

Decoupling Traffic Growth from Economic Growth – Is this Plausible for the UK?

Context

The economic expansion of an economy (economic growth) is typically associated with a corresponding increase in traffic levels. In simple terms a larger economy creates increased activity resulting in greater demand for personal and business travel. A greater number of economically active people boost commuting and work-related travel and higher disposable incomes increase the amount of money that can be spent on transport. Since 1970-1995 the average number of kilometres travelled per person per year has increased from 6293 to 12,337, a 96% increase (Transport Statistics for Great Britain (TSGB)). Economic growth over the same period has totalled 72% (24% less than traffic) (DEFRA 2003). The UK has a broadly car based economy which emerged from post war planning policies, centred on the personal vehicle. Public transport, particularly when compared to our European rivals has suffered from chronic underinvestment. We have the third highest fares in Europe, least level of revenue support and lowest levels of investment in relation to GDP (gross domestic product). This combined with the fact that the relative cost of car ownership has fallen and public transport costs have risen above inflation has created a profusion of road traffic growth (Modal share for road is currently 85% by passenger transport DfT 2002). This has led to increasing concern in the UK that this relationship is unsustainable and therefore a level of decoupling has become desirable. The impacts of doing nothing include increasing levels of traffic congestion, environmental damage and the realisation that a road building programme will not solve the problem.

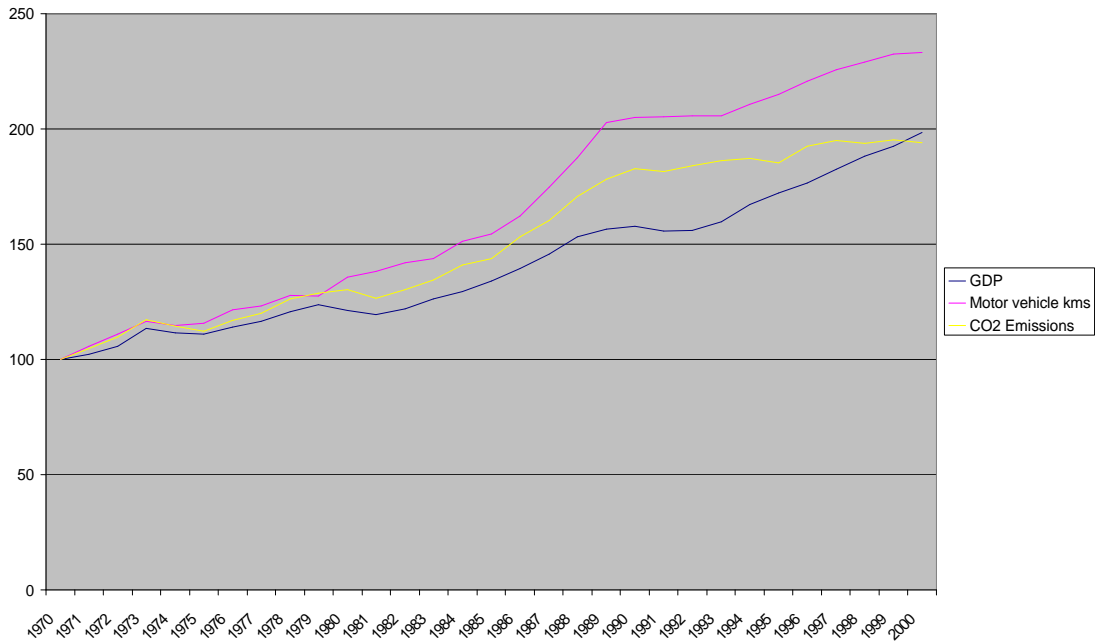
Introduction

When assessing the UK in context to other similarly industrialised countries Transport Intensity is an important indicator. Transport intensity can be defined as

“an aggregate measure of the resource importance of transport in the national economy, transport is therefore the ratio of gross mass movement to Gross Domestic Product (GDP)” (Standing Advisory Committee for Trunk Road Assessment (SACTRA) 1999)

In simple terms the amount of traffic the economy generates to achieve a nominal unit of GDP. As the transport intensity of an economy increases it becomes less efficient. The transport intensity of the UK is increasing. This is highlighted by the difference of 24% between traffic growth and economic growth 1970-1995. The diagram below displays the increasing intensity of the UK economy through a comparison of motor vehicle kilometres, GDP and CO2 emissions.

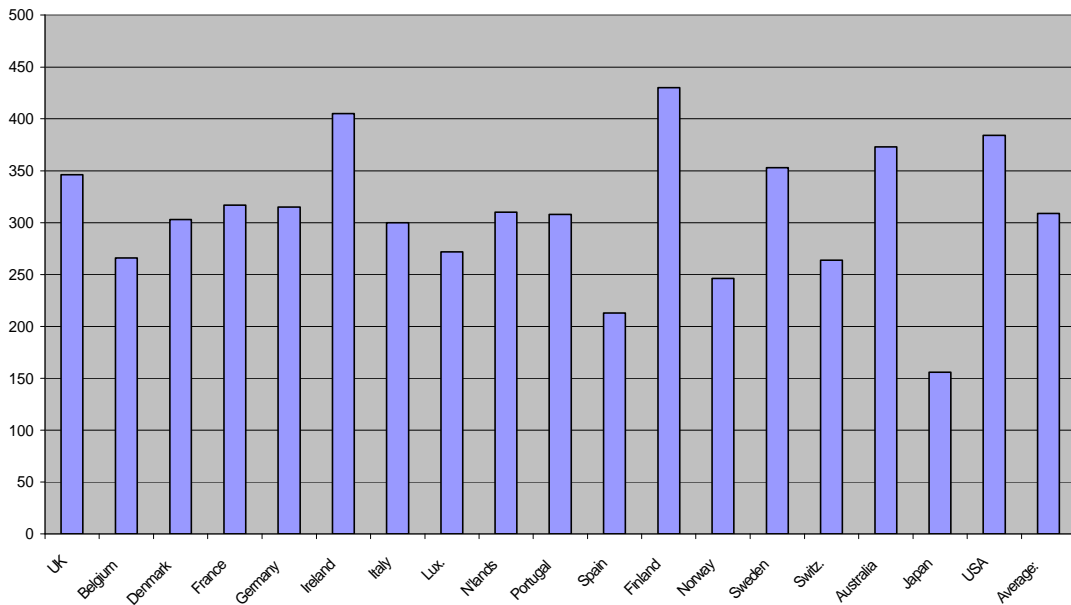
A comparison of GDP, Motor Vehicle Kilometres and CO2 Emissions Growth 1970-2000



Source: Department for Transport (DfT) 1970=100

The UK when compared to other similarly industrialised countries is part of an overall mixed picture. The diagram below details the variation of transport intensity across a number of similar industrialised nations taken as a measure of car traffic kilometres per 1000 USD (\$000) of GDP.

Car traffic km per \$000 of GDP



Source: (Transport Statistics Great Britain 1997(TSGB))

This shows that transport intensity varies between countries. The UK has a relatively high level, implying an inefficient use of transport as a resource. Influences on travel demand and therefore transport intensity are varied though are typically summarised as the following:

- natural features i.e. geography
- environmental factors i.e. land use
- social and demographic features i.e. the household size and structure
- transport opportunities i.e. infrastructure
- changing consumer preferences

A country such as Canada is likely to create a greater level of travel demand through, for example lower levels of population density than the UK. A further summarisation below reflects the fundamental reasons for why and by what means we travel.

- **external factors** i.e. geography, spatial and social factors
- **income**
- transport **policy instruments** which affect price, speed and quality of travel

Within the discussion section the three summary points above are referenced providing an indication to the reader their importance when assessing means to decouple.

Within society traffic levels are infringing upon our quality of life e.g. through air pollution and traffic noise. It has been argued by certain commentators that if we can technically solve these problems i.e. transfer to non polluting battery cars, concerns over road traffic growth would be less important. However, it is not as simple as that, therefore a more holistic approach to consumption and its relative effects on natural resources could offer an alternative solution. The European Union (EU) states that:

“economic growth, social cohesion and environmental protection should all go hand in hand”

In clarification the EU believes economic and social development should be decoupled from environmental degradation and resource consumption. It could be argued for example that decoupling economic growth from carbon dioxide emissions could be just as relevant a question to examine. Today's society continues to suffer its greatest impact through road traffic (25% of total CO₂ emissions come from road transport Energy Savings Trust). Road traffic therefore remains a poignant proxy for many of the negative outcomes of consumption created within our society today reinforcing the rationale to decouple.

Potential to Decouple Discussion

i. Road Pricing (*policy instruments, income*)

Road pricing can be defined as the charging for part or all of a road network. Currently within the UK we pay a one off charge through Vehicle Excise Duty (VED). VED is adjusted for the type of vehicle owned by the individual. In absolute terms we pay for the road network in terms of ownership and not use. A consensus of opinion exists which highlights road user prices do not reflect costs. Road users are able to operate externally to costs including environmental damage, congestion, noise and accidents. It is argued a situation has arisen where a “*market failure*” has occurred. In effect unnaturally high or rampant demand has been created through the lack of true market prices. Internalisation to the user would almost certainly reduce traffic levels. This could be achieved by charging for use of the road network, principally a transfer from ownership to use. It is to be assumed that road pricing would come in the form of a wider area form of charging encompassing the whole UK network. The Standing Advisory Committee on Trunk Road Assessment (SACTRA, 1999) has at length studied the implications of road user charging on the economy. It concluded that little empirical evidence exists surrounding the effects on the economy. What is stated though is the case for internalising costs and the benefits likely to be accrued such as improved journey times, beneficial to business. Empirical analysis of wider area charging points to a reduction of 35% on inner conurbation/suburban levels of congestion with a similar fall on motorways

(Oscar Faber/NERA 2002). Charging is likely to require a cost benefit analysis of above 1.0 to be politically acceptable.

The practicalities of road user charging can be examined in example of the London congestion charge. The following key indicators have been observed:

- 60,000 less vehicles enter the charging zone (a 16% reduction) on a daily basis of which 15-25% have switched to non car modes
 - Journey times have decreased by an average 14% while journey time reliability has improved by an average 30%
- (Source Transport for London (TfL) 2003)

TfL estimate that reduced congestion is worth approximately £180 million pounds a year to the London economy. The first year is on course to generate revenue of £68 million set to increase to £80-100 million in future years. This revenue is in part being used to improve public transport.

Given the lack of road user pricing examples in the UK it is useful to look at the economic consequences of traffic reduction measures elsewhere. The Oxford transport strategy was initiated in 1991 to reduce car trips and encourage modal shift to non car modes such as walking and cycling. This was done through a package of measures including increasing road priority to public transport, improving park and ride facilities as well as upgrading cycling and walking infrastructure. The response has been a drop in car based trips from a 54% modal share in 1991 to 39% in 2000. Public Transport Patronage has increased from 27% (modal share) in 1991 to 44% in 2000. In terms of the economy the initial fears have remained unfounded. The number of visitors to the city has remained high and retail occupancy rates have remained close to 99%.

A scheme for wider area charging would require significant investment in technical resources to make it possible. Principally illustrated through the London congestion charge, the ability to track, monitor and fine non complying vehicles requires a great deal of technical application. Likely reliance on satellite navigation has accompanying issues of personal privacy. The definition and establishing of external costs and optimal charging levels are likely to offer significant obstacles. It has been stated by SACTRA that the perfect quantifying of external costs is not possible to achieve. Concern also exists regarding the economic affect on peripheral areas of the UK or low income groups. Finally government determination is required to overcome the infringement of personal mobility and the basic human right to free travel which are likely to be lauded in certain quarters true or not.

ii. Land Use Policies (*policy instruments, external factors*)

It is felt by a number of commentators that through better planning we can reduce our reliance on road vehicles. In the simplest case if we all could live closer to our work, walk instead of drive reducing the number of trips made by car. The concept of 'urban sprawl', a case in point being Phoenix, Arizona with a land size comparable to Los Angeles but with a population one third of the size would be the exact opposite of what we wish to achieve. Through such low land densities it becomes difficult to create a business case for public transport and the use of car becomes all encompassing.

It has been recognised that the need to integrate transport within a coherent planning strategy offering potential benefits as increased walking, cycling and a better model in which to make public transport economically viable. This would typically be done through both increases in land densities and a diversification of uses. Within the UK this is now reflected in *PPG (Planning Policy Guidance) 13 – Transport* promoting sustainable and integrated development in relation to transport.

Stockholm is a strong example of the effectiveness of land use planning. The city is based upon connections to the 'Tunnelbana' rapid transit system. The expansion of the city has been planned through the provision of communities of 60,000-100,000 divided into smaller settlements of 10,000 to 15,000. This has been done in such a way that a Tunnelbana station if possible is at the centre of such a development. In turn development is focused within 500 metres of the station. Such development practice has been phrased as a 'Transport Development Area' (TDA) (Hines/Royal Institute of Chartered Surveyors 2002). The South

East England Regional Assembly (SEERA) has identified 100-150 stations with potential to be a TDA out of about 500 stations. The key aims of a TDA are:

- Integration of land use planning/transport policy
- Promotion of mixed use development where appropriate
- Securing reductions in the need to travel and use of private cars while promoting alternative, more environmentally friendly forms of transport
- Integration within and between the different types of transport

Kenworthy and Newman (1992) compare Toronto and Detroit. Toronto is said to have shown a “reversal of the trend towards motorisation and dispersal”. This has occurred through increased density and improved public transport. As a comparison Detroit has seen falling densities and a near failure of the public transport system. They summarise by stating that across a 20-30 year framework a city can shift from being car based towards the city characterised through the TDA concept above.

Land use policies and regional strategies have a significant lag from conception to practical application therefore combined with changing government administrations the vulnerability of policy changes remain a significant barrier.

iii. Technological Development (*external factors, income*)

The increased use of ICT (Information Communications Technology) has the prospect to reduce travel demand, particularly commuting and business associated trips. Practices such as teleworking or videoconferencing are being catalysed through the advancement of technology such as broadband. Typically this allows workers to work remotely from home, as well as reducing the need for business meetings to occur in person. The EU believes that through investment in next generation technology such working practices can become the norm. The UK government also recognises the potential to reduce travel and create more flexible work practices. The table below displays the results of the Labour Force Survey in 2000 of people estimated to be teleworking in the UK. At present just below 6% of all workers are involved in some form of teleworking.

Teleworking as a proportion of all workers

Teleworker homeworkers	312,000
as % of all employees/self-employed	1.10%
Teleworkers who work in different places using home as a base	805,000
as % of all employees/self-employed	2.90%
Occasional teleworkers	477,000
as % of all employees/self-employed	1.70%
All teleworkers	1,593,000
as % of all employees/self-employed	5.80%

Through the UK government publication ‘*working anywhere*’ a number of case studies are detailed. ADAS consulting is a small IT firm which originally had 90 office locations. Through ICT this has been reduced to 25 and now 500 employees work permanently from home. Each home based worker is estimated to have reduced annual business mileage by 2000 miles. Surrey County Council is a further example where traffic reduction has been achieved. ‘*Surrey Workstyle*’ promotes flexible working for the council’s employees. This has been done for example through the use of satellite offices allowing staff to work closer to home. This is once again based on improved use of ICT to make remote and flexible working possible. This has resulted in the rationalisation of office space from 74-21 locations. Though estimation of business mileage reduction has not been quoted the likelihood is once again significant reductions per employee per year. If this case could be replicated within many more firms the potential for traffic reduction is clear.

In terms of business culture it may take many more years for companies to accept new working procedures. Many industries offer less chance of successful use of ICT to allow

workers to work remotely such as manufacturing. It should be cautioned that technological advancement could encourage yet further dispersal in terms of land use patterns as the barriers of distance become irrelevant. This could mean those commuting and work journeys that are made are longer than previously. Additionally the costs of technology in terms of infrastructure of both initial cost and renewal may also prove prohibitive for some firms. On one hand we may have some reduced physical travel and therefore a decrease in road traffic though a more educated society (technology based) is likely to be one with greater levels of mobility. The internet for example has assisted in the much of the population's awareness of increased travel destinations resulting in greater proportions of the population going abroad than previously was the case.

iv. Production and Dematerialisation (*external factors*)

Some commentators have suggested demand for manufactured goods is in decline and a process of dematerialisation is taking place. Dematerialisation can be defined as:

“the reduction of the throughput of materials in human society” (van Oers Kliejn, van der Voet)

Focusing on the consumer, increased life span of products, smarter packaging and the use of lighter materials can act to reduce the freight volume within society. The proliferation of new technology has a role to play. The shift of many individuals to read news online has resulted in a decline in physical media i.e. daily newspapers, a shift from a material to information society. In the context of road traffic the effects are likely to be two way. Dematerialisation may promote the movement of goods and components being moved over much longer distances than in past, e.g. components used to build a PC in Ireland have been made in Taiwan, USA. Policy makers should be keenly aware of this and be prepared to put measures in place to mitigate its effects i.e. encourage local sourcing.

v. Consumer Behaviour (*external factors*)

In an ideal world if we brought products manufactured locally they would only be moved a short distance theoretically creating less traffic. The EU has proposed the concept of '*food miles*' i.e. a product would have packaging indicating the distance it has travelled to reach the shelf. In terms of practical application much relies on improved uses of technology that would allow smart tracking. A valid example in the UK is the emotive subject of beer. 100 years ago it was probable that the local pub stocked the ales of local breweries. Today pub chains transport beer from the brewery to a large central distribution centre and then to the pub. In theory this adds a second link that would not have existed perhaps even 20 years ago. If you factor in this effect in similar industries particularly supermarkets the situation is clear and therefore significant scope for a reversal of this process exists.

Educational and social awareness of such issues creating traffic are important in encouraging their reduction. At present little evidence exists demonstrating the government has promoted this.

Summary

The five discussion topics considered would almost certainly come as a package of measures to be most effective in a decoupling process.

A discrepancy exists between theoretical understanding towards traffic reduction and evidence to prove practical application can be successful (both to traffic levels and the economy). No country as such has attempted all out decoupling and therefore much more practical knowledge is to be gained. As an example the London congestion charge alone may take five years to fully assess.

Road pricing appears to have the potential for a 'double dividend'. This would occur through costs for an 'environmental tax' i.e. charging being exceeded by improvements in economic efficiency elsewhere in the economy through the elimination of inefficient taxes i.e. VED.

We are perceived to becoming a more individualistic consumer driven society but the role of government interventionist policies remains central to much of the discussion above. Therefore decoupling is likely to rely first and foremost on coherent government policies and a genuine long-term commitment to achieve decoupling.

Summary positive/negative aspects of decoupling measures

Decoupling Measure	Economic Sensitivity	Positive +	Negative -
Road Pricing	High	Strong traffic reduction rationale Relatively short period of time to initiate, Increasing public support - London congestion charge effect Internalisation of costs Prospect of a 'double dividend' Technological advancement	Large initial financial investment Risk of competitive damage to the economy Privacy concerns Technological issues
Land Use	Low	Small economic impacts Strong side benefits i.e. better urban environment	Lag from policy formulation to execution Complex regional dynamics policy measures could be too crude
Technology	Low	Organic effect i.e. less reliant on government policy and resources Promotion could result in economic benefits i.e. information society	Lag from cultural change and acceptance Impact consigned to particular industries
Production	Medium	Organic effect Economic benefits i.e. information society	Government catalyst required (tax regime) Potential economic damage to some industries
Consumer	Low	Only passive government intervention required	Difficult to monitor and instigate

Conclusions

The UK has a high level of transport intensity implying a degree of decoupling is possible. Increased promotion of the benefits must be a priority in winning public support. The ambiguous nature of decoupling acts as a significant barrier, for example do we aim for a reduced level of traffic growth or a complete halt. At present the decision to attempt all out decoupling does not appear to have been made, certainly within the current government. The Transport Planning profession has a role to raise the profile of this issue and force it upon the mainstream political agenda.

Referring to the summarised instigators of travel demand within the introduction it has been demonstrated that each discussion area can be attributed to at least one of these. This establishes that a reduction strategy will come in the form of a package of measures both in terms of practicality as well as creating the strongest case for success. As an example if we base our whole strategy on road user charging we are likely to be putting unnecessary pressure on the economy than a package of balanced measures could do. The danger of this is that we adopt a "*laissez faire*" approach with no clear goals and loose targets.

The case for road pricing should be emphasised. Price effects are generally less than income when assessing elasticities of demand though significant enough to make a difference i.e. a 10% change in fuel price will lead to a 1.5% change in traffic vehicle kilometres in the short term and 3% in the long term (SACTRA). The Fuel Duty Escalator (FDE) demonstrated the effectiveness of price effects in maintaining traffic growth at just below economic growth from which a degree of decoupling has already occurred. Additionally the case for technological advancement being catalysed through charging should be lauded. An example would be efficiency gains such as incentives to decrease the empty running of Heavy Goods Vehicles (HGV's). The evidence after the 9/11 attack was that increased uses of videoconferencing helped compensate for the restrictions in air travel. Broadly speaking behavioural change can be accelerated. Revenue recycling and not simply taxation is vital in both maintaining public support and assisting in the creation of an effective public transport system vital to decoupling. Additionally a clear goal exists for both policy makers and researchers to achieve a 'double dividend' of traffic reduction and improved economic growth.

Land use policies are likely to form part of an overall long term strategy aimed at traffic reduction. Specific areas of effectiveness will remain high i.e. urban areas where land densities create a stronger case for public transport sustainability. Land use policies have a particularly low economic sensitivity which acts as a key advantage, though on the downside they are a largely passive means of traffic reduction. In summary a "soft" measure confined as a package of measures to be most useful.

ICT or the use of technological advancements to decrease travel demand is largely focussed upon aspects of business associated travel. In terms of traffic reduction it's entirely plausible that reductions in growth will occur in commuting or business travel though the likely impacts on leisure or social travel are small. The risk is that as we become a more interactive global community the raised awareness of the world around us dramatically increases travel demand. An example is that increasing proportions of the population are prepared to travel greater distances than they had done previously to visit "premium" retail centres opposed to their most local shopping centres. When combined with the example of distribution linkages within the discussion it becomes clear that as society becomes more complex travel demand is changeable, at present that seems to be in favour of increased demand though the prospects are that this could be cancelled out by developments in the future i.e. increases in home working.

Dematerialisation and consumer behaviour reflect the fact that society will change over time perhaps eventually decoupling could occur by organic means largely without intervention from the government. Consumers in an increasingly affluent and educated society should expect to pay for their impact on the environment as is the case through traffic generation and be accustomed to behaving in a suitable way to encourage the sustainability of this planet i.e. not to drive when they can walk.

The case for the economy remains under researched though when faced with initial findings it would not be over presumptuous to remain positive. At the outset of writing this paper my initial thinking was that a '*road building equal's jobs*' argument may dominate the rationale against attempted decoupling. What appears to be the case is that empirical (where available) and practical evidence suggests at least an economically neutral if not economically positive (double dividend) scenario could occur through attempts to mitigate traffic growth. Business relations could have been better handled when the government applied the FDE and this would need to be improved when applying a form of road charging. An increased promotion of the benefits to business need to be made; i.e. improved journey time reliability. The risks of attempted decoupling to the economy are clear and therefore significant further research is required. This aside the intangible benefits for society not economically grounded makes the case for decoupling morally relevant. This would come in the form of an improved urban environment (reduced traffic noise), decreased social exclusion (improved public transport) and improved air pollution. What the car lobby are reticent to acknowledge is that *their right to drive and personal freedom* have significant costs for non car users within society.

A body independent from the government in the same vein as the Monetary Policy Committee (MPC) at the Bank of England would be desirable. When wishing to achieve a consistent decoupling policy, buffering against policy swings is paramount in importance. The power to set the levels of charging employed within a wider area scheme is one valid reason to have such a committee. This would create a non political platform. In a practical sense the government could reign in such a committee, as the MPC, though politically this would be damaging. Members would be formed from suitably qualified persons within academia or industry.

As stated in the introduction the European Union wishes to see a balance of economic growth, social cohesion and environmental protection. In reality traffic and its affects will continue to have a significant effect above any other factor on our society and it is reasonable that measures be targeted at its reduction. Mitigating factors such as cleaner, quieter vehicles are largely insignificant when compared to increasing congestion. It is foreseeable that explicit traffic levels as an overriding issue has decreased importance in the future as technology gives us the means to tackle the harmful issues associated on an individual basis, i.e. reduced environmental impacts.

The barriers to decoupling are social, technological and political, should and could be overcome. It should be acknowledged that without attempts to decouple, economic growth is likely to be infringed through increased congestion. In that sense we appear to have no option but to decouple.

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This paper in does not reflect the views of WSP Group.

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