

Behavioural Change in Transport

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Structure

- Growing consensus on need for behavioural change
- Current transport measures
- Evidence base
- Need for more than “pull” measures
- Framing behavioural change
- Conclusions

The need for behavioural change

- Technology alone cannot achieve the levels of carbon reduction needed
- Step changes in technology are uncertain
- Increasingly recognised in the academic literature and more recently in some policy documents
- Polls suggest that the public recognises that lifestyle changes will be required.

Climate Change Programme and proposed Energy White Paper Policies: savings in transport sector MtCO₂

Measure	2010	2020
Climate Change Programme		
VA and successor	8.4	13.2
RTFO	4.4	5.9
Wider measures	2.9	2.9
Sustainable distribution (Scotland)	0.4	0.4
Local Authority policies	0.7	0.7
Total	16.8	23.1
Energy White Paper		
Further vehicle efficiency gains	0.4	6.2
Domestic aviation in ETS	0.0	1.1
Total	0.4	7.3
Overall total	17.2	30.4

Carbon Pathways (DfT 2008)

- Reliant on new car technology and renewable fuels.
- Behavioural measures account for 12% of the savings in 2020.

Building a low carbon economy (CCC, 2008)

- Three ambitions and their percentage saving from behavioural measures:
 - Current 0%
 - Extended 18%
 - Stretch 30%
- Extended: includes smarter choices and eco driving
- Stretch: further savings from eco-driving and speed reduction and enforcement at 60mph

Evidence on behavioural change

- Fiscal incentives
- Freight
- Public transport
- Smarter choices
- Sustainable travel towns

Fiscal measures

- Fuel Duty Escalator (1993-1999) – saved 7 Mt CO₂
- Company Car Tax
 - saved 0.7 to 1.1 MtCO₂
 - new company cars emitted less CO₂ per km than new private cars
- Vehicle Excise Duty: ?
- London congestion charge: CO₂ reduction of 19.5% 2002-2003

Fiscal measures

- Taxes and charges on use (fuel or carbon) rather than ownership impact on emissions:
 - Short run on vehicle kilometres and driving style
 - Longer run through encouraging the purchase of lower emission vehicles.
- Such charges will also reduce any rebound effect from more efficient vehicles by increasing the costs of use.

Fiscal measures

- *“Carbon and fuel taxes are the ideal measures for addressing CO₂ emissions. They send clear signals and distort the economy less than any other approach”*

ECMT 2007, p9

Freight operations

- McKinnon (2006) benchmarking:
 - If fleets below the average subsector performance achieved the average – 5% fuel saving
 - If all are raised to the average of the top third of performers – 19% fuel saving
- Case studies (DfT various) indicate fuel savings:
 - Aerodynamic styling 7-15%
 - Lower rolling resistance tyres 5-13%
 - Safe and fuel efficient driving 2-12%
 - Consolidation 38%
 - Site specific advice 18%

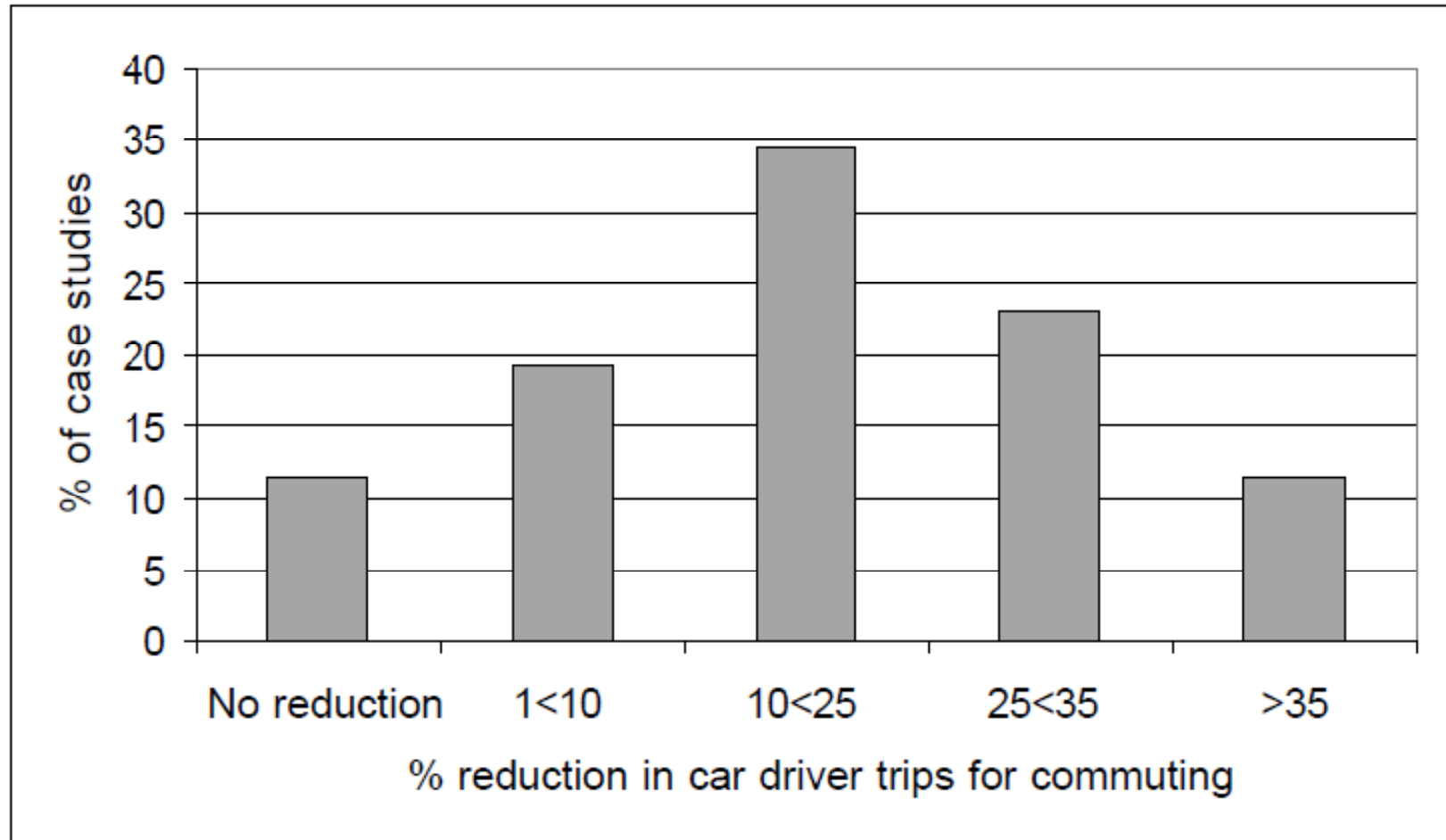
Public transport pricing and use

- A valuable facilitating measure
- NOT good at getting people out of their cars
- Bus and rail can lose energy efficiency advantage as cars increase in efficiency.

Smarter choices

- Interventions to reduce car use:
 - At destination (or origin)
 - At point of access to vehicle or use of vehicle
 - Information to increase awareness of options
 - To reduce the need or desire to travel.

Workplace travel plans: impacts (Cairns et al, 2008)



Travel plans

- Workplace: average reduction in car kilometres 17.8%
- Schools: 8 to 15%

Rethinking ownership

- Car clubs
- 81,450 members share 1,925 cars (1.6.09) – up from 64,00 in just 6 months from December 2008.
- Impacts?

Car club impacts (most figures from Myers and Cairns 2009)

- 1 car club car replaces:
 - 14 existing car (& 9 intended purchases)
 - So in total each car replaces 23 on the roads (or 0.63 cars per member)
 - Given the number of car club cars in June 2009 this equates to around 44,000 vehicles
- Reduction in car mileage – more difficult to assess, reduction assessed to be between 13 and 62%
- Car club vehicles emit 36% less CO₂ per kilometre than the fleet average

Eco driving

- Applies to all modes
- Car probably save 5 to 10% (reduces over time as vehicles become more efficient)

Other interventions (Cairns et al)

- Information
 - Public transport marketing and awareness campaigns 1.5 to % increase in demand
 - Personalised travel planning 2-15% reduction in car use

- Need to travel
 - Teleconferencing 10-30% reduction in business kms
 - Teleworking 2 to 6 fewer commute trips a week

Smarter choices – all case study evidence

- Impacts may be overstated:
 - First movers more committed
 - Estimates do not include additional emissions from passenger transport or rebound effects

- Impacts may be understated:
 - Later implementations should learn from earlier experiments
 - Embedding into society – virtuous circle

Sustainable Towns 2009

Table 2 Car mileage reduction and CO₂ saving per annum

Town	Million car kms 2004	Million car kms 2008	reduction	CO ₂ savings tonnes
Darlington	355.4	321.1	34.3	7000
Peterborough	610.7	579.8	30.9	6400
Worcester	427.1	407.8	19.3	3900
total				17,300

Towns and change

Building resilience and enabling local initiative

- Transition towns
- Citta slow movement

Experimental evidence

- Behavioural response to personal carbon trading and carbon tax domestic energy and transport: 12-19% carbon saving (Bristow and Zanni, 2009)
- Tradable carbon permit for transport only compared with fuel tax: save 11.4% permits and 0.4% tax (Harwatt, 2008)
- Seek 60% reduction in transport related CO₂ emissions: 21% saving (Tight et al, 2007)

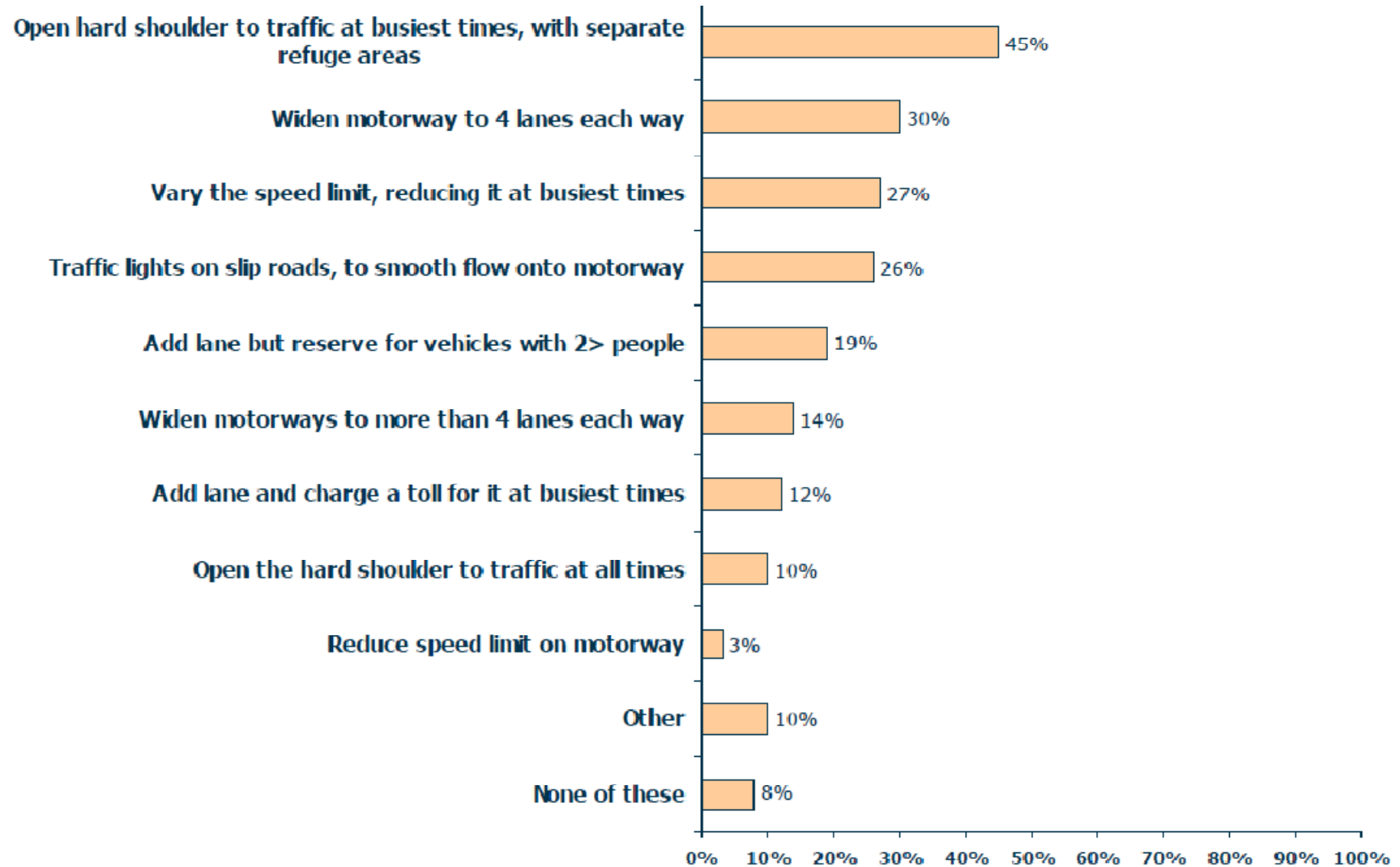
Achieving BIG behavioural changes?

- Evidence from case studies and experiments suggests that the maximum saving that people are likely to envisage or adopt in the short run is less than 20%
- How then to achieve the consistent “push” toward change that could lead to bigger changes over time?

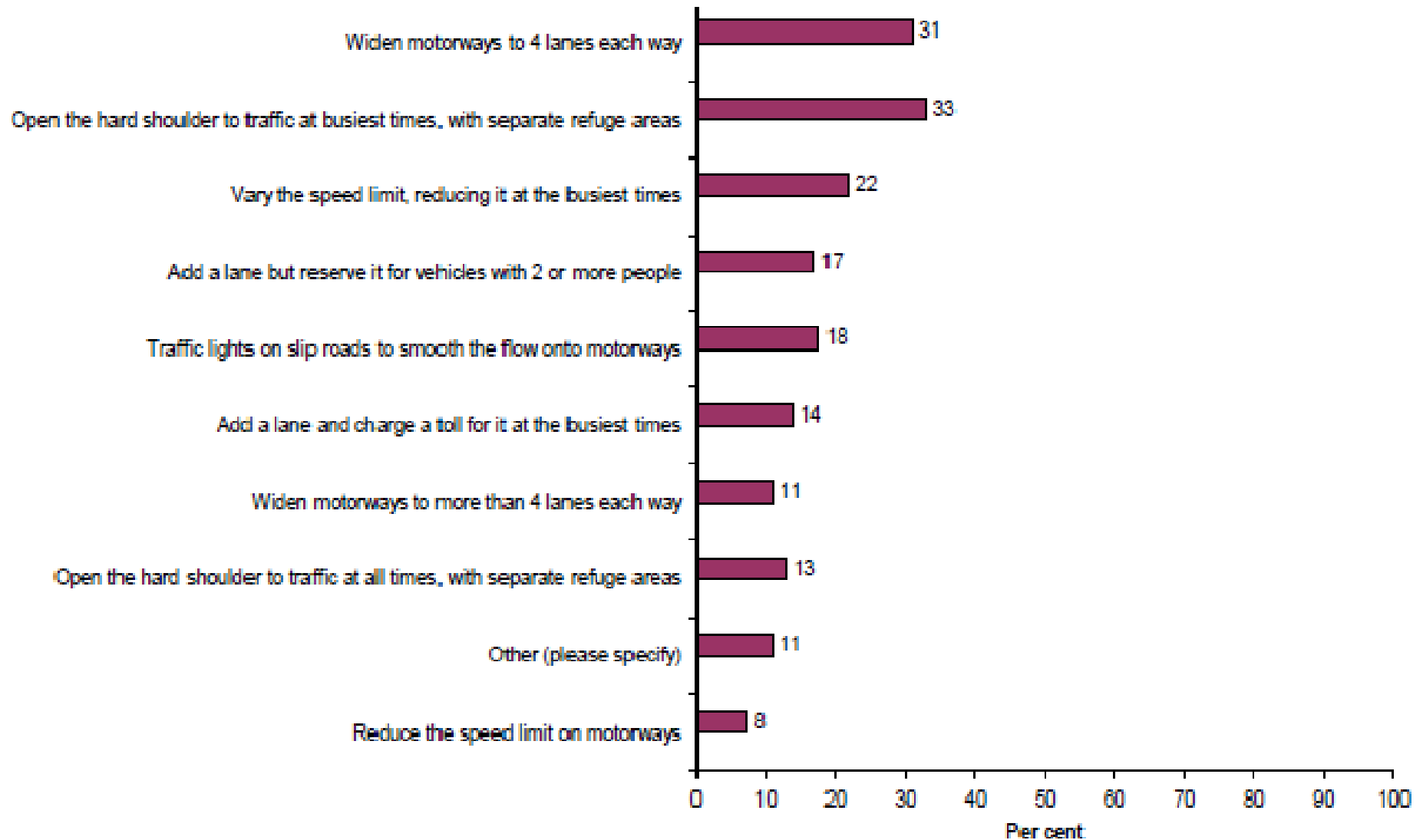
A policy framework

- Tax based – carbon tax
- Trading – personal carbon trading
- How acceptable might such policies be?

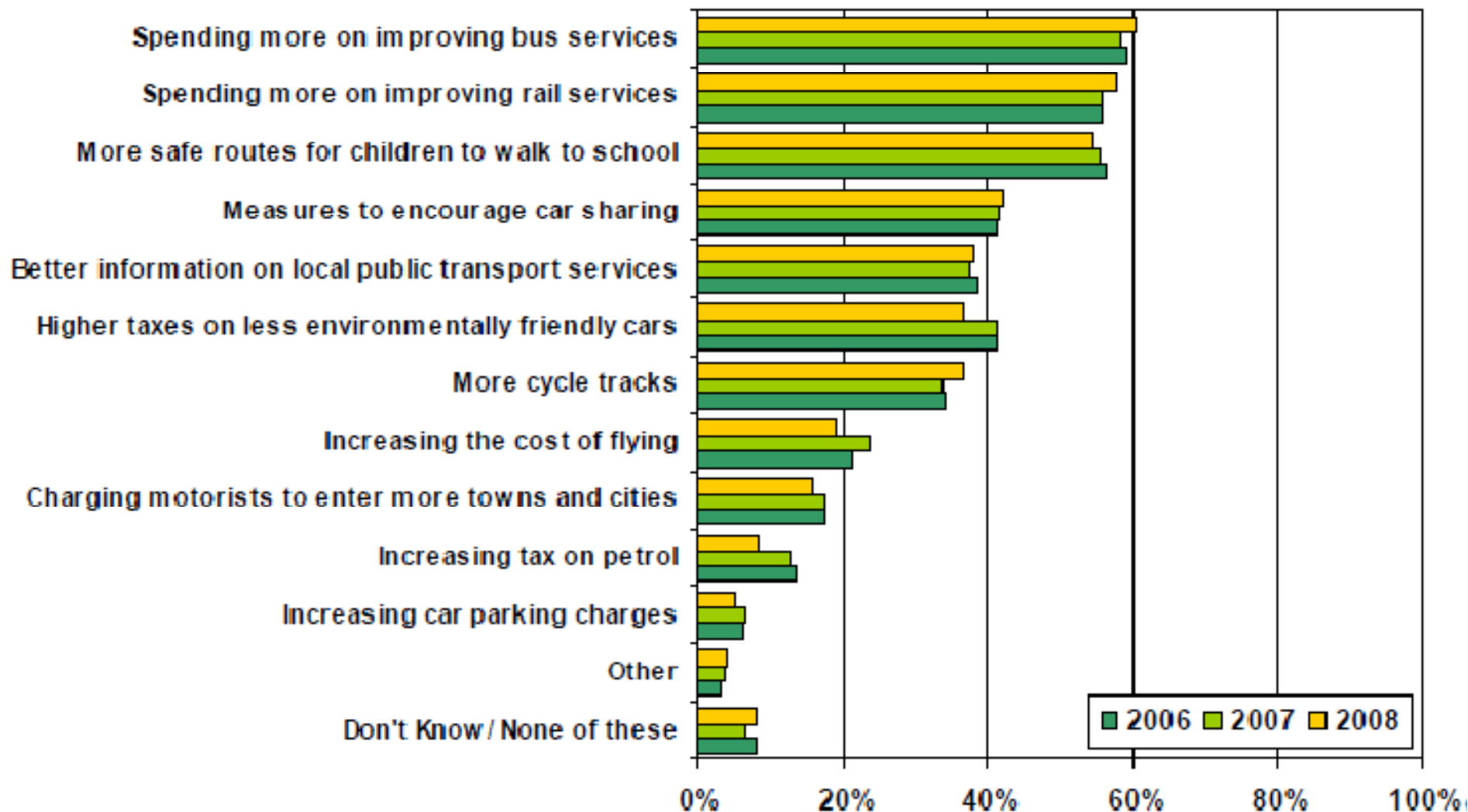
Support for ways of reducing motorway congestion (GFK 2008)



2009 Omnibus survey (DfT)



Supported policies (Omnibus survey, DfT 2009)



Support for personal carbon trading (or similar)

Study type, sample size and date	% support
National Poll, 1619, 2006 (YouGov)	25%
National Poll, 2645, 2006 (YouGov)	61%
In-home interviews 1192, 2007 (EST)	29%
On-line poll, 1081, 2008 (IPPR)	31%
CAPI South East England, 208, 2008 (Bristow et al)	43%
Postal survey, Cambridge, 152, 2008 (Von Knobelsdorf)	44%
Postal survey, Nottinghamshire, 317, 2008 (Wallace)	42%
Postal survey, national, Sweden, 938, 2007 (Jagers et al)	47%

What influences acceptance?

Personal Carbon Trading Design

- Initial allocation of carbon allowances
- Choices in disposal of excess permits
- Permit life
- Limits on permit purchase
- Scope of the scheme
- Who provides carbon accounts
- How is the price set
- Transactions
- Price

Key attributes

Permit allocation

- Preference for equal allocation to adults and some allocation for children
- Additional support for those with extra needs

Carbon Tax

- What happens to the revenues?
- Least preferred: no hypothecation
- Two preferred options:
 - Revenue is spent on measures to support behavioural change
 - Threshold exemption (like income tax)

Conclusions

- Behavioural change is essential
- Experience and experiment suggest the impacts of pull measures will be limited
- Push measures are needed to provide a consistent framework for change
- Evidence suggests that push measures could be acceptable if perceived to be both fair and effective.