Christian Gerondeau and some commonly-held but mistaken ideas in transport

***Dr John Walker**, of Thales Services Division, revisits 'Transport in Europe', a book published in 1997 by Christian Gerondeau, a key player in transport planning in France from the early sixties through to the current time. He finds there much that is relevant today and suggests that if we want a successful transport policy, integrated or otherwise, we have to start from facts and not from mistaken opinions.*

Whilst my mainstream job is with Thales in the UK, especially in the field of road pricing, in my 'spare time' I edit books on ITS and Mobile Communications for Artech House. In 1997 we published *Transport in Europe* by Christian Gerondeau -- translated and updated from the original 1996 French version. As a young engineer Gerondeau worked in the French Ministry of Public Works, and in 1963 published a number of documents forecasting the dramatic increase in road traffic that has subsequently come about; this was influential in ensuring the inclusion of a major motorway building programme within the subsequent Fifth National Plan. In 1969 he was appointed a special advisor on infrastructure and transport to the then Prime Minister, Jacques Chaban-Delmas. He was also responsible in the 1970s for the integration of the national rail network with the Parisian suburban rail network and the Metro system -- something London is still struggling with today -- and was a key figure in getting seatbelts accepted in France. So he has an enviable record in transport planning, relating to both public and private transport.

His book, which is now unfortunately out of print, lists 20 commonly-held but (in his opinion) mistaken beliefs about road and rail transport, including:

- It is possible to relieve road traffic by developing the other means of transport.
- The road network works badly.
- Roads create traffic and it is useless to build new ones.
- Congestion can only get worse and the road network will come to a complete standstill.
- City centres will be overrun by cars.
- Europeans are irrational when it comes to their cars.
- Air pollution is getting constantly worse and the air in our towns will soon be unbreathable.
- Road traffic is a major contributor to the greenhouse effect.

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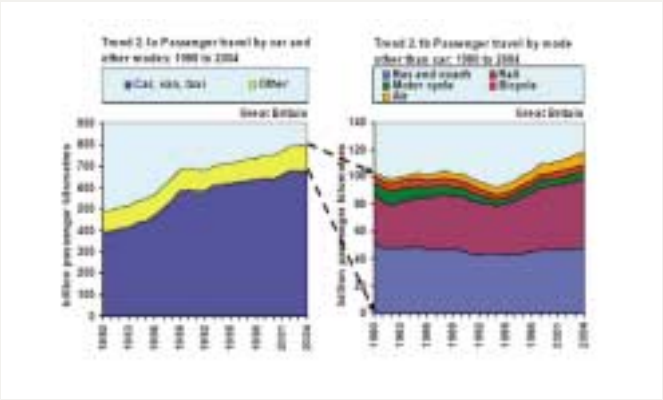
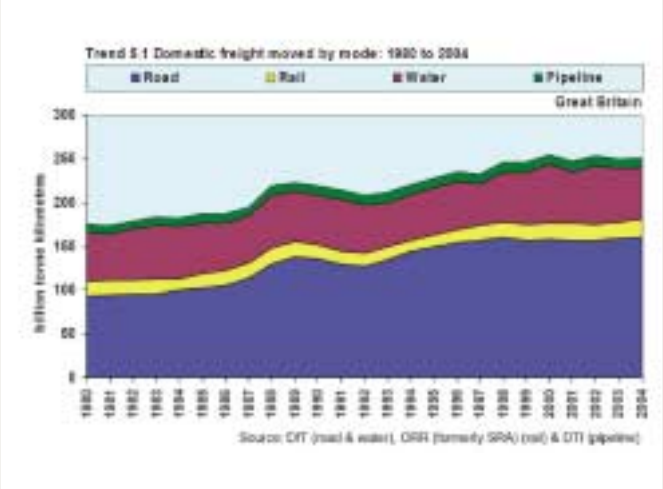


Figure 1a: UK passenger travel by mode 1980-2004 (from DfT publication 'Transport Trends: 2005')

- Established oil reserves are diminishing and there will soon be a shortage.
- Road transport does not pay its true cost.
- If rail transport is in difficulty, it is due to unfair competition.
- International traffic causes problems at border crossings.
- Rail and river transport carry a large part of freight transport in Europe.
- Combined transport is the answer of the future.
- Heavy Goods Vehicles are responsible for traffic jams.
- It is still essential to build new underground lines in European towns and cities.
- It is impossible to build new road infrastructures in densely populated areas.
- Road accidents are inevitable.
- Transport policy is influenced by a powerful 'road lobby'.
- Europe has a coherent transport policy.

Figure 1b: Freight transport by mode 1980-2004 (from DfT's 'Transport Trends: 2005')

However, Gerondeau says in his book that all these ideas, and many others, are disproved by an objective analysis of the facts and can be refuted point by point. (And in my opinion, not much has changed in the last ten years). So let's look at these ideas. Most of the words below are Gerondeau's, or a paraphrase of them. Where possible I have added more up-to-date statistics.



It is possible to relieve road traffic by developing the other means of transport.

On Gerondeau's 1996 statistics, rail freight wagons travel 14 billion kilometres in Europe, whereas the figure for all road vehicles is 3,000 billion. It is therefore obvious that one or two orders of magnitude increase in rail freight would be needed to accommodate a significant transfer from road traffic - clearly an impossibility. Figure 1 confirms that road transport continues to be the dominant mode in the UK today.

The road network works badly.

The average home-to-work journey in Western Europe, during the rush hour, took 19 minutes in 1996. Furthermore the journey time was not increasing, whereas the distance travelled was, meaning that average speeds were increasing. Ninety percent of Western Europeans confirmed that they did not encounter traffic jams on their journey to work.

Roads create traffic and it is useless to build new ones.

In 1996 Western Europe had one vehicle for every 2 inhabitants, including children and the elderly, and 80% of workers commuted by car, so this percentage can't increase much more. Populations are stable and traffic increases are typically 2%-3% per year – so major increases in traffic are behind us. New roads absorb existing traffic, and even if they 'fill up', they still have an economic benefit as well as giving new opportunities to the local inhabitants.

As Gerondeau says, 'Whatever the circumstances, the traffic situation is always better after the creation of new roads than it was previously.'

Congestion can only get worse and the road network will come to a complete standstill.

Congestion may decrease in the future rather than increase, if the road network is granted a minimum level of investment (in fact a very moderate level when compared with the receipts it generates); but things will get worse if road construction is systematically opposed. Also, taking into account the improvement to road network management through ITS and road tolls in areas of high demand, it is clear that congestion is not inevitable. Such measures are now being implemented in the UK – as shown for example by the Active Traffic Management (ATM) project on the M42, and the Government's commitment to the principle of road pricing.

City centres will be overrun by cars.

Contrary to popular belief, road traffic has stabilised or fallen in almost all town centres in Western Europe, due to improvements in road infrastructure, and to road use and parking policies. It is widely recognised that a better balance must be found between different types of transport and different road users: pedestrians, cyclists, road vehicles and public transport, including the diversion of through traffic. Public transport has a major role to play, especially in large cities. But in order to avoid economic decline and population drain, a place must be reserved for the private car, including access and parking facilities – preferably underground. New demand is mainly related to journeys on the outskirts of towns.

These views of Gerondeau are confirmed in John Wootton's 1998 Rees Jeffreys Lecture at the University of Southampton. He pointed out that the dispersed patterns of movement of private motor vehicles in the West Midlands 'are virtually impossible to satisfy with a financially viable public transport service. Sadly, it seems the current popular belief that improved public transport services will solve the problems of congestion is false.'

Europeans are irrational when it comes to their cars.
No they are not. If people choose to use their cars, it is because there are significant and measurable advantages to doing so. As previously indicated, the average travel time to work by car is 19 minutes; but this increases to 49 minutes if public transport is used. So the car gives people an extra hour of free time per day. And these advantages for individuals translate into benefits for the community.

Air pollution is getting constantly worse and the air in our towns will soon be unbreathable.
After an absence of 100 years, lichens, which are extremely sensitive to acid pollution, have reappeared in the centre of Paris after having vanished in the 19th Century. London smog in winter is no more than a memory. The air in European cities is much purer than it was a century ago, due to reduced industrial, domestic and traffic pollution. Cars today are orders of magnitude less polluting than they were 20 years ago.

Road traffic is a major contributor to the greenhouse effect.
Gerondeau contended that 'It is impossible to effectively limit worldwide production of carbon dioxide by limiting road traffic, because the latter is only a minor source of the product in the world', and that 'the precise effects of carbon gas emissions on climate balance are the subject of great debate among scientists at the present time'.

However, I think it is fair to say that the debate has moved on significantly in the last 10 years. Much more evidence is available and it is now generally accepted that climate change is a reality and needs to be tackled urgently. Transport greenhouse gases currently represent a quarter of man-made emissions, and emissions are rising, unlike emissions from most other sectors. However, CO2 emissions per vehicle are decreasing (figure 2) – albeit slowly. And bearing in mind, as indicated above, that It is NOT possible to relieve road traffic by developing the other means of transport, this problem of automotive CO2 emissions must be tackled at the automobile, and not elsewhere. As Gerondeau says, 'Only the road can relieve the road'.

Established oil reserves are diminishing and there will soon be a shortage.
'In 1960, proven oil reserves were calculated at 45 billion tons, equal to 32 years of consumption at the extraction rate at that time. In 1994 the reserves were calculated at 135 billion tons, equal to 42 years of consumption at the current rate of extraction, **and this despite the quantities consumed since 1960**. In fact the threat of shortage is continually receding as oil companies improve techniques and increase exploration. Of course, one day, far from now, this will no longer be the case, and new tension cannot be dismissed for the future. But when the natural oil resources are exhausted, it will be possible to create fuel from many other sources: first, natural gas; then, coal and oil shale. Later on, products of agricultural origins can be used, not to mention maybe in the very long term the electric vehicles that are now beginning to be introduced,'

I quote this paragraph in its entirely to show how prophetic Gerondeau has been. He was making two predictions. Firstly, better methods of oil exploration will identify new deposits – as occurred for example the North Sea in the last quarter of the 20th century. Secondly, better methods of extraction mean that previously uneconomic reserves can be exploited – especially when the oil price rises. It is now accepted that the country with the second largest oil reserves (after Saudi Arabia) is Canada, with its Athabaska tar sands and oil shales. Furthermore, greater than 40% of vehicle fuel currently consumed in Brazil is alcohol produced by fermentation of renewable agricultural crops, while 5 million US cars are already 'ethanol-enabled' (Paul O'Neill, at *Intelligent Infrastructure Futures* seminar, London, 16.05.06). In the UK the Renewable Transport Fuel Obligation will come into effect in April 2008, mandating that biofuels must comprise 5% of vehicle fuels in the financial year 2010/11. It has also been claimed that biobutanol can be blended with conventional grades of petrol **and can already be used at up to a 10 per cent blend without any modification required to existing vehicle technology**.

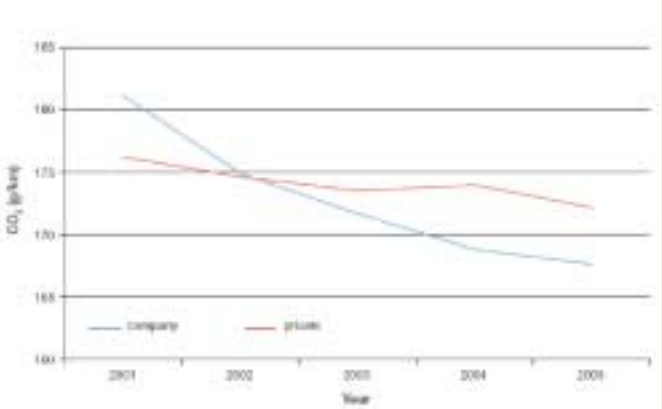


Figure 2: CO2 emissions 2001-2005 (DfT Annual Report 2006)

Road transport does not pay its true cost.
In 1995 road users paid European Governments three times what they cost – 167 billion ecus compared to 57 Becu. Of course this does not include road accidents, pollution and greenhouse gases, but the cost of road accidents is mostly borne by motorists through their insurance premiums. In comparison, rail companies on average meet less than half their costs.

If rail transport is in difficulty, it is due to unfair competition.
The reality is that, except in a few well-defined niches, rail transport no longer fills the needs of the modern European economy, and that most of its market has disappeared to competition from other modes. In fact, rail transport, in terms of passenger-kms, has stayed broadly constant in the UK over the last 100 years, though there has been some increase since 1996 (fig. 1); road traffic in contrast has increased by an order of magnitude since 1952, from 60 billion passenger-km to 600 billion in 2004 (fig. 1). Furthermore, nearly all of Europe's railways are subsidised, whereas other modes are taxed. 'The only exception is to be found in the UK' says Gerondeau.

International traffic causes problems at border crossings.
In reality, cross-border traffic is only 10% of equivalent traffic within a country. For example, in 1995 there were 25 planes with 250 seats and 10 trains with 350 seats between Paris and Marseillles per day, whereas between Paris and Munich, which is the same distance away and a bigger city, there were only 10 planes with 125 seats and practically no trains. The real transport problems are within each individual country, particularly in conurbations. 'Europe, contrary to the United States, is not a continent but an archipelago, and for the most part will remain as such.'

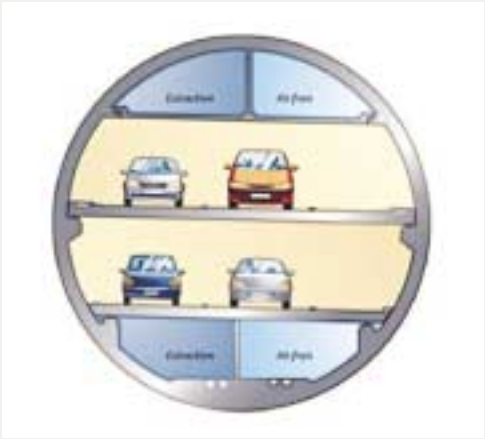


Figure 3: A metroroute in cross-section. (picture courtesy of Cofiroute)

Rail and river transport carry out a large part of surface freight transport in Europe.
Firstly, Gerondeau points out that freight is often quoted in meaningless units – namely tonne-kilometres. If we are concerned with effects on the economy, we must use economic (ie monetary) units. In tonne-km, European railways represent 18% of European freight transport; but the economic share, in terms of financial turnover, is 2-3%, and the physical share, in terms of distance, is less than 1%. As an illustration, he quotes the French National Institute of Statistics: 'for 50 francs (about 8 euros) it is possible to transport one ton of crude oil from Mexico by boat, or 3 kilos of strawberries by plane. In other words the economic value of the tonne-kilometre varies, in this case from 1 to 333.'

Combined transport is the answer of the future.
Truck freight depots are widely scattered and average distances are short in Europe – partly because of the 'border effect' discussed above. 'Combined transport' techniques which put road trailers or containers onto the railway, and use the railway for part of the journey, can only be used in a few cases, and would relieve traffic to only an insignificant extent – perhaps 1%. 'For transport of both freight and people, Europeans have overwhelmingly opted for simple, unimodal systems, and not complex, intermodal systems, . . . that are penalising and costly for short-distance travel.'

Heavy Goods Vehicles are responsible for traffic jams.
Traffic jams occur in two circumstances: in urban areas during rush hours, and outside urban areas at weekends or holidays. In both cases, there are few HGVs on the roads. Except therefore for the rare (according to Gerondeau!) cases of chronic inadequacy of motorway capacity, it is impossible to hold HGVs responsible for congestion.

It is still essential to build new underground lines in European towns and cities.
In most European towns, transport demand is stable or decreasing, except in the (outer) suburbs – but their low population density cannot be efficiently served by public transport – as already indicated above. The construction of new underground lines is expensive, and no panacea. In general, the most cost-effective solution for these suburbs is new roads.

It is impossible to build new road infrastructures in densely populated areas.
This is one of Gerondeau's[1] 'big ideas' – the creation of underground motorways, or 'metroroutes' as he terms them, constructed by large tunnel-boring machines, and reserved for vehicles no more than two metres in height. This means that two decks, each with three traffic lanes, can be constructed, as opposed to a single carriageway of only two lanes if trucks are permitted. (See figure 3) Since as we have already discussed, urban congestion is due to cars, not trucks, these metroroutes should relieve it significantly. Construction of the first metroroute is underway to the west of Paris, and is expected to enter service in 2007 as a tolled tunnel (see http://www.a86ouest.com/).

Road accidents are inevitable.
In 1995 there were 45000 deaths and 1.5 million injuries due to road accidents in Western Europe. Road insurance for this costs 60 billion euros to 'repair the damage' but much less has been spent on prevention. This needs to change. And a well-conceived road network improvement is one of the most effective solutions for reducing the number and seriousness of accidents, according to Gerondeau. But it is fair to say that in the last 10 years there has been considerable investment not only in road improvements but also in use of speed and red light cameras and new technology on cars – more air bags, NCAP rating, with the concomitant reduction in injuries and deaths. ITS research into topics such as Intelligent Speed Adaptation (ISA), Advanced Driver Assistance Systems (ADAS) and Cooperative Vehicle Highway Systems (CVHS) promise further improvements.

Transport policy is influenced by a powerful 'road lobby'.
This is not the case. Road activities include road builders, car manufacturers, equipment manufacturers, garage owners, the oil industry, transport and freight companies, etc. These professions are different, have very little contact with each other, either nationally or on a European level, and have not become an organised group. The International Road Federation did not even have a full-time permanent representative in Brussels in 1995. (Though it does now). In contrast, the rail and public transport industry (the International Union of Railways – UIC) employed over 100 people in Paris; the Community of European Railways (CCFE) had 20 people in Brussels, and the well-staffed International Union of Public Transport (UITP) also had an office there.

Europe has a coherent transport policy.
According to Gerondeau, for air and road freight transport, Western Europe is freely open to competition, and global national subsidies are forbidden. Conversely, for rail transport there are massive subsidies, and road transport is taxed in order to encourage hypothetical transfer of traffic to the railways. In 1995, in half of the EU countries it was forbidden to create new long-distance coach lines, in order to protect the railways.

CONCLUSIONS

It seems to me that Gerondeau's statements are mostly correct and still relevant today. Nonetheless, road accidents, pollution, congestion and climate change are real problems and need to be tackled, using ITS techniques such as road pricing, ADAS, ATM, CVHS and ISA, as well as improved or alternative fuels. But if we want a successful transport policy, integrated or otherwise, we have to start from facts and not from mistaken opinions.

1. To be accurate, as Gerondeau acknowledges, metroroutes were the brainchild of two French engineers, Jean Pehuet and Francois Lempriere.

(Note that the opinions expressed in this article are those of the author. They are not necessarily the opinions of Thales, of Artech House or of ITS (UK)). You can contact John Walker, Thales, by email at john.walker@thales-ts.com

ITS UNITED KINGDOM CALENDAR 2006

THURSDAY 7 SEPTEMBER
Enforcement Interest Group – Tyco, nr Cambridge

TUESDAY 26 SEPTEMBER
Automotive User Interest Group - London E1

8-12 OCTOBER
ITS World Congress – Excel, London

FRIDAY 13 OCTOBER
Electronic Ticketing for Rail Seminar by Passenger Information Interest Group & Banverket, Sweden — Atos Origin, London

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ITS United Kingdom owes a great debt to these members and their organisations who willingly give of their time and energy to promote the cause of ITS in the United Kingdom. Please give them your support.

IIS - the four horsemen of the Apocolypse?

The Foresight Project 'Intelligent Infrastructures Systems' was launched in May 2006 by the DTI. Distinguished speakers, including Dr. Stephen Ladyman MP, Minister of State for Transport and Sir David King, Chief Scientist Adviser to HM Government, addressed the invited audience on the future transportation requirements for the UK over the next 35 year period stating that this was a significant project that presented an ambitious challenge for the UK's transportation industry and an opportunity to influence the changes.

Project research had determined four futuristic cultures all diametrically opposed to the others; each scenario was dependent upon emerging and maturing technologies, the enthusiasm, commitment and willingness to embrace the enormous challenges that future travel options would bring to livelihoods, leisure and lifestyles. In isolation the scenarios illustrated potential 'doomsday' projections however Dr Stephen Ladyman indicated that the most likely outcome would be a fifth 'common denominator' resolution that represented a compromise derived from all four scenarios. He emphasised the importance of planning now for this substantial challenge stating that inertia would condemn future generations to excessive demands on an ageing transport network that would result in intolerable congestion, overloaded public transportation and prohibitively excessive transportation and travel costs.

Dr Ladyman recognised that this radical restructuring of the UK's transportation structuring would require massive commitment and investment however that was seen as to be an essential requirement as opposed to a desirable situation. It was equivalently essential that this restructuring was achieved in a manner that did not place the UK's economy in jeopardy nor at a commercial disadvantage to rival competing nations.

The Foresight Project's recommendations proposed that planning should start forthwith and the accompanying 'Next Steps' publication highlighted a wide range of organisations that had been allocated Actions to progress; for example ITS UK was tasked to establish an Interest Group to monitor future 'Intelligent Infrastructures Systems' development - a task initiated at the AGM where Members embraced the challenge whilst simultaneously recognising the significant commercial opportunities and societal benefits that this brings.

The UK's ITS industry has the experience, capacity and abilities to support the Foresight Project and is positioned advantageously to contribute significantly to its development through the accumulated industrial 'horsepower' that can be employed to contribute to future transportation requirements. The comprehensive breadth of ITS expertise means that those contributions will be substantial ensuring that the UK's ITS industry position as 'major player on the circuit' in addition to providing a unique chance to exploit opportunities within the UK's transport infrastructures as well an on a global scale. Further information on Project Foresight is available via the link - http://www.foresight.gov.uk/Intelligent_Infrastructure_Systems/Index.htm

The ITS industry has latterly acquired a high degree of credibility that enables it to capitalise on this opportunity through providing the influential role evidenced through the number of Project Actions allocated to the ITS industry. The first stage has already taken place with a follow-up Workshop in Newcastle in late June.

Neal Skelton
Head of Professional Services, ITS UK

ITS United Kingdom, the UK association for the promotion of Intelligent Transport Systems (ITS), is a not-for-profit public/private sector association financed by members' subscriptions, and provides a forum for all organisations concerned with ITS. We work to bring the benefits that ITS can offer in terms of economic efficiency, transport safety, and environmental benefits to the United Kingdom – and at the same time expand the ITS market.

The membership, currently over 150 organisations, comprises Government Departments, Local Authorities, Police Forces, consultants, manufacturing and service companies, academic and research institutions.

New members are always welcome and benefit from ITS United Kingdom activities including seminars, workshops and regular news dissemination. ITS United Kingdom encourages discussion on issues such as public/private co-operation, standards, legislation, information provision and new technology.

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