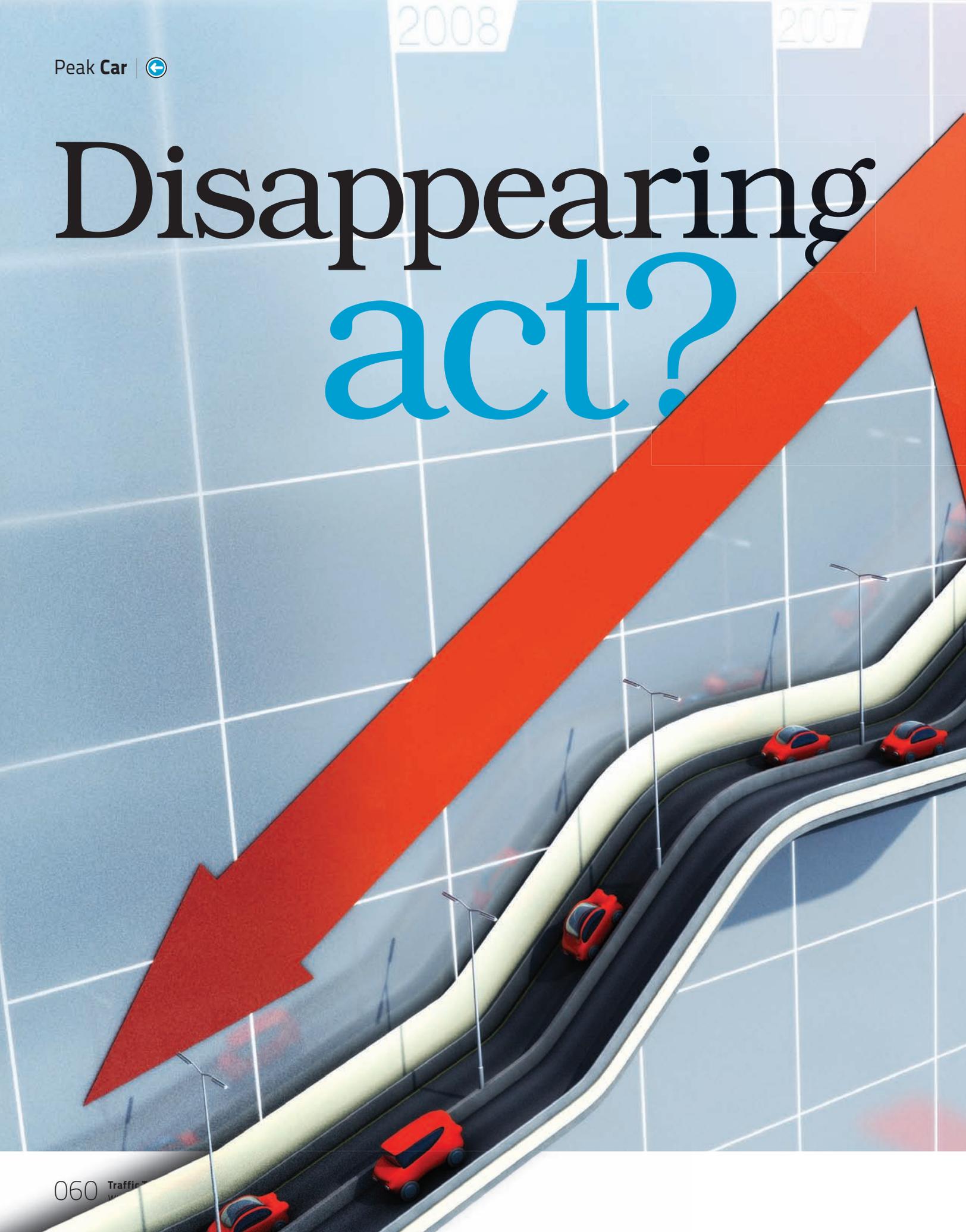


2008

2007

# Disappearing act?





Statistical VMT evidence from some of the world's most congested countries clearly points to declining car use. **Bern Grush** analyzes whether this is a short-term blip or a sign of things to come

Illustration courtesy of Magictorch

**T**he term 'peak car' has appeared increasingly in the 2011 media, purporting to describe a permanent cap and gradual decline in the use of the automobile in the developed world. This differs critically from a transient vehicle-miles traveled (VMT) dip or stagnation due to economic downturn and from a plateau due to saturation or demographic trends. There is clear evidence of a VMT dip in the USA, the UK and Australia between 2004-2008 – and possibly earlier in some interpretations of the data. This trend has likely shown up in other countries as well. There are several interpretations of such data that prematurely point to a long-term VMT plateau.

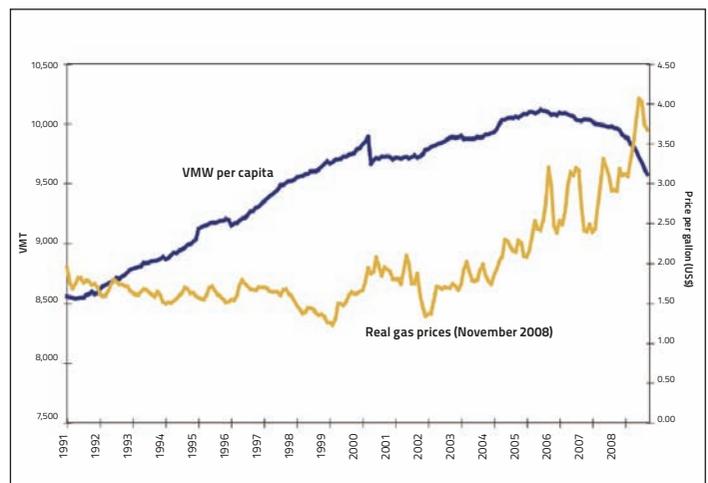
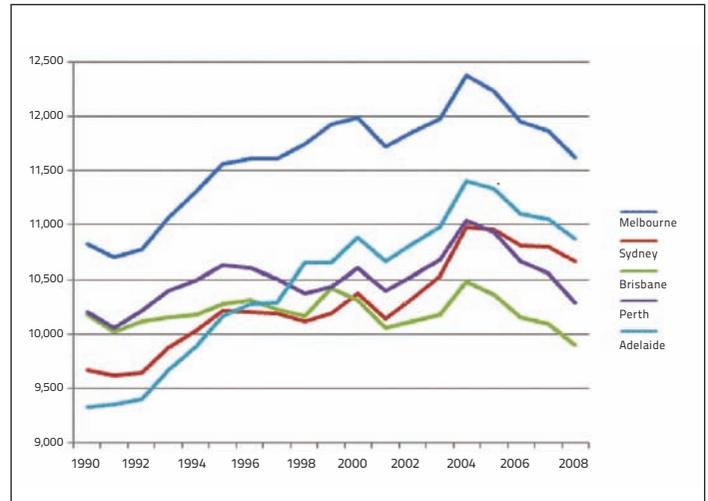
Peak car is different and more ominous, and the arguments for this interpretation are tentative. The data horizon is too short to predict the end of a major technology and there are some underlying anthropological factors that demand that 'automobility' stay with us for at least the current century. The expression, 'automobility' is used in this instance in place of 'the car', as in all likelihood the car, as we know it, will not last beyond 2035 or 2040. It will not, however, be replaced to the extent some may wish by bus, bike or train. Rather, intelligent, self-driving technology that we have not yet invented will retain a major role in surface transportation, and this is likely to increase VMT.

My prediction is based first on the divergent pace of innovation for automobility systems as compared with transit systems, and secondly the unworkability and undesirability of governments creating the policies needed for a complete transition. It is also based on a bias toward autonomous, powered vehicles in human settlement design and organization, and lastly nearly instinctive and universal anthropological factors relating to travel budgets (time and money).

How we interpret faltering VMT data in countries where this occurs informs our response to problems such as transportation funding, demand management, and global warming. To convince ourselves that VMT is in permanent decline is to risk justifying continued abdication of our responsibilities for solving our surface transportation problems and simply let road and highway funding and demand management 'sort themselves out'. We also risk gloating prematurely over the effects that global-warming messaging may be having. We should be cautious.

Let's look at the data through the lens of each of these three interpretations...

(Figure 1, top) **Estimated car passenger km per capita (FY 1990-2008).** From an online document, *A Sustainable Population Strategy for Australia: Submission by the Bus Industry Confederation* (Figure 2, bottom) From *The Road... Less Traveled: Analysis of Vehicles Miles Traveled Trends in the USA*, Puentes and Tomer, Brookings, December 2008



Source: Traffic Volume Trends and Energy Information Administration

### VMT dip?

The evidence that something significant occurred cannot be set aside. The decline shown in Australia from 2004 to 2008 (Figure 1) has been interpreted as a permanent trend rather than transient in a 2011 paper by Newman and Kenworthy called, *Peak Car Use: Understanding the Demise of Automobile Dependence*.

The US numbers are similar to the Australian numbers, showing a slowdown then a decline in per-capita VMT from 2004 to 2008 (Figure 2). This Brookings study, possibly the first in-depth examination of the decline in US VMT, concluded: "...reduced driving will only intensify ... governments' need to seriously reconsider ... reliance on the gas tax to fund surface transportation. Environmentally, stalled or reduced driving should offer a positive development in the creation of a more environmentally sustainable transportation network. Developmentally, reduced driving demand will instinctively lead to more demand for development less reliant on the automobile and could signal a continued reinvention of this nation's cities and inner suburbs."

However, a little over two years after the Brookings study was released, an FHWA press release from March 2011, *The Nation's Highway Traffic Reaches Highest Level Since 2007*, contradicted this conclusion, "... underscoring the "need for continued investment in roads, bridges and tunnels. ... Americans drove three trillion miles in 2010, the most vehicle miles traveled since 2007 and the third-

Fuel demand is relatively inelastic if prices creep slowly





highest ever recorded..."<sup>[1]</sup>

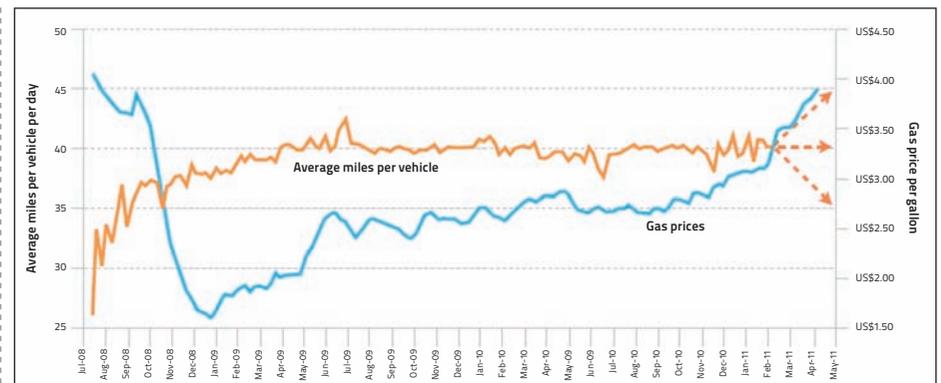
A graph compiled by Progressive Insurance (Figure 3) plotting VMT/vehicle-day in monthly averages since mid-2008 shows a resurgence in VMT and could be seen as evidence that the 2004-08 VMT decline was transient. I do not know if Australia experienced the same VMT recovery as the USA.

Note that Figure 1 and Figure 2 show miles per capita, making it difficult to align numbers in these two datasets with those in Figure 3 (but we are only considering trends). There appears to have been a strong recovery to 40 VMT/VD (from 26) during the nine months commencing with July 2008. Quite a jump, as gas prices tumbled to US\$1.75 from over US\$4.00. Thereafter VMT remained steady while gas prices have slowly crept up. This view of the data says fuel demand is relatively inelastic if prices creep slowly. Unfortunately, the VMT data was not available for Figure 3 after the March 2011 fuel price spurt.

### VMT plateau?

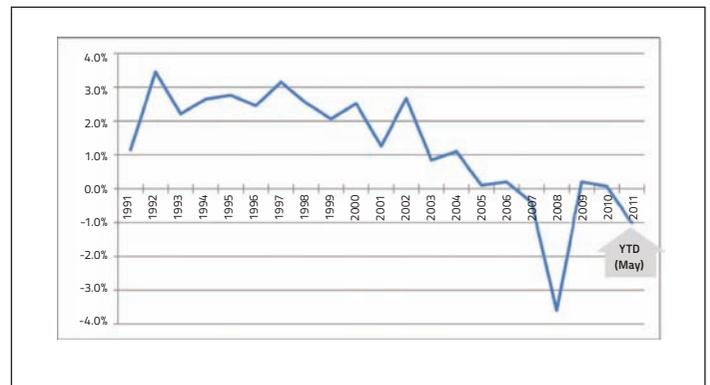
Clearly there has been a sustained dip that is easily pinned on economic variability and political events since the dot-com crash and, more recently, on fuel prices. As these are the most significant correlates in the data, might they be hiding a longer, permanent trend, in spite of the VMT uptick announced in the 2011 FHWA press release and that Figure 3 seems to contradict the analysis of peak car based on 2004-08 data used by Puentes-Tomer at Brookings (Figure 1) and Newman-Kenworthy at CUSP (Figure 2)?

Considering this, I used the FHWA source data to compile a plot of percentage differences in US VMT year-over-year (Figure 4). There is a slowdown in the annual VMT increases that appears to start at the dot-com crash, nudged down again after 9/11, rallied a bit at the front-end of the Iraq War, continued to slow until it finally went negative in 2007 over 2006, and lost a further 3.5% in 2008 over 2007 through the



Source: USDOT, Federal Highway Administration; Progressive

(Figure 3, above) Miles per vehicle day from 2008 to early 2011 (Figure 4, right) Shows percentage difference in US VMT year-over-year (everything above 0% is growth and below that is decline)





The daily commute influences everything from where we live to how we travel

continue to grow whereas transit, biking, and walking are unlikely to show similar advances. This would lead to a further increase in congestion and put yet more pressure on demand management policies. Upticks in fuel prices may create dips, and help sustain a lengthy plateau, but they predict an eventual resurgence in VMT.

The growth of urbanism implies aggregation to higher densities, fewer VMT and increased transit use. This appears in some data sets to be gradually taking hold and would likely be a very long-term trend. But how deep can it go? Urban land prices will climb, which would admit only trendsetters to return to the city. Suburbs will become the new slums. Phil Hayward, an independent researcher in New Zealand, commented, "It will be impossible for more than a small minority of people to relocate into dense urban locations before the rising land prices at those locations 'price out' those not already there." I predict growth in urbanism will help sustain a long, shallow plateau, but will not have a permanent effect.

The aging of cities implies that as the population of a city gets older, it drives less. This is from the Australian study – a country with a pronounced baby-boom population. This would contribute to a 15-20-year dip or plateau as this cohort passes through. It might exaggerate that dip, but not indicate a sustainable peak.

subprime crisis. So the studies showing a 2004-2008 decline are not overstating those four years. However, there was a sharp recovery in 2009 over 2008 that was sustained in 2010. This was followed by a new decline in the first five months of 2011 – (possibly) negative again for the third time in four years – as gas prices climbed.

For whatever combination of reasons, VMT is declining and it is not a minor dip. Will this turn into a plateau in a few years as these factors settle out, or will it continue to decline until the "demise of automobile dependence" as Newman and Kenworthy suggest?

Many of the reasons offered by the studies depend on underlying trends to defend at least a long-term plateau – if not a new, permanent decline – but none is enough to sustain a permanent decline.

Fuel cost increases are no longer seen as occasional political blips, but as a permanent bumpy ride as oil-extraction continues to be more costly. While no-one thinks pump prices will drop and stabilize, I assert that peak oil will eventually lead to more cars and more VMT, since a rise in value for energy for automobility would drive sustainable power innovation, as well as smarter, smaller, safer and swifter cars – i.e. the qualitative advantages of cars will



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The growth of public transport does not necessarily imply a reduction in VMT. Historically, VMT growth outstrips growth in Transit Miles Traveled, but this may be changing. In an article in the *New York Times Magazine* (January 2011) the Center for Clean Air Policy's Steve Winkleman pointed to a 38% growth in US transit ridership since 1995 – versus a 14% growth in population and 21% growth in highway VMT. He also noted that by 2008 teleworking would contribute (only) about 1% of the drop in VMT. This would also contribute to a plateau, but would have to be sustainable to maintain that plateau. The kind of public systems we have now (large vehicles, fixed routes) has too many limitations and entrenched inefficiencies to cause the demise of automobile dependency.

Fundamental demographic shifts are also in play. Winkleman's research also points to other causes for VMT saturation, such as the growth of knowledge- and service-oriented sectors, full penetration of women in the workforce, increasing percentage of households without children, and growth in minorities and immigrants that typically generate fewer VMT.

### VMT peak?

All of these factors would contribute to a long plateau and would exaggerate short-term dips as they all put more people on the modal decision boundary between automobile and non-automobile in times of rising fuel costs, new-car purchases, and moving domiciles. But the question now is whether a long plateau will end in a slow return to former levels, or would the decline signal an absolute peak?

Automobility will indeed peak at some point in humanity's future. Whether that has already happened in some countries needs to wait for more data. Certainly it has not happened worldwide. As and when this peak unrolls across the economic development gradient of the countries in the developed world it will be followed by a plateau of automobility – but never its demise. What will that plateau look like? How long will it last? And will a new post-oil peak arise in 20 or 30 years? I predict the plateau will be modest at best – in the range of 80-100% of current volumes, that it will last 10 to 20 years, and will be followed by a post-oil peak significantly surpassing current VMT levels, but we will have technology to mitigate its congestion effects.

The travel behavior models discovered by J. C. Tanner in the 1960s, developed by Y. Zahavi in the 1970s and elaborated by C. Marchetti in the 1990s teach us about two travel invariants, or 'Zahavi budgets', that limit natural human time and money expenditures for mobility. Humans

Commuters aim to keep their daily journeys to 'around an hour'



I predict the plateau will be modest at best – in the range of 80-100% of current volumes, that it will last 20 years and will be followed by a post-oil peak

intuitively seek to limit daily travel time to 'about an hour'. It predicts the radius of pedestrian cities would be about 2.5km and the car expands that to 20-25km. Cities that are bigger than that either tend toward having people live and work within the radius of a one-hour round trip or have people spending more than their instinctive time budget on travel. This correlates well with our anxiety over congestion study reports of 'average commute times' of 75 or 90 minutes (or more) in some larger cities. It also influences where individuals locate, which modes they will choose, and which jobs are 'within reach'. Most importantly, it selects for the automobile where there is not transit that is within the time budget, because in most door-to-door circumstances the automobile is considerably faster than public transportation. This time budget tells us why our many attempts to reduce driving will continue to fail, and why a new peak will materialize, post-oil.

The automobile also leaves the Zahavi radius whole – the car can reach almost anywhere within a radius. Job and location reach via public transportation is more fragmentary. The area that can be accessed within the Zahavi radius functionally defines a city. As the automobile adds so significantly to that radius, this forms a significant barrier to the 'demise of automobile dependence'.

Interpreting the fall or rise of VMT as transient or permanent is difficult on a short horizon, as there are many immediate causes as well as long-term underlying causes. It is fair to speculate that VMT is close or at saturation in any country that has car ownership at 0.6 or 0.7 per capita for the kind of cars we have now. Hence, during harder economic times or upswings in fuel prices, VMT may fall and underlying demographic trends can be expected to sustain plateaus. But the versatility of automobility, its Zahavi reach, and its economic power all indicate that once current economic and demographic trends play out VMT will recover. ○

### References

<sup>[1]</sup> [www.fhwa.dot.gov/pressroom/fhwa1103.htm](http://www.fhwa.dot.gov/pressroom/fhwa1103.htm)

