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### Paul Mees

Paul Mees, a world class transport researcher and policy analyst, died in Melbourne on 19th June 2013 aged 52. Paul's list of achievements and prolific high quality transport analysis and policy advice ensured that his work spread far beyond his native Melbourne. Paul was a controversial figure because he brought his razor sharp intellect to bear on critical policy issues and spoke out loudly and bluntly about what was going wrong and how to put it right. In May 2008 the Melbourne daily newspaper, The Age, ran a story with the heading "Melbourne Uni demotes transport dissident" and Paul's trenchant criticisms of road building and public transport privatisation became known to a much wider audience than those involved in transport.

Paul was the author of two significant landmark books "A very public solution" published in 2000 and "Transport for suburbia: beyond the automobile age" published in 2010. He also contributed to this journal and in the process triggered a vigorous response and debate. He wrote two articles on "the density delusion", one in volume 15, number 2 and another in volume 16, number 3 and co-authored an important paper with Anthony Morton with the title "Too good to be true? An assessment of the Melbourne travel behaviour modification pilot" which was published in volume 16 number 2.

This journal is enormously grateful to Paul for all his work and contributions and we are very lucky indeed to have his books and articles available to us now as we strive to nurture and disseminate the virtuous virus of sensible, intelligent, total system thinking around mobility and transport.

In 2014, our 20th year of publication, we will publish a special issue completely devoted to Paul's work. The special issue will celebrate his life and work, assess his distinctive contribution and publish new material that has a strong resonance with his ideas, thinking, motivation and policy impact.

As we approach the end of 2013 we need Paul's trenchant analysis and straight talking more than ever. The world is still polluted with ridiculous road building schemes that are very expensive and stand no chance at all of delivering their utopian promises especially an end to congestion. The schemes are very strong in Paul's home state of Victoria but also in the UK where we can spend hundreds of millions on totally useless schemes that we know will not achieve their objectives and are based on deliberate falsification of evidence and propagation of myths not supported by data. If any readers doubt this please go back 10 years and extract the arguments for building the road couched in terms of jobs to be created and congestion to be reduced and then fast forward and check the outcomes against the predictions. Paul Mees got into hot water in 2008 with his choice of language in describing the direction of travel of transport policy in Australia and the state of Victoria but his words are far less damaging and insulting than the attack on landscape, nature, ecology, climate, health, children, older people and quality of life perpetrated by the road builders. We are reminded of the much quoted speech of the Scottish landscape architect Ian McHarg:

*"I welcome the opportunity to describe the ecological method of highway route selection...but first I have to reveal my loathing of you and your kind. If you all had a fatal paroxysm, I would find it difficult to mobilize a single tear. You have been engaged in an onslaught against the American environment, you have dismembered, dissected and destroyed significant areas of American cities. Your depredations must end. There is no reason that the American public should pay so dearly to have their environment attacked by such insensitive bullies. You must learn about the environment, both natural and social. You must ask nature whether you may build, where and how, but you must also ascertain from those who will be impacted what are their perceptions, values, needs and desires. Only then will you be able to design high-*

*ways fitting to the land, fit for people.  
And so now I will show you how"*

McHarg, I (1995) *A Quest for Life: an autobiography*, Wiley, page 189

McHarg probably trumps Paul Mees with the severity of his words and condemnation of those doing the damage but it was a different age and universities were better places than they are now and did not worry about annoying their funders and paymasters as they now do.

I am now in danger of trumping McHarg. The city of Kolkata in West Bengal, India, formerly known as Calcutta, has banned bicycles on 174 "key streets"<sup>1</sup>. It is very hard to imagine a more wrong headed, socially unjust, environmentally ruinous attack on poor people. Kolkata is chaotic and there are very real problems in coping with traffic volume and the mix of traffic but to savage a mode of transport that is genuinely egalitarian, services the needs of millions of Kolkata citizens and takes up much less space than large cars with one occupant is an insult to democracy, an abuse of power and a slap in the face for those relatively poor citizens who do cycle. The bicycle ban is the nearest thing on the planet to clearing the streets of pesky poor people so rich people can have more space to drive their cars and more opportunities to kill pedestrians because they can drive faster.

The reason for the ban defies reason:

*"There is just not enough space for all kind of vehicles," says Dilip Kumar Adak, deputy commissioner of the city's traffic police department.*

*"Cycles slow down traffic and removing them will make the streets safer and traffic speedier.*

Source: quote taken from the BBC news item in Note 1

The scale of the tragedy unfolding in Kolkata is staggeringly large. Not only is it an attack on relatively poor people who are doing exactly the right thing when they

choose to cycle, the ban will also achieve the direct opposite of what it is meant to achieve. Banning bicycles will encourage the space greedy modes of transport to take up yet more space and add to traffic congestion and reduce the carrying capacity of the road itself. A road can carry far more people if they use the bike or bus than if they sit in a car and those supporting this ban will add to congestion, pollution, chaos and a reduced carrying capacity. A bicycle requires 3 sq metres of space per person when moving at 10kph and a car with one occupant requires 60 sq metres.<sup>2</sup> Those supporting this ban have chosen to favour a mode of transport that performs 20 times worse in terms of the space it needs in one of the world's most crowded and short-of-space cities.

Wrong headedness is not something that festers in India whilst all is light and joy in the EU, Australia or North America. Paul Mees spent a great deal of his life exposing nonsense around new road building and the neglect of rail in the state of Victoria and it is the same in the UK. A recent report "Where the Money's going"<sup>3</sup> analyses the public spending decisions of newly created local transport authorities and reveals a very interesting breakdown:

- £710 million on new road capacity
- £171 million on rail projects
- £14 million on tram/metro projects
- Nothing at all on cycling
- £65 million on walk/public realm

This is not as blatant as banning bicycles but it shows very clearly that public spending decisions are the opposite of the rhetoric and don't care at all about walking and cycling and want to pursue a business as usual scenario based on lots of car trips, lots of car parking space, lots of air pollution and lots of greenhouse gases. This is as socially unjust, undemocratic and inequalitarian as Kolkata's bicycle ban.

1 Why has India's Calcutta city banned cycling?  
<http://www.bbc.co.uk/news/world-asia-india-24237390>

2 Whitelegg, J (1993) *Transport for a sustainable future*, Belhaven Press, London, page 79

3 [http://www.bettertransport.org.uk/files/admin/LTB\\_report\\_250913\\_web\\_FINAL.pdf](http://www.bettertransport.org.uk/files/admin/LTB_report_250913_web_FINAL.pdf)

In this issue of WTPP we return to some earlier themes that are central to an improved understanding of how to get things right and reduce the likelihood of wrong headedness. Jeff Kenworthy presents us with a robust study of 42 cities and demonstrates that car use and GDP growth are decoupling. This is not just an interesting academic point but a hugely significant piece of evidence in the ideological battle around car use, road space and economic growth. It is perfectly possible and certainly desirable to envisage a future of low car ownership and use, low levels of vkm of car trips and a healthy economy and also an economy that is genuinely delivering quality of life and high value democratic gains. This is seriously contested territory and Kenworthy's paper stands as rock solid scientific evidence that we can ditch all the arguments around traffic, road building and economic growth. It is old hat!

Holzapfel interrogates German road and motorway planning and building and shows that it is totally removed from the reality of life as lived by citizens. He shows that as a process it is divorced from important considerations related to short trips to go shopping or taking children to school and unrelated to its impacts on freight movement and longer distance movement of products. These excluded issues alter the nature of society and mobility with many negative consequences and should be corrected in the planning process of adding new road capacity. Holzapfel's conclusions go beyond this level of reform of a planning process and recommend that we should have "a concept that considers the effects of newly planned roads on the everyday mobility of ordinary people and cites as a replicable model of real planning for everyday life the example of Tübingen's French quarter and the work of Andreas Feldtkeller in producing the "city of short ways" with much increased walking and cycling levels.

John Whitelegg  
Editor

## **INVITATION**

In 2014 we will publish a special issue to celebrate the life and work of the Australian transport planner, academic, activist and broadcaster, Paul Mees. We invite contributions for this issue to be submitted by 31 January 2014. The contributions should have a bearing on Paul's work and interests and contributors are invited to discuss this with the editor in advance. We will publish material in this special issue that has already been published elsewhere as long as we have documentation to show that the original publishers give permission.

Please contact John Whitelegg on:  
[johnwhitelegg@phonecoop.coop](mailto:johnwhitelegg@phonecoop.coop)  
if you want to discuss a proposed contribution



**Decoupling Urban Car Use and Metropolitan GDP Growth**

*Jeff Kenworthy*

**Abstract:**

Data for 1995 and 2005 on forty-two cities in the USA, Canada, Australia, Europe and Asia suggest that car use as well as total motorised mobility have decoupled from real growth in metropolitan GDPs. The car vehicle kilometres travelled per unit of GDP in thirty-nine out of the forty-two cities studied has reduced by an average of 24%. In thirty-five or 83% of the cities, total motorised passenger kilometres travelled per unit of GDP was lower in 2005 than it was in 1995, by an average of 26%. Decoupling of urban mobility from GDP can occur in the context of still rising car use or total mobility. However, in twelve out of the forty-two cities the actual car use per capita also declined by an average of over 6%. Overall, it is found that the average increase in car use in these forty-two cities from 1995 to 2005 was 7% or less than one-third of the level in the 1980s. This decoupling of car use from GDP growth is thus part of the 'peak car use' phenomenon. New data showing an improvement in the relative speed of public transport systems compared to general road traffic over many decades, which is being led by a strong global trend towards urban rail, may help to explain these results. Further research is needed to see if Chinese and Indian cities, with their heavy investments in rail, can also start to show a decoupling of passenger transport from GDP. Overall, the results suggest a possible future where wealth can continue to be created globally whilst reducing the use of cars, oil and their damaging global impacts.

**Keywords:** car use per capita, GDP per capita, decoupling, peak car use, motorised mobility, urban rail, relative speeds.

**Road planning in Germany: an urgent need for reform**

*Prof. Dr.-Ing. Helmut Holzapfel*

Institut für Verkehrswesen, Universität Kassel

**Abstract:**

In Germany in 1971 the basic plan for the construction of the federal road network was adopted. The existing planning procedures for motorways and roads since then only slightly changed: They oriented on paradigms as an ever-growing demand for transport and an optimal access to motorways for high speeds. The article looks at the processes and their implications for the future.

**Keywords:** planning process, planning of motorways, transport infrastructure and economy

## **Decoupling Urban Car Use and Metropolitan GDP Growth**

*Jeff Kenworthy*

### **Introduction**

It is common to see increasing car use linked to increases in wealth. This was referred to by Lave (1992) as an “irresistible force”. In the light of the “peak car use” phenomenon that is now observable in many developed nations and increasingly in the cities of those nations (Newman and Kenworthy, 2011), it is interesting to look at the relationship between urban passenger transport, especially car use, and the development of GDP in cities. The significance goes well beyond the academic interest in something once considered virtually a law of transport (Schafer and Victor, 2000). The global agencies dealing with the difficult question of whether the world can adjust to meet the challenge of climate change, must find a mechanism to enable GDP and transport to be decoupled. Technological advances can play their part in reducing carbon for each kilometre of travel, but this is much more likely to be effective if at the same time the amount of kilometres travelled is also decreasing. Without this their global models will never be able to incorporate a valid way of achieving a future with a maximum of 2° C of temperature rise (Fulton et al, 2013).

With the update of the Millennium Cities Database for Sustainable Transport (Kenworthy and Laube, 2001) being undertaken by the author, it is now possible to examine this point in more detail. Both car use per capita (vehicle kilometres) and GDP per capita for two years (1995/6 and 2005/6) for forty-two cities in the USA, Australia, Canada, Europe and Asia are now available on a consistent methodological basis.<sup>1</sup> These cities have 2005/6 GDPs per capita (in 1995 US dollars) between \$55,070 (Washington DC) and \$18,823 (Hong Kong).<sup>2</sup> As well, we can examine similar relationships between total motorised mobility in cities involving passenger kilometres of travel by cars, motorcycles and public transport.

There are two ways of undertaking this analysis. One is to express all GDPs for

cities for both 1995 and 2005, in this case in real US dollars (pegged to 1995, since the initial set of data were for that year). This is particularly important if one is trying to make comparisons between cities in different countries, for example, which cities are higher or lower on particular variables related to wealth. In doing this, however, we also introduce factors into the analysis which are not consistent between countries. What affects the value of the US dollar on the international money markets may not be affecting, for example, the value of the Euro in the same way. Depending on the aims of the analysis, conversions between currencies can introduce distortions, which confuse the results. In this analysis the aim is to investigate the possible extent to which growth in mobility and especially car mobility may have decoupled from growth in wealth or GDP per capita. It is thus very important to ensure that both the mobility variables and the wealth data for these cities are kept within the same domain and are not affected by divergent external factors that can come into play in converting to a common currency. In the central analysis in this paper real GDPs in local currencies have therefore been used (pegged to 1995).

### **Car vehicle kilometres and growth in metropolitan GDP**

In order to see how the development of car vehicle kilometres in this global sample of cities relates to the development of their GDP, this research has calculated the car kilometres driven to generate one unit of real GDP in local currency in 1995 and 2005 for each metropolitan area (e.g. for US cities this was car kilometres per real 1995 US dollar of GDP and in European cities using the common currency it was car kilometres per real 1995 Euro of

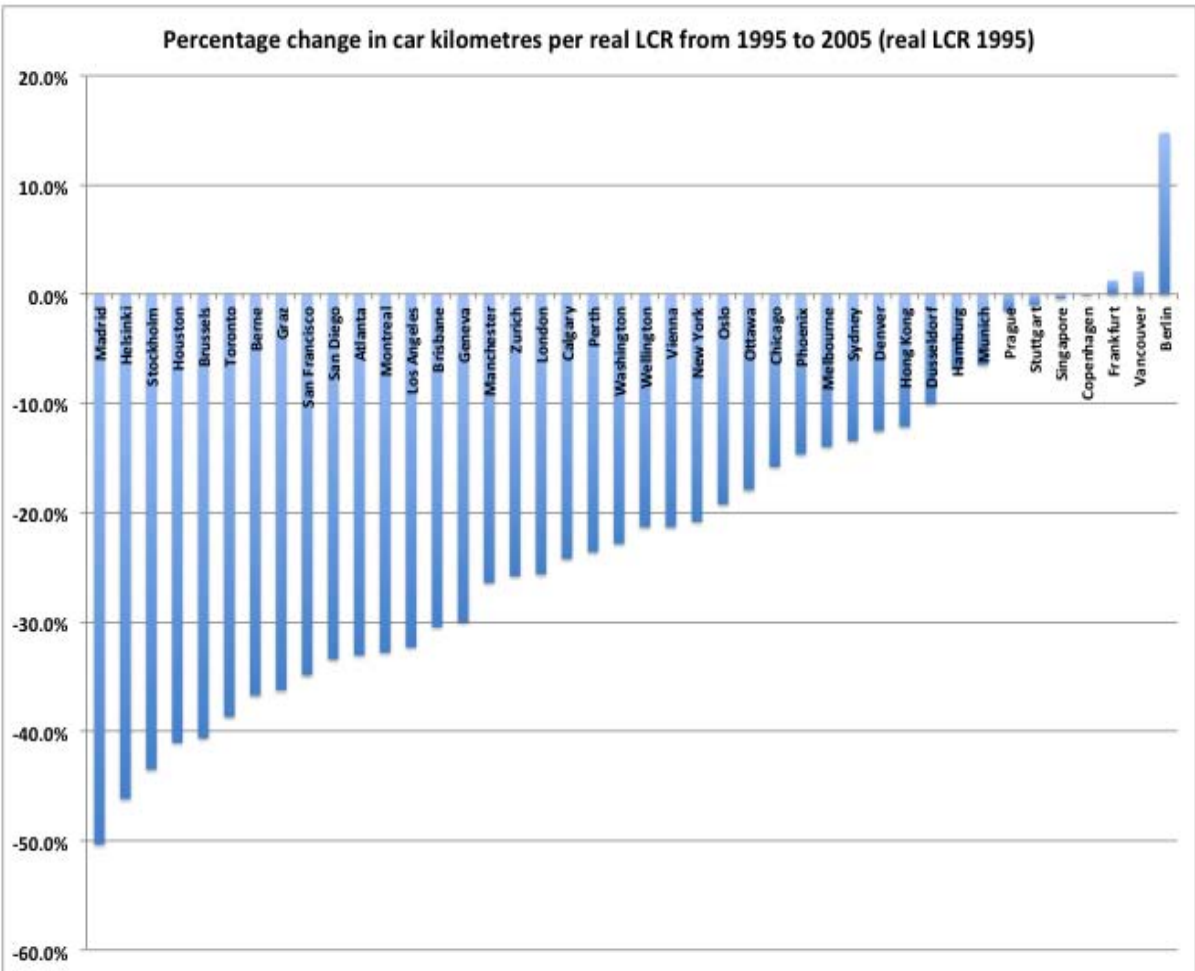
<sup>1</sup> Note that some cities have 1995 and 2005 data and some have 1996 and 2006, depending on Census years. For simplicity the data are referred to as 1995 and 2005.

<sup>2</sup> All comparisons in the paper, which refer to GDP in US dollars, are performed on the basis of real dollars (\$US1995). Currencies are converted to US dollars in the appropriate year using the IMF's Standard Drawing Right found at: [http://www.imf.org/external/np/fin/data/param\\_rms\\_mth.aspx](http://www.imf.org/external/np/fin/data/param_rms_mth.aspx). All conversions are done as at 31/12 of the relevant year or the date closest to that (e.g. 29/12). US dollars are converted to 1995 US dollars using the World Economic Outlook GDP Deflator for the USA found at: <http://www.econstats.com/weo/V005.htm>.



GDP and so on). To do this the per capita GDP for each metropolitan area was calculated based on the functional economic region or labour market area for each city and expressed in 1995 real local currencies. This was then divided into the per capita car vehicle kilometres for that year. Local currencies were converted to real 1995 values using the World Economic Outlook GDP Deflator found at: <http://www.econstats.com/weo/V005.htm>. for the country in which each city is located. The main aim here was not to compare the relative amount of car driving per unit of real GDP between cities, but how the amount of driving per unit of GDP has changed over the ten year period between 1995 and 2005 in each city.

per unit of GDP (50% in Madrid) is shown first, with the last city being Berlin, which was one of only three cities that showed an increase in this factor (15%), the other two being Frankfurt and Vancouver, but the increase in both these cases was very small (1.3% and 2.1% respectively). Berlin was the only city in the analysis to experience a fall in real GDP per capita in local currencies (20,678€ to 20,463€), which when also combined with an increase in car use per capita, resulted in the 15% increase in car kilometres per unit of GDP. In the case of Vancouver, there was only a tiny increase in real GDP per capita (CAD\$35,213 to CAD\$35,511), while car use also grew a little. Frankfurt was similar.



**Figure 1. Percentage change in car kilometres travelled per unit of real GDP in forty-two cities (real local currencies).**

This can be expressed as a percentage. Table 1 shows the results of this analysis for the forty-two cities under consideration. Importantly, it shows the decadal percentage change from 1995 to 2005 in the amount of car driving per unit of real GDP. The city with the biggest drop in car driving

Figure 1 shows the percentage changes in car kilometres per unit of real GDP for each city and reveals the extent to which car use decoupled from GDP over the 10-year period. It shows that thirty-nine out of the forty-two cities reduced in their car kilometres per GDP

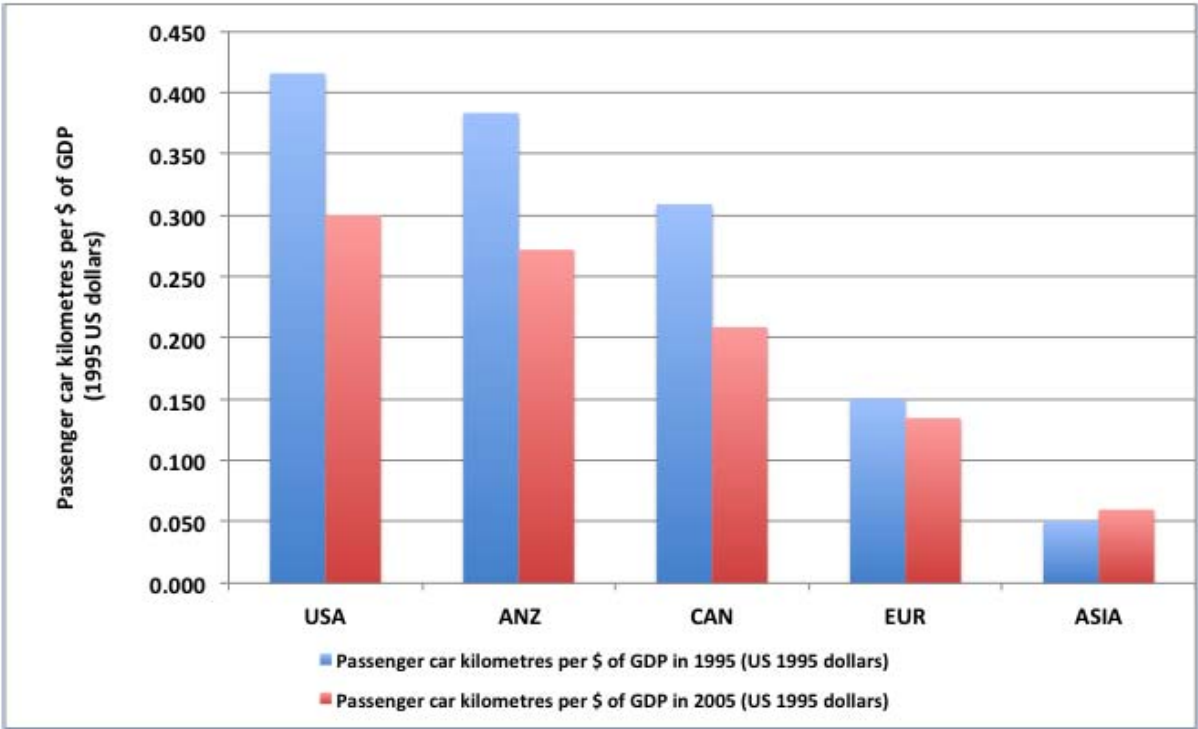
City	Local currency	Passenger car kilometres per LCR, 1995 (real LCR 1995)	Passenger car kilometres per LCR, 2005 (real LCR 1995)	% change 1995-2005
Madrid	EUR	0.300	0.149	-50.3%
Helsinki	EUR	0.195	0.105	-46.2%
Stockholm	SEK	0.023	0.013	-43.5%
Houston	USD	0.558	0.329	-41.1%
Brussels	EUR	0.128	0.076	-40.6%
Toronto	CAD	0.207	0.127	-38.6%
Berne	CHF	0.109	0.069	-36.7%
Graz	EUR	0.207	0.132	-36.2%
San Francisco	USD	0.344	0.224	-34.8%
San Diego	USD	0.503	0.335	-33.4%
Atlanta	USD	0.651	0.436	-33.0%
Montreal	CAD	0.247	0.166	-32.8%
Los Angeles	USD	0.439	0.297	-32.3%
Brisbane	AUD	0.384	0.267	-30.5%
Geneva	CHF	0.110	0.077	-30.0%
Manchester	GBP	0.424	0.312	-26.4%
Zurich	CHF	0.093	0.069	-25.8%
London	GBP	0.285	0.212	-25.6%
Calgary	CAD	0.252	0.191	-24.2%
Perth	AUD	0.280	0.214	-23.6%
Washington	USD	0.339	0.262	-22.8%
Wellington	NZD	0.235	0.185	-21.3%
Vienna	EUR	0.141	0.111	-21.3%
New York	USD	0.236	0.187	-20.8%
Oslo	NOK	0.026	0.021	-19.2%
Ottawa	CAD	0.235	0.193	-17.9%
Chicago	USD	0.313	0.264	-15.8%
Phoenix	USD	0.422	0.360	-14.6%
Melbourne	AUD	0.265	0.228	-14.0%
Sydney	AUD	0.231	0.200	-13.4%
Denver	USD	0.354	0.310	-12.5%
Hong Kong	HKD	0.003	0.003	-12.1%
Dusseldorf	EUR	0.160	0.144	-10.0%
Hamburg	EUR	0.159	0.148	-6.9%
Munich	EUR	0.124	0.116	-6.5%
Prague	CZK	0.013	0.013	-1.6%
Stuttgart	EUR	0.189	0.188	-1.0%
Singapore	SGD	0.053	0.053	-0.4%
Copenhagen	DKK	0.023	0.023	-0.1%
Frankfurt	EUR	0.159	0.161	1.3%
Vancouver	CAD	0.192	0.196	2.1%
Berlin	EUR	0.149	0.171	14.8%

**Table 1. Car kilometres travelled per unit of GDP in real local currencies, 1995-2005.**

by an average of 24% (across the entire forty-two cities the decline was 21%).

These cities have thus been able to grow their economies while experiencing major reductions in the relative amount of car driving associated with this wealth creation (see further section on links to peak car use below). Overall, the data suggest that in the overwhelming majority of cases where real per capita GDP has grown, this wealth creation has decoupled from car use. Despite the issues that may be introduced in converting all currencies to a common one, it is still interesting to get an idea of

counterparts. European cities needed less than half the car use to generate the same amount of GDP as in US cities. These have been the same patterns observed since we began collecting the city data from the 1960's (Newman and Kenworthy, 1989). The two relatively wealthy Asian cities of Singapore and Hong Kong had about one-fifth of the car use per GDP as the US cities in 2005. Similar patterns are evident in 1995, except that the gap between the Asian cities and the rest of the cities was much greater in 1995 than in 2005 (these Asian cities increased in their car kilometres per dollar of GDP while all the



**Figure 2. Car use (vehicle kilometres) per dollar of GDP in US, Australia/New Zealand, Canadian, European and Asian cities, 1995 and 2005 (using real 1995 US dollars).**

the comparative amount of car driving per unit of real GDP between cities in different regions. In this case the GDPs were all converted to 1995 US dollars to enable these cross-city comparisons. Figure 2 provides these data averaged by region.

In all regions except Asia, the car kilometres driven dollar of GDP have declined from 1995 to 2005, with the European cities showing on average the least decline. Here we also see that in 2005, US cities experienced by far the most car use for every dollar of generated GDP, Australian cities were a little more efficient in this respect, while Canadian cities were clearly lower than both their US and Australian

other regions declined). A similar situation is observable between the Canadian and European cities because of the small relative decline in car kilometres per dollar of GDP experienced in European cities.

In interpreting the results in Figure 2, there may also be specific economic circumstances, which could have relevance to the observations. For example, in the USA while national GDP per capita has risen considerably, the bulk of that economic growth has been within already very wealthy population segments. Meanwhile, the period from 1999 to 2009 saw a decline of 5% in real median household income and by 2011 real median household income

in the USA was at the lowest level it has been since 1995 (<http://www.profitconfidential.com/economic-analysis/american-real-incomes-fall-to-1995-levels/> accessed June 25, 2013).

If most economic growth is accruing to very high income people while the bulk of households are not really getting any wealthier in real terms, then one might expect that (a) these already very high income people are not needing to drive more just because they are now even more wealthy, while (b) the average person is roughly as rich in real terms as before and therefore possibly driving about the same as well. The net effect in both cases would be a decline in car kilometres per dollar of real GDP. The results thus do leave scope for more investigation and research.

### Links to peak car use

Peak car use appears to be happening due to a combination of factors relating to the growth of the knowledge/services economy, the urban youth culture and use of social media, an increasing popularity of urban locations with rising urban densities and a revival in the use of transit, especially urban rail (Florida, 2010; Newman and Kenworthy, 2011). These can all be

contributing to the decoupling of car use from GDP. Of course, it is possible that GDP and car use could be decoupled, but with both still growing, albeit with GDP growing more strongly to give the effect of lower vehicle kilometres per unit of GDP. Figure 3 explores this in more detail by examining the actual changes in car vehicle kilometres per capita for each of the forty-two cities in this analysis between 1995 and 2005. The data are sorted from lowest to highest according to the 1995 values.

A close examination of the chart reveals that twelve out of the forty-two cities did in fact not only achieve relative reductions in the amount of car driving associated with their GDP growth, but also absolute declines in per capita car kilometres of driving (Atlanta, Houston, San Francisco, Los Angeles, Oslo, Toronto, Montreal, Zürich, Stockholm, London, Vienna, Graz). The average decrease in per capita car use for these twelve cities was 6.4%.

Furthermore, sixteen of the cities experienced per capita increases in car vehicle kilometres of less than 10% over a decade, suggesting a significant slow down in the growth rate of per capita car kilometres. The average increase between 1995 and

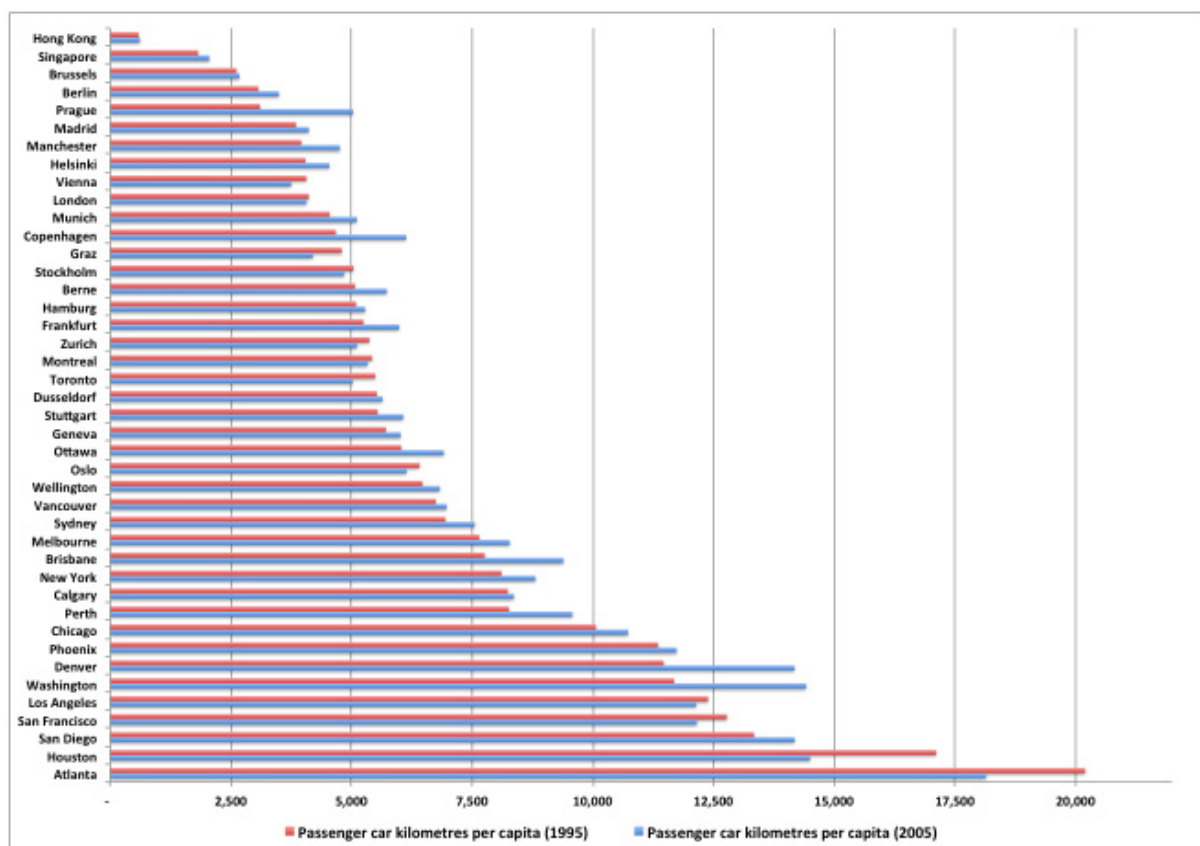


Figure 3. Annual per capita car kilometres in forty-two cities, 1995 and 2005.

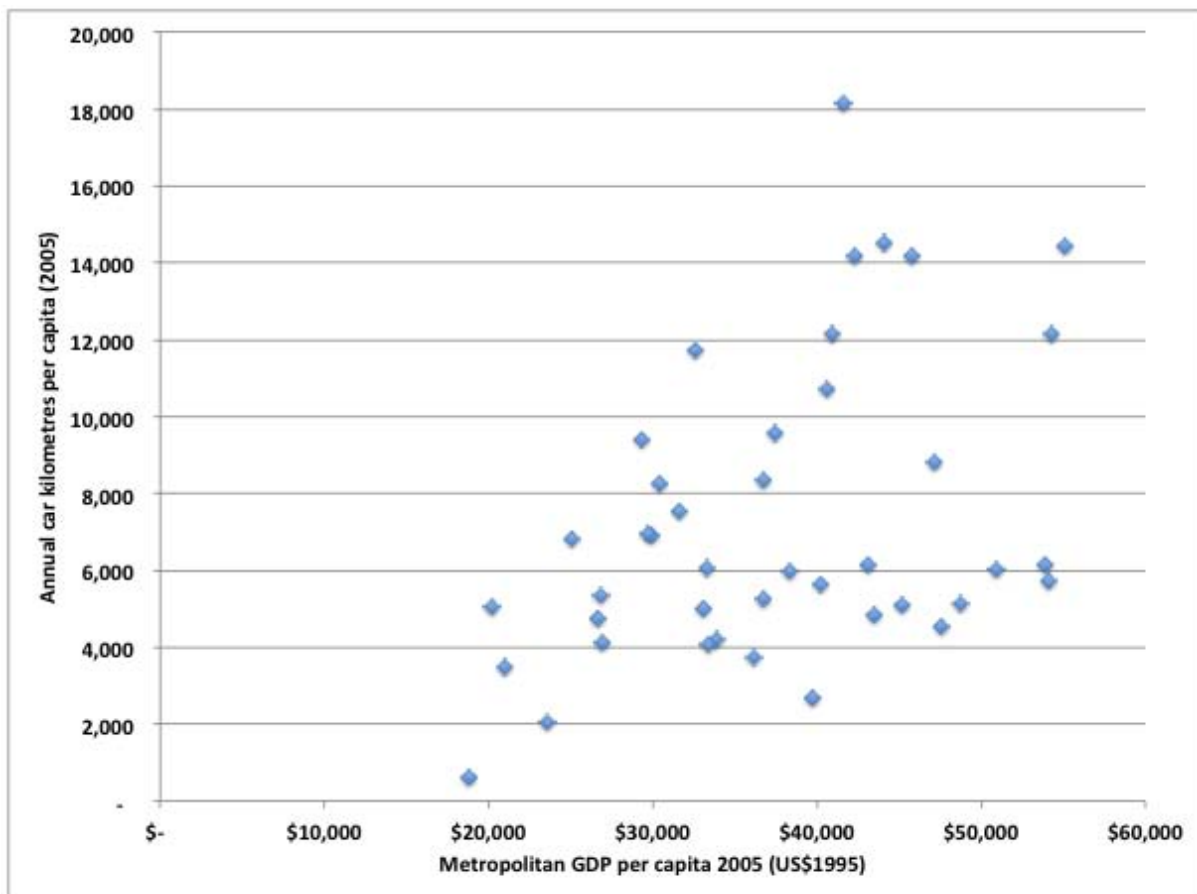
2005 was 5.4% for San Diego, Phoenix, Chicago, Calgary, New York, Melbourne, Sydney, Vancouver, Wellington, Geneva, Stuttgart, Düsseldorf, Hamburg, Madrid, Brussels and Hong Kong. The remaining fourteen out of the forty-two cities in this analysis grew in car use per capita between 1995 and 2005 by an average of 20.8%.

We have shown elsewhere that the average decadal percentage increase in car vehicle kilometres per capita in cities from 1960 to 1970 was 42%, from 1970-1980, 26% and 1980 to 1990, 23% (Newman and Kenworthy, 2011). Overall, in this analysis of forty-two cities from 1995 to 2005, those that increased in car vehicle kilometres per capita did so by 12.6%, or about half the 1980 to 1990 figure. For the forty-two cities as a whole, car use per capita increased on average by only 7.2%, or less than one-third as was typical for the 1980s in similar cities.

As mentioned at the beginning, one of the persistent ideas in the literature is that car use is strongly related to GDP. In our previous research on whole cities we found little relationship between wealth and

car use (Newman and Kenworthy, 1999). For 1995 no statistically significant correlation between GDP per capita and car kilometres travelled per capita could be seen in the fifty-eight higher income cities with a GDP per capita over \$11,000 (US\$1995). For the twenty-six lower income cities with GDP per capita less than \$11,000 there was a significant relationship, with car use increasing with GDP per capita (Kenworthy and Laube, 2001).

If we examine the correlation between annual car kilometres of travel per capita and GDP per capita using the later 2005 data for the forty-two wealthy cities here, there appears to be a very weak positive relationship, but with a huge amount of scatter in the data. As a result, GDP per capita, at least in wealthier cities, is an extremely poor predictor of car use per capita. For example, at \$40,000 GDP per capita, Figure 4 shows car use ranging from less than 3,000 kilometres per capita up to over 18,000 km, with a number of cities lying somewhere between these extremes. This question of the relationship between mobility and GDP is returned to later in the discussion section.



**Figure 4. Relationship between per capita metropolitan GDP and annual car kilometres per capita for forty-two cities in 2005.**



## Total motorised personal mobility and GDP

With the reducing amount of car use (vehicle kilometres) associated with every real unit of GDP, it is interesting to see whether this also applies to the total amount of personal motorised travel that people have to undertake to meet their needs in cities. In other words, is car use

simply being replaced by other forms of mobility in generating the GDP of an urban region? In this case we combine annual car, motorcycle and public transport passenger kilometres and express this per unit of real GDP in the local currency. The annual public transport passenger kilometres for each city is for the entire system (all modes and all operators collected carefully from the relevant organisations).

City	Local currency	Total motorised pkm per LCR, 1995 (real LCR 1995)	Total motorised pkm per LCR, 2005 (real LCR 1995)	% change 1995-2005
Helsinki	EUR	0.362	0.181	-50.1%
Stockholm	SEK	0.049	0.026	-46.4%
Madrid	EUR	0.503	0.290	-42.3%
Houston	USD	0.832	0.481	-42.2%
Montreal	CAD	0.392	0.238	-39.2%
Brisbane	AUD	0.662	0.405	-38.8%
Brussels	EUR	0.246	0.156	-36.5%
Toronto	CAD	0.296	0.188	-36.5%
San Diego	USD	0.715	0.467	-34.7%
Graz	EUR	0.331	0.219	-33.7%
Perth	AUD	0.483	0.324	-33.1%
Los Angeles	USD	0.627	0.427	-31.9%
Berne	CHF	0.224	0.154	-31.4%
San Francisco	USD	0.487	0.348	-28.6%
Atlanta	USD	0.806	0.590	-26.8%
Manchester	GBP	0.644	0.472	-26.7%
Washington	USD	0.526	0.391	-25.6%
Ottawa	CAD	0.358	0.268	-25.0%
Geneva	CHF	0.148	0.111	-24.9%
Calgary	CAD	0.371	0.280	-24.5%
Copenhagen	DKK	0.047	0.036	-23.7%
New York	USD	0.400	0.308	-23.0%
Zurich	CHF	0.183	0.142	-22.5%
Melbourne	AUD	0.450	0.350	-22.4%
Wellington	NZD	0.393	0.314	-20.1%
Chicago	USD	0.513	0.432	-15.9%
London	GBP	0.527	0.449	-14.7%
Phoenix	USD	0.566	0.485	-14.3%
Sydney	AUD	0.401	0.344	-14.2%
Prague	CZK	0.036	0.031	-14.2%
Denver	USD	0.557	0.485	-12.8%
Hamburg	EUR	0.303	0.269	-11.1%
Dusseldorf	EUR	0.248	0.222	-10.5%
Singapore	SGD	0.173	0.159	-7.8%
Vienna	EUR	0.229	0.224	-2.2%
Stuttgart	EUR	0.288	0.300	4.1%
Oslo	NOK	0.038	0.040	5.1%
Munich	EUR	0.235	0.248	5.6%
Hong Kong	HKD	0.026	0.028	6.0%
Frankfurt	EUR	0.244	0.261	7.1%
Vancouver	CAD	0.287	0.309	7.4%
Berlin	EUR	0.295	0.350	18.7%

**Table 2. Total motorised passenger kilometres per unit of GDP in real local currencies, 1995-2005.**



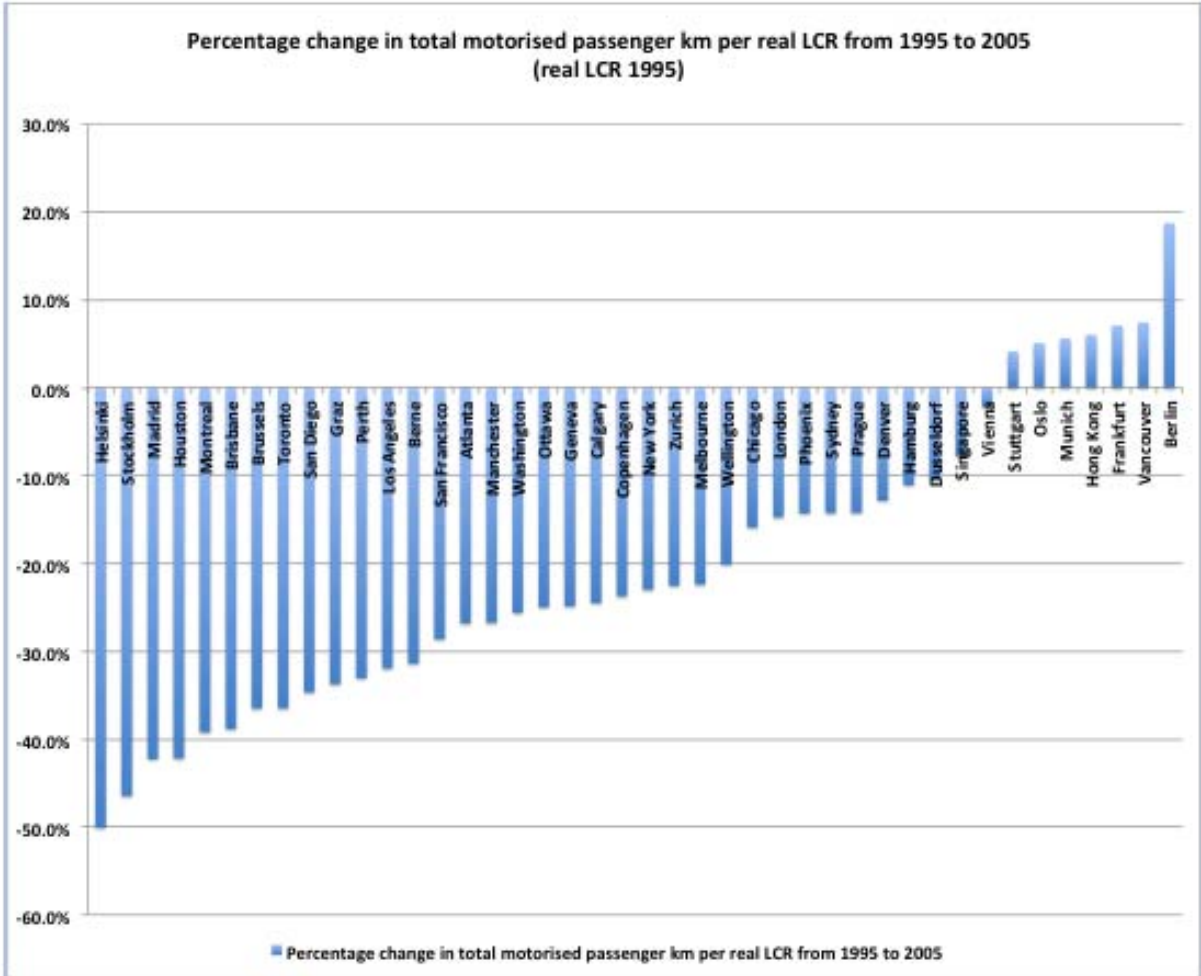
Table 2 shows the result for 1995 and 2005 for the forty-two cities ordered according to the largest reduction in total motorised mobility per unit of GDP (Helsinki, -50%) to Berlin with a 19% increase. It demonstrates again that the large majority of cities needed significantly less total personal motorised mobility in 2005 relative to the amount of real GDP they generated, compared to 1995. There are only seven out of the forty-two cities that increased in this factor. Overall, in the thirty-five cities that reduced in this factor, the average reduction was 26% over the ten years, while across the entire sample, including those cities that increased, the overall reduction in motorised mobility per unit of GDP was 20%.

Figure 5 presents the percentage changes for each city. The seven cities to have increased in total motorised mobility per unit of GDP from 1995 to 2005 were, Stuttgart, Oslo, Munich, Hong Kong, Frankfurt, Vancouver, Berlin and. In the case of Hong Kong the mobility increase

per capita was all in transit, with combined car and motorcycle passenger kilometres per capita declining. In the other six cities that increased, all the forms of passenger mobility per capita rose. In fact, only eight cities out of the forty-two cities actually declined in per capita total motorised mobility from 1995 to 2005 (Graz, Stockholm, Melbourne, Montreal, Toronto, Atlanta, Houston, and Los Angeles).

In summary, in 83% of the cities in the analysis, total motorised mobility relative to GDP reduced or decoupled between 1995 and 2005.

Figure 6 groups the cities into their respective regions and uses real 1995 US dollars for cross-city comparisons. It shows that in 1995, Australian cities had the highest level of overall personal mobility per dollar of GDP. This was followed closely by the US cities, then the Canadian cities with a big drop in this factor, then the European cities with another big drop and finally the Asian cities which were lower again,



**Figure 5. Percentage change in total motorised passenger kilometres travelled per unit of real GDP in forty-two cities (local currencies).**

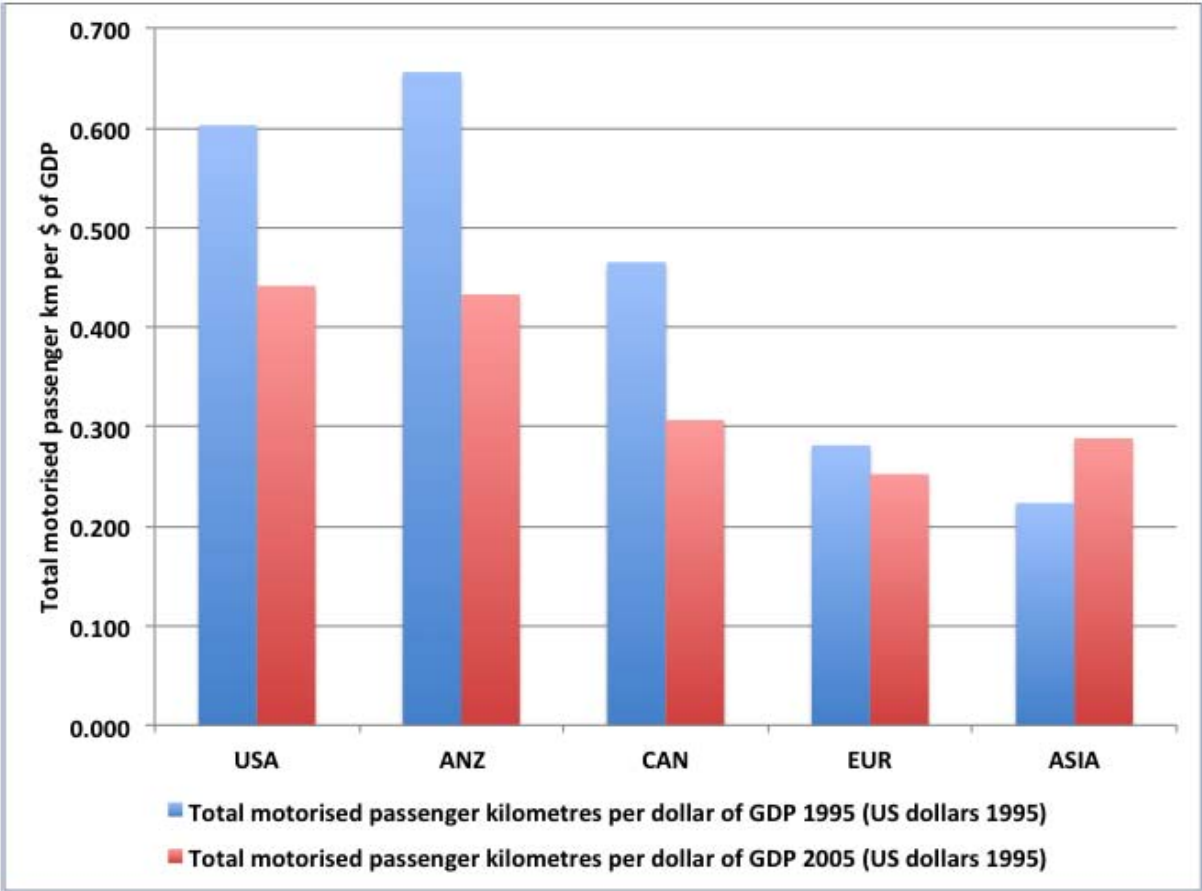
but by a lesser margin than the other differences. By 2005, all the groups of cities had reduced their personal mobility requirements relative to GDP, except the Asian cities, which went up. This meant that by 2005 the two Asian cities of Singapore and Hong Kong on average had more personal mobility per dollar of GDP than the European cities and were almost equal to the Canadian cities. Also the US cities overtook the Australian cities in 2005 by a tiny margin to become the leading cities in this factor, but the remainder of the comparative differences were similar to 1995. In general, in comparing 1995 and 2005 there seems to be a “flattening” process at work so that the differences in motorised personal mobility levels relative to GDP are becoming less pronounced.

**Discussion**

This paper provides a global perspective on the important topic of whether urban economies can grow whilst reducing the overall mobility and especially car mobility associated with that growth. It does this through a snapshot for only two years of data for each city, albeit separated by a

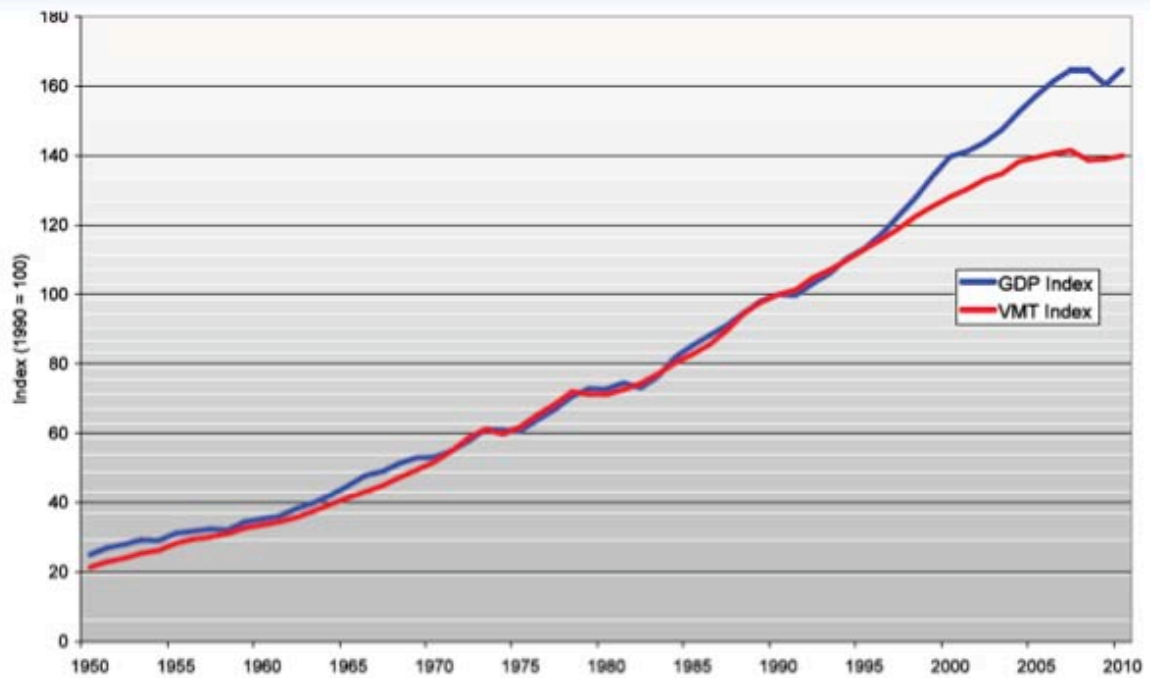
period of ten years. However, research by Kooshian and Winkelmann (2011) also supports the proposition that GDP has in fact decoupled from private mobility, certainly in the United States, by showing a perspective dating back as far as 1945. They suggest that the strength of this decoupling is likely to continue into the future. Figure 7, taken from their work, shows the national index of Vehicle Miles Travelled (VMT) against GDP for the USA from 1950 to 2010. It can be clearly seen that 1995 was the point where GDP in the US separated from its almost perfect correlation with VMT growth in the post-World War 2 period.

They go further in their analysis by showing the VMT per dollar of real GDP from 1945 to 2010 in the USA, as well as a projection out to 2030 (Figure 8). It is again clear that 1995 was essentially the peak in the travel intensity of the US economy and from that year on, notwithstanding some small variations, less vehicle travel was needed for every dollar of GDP generated. Based on Figure 8, between 1995 and 2005 there was approximately an 8% drop in the VMT per dollar of GDP in the



**Figure 6. Total motorised mobility (passenger kilometres) per dollar of GDP in US, Australia/New Zealand, Canadian, European and Asian cities, 1995 and 2005 (using real 1995 US dollars).**

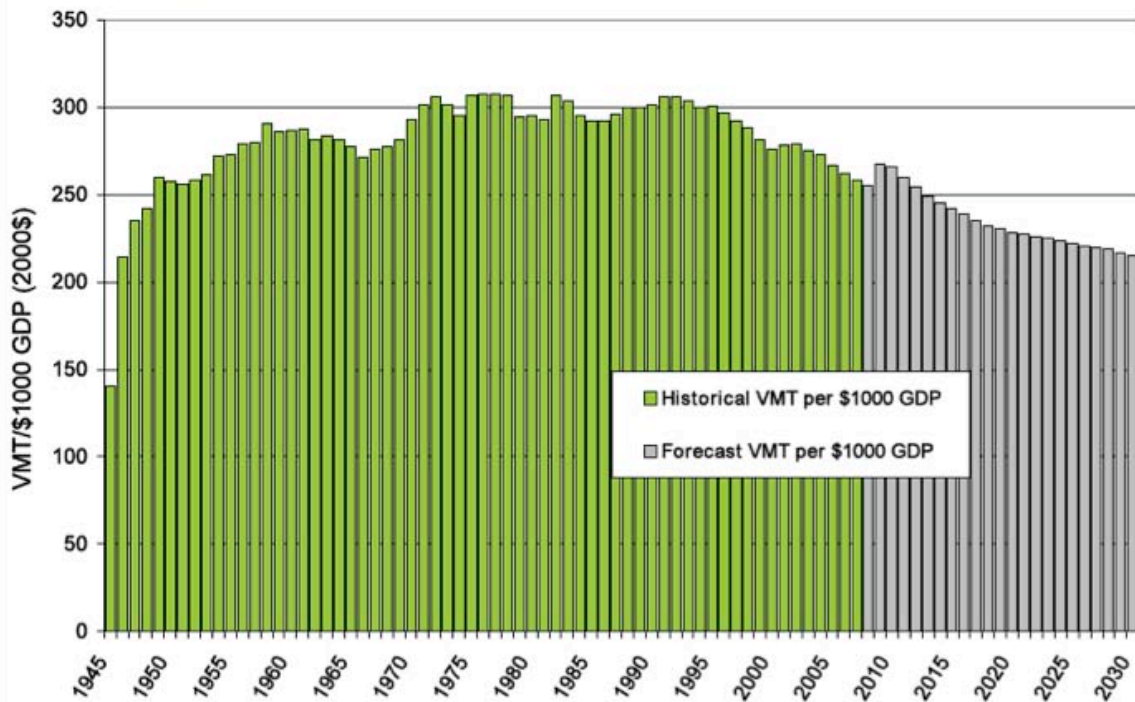
## US National Indexed VMT and GDP, 1950-2010 (1990=100)



**Figure 7. US national VMT indexed against national GDP, 1950-2010.**

Source: Kooshian and Winkelman (2011)

## Transportation Vehicle Miles Traveled/\$GDP, 1945-2030



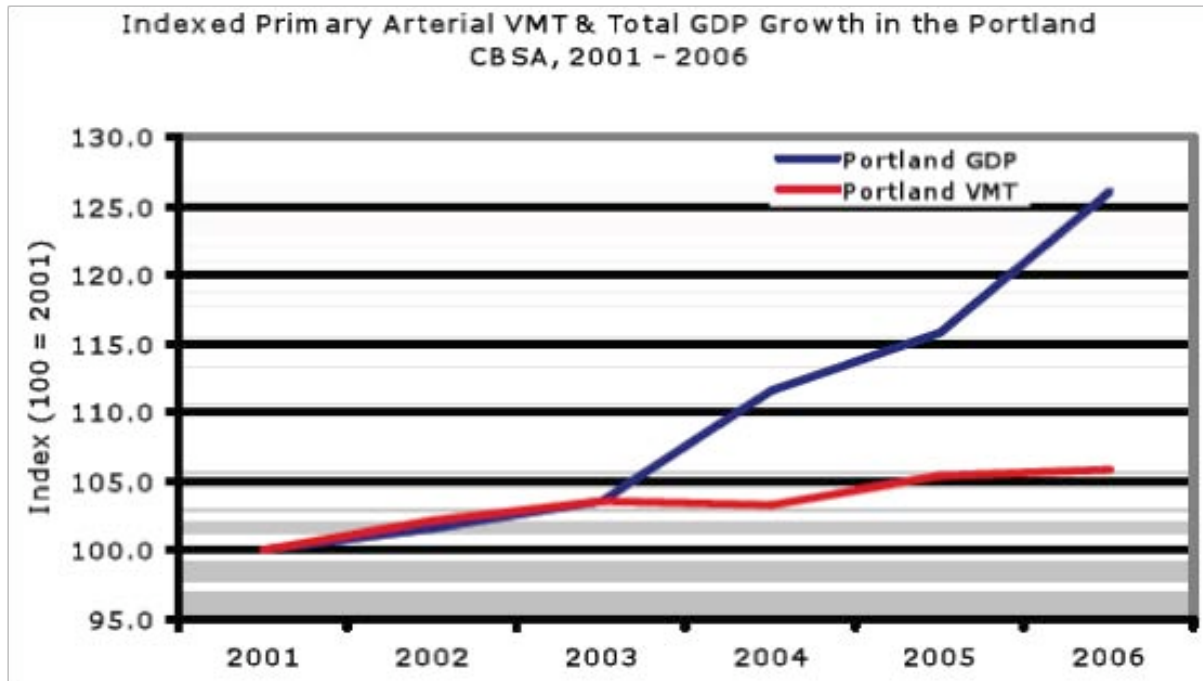
**Figure 8. Vehicle Miles Travelled per dollar of GDP in the USA from 1945 to 2030.**

Source: Kooshian and Winkelman (2011)

USA. By comparison, the data on the ten US cities in this study showed a 26% decline. The data used by Kooshian and Winkelman represent total VMT, not just private passenger vehicles, so it seems that:

- (a) the decoupling effect is less when freight and commercial traffic is factored in and,
- (b) the effect is more pronounced in cities.

ever, one major underlying factor not captured in their work is likely to be the reductions in comparative investment in infrastructure for freeways compared to public transport, which seem to be propelling a rise in public transport patronage across all these cities (Newman et al, 2013). Figure 11 shows the increase in public transport passenger kilometres per capita by region for these cities from 1995



**Figure 9. Decoupling of GDP from Vehicle Miles of Travel in Portland, Oregon.**  
Source: Kooshian and Winkelman (2011)

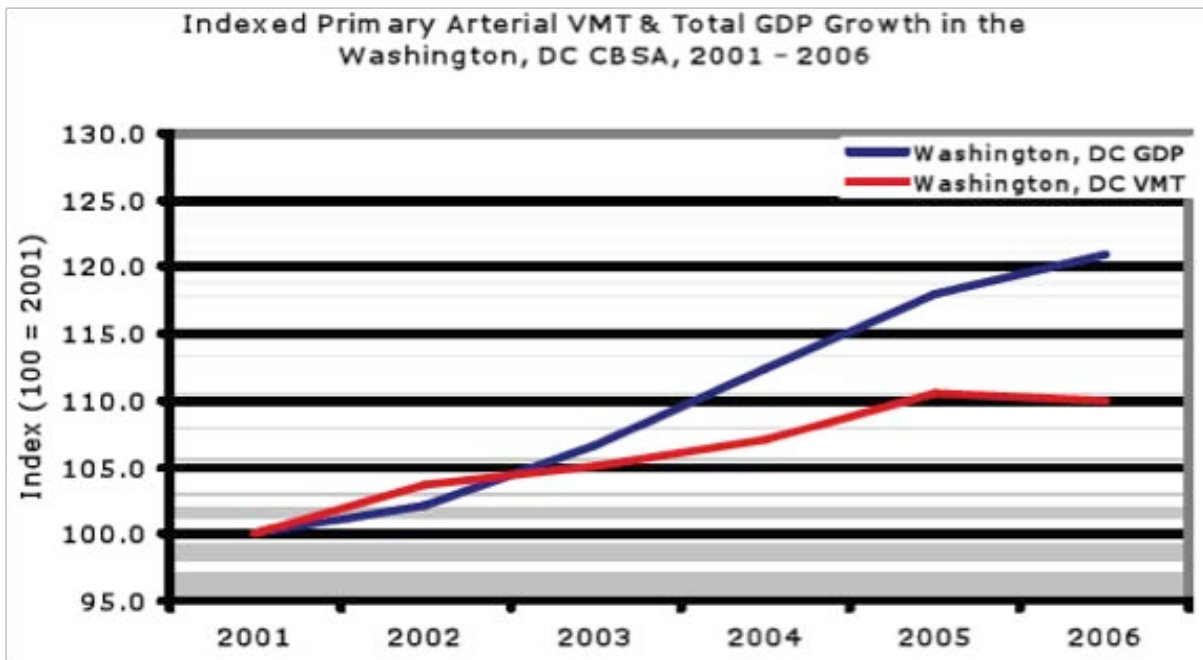
Their own data for cities (e.g. Figures 9 and 10) also show a stronger decoupling effect, in the case of Portland (26%) and Washington DC (20%). Furthermore, the modelled national projection in Figure 8 shows a sustained and steady decline in the total travel intensity of the US economy, as far out as 2030. The research in this paper covering forty-two cities in seventeen countries, suggests that this decoupling of car use and total private motorised travel from GDP growth, which is so clear in both the USA as a whole and within its individual cities, is likely to be a more widespread global phenomenon, in at least the developed world. The mechanisms underlying the results reported here are likely to involve a complex array of factors. Kooshian and Winkelman (2011) mention factors such as demographic shifts, fuel prices, congestion, growth of the service sector and telecommuting and e-commerce as important in understanding the trend. How-

to 2005 (US cities rose 16%, Australian cities 11%, Canadian cities 12%, European cities 22% and Asian cities 19%).

The key data seem to be an improvement in the relative speed of public transport to traffic (average road speed) and especially rail speed, as shown in Figure 12.<sup>3</sup>

It is clear from these data that the rise in importance of rail in cities is largely behind this increase in the relative speed of public transport compared to general traffic. In

<sup>3</sup> These public transport data have been carefully collected for all modes and operators for all the cities in the sample in each year and the speeds weighted by the number of passenger hours spent in each mode (see Newman et al (2013) for details of cities involved). The average road speed is the 24 hour/7days road network speed mostly derived from computer models in each city. These data are the results of my and my colleagues' comparative research on cities over the last 30 years (e.g. Newman and Kenworthy, 1989; Kenworthy and Laube, 1999; Kenworthy and Laube, 2001), including on-going updated data for 2005, in the process of being progressively published at present.



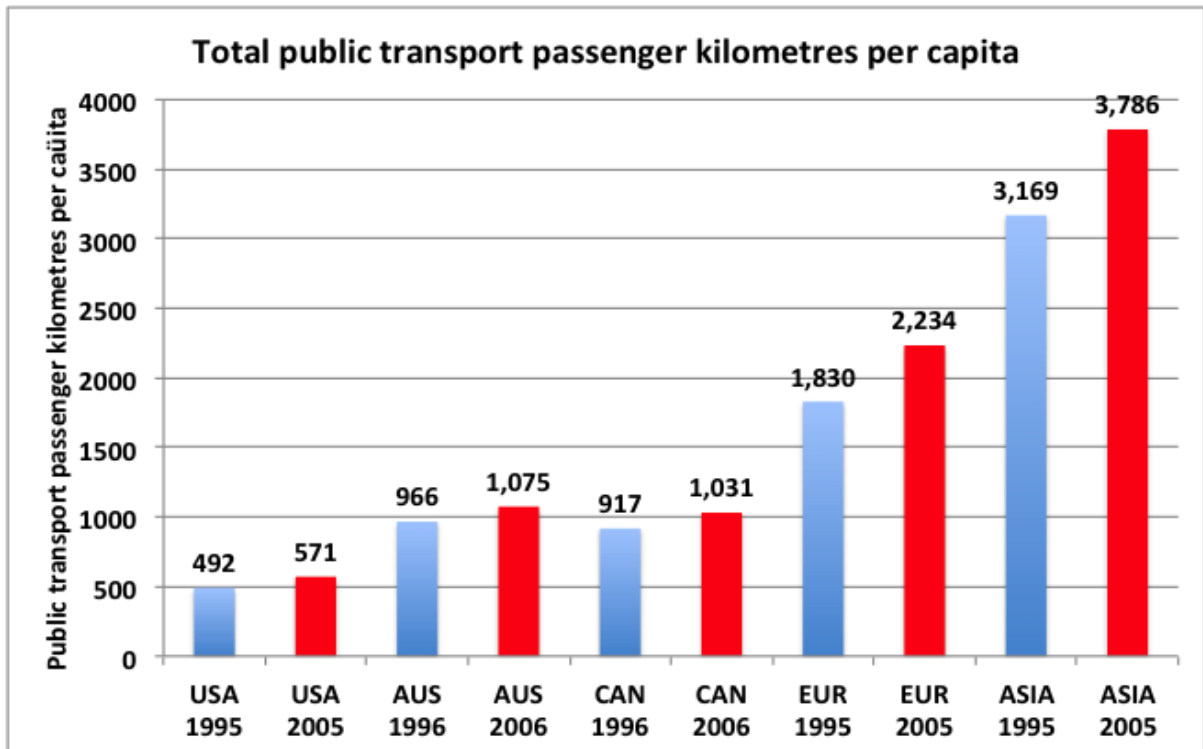
**Figure 10. Decoupling of GDP from Vehicle Miles of Travel in Washington DC.**

Source: Kooshian and Winkelman (2011)

the absence of any area-wide congestion control in any city this is hardly surprising, because buses suffer a worse fate than cars in congested conditions in terms of providing a speed-competitive mid-level public transport option. Yet it is the unrestrained use of cars in peak periods, which causes the congestion that so damages bus competitiveness. An even greater im-

provement in the relative speed of public transport could be gained by controlling congestion in a systematic way so that buses could compete effectively in speed terms with cars (Bradley and Kenworthy, 2012).

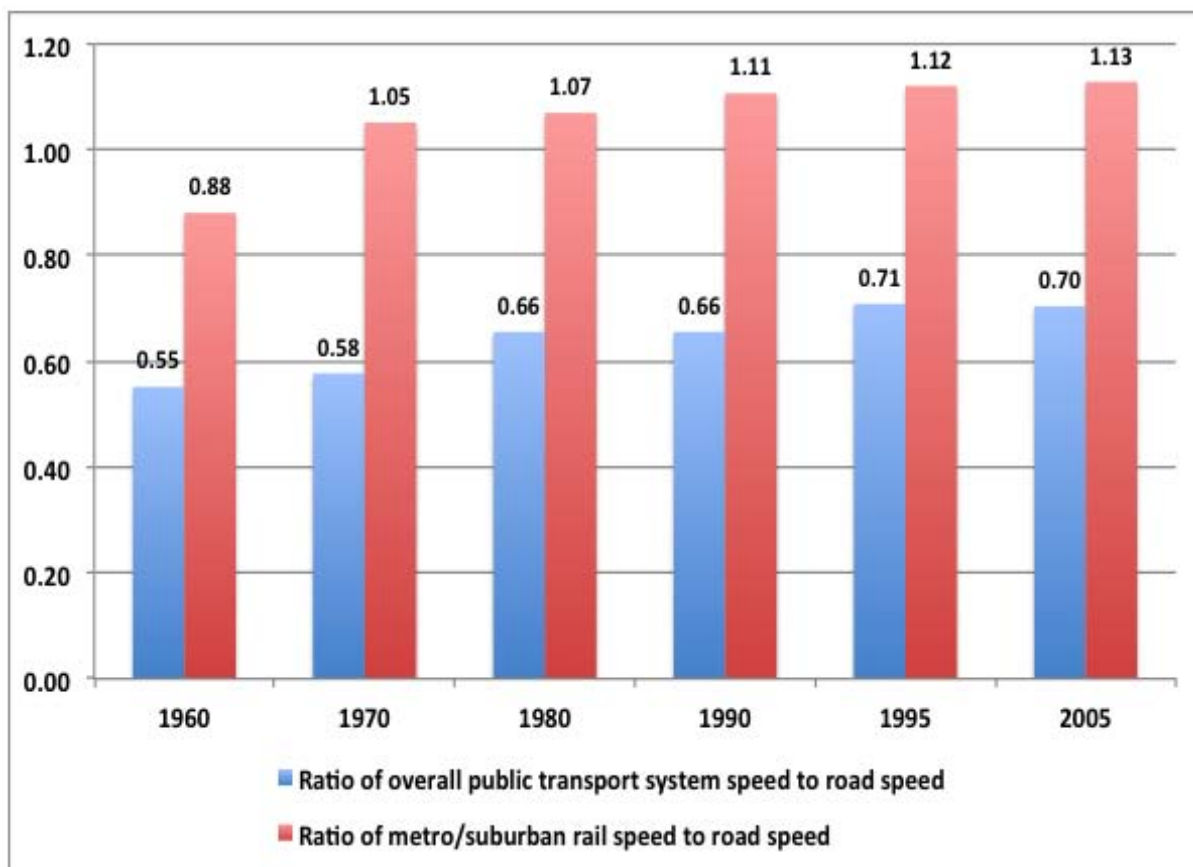
It should also be noted that when public transport travel rises, it is not simply that one passenger kilometre by public trans-



**Figure 11. Public transport passenger kilometres per capita by region, 1995 and 2005.**

Source: Author's own data from update of Millennium Cities Database for Sustainable Transport.





**Figure 12. The relationship between overall public transport system speed and rail system speed in cities compared to their general road traffic speed, 1960 to 2005.**

Source: Author's own data from update of Millennium Cities Database for Sustainable Transport and Kenworthy and Laube (1999).

port replaces one passenger kilometre driven by cars. Neff (1996) and our own work (Newman and Kenworthy, 1999) has shown that there is a "transit leverage effect" whereby one passenger kilometre by public transport replaces multiple passenger kilometres by car. It can be suggested then that as public transport gains in relative importance in urban mobility we might expect that the decoupling effect between GDP and car travel should actually strengthen. Essentially, public transport is a much more efficient and cost-effective way of providing urban mobility needs. Even if public transport mobility increases, it is quite possible that both car mobility and total motorised mobility per dollar of GDP can decline due to public transport's ability to replace multiple kilometres of car travel.

This change in priorities, as cities recognise the greater value in public transport investment as well as the need for congestion control, enables us to see a major policy direction that could be the driving mechanism to enable cities of all

kinds to continue their growth in wealth whilst decoupling from car use growth.

## Conclusion

The data presented in this paper suggest that in general, personal mobility in relatively wealthy cities, and in particular car vehicle kilometres of travel, have decoupled from GDP growth. This trend is supported by independent research from the USA at both a national and city level. The results also appear to be in line with the idea of peak car use in these more prosperous cities around the world, with evidence that many cities experienced a decrease in car vehicle kilometres per capita from 1995 to 2005, while many others increased by an average of only around 5% in the 10 years, a major reduction on growth rates in previous decades. The amount of total personal motorised mobility (car, motorcycle and public transport passenger kilometres) associated with generating one unit of real GDP appears to be also diminishing in the majority of cas-



es, and the differences between wealthy cities in this factor are also declining. American and Australian cities, however, remain significantly higher than cities in Canada, Europe and Asia. Further research is needed to better understand these observed phenomena and their implications. This would include more detailed examination of Indian and Chinese cities to see if they too may be beginning to decouple transport from GDP as they move to significant investments in rail over roads. The 'peak car' phenomenon may well therefore be helping us to imagine a future where wealth can continue to be created globally whilst reducing the use of cars, oil and their damaging global impacts.

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#### **References:**

Bradley, M. and Kenworthy, J. (2012) Congestion offsets: Transforming cities by letting buses compete. *World Transport Policy and Practice* 18 (4), 46-69.

Florida, R. (2010) *The Great Reset: How New Ways of Living and Working Drive Post-Crash Prosperity*. Harper Collins, New York.

Fulton, L., Lah, O. and Cuenot, F. (2013) Transport Pathways for Light Duty Vehicles: Towards a 2° Scenario. *Sustainability* 5, 1863-1874.

Kenworthy, J.R. and Laube, F.B. (1999) *An International Sourcebook of Automobile Dependence in Cities, 1960-1990*. University Press of Colorado, Niwot, Boulder, Colorado. 704 pp.

Kenworthy, J. and Laube, F. (2001) *The Millennium Cities Database for Sustainable Transport*. (CDROM Database) International Union (Association) of Public Transport, (UITP), Brussels and Institute for Sustainability and Technology Policy (ISTP), Perth.

Kooshian, C. and Winkelman, S. (2011) Recent trends in the travel intensity of the US economy. Center for Clean Air Policy, Washington DC. (available at: <http://www.cts.umn.edu/events/wstlur/symposium/2011/agenda/documents/presentations/2-kooshian.pdf> - accessed July 7, 2013)

Lave, C. (1992) Cars and demographics. *Access*, 1, 4-11.

Neff, J. W. (1996) Substitution rates between transit and automobile travel. Paper presented at the Association of American Geographers' Annual Meeting, Charlotte, NC, April.

Newman, P., Glazebrook, G. and Kenworthy, J. (2013) Peak Car and the Rise and Rise of Global Rail: Why this is happening and what it means for large and small cities, *Journal of Transportation Technologies* (accepted).

Newman, P.W.G. and Kenworthy, J.R. (1989) *Cities and automobile dependence: An international sourcebook*. Gower, Aldershot.

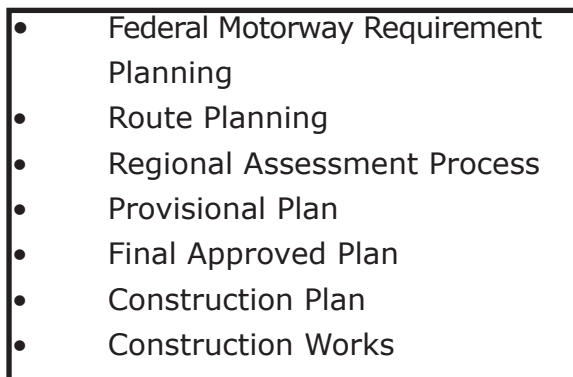
Newman, P. and Kenworthy, J. (1999) *Sustainability and cities: Overcoming automobile dependence*. Island Press, Washington DC.

Schafer, A. and Victor, D.G. (2000) The Future Mobility of the World Population, *Transportation Research, A* 34: 171-205.

## Road planning in Germany: an urgent need for reform

Helmut Holzapfel

Controversies and discussions regarding the construction of new roads and motorways are commonplace<sup>1</sup>. And articles and essays calling for earlier and more intensive involvement of regular citizens in this discussion process are also not in the least a rarity. Nonetheless it is necessary to think more basically about how a paradigm shift in this entire endeavour could occur - not only in how the planning is conducted but also in what is being planned, in the content of the planning as such.



**Fig. 1: Planning process for federal roads and motorways in Germany (Source: Lower Saxony)**

How is a motorway planned today in Germany? The process is more or less set by an assortment of laws and regulations. As shown in fig. 1 above, the process begins with the preparation of a requirement plan, proceeds with the determination of a route for the proposed motorway and the preparation of provisional and final plans in advance of the actual construction plan and construction works. Closer inspection of this approach makes it immediately apparent that important points are missing. Already in the 1970s, such planning processes were analysed and criticized by authors such as Claus Heidemann or Horst Rittel<sup>2</sup>. They were able to clearly show how the content of the planning depended on the input of particular interest groups; they demanded that additional important steps be incorporated in the process to counteract such influence and to improve the whole procedure. These included for example:

- The addition of a point for the **formulation of the goals to be achieved**

**by the plan** and a more exact **analysis of the reason for the commencement of the activity**

- Inclusion of an additional point for a genuinely realistic **overview of the measures to be taken together with the explicit formulation of alternatives to these measures**

- The addition of a point in which a **comprehensive projection of the effects of the planned measures on the real situation** would be undertaken

- The addition of a point for **evaluating the actual effects of the measures taken** in order to allow a subsequent review of what really occurred

Until now, almost none of these points have been incorporated in the planning of federal motorways in Germany. A systematic evaluation of the effects of already completed activities, for example, in the construction of autobahns that were supposed to generate an economic upturn in the new states of the former German Democratic Republic would have shown that many of the promised effects never in fact transpired.

To put it succinctly: The process used for federal motorway route planning in Germany has been out of date for a good 30 years when compared to scholarly advances in the field of planning science. It is urgently in need of revision. And this is not the worst of the story. Not only is the process which is used defective, the object that is considered in that process is the wrong one. The issue is not simply whether or not a given roadway should be constructed, but rather what will the effect be on the everyday lives and possibilities of real people. Where is that to be found? Where does it stand in the planning processes how far I have to walk to get to a shop? Where is the section that deals with how children in affected communities should reach their schools?

What "mobility" – a term that is commonly invoked by government ministers and never defined – could mean, namely good

<sup>1</sup> Reh (2013) criticised road building plans in Germany as unaffordable and sees the necessity of a change of paradigm, Kutter (2012) sees the ever growing speed of the motorcars in Germany as a lack of political intelligence.

<sup>2</sup> See, for example, Rittel (1973) or Heidemann (1979)

and convenient accessibility of the essential facilities of everyday life, is not represented in any form in the planning of traffic routes. Is such accessibility really significantly improved through the construction of new roads, or do the new roads simply cause essential businesses to “wander” further away from customers. Where in planning process do we find a consideration of the fact that new roads make freight shipments cheaper and easier and the resultant effects of this development on how we really live? Is our quality of life improved by the ever greater distances that products are driven around and transported or by the increasingly extreme divisions of labour in the production process that are promoted by cheaper transport? Or are these developments rather a disadvantage, as we experience, for example, with food products that are made available to us in such a manner that well informed and sustainable consumption of them is hardly possible?

Instead of considering questions of this sort, the debate in planning of new roads tends to focus on the effect of a motorway on the landscape. An example of this is the discussion surrounding the Waldschlößchen bridge in Dresden<sup>3</sup>. But here, too, the segregating effects of a new route as they play out in the everyday lives of the concerned citizens, as for example in a stroll through the city, do not come into consideration.

Instead – without any proof or any evaluation – a basic assumption is made that the facilitation of the accessibility of distant locations through the construction of a new motorway is of benefit to our local economies. In nearly every speech of every transport minister we hear that there is an urgent need to develop our long-distance transport infrastructure, particularly in our “export-orientated economy”. Is this really the case?

What effect does a new autobahn from Place-X to Place-Y really have on Germany’s exports? Our country is better connected and more accessible than any other country in Europe. The fact is that yet another new autobahn does not change the export situation in any meaningful way. And yet this argument is part of a standard formulation that has been internalized

as a dominant ideology in the minds of hundreds of employees in the trade associations and chambers of commerce in Germany. The prevailing belief is that it is always of benefit to the economy whenever and wherever a new road is built.

In more serious economic studies, it is meanwhile increasingly accepted that regional cooperation and regional networks have more significant economic and living-quality effects than further improvements in long-distance accessibility<sup>4</sup>. For the general public, local presence, safety and quality of life are more important factors than the construction of long-distance motorways in establishing perceivable benefits in the lives they lead. However, it is precisely these critical small-scale networks that are often unexpectedly destroyed or endangered by the construction of long-distance motorways. As construction of the new Autobahn A 44 from Kassel to Eisenach finally began, the proponents of the new route were astonished when they came to understand that the local Federal Road B 7 to Kassel would be closed and that the main street through the village of Kaufungen (a traffic-calmed thoroughfare) would be used as a detour route in the event of obstructions on the new autobahn.

In the existing planning process, no one makes an evaluation of the very considerable disturbances in local situations that new long-distance roads are sure to cause. These disturbances are not only experienced by wildlife but also by people. Furthermore, these disturbances also impact local economies, because improved long-distance accessibility entails most certainly that products will be delivered from ever greater distances and that larger units of production and distribution will be formed and gain dominance.

<sup>3</sup> This new motorway- bridge had a very severe impact on the historic view of the Elbe River valley in the vicinity of Dresden. Its construction was a matter of controversy and in the end resulted in the withdrawal of the UNESCO World Cultural heritage status for the area. On this point, see Körner/Holzappel/Bellin-Harder (2012)

<sup>4</sup> This became so clear with the oversized transport infrastructure in the newly included German states of the former German Democratic Republic that even leading government officials from Saxony (see Heinemann, 2010, p.188) supported expert assessments produced by economic researchers from Halle that argued that instead of investing in the long-distance infrastructure money could be better spent in the direct promotion of specific industrial locations.

When some 15 years ago a publication of the Wuppertal Institute<sup>5</sup> pointed out that a standard container of yoghurt contained ingredients from all over Europe, this fact provoked astonishment and dismay. Today, one can generally assume that food products do not only contain ingredients from throughout Europe, but that they are constituted on a global basis with impurities that are likewise of global dimension. Do these continual reductions in the cost of transport in global networks really result in an improvement in our products? Are these transport possibilities and the products they give rise to really of benefit in the everyday lives of normal people?

The everyday life of most people in Europe continues to take place today as before on a local basis in cities and towns. In the German motorway planning process, however, the local interests of the cities and towns are hardly represented at all. Every long-distance motorway leads to a locality and the traffic that is headed to this place must also be absorbed and coped with. In the 1960s in some countries an attempt was made to redesign cities so that such long-distance traffic could also pass along city streets without difficulty<sup>6</sup>. Wide ring roads and expressways were built, for example in England in Coventry and in Germany in Kassel. Today these cities serve as exemplary cases of how ill-advised transport planning can have a destructive effect on urban life.

The relevant issue is not only 'more' citizen involvement in the motorway planning process. The interests of the people in their local communities and in connection with their everyday lives must be represented and integrated into the planning process. In the place of a national plan for transport routes we should rather have a concept that considers the effects of newly planned roads on the everyday mobility of ordinary people. Citizen involvement in the planning process must have the effect that the interests of those persons living in cities and towns are considered more closely and effectively.

Tübingen, for example, in its French Quarter that has been redesigned by Andreas Feldtkeller is an example of a "city of short ways". There the locality as such has

been emphasised and mobility takes place principally on foot and by bicycle<sup>7</sup>. Without impinging on people's activities, long-distance mobility with the automobile has been significantly reduced.

What we need is a national mobility plan that seeks to develop and promote models of this sort. Instead of focusing on the construction of streets, such a mobility plan would rather seek to provide the public with good accessibility to businesses, doctors' practices and public facilities – without forcing the use of an automobile. An integrated view encompassing both residential development and transport planning must be the aim, which at the same time takes all types of transport into account (not only the automobile). Of particular relevance in such a plan would be the small-scale connections that occur on foot or by bicycle, as well as possibilities to have easy and comfortable access to effective modes of public transport. With these essential factors in place, it would then be possible to integrate long-distance road planning in the context of such a plan. We certainly need new planning processes, but just as much as we need new content in the plans that we fashion.

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<sup>5</sup> See on this point, Böge (1993).

<sup>6</sup> See Holzapfel, H. (2011, p. 51 ff.)

<sup>7</sup> Details about Tübingen see:

<http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/case-studies/tubingen-sudstadt>

## References:

Böge, S. (1993): Erfassung und Bewertung von Transportvorgängen: Die produktbezogene Transportkettenanalyse. In Läßle, D. (ed.) (1993): Güterverkehr, Logistik und Umwelt, Analysen und Konzepte zum interregionalen und städtischen Verkehr. Berlin, pp.132-159

Heidemann, Claus (mit Klaus J. Beckmann, Albrecht Rütth, Wilfried Ruske, Konrad Stöcker):

Thesen zum Ablauf der Verkehrsplanung. In: Schriftenreihe Stadt-Region-Land des Instituts für Stadtbauwesen Heft 43, pp. 1-35, Aachen 1977

Heinemann, Reinhard: Dokumentation und Bewertung der Infrastruktur-Investitionen Sachsens im Verkehrsbereich 1991 bis 2006, Dissertation, Universität Kassel 2010

Holzapfel, Helmut Urbanismus und Verkehr, Wiesbaden 2014 - forthcoming

Körner, Stefan; Holzapfel, Helmut und Berlin-Harder, Florian (eds.): Landschaft und Verkehr, Kassel 2012

Kutter, Eckhardt Ohne Verkehrspolitik gibt es keine Verkehrsgestaltung in: Verkehr und Technik, Heft 10, 2012, p. 363-367

Reh, Werner Steht ein Paradigmenwechsel in der Verkehrsinfrastrukturplanung des Bundes an? In: Holzapfel, Helmut und Protze K. (eds.) Verkehrsplanung und Landschaft, Kassel 2013, S. 11-26

Rittel, Horst.; Webber, Melvin: Dilemmas in a General Theory of Planning. In Policy Sciences 4, 1973, S. 155-169



## **Transport Beyond Oil: policy choices for a multi-modal future.**

Edited by John L. Rennie and Billy Fields  
Island Press, 2013  
ISBN 978-1-61091-041-5

Review by John Whitelegg

This book gets off to a bad start with a bold marketing plug for high speed rail (HSR). The first page of text (xi) talks up HSR as “an important step in this century’s most important transportation infrastructure program”. This is most unfortunate because it is a bold marketing plug without any evidence to substantiate the claim and because high speed rail is invariably a key component in generating extra travel at the same time as air travel and car travel continue to grow. HSR is central to the 21st century concept that mobility is good, moving very fast, very quickly is good and that tax dollars can be found for high profile vanity projects that cannot be found for more humble, routine and life enriching forms of walking, cycling and public transport in local communities. This is a perversion of sustainable mobility and sustainable transport and has no role to play in the restructuring of space and community life that is central to creating sustainable, zero carbon life styles. The alleged benefits of HSR (page xiii) are illusory. It is very expensive indeed and it does not make any meaningful contribution to a decarbonised transport system. The UK HSR project (known as HS2) is now estimated to cost upwards of £70 billion<sup>1</sup> and it will hardly make a dent in road transport or aviation as more of us than ever before travel very fast over very long distances very often.

For a book about a “multimodal future” it is bizarre that it nails its colours so strongly to the HSR mast so soon.

The book then gets better, though returns to HSR marketing at several points including a whole chapter (Chapter 8). There are nevertheless excellent contributions throughout the 16 chapters many of which point to the practicality and deliverability of a future without oil and one based on new concepts of urban design (chapter 13 by Rennie) and the importance of walking and cycling in combination with urban design. Sipe and Dodson (chapter 2) rehearse their

highly original and policy relevant analysis of oil vulnerability and the links between highly oil dependent suburbia and housing debt. Litman (chapter 3) rehearses important findings around the cheapness of fuel prices and reminds us that “vehicle fuel prices would have to increase by half or two thirds if production subsidies and favourable tax policies were eliminated”. This is, of course, only scratching the surface. The European Environment Agency calculated that the total annual transport subsidy across all EU 27 countries was 270-280 billion Euros<sup>2</sup>. Mobility is purchased at a truly staggering, eye watering cost and paid for by many millions of tax payers who can’t afford to travel and the price paid by car drivers, air travellers and the rich passengers who use HSR pays only a fraction of what it costs to make these options available. It is many years since Weizsaecker of the Wuppertal Institute said “prices should tell the ecological truth” and they don’t and mobility is under priced and that is why we consume a lot of it.

It is very gratifying to see a chapter on induced travel (chapter 4) which repeats and reinforces what surely must be the most self-evident reality in transport planning (supported by a great deal of evidence) and the most ignored by politicians, highway authorities and road builders. If we build more roads and increase road capacity we generate additional traffic. As the authors say “this has been observed since Western nations began to motorize and to construct major road facilities” (page 70). In an age of fiscal crisis and austerity (late 2013) it is especially irritating to see projects like the Lancaster Northern Bypass (Northern England) go ahead at a cost of 30,000 Euros per metre. The road is promoted as a congestion solution, amongst other things, and the induced traffic story reveals the harsh reality that it cannot do this and it will cost a great deal of money that could be utilised for better bus, rail, walking and cycling facilities.

1 The cost has already increased from £32 billion to £46 billion and the Mayor of London has said it will go up again to £70 billion

2 Source: European Environment Agency  
[http://www.eea.europa.eu/data-and-maps/indicators/transport-subsidies/term\\_2006\\_23\\_transport\\_subsidies\\_final\\_version.pdf](http://www.eea.europa.eu/data-and-maps/indicators/transport-subsidies/term_2006_23_transport_subsidies_final_version.pdf)



The book as a whole repeatedly mentions the importance of walking and cycling and its closely related subjects of densification and TODs (Transit Oriented Development). Chapter 6 by Bradley Lane is explicit about the need to make maximum use of walk, bike and public transport because they can “absorb displaced automobile travel” (page 109). It is a great pity that the many scattered references to walking and cycling are not pulled together anywhere with a strong message (perhaps as strong as the high speed rail message) that these carbon free modes can do what the book says on the cover and take us a long way “beyond oil”. This reviewer finds it very surprising indeed that there is, for example, no mention of Freiburg im Breisgau in Germany and its modal share characteristics (24% of all trips every day on foot, 28% by bike and 20% by public transport). If this could be replicated across every US city with more than 100,000 people it could make a substantial contribution to eliminating oil and creating much more liveable, exciting, safe and clean communities.

Dutta (chapter 7) returns to the walking, cycling and liveability theme. He also identifies the fallacy at the heart of the policy that promotes fuel efficiency. If vehicles become more fuel efficient, then driving is cheaper so people will drive around more. This is sometimes referred to as the “rebound effect”. He says rather provocatively but also with a great deal of insight “There is in this data a possible reversal of the efficiency case—rather than efficiency, engine inefficiency may hold the answer!” (page 130)

The chapter on High Speed Rail (Chapter 8) is remarkably free of analysis or up-to-date reflection on what is going on in the UK or France. In the UK severe doubts are now emerging on a daily basis around the very poor performance of HSR in reducing carbon, switching trips from car to HSR or aviation to HSR and the degree to which HSR is embedded in a solidly gung-ho economic growth expansion of all forms of long distance transport. The UK HSR project (HS2) is losing ground rapidly on cost projections, environmental damage, poor evidence in favour of job creation and older city regeneration and its regressive nature (it will be a rich man’s railway and

do very little for the bulk of the UK population). The UK debate has been summarised by the BBC (Note 3). The case for HS2 has also been damaged by developments in France and headlines like “France plans huge cuts in superfast trains” (Note 4)

The chapter on biodiesel and rail freight (chapter 9) quite rightly raises the question of the consequences of allocating crop growing land for human consumption to crops that feed cars, trucks and trains. There is an intense global discussion around food production and rising global population and the advisability of feeding people from things we grow on land rather than feeding trains, trucks and cars that will need more land to feed their appetites as bloated subsidies and cheap transport create higher levels of demand. This is the public policy context within which any discussion of biofuels has to be nested. It is understood that we can convert crops or crop residues into biofuel and that this can drive trains and trucks but do we want to carry on into the future with a rising total of tonne-kilometres of freight moving around uselessly? This is the problem discussed by Steffi Boege in the first issue of this journal in 1995 (The well travelled yoghurt pot, World Transport Policy and Practice, Volume 1, number 1, 1995). The chapter concludes by stating that “all these considerations point negatively to the question of how reliable biodiesel will be as a fuel source in the face of ramped up demand”. This is correct but it is a shame that a chapter on rail freight did not flag up the very many links that exist between cheap fuel, spatially dispersed production driven by labour price and taxation factors and the degree to which the transport system is expected to cope with the burdens of freight demand that are artificially generated by large subsidies and unnecessarily long supply chains. This is very well illustrated by the award winning yogurt study. These same points can be made about another freight chapter (chapter 11). Chapter 11 makes good points about eliminating subsidies and revisiting the user pays principle but like chapter 9 misses the

3 <http://www.bbc.co.uk/news/magazine-24159571>

4 “France plans huge cuts in superfast trains”. The Times, 29 June 2013

<http://www.thetimes.co.uk/tto/news/world/europe/article3803445.ece>

“useless transport” point and the scope for regionalising and reducing supplying chains by substituting “near” for “far”.

Chapter 10 explicitly addresses the role of walking and cycling in reducing oil dependence e.g. “walking and bicycling are the most cost-effective ways to curb a substantial portion of projected growth in vehicle miles travelled” (page 178). This is exactly the point made earlier in this review showing the Freiburg modal split data. The chapter shares some impressive statistics with its readers. In the USA 48% of all trips are less than 3 miles long and 27% are less than one mile and “72% of these short trips are taken by motor vehicle” (page 181). The potential for walking and cycling is enormous and under-exploited. This is a useful and quotable chapter but like many other discussions of walking and cycling it misses the importance of doing something about vehicular traffic i.e. reducing speed and volume if we want to create the space for walking and cycling to expand. Promoting so-called active transport (walking and cycling) is not just a matter of high quality traffic free routes and infrastructure, as important as this is. It must also tackle the dominance of the car and its impact on dividing communities, creating noise and smells and terrifying the potential walking or cycling person who thinks it is a good idea to abandon the car but worries that it is just too dangerous. It is still very rare for decision takers to grasp this nettle and set out to reduce traffic volume and speed as a fundamental contribution to making walking and cycling more attractive.

Peter Newman’s contribution (chapter 12) makes a centrally important link between things that are very often dealt with in separate boxes and so fail to harness synergy. He links technology, global climate change, governance, peak oil, city planning, urban economics and urban cultural change. In the view of this reviewer he then misses the main point by saying that these converging trends point to “a new kind of city building based around renewables and electric transport” (page 204). This is wrong. Surely we need cities that are human scale, conserving of energy, supportive of thriving communities and

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maximising walking and cycling. We have the Freiburg example quoted above with over 50% of all trips by walk and bike so what is wrong with aiming for the 75% city (75% of all trips on foot and by bike) and the rest can be electric with the electricity sourced from PVs, wind turbines, HEP etc)?

Newman has done more than most to promote a city structure that supports walking and cycling so maybe he would support the 75% city. His reference to Pedestrian Oriented Development (PODs) and Green Oriented Development (GODs) on page 205 and Transit Oriented Developments (TODs) on page 213 is timely and important and is covered in more detail in his other publications.

On a minor note his reference to Jan Gehl transforming central London (page 213) is incorrect. Central London is a car-dominated noisy mess and is not transformed at all. It is a monument to the UK’s preference for grandiose sounding policy documents that say the right things and the same people who sign off the splendid documents then go on to deliver absolutely dreadful results on the ground. If readers think this is too severe please walk along Euston Rd from the Eurostar terminal to Euston Station or down Tottenham Court Rd or down Gower St or do a full north south walking trip from Euston to the House of Commons and then tell us all what you think. The area in front of the House of Commons is a noisy, smelly, traffic-infested mess in what must be one of the most prestigious public spaces in Britain. This is not Gehl’s fault or Newman’s fault and Jan Gehl’s reports are wonderful and tell us exactly what we should do to improve the urban realm and create high quality public space. I will leave it to others to comment on what has actually happened to improve things in Perth and Melbourne following on Gehl’s consultancy reports.

Newman hits the bull’s eye on page 214/215 when he highlights the importance of reducing travel demand through urban design. Yes, we need this now. His enthusiasm for Travel Smart (page 215) is less impressive. We have had many Travel Smart projects in the UK and they usually co-exist with many other projects that are designed to do the opposite i.e.

increase car use. We routinely reduce car parking charges, build new houses that build in car dependency e.g. a scheme in a small town (Grange over Sands) in Cumbria where 42 new homes have 121 new car parking spaces and zero bike parking, grossly inadequate bus services and narrow roads that make walking and cycling very unattractive indeed. Perhaps the planners who advocate Travel Smart will tell us how 121 car parking spaces for 42 new homes will encourage modal split towards walk and cycle? Travel Smart is a good tool but in the UK is swamped by its parasitic partner "Travel Unsmart."

John Rennie fleshes out the role of transit-oriented development (TOD) in chapter 13. His detailed analysis of 39 US cities is an extremely valuable contribution to the TOD debate and the degree to which we can expect reductions in car use and oil use in TODs. Essentially Rennie is exploring a "what-if" scenario which is what is needed if we are to communicate the significance and practicality of an oil-free future. He is forecasting the impacts of TODs on reducing oil dependence among the next 100 million Americans by 2050. His scenario shows that the TOD approach performs much better than a business as usual (BAU) approach (suburbs, low density, low level of bike, walk and public transport use) so it is now up to politicians and decision takers to move beyond BAU and embrace a new reality.

Jeff Kenworthy (chapter 14) applies his enormous talents and global data base experience to the central issue of urban mobility and land use in cities. His analysis of transport and energy issues in 33 cities provides a solid evidence base for reflecting on unintelligent trends over recent decades and the ways that mobility, land use and energy interactions can be put on a much more intelligent trajectory in the future. Unsurprisingly density emerges as a key variable in the "getting it right" mix and he reports on generally positive trends in this variable across the 33 cities. The author quite rightly identifies the importance of powerful underlying factors when he argues that "measures are needed to curb the still-growing (but slowing) car use per person in most

cities" (page 261) and he goes on to list "right prices", congestion charging and certificates of entitlement for car purchase in Singapore, Beijing and Shanghai (page 261). His concluding remarks about the rebound effect.. "the evidence that technological changes that produce more fuel efficient cars can easily be eaten up by increases in car use" (page 262) should be written in large letters in every office inhabited by a senior politician or transport official. The same offices need a second warning banner about "electro-mobility" e.g. plug in hybrid cars of various kinds "Substituting the current massive demand for private mobility based on liquid fossil fuels is not possible or desirable for many reasons e.g. space demands". In addition to the space demand point this reviewer is reminded of a cartoon that appeared many years ago (possibly in bad taste) showing a dying pedestrian underneath a car in a city street saying "thank goodness I was hit by an environmentally friendly vehicle and not one powered by fossil fuels".

Chapter 15 marks a welcome return to non motorised transport and reviews the US Nonmotorised Transportation Pilot Program (NTPP). The two authors, Fields and Hull, make some very strong points that echo this reviewer's comments above about "Travel Unsmart". Throughout the NTPP policies that support low density car-dominated scenarios continued to be implemented (page 206) and regulations and subsidies, pricing and street design all fostered maximum energy use and minimum efficiency. The "Four D" conceptual framework of density, diversity, design and proximity of destinations (page 268) gives us all a strong framework for working out how we went wrong and how to make things right and his critique of planning and its failures (page 286) is spot on and applies a fortiori in the UK.

The final chapter (Chapter 16) attempts the very difficult task of exploring policy barriers and how they can be overcome. Those of us working in sustainable transport invariably end up in this hard place and chapter 16 is no exception. The case for a major paradigm shift away from oil, vehicles, massive subsidies and unintelligent spatial planning is overwhelmingly strong, clear and proven. The likelihood

of this shift being made is very low and the authors give us many depressing references to US federal policy and the reduction of funds for walking and cycling projects and the boosting of funds for highways and policy changes that would make it easier to recover oil from wilderness areas. The contrast between what is happening and what we know should happen is dramatic. So how do we change all this bearing in mind that we have failed in the UK and more generally in the European Union so any criticism of the US and its massive 70% take of global oil production (page 295) has to be moderated by some self awareness and some evidence that we are putting our own house in order?

Sadly the authors do not provide any guidance on how we can produce or accelerate the much need paradigm shift and this reviewer has also failed on this test so we are all still waiting for the breakthrough that is long overdue and that will eventually deliver a zero carbon, oil free, child-friendly transportation future. Finally, there is a major omission in a book with such an attractive title. The title is "Transport Beyond Oil" and it is remarkable that a book with such an attractive title does not look at major policy and practice examples where something like this is happening or has happened somewhere on the planet. Cuba went through its "special period" and adapted to a situation of much reduced oil. How was this done, what is involved in adaption, who gained and who lost? Did it work well? What can we learn from it? It is not necessary to follow the Cuban example but in policy shift terms we do need to understand how other shifts have been made in the past and how this was done. In the same vein Sweden has an oil-free plan<sup>5</sup> and this merits some attention and it is a great shame that it is ignored in this book. A very sophisticated car-loving nation state, the home of Volvo and Scania, has decided to become oil free and this surely merits some serious attention and discussion in this book and it is not there. The Swedish oil-free plan has now been followed up by a government commission on fossil-free road transport<sup>6</sup> and this has also been ignored in this book. Why?

5 "Making Sweden an oil free society"  
<http://www.government.se/content/1/c6/06/70/96/7f04f437.pdf>

6 The Swedish Commission on fossil-free road transport  
<http://www.sou.gov.se/sb/d/17384>