

NEW MOBILITY

BEYOND THE CAR ERA

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Change is in the air

This book is about the coming changes in our mobility that require a new way of thinking about the subject. By 'changes' I don't mean futuristic cars and planes. The main transport technologies in use today came out of the industrial revolution and were invented over a hundred years ago. Since then they've improved, of course, but in essence today's vehicles are no different from those used a century ago. Even manned spaceflight goes back more than fifty years. Society has already been adapting to these technological achievements for a hundred years now. It seems our adoption of new transport options proceeds far slower than evolution of the technologies themselves.

In *New Mobility—Beyond the car era* I take a look at the strong growth of mobility over the past century, at the ever greater distances we travel, at cars, public transport and cycling, at the economic significance of mobility, at metropolises and at airports. By considering the forces and 'laws' that govern mobility, a picture emerges of the surprising changes that lie ahead of us. How will these driving forces affect mobility trends over the coming decades?

Since 1950 car transport has increased tenfold – and now accounts for three-quarters of all passenger mobility

In Western-Europe¹ it was around 1950 that cars took over from public transport as the most frequently used means of transport. Since then the volume of car traffic has increased tenfold, while cycling and public transport have seen scarcely any growth. Private car transport now accounts for three-quarters of all passenger mobility, making it by far the predominant means of transport.

1 The focus of this book is on Western Europe and, more generally, on areas with a population density and level of urbanization similar to those of European countries and with mature motorway grid. However, the driving forces behind mobility, as discussed in this book, apply universally and are useful for developing mobility and infrastructure policies in any extensive urban area.



There have been repeated calls for something to be done about the unending growth of car transport, particularly in the final quarter of last century, as public transport and cycling lost ever more of their market share. A reduction in car traffic was seen as imperative, to tackle acid rain, to maintain or improve the quality of life in both urban and rural areas, and to address climate change. At the time a range of alternative scenarios were drawn up, some of which assumed breaches in historical trends. Governments proposed all manner of policy measures, suggesting your car could manage a day without you. Despite all the good intentions we can now conclude in hindsight that road traffic has continued to grow unabated. Simple extrapolation of trends proved the best way of predicting the future.² What happened in reality, in other words, was business-as-usual. The alternative scenarios of yesteryear have proved no more than wishful thinking.

In 1948 the 500th Volkswagen Beetle was sold in the Netherlands.

² Apart from growing traffic congestion, which has been systematically underestimated. See the chapter *A new compass for mobility policy*.

Car traffic growth is coming to an end

This is all set to change. Growth of car traffic is almost over, and in major cities there's a new upsurge in travel by mass transit³ and cycling. These changes are not the result of any kind of government policy, but are driven by the factors governing mobility trends. The coming decades will see trends emerging that differ from those of the past half century. In this book I describe what will be changing and how we can take advantage of these trends.

It's not just mobility trends themselves that will be changing. It's time to rethink the current 'mobility narrative', too, for it's out of step with the changes ahead. Given the deep-seated nature of the old narrative, we're all too easily lulled into thinking that historical trends will simply continue. So we need to adopt a new mindset on the issues.

People construct 'stories' reflecting the reality around them. Their big advantage is that they help reduce the complexity of the world and make it easier to comprehend. We introduce our own explanations – perceived causes and effects – that allow us to remember and communicate these stories better than isolated facts. If we all believe in the same stories, the same narratives, they become part of our culture. And that holds for the outmoded mobility narrative, too.

The big drawback of narratives is that they're often taken for reality and – even more importantly – that facts and arguments that don't fit the generally accepted narrative fail to be seen. And that leads, largely unconsciously, to tunnel vision. Facts not in line with the familiar narrative make us uncomfortable and, partly for that reason, receive little attention in the media. More than anything else, we like to hear what we already know.⁴

3 The American term 'mass transit' expresses best what we're concerned with here: transporting masses of people in a short space of time, at speed, and with minimum space requirements, as with underground rail and other forms of light rail. 'Public transport' is a broader term encompassing buses, with their social function, and intercity rail over longer distances.

4 This passage on 'narrative' is a very brief summary of what behavioural psychologists and communication experts often refer to as 'the narrative fallacy' and 'confirmation bias'. See, for example: *The Black Swan* (2007) by Nassim Taleb, *Nudge* (2007) by Thaler and Sunstein and *Thinking Fast and Slow* (2011) by Daniel Kahneman. The transition to a 'new narrative' is also known as a paradigm shift.

From the old to the new narrative

To get to grips with the coming changes in the realm of mobility, we must free ourselves of the old mobility narrative. Above all else, this narrative revolves around new road construction and congestion relief, because of the perceived benefits of such action for the economy. For fifty years now, governments have been trying unsuccessfully to ease congestion. And they continue to do so today, faithfully adhering to the logic of the old narrative. Another element of that narrative is the futile contradiction between private cars and public transport. Those on the political right want more funding for roads, those on the left for public transport. For decades now, dogmatism on both sides has led to an impasse in public opinion-forming, leaving the question of how accessibility can be truly improved out of the equation.

Today, the old mobility narrative is too much at odds with reality to be of help any more. Outmoded habits of thought are holding us back from elaborating policies that really work. In this book I provide the outlines of a new narrative on mobility and take a fresh look at how we can achieve economic prosperity and help social values flourish.

A new perspective on mobility is crucially important. It will mean an end to taxpayers' money being wasted on inefficient mobility policies. How can maximum accessibility be achieved per euro investment? What mobility policies will contribute most to a thriving economy? And how can mobility policies help prevent urban sprawl disfiguring the landscape and indeed help improve the quality of the countryside? It is to questions like these that I will be giving answers in line with the times.

And so in *New Mobility* I hope to offer readers new insights. I do so in the knowledge that improved insight does not always lead to change. In his fascinating book *The Black Swan*, Nassim Taleb puts it succinctly: "The awareness of a problem does not mean much – particularly when you have special interests and self-serving institutions in play". The question is whether the lobbyists and institutions that Taleb is referring to are ready for major changes. The fact that reality's already changing and that ideas and institutions will therefore inevitably change as well would suggest an affirmative answer. On the other hand, it's an inescapable fact that substantive underpinning of mobility policy has fallen to a low level and that facts and arguments have largely lost out to entrenched interests. It therefore remains to be seen whether this book will help guide us through the changes that are already unfolding. This as yet unanswered question does not restrain me, though, from taking pleasure in offering new insights.

The car system is now mature

The car is now approaching the end of its meteoric rise to power, at least in the affluent nations of the west. It took a century, but today everyone takes cars for granted, most countries in Western-Europe have a fully-fledged motorway grid and virtually everyone can afford a car. Even today's pensioners grew up with cars. Over the years we've adapted our spatial behaviour to the new potential offered by cars. Instead of corner shops we now have supermarkets. Because car speeds have on average not increased in the past fifteen years, though, this upscaling of our lives is coming to a halt. In a similar vein, the number of car trips made daily has not risen for many years. The car system has thus grown to maturity.

Most of today's mobility growth is now due to air travel, which for twenty years has been the fastest growing mode of transport and will, within a few decades, overtake cars. At present that may be hard to imagine, but the facts and forces underlying mobility trends point to this shifting reality. And so in this chapter I describe how our desire to get around ever faster is the main driving force behind the vigorous growth of automobility. The same driving force steered the historical development of mobility and is now driving the pronounced growth of air travel.

The car is now approaching the end of its meteoric rise to power

It was in the space of a mere thirty years that the key innovations in transport technology took place: the combustion engine, the train, the electric motor, the car, asphalt and the aircraft, all were developed between 1880 and 1910. Now, over a hundred years on, virtually all our transport still hinges on these technological inventions.⁵ An important next step was introduction of the conveyor belt system and industrial mass production, allowing the cost of the legendary Model T Ford to be cut by two-thirds within a mere ten years, for example. Costs continued to fall, and combined with the rising prosperity this led to the upsurge in private car use after the Second World War. Since 1960 car ownership has risen tenfold, from only 50 cars per 1000 inhabitants to 500 today.⁶ In the street with terraced houses where I grew up I can remember three people having a car. Now there's at least one outside every front door.

5 Later innovations in transport technology are the jet engine (1940), the shipping container (1960) and manned spacecraft (1960). Even these are already over fifty years old.

6 In the EU-28 there were on average 491 cars per 1000 inhabitants in 2013.

In pursuit of speed

What's behind the car's enormous success? Affordability and comfort obviously play a major role, but the single most important contributing factor is its speed. Speed, after all, is what it's about when it comes to mobility. From door to door, the car's virtually always faster than other modes of transport. Only on the shortest trips is it faster to cycle – particularly in towns and cities, where car speeds are generally slow. For longer distances within urban districts and for links between city centres, the train may be quicker door-to-door. But public transport is very rarely faster than today's car journeys and on most trips public transport takes at least twice as long.⁷ The high speed door-to-door is the main reason why cars account for three-quarters of our transport movements.⁸

What we gain from increased speed is that we travel further. It's not time that we gain, but distance.

The huge importance of speed emerges clearly from transport history, which can be regarded as a continual decline in 'friction of distance'. Until the industrial revolution travel speeds were relatively slow and had not increased for many centuries: 5 km/hour on foot, and 8 to 15 km/hour by horse and carriage, horse-drawn barge and sailing ship. At 30 km/hour the steam train was a major step forward and signalled a fairly abrupt end for the slower horse-drawn barge. Electric trains were even faster, and particularly after the construction of motorways from the 1960s onwards the speed of the car also shot up. With the emergence of buses and cars, the horse and carriage faded into history. Today, the car takes us from door to door at an average speed of 40 to 45 km/hour.⁹ At around 250 km/hour, air travel is a lot faster still, despite the often long waiting times at airports. Over the past two centuries we've thus seen a shift to ever faster modes of transport. It is this historical pattern that predicts a bright future for air transport.

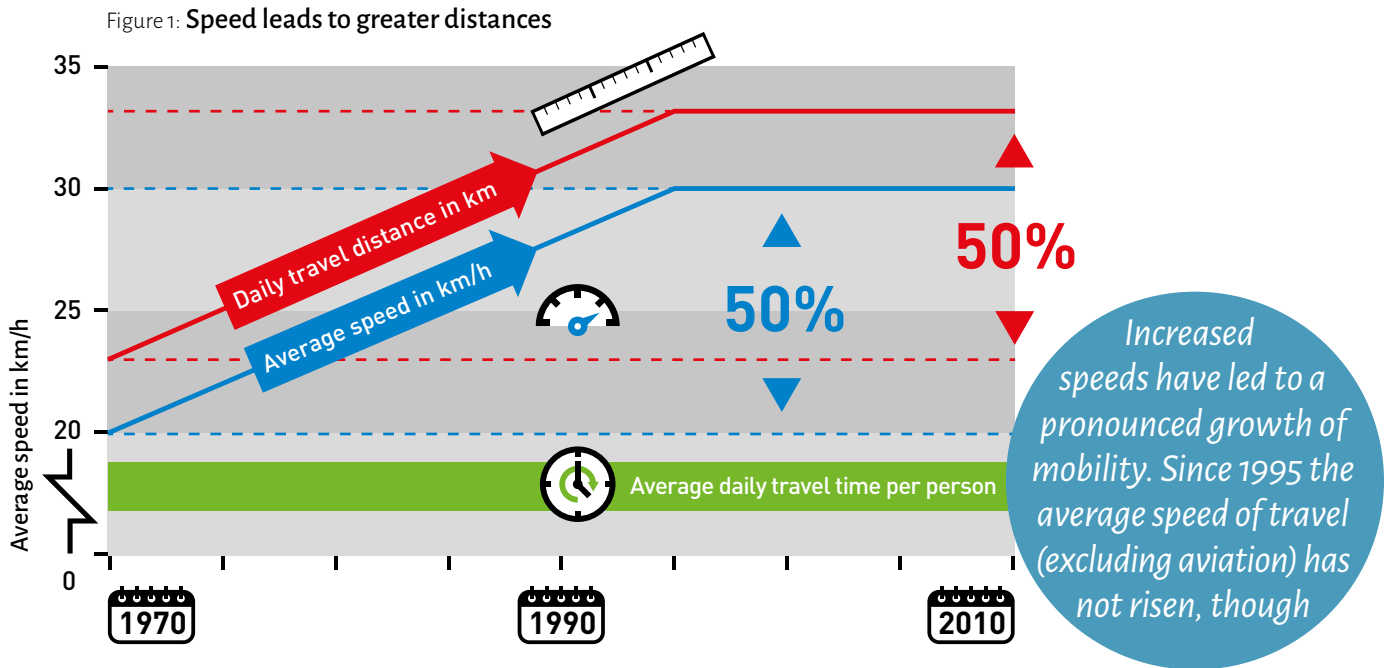
7 On only 0.01% of trips is public transport faster than driving by car and on 88% of trips public transport takes over twice as long. Data for the Netherlands.

8 Air travel, wrongly, is still not included in most transport and mobility statistics. If it is included, the share of car travel is over 65%.

9 Estimates for average car speed: England 40 km/h (2010), Germany 42 km/h (2008), Switzerland 39 km/h (2010), the Netherlands 45 km/h (since 1995). In the absence of road congestion cars would drive 1 km/h faster on average (Dutch data). The differences between European countries are due mainly to the proportion of people living in large cities, where car speeds are low, and to the amount of car mileage on motorways, where car speeds are high.

Ever longer travel distances

Surprisingly enough, the fact that speed is the strongest driver of our mobility doesn't mean we've saved any time, because what we gain from greater speed is that we travel further. On average, large groups of people prove to travel a constant amount of time per day: 1.1 hours per person per day.¹⁰



So higher speeds result in longer travel distances and thus unavoidably in increased mobility (see 'Constant travel times' on page 13). In the 25 years from 1970 to 1995 there was a 50% increase in mobility, but no parallel growth in the time spent travelling.¹¹ It was the growth in speed that enabled growth in mobility. Since the end of last century there has been no further increase in speed and consequently no increase in the average distance people travel. And so average per capita mobility – excluding air travel – has ceased to grow.

10 Measured values for the average time spent travelling lie between 0.8 and 1.5 hours per person a day. Surprisingly, the time spent on travel is entirely independent of income level, era and culture. Despite the empirical spread, it's clear that over the longer term mobility growth is due above all to increased speeds and not to an increase in the time spent travelling. Further explanation and statistical underpinning can be found in *The Attractiveness of Car Use* (2012).

11 Data for Great Britain: *National Travel Survey*, multiple years.



Constant travel times

One fascinating and significant 'law' of mobility is the unchanging length of daily travel time. On average, people in a city or nation prove to devote about 1.1 hours a day to travel. This average depends not on income levels, was as true in previous centuries as it is today, and holds in African villages and American cities alike. These constant travel times have been confirmed in numerous statistical studies since first being formulated in 1974. Inhabitants of Berlin spent 70 minutes a day travelling in 2013 and in the USA people travelled an average of 1.1 hours a day in 2014. British statistics reveal that travel times in England have fluctuated somewhat between 1.0 and 1.1 hours a day between 1972 and now. According to their statistics Germans as a whole spent a little more time traveling: 1.3 hours a day. This constancy obviously holds not for everyone individually, just for larger groups.

One of the consequences of this 'law' is that mobility growth in a given country is necessarily equal to population growth times growth of average travel speed. This approach to mobility growth differs from the conventional approach of traffic specialists and is especially helpful for understanding and predicting long-term trends. The transport models most commonly used for mobility projections were developed after the car took over from rail as the dominant mode of transport and are unsuitable for predicting the coming changes in mobility.

Even if total travel time fluctuates a little round the figure of 1.1 hours a day, in the long term changes in speed and mobility are far greater. In this approach, the factors usually used to explain and predict mobility trends, such as car ownership, personal income and prices, determine the speed and thus indirectly the rate at which mobility grows.