

Beyond 'Predict and Provide'

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What is 'predict and provide'?

“Increasing car use is inevitable”, so

1. Forecast traffic growth
2. Calculate extra road space you need
3. Provide that road space
4. This will solve congestion

Build the Roads...



... and they will come



BUT



it did not



solve congestion



Unintended effects

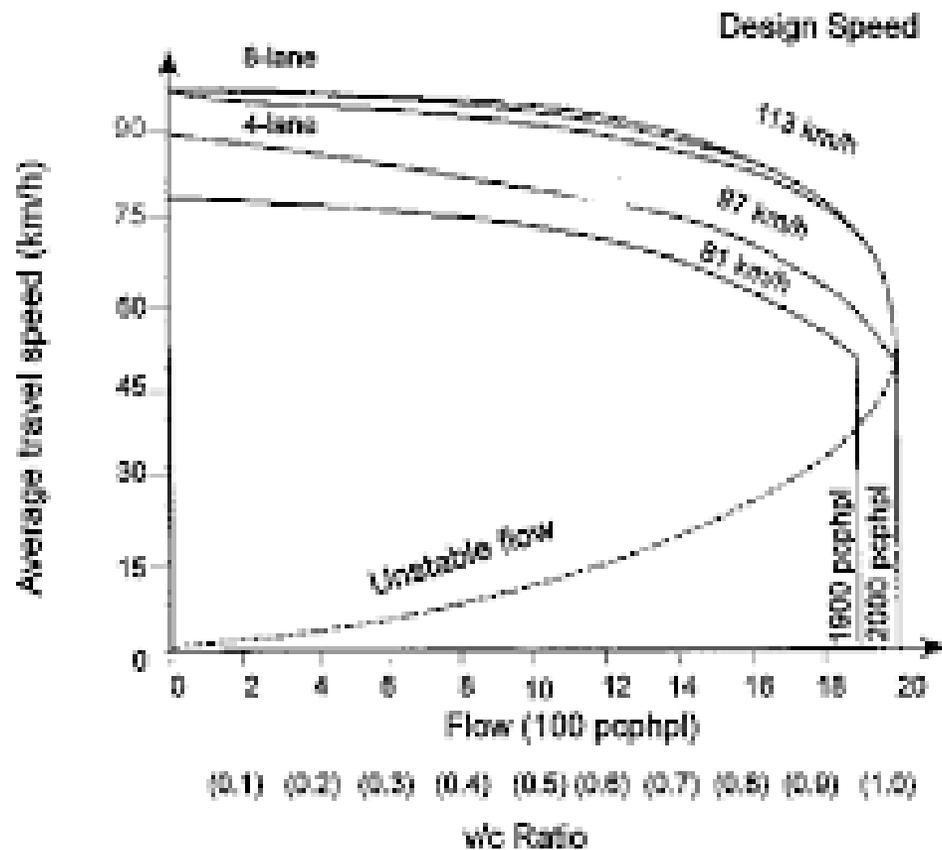
Urban Landscape changes

You create a car-dependent city where it becomes impossible to live without a car.

Unintended Effects – Air quality



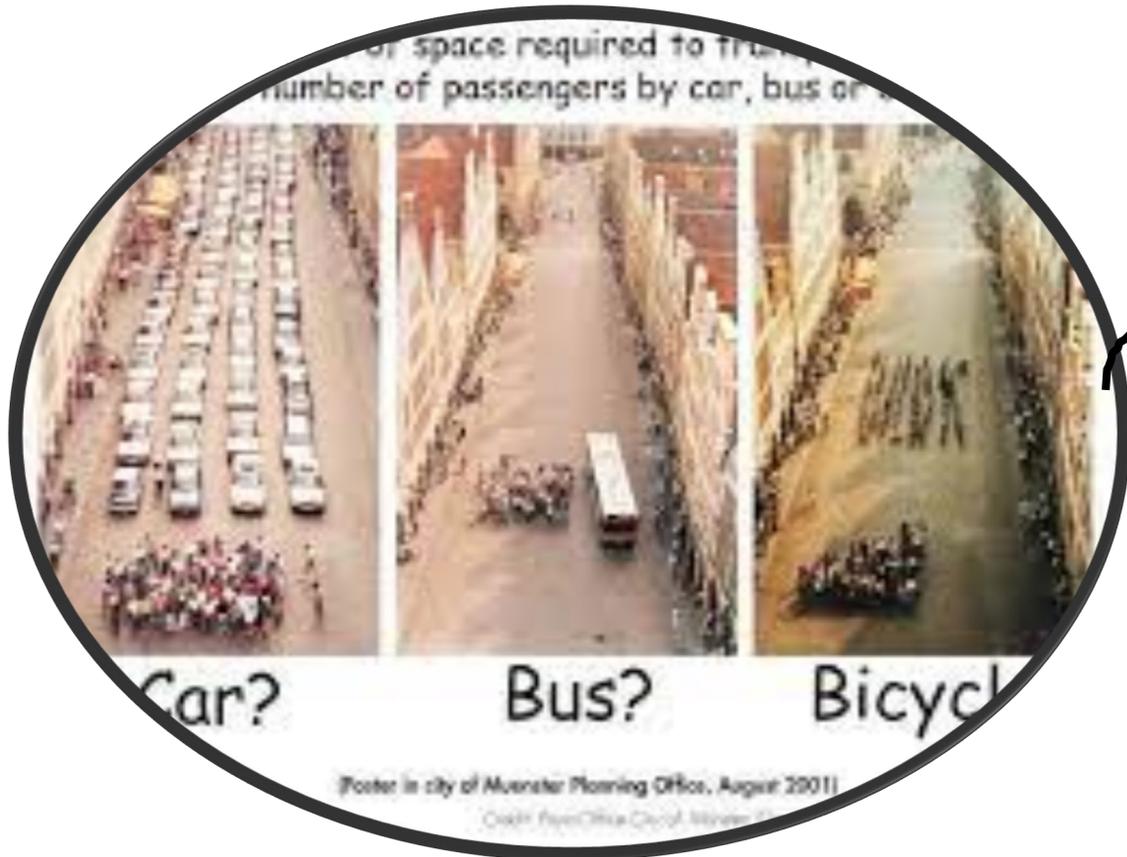
Traffic Flow Theory



The more traffic there is...
...The slower it goes
..until you reach capacity...
Then
It stops.

(It's **not** like water pressure in a pipe)

Road space required for car or public transport – better vision



used is

$$v^2 = 523 - \frac{4 \cdot 14 \left(\frac{N}{G}\right)^{\frac{1}{2}} \left[\frac{P}{c} + \frac{4 \cdot 8 (1-p)}{c'}\right]}{(1-\gamma-\gamma') J \cdot f \cdot T}$$

where v is traffic speed in the central area in mile/h
 N is number of car and bus commuters = 254 7507
 G is area of ground per commuter = 1 141
 p is proportion travelling by car (at present 0.457)
 c is car occupancy = 1.457
 c' is bus occupancy = 397
 γ is proportion of road taken by commercial vehicles = 0.3A^{1/6}
 γ' is proportion of road taken up by intra-central journeys = 0.24A^{1/8}
 J is efficiency of the road system = 0.466
 f is proportion of A used for roads = 0.146
 T is duration of peak period = 2 hours
 A is area of Central Area = 348m. sq ft⁸
 la assumes that the total number of bus an
 as constant.

Travel Faster by Travelling Slower???

**If 5% of travellers shift from bus to car,
speeds go down**

Car Users	lose	5.5 minutes
Bus users	lose	6.2 minutes
Overall average	lose	4.8 minutes

But the 5% of shifters gain 3.7 minutes

**If 5% of travellers shift from car to bus,
speeds go up**

Car Users	gain	4.3 minutes
Bus Users	gain	5.7 minutes
Overall average	gain	3.7 minutes

But the 5% of shifters lose 16.1 minutes

Induced Traffic

the traffic on an improved road network that would not have occurred if the network had not been improved

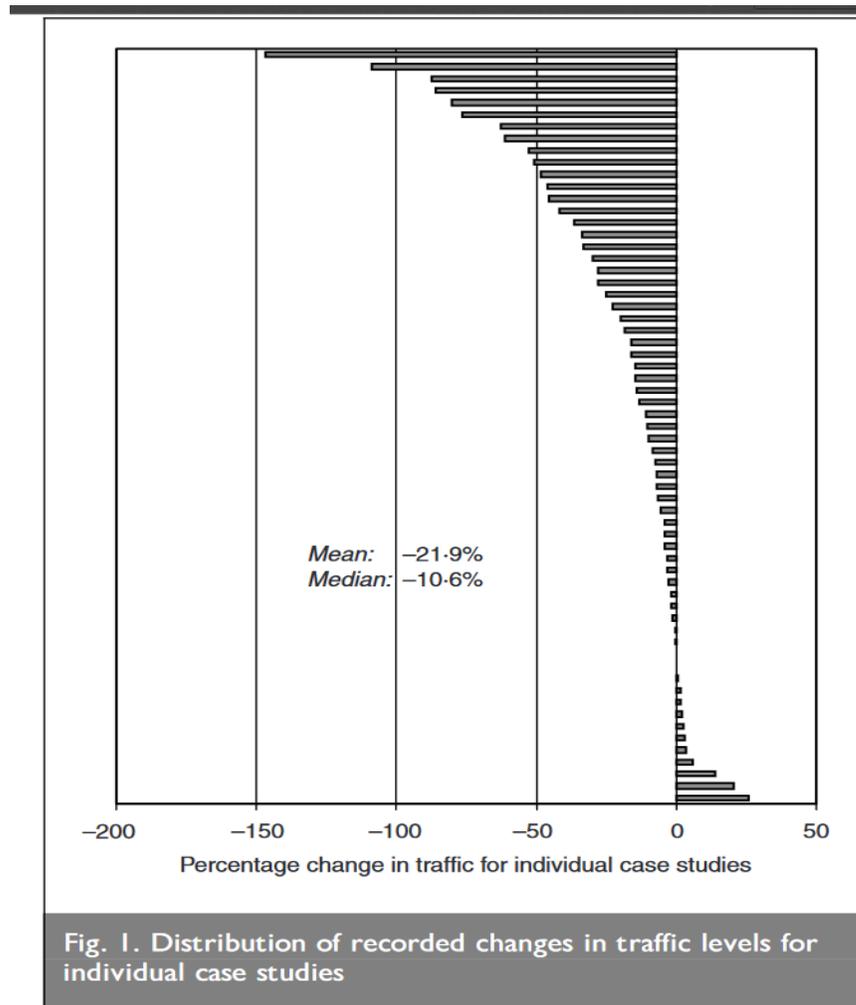
Behavior Changes

- **Car ownership**
- **Number of trips**
- **Origins and destinations**
- **Mode of transport**
- **Land use**
- **Car dependence**
- **Route and time**
- **...**

“an average road improvement has induced about 10% extra traffic in the short run, maybe 20% in long run”

(but very variable)

And reductions in traffic after reallocation of road capacity



- 'More than 100%' in big town centre pedestrian schemes
- *Increases* in traffic for 'bypass+pedestrian' schemes
- Generally, bigger schemes have greater reduction
- 2002 overall mean -21.9%, median -10.6%. (Less than 1998 because more small schemes included)

The forecasts were not always very good

UK

Government forecasts vs actual road traffic

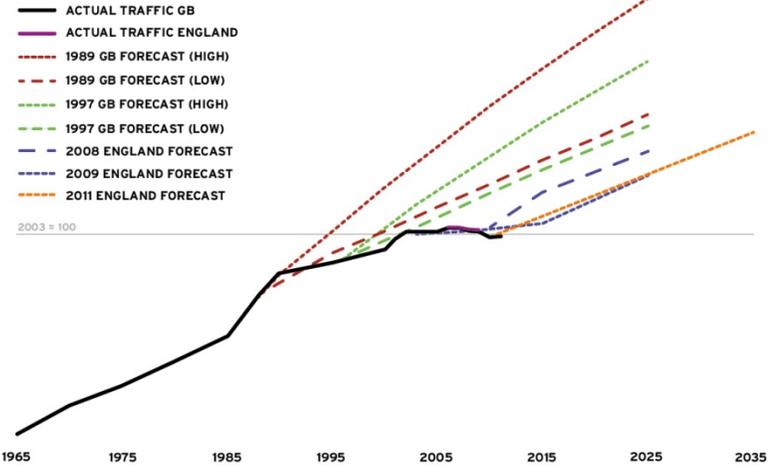
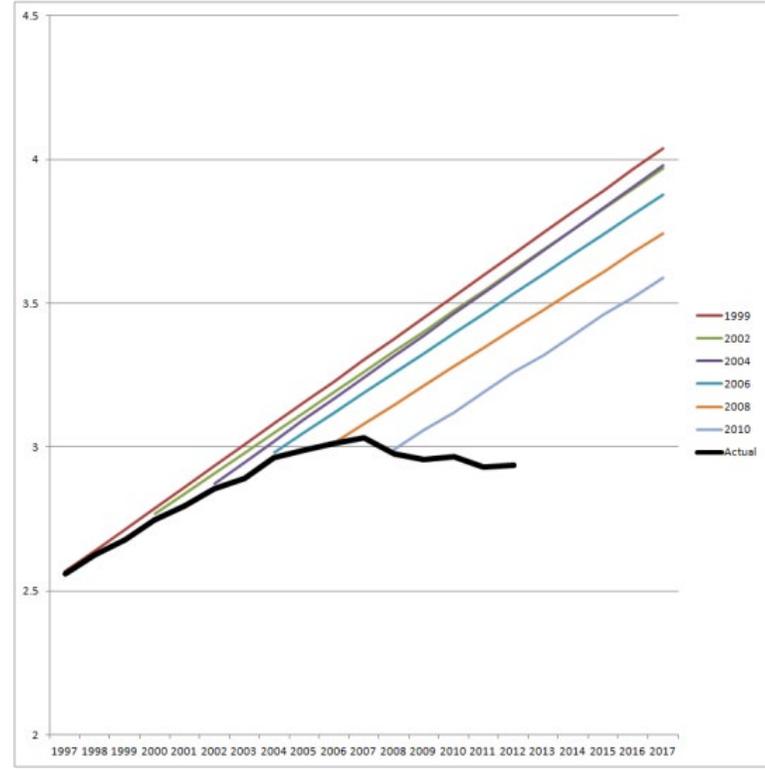


Chart first published in 'Due Diligence, Traffic Forecasts, and the Pension Infrastructure Programme' by Phil Goodwin, Local Transport Today, 13.4.2012
Source data calculated by Mitchell, Stokes, Goodwin, IAM Motoring Facts, from DfT original sources.

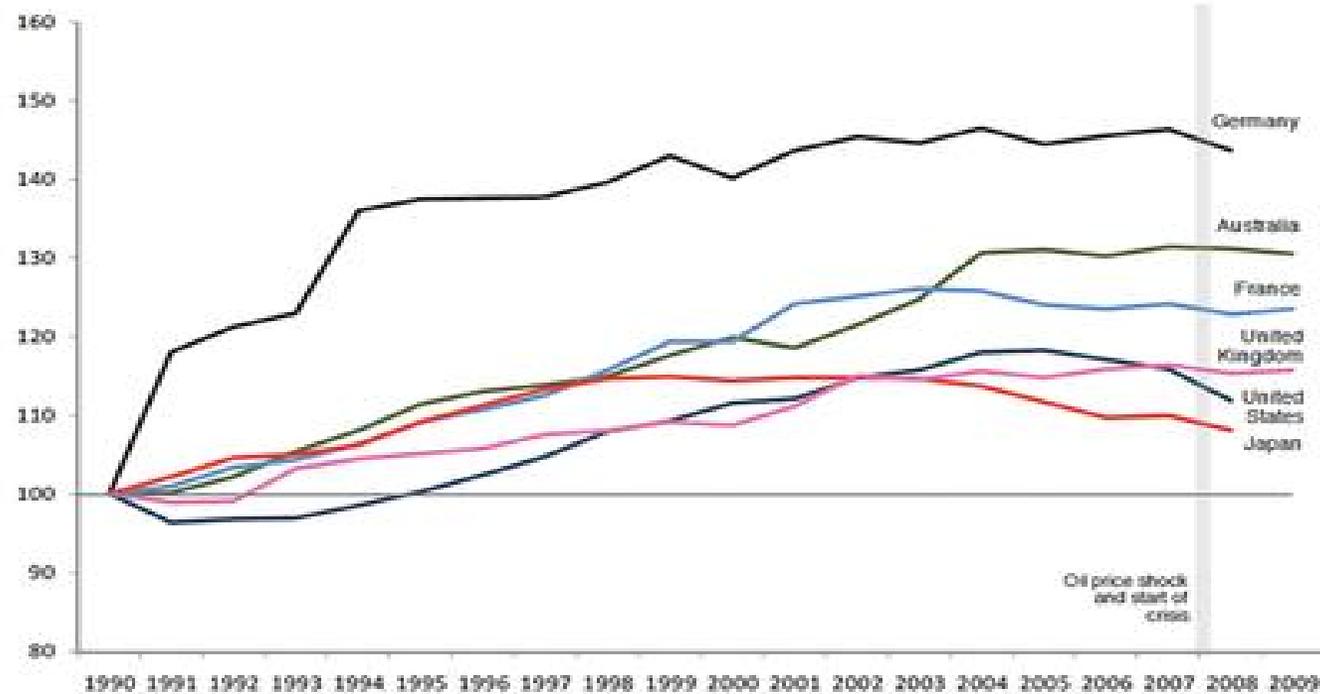
USA



2010-2016 international debate

Are we already reaching 'peak car'?

Passenger-kilometres by private car and light trucks, 1970 – 2009,
index (1990 = 100)



Source: International Transport Forum statistics.

Peak Car?

- Young people less propensity to drive than old – and each successive generation a bit less – and they did not ‘catch up’ as they got older
- Location effect – especially in big cities or compact small ones
- Relationship with income less

What if the forecasts are right?

If it is not possible to increase the overall capacity of an urban road network to match traffic growth:

***1. Traffic per kilometre of road* will increase, and congestion will get worse (in intensity, duration, or spread).**

2. Increased road capacity will not solve congestion, but reduce the pace at it gets worse.

3. Therefore Demand Management necessary, as well or instead.

Climate affects transport; transport affects climate

TWO Futures

1. Runaway Climate Change

Progressively more serious effects on climate, weather, sea levels, flooding, heat waves, mass population displacement, production chains, Greater incidence of 'Unpredicted' emergencies affecting Coasts, rivers, flood plains, Water drainage and sewage security, medical services, Food supply and distribution

Reduced standards of living and available income. This will transform economic geography, consequent travel patterns.

This is not a future of traffic growth

2. Successful Limits to Climate Change

- Deep reduction in fossil fuelled road traffic, Halt to policies and infrastructure which embed car dependence, Reinforce the advantages of active travel, and localism, Enabled by non-climate economic advantages of this approach – reduced congestion, better health:

Not necessarily reduce quality of life and effective incomes. This will transform economic geography, consequent travel patterns, This is not a future of traffic growth

What to do instead?

(more details in the paper and references)

Review the street space and urban land share allocated to cars

Use some combination of road space allocation, road pricing, and parking standards to manage traffic

Tackle the distortions: subsidies which things worse instead of making things better.

Ensure that high quality alternatives to private cars are convenient and efficient and well funded and have priority access.

Include integration of transport and land-use in land use and regulation.

A debate in Moscow, 1979

- In the West, two stages. First car use and public transport use increased. But then, car use and road space increased, and public transport declined, causing increasing congestion and other problems.
- 'Centrally planned economies need not have this 'second stage', because Government priority would be high quality affordable public transport systems'. This would protect against repeating the experience of the West.
- But maybe... not? The conflict between car use and public transport was not due to the social system in operation, but to the technical laws of traffic flow and the economics of individual choice.

Summary: 'Predict and Provide' *sounds* sensible but it is fundamentally flawed

It did not cure traffic congestion.

It damaged urban landscapes, car dependence and health.

It harmed the relationship between car use and public transport use.

It induced more traffic.

The high forecasts were wrong: but even when right, traffic reduction was more necessary, not less.

Climate change imposes traffic reduction and new priorities.

There are better alternative policies. Cities work better with less traffic, for economics, health, efficiency and welfare.