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Evaluating travel interventions:
where the best evidence is the enemy of the good

Dr Jillian Anable (Centre for Transport Research, University of Aberdeen, UK)

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Complex interventions …

…involve the flexible and tailored implementation of multiple interacting activities in a variety of settings to change the population's behaviour.

- We need to understand:
  - Overall impact
  - Effectiveness and cost effectiveness
  - How they work (or do not work)
  - How their effects are distributed
  - Potential scalability

But which evidence is the best and most reliable?

Soft/Smart Travel initiatives (aka TDM)

Initiative	Mechanism
Promotion	
Information and skills	• Personal Travel Planning , Information/knowledge, Travel Training
Marketing, campaigns and ticketing	• Targeted publicity and persuasion approaches, Tourist travel management, public transport ticket options, events.
Financial incentives	• Parking, Public transport, Promotion of tax incentives
Regulatory measures and managing demand	• Restrictions vehicles, workplace destination parking, intelligent systems
Complementary measures	• E-substitution, influencing housing and business choices , health education publicity
Provision	
Making sustainable choices more attractive	• Security, lockers, showers, back up in emergencies
More sharing of vehicles	• Car clubs, Cycle sharing/rental, trip sharing, pool cars/vans
Infrastructure and services	• Improved cycle routes and networks, public realm upgrading, new interchanges and services

Questions

1. What is the potential for ‘soft’ interventions to change travel behaviour?
2. What is the evidence on ‘what works’?
3. What do we still need to know?
4. How might we collect the evidence to fill the evidence gaps?
5. Should we wait for ‘better’ evidence before investing?

Potential impact on car traffic

(from *Cairns, S., Sloman, L., Newson, C., Anable J., Kirkbride A. and Goodwin, P. (2004)* Smarter Choices – Changing the way we travel. *For UK Department for Transport*)

11% reduction in ALL TRAFFIC after 10 years.

Potential impact on CAR traffic after 10 years =

	Urban	Rural/ M'way	Total
High	18%	12%	15%
Low	4%	2%	3%

NB; Cairns et al., (2004) quotes figures for 'All' Traffic not 'Car Traffic', but figures in the table are for 'Car Traffic' only

Scepticism about Smarter Measures

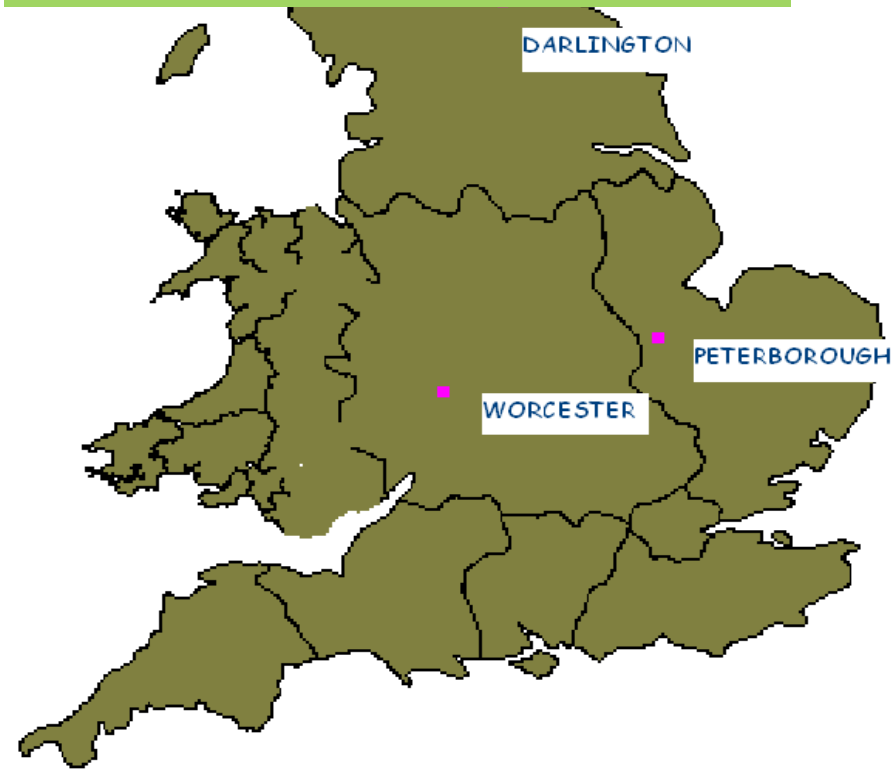
- ‘Cherry picked’ evidence?
- Unscientific monitoring and evaluation?
- What are the mechanisms of behaviour change? Who changes, when and why?
- Behaviour change is just short term?
- Only has an impact on short journeys?
- ‘Preaching to the converted’?

So, after a large-scale demonstration study, what have we learnt?

Sustainable Travel Towns

<u>2004 – 2009</u>: £10m from DfT +
£5m from each town
- Darlington £4.4m
- Worcester £4.4
- Peterborough £6.8m

= £10 per head



The Effects of Smarter Choice Programmes in the Sustainable Travel Towns:
Summary Report

Lynn Sloman, Sally Cairns, Carey Newson,
Jillian Anable, Alison Pridmore and Phil Goodwin

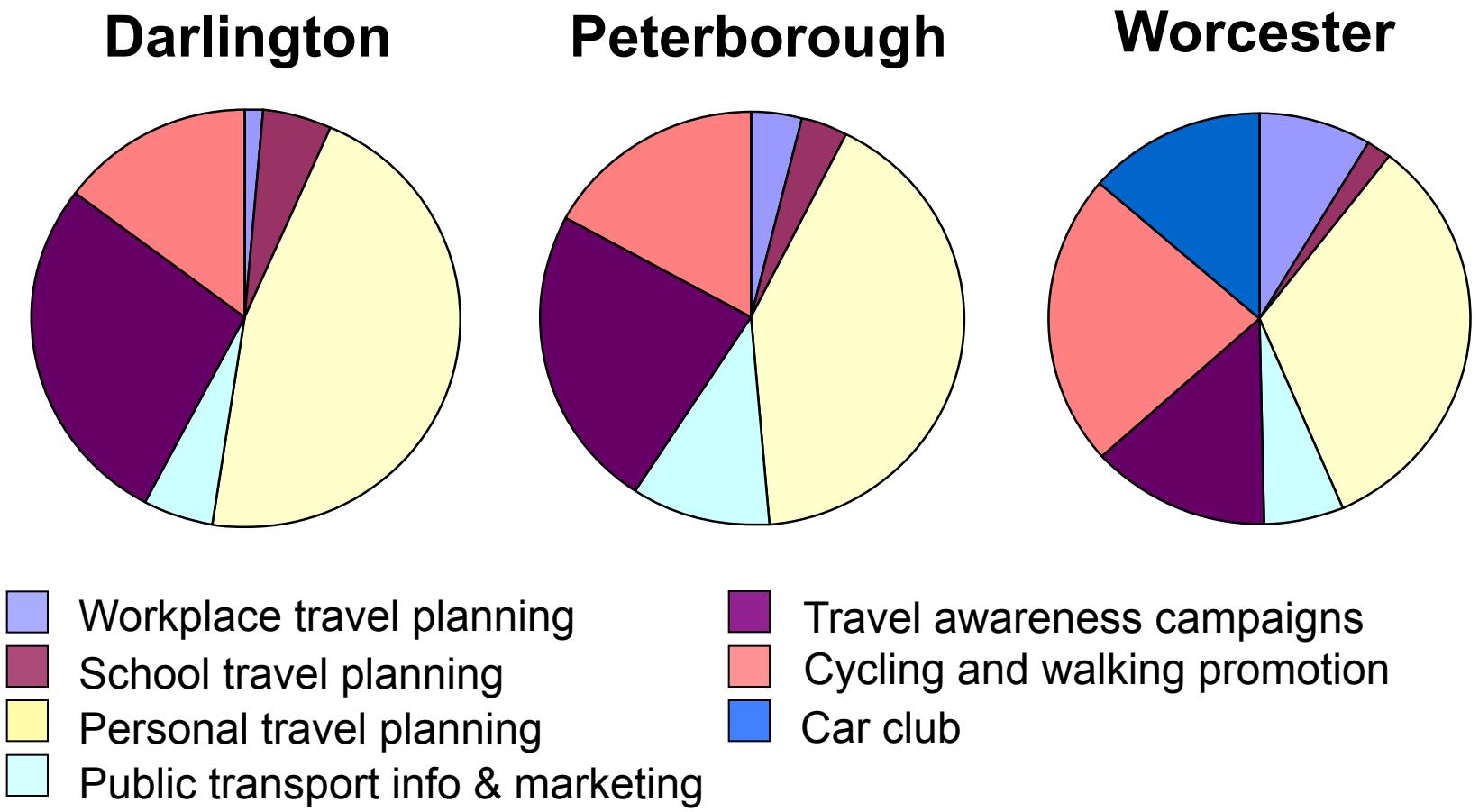
Report to the Department for Transport
January 2010

AEA TRL transport for quality of life

UWE University of the West of England

University of Aberdeen

STTs: balance of measures (£revenue)



Data sources

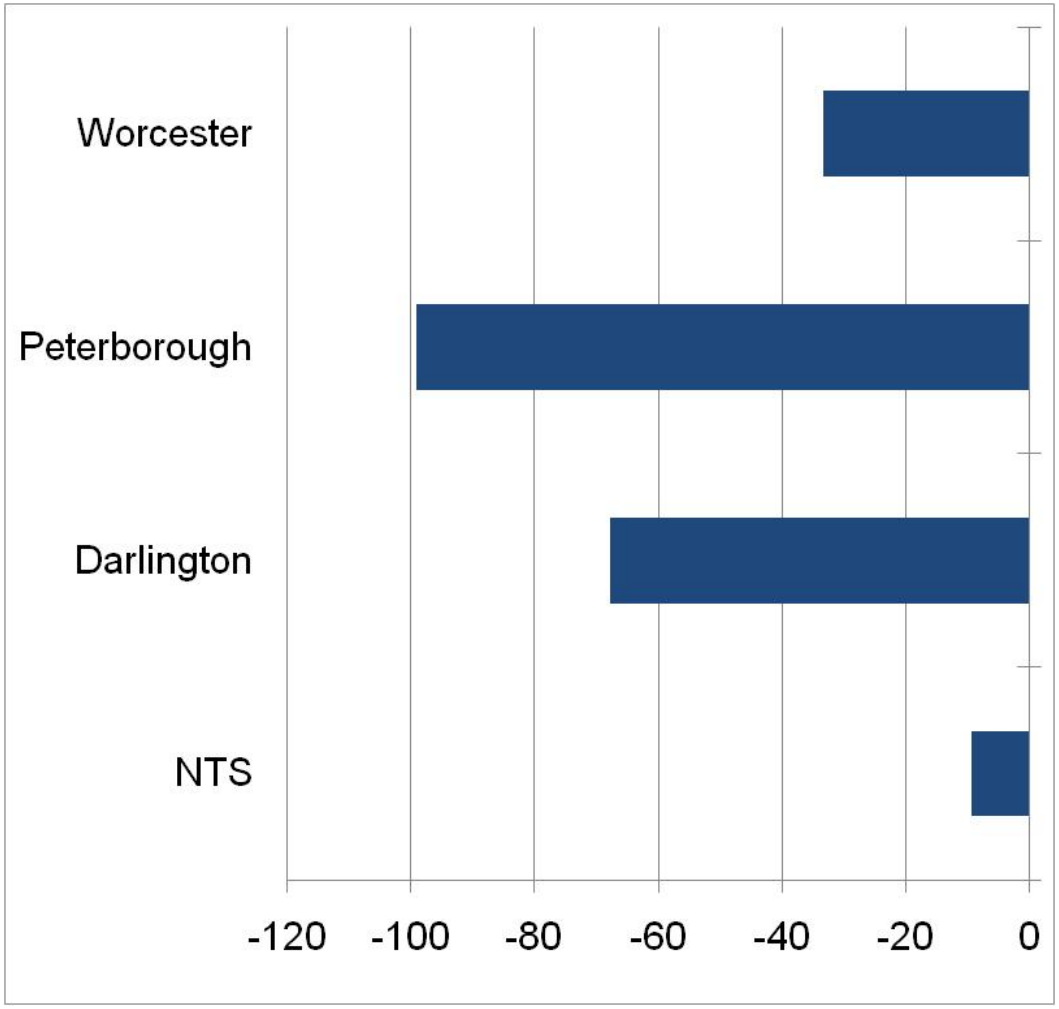
Town Data

- **Household travel survey** (undertaken 2004 & 2008, 4000 people each town each survey)
- **Counts of:**
  - Vehicles
  - Cyclists
  - Pedestrians
  - Bus passengers
- **School and workplace surveys**

National Data

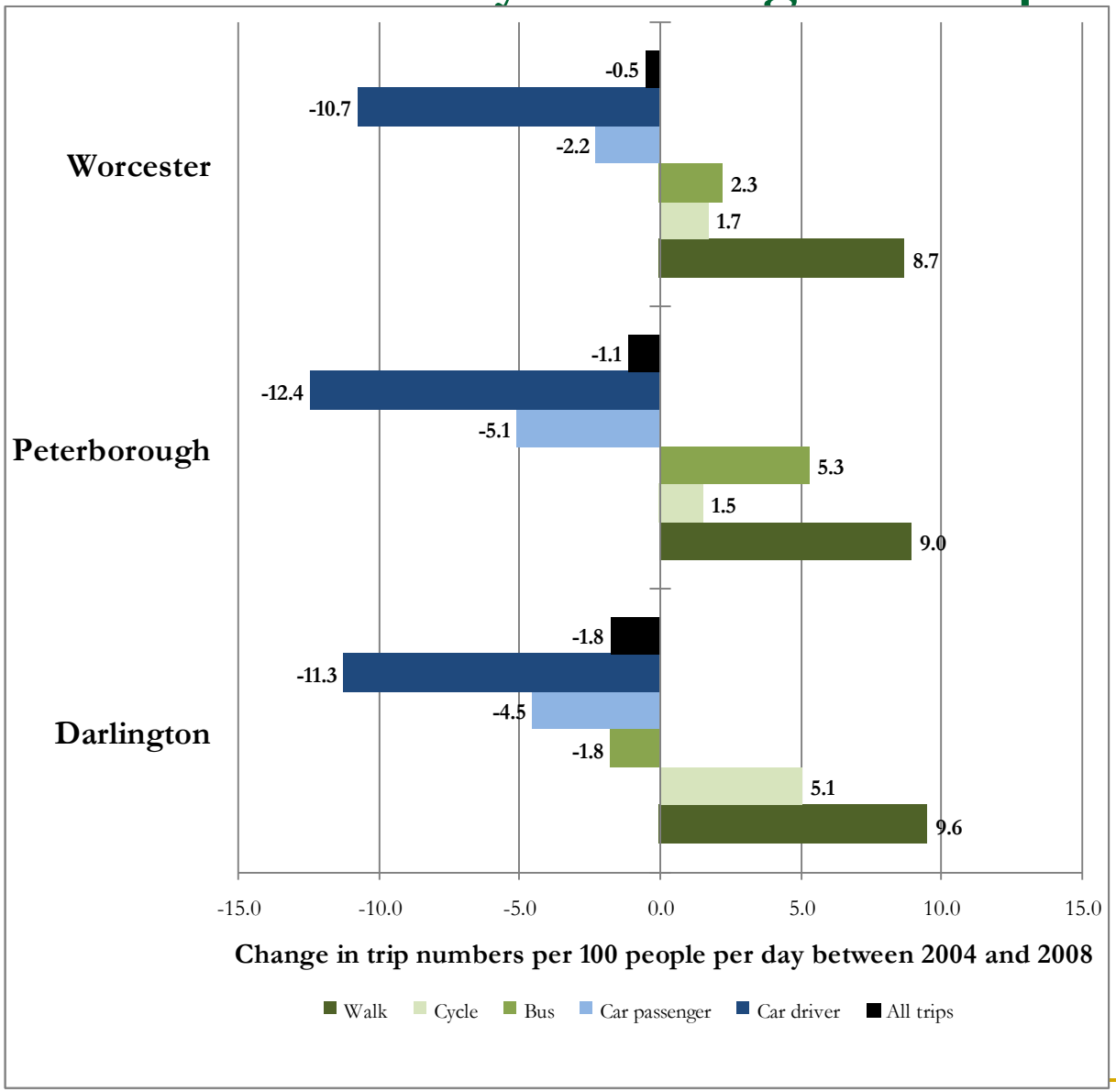
- **National Travel Survey** medium-sized urban areas
- **National Road Traffic Estimates** urban roads

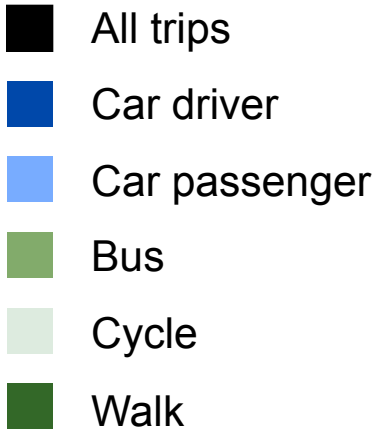
Household surveys – change in distance driven (VMT)



Change in car driver km per 100 people per day 2004 to 2008.
Household travel survey - weighted dataset; trips<50km.
National Travel Survey – all trips in medium urban areas.

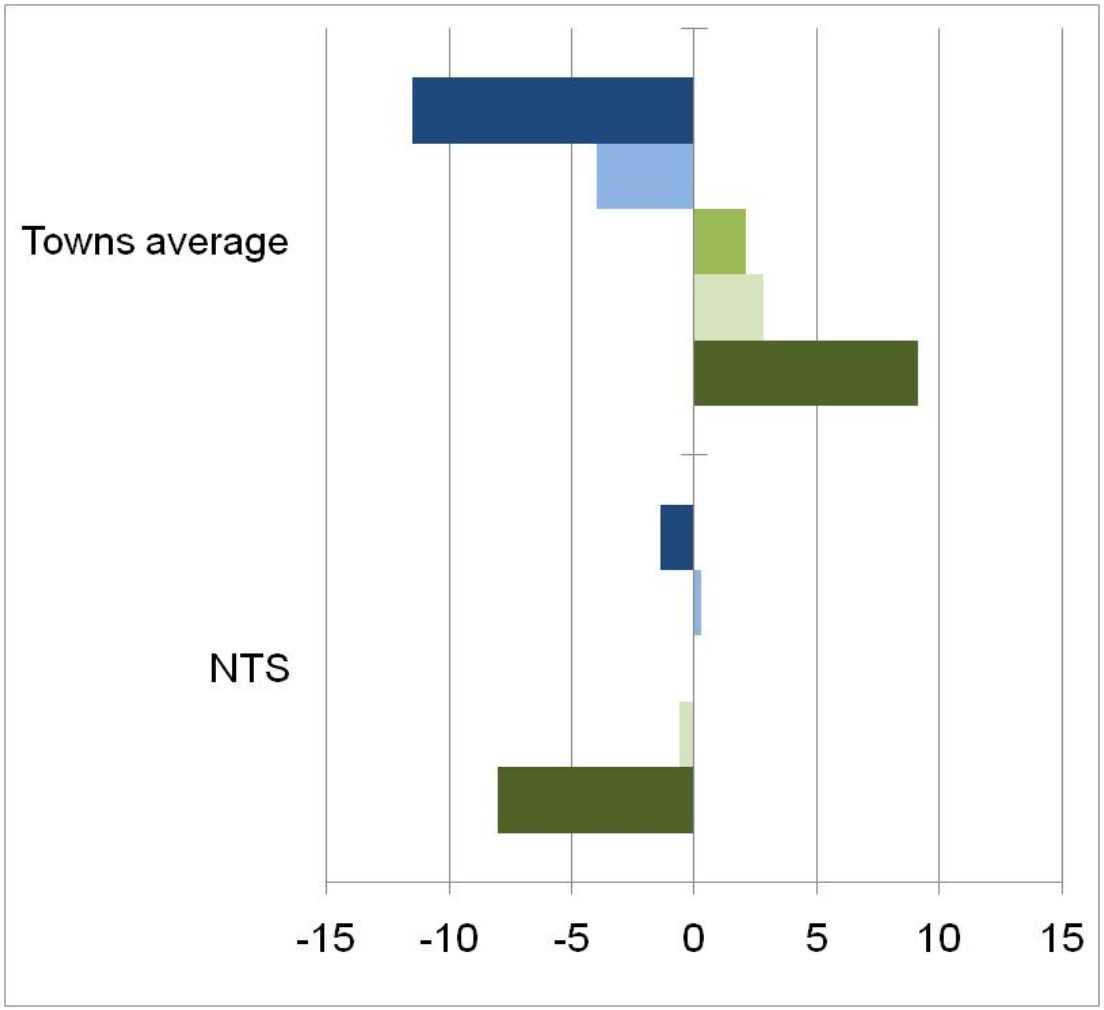
Household surveys – changes in trips by mode





Change in trip numbers per 100 people per day 2004 to 2008; weighted dataset; trips<50km

Household surveys – changes in trips compared to NTS



Change in trip numbers per 100 people per day 2004 to 2008.
Household travel survey - weighted dataset; trips<50km. National Travel Survey – all trips in medium urban areas; some issues with walking and cycling data.

Patterns of demand (travel survey results)

Mode shift

e.g. replacement of trip by car with trip by bus, bike or foot

+

Destination/mode shift

e.g. replacement of medium length car trips with shorter journeys by bus, bike or foot

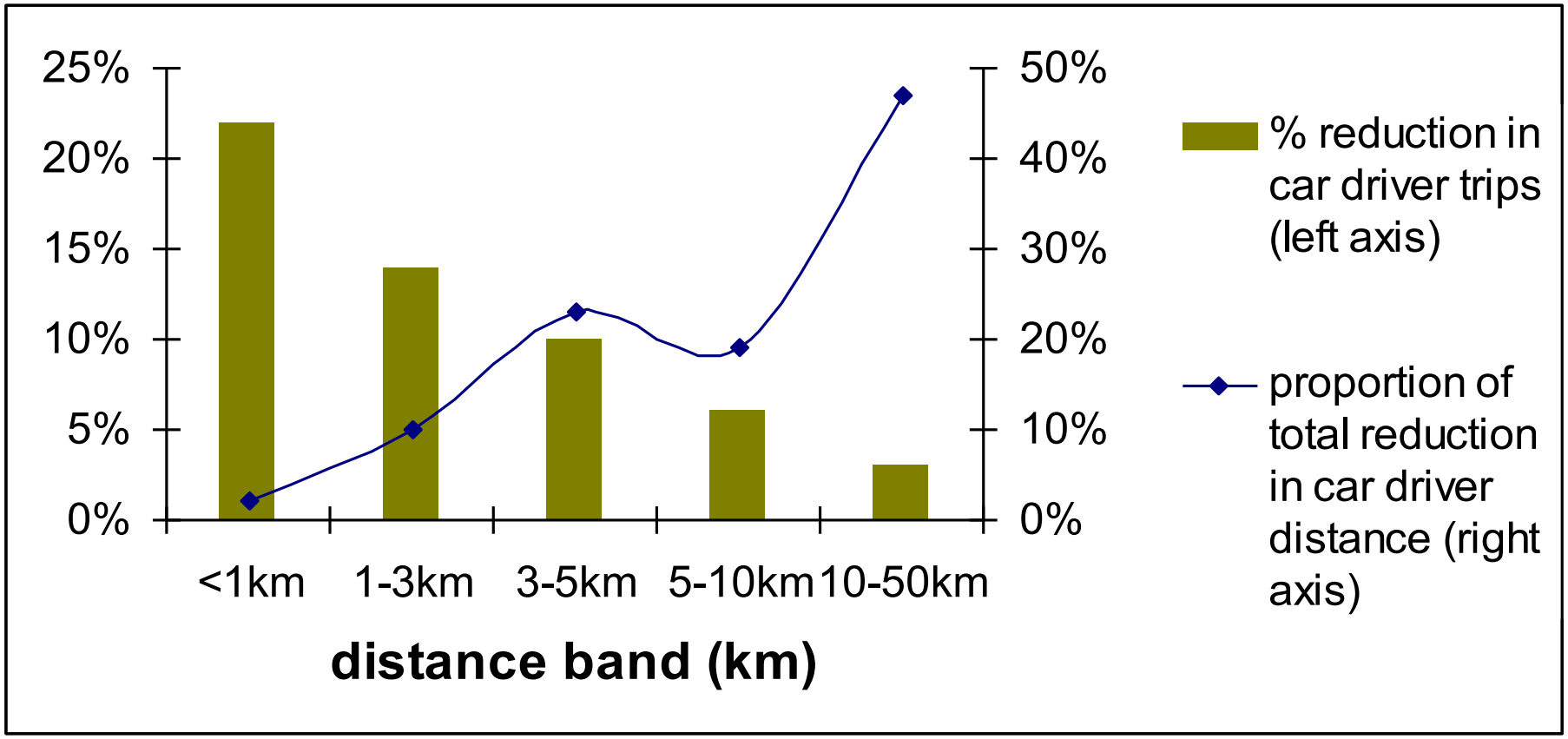
+

Trip evaporation

7% of reduction in car use from a net reduction in trips

Car driver trips and distance: variation in impact according to trip length

Largest behaviour change seen in short trips, but largest reductions in DISTANCE from medium/ long distance trips



Outcomes: who changed behaviour?

- **men + women** equally
- *most* **age** groups (but 41-45 yrs & 61-65 yrs show less change)
- People at a **'transition point'** most susceptible:
  - largest reductions: college students, job seekers, recently retired
  - lowest reductions: full-time and part-time workers and intensive car users (41-45 year olds)

Car driver mode share for full-time workers fell by 5%, but contributed 40% of reduction in car driver trips

Which journey purposes were most affected?

- Looking at reduction in *total car driver distance* (trips<50km):
  - Leisure trips contribute 45% of savings
  - Shopping trips contribute 30%
  - Work-related business contributes 21%

- Effects on most journey purposes, in most distance bands
- leisure and shopping: largest and most consistent effect on car driver mode share and distance
- business and commuter travel: substantial effects on car driver distance (but effect on inconsistent between towns)

Summary of how travel patterns changed

- **Increases** in walking, cycling and/or bus use
- **Reductions** in residents' car use leading to (smaller) observed reductions in traffic, particularly in central areas
- Main effect was on **trips of <50km**
- **Shorter car trips were more affected than longer trips** …but nearly half of the total effect on car driver distance was from medium length trips
- There was a **combination of mode-switching, trip evaporation and destination-switching**
- Most of the car driver distance savings came from **leisure and shopping** …but full-time workers still contributed around one-third of the total car driver distance savings
- Behaviour change was greatest among **college students and people looking for work**, moderate for retired people / people on 'home duties'; and least among those in full or part-time employment

Remaining gaps in evidence

Scale of change	A few people changing a lot, or a lot of people changing a little?
Durability/ longevity	How long will the savings last? What needs to happen to reinforce and lock-in the savings?
Who responds?	How should interventions be targeted for best results?
Why do they respond?	What are the psychological and interpersonal processes involved?
Which measures work?	Can changes be attributable to specific measures?
What value synergy?	Is there value in implementing a combination of measures at once
Generalisability	What are the effects in populations different from those previously studied?
Distributional impacts	Are inequalities widened as a result of interventions?
Wider impacts	Health impacts; economic growth; employment retention; neighbourhood satisfaction

UK Government response

*"The **limited evidence** about the impacts of Smarter Choice measures needs to be understood ."*

*"The scale of the impacts indicated by the **limited evidence** needs to be related to the intensity of the proposed application so that a benchmark of an appropriate scale can be derived."*

Academic critique

Graham-Rowe, E., Skippon, S., Gardner, B. and Abraham, C. (2011) Can we reduce car use and, if so, how? A review of available evidence. *Transportation Research Part A:* 45 (5), pp. 401-418.

Möser, G. and Bamberg, S. (2008) The effectiveness of soft transport policy measures: A critical assessment and meta-analysis of empirical evidence. *Journal of Environmental Psychology* 28 (1), pp. 10-26.

- Findings produced by more 'scientific' methods should be accorded greater weight
- Randomised control trials (RCTs) should be used 'wherever possible'
- More reliable studies show smaller effect of smarter choices
- Need to produce objectively quantifiable results
- RCTs are necessary to address weaknesses in transport research

Randomised control trials

- Samples are randomly assigned to one or more different treatments
- Subjects should not know which group they are in
- Everything else should be held constant for the two groups
- Factors must only be changed one at a time

Arguments ‘for’:

- demonstrate **causality** (rather than mere association) and eliminate bias
- Generate more valid (scientific) findings

Arguments against RCTs

- Cannot be applied to complex interventions
- Every location is unique
- There are complex synergistic effects of interventions
- 'Double blind' methods: only the most trivial of interventions can be hidden from its subjects
- Cannot help to identify causal ***mechanisms – therefore cannot address questions about durability and scale***

More or better evaluation?

- We need better evaluation, but:
  - ‘Gold standard’ methods are rarely appropriate in complex interventions
  - Evaluating an intervention too early risks reaching unhelpful or misleading conclusions
  - Better to focus on understanding the *processes* before measuring changes in behaviour
  - Rather than test whether a programme ‘works’ – test general theories about how interventions work by aggregating evidence across a range of situations

Conclusions

- Demanding the ‘best’ evidence is unrealistic for complex interventions in multiple socio-spatial contexts
- With many interventions – we know enough to conclude that they ‘work’ – but not enough to understand how to scale up for larger and longer term change
- The focus has to be less on the numbers and more on the processes of change
- The call for evidence based policy may stifling methodological creativity and …

Reality check

“ Those making policy decisions may be influenced more by certain key findings of research than by the weight and methodological rigour of scientific evidence ”

Ogilvie, D., Cummins, S., Petticrew, M., White, M., Jones, A and Wheeler, K. (2011) Assessing the Evaluability of Complex Public Health Interventions. *The Milbank Quarterly*, 89 (2), pp.206-225)