

# Interim Evaluation of the Implementation of 20 mph Speed Limits in Portsmouth

## Summary Report

Atkins was commissioned by the Department for Transport (DfT) to carry out an Interim Evaluation of a scheme designed by Portsmouth City Council (PCC) to implement an area-wide 20 mph speed limit using signing alone. All data was gathered by PCC.

### Introduction

Portsmouth City Council (PCC) is the first local authority in England to implement an extensive area-wide 20 mph speed limit scheme covering the majority of its residential roads and using speed limit signing alone i.e. terminal and repeater signs. PCC has introduced 20 mph speed limits on 410km of its 438km road network – i.e. 94% of the length of its roads.

This document summarises the findings of an interim evaluation of the impact of the scheme. It reports on monitored changes in traffic speeds and road casualties, comparing data for "Before" and "After" scheme implementation. The document is intended to provide an early transfer of information to other local highway authorities on the effectiveness of implementing speed limits through use of signs alone and without providing any accompanying traffic calming measures.

### Background

On most of the roads where the speed limit signs and road markings were installed, the average speeds before installation were less than or equal to 24 mph. The relatively low speeds on these roads before the

scheme implementation were mainly attributable to narrow carriageways and on-street parking which reduce the effective width. 20 mph signs were also provided on roads within the sectors with median speeds greater than 24 mph in order to avoid inconsistency in the signed speed limits within the sectors.

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. The cost of implementing the scheme was £0.57million which came from the LTP capital expenditure programme.

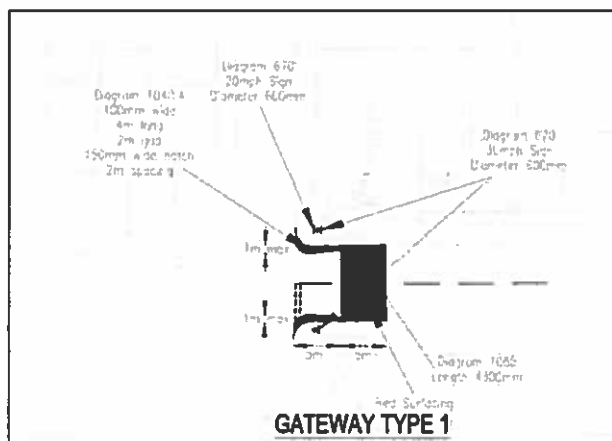
The implementation of the 20 mph speed limit scheme was carried out using a combination of post-mounted terminal and repeater signs. 20 mph speed limit roundel road markings were also provided on the carriageway next to the terminal post-mounted signs. For ease of installation the city was divided into six sectors: Central East, Central West, North East, North West, South East and South West.

### Stakeholder Engagement

Public information about the scheme was disseminated via the media and community involvement. This proactive approach was agreed, following legal advice, as a better publicity strategy than publishing a long list of street names using on-street notices. The approach received positive feedback from the public, and no complaints were received about lack of information.

In summary, the stakeholder engagement process included:

- consultations with Neighbourhood Forums and residents' associations;
- publishing statutory advertisements in the local press;
- placing articles in the local press;
- television and radio interviews both locally and nationally;



- application of Intranet and Internet news flashes;
- including the FAQ website link in the Traffic Regulation Order (TRO);
- exhibition of plans and posters in all schools and public buildings;
- sending each school pupil home with a leaflet; and
- distributing plans and leaflets at the Civic Offices.

Community engagement involved close liaison with the local schools. Each child was sent home with a publicity leaflet showing which roads in their sector would be affected, responses to Frequently Asked Questions (FAQs), and contact details. This was supported by large posters placed in school halls. Posters and leaflets were also placed in doctors' surgeries, libraries, shopping centres, etc. At the same time, the scheme received considerable publicity in the local press, Council officers and Members gave interviews on the local radio, and a dedicated phone line was set up. Within the Council, cross party member support was received early which enabled a coordinated approach to seeking public support.

Support from the Police was on the basis that the scheme would be self-enforcing without the need for direct enforcement using fixed time / distance cameras or mobile spot speed safety cameras. All other statutory consultees did not have any objection to the scheme.

#### Data gathered and analysis



#### Traffic Speed

Average "Before" and "After" spot speed data was available for the South East, Central East and Central West sectors. The speed data covered 60 monitored sites in the South East sector, 52 in the Central East sector and 47 in the Central West sector, a total of 159 monitored sites.

#### Traffic Volume

Classified vehicle counts based on vehicle classifications were conducted from 0600 to 2200 hours for the "Before" and "After" periods on the same day of the week (Tuesday/Thursday) in July to allow for seasonal variations in traffic flows.

This traffic volume data was received from PCC for the cordon roads (those on the boundary of the 20mph speed limit scheme). This was analysed in order to identify whether any traffic migration had taken place.

#### Safety

"Before" and "After" road traffic accident and casualty data was provided for the roads in all six sectors which had 20mph speed limits. In each case, the "Before" period was 36 months with the "After" period covering only 12 months. There was no gap in the accident data to separate the implementation period; consequently the implementation period is included in the "Before" study period. This is justified because the implementation period involved erecting signs off running lanes, with the signs being covered until implementation day.

The data included the following accident parameters:

accident reference; date; location of accident; accident description; grid reference; severity; vehicle type; casualty class and casualty age.

Given that only one year of "After" data was available, the "Before" data for the three years was averaged to provide a comparative one year baseline period.

#### Comparison with 20mph zones

The effects of the 20mph speed limits implemented in Portsmouth were compared to those of 20mph zones in London and Hull. In contrast to the scheme in Portsmouth, Hull City Council and various London Boroughs have chosen to install traffic calming measures in addition to speed limit signs.

Information was gained from these areas via internet research and consultation with respective local authority officers.

#### Summary of outcomes

##### Traffic Speed

The average speed after the 20 mph speed limits were imposed was 0.9 miles per hour lower than the average speed before the speed limits were imposed. This change is not statistically significant.

At sites where the average "Before" speed was greater than 24 mph the average speed reduced by 7 mph. This change is statistically significant.

**Average Traffic speed changes after 20 mph speed limit implementation**

Sector	Average Before Speed (mph)	Average After Speed (mph)	Speed Change (mph)
Central West	20.2	19.1	-1.1
South East	19.6	18.6	-1.1
Central East	18.5	17.9	-0.6
<b>All Sectors</b>	<b>19.4</b>	<b>18.5</b>	<b>-0.9</b>

Despite a reduction in the number of sites with average speeds above 24 mph (21 sites before scheme implementation), 14 sites were found to still have average speeds between 24 mph and 29 mph after the schemes were implemented.

**Traffic Volume**

Due to the limited amount of data available at this stage, it has not been possible to determine if the scheme has had an effect on traffic migration or vehicle composition.

**Safety**

The analysis showed the total accident reduction was 13% and the number of casualties fell by 15%. KSI casualty numbers stayed the same whilst KSI accidents increased by 2%. None of these results were statistically significant when compared against national trends.

There were wide variations between the six sectors.

**Change in accident numbers by accident severity**

Sector	Before (Average of 3 year data)			After			% change	
	Slight	KSI	Total	Slight	KSI	Total	KSI	Total
Central East	30.7	6.0	36.7	34.0	3.0	37.0	-50%	1%
Central West	21.0	3.0	24.0	16.0	6.0	22.0	100%	-8%
North East	29.7	2.3	32.0	28.0	4.0	32.0	71%	0%
North West	26.3	3.0	29.3	19.0	4.0	23.0	33%	-22%
South East	13.7	1.7	15.3	15.0	0.0	15.0	-100%	-2%
South West	25.0	2.7	27.7	13.0	2.0	15.0	-25%	-46%
<b>All Sectors</b>	<b>146.3</b>	<b>18.7</b>	<b>165.0</b>	<b>125.0</b>	<b>19.0</b>	<b>144.0</b>	<b>2%</b>	<b>-13%</b>

**Change in casualty numbers by casualty class and injury**

Sector	Before (Average of 3 year data)			After			% change	
	Slight	KSI	Total	Slight	KSI	Total	KSI	Total
Central West	32.7	6.0	38.7	38.0	3.0	41.0	-50%	6%
Central East	25.0	3.0	28.0	18.0	6.0	24.0	100%	-14%
North East	34.7	2.3	37.0	29.0	4.0	33.0	71%	-11%
North West	28.3	3.0	31.3	21.0	4.0	25.0	33%	-20%
South East	16.0	1.7	17.7	15.0	0.0	15.0	-100%	-15%
South West	29.3	3.0	32.3	17.0	2.0	19.0	-33%	-41%
<b>All Sectors</b>	<b>166.0</b>	<b>19.0</b>	<b>185.0</b>	<b>138.0</b>	<b>19.0</b>	<b>157.0</b>	<b>0%</b>	<b>-15%</b>

Previous research has suggested average speed reductions of about 1mph (as observed in Portsmouth) result in accident reductions of about 5%, for roads with similar traffic flows.<sup>1</sup> The confidence limits associated with the one year's after data in Portsmouth are larger than this.

**Comparison with other 20 mph schemes**

When the results of the 20 mph limit (without traffic calming) are compared to the effects of 20 mph zones (with traffic calming), it is evident that 20 mph zones are more effective in terms of casualty and speed reduction. This is likely to be attributable to the greater reductions in average speed (typically 9 mph) achieved by 20 mph zones. It is however noteworthy that on roads in Portsmouth with high initial speeds (average speeds greater than 24 mph) an average 7 mph speed reduction has been achieved by the 20 mph limits.

Research carried out by TRL for Transport for London and observations during an experiment in Hull (in 1998) showed that the implementation of 20 mph speed signs alone only resulted in a 1 mph reduction in speed. This is comparable to the reduction in speeds observed in Portsmouth.

**Conclusions to date**

- The average speed reduction achieved by installing speed limit signs alone is less than that achieved by the introduction of 20 mph zones partly because 20 mph Speed Limits are implemented where existing speeds are already low;
- Within an area-wide application of 20mph sign only limits, those roads with average speeds higher than

<sup>1</sup> This figure was not based on before and after studies of traffic calming schemes but is based on analysis of the accident frequency and the characteristics of 300 UK roads. From this a model relationship was developed linking speed and accident frequency to enable predictions in the reduction of accidents if speed is reduced. Taylor et al, (2002) *The Effects of Drivers Speed on the Frequency of Road Accidents*, TRL Report 421, Crowthorne

24 mph generally benefit from significant speed reductions, but not to the extent that the 20mph speed limit is self enforcing;

- Based on the available data for one year after scheme implementation, casualty benefits greater than the national trend have not demonstrated but nonetheless may be demonstrated when more data is available; and
- The evaluation of area-wide schemes relies on good quality data and an appropriate evaluation design.

#### **Possible follow-on work**

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- An analysis of available travel to school data is needed in order to assess the impact of the scheme on non-motorised user journeys to school;
- A review should be carried out of highway satisfaction surveys to determine the impact of the scheme on public perception and behaviour, and assess the perception of aggressive driving; and
- An evaluation study that takes account of 3 years of "After" data to monitor the long-term impacts of the 20 mph scheme in PCC would offer stronger evidence of outcomes.

#### **Further Information**

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For further details of the Portsmouth City Council 20 mph interim evaluation and copies of the Final Report, contact:

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