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Impact of 20mph speed limits

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This paper examines the experiences of a number of highway authorities that have introduced 20mph speed limits and 30km/h zones.

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Executive Summary

20mph speed limits are increasingly being viewed as an effective means of improving the safety of vulnerable road users, particularly in areas where they are most likely to be sharing the road space, such as residential areas, school zones and/or town and city centres.

United Kingdom

The UK's first 20 mph speed limit zones were introduced in England in 1991, in Sheffield, Kingston upon Thames and Norwich.

Increasing the safety of road users and pedestrians has been the primary driver of 20mph zones in the UK. There are now an estimated 2,150 20 mph zones in operation in England.

Case study evidence indicates that 96% of 20 mph zones take the form of vertical traffic calming/deflection measures, such as road humps. 1% of zones utilise horizontal measures, such as chicanes, and 3% contain a mix of vertical and horizontal measures.

10% of 20 mph measures are speed limit controlled areas, using signing only.

The UK Department for Transport recommends the use of signed only 20mph zones in places where speeds are already low (<24mph), physical traffic calming is recommended in areas where speeds exceed 24mph.

Portsmouth

Portsmouth City Council (PCC) was the first local authority in England to implement an extensive area-wide 20 mph Speed Limit scheme, without traffic calming.

The average overall speed for the introduction of 20mph speed limits was already lower than the new 20mph limit (19.8 mph). However, this was reduced further, to an average of 18.5 mph, after implementation of the scheme. There were areas where speeds exceeded 24mph, and the speed reduction achieved was more pronounced in these sites.

There was a reduction in the total number of accidents (KSI and Slight) of about 34 per year (21%).

Although there are some indications that the Portsmouth scheme has been a success, no sound conclusions can be drawn on the basis of Portsmouth's 20mph limits alone.

Bristol

In 2010 Bristol City Council introduced two sign only 20 mph pilot areas as part of the Cycling City project in partnership with the NHS initiative Active Bristol.

The planners of the pilot had recognised the success of the Portsmouth scheme; however, whereas traffic speed in Portsmouth is calmed by the prevailing environmental conditions, including congested residential areas with high levels of on-street-parking, Bristol is more open.

The public were supportive of the pilot with 82% of survey respondents supportive of 20mph speed limits.

Manual counts indicated increased levels of walking and cycling, however, surveys suggest they have remained unchanged.

A few people felt it was safer to cross the road as a result of 20mph speed limits, however, The number of people who considered it unsafe for children to play on the street unsupervised actually increased.

While there is generally strong support for the introduction of 20mph speed limits on residential streets, it is less clear from the Bristol evaluation if any of the predicted outcomes have or will be realised.

The Bristol project is at an early stage in its development and therefore the findings of the monitoring report used in this paper cannot be considered as a definitive assessment. It takes time, a number of years in fact, to accurately assess variances in vehicle speeds, collision data and walking/cycling levels that would show clear trends.

Edinburgh

The introduction of 20mph limits on residential streets and streets with high levels of pedestrian activity is a key element of Edinburgh City Council's (ECC) Local Transport Strategy and both the Council's Active Travel Action Plan (ATAP), and the Road Safety Plan for Edinburgh to 2020 (RSP).

Already approximately 50% of the residential streets in Edinburgh are designated 20mph zones where the speed is restricted by physical traffic calming features.

"The introduction of the scheme cost around £200,000 excluding surveys, of which £113,000 was the costs of signs and surface markings. This compares to an estimated £600,000 for conventional 20mph speed limit treatment (with traffic calming) in the same area."[1]

This pilot covered some 40km of road, which works out at £5,350 per km although it is anticipated that economies of scale can be realised when rolling out the scheme. By way of comparison the Portsmouth scheme cost £1398 per km.

75% of the surveyed 20mph streets continue to have average vehicle speeds in excess of 20mph, however in all streets (except the four locations) speeds remain lower than 24mph an average fall of 1.9mph.

[1] Shaw, L. (2013) Before and After Research into the implementation of 20mph speed limits in South Edinburgh. City of Edinburgh Council

A speed limit of 20mph covering most streets in Edinburgh could now be introduced by the city council by 2017.

Dublin

Dublin City Council was the first local authority in Ireland to introduce a 30km/h speed limit. This has been in force in most of the city centre's shopping and central business areas since 2006.

A Senior executive engineer with Dublin City Council has stated that the 30km/h speed limit has not brought about any reduction in traffic speeds. Furthermore, the council do not have sufficient data on traffic collisions to determine whether the scheme had any impact on the number and severity of collisions.

Europe

Across the EU the setting local speed limits is devolved to local authorities, including in GB and ROI. Many local authorities have already (more than 80[2]) made widespread use of 30 km/h (18.6mph) zones, particularly in residential areas, notable examples include:

- Graz in Austria (current population 255,000). Graz became the first European city to introduce a 30 km/h city-wide limit, this covers approximately 80% of it's road network;
- In the city of Stuttgart, Germany (population 600,000) 85% of the road network has a 30 km/h limit;
- By 2001 some 80% of Munich (population 1.35 million) was covered by 30 km/h zones with more being planned. Some of Munich's residential streets have an even lower 20 km/h limit with associated traffic calming measures;
- The Belgian city of Ghent, with a population slightly smaller than that of Belfast and larger than that of Cork City, has one of Europe's largest pedestrian areas, including the whole city centre;

Comments

It is clear that 20mph speed limits are becoming increasingly common; particularly in the current economic climate this route has enable local road authorities to take affirmative action against the road safety problems caused by excessive speed, without the capital outlay required to install physical traffic calming measures. What is less clear is whether or not area wide speed limits have any meaningful impact.

[2] Madruga, P., Colville-Anderson, M. Vygontaite, N. and Kujanpaa, R. (2013) Analysis of 30 km/h Zone. Copenhagenize Consulting [online] available from:

Contents

1 Introduction

20mph speed limits are increasingly being viewed as an effective means of improving the safety of vulnerable road users, particularly in areas where they are most likely to be sharing the road space with cars, such as residential areas, school zones and/or town and city centres.

This paper examines the experiences of a number of cities/regions that have introduced 20mph zones, or in the case of most EU member states, 30km/h zones.

2 United Kingdom

The UK's first 20 mph speed limit zones were introduced in the England in 1991, in Sheffield, Kingston upon Thames and Norwich. Since then a considerable number have been installed, and although the Department for Transport (DfT) no longer keeps a central record of the actual number (they are administered at local authority level), it is estimated that there are over 2,000 20mph zones in operation in England (in 2009).[3]

2.1 Statutory framework for 20mph zones and limits

Prior to 1999 local authorities in England and Wales were required to get specific consent from the Secretary of State to implement a 20mph limit and it could only be introduced as part of a physically calmed "zone" (complete with traffic calming measures) or on short sections of road with a proven accident record.[4]

These rules were relaxed in 1999 when the DfT published new guidance for local authorities on how to implement both 20 mph zones and signs-only limits. This empowered local authorities to determine whether 20 mph speed limits or zones should be used.

The guidance suggested that 20 mph speed limits by signs alone would be most appropriate where 85th percentile speeds are already low as it was felt any unreasonable reduction would lead to low compliance levels. New guidance was issued in 2006 with the DfT Circular *"Setting local speed limits"* and since then two further amendments have been issued in 2009 and 2011. The key points of interest in the current guidance are that the DfT:

- Want to encourage highway authorities, over time, to introduce 20mph zones or limits into streets which are primarily residential in nature; and into town or city streets where pedestrian and cyclist movements are high, such as around schools, shops, markets, playgrounds and other areas; where these are not part of any major through route.

[3] DfT (2009) Review of 20 mph Zone and Limit Implementation in England [online] available from: http://nia1.me/1um
[4] The Road Traffic Regulation Act 1984

- Permit councils to use signs painted on roads as an alternative to expensive upright signs, cutting street clutter and costs.
- Believe that, if average speeds are already around 24 mph on a road, introducing a 20 mph speed limit through signing alone, is likely to lead to general compliance with the new speed limit.
- Suggest that to achieve compliance there should be no expectation on the police to provide additional enforcement beyond their routine activity, unless this has been explicitly agreed.
- The latest guidance issued in June 2012 reduces the need for councils to use speed humps in 20 mph zones and make it cheaper and easier for councils to put in place variable speed limits outside schools when local residents want these schemes.

2.2 Rationale for 20mph speed limits

Increasing the safety of road users and pedestrians has been the primary driver of 20mph zones in the UK. The first 20 mph speed limit zones were intended to address the serious problem of child pedestrian accidents occurring in and around residential areas, and so initially most of the 20 mph zones were limited to these areas, although there were a small number of 20mph zones in town centres and rural areas.

2.3 Current situation

In 2009 the DfT published a review of the implementation of 20 mph zones and limits in England. The review considered where and when zones and limits are being implemented, the rationale for their use and the characteristics of supporting traffic calming measures. The main findings of the review are:

- There are an estimated 2,150 20 mph zones in operation in England;
- Case study evidence indicates that 96% of 20 mph zones take the form of vertical traffic calming/deflection measures, such as road humps. 1% of zones utilise horizontal measures, such as chicanes, and 3% contain a mix of vertical and horizontal measures;
- 10% of 20 mph measures in case study authorities are speed limit controlled areas, using signing only;
- The average case study LHA road network length incorporated within zones and limits is 2.7 km, with a range from less than 1 km to 25 km.
- In case study areas the percentage of the total LHA road network covered with 20 mph zones and limits varies from less than 1% to 44%;
- In forming the decision to introduce 20 mph zones and limits, implementation in the vicinity of schools provided by far the strongest rationale. This rationale was not always supported by historic evidence from recorded casualties in the 20 mph zones and limits areas; while

- The location of zones and limits did not appear to be linked to levels of social deprivation or the proximity to hospitals.[5]

2.4 Outcomes

20mph zones in England have proved very effective at reducing both the number and severity of accidents.[6] The first widespread evaluation of 20 mph zones in the UK was carried out by the Transport Research Laboratory (TRL) in 1996.[7] It found that IRTC were reduced by 60%, and child IRTCs were reduced by. The evaluation did not find evidence that RTCs increased on surrounding roads 67% due to drivers changing their route.

There have been a number of subsequent studies, as summarised below:

- From 1994, there was a widespread introduction of 20 mph zones in Hull, and by 2003, there were 120 zones covering 500 streets. The casualty statistics between 1994 and 2001 showed a drop of 14% in Hull (on all roads), compared to a rise of 1.5 per cent in the rest of Yorkshire and Humberside.[8]
- In the 20 mph zones in Hull, there was a decrease in total RTCs of 56 per cent and in fatal and serious injuries of 90 per cent. The biggest reductions were pedestrian casualties, which fell by 54 per cent, child casualties which dropped by 54 per cent and child pedestrian casualties fell by 74 per cent.[9]
- Transport for London (TfL) recorded a 57% reduction in serious/fatal accidents while the frequency of injury accidents fell by around 42%[10] in areas designated as 20mph zones.
- A 2007 review of half of the 20 mph zones which had been implemented in London (78 zones) found that they reduced injury RTIs by about 42 per cent and fatal or serious RTIs by 53 per cent.[11]
- A report by the same authors, published in the British Medical Journal (BMJ) in 2009 reported that fatal or serious injuries to children, were reduced by 50.2 per cent.[12]
- The BMJ analysis showed that the reduction in road injuries in 20 mph zones occurred at a greater rate than the overall trend of reduction in casualties in London, that this was not attributable to any regression-to-the-means effect, and that there was no displacement in RTI risk to roads close to the 20 mph zones.

[5] DfT (2009) Review of 20 mph Zone and Limit Implementation in England [online] available from: http://nia1.me/1um
[6] DfT (2011) Infrastructure and Cyclist Safety. DfT London [online] available from: http://nia1.me/mp
[7] Webster, D.C. and Mackie, A.M. (1996) Review of traffic calming schemes in 20 mph zones, TRL215, 1996 [online] available from: http://nia1.me/1w3
[8] RoSPA (2012) 20 mph Zones and Speed Limits [online] available from: http://nia1.me/1wb
[9] Ibid
[10] TfL (2002) Review of 20 mph Zones in London Boroughs[online] available from: http://nia1.me/mj
[11] Grundy, C., Steinbach, R., Edwards, P., Wilkinson, P. and Green, J. (2007) 20 mph zones and Road Safety in London [online] available from: http://nia1.me/1wa
[12] Grundy, C., Steinbach, R., Edwards, P., Green, J., Armstrong, B. and Wilkinson, P. (2009) Effect of 20 mph traffic speed zones on road injuries in London, 1986-2006: Controlled interrupted time series analysis. British Medical Journal.

- TRL carried out research on 20 mph limits in 1998 which examined the effectiveness of 20 mph limits without traffic calming measures. This review indicated that the use of 20 mph signs alone, without associated traffic calming methods, led to speed reductions, on average, of about one mile per hour concluding that:

  "20 mph speed restrictions where reliance is placed primarily on the signing of the limit are less effective in reducing traffic speeds than when zone treatment (traffic calming) is used."

2.5 20mph zones vs. 20mph limits

Despite the clear success of 20mph zones and their apparent benefits when compared to 20mph speed limits, many organisations including road safety groups and pedestrian and cyclist representatives have been campaigning for the introduction of 'default' 20mph limits on residential roads in Britain – a notable example is the 20's plenty campaign (see: http://www.20splentyforus.org.uk/).

Several local authorities have responded with the likes of Portsmouth, Islington and Oxford, taking the step of setting 20 mph as the default speed limit for their area, enforced by signage alone. The schemes are in their infancy and clearly more evidence is needed on the long term effectiveness of default 20 mph speed limits, although early evaluations have demonstrated some promising results.

Proponents of 20mph speed limits, without traffic calming, point to two distinct advantages over 20mph zones:

Cost Portsmouth City Council spent £1,100 per km for limits compared to £60,000 per km for physically calmed zones.[13]

Time scale A default 20 mph speed limit can also be established quickly. Haringey council estimate rolling out speed limits would take two years as opposed approximately 10 – 15 years to complete zones.[14].

2.6 Portsmouth

Portsmouth City Council (PCC) was the first local authority in England to implement an extensive area-wide 20 mph Speed Limit scheme, without traffic calming.

2.6.1 Scheme design

The first 'experimental scheme' was installed in 2004; this included school zones and the residential areas within their vicinity. The decision was then taken to extend the

[13] Toy, S.E. (2013) Delivering soft measures to support signs-only 20mph limits [online] available from:

[14] London Assembly Transport Committee (2009) Islington, Hackney, Southwark, Brent, Kingston upon Thames, Lambeth, Tower Hamlets, Merton. Responses to the Transport Committee survey; 20mph on all Islington roads, Islington Gazette, 12 March 2009

scheme, with funding provided to introduce a 20mph speed limit across the city's residential areas which had existing [recorded] speeds equal to or less than 24mph. For ease of installation the city was divided into six sectors: Central East, Central West, South East, South West, North East and North West. This amounted to 94% of road length (410 km of the 438 km of road length) in PCC.

The relatively low speed before the scheme implementation on these roads is 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. The aim was to ensure that the scheme was self-enforcing so as to avoid the need for extra Police enforcement.

2.6.2 Implementation

Before speed limits were changed a comprehensive programme of surveying the identified roads in each sector was carried out. The implementation, including the consultation process, started in April 2006 - it was completed in March 2008.

The implementation of the 20 mph Speed Limit scheme was carried out using a combination of post-mounted terminal and repeater signs on roads with existing speeds equal to or less than 24 mph.

Figure 1: 20 mph terminal signs on Lyndhurst Road, Portsmouth

Source: DfT/Atkins

20 mph speed limit roundel road markings were also provided on the carriageway coincident with the terminal post-mounted sign locations at street entries. However, 20 mph signs were also provided on roads through residential areas with speeds greater than 24 mph in order to provide consistency in the signing and road user perception.

2.6.3 Cost

The scheme cost £572,988 and this was wholly funded using capital from the Council's Local Transport Plan capital settlement. Table one shows the cost of implementation on 410km of PCC road length. This equates to £1398 per km; if the cost per km were similar in Northern Ireland, the cost of implementation would exceed £6m (4293km of road).

Table 1: summary of costs to PCC for planning and implementation of 20mph speed limits

Task	Cost (£)
Consultation	20,626
Preparation and Supervision	117,089
Traffic Surveys	14,535
Implementation	420,738
Total	572,988

Source: Atkins/DfT

2.6.4 Traffic Speed Changes

Table 13 below indicates the change in average speed at the 223 monitored sites within the six sectors of Portsmouth following implementation of the 20 mph speed limit scheme.

Table 13: Average Traffic speed changes after 20 mph speed limit implementation

	Average Speed before (mph)	Average Speed After (mph)	Speed Change (mph)
Central West	20.2	19.1	-1.1
South East	19.6	18.6	-1.0
Central East	18.5	17.9	-0.6
North East	18.2	16.4	-1.8
South West	18.4	16.9	-1.5
North West	23.9	22.2	-1.7
All Sectors	19.8	1805	-1.3

Source: Atkins/DfT

The average overall speed for the six sectors before the scheme implementation was already lower than the new 20mph limit at 19.8 mph. However, this was reduced further, to an average of 18.5 mph, after implementation of the scheme.

Reductions in average speeds were recorded across all sectors even those where the average speed had been below 20mph. for example, the North East sector recorded the greatest decrease (-1.8mph) with the average speed going from 18.2 to 16.4mph.

Although average speeds in the city were already low, there were exceptions with almost 15% of the sites surveyed (32 out of 223) having an average speed greater than 24mph before the scheme was introduced. The result of the speed reduction was most pronounced in these sites:

- a reduction in average speed was recorded in 28 out of the 32 sites (88%);
- one site retained a similar before and after average speed recordings;
- three other sites recording an increase.
- Speeds reduced to below 20 mph at 12 of these sites (this represents at least a 5mph decrease in the average speed); and
- 10 of the 32 sites had an average speed of 33.8 mph prior to implementation - the average speed at 7 of these 10 sites had reduced to 22 mph, reduction of 11.8 mph.

2.6.5 Impact on safety

Before and after casualty data was used to measure the effectiveness of the scheme at reducing casualties, overall, in the six sectors:

- There was a reduction in the total number of accidents (KSI and Slight) of about 34 per year (21%).
- The total number of KSI accidents increased by about 1.5 per year. However, the total numbers of KSI accidents are small across all sectors;
- There was a 25% reduction in slight injuries

Table (…) Change in accident numbers by accident severity

Sectors	Before (Average of 3 years data)			After (Average of 2 years data)			%change	
	KSI	Slight	Total	KSI	Slight	Total	KSI	Total
Central East	6.0	30.7	36.7	4.5	27.0	31.5	-25%	-14%
Central West	3.0	21.0	24.0	4.0	17.5	22.0	33	-8%
North East	2.3	24.0	26.3	3.5	11.5	15.0	50%	-43%
North West	1.7	13.7	15.3	1.0	11.0	12.0	-40%	-22%
South East	2.3	29.7	32.0	4.0	22.0	26.0	71%	-19%
South West	3.0	26.3	29.3	2.9	20.0	22.9	-5%	-22%
All Sectors	18.3	145.3	163.7	19.9	109.0	129.4	8%	-21%

Source: Atkins/DfT

2.6.7 Key lessons

The main learning points from the review of the PCC 20 mph Speed Limit scheme include:

- **The need to gain public acceptance:** Publicity, using community engagement and the media, is pivotal to gaining public acceptance/support for the scheme;

- **The need to have support from key stakeholders:** Engagement of stakeholders right through from the design and implementation of the scheme is important in order to gain public support and acceptance. For instance better engagement of bus operators and emergency services in order to identify key routes for a coordinated approach is encouraged which would in turn promote closer working relationships;
- **The need to ensure 20mph limits are appropriate:** Carrying out a survey and design of each road separately by staff with knowledge of the relevant legislation is key to ensuring suitability of the road environment for implementing 20 mph Speed Limits;
- **Decisions should be evidence based:** The scheme should be based on robust evidence of casualty saving benefits that should be outlined in the early stages of scoping the scheme.

2.6.8 Transferability

Outside London, PCC considers itself as the most densely populated city in Great Britain. The majority of residential streets are narrow, with terraced housing and cars parked on both sides. As such, the provision of the 20 mph Speed Limit scheme on such roads only formalised an existing practice and possibly helped to reduce the incidences of aggressive driving.

That being said, it is extremely positive to note that in those areas where there was a problem with high speeds (those which exceeded 24mph), that the new speed limits appear to have been most effective. To further reduce limits in problem areas PCC is considering to use of additional traffic calming measures to reinforce the signage. This is likely to add significantly to the costs, but is also expected to improve the safety benefits of the scheme.

Analysis carried out on behalf of the DfT found that prior to the speed reductions, an average of 18.7 people per year were killed or seriously injured and this rose to 19.9 people per year after the implementation of the blanket 20mph limit. The reasons for this are unclear, but certainly it would be unreasonable to suggest it is a direct result of this policy.

Indeed given this scheme is at such an early stage of implementation it is inappropriate to draw any firm conclusions on the effectiveness of the widespread use of 20mph speed limits on this experience alone. Daryl Loyd, the Head of Road Safety Statistics at the Department for Transport has stated:

> *"No sound conclusions can be drawn on the basis of Portsmouth's 20mph limits alone. Unfortunately, at this time, there is no specific national information on where all 20mph zones and limits are located. Therefore evaluating the changing relationship between accident rates, travel behaviour, wider health impacts and 20mph zones is challenging."*

2.7 Bristol

In 2010 Bristol City Council introduced two sign only 20 mph pilot areas as part of the Cycling City project in partnership with the NHS initiative Active Bristol. The stated aims of the 20 mph pilot areas were to:

- Encourage more people to walk and cycle;
- Improve road safety (in line with the City Council's Casualty Reduction targets); and
- To help create more pleasant and shared community space.

These pilots have been monitored and the encouraging results have supported the council's intention to roll out 20mph limits to all residential streets. The City Council stated, in the Joint Local Transport Plan 3, the intention to extend 20mph speed limits across the City (West of England Partnership, 2011).

The decision to trial an area wide 20mph speed limit scheme as opposed to introducing site-specific traffic calming reflected the dispersed nature of road casualties across the city's unclassified roads; around 40% of the city's collisions take place on unclassified roads.

2.7.1 Differences with Portsmouth

The planners of the pilot had recognised the success of the Portsmouth scheme, however, whereas traffic speed in Portsmouth is calmed by the prevailing environmental conditions, including congested residential areas with high levels of on-street-parking, Bristol is more open.

2.7.2 Pilot design

The first pilot (Inner South pilot area) became operative on 21st May 2010, with the second (Inner East Bristol) on the 22nd October 2010. These areas were chosen as they were deemed most likely to benefit from the introduction of a 20mph limit, this was based on:

- the level of collisions, particularly those involving pedestrians, cyclists and children;
- the layout and types of streets;
- existing traffic volumes and speeds; and
- the presence of schools and other community facilities

The scheme was designed to minimise the number of signs and street clutter wherever Possible whilst ensuring the design remained in accordance with DfT guidance and the Traffic Signs, Regulations and General Directions (see figure 2).

- Repeater signs were placed at the maximum spacing permitted;
- Signs were mounted to existing lamp posts; and
- Physical measures were included in areas where mean speeds were above 24mph.

Figure 2: Signage and road marking used to indicate 20mph speed limits in Bristol

Terminal / Entry points: 20 mph road markings (carriageway roundels) and large (600mm/24 inch diameter) traffic signs were installed at the junctions where the speed limit changes. These alert drivers to the change in speed limit.	
Repeater signs: Smaller (300mm/12 inch diameter) 20 mph repeater signs were also placed at regular intervals on either side of the road around the areas to remind drivers and riders that the speed limit is 20 mph.	
Vehicle Activated Signs: Several 20 mph flashing Vehicle Activated Signs (VAS) were installed at some of the higher speed roads / major roads within the pilot areas to remind drivers to keep to the lower speed limit.	
Additional 20 mph carriageway roundels: In order to increase the prominence of the 20 mph scheme, additional 20 mph carriageway roundels were installed at several of the higher speed / major roads, throughout January and February 2011. These road markings have been installed alongside 20 mph VAS or a 20 mph repeater sign.	

Source: Bristol City Council

2.7.3 Outcomes

Following the introduction of 20mph areas, extensive monitoring was carried out in order to assess their impact on:

- Public opinion;
- Pedestrian and Pedal Cyclist levels;
- Traffic speeds;
- Road casualties;

- Noise and air quality; and bus journey times and service reliability.

Household surveys conducted both before and after the pilot showed strong support from residents for 20mph speed limits in residential areas:

Public opinion

- 82% of respondents were supportive of 20mph speed limits;
- 70% agreed that the 20mph speed limit should be applied to all residential streets in Bristol;
- The survey highlighted frustration with drivers 'non-compliance of the new speed limit' with 57% of people feeling 20mph speed limits do not work.[15]

Pedestrian and Cycling levels

- Manual counts indicate increased levels of walking and cycling, however, surveys suggest they have remained unchanged.

Traffic Speeds

- Residents continue to report incidences of speeding.

Road Safety

- Few people felt it was safer to cross the road as a result of 20mph speed limits
    - The number of people who considered it unsafe for children to play on the street unsupervised actually increased

Quality of life

- There was very little change in how often people said that they are speaking to their neighbours or how many friends or acquaintances people have locally;
- A greater number of residents felt traffic noise had reduced since the introduction of 20mph speed limits; whereas
- Residents' perception was that the level of traffic pollution increased.

While there is generally strong support for the introduction of 20mph speed limits on residential streets, it is less clear from the Bristol evaluation if any of the predicted outcomes have or will be realised. There is a definite sense from the report that despite the support for the scheme, residents do not feel it has made much difference with many concerned that stronger enforcement and improved awareness is essential.

The Bristol project is at an early stage in its development and therefore the findings of the monitoring report used in this paper cannot be considered as a definitive assessment. It takes time, a number of years in fact, to accurately assess variances in vehicle speeds, collision data and walking/cycling levels that would show clear trends. Therefore, the findings in this report should be considered for what they are – a monitoring reports that is broadly supportive of 20mph speed limits on residential roads.

[15] Page 11 - Bristol City Council (2012) 20MPH Speed Limit Pilot Areas: Monitoring Report [online] available from: http://nia1.me/1xa

2.8 Edinburgh

The introduction of 20mph limits on residential streets and streets with high levels of pedestrian activity is a key element of Edinburgh City Council's (ECC) Local Transport Strategy and both the Council's Active Travel Action Plan (ATAP), and the Road Safety Plan for Edinburgh to 2020 (RSP). The council feels that by lowering the speed of vehicles more people will be encouraged to walk or cycle while both the frequency and severity of collisions will be reduced.

Already approximately 50% of the residential streets in Edinburgh are designated 20mph zones where the speed is restricted by physical traffic calming features. These have a proven track record of casualty reduction and are self-enforcing; they are, however, costly to implement (ECC spent in excess of £10m on traffic calming[16]) and require maintenance[17].

Inspired by the success of Portsmouth City Council's 20mph speed limit policy, ECC took the decision to trial a 20mph speed limit (without physical measures) in the south central area of the city in 2012. This decision was taken on the basis that while it was necessary to address road safety problems caused by speeding, the capital costs involved with rolling out 20mph zones with physical measures was prohibitive.

> *"The introduction of the scheme has cost around £200,000 excluding surveys, of which £113,000 was the costs of signs and surface markings. This compares to an estimated £600,000 for conventional 20mph speed limit treatment (with traffic calming) in the same area."*[18]

2.8.1 Outcomes

The Edinburgh pilot was evaluated based on changes to vehicle speeds and volumes, road traffic incidents, and the attitudes of residents to walking, cycling, and the local environment. The outcomes of this evaluation are summarised below:

- Speed surveys were undertaken across a sample of street locations in the pilot area, before and after implementation. For the 28 locations that had their speed limit changed to 20mph, average 'before' speeds were 22.8mph, while 'after' speeds fell to 20.9mph; an average fall of 1.9mph;
- Although the average speed reduction has been small, the biggest drops in average speed have been recorded in areas where the highest 'before' speeds were recorded;
- Four locations across the pilot saw slight increases in average vehicle speeds from the 'before' to the 'after' survey;

[16] Meeting with City of Edinburgh Council's Strategic Planning Manager – Brian Sharkie
[17] Shaw, L. (2012) Evaluation of the implementation of 20mph speed limits in South Edinburgh: Research Report. City of Edinburgh Council
[18] Shaw, L. (2013) Before and After Research into the implementation of 20mph speed limits in South Edinburgh. City of Edinburgh Council

- 75% of the surveyed 20mph streets continue to have average vehicle speeds in excess of 20mph, however in all streets (except the four locations) speeds remain lower than 24mph - the DfT threshold recommended for the effective operation of 20mph Limits;
- There was insufficient data to assess the impact on accident frequency and severity;
- There were only marginal improvements to attitudes towards road safety i.e. a small number of people indicated they would be more likely to walk or cycle but the difference was not statistically significant.[19]

2.8.2 Costs

The pilot costs were met from the approved annual Road Safety capital budget, with costs spread across the financial years 2010-13, reflecting the extent of the project. The cost of the pilot is in the order of £213,542, and comprises the following key elements:

- £112,792: signage and surface markings;
- £61,340: staff costs;
- £13,760: attitude surveys (50% funded by the Scottish Government);
- £7,530: vehicle surveys;
- £15,000: consultation costs; and
- £10,000: campaign advertising.

This pilot covered some 40km of road, which works out at £5,350 per km although it is anticipated that economies of scale can be realised when rolling out the scheme. By way of comparison the Portsmouth scheme cost £1398 per km.

2.8.3 Moving forward

Based on the perceived success of the pilot a strategy was outlined for a roll-out of 20mph limits to all residential streets, main shopping streets, city centre streets, and streets with high levels of pedestrian and/or cyclist activity across Edinburgh.

The city council supported this strategy and the introduction of 20mph speed limits across the type of areas discussed is a key element of the ECC Local Transport Strategy for January 2014-2019 which was approved by the council in January of this year.

A speed limit of 20mph covering most streets in Edinburgh could now be introduced by the city council by 2017.

[19] Turley, M. (2013) South Central Edinburgh 20mph Limit Pilot Evaluation [online] available from: http://nia1.me/1xh

2.9 Elsewhere in Scotland

Although 20mph zones/limits are increasingly common within cities, the Scottish Government has published plans to implement a 20 mph speed limit trial at a number of towns and villages across the trunk road network in Scotland – these schemes will be largely sign-only. The key objective of this scheme is to improve road safety for vulnerable road users such as pedestrians, children, cyclists, motorcyclists and equestrians.

The proposed sites are Maybole; Largs; Biggar; Langholm and Oban. They have been identified based on a clear and robust set of criteria relating to:

- Vehicle speeds;
- The safety record of the route within the town or village, with a focus on vulnerable road user accidents; and
- The physical characteristics of the route (traffic volumes, HGV levels, length of the section, carriageway width, parking provision).[20]

The outcomes of this trial will be particularly interesting in the context of this Bill although clearly the timeframe will be such that it is unlikely the results will be available for consideration.

3 Republic of Ireland

Under the Road Traffic Act 2004, councils can set 30km/h speed limits in areas deemed to be appropriate, for example, where there is a high concentration of vulnerable road users, especially children and/or there is evidence of road collisions in which vulnerable road users were involved.

Again, as with elsewhere a key consideration for the application of the 30km/h speed limit is that its success should not be dependent on the use by the Gardaí of an unreasonable level of enforcement. Therefore the Irish Department for Transport recommends that 30km/h zones should be limited to areas where the mean speed of vehicles does not exceed 40 km/h. If it exceeds this speed then environmental or engineering measures must be provided to reach this target before the new limit is applied.[21]

3.1 30km/h zones in Dublin

Dublin City Council was the first local authority in Ireland to introduce a 30km/h speed limit. This has been in force in most of the city centre's shopping and central business areas since 2006 (see figure 2). A list of all the roads with 30km/h speed limits can be found at:

[20] The Scottish Government (2014) Speed Limit Trials [online] available from: http://nia1.me/1xi
[21] Road Traffic Act 2004Section 9(9): Guidelines for the Application of Special Speed Limits

http://www.dublincity.ie/RoadsandTraffic/generaltrafficmeasures/Pages/SpeedLimitsinYourArea.aspx

The lower speed limit was introduced in the interest of road safety and to make the city centre more attractive to pedestrians and cyclists. However, a senior executive engineer with Dublin City Council has stated that the 30km/h speed limit has not brought about any reduction in traffic speeds. Furthermore, the council do not have sufficient data on traffic collisions to determine whether the scheme had any impact on the number and severity of collisions.

Despite this Dublin City Council plans to extend the scheme by introducing a default 30km/h speed limit to all residential areas in the city. Other counties where 30 km/h zones are used include:

- Cork city centre; Cork County (residential);
- Clare County (ferry terminal);
- Dún Laoghaire-Rathdown County (urban, residential, some schools)
- Kilkenny County (urban) etc.

4 European Union

Across the EU the setting local speed limits is devolved to local authorities, including in GB and ROI. Many local authorities have already (more than 80[22]) made widespread use of 30 km/h (18.6mph) zones, particularly in residential areas, notable examples include:

- Graz in Austria (current population 255,000). Graz became the first European city to introduce a 30 km/h city-wide limit, this covers approximately 80% of it's road network;
- In the city of Stuttgart, Germany (population 600,000) 85% of the road network has a 30 km/h limit;
- By 2001 some 80% of Munich (population 1.35 million) was covered by 30 km/h zones with more being planned. Some of Munich's residential streets have an even lower 20 km/h limit with associated traffic calming measures;
- The Belgian city of Ghent, with a population slightly smaller than that of Belfast and larger than that of Cork City, has one of Europe's largest pedestrian areas, including the whole city centre;

4.1 EU policy on 30km/h zones

In September 2011 the European Parliament adopted a resolution (not a force of law) urging local authorities across the European Union (EU) to introduce a 30km or 20mph

[22] Madruga, P., Colville-Anderson, M. Vygontaite, N. and Kujanpaa, R. (2013) Analysis of 30 km/h Zone. Copenhagenize Consulting [online] available from:

standard speed limits in residential areas and on single-lane roads in urban areas which have no separate cycle lanes.[23] This recommendation was originally contained in the Koch Report,[24] written by the German MEP Dieter-Lebrecht Koch, which addresses transport safety issues in Europe.[25]

4.2 Graz, Austria

Graz became the first European city to introduce a 30 km/h city-wide limit in 1992; they currently cover approximately 80% of the city's road network. The main aims of the scheme were to improve road safety, reduce pollution, and cut noise.

The 30km/h speed limit is in effect across all residential roads, school zones and areas around hospitals, this equates to over 75% of the city's roads. Speed limits of 50 km/h (31.25mph) remain on through roads.

Before the implementation of this measure a comprehensive (public) awareness campaign was carried out focusing on different levels:

- Level 1: Politicians and decision takers;
- Level 2: multipliers (like journalists, local representatives); and
- Level 3: the general public.

Additionally, the following actions were carried out during the introductory phase of the test period i.e. in September and October 92:

- extensive information was distributed via the media;
- boards, banners and bills were displayed within the main street network; and
- various individual actions near intersections, such as moving banners, etc.

The introduction of wide-spread 30km/h zones was strongly opposed in Graz and for this reason it was decided to have a test phase of two years – to enable people to make an informed decision. Following this two year period, the majority who were against the proposal had changed their views and support for the scheme is now widespread.

Enforcement

The monitoring of the "30 km/h speed limit" in Graz, demonstrated that effective enforcement was essential to ensure compliance. Given the strain this placed on police resources, it was decided (in 1996) to outsource the monitoring of speeds to a private speed control company.

[23] European Cyclist Federation (2011) European Parliament recommends introduction of 30kph / 20mph zones across Europe [online] available from: http://nia1.me/ms
[24] REPORT on European road safety resolution 2011-2020 - A7-0264/2011 [online] available from: http://nia1.me/mr
[25] (EC) European Commission (2012) EU Transport in figures: Statistical Pocketbook 2012 [online]

The private company was responsible for controlling and monitoring of the speed limit. It collected monitoring data which were then passed on to the police to carry out the enforcement; this was done through the issuing of penalty notices (delivered to the offenders' homes). In 2010 the city brought the function, undertaken by the private company, back in-house.

Outcomes

- Wherever a 30 km/h speed limit had been introduced, the number and severity of road accidents has been reduced (by 25%).
- The number of accidents on 30km/h roads is relatively low - approximately 80% of all the city's accidents happen on streets where there is a 50 km/h speed limit (which is only 20% of the overall street network).
- The experience of Graz emphasises the importance of enforcement with the evidence suggesting that the speed limit is ineffective within Graz, unless there is strict enforcement.
- There is only anecdotal evidence to suggest this policy has contributed towards increased levels of walking and cycling within the city as non-motorised transport has traditionally been popular in Graz.
- The number of accidents on 30km/h roads is low - approximately 80% of all the city's accidents happen on streets where there is a 50 km/h speed limit (which is only 20% of the overall street network).

4.3 The Netherlands

30 km/h zones (known as Zone 30) were first introduced in the Netherlands in 1983.

- By 1998, about 15% of the total length of residential streets in the Netherlands had been converted into Zones 30;
- By early 2003, this rose to approximately 45%; and
- By 2008 about 75% of residential roads were Zone 30.[26]

Zone 30 appears to have been very successful in the Netherlands:

- In 1998, 48 serious crashes were registered per 1,000km of 30km/h roads;
- In 2003, there were 21 serious crashes; and
- In 2008 there were 17 serious crashes per 1,000km of 30km/h roads.[27]

According to Elvik (2001) the average number of injury crashes decreases by about 25% when a residential area with a 50km/h speed limit is designated as a Zone 30.[28]

[26] SWOV (2010) Zones 30: Urban Residential Areas [online] available from: http://nia1.me/pi
[27] SWOV (2010) Zones 30: Urban Residential Areas [online] available from: http://nia1.me/pi
[28] Elvik, R. (2001). Area-wide urban traffic calming schemes; a meta-analysis of safety effects. *Accident Analysis and Prevention*, vol. 33(3) pp. 327-336.

When Zone 30 was first introduced, many of the initial schemes included physical traffic calming measures which resulted in high levels of compliance. However, as was the case in the UK, Dutch local authorities wanted to reduce costs and as a result, most schemes introduced since 1998 do not have any physical measures.

Analysis by the Dutch Traffic Safety Association has found that only a very small number of vehicles drive at speeds lower than 30km/h while 85% drive at speeds lower than 45km/h (28mph). Research shows that sign only areas continue to have problems with excessive speed and while temporary enforcement drives result in better compliance levels, this is temporary.

The Dutch Traffic Safety Association makes the following recommendations;

- Speed humps are the most effective means of controlling vehicle speeds;
- 20mph zones should be less than 1km^2 as this would put a lot of pressure on surrounding through roads;
- Zone 30 should have 'limited access' gates, limiting access to those who live or work within the zone, thereby eliminating through traffic.[29]

[29] SWOV (2010) Zones 30: Urban Residential Areas [online] available from: http://nia1.me/pi