

# **National Road Pricing: vision and reality**

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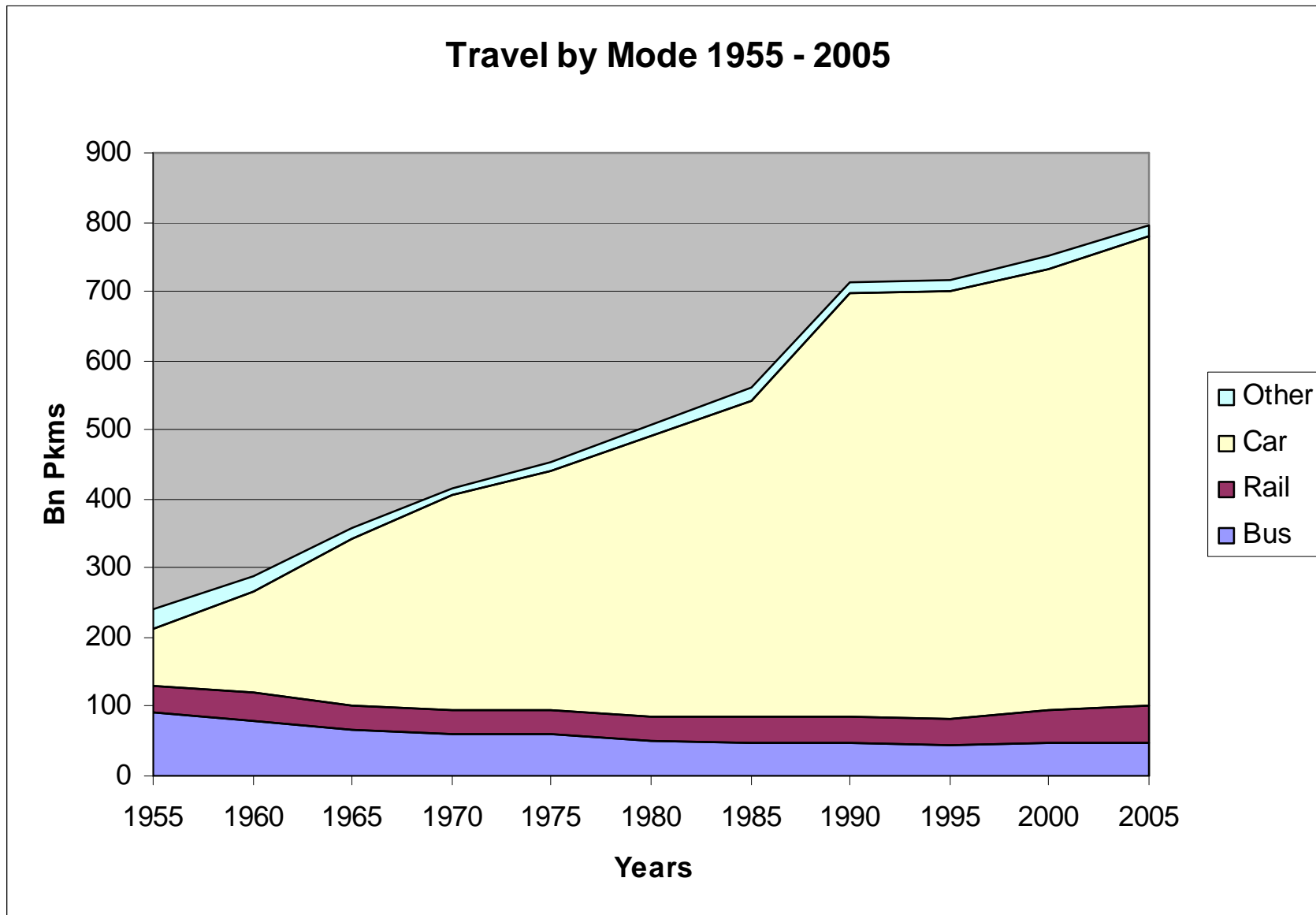
As economies grow, the private car

tends to replace public transport  
and cycling and walking...

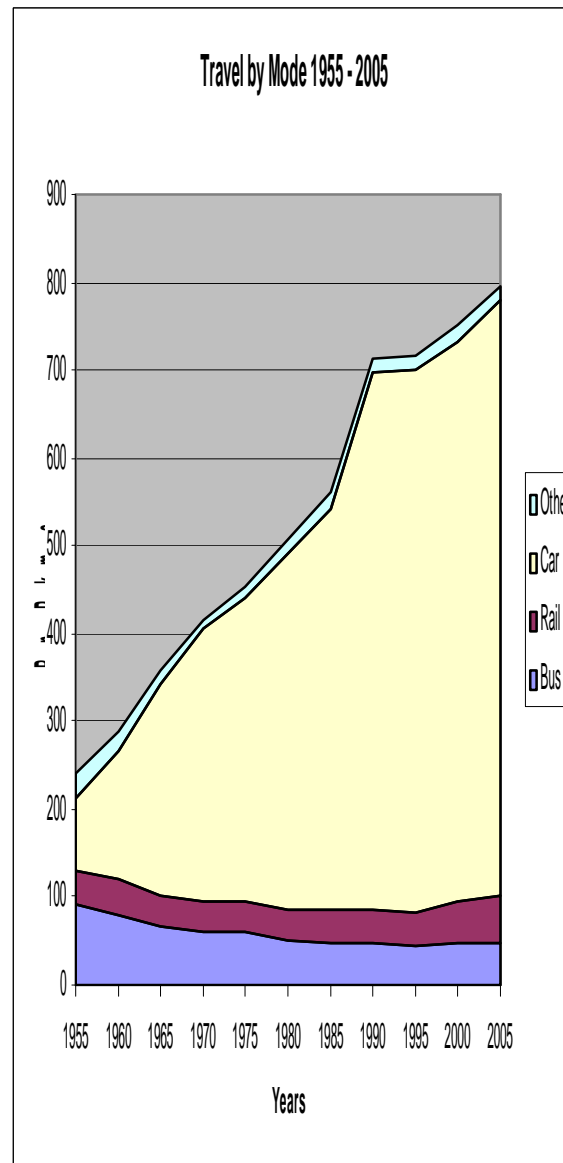
...if the car is easily available and

becoming cheaper **relative to incomes**

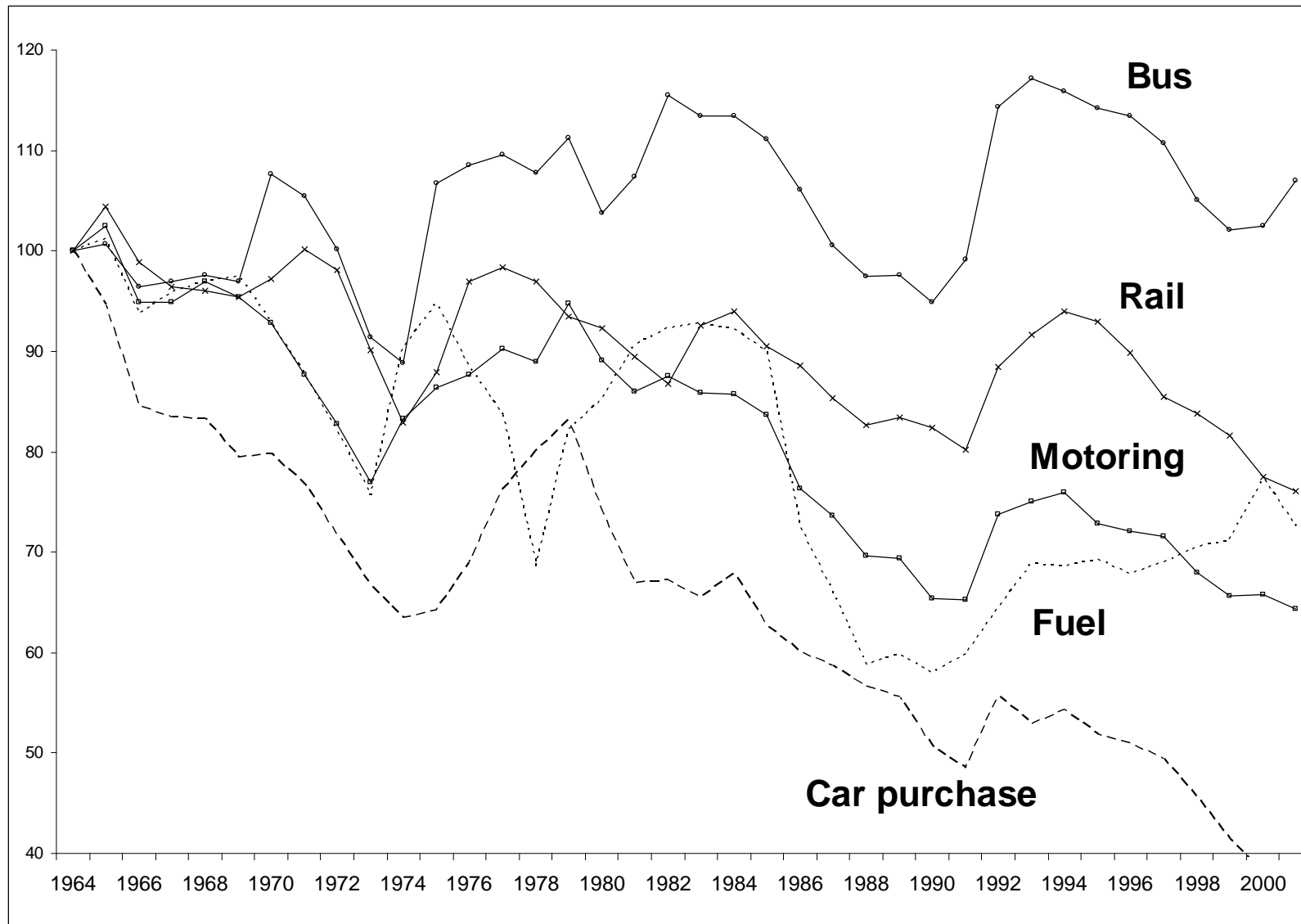
# Changes in Modal Use in Great Britain 1958 to 2005 (bn pkms)



# Changes in Modal Use in Great Britain 1958 to 2005 (bn pkms)



# Price indices relative to gross household income 1964 - 2002



Costs in public transport industries

keep pace with general incomes (labour costs)

But costs of owning and running cars fall (technical progress,  
productivity)

# This growth in mobility of people and goods

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is one of the great benefits of modern society

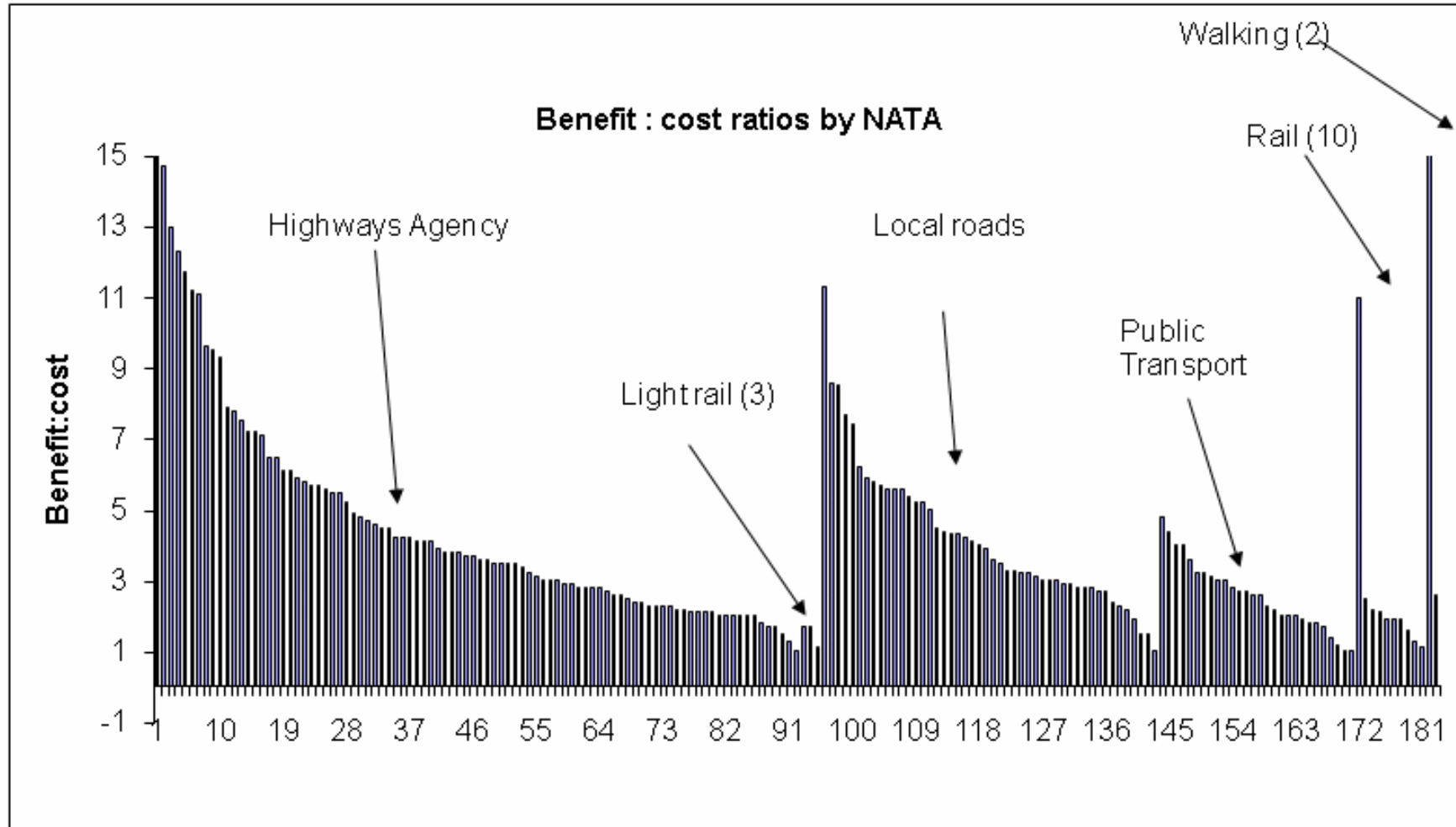
It improves standards of living and makes people better off

BUT

- we must provide the appropriate infrastructure
- we must deal properly with the damages done to non-travellers
- it is not sensible to try to meet all demands ...  
..... demand must be managed

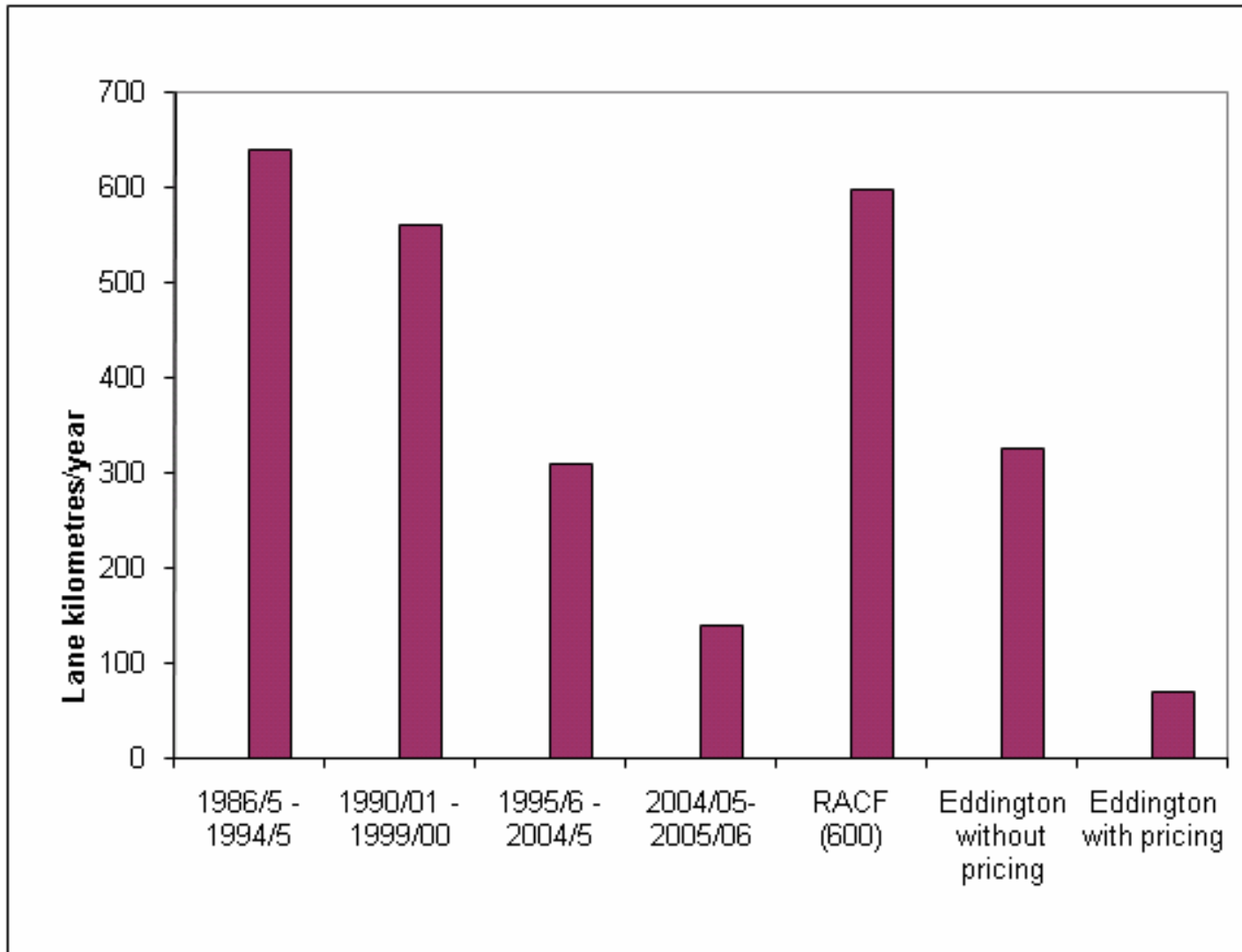
Especially in big cities – there is not enough space!

# In GB we have underinvested in infrastructure



Eddington evidence base ([www.DfT.gov.uk](http://www.DfT.gov.uk))

## Great Britain strategic road construction rates



In public policy it is often forgotten that

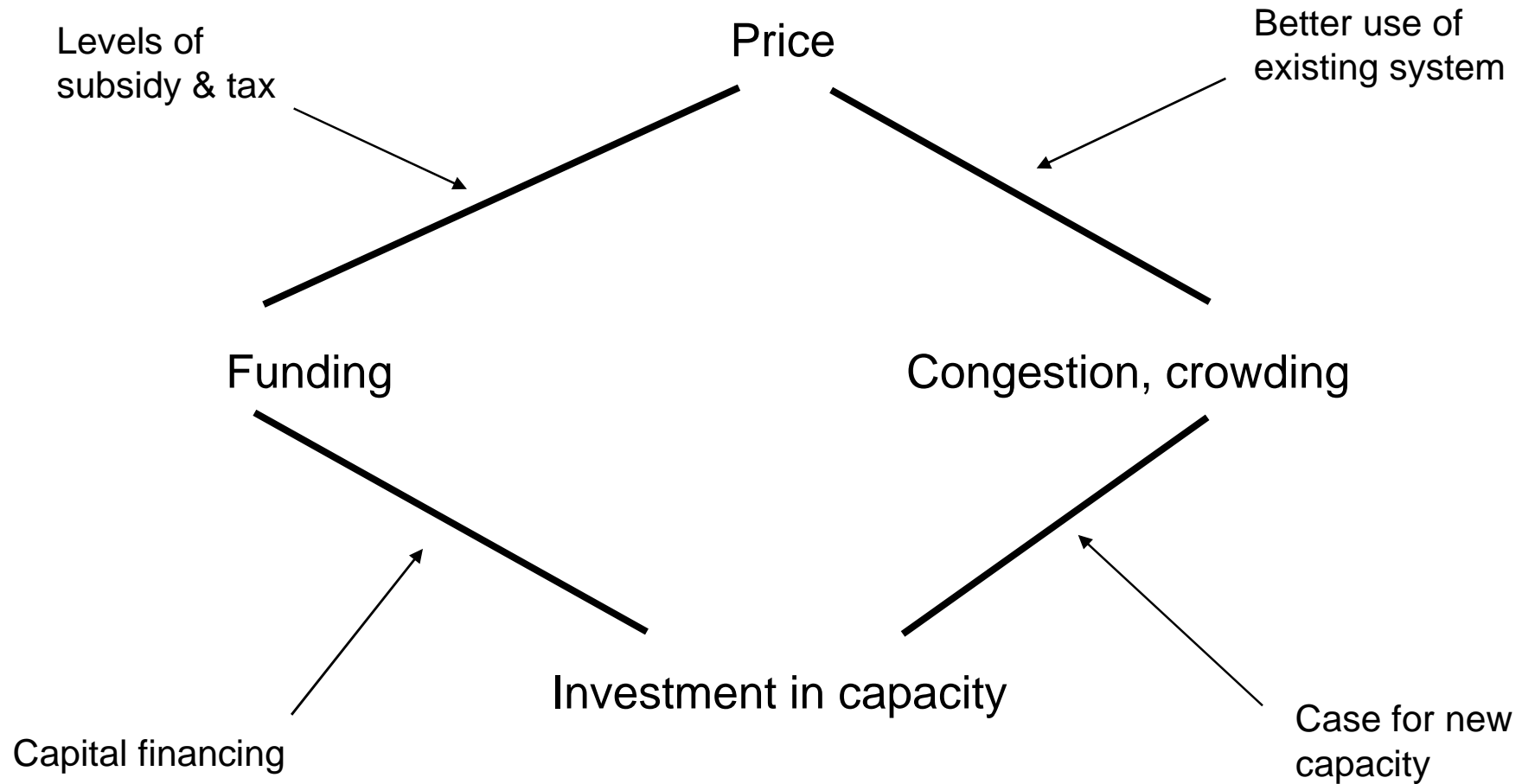
price,  
capacity and  
funding

are fundamentally interlinked.

You cannot decide one without the other two!

# Infrastructure policy: *Interlinked* issues

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# Population change in Great Britain 2001-21 and 2021-2041

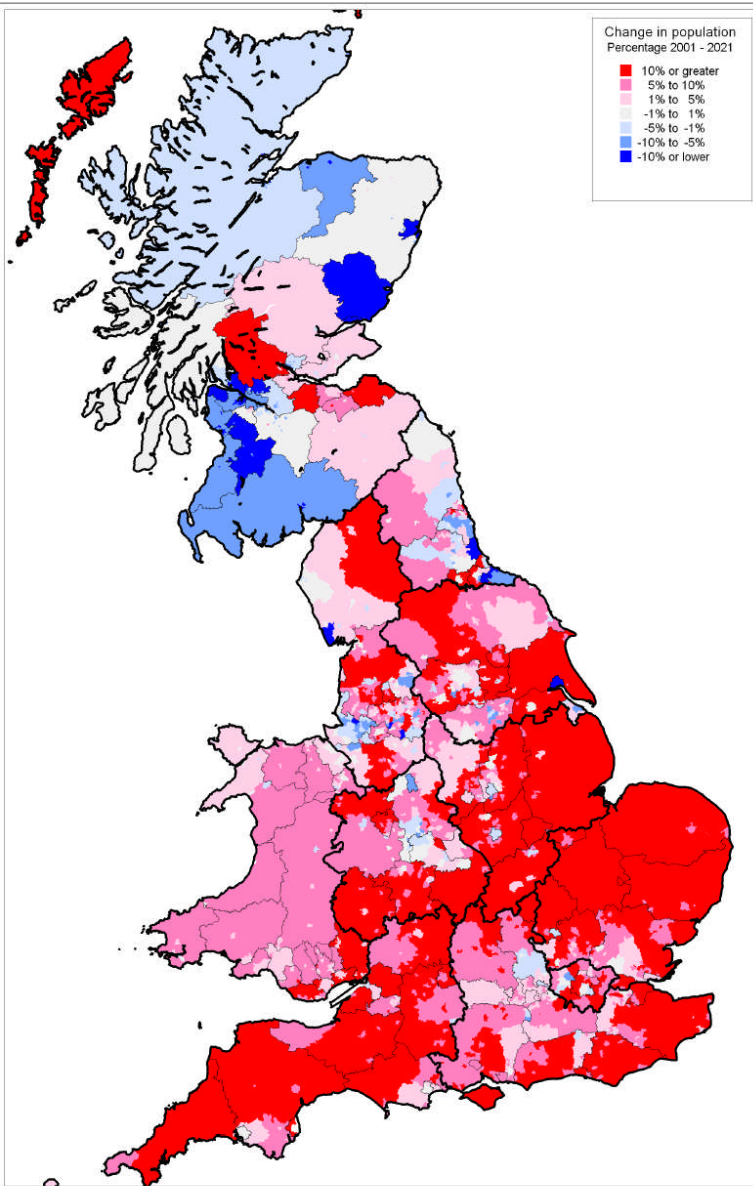


Figure 6.14 Percentage change in total household population 2001 to 2021

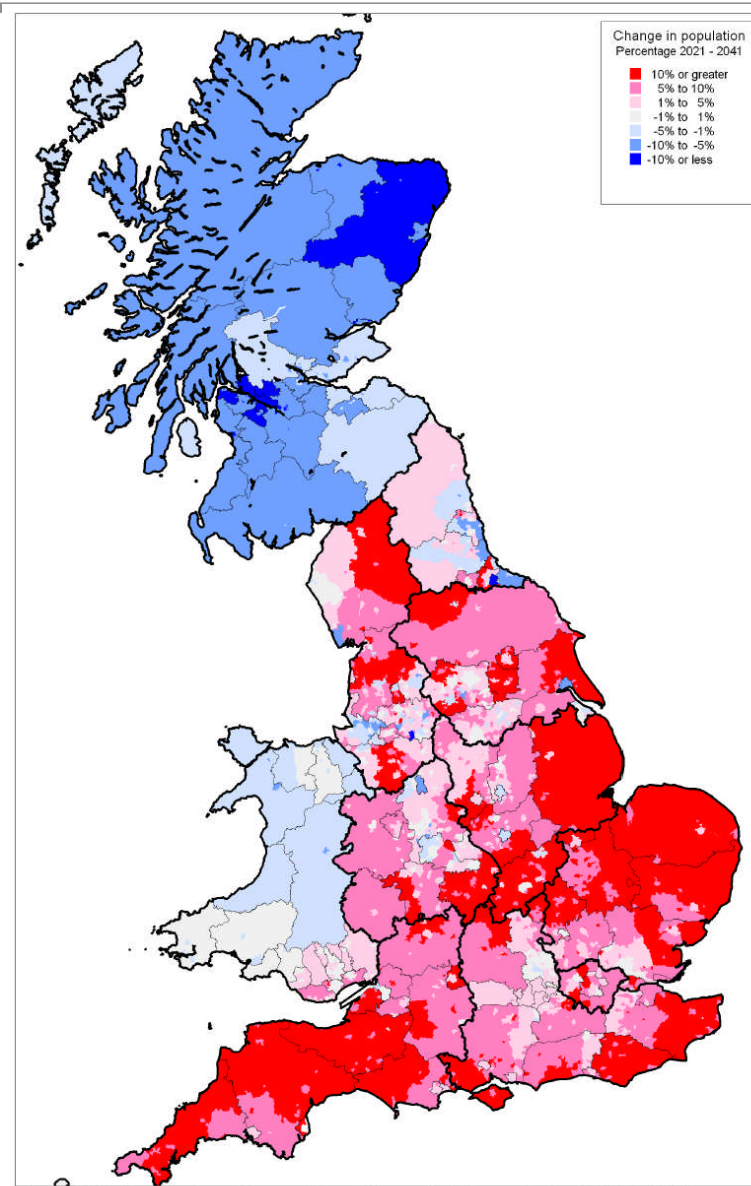


Figure 6.15 Percentage change in total household population 2021 to 2041

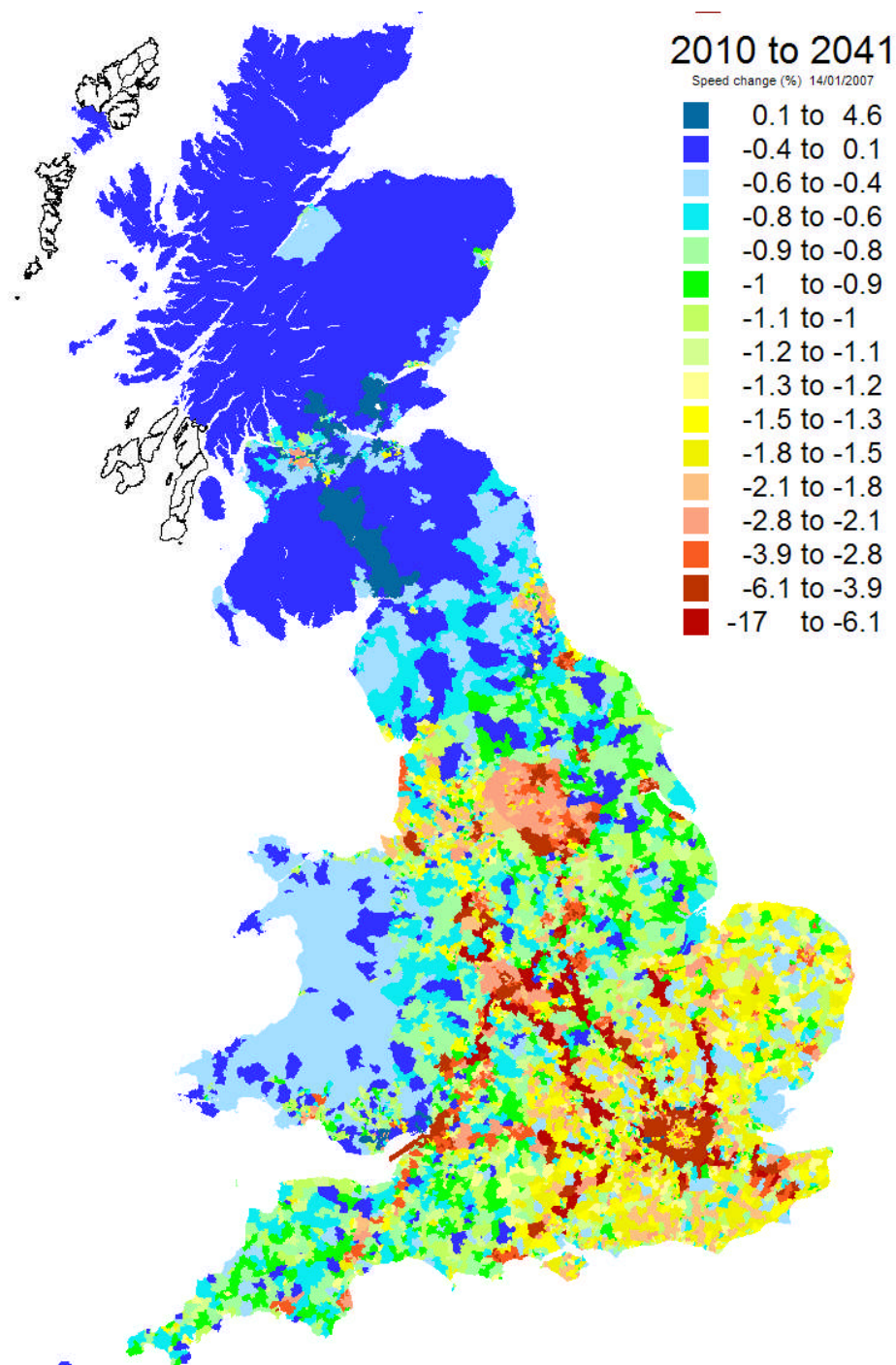
## Population growth and increasing real incomes will increase demand

### Average weekday growth in car trips and distance travelled 2003-41

Area	Car trips %	Vehicle Kilometres %
<b>GREAT BRITAIN</b>	26.4	39.7
Scotland	10.3	25.5
North East	18.2	33.3
North West	22.5	36.4
Yorkshire & Humber	27.9	44.3
West Midlands	23.5	35.5
East Midlands	29.4	43.8
East	31.8	48.4
London	35.2	40.7
South East	27.9	40.0
South West	31.4	47.4
Wales	20.9	34.7

	% increase 2005-41
Car trips	24
Car traffic	37
Van traffic	73
HGV traffic	27
Articulated vehicles	66

Source: trips TEMPRO V5 database, vkm Arup



**Consequences for  
AVERAGE speeds of  
adding this traffic  
growth to existing  
network**

**At peak times it will be  
much worse than the  
average**

## Definition of road pricing

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Charges per vehicle kilometre

that vary by time and place to reflect

Congestion

AND

Environmental damages

Noise

Additional accident hazard

Local air pollution

Global emissions

(Global emissions are best addressed by simple fuel duty)

## Road pricing – the new way to manage demand?

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Road pricing is an old idea: “polluter pays”

It has been working in Singapore for many years

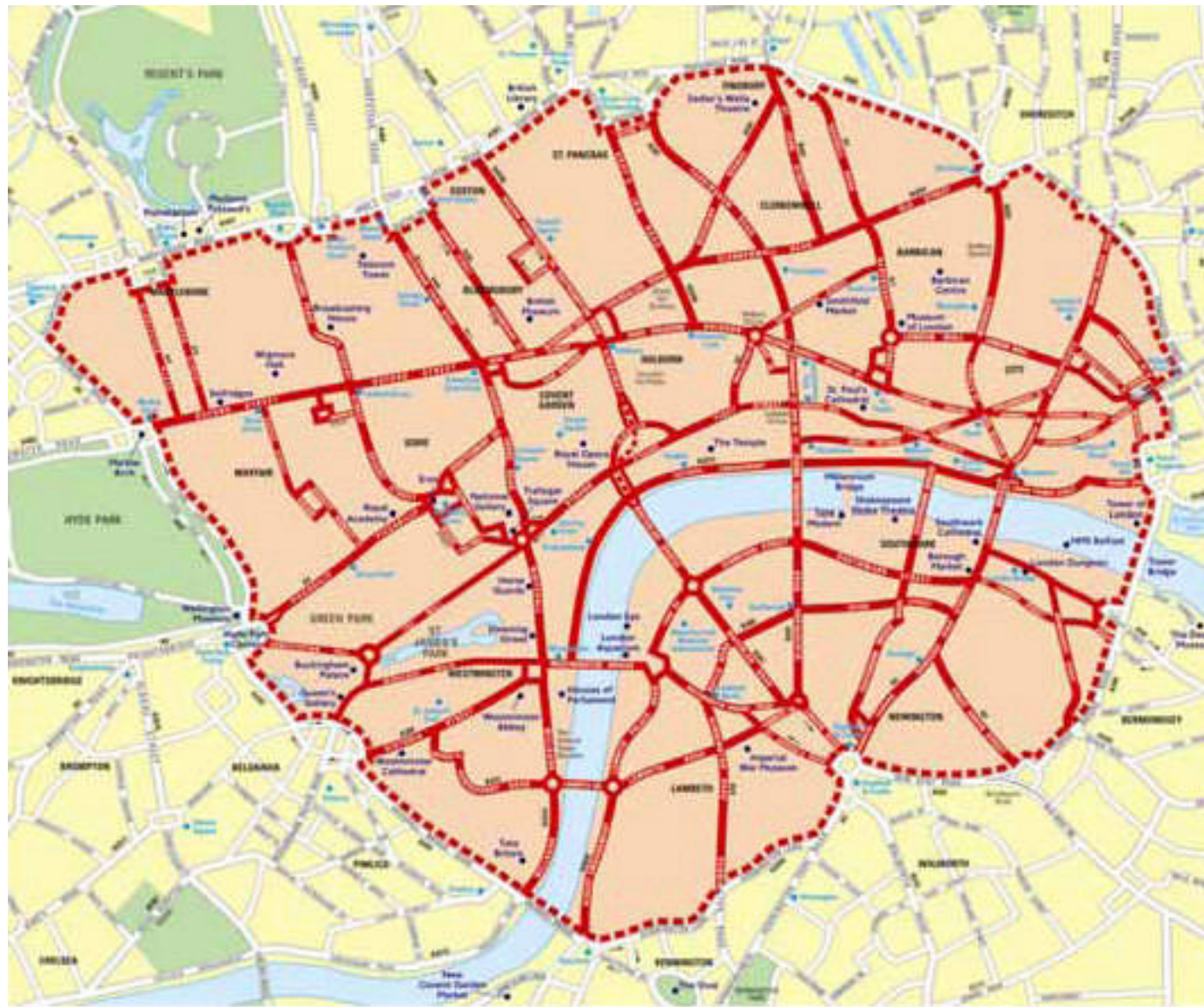
Introduced in London in 2003

It works!

BUT

Is it a good way to deal with the national problem?

# Central London Congestion Charging



# But Congestion Charge area is a *tiny* part of London

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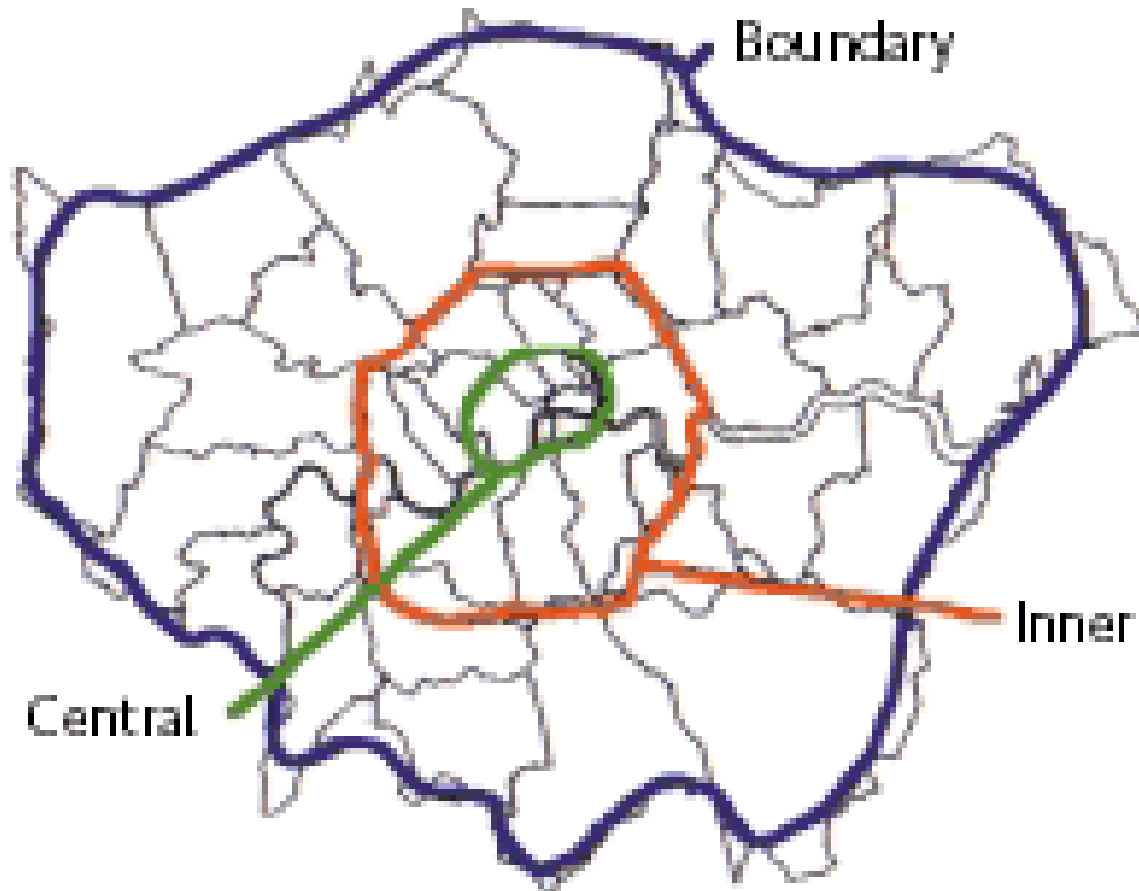


Figure 2.1

Traffic entering the central London charging zone during charging hours (07.00-18.30).

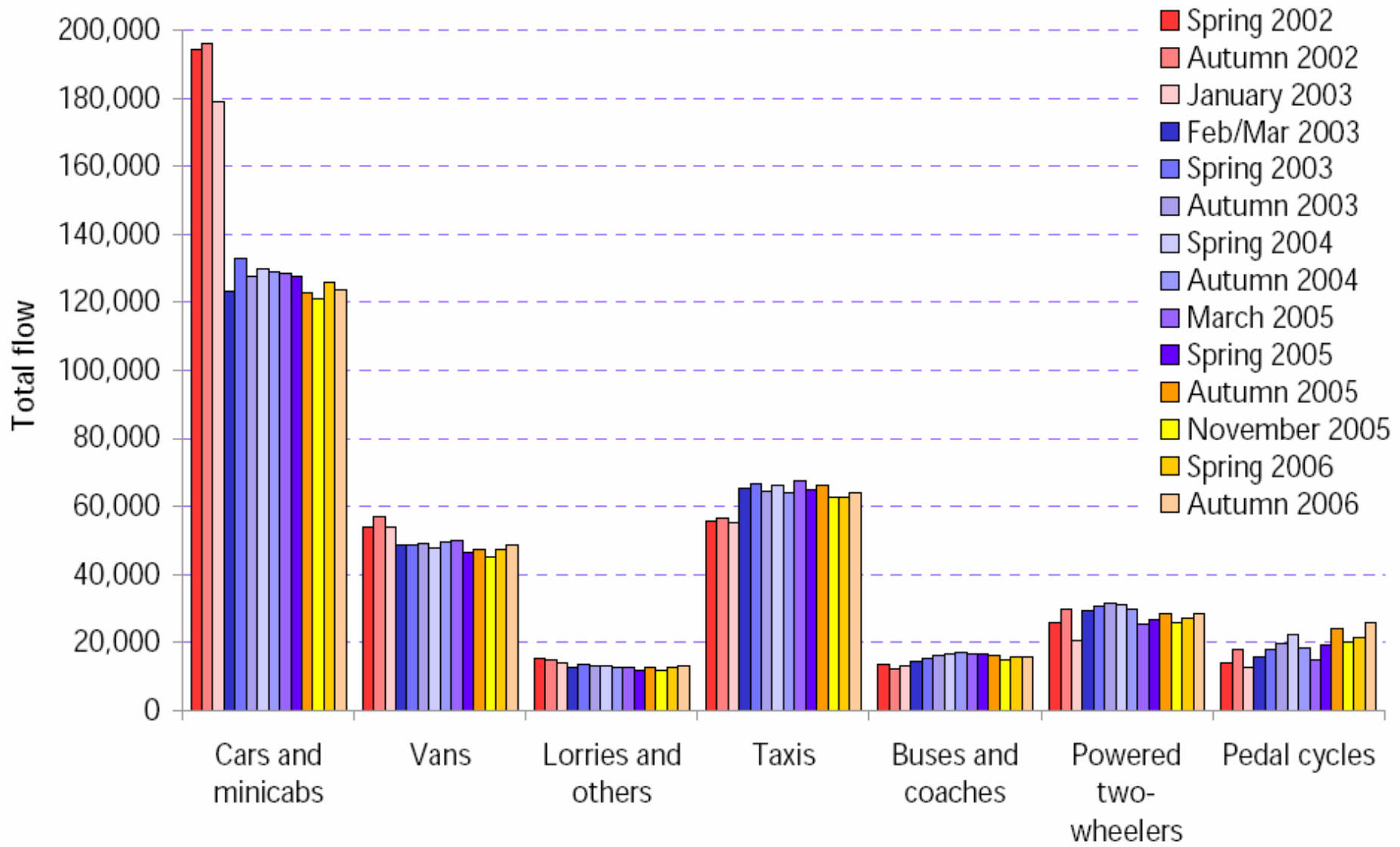
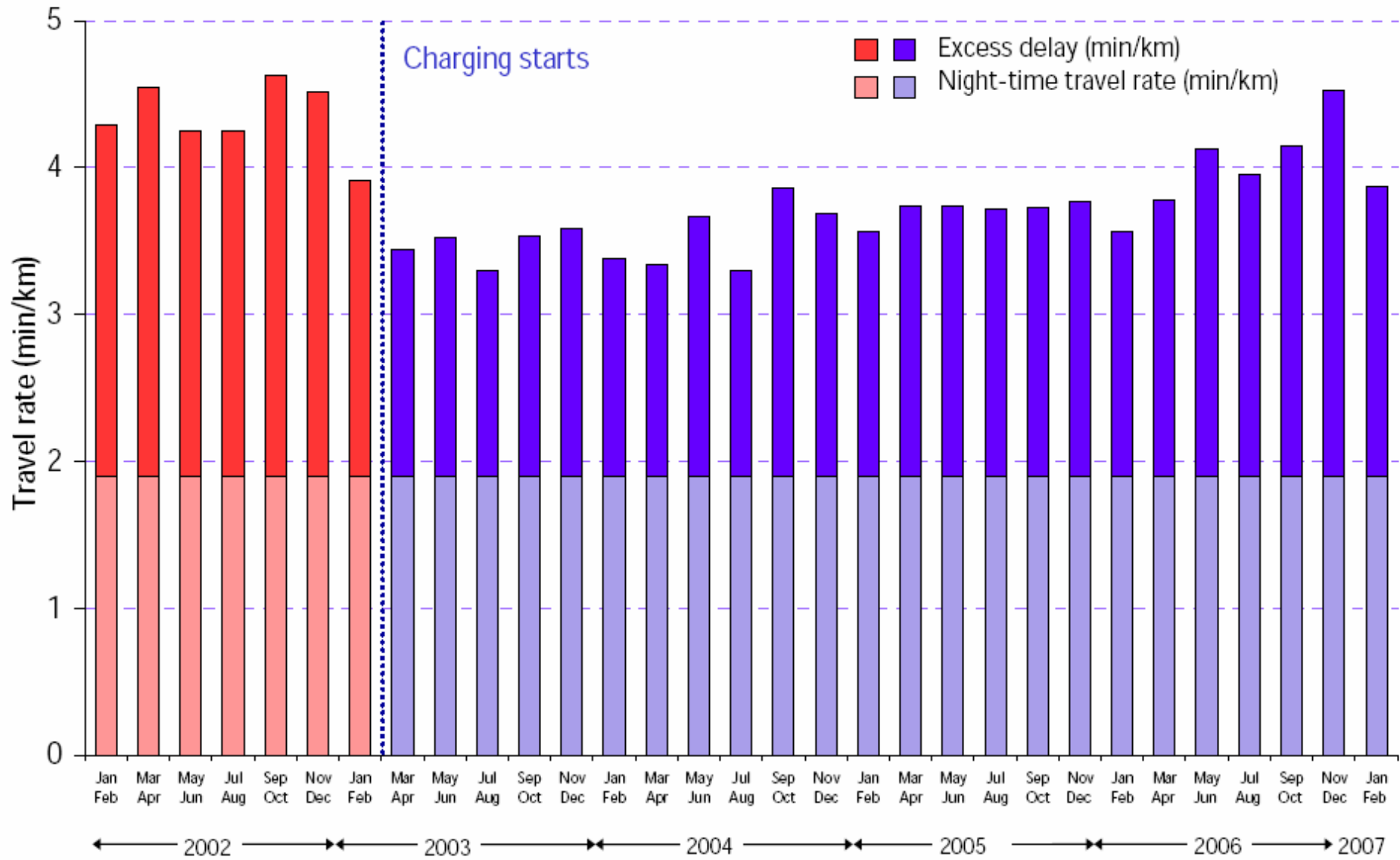


Figure 3.1

Congestion in the central London congestion charging zone during charging hours (07.00-18.30). Moving car observer surveys.



## The UK Government seems to be serious about National Road Pricing...

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### **BUT**

Few people understand it

The various policy options have not been explained

The public cannot yet form an informed view  
(but they oppose it!)

**What are the issues to be resolved and then explained?**

## Issue 1: Objectives?

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- Congestion relief?
- National productivity?
- International competitiveness?
- Personal welfare?
- Carbon emissions?
- Air pollution?
- Raising money?
- Relief of poverty, deprivation, social exclusion?

Clarity and simplicity are essential and you cannot expect to do too much

## **Issue 2: What exemptions or concessions?**

1. Residents?
2. The disabled?
3. The elderly?
4. Police and emergency services?
5. “Essential service workers”?
6. Utilities’ vehicles?
7. The unemployed?
8. Motor Cycles?
9. Public transport vehicles?
10. Commercial vehicles?
11. Taxis?
12. Alternative fuel vehicles?

### **Issue 3: How much will it cost to implement and operate?**

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Unless costs are strictly limited they will obliterate the benefits

**Technology is not the problem – but high costs would ruin the policy**

## Issue 4: Who gets the revenues?

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In 2041 conditions £50 billion a year could be at stake!

1. Reduce fuel duty and/or tax disc (tax revenue neutrality)?
  2. Improve public transport alternatives?
  3. Improve road maintenance and road capacity?
  4. Defray the investment and operating costs of the pricing system?
  5. Other local or national public expenditure purposes?
- } complimentary measures

## Revenue neutrality causes problems

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Money would be taken from urban areas and given to rural areas

There is no new money for “complementary measures”

- better public transport
- better road maintenance
- more road capacity

Public would only accept RP if revenues are kept for local use?

## Issue 5: New road capacity?

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Clarity on a coherent future strategy for roads is crucial

(the UK does not have one)

## New road capacity?

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There is a very strong case for some new roads without road pricing

Would National Road Pricing demolish the case for new roads?

NO!

It might reduce it but not remove it

With proper road pricing you have proper investment signals

In some cases there is enough benefit to justify tunnelling – and enough revenue to pay for it

## Pricing and funding infrastructure

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The efficient pricing rules are all of the form

$$\text{Price} = \text{Marginal [social] Cost}$$

if price is above *marginal* cost this is a signal that capacity should be increased in the public interest.

If there are Constant Returns to Scale

then Marginal Cost and Average Cost are the same.

So, with CRS at the optimum

$$\text{Price} = \text{Average Cost} \quad \text{Or} \quad \text{Revenue} = \text{Cost}$$

So the enterprise should break even; profit = 0

## When road prices and capacity are fully optimised:

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Total charge revenue net of total environmental costs =

$$\gamma_c \times \text{total private costs} + \gamma_k \times \text{cost of capacity}$$

Here  $\gamma_c$  is the degree of homogeneity of the personal costs

And  $\gamma_k$  is the degree of homogeneity of the capacity cost

If  $\gamma_c = 0$  and  $\gamma_k = 1$  then

**the optimal road network would break even**

## Ratio of revenues to costs and km. of road, by road type and Region. Revenue neutral, net of environmental cost (2010)

South E		Ratio revenue:cost						Kilometres of road								
		M Way	Trunk D & S	Principal D & S	B rds	C & Unclass.	M Way	Trunk D & S	Principal D & S	B rds	C & Unclass.	Total				
Area	Central Lon													0		
	Inner Lon													0		
	Outer Lon													0		
	Inner Conurb													0		
	Outer Conurb													0		
	>250k				18.5	2.1					32	213	361	2,190	2,795	
	>100k				7.5	4.0	-0.3				22	130	312	1,329	1,792	
	>25k				1.3	-0.7	-0.3				143	1,059	1,691	8,628	11,520	
	>10k				13.9	-0.3	-0.3				20	255	444	1,318	2,037	
			Trunk Dual A	Principal Dual A	Trunk Single A	Principal Single A	B rds	C & Unclass.		Trunk Single A	Principal Single A	B rds	C & Unclass.			
Rural	-11.5	-7.5	-4.3	-1.7	-0.7	-0.6	-0.2		655	388	238	253	2,333	2,259	22,841	28,966
									655	388	238	470	3,989	5,066	36,305	47,110

Source: Archer and Glaister, Independent Transport Commission, 27 November 2006

## Ratio of revenues to costs and km. of road, by road type and Region. Revenue neutral, net of environmental cost (2010)

Scotland		Ratio revenue:cost						Kilometres of road									
		M Way	Trunk D & S		Principal D & S		B rds	C & Unclass.	M Way	Trunk D & S		Principal D & S		B rds	C & Unclass.	Total	
Area	Central Lon															0	
	Inner Lon															0	
	Outer Lon															0	
	Inner Conurb	-9.3					0.1	-0.1	43			146	110	2,465	2,764		
	Outer Conurb	-5.9					7.5	-1.1	-0.2	-0.1	71		65	344	741	2,812	4,033
	>250k						29.7	1.2	-0.3	-0.2			12	97	132	898	1,139
	>100k						-0.6	-0.3	-0.4	-0.1			37	68	147	572	824
	>25k						-0.1	-0.5	-0.4	-0.1			60	196	437	1,798	2,490
	>10k						-0.7	-0.7	-0.2	-0.1			49	169	162	1,009	1,390
	Rural																
		M Way	Trunk Dual A	Principal Dual A	Trunk Single A	Principal Single A	B rds	C & Unclass.	M Way	Trunk Dual A	Principal Dual A	Trunk Single A	Principal Single A	B rds	C & Unclass.		
		-4.7	-5.0	-5.9	-1.2	-0.4	-0.2	-0.1	272	305	42	2,285	6,419	6,487	30,757	46,566	
									<b>386</b>	<b>305</b>	<b>42</b>	<b>2,508</b>	<b>7,440</b>	<b>8,216</b>	<b>40,310</b>	<b>59,207</b>	

Source: Archer and Glaister, Independent Transport Commission, 27 November 2006

## Issue 6: “is it “fair”?”

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It's NOT obvious

It's difficult to analyse

You cannot start an analysis until government decides

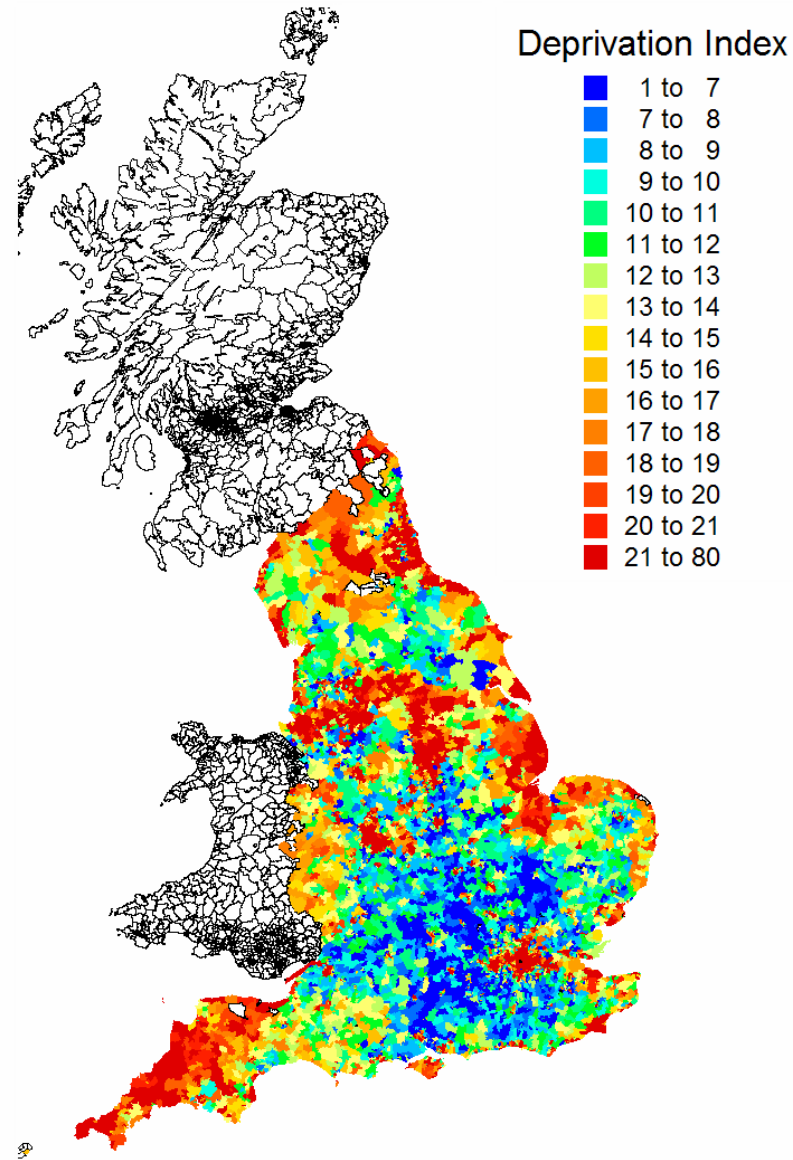
Discounts and exemptions?

Who gets the revenues?

What's the investment strategy?

You need to know the whole package.

## Map of deprivation in England (at census ward level)



## Issue 7: carbon emissions & the environment

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Current duty on petrol (above normal VAT) is £0.47 +VAT per litre

Stern's \$85/tonne of CO<sub>2</sub> would imply duty of £0.14 per litre

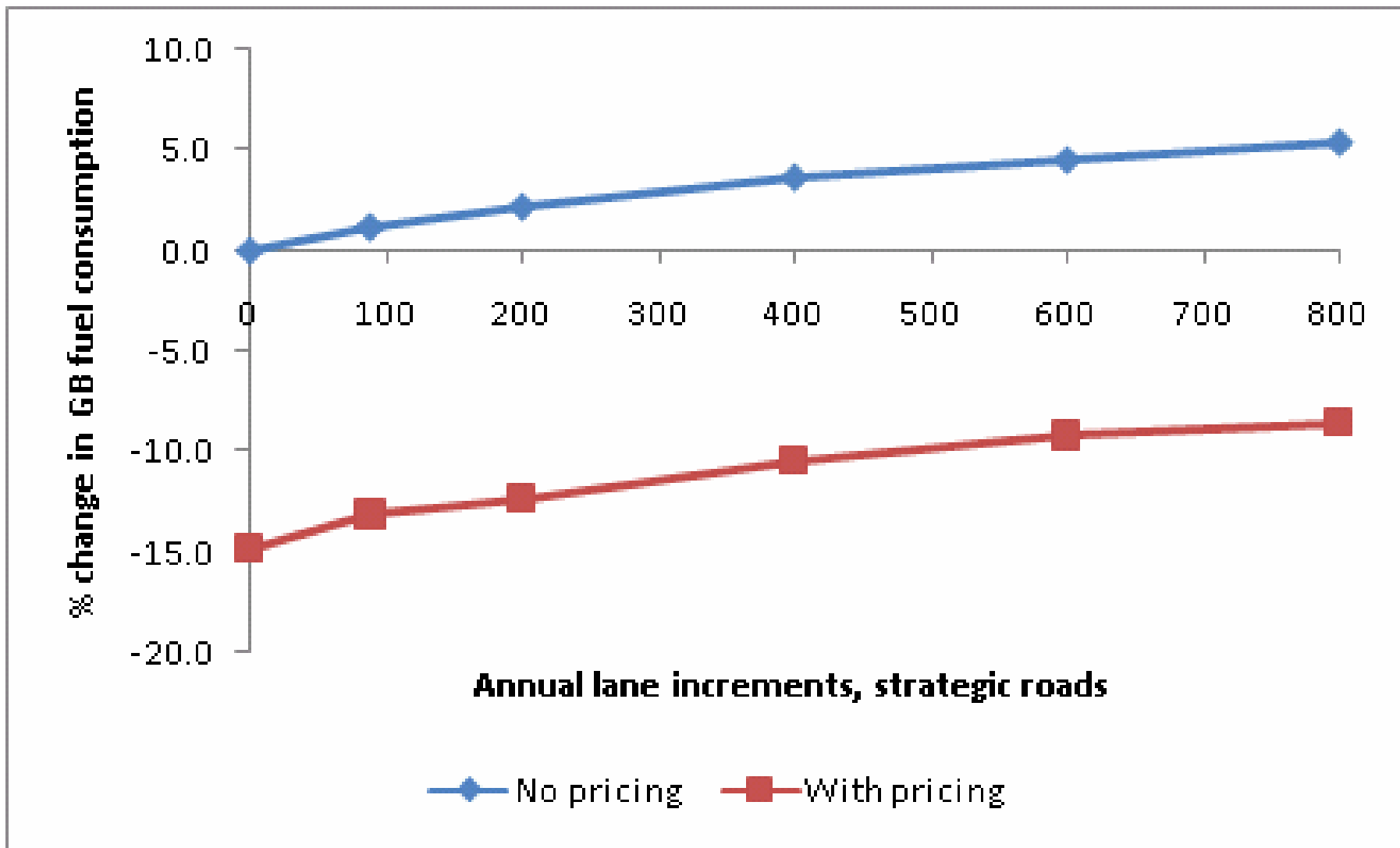
**Rational pricing of carbon is not going to remove need for new road capacity in the right places.**

Building new road capacity does allow more traffic

But...

.... It does not cause a big increase in carbon emissions

## Changes in GB fuel consumption (%), pricing and strategic road capacity increases (annual lane km), 2041



Source: Banks, Bayliss and Glaister, RAC Foundation (forthcoming)

## Issue 8: Trust and Governance

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Which body would

set the charges?

collect the revenues?

make investment decisions?

carry the risks on those decisions?

Governance of the funds. Credibility is essential on:

Prudence and efficiency

Accountability

Transparency

Nb. London CC “works” only because these issues are resolved

## Ownership and control?

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? Create new bodies to “own” and “regulate” local roads?

Public Trusts?

Regulated, privatised utilities?

? What appropriate procurement and financing arrangements?

PPP/PFI?

Conventional public sector?

Open market provision?

## Issue 9: Who will take the lead?

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Many national and local government departments involved:

Transport, Treasury, Legal, Communications, Environment, Regions....

Successful delivery will require

- clarity on objectives

- clarity on the money

- commitment to some new road capacity

- and strong national leadership

  - willing to take the political risk and

  - with the ability to EXPLAIN it to the public.

# Big issues to resolve for a practical policy

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1. What are the objectives?
2. Who will get reductions or exemptions?
3. Cost?
4. What happens to the revenues?
5. Implications for future road building strategy?
6. Is it Fair?
7. Carbon and the environment
8. Trust and Governance?
9. Will anyone take the lead?