

# 20mph Research – Analysis of speed outcomes in 20mph limit areas using GPS data for 12 case study areas

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# Structure of Presentation

- Study purpose and objectives, and overall methodology
- Existing evidence and wider trends in vehicle speeds
- Analysis of area-wide speed outcomes using GPS data
- Questions and discussion

# Study purpose

- Atkins, Aecom and Professor Mike Maher were commissioned by the DfT in 2014 to undertake research into **20mph signed only speed limits**.
- Purpose - To address an evidence gap regarding the effectiveness of 20mph speed limit only schemes.

# Study objectives

- To evaluate the effectiveness of 20mph speed limits, in a range of settings.
- To examine drivers' and residents' perceptions of 20mph limits.
- To assess the relative costs/benefits to vulnerable groups e.g. children, cyclists, the elderly.
- To evaluate the processes and factors which contribute to the level of effectiveness of 20mph speed limit schemes.

# Case studies

- 12 case study schemes; generally implemented 2012-2015
- 8 large residential area-wide schemes
- 2 small-scale schemes in self-contained residential areas
- 2 focused on city centre areas

# Data sources and analysis

## Stakeholder interviews:

- National stakeholders (DfT, PACTS, ACPO, ABD, etc.).
- Local stakeholders (officers, councillors, police, public health, bus operators, interest groups)

## Social research (attitudes, perceptions and behaviours):

- Residents and drivers questionnaires (sample = ~3400)
- In-depth interviews with drivers (sample = ~200)
- 12 focus groups and online surveys with specific user groups

## Detailed data analysis (speed, safety and other outcomes):

- GPS area-wide speed data (tomtom data)
- Local authority spot speed data, collected using inductive loops, radar devices or similar technology
- STATS-19 safety data (collisions, injuries, contributory factors)
- Other secondary data provided by local authorities

# Analysis of speed outcomes

# Existing evidence on speed impacts

## Small 20mph zones

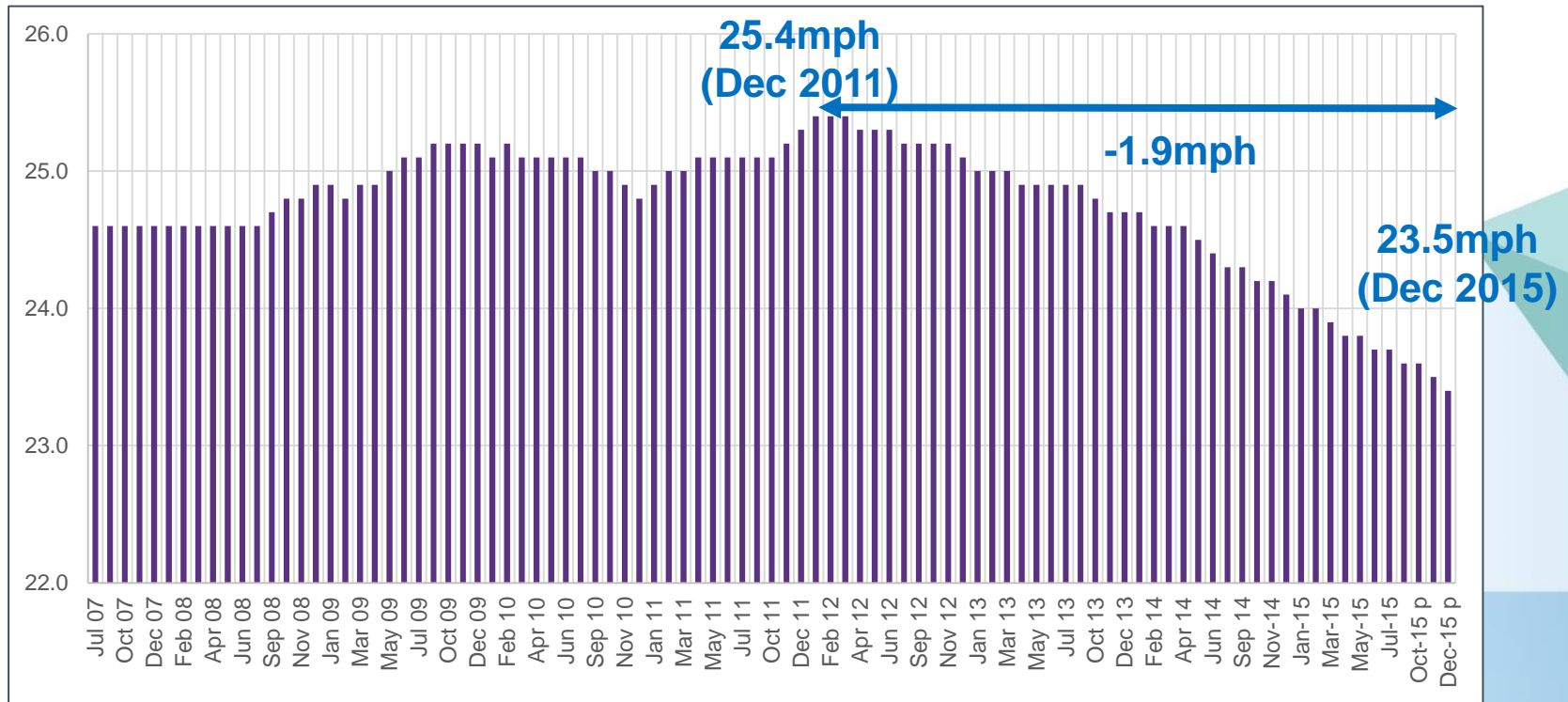
- Two extensive studies undertaken by the Transport Research Laboratory (e.g. Webster & Mackie, 1996; Webster and Layfield, 2003)
- 20mph zones can achieve substantial reductions in average speed, of around **9-10 mph**
- Small schemes (typically covering a few kms of road length), before speed well above 20mph (typically around 25mph), implemented to address location-specific safety issues

## 20mph limits

- Less evidence available (Portsmouth, Bristol, Edinburgh, national trial programme of advisory 20mph speed limits across Scotland)
- 20mph limits deliver much smaller reductions in average speed, typically around **1-2mph**
- Large scale, lower before speeds (closer to 20mph)

# Wider speed trends

- Average vehicle speeds during the weekday morning peak on locally managed 'A' roads (mph)

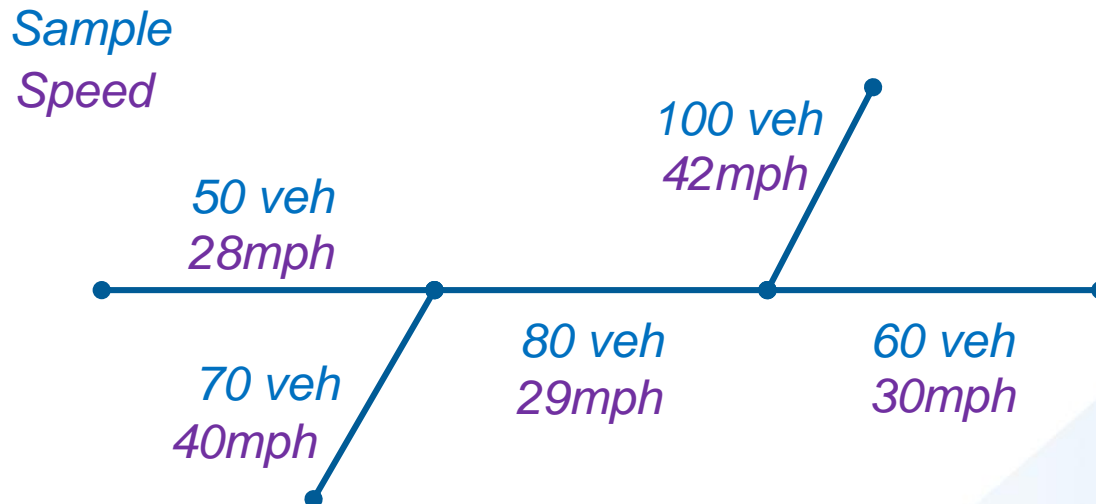


- % exceeding the speed limit on 30mph roads fell from **54% in 2011** to **52% in 2015** (*Free flow vehicle speeds in Great Britain, DfT, 2015*)



# What is TomTom data?

- Anonymised GPS data
- Available at segment level
- Each segment gives:
  - Sample, Speed (avg/med), Journey Time (avg/med), Distance, Every 5<sup>th</sup> Percentile Speed



# Strengths and weaknesses

Strengths	Weaknesses
Historically available	Only GPS vehicles (behaviour/affluence?)
Whole area, not spot locations	Requires full segment traversal
High area sample	Low individual segment sample
Over many days	But aggregated days
Disaggregation (to periods/segments)	

# Methodological challenges

- What is the average speed in an area?  
(issues of aggregation, samples, distance)
- What is the right metric for measuring change in speed?  
(issues of slow moving vehicles)

# Agreed methodology

- Use one year's pre and post scheme data
  - Split to peak and non-peak hours
- Flow and distance weight each segment's data
- Use a two core metrics:
  - Median speed
  - Percent of vehicle distance driven compliantly

## Sample sizes

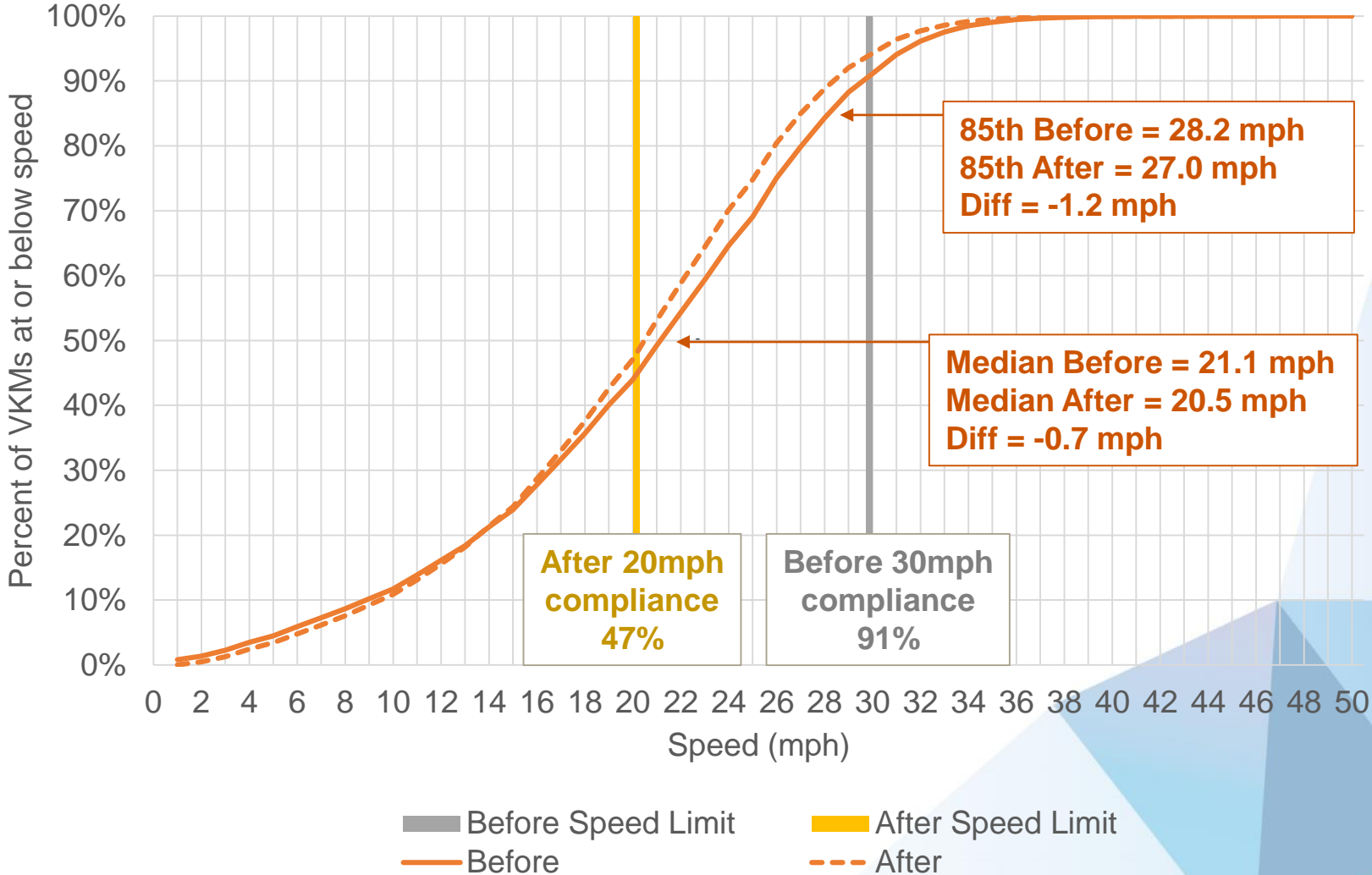
Distance	Before – Peak VKMs	Before – Non-Peak VKMs	After – Peak VKMs	After – Non-Peak VKMs
1,912km	3.2 million	8.4 million	4.1 million	10.1 million

# So what have we learnt?

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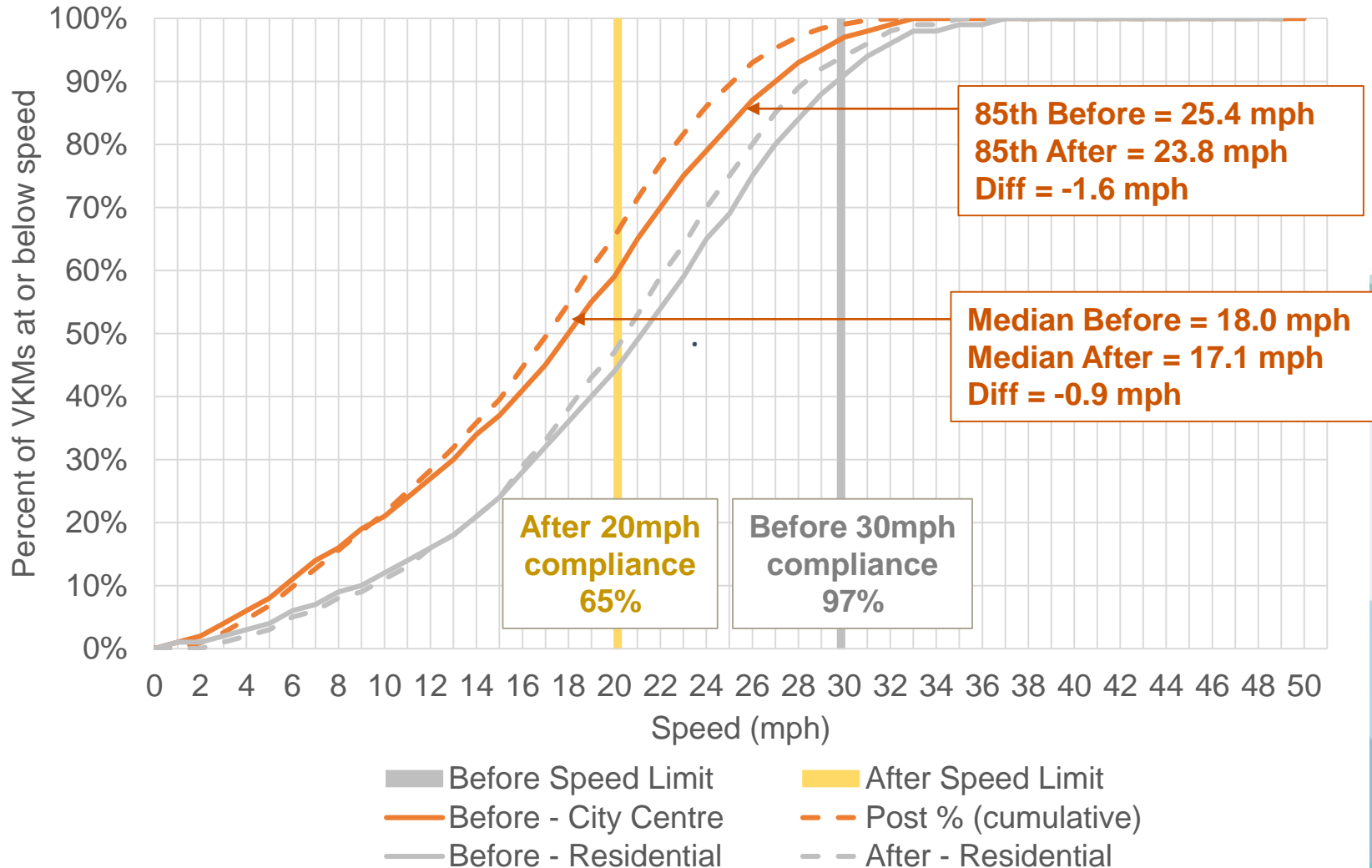
# New 20mph limits in Residential areas

## Cumulative speed distribution, overall (PROVISIONAL RESULTS)



# New 20mph limits in City Centre areas

## Cumulative speed distribution, overall (PROVISIONAL RESULTS)



## Other key findings (PROVISIONAL RESULTS)

- There was no clear difference between peak and non peak findings (journey purpose)
- Roads with higher pre-scheme average speeds showed greater reduction in speed when 20mph introduced
- Class of road is a large factor in the speed drivers choose to travel
- Pre-existing traffic calming increases 20mph compliance to 67%
- There is no evidence of speed displacement impacts



# Other areas of research

- Perceptions and behaviour
- Transport outcomes – spot speeds, casualties, perceptions of the quality of the environment for walking and cycling, increase in active travel, displacement if traffic, etc.
- Wider impacts – health, noise and air quality, community benefits, etc.
- Adverse / unintended impacts

# Questions and discussion