August 2014]

Table 6.2 UK examples of areas where a blanket 20mph approach has been rejected

Area / local authority	Current situation	Reasons	Outcomes
Dundee	In June 2014 a council motion calling for signed-only 20mph speed limits across residential streets in Dundee was narrowly defeated.	Current policy at Dundee City Council is to prioritise pedestrian accident injury sites for analysis and treatment prior to any consideration of 20mph sites. According to the head of transportation, "This policy essentially targets the council's limited resources to locations where injury accident are occurring rather than installing traffic calming on roads where there is no injury accident history"[32]. Scottish Government guidance suggests expensive engineering works would be needed to provide traffic calming that would be self-enforcing and would not require additional police enforcement.	It is has been Dundee City Council's policy for approximately 10 years not to implement signed-only 20mph speed limits as there is evidence that these schemes typically reduce speeds by between one and two miles per hour on streets where the average traffic speed is already relatively low.
Kikrlees, West Yorkshire	Rejected blanket 20mph limits in 2013	View that there was little evidence that 20mph limits reduce speeds and collisions Police favoured case-by-case approach	-
Norfolk County	Rejected area-wide 20mph limits in urban areas in 2013	Considered that blanket 20mph schemes are not good value for money relative to more targeted measures	-
Hartlepool	Plans for town-wide 20mph limit rejected in 2011	Poor response to consultation; out of 62 responses, 35 opposed town-wide limits	-

[32] Smith D (2014) *Call for 20mph zones to be introduced on streets across Dundee*. Available at **http://www.thecourier.co.uk/news/local/dundee/call-for-20mph-zones-to-be-introduced-on-streets-across-dundee-1.313390** [Accessed online 8 July 2014]

Area / local authority	Current situation	Reasons	Outcomes
Sheffield	Rejected city-wide approach to 20mph in 2012 Adopted incremental approach instead, with 20mph limits to be introduced in seven residential areas	View that evidence suggested that a signs-only approach would only result in a short-term and marginal adjustment in speeds amongst some drivers, and that achieving a fundamental change in driving behaviour would be a lengthy process	-

Examples from Europe and overseas

6.5 In addition to examples from the UK, there are also many relevant examples from overseas. As most other countries set speed limits in metric units, the schemes examined have generally involved lowering the speed limit from 50km/h (32mph) to 30km/h (19mph). Especially in some European countries, 30km/h speed limits have been in place for quite some time, so it is instructive to examine the impacts that have been observed and the lessons that have been learnt. These examples are listed in Table 6.3 below.

Table 6.3 Relevant examples from other countries

Country, city	Background and measures implemented	Observed outcomes
Australia[33]	• Whilst this example does not pertain to a 30km/h speed limit, it is of relevance because it provides an insight into the impacts of a widespread reduction of speed limits in urban areas without physical traffic calming measures. • The default urban speed limit (which is the speed limit that applies in urban areas unless otherwise signed) was previously 60km/h across Australia. In general, this limit therefore applied to residential roads and collector roads. • Between 1997 and 2003, every state and territory (except the Northern Territory) lowered their default urban speed limit to 50km/h. This was done on a state- or territory-wide basis via a change in legislation, together with publicity and marketing. In general, no new signs or traffic calming measures were introduced. The exception to this is where some collector roads have been excluded from the lowered limit, which necessitated new 60km/h signs.	• Each state and territory where the limit was lowered conducted some form of monitoring to understand the impacts that the speed limit reduction had. • On 50km/h roads, mean speeds were observed to fall by between about 1km/h and 2km/h. • This monitoring consistently showed a decrease in the number of casualty collisions, of up to 20%. • Interestingly, some results also suggested that lowered speeds also occurred on roads where the 60km/h limit was retained.

Austria (Graz)[34] [35]	• Initially, small 30km/h zones with some physical traffic calming were implemented. Due to their success, 30km/h was later applied to whole areas, but in order to reduce implementation costs fewer measures were used (only road markings, entry treatments and public relations work).
	• There was still demand for 30km/h to be expanded more widely, however simply applying the previous approaches was considered to be too expensive.
	• A new city-wide approach was therefore used, that applied a 30km/h limit to the whole city except for a network of 'priority roads'. This scheme consisted of the following elements:
	  ◦ Signs at the city boundary
	  ◦ Road markings, consisting of speed limit roundels and repeaters
	  ◦ Intensive public relations
	  ◦ Police enforcement complemented by vehicle activated signs
		• The number of serious injury collisions declined by 24%, whilst the number of slight injury collisions declined by 12%, indicating a disproportionate decrease in more severe collisions.
		• The largest decrease by transport mode was for pedestrians, with pedestrian collisions declining by 17%.
		• There was a slight reduction in average vehicle speeds. However, due to a reduction in extremely high speeds, vehicle speeds became more homogenous.
		• Public acceptance rose from less than 50% prior to implementation, up to 77% post-implementation.
		• A reduction in vehicle noise was observed.
		• A slight reduction in NO_X emissions was observed.

[33] Woolley J (2005) Recent advantages of lower speed limits in Australia in *Journal of the Eastern Asia Society for Transportation Studies*, 6, pp3562–3573.

Country, city	Background and measures implemented	Observed outcomes
Denmark[36]	• 30km/h streets in Denmark have some requirements for physical measures. They were created as a cheaper alternative to 15km/h streets, which had more stringent requirements for physical measures. As such, 30km/h streets became much more popular, especially in existing residential areas.	• Mean vehicle speeds fell by about 11km/h, although this was through the use of physical measures. • On 30km/h streets, there was a 24% reduction in the number of collisions, with a 45% decrease in the number of casualties. This benefit appeared to also extend to the streets just outside of the 30km/h areas, with an 18% reduction in the number of collisions and 21% decrease in the number of casualties. (These results have been adjusted to take into account the trend in the control group, which consisted of all local urban streets in Denmark.) • A more intensive analysis was undertaken for casualties per road user kilometre (which includes motorised traffic, cyclists and pedestrians), for a smaller sample of streets. It was found that casualties per road user kilometre fell by 72%.
Germany (Hamburg)[37]	• A 50km/h limit already applied in inner cities. In 1983, 30km/h speed zones were proposed by the Hamburg Police traffic department in conjunction with local authorities. • Such zones were limited to areas that are residential in character, and excluded main roads. Within each zone, all roads should be similar in width and character, which may necessitate some design change. All junctions within the zones were uncontrolled, with all signs controlling traffic removed. Within the zones, no zebra crossings or cycleways were required. • Following the example in Hamburg, 30km/h zones were included in national legislation in 1985, which enabled their spread to other cities.	• 55% of drivers complied with the limit (which implies that the median vehicle speed became less than 30km/h). • A decrease in the number of collisions was not observed, although there was a decrease in the severity level of the collisions that did occur. • A small decrease in vehicle noise levels was observed.

[34] Sammer G (1994) General 30 kph speed limit in the city : the results of a model project in the City of Graz in Hakkert AS *The Third International Conference on Safety and the Environment in the 21st Century - Lessons from the past: shaping the future, 7–10 November 1994, Tel Aviv, Israel*. pp598–608.
[35] Sammer G & Wernsperger F (1995) Results of the scientific investigation accompanying the pilot trial of 30 kph limit in side streets and 50 kph limit in priority streets in PTRC Education and Research Services *The 23rd European Transport Forum : Proceeding of Seminar G : Traffic Management and Road Safety, 11–15 September 1995, Warwick*. P394, pp27–38.
[36] Engel U & Thomsen LK (1992) Safety effects of speed reducing measures in Danish residential areas in *Accident Analysis & Prevention*, 24(1), pp17–28.
[37] Scharping F-K (1994) Experience report – 30km/h speed limited zones in Hamburg – speed reduction measures on inner city roads in Hakkert AS *The Third International Conference on Safety and the Environment in the 21st Century - Lessons from the past: shaping the future, 7–10 November 1994, Tel Aviv, Israel*. pp585–589.

Country, city	Background and measures implemented	Observed outcomes
Germany[38]	• Before and after study in selected German cities, to analyse the impact of introducing a 30km/h limit together with traffic signal offsets optimised for progression at 30km/h.	• Improved traffic flow was observed. • Possibly also improved safety and reduced emissions, although evidence not conclusive.
Netherlands[39]	• As traffic levels in built-up areas increased, many collisions seemed to be caused by conflicts between vehicles and vulnerable road users such as pedestrians and cyclists, in particular the young and the elderly. The initial response drew on the principle of separation between different traffic types. • Subsequent to this, an alternative approach based on integration of all road users was applied. This was based on the principle of making motorised traffic subordinate to other road users, with the solution being the 'woonerf' or 'home zone'. However, barriers to widespread implementation of this solution included high costs. • There was therefore a need for a new approach that would achieve lower speeds without the disadvantages of the woonerf. Following demonstration projects, the 30km/h regulation was introduced in 1984, which allowed municipalities to introduce 30km/h zones. Such zones generally employ a range of engineering measures, to create an environment that encourages speeds of no greater than 30km/h.	• Changes in vehicle speeds varied widely depending on the type of engineering measures employed. Speed humps were found to be the most effective, achieving 85%ile speeds of 30km/h or less. Other measures were generally less effective. • Traffic volumes generally fell by between 5% and 30%. There did not appear to be any noticeable changes in walking and cycling levels. • After correction for national and local trends, the number of injury collisions decreased by about 25%, with a 5% reduction in the number of all collisions. • A survey showed that there was a high level of acceptance of the 30km/h regulation, and that safety was perceived to have improved.

[38] Schuster G (1994) Analysis of the effects of low progression speed in progressive signal systems in Hakkert AS *The Third International Conference on Safety and the Environment in the 21st Century - Lessons from the past: shaping the future, 7–10 November 1994, Tel Aviv, Israel*. pp590–597.
[39] Vis AA et al (1992) *Safety effects of 30 km/h zones in The Netherlands* in *Accident Analysis & Prevention*, 24(1), pp75–86.

Country, city	Background and measures implemented	Observed outcomes
Switzerland[40]	• 30km/h speed limits can be imposed on a local basis, in areas up to 1km^2 in area. • Can include neighbourhood streets and collector street in residential areas, but not main highways. • Physical traffic calming measures are generally used where vehicle speeds are particularly high. • By 2005, 700 districts and areas in Switzerland had implemented 30km/h zones.	• For zones in 'urban areas', there was a reduction in the 50%ile speed of about 7km/h (from 37km/h to 30km/h), and a reduction in the 85%ile speed of also approximately 7km/h (from 45km/h to 38kmh/h). However, for zones without physical traffic calming measures, only negligible changes in speeds were observed. • For zones in 'large/medium-sized towns/cities' there was a modest reduction in collision per year of about 4%, but a larger decrease in the number of casualties per year by about 15%. It was also found that 30km/h zones are more effective in areas with a dispersed spatial distribution of collisions, whilst more targeted interventions are suited to tackling concentrations of collisions (particularly at junctions). • A simple cost-benefit analysis was also undertaken. It was found that the benefits exceeded costs within a period of about three years. This is on the basis that on average, each zone results in a reduction of one collision and 0.5 casualties over a three year period.
USA (New York City) [41]	• In August 2010 the Mayor of New York and the Department for Transportation (DOT) committed to a pilot programme to test the safety performance of neighbourhood 20mph zones. The first zone was installed in the Claremont section of the Bronx in 2011. • In October 2013, DOT announced a further 15 communities from across the city selected to become Neighbourhood Slow Zones by 2016/17. These communities were selected from among 74 applicants. DOT selected each location based on crash history, community support, proximity of schools, and senior and day-care centres, among other criteria. • To reduce speeding and increase safety. Mayor Bloomberg stated that 'speeding is the single greatest contributing factor in traffic fatalities in our City'.	• Following installation in 2011, the Claremont Slow Zone saw a 10% reduction in the worst speeding in the neighbourhood, and across the city, speed bumps have been shown to reduce pedestrian crashes by more than 40% and reduce speeds by nearly 20%. • Slow zones are marked by high-visibility blue gateway signs at all streets entering the area, with signs noting the 20 mph speed limit in the zone, as well as speed bumps and stencilling of '20mph' eight-foot-high letters to make clear that motorists are in a reduced speed area. Areas that include fire stations, hospitals, and truck routes are avoided and the amount of bus routes are kept to a minimum inside the proposed zones. • The period between 2008 and 2013 recorded the fewest traffic fatalities since the City began collecting data in 1910.

[40] Lindenmann HP (2005) The Effects on Road Safety of 30 Kilometer-Per-Hour Zone Signposting in Residential Districts in *ITE Journal*, June 2005, pp50–54.

[41] New York City (2013) *Mayor Bloomberg and Commissioner Sadik-Khan Announce Citywide Expansion of Neighbourhood Slow Zones to Combat Speeding on Residential Streets and Further Improve Record Traffic Safety*. Available at **http://www1.nyc.gov/office-of-the-mayor/news/329-13/mayor-bloomberg-commissioner-sadik-khan-citywide-expansion-neighborhood-slow-zones-to/** [Accessed online 7 July 2014]

Other implementation issues

Public attitudes

6.6 In early 2014 the Automobile Association (AA) conducted a survey amongst 25,000 panel members into opinions on a variety of issues related to 20mph zones[42]. The overriding message is that councils and local authorities should consider the views of residents before imposing 20mph speed limits on their streets. A selection of responses is shown in Table 6.4.

Table 6.4 AA survey responses

Statement	Agree	Disagree
1. 20mph speed limits across residential neighbourhoods offer such a great road safety benefit that residents' views need not be taken into account.	32%	47%
2. Residents should be consulted before a 20mph speed limit is set on their road.	69%	18%
3. 20mph zones should not include any roads where there are no houses, shops or schools.	75%	12%
4. It is OK for 20mph speed limits on local neighbourhoods to be enforced by a speed camera system.	41%	38%
5. Speed camera enforcement should only be used in 20mph speed limit zones when a specific problem emerges.	61%	21%

6.7 There is interesting regional variation in responses with the greatest calls for wider consultation on 20mph zones coming from the regional centres of Manchester, Liverpool, Birmingham and London; areas where speed limits will have the greatest impact on commuters, services and businesses. However, Londoners were also most likely to disagree with the statement that 20mph zones should be limited to roads with houses, shops or schools (statement 3 in Table 6.4).

6.8 The challenge is understanding the local traffic context and managing it appropriately. A blanket 20mph speed limit imposed on main roads removes the incentive to stay on faster moving routes and instead divert through neighbourhoods. This could contribute to quieter streets being used as 'rat-runs' which in turn may require physical traffic calming measures.

Soft measures

6.9 Bristol City Council and the NHS commissioned a study that explored the effectiveness of social marketing interventions to support the implementation of signed-only 20mph limits, which was undertaken by the University of the West of England[43] [44]. The study identified an apparent disconnect between general public support for 20mph in residential areas, and the lack of action to comply with this limit when driving.

[42] AA (2014) *Slow down and consult on 20mph zones, AA members tell councils*. Available at **http://www.theaa.com/newsroom/news-2014/aa-members-want-a-say-on-20mph-zones.html** [Accessed online 25 June 2014].

[43] Toy S (2012) *Delivering soft measures to support signs-only 20mph limits*. University of the West of England, Bristol.

[44] Toy S (2012) *Delivering soft measures to support signs-only 20mph limits: A practical guide*. University of the West of England, Bristol.

6.10 A number of factors were identified to explain this non-compliance:

- Psychological factors:
  - People supportive of 20mph on their own street, but reluctant to drive more slowly elsewhere
  - Perceived pressure from other drivers to go faster than 20mph
  - Habit, given that most drivers have learnt to drive at 30mph in urban areas
- Practical factors:
  - No fear of getting caught
  - Road environment, as the current design of many roads gives visual cues consistent with speeds of 30mph or more
- Informational factors:
  - Lack of awareness of the new limit
  - Misconceptions, such as that driving at 20mph will significantly increase journey times

6.11 It was found that driver attitudes towards 20mph could be broadly split into three categories:

- **Supporters**: 'A small number of enthusiasts or visionaries that are keen to support 20mph.'
- **Pragmatists**: 'A large number of pragmatists or conservatives that prefer to follow the norm and drive at 30mph.'
- **Sceptics**: 'A small number of sceptics or self-determinists that are resistant to observing speed limits on principle.'

6.12 As such, a social marketing campaign to achieve behaviour change and make 20mph 'normal' is essential to support the roll-out of signed-only 20mph schemes. It is suggested that a programme for soft measures should comprise the following five elements:

- **Education**: Helping people to understand why 20 is important and how they can change their driving habits
- **Enlightenment**: Developing a broad vision for 20mph and selling the vision to win over residents, visitors, employees and employers
- **Engagement**: Listening to local concerns, helping communities to change their streets
- **Encouragement**: Visual reminders and rewards for keeping to the limit and driving considerately
- **Enforcement**: Warnings, sanctions and penalties for breaking the limit or for anti-social driving

6.13 Implementing such measures requires an adequate budget (at least 10% of the budget for physical implementation), along with a project team that has the 'soft' skills required for social marketing. It also needs to be recognised that successfully achieving and sustaining culture change is a long and slow process. It requires ongoing actions, to gain awareness, provide information and then provide periodic reminders.

6.14 The study notes that from a social marketing perspective, the ideal implementation approach would be a 'big bang' implementation programme, accompanied by appropriately timed social marketing. However, it is recognised that a phased approach to implementation is often adopted for pragmatic reasons .

Discussion of key findings

6.15 A wide range of case studies, from both the UK and overseas, have been examined in this chapter. As expected, the impacts of the case studies vary widely, given the diverse nature of

the schemes implemented. Nevertheless, there are some common themes that emerge, and the key findings from the case studies are summarised in Table 6.5 below.

6.16 In general, whilst the signed-only schemes in the UK examined have shown only small reductions in vehicle speeds of 1–2mph, early monitoring indicates that they are achieving a number of positive benefits, including reductions in collisions. However, to confirm these trends further post-implementation data gathered over a longer period of time will be required.

6.17 There are also a number of relevant findings from the overseas case studies. It is interesting that a common trajectory regarding the requirements for implementing 30km/h schemes may be found in many countries. This comprises a starting point where any 30km/h schemes required quite significant physical measures, including 'home zone' type treatments. These were implemented in small areas, and there was then pressure to implement them more widely. However, this was prevented by the high cost of implementation. As such, in many cases the requirements for physical measures have been eased, in order to facilitate more widespread implementation of 30km/h schemes. However, in most cases, at least some physical measures are still used.

6.18 As such, Graz is a particularly useful case study, as it involved a city-wide lowering of the speed limit primarily using signs. The scheme also included a programme of police enforcement. Whilst the decrease in average vehicle speeds was small, there were significant decreases in casualties, with serious injury collisions declining by about a quarter. In addition, public acceptance of the scheme rose after it had been implemented.

6.19 Another relevant case study comes from Australia, where the default urban speed limit was lowered from 60km/h to 50km/h. Although this did not involve 30km/h speed limits, it provides a good example of the effects of a widespread decrease in urban speed limits, without any associated physical measures. It was found that average speeds declined, and that reductions in collisions was observed.

6.20 Research undertaken by the University of the West of England has shed some light on drivers' attitudes towards complying with 20mph limits. The conclusion of this research suggests that it is vital that an integral programme of 'soft' measures be included as part of any scheme. The aim is to achieve cultural change to make driving at 20mph 'normal', although this is recognised to be a slow and long process.

Table 6.5 Summary of key findings

Impact theme	Evidence from UK case studies	Evidence from European and overseas case studies
Road safety	Some reductions in collisions and casualties observed for signed-only 20mph limits, although this is generally based on a short post-implementation monitoring period.	Reductions in collisions and casualties have been observed for schemes implemented overseas, although the magnitude of the decrease varies. The reductions seem to be greatest where schemes include some physical measures. In some cases, it was also found that collisions and casualties fell on surrounding roads that were not directly affected by the speed limit reduction.

Impact theme	Evidence from UK case studies	Evidence from European and overseas case studies
Traffic speeds	20mph limits without physical measures have generally decreased mean vehicle speeds by approximately 1–2mph.	Significant reductions in traffic speeds occurred where schemes included physical measures; in other cases, a smaller impact was observed. Interestingly, in some cases it was found that vehicle speeds on surrounding roads (not affected by a speed limit change) also decreased.
Environment and health	-	Little information, although a slight reduction in NO_X emissions was observed in Graz.
Amenity	May have some positive impact on amenity, as post-implementation surveys indicate that many residents view 20mph schemes positively. A slight reduction in traffic noise was observed in one case study.	Little information, although in some cases a slight reduction in vehicle noise had been observed.
Inequality	-	-
Transport efficiency	Available evidence shows a negligible effect on journey times, for both general traffic and buses.	Some evidence that a 30km/h limit, coupled with traffic signal offsets optimised for progression as 30km/h, results in smoother traffic flow.
Traffic volumes and sustainable modes	In some cases there have been reductions in traffic volumes and an increase in walking and cycling, although it is difficult to determine whether this can be solely attributed to 20mph or is caused by other factors.	In one case study, a reduction in traffic volumes was observed.

7 Detailed case studies

Chapter summary

- This chapter examines four case studies in greater detail: Islington, Camden, Kingston upon Thames and Bristol.
- The results that are available indicate that speed reductions of 1–2mph are achieved for area-wide schemes. There is generally not yet enough data to draw conclusions any impact on the number of collisions.
- Various lessons can be learnt from the experiences of the case studies in terms of the practicalities of implementation. In particular, early engagement with key stakeholders, such as police and bus operators, is essential.
- Post-implementation levels of support for the schemes has generally been high.
- A consistent theme is that enforcement will only play a small part in achieving lower speeds.

Introduction

7.1 In order to obtain more detailed information that is pertinent to this study, four case studies have been selected for further investigation. As London is the primary focus of this study, three out of the four case studies are located in London, with the fourth located outside London as a point of comparison. The aim has been to select four authorities that will provide a range of relevant experiences and lessons.

7.2 Islington and Camden are two inner London boroughs which have implemented borough-wide 20mph schemes. Kingston upon Thames provides a contrast, both because of its outer London location and also as it has not adopted a blanket approach. Finally, Bristol is an example from outside London.

Islington

7.3 Islington was the first borough to implement 20mph limits on all of their borough roads, including main roads, making it an interesting case study. Previously, Islington implemented 20mph zones across the borough between 2002 and 2009, targeting those areas with the

worst accident trends. The introduction of a blanket 20mph limit completed its 20mph programme, bringing the remaining 22% of borough roads to 20mph.

7.4 The borough's approach to delivering 20mph limits and the discussion with stakeholders including the Metropolitan Police and London Buses provide some useful background information for boroughs seeking to adopt a similar approach. For example, the cost of the scheme was originally expected to be £1m, but rose to £1.6m following requests from the Department for Transport and police that the signs were illuminated.

7.5 A discussion was held with Islington to expand on the information provided in their response to the questionnaire. The key points raised in this discussion are listed in Table 7.1.

Table 7.1 Findings from Islington case study

Topic	Findings
Impact of 20mph zones/limits	• Surveys on the borough wide 20mph limit on non-Principal Roads indicated that there was an average reduction of 1mph. • Surveys undertaken on the Principal Road network before and after implementation of the 20mph limit showed the average speed went down 1mph from 23mph to 22mph. The 85th percentile speed (the speed at or below which 85% of the traffic is travelling) fell from 28 to 27mph
Cost-benefit assessment	• Islington have typically examined cost benefits on the First Year Rate of Return, predicting the number of accidents their 20mph zones would help reduce. However, it is difficult to attribute accident reduction to 20mph limits as there are a number of contributing factors (e.g. engineering measures, driver education, targeted advertising campaigns, vehicle safety improvements etc.)
Consultation and barriers to implementation	• Transport for London's London Buses were initially opposed, concerned about the impacts on bus journey times. The opposition was somewhat reduced where it was shown that the journey times did not significantly increase, often due to the 20mph roads having low average speeds in the first place. • The Metropolitan Police were initially concerned from a resources and enforcement perspective, but over time the increased support for 20mph limits has led to a softening of this position as the Council prefers compliance rather than enforcement. • Ipsos Mori-commissioned surveys targeting residents found overall support for the scheme
Authority and enforcement	• Islington prefer to foster a cultural shift towards 20mph that encourages compliance above enforcement. • Recently, the police has run 'stop and advise' sessions, resulting in improved awareness and in some cases picking up minor incidents. • A speed gun calibrated to 20mph has been acquired, enabling some enforcement of the limit.
Soft measures	• Some marketing to raise awareness was undertaken in addition to public meetings and the formal consultation. This has included advertising on buses.
Cross-boundary and hybrid solutions	• Neighbouring boroughs have progressed 20mph limit proposals, welcomed by Islington

7.6 Subsequent to the discussion with Islington, police enforcement of the borough-wide limit was commenced in October 2014. A number of enforcement operations have already been run (which are intended to be held on an ongoing basis), and it is understood that a number of fixed penalty notices (FPNs) have already been issued. This is seen as a progression from the 24 stop and advise sessions held since November 2013, which were run in 13 different locations and resulted in 938 motorists being stopped.

Camden

7.7 Camden is another inner London borough that has implemented 20mph across all of its borough roads. This was completed in late 2013. The findings of a discussion held with Camden are listed in Table 7.2 below.

Table 7.2 Findings from Camden case study

Topic	Findings
Impact of 20mph zones/limits	• Monitoring consists of ATCs on a representative sample of affected roads. It is ongoing for three years, and will be reported on in due course. Data on reported collisions will also be examined as it becomes available. • Monitoring will also draw upon the regular screenline counts that Camden also undertake, which include cycle counts. • Undertaking attitudinal surveys may also be considered. • There are also some air quality monitoring stations in Camden, but it would be difficult to isolate the impact of 20mph from other factors.
Cost-benefit assessment	• Scheme costs consisted of a capital element for implementation, plus an ongoing element for monitoring. • Initial estimates of scheme costs were higher than then actual cost. This was partially because the initial estimates were based on a 'worst-case' view. In addition, discussions were held with DfT to clarify signing and lighting requirements, and internal discussions were also held to determine the signage and road markings that were viewed as essential. The outcomes of these discussions were then used to design the details of the scheme. • The scheme costs were covered by LIP funding. • The possibility of drawing upon public health funding was explored, however this did not eventuate. At the time, public health was a new responsibility for local government. As such, it was found that the transport and public health teams spoke different 'languages'. In addition, a significant amount of officer time was required to demonstrate the public health benefits of the 20mph scheme through a business case. Now that the public health function is more embedded, there is a better working relationship between the transport and public health teams.
Consultation and barriers to implementation	• The main complaints received post-implementation were concerns about how signs and road markings were being used in conservation areas. On the other hand, some people also raised concerns about there not being enough signs and road markings. • Some concerns have also been raised that 20mph is making roads less safe, due to drivers using dangerous manoeuvres to get past vehicles travelling at slower speeds. However, this is based on anecdotal evidence only. • The queries and concerns received have generally focussed on the street that the enquirer lives on. • There are a handful of people who have shown a more ongoing interest in the 20mph scheme, and have followed up with FOI requests for monitoring data. • The next step will be to examine the monitoring data, to identify if there are any locations where physical measures may be required to achieve lower vehicle speeds. This is likely to take place about 1 year after implementation.
Authority and enforcement	• The police were intensively engaged with throughout the development of the scheme. This resulted in an agreed position between Camden and the police, whereby police enforcement of 20mph will only take place on streets with persistently high speeds once the borough has exhausted all other measures available (such as engineering measures) to reduce speeds. • More recent discussions have indicated that there may be the possibility of police support for annual campaigns to encourage compliance.

Topic	Findings
Soft measures	• Initial measures were consultation during pre-implementation, and publicity to build awareness of the scheme during implementation. • Currently putting together LIP submission. Camden will consider in due course what softer measures may be required to support the 20mph schemes. This may tie into ongoing programmes that Camden has, such as Corridors and Neighbourhoods Schemes (CANS).
Cross-boundary and hybrid solutions	• Almost all boundary roads were included, except for those on the border with Westminster (and possibly Brent?). • At this point, discussions regarding extending 20mph onto other sections of the TLRN in Camden have not been pursued with TfL. • Some initial discussions have been held within the Central London Sub-regional Transport Partnership about developing a framework for the application of 20mph onto the TLRN.

7.8 In terms of evaluating the benefits of the scheme, a range of scenarios were evaluated for varying reductions in speed and collisions. The results obtained are reproduced in Table 7.3 below.

Table 7.3 Camden's evaluation of savings from casualty reductions

	Worst case (1 mph = 6%)	Medium case (2 mph = 12%)	Best case (3 mph = 18%)	Portsmouth 'real case' (1.3 mph = 21%)
Residential roads	£692,102	£1,384,205	£2,076,307	£2,422,358
Add Camden's main roads	£1,054,014	£2,108,029	£3,162,043	£3,689,050
Add the SRN	£2,412,265	£4,824,530	£7,236,796	£8,442,928
Add the 'red routes'	£3,544,141	£7,088,282	£10,632,423	£12,404,494

Source: Borough-wide 20 mph limit progress update

Kingston upon Thames

7.9 Kingston is a useful case study to examine, as it is an outer London borough adjacent to Surrey, in contrast to the two inner London boroughs above. It is also an authority that has not adopted a blanket borough-wide approach to 20mph, but rather has a neighbourhood decision making structure. Under this system, the borough is divided into four neighbourhoods, with each neighbourhood having autonomy over its highway network, which includes decisions over 20mph schemes.

7.10 This system means that the extent of 20mph varies across the neighbourhood. The Kingston Town neighbourhood has almost complete coverage of all residential roads, whilst in the other neighbourhoods there are lower levels of coverage. Across the whole borough, almost half of all borough roads will be covered by 20mph once schemes planned for this financial year are implemented. This means that apart from Haringey, it has the highest level of 20mph coverage out of all the outer London boroughs that responded to the questionnaire.

7.11 A discussion was held with Kingston, to expand on the information provided in their response to the questionnaire. The key points raised in this discussion are listed in Table 7.4 below.

7.12 It is interesting to note that a formal cost-benefit analysis is generally not undertaken for 20mph schemes, given that the number of collisions on residential streets is relatively low.

Table 7.4 Findings from Kingston case study

Topic	Findings
Impact of 20mph zones/limits	• Reviews completed on a neighbourhood-by-neighbourhood basis, and reports available on website. • Reviews involved re-surveying roads in scheme areas and examining collision data.
Cost-benefit assessment	• Schemes funded through LIP. • Ongoing maintenance costs absorbed into wider maintenance programme. • Some savings in maintenance costs through removal of external illumination of signs. • Formal cost-benefit analysis generally not undertaken. Difficult as number of collisions in residential streets is very low.
Consultation and barriers to implementation	• Some people question need for 20mph schemes, especially if speeds are already low and due to expectations that schemes are self-enforcing. • Post-implementation, some general queries are received regarding speeds and enforcement. • Post-implementation changes to schemes have generally involved expanding them.
Authority and enforcement	• No regular programme of enforcement. Some ad-hoc speed surveys undertaken by Safer Neighbourhoods teams. • Borough's role is generally limited to passing on any strong concerns from residents to Safer Neighbourhoods teams.
Soft measures	• Generally no scheme-specific soft measures. Consultation results are examined to see what people's attitudes are. • Publicity about 20mph schemes through ongoing Smarter Travel programme, which uses boards throughout the borough which are alternated regularly. Programme also includes work with schools.
Cross-boundary and hybrid solutions	• Currently looking at an area in Worcester Park where the only way in and out is via Sutton. Initial discussions have been held with Sutton regarding including a section of their road in the scheme, and Sutton have been receptive in-principle. Details such as implementation timing and prioritisation are subject to further discussions. • A 20mph limit is in place on Tolworth Broadway (SRN), as it was a key part of the Tolworth Greenway scheme.

Bristol

7.13 Bristol is an interesting case study for examining practice outside of London. Bristol has an authority-wide 20mph policy which it is currently implementing. It is a policy based decision to reduce the risk and severity of road casualties and create more attractive communities and environment for active modes, forming part of a broader sustainable transport package funded through the DfT's Local Sustainable Transport Fund.

7.14 Its 20mph proposal is for 90% of Bristol's adopted roads to have a default 20mph limit based only on signage. Exemptions include 40mph-50mph roads and dual carriageways. The proposals are to be delivered in eight phases, with the first five having been implemented by September 2014. The first two phases were introduced as pilot areas in 2010 (Inner East Pilot Area and Inner South Pilot Area). There are a further six phases, with the third phase introduced in January 2014, followed by the fourth in July 2014 and the fifth in September 2014.

Table 7.5 Findings from Bristol case study

Topic	Findings
Impact of 20mph zones/limits	• Pre and post scheme monitoring has been undertaken on the pilot areas show 65% of roads saw a reduction in mean speeds and 18 roads no longer saw average speeds above 24mph • Average speed reduction of 0.9mph in the Inner South area (from 23.6mph to 22.7mph), and 0.9mph in the Inner East area (from 23.4mph to 22.9mph) • No detectable trends based on the short period (one year) of evidence available at the time of reporting • Six monthly monitoring is taking place to build a more comprehensive understanding of impacts after implementation
Cost-benefit assessment	• No quantitative analysis of cost benefits has taken place to date
Consultation and barriers to implementation	• Household interview surveys have been undertaken for pre-implementation for four phases, with phase 1 post-monitoring forthcoming • Pilot areas support for 20mph limits around 82% • Set up a stakeholder group for early engagement, including local bus operators First & Wessex, taxi groups, local business representatives, the local Freight Transport Association group, and Avon and Somerset Constabulary • Bus operators – early engagement key
Authority and enforcement	• Police enforcement is assisted by neighbouring authorities introducing 20mph limits, with the local constabulary starting to now enforce 20mph limits • Although enforcement is similar to 30mph limits, the emphasis for 20mph limits is to educate, not penalise • Police are supported by community speedwatch, where police train community volunteers to use small speed guns and record speeds which for 26mph upwards results in a letter informing the driver of their speed. Three letters results result in a police visit. A 20mph awareness course has been piloted, one of three in the country • 'Pace' stickers are available for willing drivers to place on their vehicle, explaining to drivers in vehicles behind them that they are complying with the authority's 20mph limit
Soft measures	• The 20mph programme forms part of a broader LSTF programme with smarter choices measures to encourage mode shift
Cross-boundary and hybrid solutions	• Neighbouring authorities have pursued 20mph limits, which has been useful in working alongside Avon, Bath and Somerset constabulary

8 Lessons for future 20mph policy in London

Chapter summary

- Drawing on the evidence and experience examined in this report, this chapter suggests an appropriate approach to 20mph schemes in London.
- An area-wide approach is suggested, expanding on the existing nucleus of 20mph boroughs in central London. Such an approach provides more consistency and builds awareness amongst drivers, and helps to foster culture change.
- The lower cost of a primarily signed-only approach would facilitate a more rapid roll-out. The inclusion of borough main roads and TLRN roads depends on the local context. A package of complementary softer measures, aimed at achieving cultural change, should be an integral part of each scheme.
- More comprehensive monitoring of schemes should be undertaken to evaluate their impacts, and coordinated London-wide monitoring of 20mph schemes would result in more effective monitoring.
- In terms of compliance, it is unlikely that a significantly increased level of police enforcement is achievable. Giving local authorities the option of enforcing speed limits would enable better responsiveness to local issues and priorities. The wider use of Intelligent Speed Adaptation (ISA) also has a role to play in slowing vehicle speeds.

Introduction

8.1 This report has examined the current context for 20mph, as well as the varying approaches that are currently used across London. Evidence from overseas has also been discussed. In terms of road safety, the evidence is clear that in general, slower vehicle speeds result in fewer and less severe collisions. 20mph schemes are one way to achieve this, although actual speed reductions vary depending on the details of each scheme.

8.2 Therefore, drawing on the information gathered for the previous chapters of this report, this chapter recommends a feasible policy approach for 20mph in London going forward. This takes into account the current situation in London, its particular transport context as well as

differences that exist across the city. Nevertheless, there is value in pursuing a coordinated and joined-up approach throughout London, as this would result in greater consistency, minimising unexpected changes based on arbitrary borough boundaries.

8.3 These key recommendations are summarised in Table 8.1 below, and discussed further in the following sections.

Table 8.1 Future 20mph policy for London

Item	Description
Overall approach	• Applying an area-wide approach has the benefit of providing greater consistency for drivers, improving awareness and supporting cultural change • There is already a nucleus of existing 20mph boroughs in central London, and this could be used as a starting point for outwards expansion • For boroughs further away from the centre, the continued rollout of 20mph schemes on a case-by-case basis is recommended until the area-wide expansion reaches them • 20mph limits supported primarily by signage and roadmarkings are more cost effective; however, a budget should be retained to implement targeted measures where high vehicle speeds persist • Whether borough main roads and TLRN roads are included in 20mph schemes should be decided based on the local context • At least 10% of the implementation budget should be set aside for a package of complementary 'soft' measures to foster cultural change
Costs and benefits	• Evaluation of scheme benefits should focus on road safety impacts, and test a range of scenarios given the difficulty of accurately predicting changes in vehicle speeds • More certainty on the impacts of 20mph limits will be available once the DfT study is complete in 2017 • Improved clarity on signage and roadmarking requirements for 20mph limits would provide greater certainty on scheme costs • LIP funding should continue to be available for 20mph schemes, and the possibility of using public health funding should also be examined
Monitoring and evaluation	• More comprehensive monitoring over at least a three year period (encompassing collisions, vehicle speeds, movement volumes and a comparison against control areas) should be undertaken to evaluate the effectiveness of 20mph schemes • There would be merit in creating a London-wide system for monitoring the effects of 20mph schemes
Compliance	• Police enforcement is limited by available resources; this could be alleviated by allowing local authorities to enforce speed, which would enable better responsiveness to local issues and priorities • Technology such as Intelligent Speed Adaptation (ISA) has a role to play in achieving compliance, and more widespread adoption should be promoted

Overall approach

8.4 Given the strong evidence demonstrating the road safety benefits of 20mph schemes, rolling them out more widely across London would be expected to reduce the number and severity of collisions.

8.5 The maps included in Figure 8.1, Figure 8.2 and Figure 8.3 below show actual average speeds for every road in London, for the peak, inter peak and night periods respectively, based on observed GPS data. The speeds shown on these maps are overall averages for each link, including any delays at junctions. However, what is very clear is that throughout the day (peak and inter peak), the vast majority of roads in inner London have an average speed of 24mph or less. This is the case even in outer London, although speeds on main roads tend to exceed

24mph, particularly in the inter peak. Unsurprisingly, speeds at night time tend to be higher, although the majority of roads still have an average speed of up to 24mph.

8.6 This suggests that inner London is suited for the more widespread implementation of 20mph schemes. Whilst it is recognised that mid-block speeds (excluding delays at junctions) may be higher than indicated on the maps, the nature of the road network in London means that overall journey times are in any case largely dictated by junction delays. As such, slowing vehicles to 20mph would not be expected to have any significant impact on overall transport efficiency.

8.7 Employing an area-wide approach would be the most efficient way of achieving this. At present, in many parts of London there are a patchwork of 20mph zones and limits, which in some cases end abruptly at borough boundaries. This is likely to be confusing to drivers, and results in an unnecessary proliferation of signage. Area-wide approaches provide greater consistency, and hence should help to enhance driver awareness. This approach would also reinforce cultural change, by being consistent with the message that 20mph is an appropriate speed to drive at in urban areas.

8.8 There is already a 'nucleus' of authorities in central London with borough-wide schemes. These are surrounded by a number of other borough who intend to roll out borough-wide schemes. Ideally, a coordinated approach between boroughs would be beneficial, where the existing 20mph nucleus forms a starting point, with 20mph radiating outwards from this. In particular, it would be desirable to avoid situations where there is a ring of 20mph boroughs surrounding a borough that has not adopted 20mph, as this would appear illogical and undermine the credibility of 20mph limits.

8.9 In tandem with this, it would be appropriate for other boroughs (that are further away from the core) to continue implementing 20mph schemes on a case-by-case basis in the meantime. Once the core 20mph are has expanded from central London and reaches each borough, it will then be a matter of filling in the remaining gaps.

8.10 In the first instance, in order to expand the area-wide approach, 20mph limits supported primarily by signage and road markings are likely to be the most feasible to implement, given their lower implementation cost. This means that it will be possible to roll them out and achieve wider coverage more rapidly in the current climate of constrained resources. Nevertheless, it is also suggested that a budget be held back, so that appropriate targeted measures can subsequently be implemented where vehicle speeds remain persistently high.

8.11 Another issue to consider is whether borough main roads should be included in 20mph schemes. The borough-wide schemes that have been implemented to date have applied to borough main roads, however, it is important to note that these have all been borough located in central London. In parts of outer London, the character of some borough main roads that primarily have a traffic movement function is not likely to be suitable for 20mph. This can be seen on the average speed maps, where many main roads (particularly in outer London) have average speeds of over 30mph in the inter peak period.

8.12 However, in these cases a more targeted approach to applying 20mph on specific sections of main roads would be more appropriate, for example around where the 'place' function of a road becomes more important, such as in the vicinity of shops. In general then, the decision on whether borough main roads should be included in 20mph schemes should be made locally, taking into account the differing context of each borough.

8.13 A similar issue arises regarding whether TLRN roads should also be included as part of 20mph schemes, although the crucial difference in this case is that the decision ultimately rests with TfL. However, many of TfL's policies recognise the benefits of 20mph, and the work of the Roads Task Force advises that 20mph is suitable for roads with an important 'place' function. As such, where TLRN roads fall within an appropriate category, as well as already exhibit low speeds, TfL should work collaboratively with 20mph limit boroughs to consider the suitability of applying a 20mph limit on a case-by-case basis.

8.14 A key point is that 'soft' measures need to be included as an integral part of all 20mph schemes. These measures need to go further than solely publicity, and encompass a broader package of initiatives aimed at fostering sustained culture change to make driving at 20mph normal. To enable this, at least 10% of a scheme's budget should be set aside for this purpose.

Legend

- Road Speeds > 30 mph
- Road Speeds 24 - 30 mph
- Road Speeds 20 - 24 mph
- Road Speeds 0 - 20 mph

Road Speeds in London Peak Journey Times

Figure 8.1 Average vehicle speeds in London, peak period

Source: 2013 TomTom Multinet Speed Profiles

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Created by:	Last Updated:	Scale:
ORussell	06/10/2014	300,000

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Legend

- Road Speeds > 30mph
- Road Speeds 24 - 30 mph
- Road Speeds 20 - 24 mph
- Road Speeds 0 - 20mph

Road Speeds in London Inter Peak Journey Times

Figure 8.2 Average vehicle speeds in London, inter peak period

Source: 2013 TomTom Multinet Speed Profiles

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Created by:	Last Updated:	Scale:
ORussell	06/10/2014	300,000

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Road Speeds in London Night Journey Times

Figure 8.3 Average vehicle speeds in London, night time period

Source: 2013 TomTom Multinet Speed Profiles

steer davies gleave

Created by:	Last Updated:	Scale:
ORussell	06/10/2014	300,000

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Scheme costs and benefits

8.15 The primary benefit of 20mph schemes is an improvement in road safety, with fewer and less severe collisions. As such, the evaluation of scheme benefits should focus on quantifying anticipated changes in the number of collisions. This difficulty is that this is dependent on the vehicle speed reductions that are achieved, which is likely to be heavily dependent on local circumstances.

8.16 As such, it is suggested that a range of speed reduction scenarios be tested, drawing of DfT guidance and any local experience from previous schemes. These can be used to then estimate the expected change in the number of collisions for each scenario. The benefit of this can then be valued, by using current DfT estimates for the cost of a collision for each severity level.

8.17 In addition, there may be other impacts, but these are likely to be negligible, difficult to estimate and/or longer-term in nature. As such, rather than attempting to quantify these impacts, it would be more practical to note that they are possible. A summary of this is provided in Table 8.2 below.

8.18 The points above are based on currently available information on the impacts of 20mph limits. More certainty will be available once the findings of the current DfT study are available, however it is not scheduled to be completed until 2017.

Table 8.2 Estimating impacts

Impact theme	Likely outcome	Suggested approach to estimating impact
Road safety	Some reductions in collisions and casualties observed for signed-only 20mph limits	Exact impacts will depend on local circumstances, so estimate speed and collision reductions based on a range of scenarios (see text above)
Traffic speeds	Varies by location, but 20mph limits without physical measures have generally decreased mean vehicle speeds by approximately 1–2mph	
Environment and health	Evidence on vehicle emissions is mixed, impact likely to be negligible	Note that any emissions impact is likely to be negligible
Amenity	May have some positive impact on amenity, as post-implementation surveys indicate that many residents view 20mph schemes positively. Any noise impact likely to be negligible	Note that there may be positive impacts on amenity, although these are difficult to quantify Note that any noise impact is likely to be negligible
Inequality	May have a positive impact on inequality, particularly by improving road safety for vulnerable road users, such as pedestrians and cyclists	Note that there may be a positive impact on reducing inequality
Transport efficiency	Negligible effect on journey times, for both general traffic and buses.	Note that any impact on vehicle journey times is likely to be negligible
Traffic volumes and sustainable modes	In some cases there have been reductions in traffic volumes and an increase in walking and cycling, particularly where 20mph has been implemented as part of a wider package of measures	Note that 20mph will help to encourage higher levels of walking and cycling, although this is likely to be a longer term effect

8.19 As noted above, the costs of 20mph limits are potentially much lower now, as extensive physical traffic calming measures are no longer required. However, there appears to still be uncertainty regarding the costs of implementing such schemes. For example, the cost to

implement the borough-wide scheme in Islington was higher than anticipated, due to requirements for sign lighting. In contrast, the implementation cost in Camden was lower than expected, following discussions with DfT to clarify their requirements. Improved guidance on the requirements for 20mph limits from DfT would assist in providing greater certainty regarding scheme costs.

8.20 There are also some potential ongoing savings from 20mph schemes, as the requirements for sign lighting within 20mph zones are anticipated to be relaxed. In addition, any estimate of scheme costs should include a budget to be held back, to implement measures in locations where vehicle speeds remain high. Also, as discussed above, a portion of the budget (at least 10%) should be dedicated to complementary measures.

8.21 In general, 20mph schemes in London have generally been implemented using LIP funding. This source should continue to be available for 20mph schemes, given that current TfL policy supports the further rollout of 20mph. Another source of funding that could potentially be drawn upon is public health funding. This has been done by some authorities outside London, but does not appear to have been used yet by any authorities in London (although Camden did consider it).

Monitoring and evaluation

8.22 One difficulty that arises when attempting to monitor the speed and road safety impacts of 20mph zones and limits, and hence evaluate their effectiveness, is that it can be difficult to isolate the impact of 20mph from changes caused by other factors or random fluctuations. In particular, collision statistics are sometimes not interpreted correctly, for example when it is reported that collisions on roads with a 20mph speed limit have increased, without taking into account any changes in the length of roads that 20mph speed limits apply to. Essentially, the key issue is that any useful analysis needs to take into account changes in exposure to properly determine whether the level of risk is actually increasing or decreasing. Further, monitoring is sometimes only undertaken for a relatively short period (such as only 12 months following the implementation of a scheme), which exacerbates these issues.

8.23 As such, it is recommended that monitoring should be undertaken for a minimum of three years post-implementation, and include the following elements:

- Recorded collisions
- Actual vehicle speeds
- Traffic, cyclist and pedestrian volumes
- Comparison against one or more comparable control areas (that are not included in the 20mph scheme), to enable the effect of a 20mph scheme to be isolated from background trends that would have occurred in the absence of the 20mph scheme

8.24 In addition, there would also be benefits in setting up a London-wide system for monitoring the effects of 20mph schemes. Whilst it is already possible to analyse the collisions statistics that occur on roads with a 20mph limit, what is missing is systematic recording of changes in the lengths of roads covered by a 20mph speed limit, as well as changes in movement volumes on roads with a 20mph speed limit. By examining the aggregate impact of 20mph schemes across all of London, a clearer and more robust understanding of their impacts will be gained.

Compliance

Enforcement

8.25 Police enforcement of 20mph speed limits (and speed limits in general) is constrained by limited resources and competing priorities. The current position of the Metropolitan Police is that enforcement of 20mph speed limits is possible where high speeds are persistent, but only on a reactive basis after other measures (such as engineering) have been exhausted. It is unlikely that a there will be any significant increase in the level of enforcement in the foreseeable future.

8.26 As such, there may be merit in advocating for local authorities to have the power to enforce 20mph speed limits, building on existing parking and moving traffic offence enforcement powers. This power would not necessarily need to be taken up by all boroughs, but it would be useful to have as an option, as it would mean that speed enforcement could be tailored to better align with local needs and priorities.

Intelligent Speed Adaptation (ISA)

8.27 Intelligent Speed Adaptation (ISA) is an emerging technology that potentially also has a part to play in fostering compliance with 20mph speed limits. As such, it is a useful tool to help achieve lower vehicle speeds in 20mph schemes without relying on traffic calming or police enforcement. A number of trials have already been carried out, and it is recommended that the more widespread use of ISA is promoted. Possible steps to achieve this are:

- Councils could lead by example, by installing ISA in their own fleets of vehicles, and also specifying that it be installed in their contractor's vehicles (for example refuse collection vehicles).
- ISA could also be rolled out in other fleets of vehicles, for example TfL buses, as well as company fleets.
- Finally, ISA could also be installed in private vehicles, although it is unlikely to prove acceptable to make this mandatory for the general public. Rather, the use of ISA could be encouraged through incentives such as discounted insurance premiums. In addition, the compulsory use of ISA could be targeted at specific groups, for example those caught repeatedly speeding.

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Appendices

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B Boroughs questionnaire

B.1 A copy of the survey as distributed to all 33 local authorities in London is included in this appendix.

Research into the impacts of 20mph speed limits and zones: borough survey

The London Borough of Merton, on behalf of LEDNet, has commissioned Steer Davies Gleave to conduct research into the impacts of 20mph speed limits and zones to inform future policy in London. In order to understand the current status of and thinking regarding 20mph schemes across the city, it would be appreciated if you (or a colleague) could take a few minutes to complete this short questionnaire. Please feel free to respond by attaching relevant reports and documents.

Please send your response to David Sutanto at
by Friday 18 July 2014.

Contact details

Borough: Click here to enter text.

Contact name: Click here to enter text.

Position: Click here to enter text.

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Q1: Current coverage of 20mph schemes

How many areas / what proportion of your borough is covered by 20mph zones and 20mph limits? (Please supply a map if available.)

Click here to enter text.

Q2: Policies

What is your borough's current policy towards 20mph zones and/or limits (such as in your LIP, road safety plan, and other broader non-transport council documents)?

Click here to enter text.

Q3: Approach to implementation and prioritisation

- Where applicable, what is your borough's current approach to implementing 20mph zones and/or limits? (For example, are you using physical traffic calming measures, or an approach primarily based on signage? Are any supporting measures being put in place, such as publicity campaigns or vehicle activated signs to encourage compliance?)

- How have different areas of your borough been prioritised?

Click here to enter text.

Q4: Reasoning

How have you built the case for the roll-out of 20mph zones and/or limits (for example speed surveys, collision history, emissions reduction, traffic reduction/diversion, quality of life, etc)?

Click here to enter text.

Q5: Monitoring and evaluation

What evidence do you have of the impacts of 20mph zones and/or limits in your borough? (Such as road safety, actual traffic speeds, environment and health, amenity, inequality, journey times, traffic volumes, mode shift, etc)

Click here to enter text.

Q6: Barriers and challenges

What have been the main challenges and/or barriers to delivering a 20mph zones and/or limits in your borough (such as negative responses to public consultations, political and stakeholder opposition, deliverability, cost, etc)? Have any post-implementation issues arisen, and if so, how were they addressed?

Click here to enter text.

Any further comments

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Control Sheet

Document Title
Research into the impacts of 20mph speed limits and zones

Document Type
Report

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Review

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