

CONTROVERSIES

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The future of cars: triumph or decline?

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Over the last decade, the future of cars has been at the heart of controversy that has been the subject of numerous prospective studies. This controversy is not about the need for an energy transition – whose advent is no longer a subject of debate - but more about the role of cars in the future. Should the use of cars be called into question? What policies should be implemented? What should the role of cars be?

Introduction, by Vincent Kaufmann

For some analysts the car as we know it has begun an inexorable decline, largely due to the problems it has created. This requires public authorities to make massive investments in alternative transportation systems focused on public and active transportation in all its forms, including innovative solutions. To support this argument, they point to increasingly unmanageable traffic congestion, and to the fact that cars no longer embody the freedom they once evoked among younger generations. As such, fewer and fewer young urbanites aged 18 to 20 are getting their driver's licenses. Several factors explain this, including driver guilt, improvements in alternative transportation systems in urban areas, developments in long-distance communications, the internet as well as online games, and the high cost of driver's licenses. With regard to transport modes, bikes could potentially replace the automobile in urban areas because they are efficient, affordable and subject to less constraints than cars, such as parking.

Conversely, other researchers consider that, given these observations, we are on the threshold of a new rise of automobiles, and that in the future public transportation,

walking and cycling as we know them are likely to experience a major decline.

In this case, public authorities will invest in infrastructure to accompany the changes in car use and simultaneously abandon certain high-cost public transportation services. In support of this vision, these researches insist that the quality of car mobility remains and will remain unparalleled, be it for transporting baggage and objects, its efficiency, its comfort, or the door-to-door service it provides and the autonomy it offers. Moreover, they point to the car's capacity to evolve, including the diversification of its uses (e.g. different forms of car sharing), as well as the potentially massive and rapid transition to electric - and quite likely autonomous - vehicles in the near future. Cars and driving as we know it today will be radically transformed. Autonomous driving is fundamental in this respect because it will free drivers, allowing them to make use of their time. In achieving this, the autonomous car will become a serious competitor to trains and public transportation in general.

To discuss these issues, we are pleased to welcome Francis Papon, a researcher with the IFSTTAR and specialist of active forms of transportation, and Mathieu Flonneau, transportation historian, automobile specialist and car aficionado in the noblest sense of the term.

Francis Papon



Francis Papon

Engineer

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"The stone age didn't end for lack of stone," as Sheikh Ahmed Zaki Yamani, former Saudi Minister of oil said in 1973 to explain low oil prices. Like any resource in a finite world, oil will reach an imminent absolute maximum or even exceed it - "peak oil" - and then decline following more or less of a bell curve. There's no reason that cars won't follow the same curve, like horse-drawn carriages that saw their heyday in Europe and North America around 1900¹ and practically disappeared from France in the 1930s. Will cars suffer the same fate?



Horse-drawn vehicles relegated to a museum
(Jaipur, India, 2009)



Car "garden" (Toronto, Canada, 2012)

Before responding, let's define what we are talking about: the car is a combination of a technology (motorized road vehicle) and a mode of operation based on the private ownership of a vehicle by its user. There are other types of motorized road vehicles (motorcycles, buses, trucks, etc.) and other modes of operation (taxis and car sharing) that also use automobiles, albeit in smaller numbers. In fact, the car has become a system² that incorporates a major economic sector, specific services, an organization of space designed for automobile accessibility, a central place in people's lives and budgets, a rite of passage that is the driver's test, a symbol of social status and a privileged position in the collective imagination. Elevated to a way of life, the car has thus dominated mobility in the United States since the 1920s and in Western Europe since the 1950s, and has since gradually spread to other parts of the world³.

The automobile age in the long term

The age of the automobile will undoubtedly come to an end. But just as we continued to work with stone despite the end of the Stone Age, just as we will continue to use oil long after peak oil, just as horses are still employed as tourist attractions, we will undoubtedly continue to use the automobile long after the end of the automobile age. By this time it will have become a banal object, like stone whose use marked very long periods of prehistory by distinguishing man from animals. Or it will become a form of entertainment from another time, like the horse - noble symbol of man's mastery of animals - that has nonetheless forged history. Emblem of the industrial era, the car will no longer be the center of gravity of our economies and societies, which have already shifted toward digital technology. But the question remains: how will we travel in the future?



Michaux Velocipede
(Musée de Bar-le-Duc, France, 2009)



Steam locomotive
(Museo del ferrocarril, Madrid, Spain, 2012)

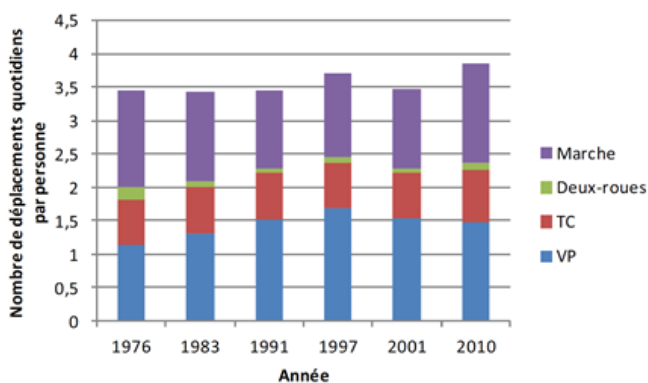
The history of transportation is better defined by the piling up and juxtaposing of technologies than the radical replacement of one technology by another. After charting routes and building boats, man domesticated the horse, invented the wheel and built roads. This construction resumed in Europe in the 17th century, allowing the aristocracy⁴ and later the bourgeoisie to travel by car. The 19th century saw a series of inventions: the dandy horse, the railroad, macadam roads, the omnibus, the tramway, the internal combustion engine, the bicycle, the automobile and the tire. In the 20th century all of these modes coexisted and improved through innovation, eventually arriving at the complex system of mobility we know today. This evolution continues today: old types of material still run, and to them are added layers of information, modes of exploitation and services that gradually change the nature of the object. The automobile of the 21st century is not that of the 19th century but remains a key means of mobility.

Signs and causes of decline

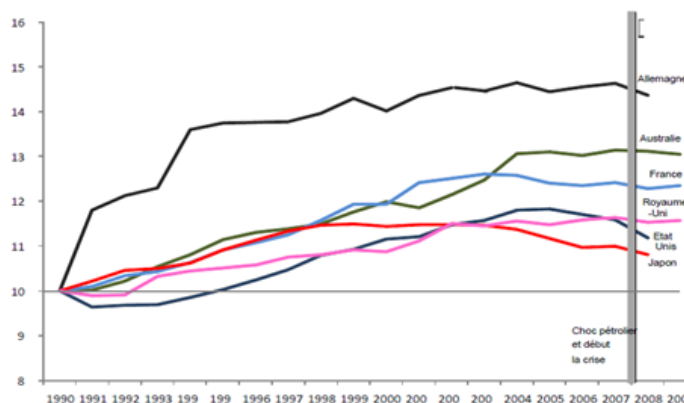
While the automobile is at the peak of its glory, certain signs signal its decline. Since the 2000s, industrialized countries have observed a plateau in the use of cars (peak car)⁵. In France, since 2002 passenger car traffic has stagnated at roughly 400 billion vehicle-kilometers per year⁶. Traffic per adult peaks at different levels depending on the territory (10,500 km per year in lowly populated urban areas versus 6,800 km per year in city centers). Individual vehicle use is declining (12,700 km per year in 2013 versus 13,320 km per year in 1994). Household car use has stabilized since 2006 while the modal share of trips made in personal vehicles has increased slightly at the national level between 1994 and 2008 (from 63% to 65%⁷) and is decreasing in urban agglomerations. Fewer young adults are getting their driving licenses⁸, and younger generations less motorized than their elders were at the same age⁹. This saturation of car use was predicted as early as the

1990s by the demographic models of Inrets-Dest¹⁰.

There are multiple explanations for the 'beginning of the end' of the automotive reign¹¹. In addition to cyclical economic causes (e.g. fuel prices and the 2009 recession), the saturation of demand could also be structural due to people's desire to control changes in their budget and time dedicated to transport, reinforced by re-urbanization and the aging of the population. This relative abandoning of the automobile may even be the result of public transportation and development policies that have ultimately led to a decline in the car's relative efficiency. These policies and their consequences could also reflect changes in preferences, attitudes and opinions about cars. Finally, new communication technologies may also reduce the need for travel and encourage "passenger" travel modes that allow people to stay connected¹²¹³.



Change in daily mobility in Île-de-France according to global transport surveys¹²: individual car peak (CP) in 1997



Change in traveler-kilometers for individual car and light utility vehicles in different countries (index 10 in 1990)¹³: cap in the 2000s prior to the 2008 crisis

The phenomenon of peak car use is observable in all developed countries, including the United States¹⁴. However, car use continues to rise in emerging and developing countries, where cars foster a fascination we have forgotten¹⁵. As such, at the global level, the automobile is far from reaching its peak. Moreover, the increase in traffic in these countries poses serious environmental and social problems.

The automobile on trial

These issues that have led Western governments to take measures to restrict car use. Traffic accidents peaked in France in 1972. Other countries, however, have yet to reach this peak. The WHO estimates the number of fatalities on Indian roads at 207,000 in 2013 (the official figure is 137,000). Air pollution has led to the implementation of emission caps

for pollutants. However, there is a clear discrepancy between approved values and actual emissions, as demonstrated by recent cases. In this respect the level of fine particles produced by diesel engines still poses a serious health risk. Traffic noise is one of residents' first grievances. There have been few studies on the cut-off effects of natural or artificial obstacles, major infrastructure, large thoroughfares and the intensity of traffic¹⁶. However, they penalize neighborhood relations and notably pedestrians and cyclists, who must either take detours or more difficult itineraries, or simply renounce traveling. Congestion naturally limits traffic volumes and is therefore more of a remedy to excess automobiles than a problem in itself. It is even used by certain municipalities to limit car use.

The depletion of oil resources may also limit car use, which is almost entirely dependent on oil as an energy source, or encourage the development of alternative energy vehicles (e.g. electric). The fight against climate change and governments' commitment to reduce greenhouse gas is perhaps the most important argument for rethinking the car, decreasing our dependency on carbon energies and promoting electric vehicles.

However, the environmental impact of electric vehicles is probably not that advantageous, given the CO₂ impact of the source of electricity (extremely high in certain countries), the need to recharge during peak electricity demand periods (which depend on thermal power stations) and battery recycling. The electric vehicle's economic model relies on heavy government subsidies for purchase, parking and recharging facilities, and forgone fuel tax revenues. Ultimately, these subsidies are more beneficial to the most wealthy households (who are the first to adopt new technology), and despite these subsidies, the market for electric vehicles remains limited (projected at a maximum of 35%¹⁷¹⁸). However, this figure barely exceeded 1% in France in April 2016¹⁹. The development of electric vehicles also poses industrial challenges.

Other ways of getting around

Governments and industry are currently exploring the sizeable environmental and social challenges that surround the car and car use but remain far from resolving them. Other uses of cars that transform its individual and private character exist (e.g. carpooling, car sharing and autonomous vehicles). However, at present there is no indication of a surge in carpooling or car sharing in France²⁰. Autonomous vehicles that liberate drivers from the task of driving still raise technical and legal questions. Despite considerable investments, alternative cars struggle to ensure the car's future.

On the contrary, the alternatives to cars- public transportation and active modes of transportation,- have long served as an important means of mobility and are the only forms of transportation that are sure to be available in the future. Of course, they too have their limits. Public transportation underperforms in less densely populated areas and guzzles colossal public subsidies that are facing reductions. Walking and to a lesser extent cycling are limited in terms of range, and both are subject to weather conditions. These three transportation modes also have notable advantages, which include saving space, low pollution, freedom from the task of driving (for public transport), and the health benefits of physical exercise which, for active modes, far exceed health risks related to accidents and air pollution²¹.



Quality public transportation (Seoul, Korea, 2011)



Walking favored (Tokyo, Japan, 2006)



Bike routes (Ulm, Germany, 2011)



Organized intermodality (Interloire, France, 2014)

The efficiency of alternative transportation modes can be improved. Walking should be promoted by eliminating car pollution from the urban environment and refocusing urban

projects on pedestrians²². Like automobiles, cycling should be treated as a veritable system by creating networks of bike routes and services like itinerary planning, repair, rental, or share systems. The offer of cycling equipment should be more diversified: electrically assisted bicycles, recumbent bikes, covered bicycles, freight bicycles and folding bikes. Public transportation should cultivate low-cost solutions, as well as improve the communication of information and quality of service. Finally, to enhance the use of both public transportation and cycling, railway operators, regional actors and local authorities should be implicated in creating mixed-mode transportation systems²³.

Mobility practices are also strongly linked to the location of activities. Urban planning that concentrates activities around public transportation hubs and offers mixed functions on a local scale naturally favors alternative forms of transportation. However, changing urban spaces takes time. It involves a real lifestyle choice: do people prefer urban lifestyles that facilitate social interaction and access to amenities, or do they retreat to peri-urban lifestyles where they have more space but are more dependent on cars?

The mobility system will undoubtedly evolve in the future. Will these changes be caused by climate constraints? Economic restrictions? Political choices? Lifestyle choices? Technological changes? Almost certainly for all of these reasons, which are interdependent. Change in mobility behaviors is catalyzed by a number of factors²⁴. The system is moving, but societal changes are slow.

The rhythm of change

Finally, car use has likely begun to decline, but this decline will be measured. However, speeding up this decline will be important, as the domination of cars has produced significant environmental, energy, health and social threats that are becoming less and less tolerable. Intensifying technological progress or placing regulatory constraints on the automotive system will not be sufficient; creating real alternatives and integrating them into all sectors of activity (transportation, health, urban planning, education and research) will be critical. Only then will we be able to comfortably consider the future of mobility - in a context where the age of the automobile has been replaced by the age of the internet. For younger generations, the car has been dethroned by digital tools that are shaping their aspirations and social practices. The links between information and communication technologies and mobility are numerous and complex, and are not limited to questions of complementarity or substitutability²⁵.

Notes

1 12,749 private horse-drawn carriages and 1,149 cars existed in Paris in 1901 (Émile

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2 Dupuy, G. (1999), La Dépendance automobile. Symptômes, analyses, diagnostic, traitements, *Anthropos-Economica*.

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6 Grimal, R. (2015) L'auto-mobilité au tournant du millénaire. Une approche emboîtée, individuelle et longitudinale. Doctoral thesis in economics (Université Paris Est), p. 64 et seq.

7 ENTC and ENTD, Inrets-Insee-SOeS.

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9 Berri, A. (2005) Dynamiques de la motorisation et des dépenses de transport des ménages. Analyses sur données individuelles et semi-agrégées. Doctoral thesis in economics (Université de Paris 1 Panthéon-Sorbonne), p. 66.

10 Bussière, Y., Armoogum, J. & Madre, J.-L. (1996), "Vers la saturation? Une approche démographique de l'équipement des ménages en automobile dans trois régions urbaines," *Population*, vol. 51, n°4-5, p. 955-977.

11 Grimal, op. cit., pp. 81-136.

12 Grimal, op. cit., pp. 81-136.

13 Statistics from the International Transport Forum OECD/FIT (2011) "Perspectives des transports, répondre au besoin de 9 milliards de personnes."

14 Millard-Ball, A. & Schipper, L. (2011) Are We Reaching Peak Travel? Trends in Passenger Transport in Eight Industrialized Countries. *Transport Reviews*, Volume 31, Issue 3, May 2011, Fig. 2 total motorized travel activity 1970-2007, p.362.

15 Papon F. (2009) "Reports modaux croisés entre contraintes climatiques, incantations occidentales, et rêves asiatiques." Jointly published in *Les cahiers de Global Chance* n°26, janvier 2009, and *Liaison Énergie-Francophonie* No. 81 – 4th trimester 2008. pp. 80-84 www.iepf.org/ressources/ressources-pub-desc.php?id=297 www.global-chance.org/IMG/pdf/GC26LEF81p80-84.pdf.

16 Héran, F. (2014) *La ville morcelée. Effets de coupure en milieu urbain*. Economica.

17 Windisch, E (2013) *Driving electric? A financial assessment of electric vehicle policies in France*. Doctoral thesis in transport (Université Paris-Est), p.232.

18 Kolli, Z. (2012) *Dynamique de renouvellement du parc automobile: Projection et impact environnemental*, Doctoral thesis in economics (Université de Paris 1, Panthéon-Sorbonne), p.218

19 http://www.ave-re-france.org/Site/Article/?article_id=6569&from_espace_adherent=0 consulted 9/05/2016

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21 Rojas-Rueda D. et al. (2011) The health risks and benefits of cycling in urban environments compared with car use: health impact assessment study. *BMJ* 2011;343:d4521 doi: 10.1136/bmj.d4521 ; Praznoczy C. (2012) *Les bénéfiques et les risques de la pratique du vélo - Evaluation en Île-de-France*, ORSidf ; Mueller N. et al. (2015) Health impact assessment of active transportation: A systematic review, in *Preventive Medicine* ; Schepers P. et al. (2015) The mortality impact of bicycle paths and lanes related to physical activity, air pollution exposure and road safety, in *Journal of Transport & Health*, Volume 2, Issue 4, pages 460–473, etc.

22 As Paris now does: <http://www.fastcoexist.com/3058685/paris-is-redesigning-its-major-intersections-for-pedestrians-not-cars>.

23 regional actors and local authorities should be implicated in creating mixed-mode transportation systems

24 Rocci, A. (2007) "De l'automobilité à la multimodalité Analyse sociologique des freins et leviers au changement de comportements vers une réduction de l'usage individuel de la voiture. Le cas de la région parisienne et perspective internationale." Doctoral thesis in

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Mathieu Flonneau



Mathieu Flonneau

Historian

Mathieu Flonneau is a professor and researcher at Paris I Pantheon-Sorbonne (SIRICE, CRHI, LabxEX EHNE) specialized in urban history and the history of mobility and motoring. President and founder of the research group P2M (Passé Présent Mobilité) and of a series of seminars on the history of mobility, he recently co-authored, *Les transports de la démocratie* (PUR, 2014), in 2016 *Vive la route! Vive la République!* (L'Aube), and *Choc de mobilités. Histoire croisée au présent des routes intelligentes et des véhicules communicants* (Descartes&Cie). He is the author of *L'Automobile au temps des trente glorieuses. Un rêve d'automobilisme* (Loubatieres).

The historian, in his own and unwilling way, is an expert in irony. With an eye on the past, he or she knows that in the long term trends and fashions are reversible and uncertain. And this applies to automobiles - or to car use more precisely (i.e. all of the car's uses in connection with the road system) - in its current reincarnation. Recent changes and fluctuations in the popularity of this subject, even in the world of academic research, have been spectacular.

Vincent Kaufmann reminds us of this, which deserves to be highlighted because what we are rediscovering is clear: cars still have many prosperous years ahead of them. Moreover, its potential to be an inclusive and convivial form of transportation – a potential we thought was long lost– is reemerging whether we like it or not.

Putting an end to the retrospective slander²⁶ of the car

It is no coincidence that this topic is covered on this site: nobody reading this Controversy can deny that there is a fundamental debate taking place on the relevance of

different modes of transportation. This debate, which has already been decided in the eyes of certain militants and partisans, sometimes transforms into an endless religious war and can result in prompt excommunications. Certain positions are thus quickly coming to be considered as a "given", partially artificially. Dogmatism in return forces dogmatize and radicalize thinking we'd hoped to be balanced, despite an intent desire to serve the general interest that is in the end unfortunately lost from sight.

Whereas the not so distant dominant media discourse portrayed driving in a completely negative light, suggesting an almost morbid and fundamentally alienating "dependency" on the golden object of the last century, it now makes sense to reflect on the historical motives that led to the rise and reign of cars over human mobility systems. This domination, which fortunately is not hegemonic everywhere, has incidentally continued into the 21st century on a global scale and, let us calmly note, will continue to spread. Did the historical contextual elements of the automobile's success and its social acceptance ever exist, and will they really and truly disappear from everywhere? Are the reasons and scales of its refusal and repression universally disseminated and shared? The deconstruction of the progressive rhetoric of modernity that the West has long associated with car use helps us to understand the contemporary situation, wherein geopolitical paradoxes remain active and relevant. For emerging countries and regions, the automobile system continues to be a driving force. While the desacralization of the car is justified, denying it any interest and qualities merits reflection, or at the very least to be evaluated and put into perspective.

Let us also note that, on a marginal scale, "refined" car usership can also exist. The love of freedom, that evanescent quality, can have depth. The car fosters this and in certain circles (sometimes elitist, I concede, but not only) is not a sad passion, and narrow mindedness is not necessarily the primary characteristic of its defenders. Of course, automobile populism exists²⁷ and unfortunately some radicalism as well²⁸, just as the populism of "ecologists" prospers and grows on the assumption of knowing "what people want"... even if their actual practices can be completely different.

Can the use of cars be progressive (or progress plain and simple)?

In my opinion, I can wholeheartedly attest as a witness (and modestly as an actor) to this inclination in the debate. My historical analysis of car usership, based on the history of urbanism and mobility, often puts me in the position of "car proponent." Okay, I accept it... but on the condition of not being relegated to your basic, run-of-the-mill advocate/defendant. Rather, I will attempt to shed light on it and compare it with other modes - which specialists, let me underline this, have always been invited - when I've

been co-teaching an interuniversity research seminar on mobilities for more than ten years now²⁹. In “defense and illustration” of the bagnole (as people often say to me with a smile), I’ve already dared to say that its advantages - not necessarily less legitimate than others - were met with outright contempt, so much the weight of the public and academic debate seemed totally unbalanced to me just a few years ago³⁰.

It is therefore without naivety that I evaluate all the potentially disastrous, and above all illegitimate, effects of reductive labelling. What we could call *reductio ad dieselum*, like the famous *reductio ad Hitlerum* is actually at work in an often biased debate based on intimidation, taboos and powerful denial.

Agreeing to take cars seriously was not easy and, until very recently, simply impossible. Its mode and support seemed outdated, and its arguments oppressive and unfeasible. It has been literally pushed – sometimes quite rightly – out of downtown areas, accused of being a devourer of spatial and energy resources, its fate was sealed.

Is the comeback of the car and the road illegitimate?

Is another vision of car usership possible? From what some are saying now, it is far from being a thing of the past, the car is and will remain a component of global mobility for a long time to come. At least the debate is worth reopening on a more equitable and realistic basis.

Thanks are in order to the Mobile Lives Forum, though quite belatedly. Because I remember an evening in Lyon full of ridicule that I permitted myself to harshly brand because I deemed it to be the antithesis of a serious analysis of the automobile phenomenon³¹. There were indeed certain anti-car arguments that were doggedly beat like a dead horse. And yet the phenomenon remains exquisite, or in any case still prized by many – even in the 21st century. As a fair line of argumentation is difficult to find, social utility criteria (i.e. taking actual uses into account) should aide social science experts and more specifically reestablish the car’s role in the overall mobility offer and relativize those occupied by gadgets downtown.

Let us therefore observe that the forced and defamatory antiquation of the automobile does not help us understand how roads are returning to the general debate (perceived as archaic), or even its mere persistence³². Because in the end, why should we be surprised? Or pretend to be surprised? That the car still exists? That it resists? That it persists? Whether we like it or not there are reasons for this, some of which, in fact, evade reasoned reason. But there are also objective reasons, like the fact that the car is much more than a car, a

mode, "travel" or CO². The relationship it fosters with others and the world deserves more than to be reduced to a group of behaviors that are stigmatized as selfish.

We must look at the realities as they are, even if it's unpleasant, and dare to name them. What Vincent Kaufmann aptly points out can be equated to a kind of return to reality (here, we are thinking of the many practices that are actually measured and relegate certain experiences of mobility that are hastily deemed "revolutionary" to marginality). This reality has been advantageously "augmented" by the digital revolution, which is well-suited to the libertarian ideal of the automobile's beginnings - versus an argument loaded with wishful thinking, so sure to be in line with history that it sometimes accepts with enthusiasm the "best of all worlds" - often low cost alas - that inevitably announces itself³³.

In the transportation world, the car was merely a problem, and all we had to do was rely on those who made it complex and perplexing to find solutions! Things have shifted in a positive way, however. The car is very much a part of the mobility debate, the proof being that we no longer avoid it, deny it or exclude it. Ideological destitution that sometimes serves as argumentation can leave a smile on your face. In this almost accusatory register the roundabout can be used as a practical symbol:

"The roundabout is an ultraliberal device...[It] reveals a somewhat simplistic discourse, that is basically to say a little Vichy...[It] is conservative...The promotion of these traditional values is, in fact, merely the counterpart of the traditional values represented by the automobile, since the values of the automobile are largely traditional values (small private ownership, fascination with power, machismo, fearful respect of authority and exclusively reactionary insubordination³⁴)."

We can admit that all of this has some truth to it, but only some. It is difficult to answer with anything but irony to outmodedness with which we began: in the ether of ideas and weightlessness of ideologies, we must not give up on progressing progressivism or enlightening conservatism! My conviction, bolstered by several years of research, is that car usership would never have become so widespread if it had been exclusive or the fruit of a plot, even that of globalized capitalism...

Finally, one of the issues that comes up is that of the renunciation (or not) of modal warfare. To fail to see or to deny the staying power of cars as they exist in 2016 is to be uninformed about the "inevitable mobility transition" — a continually postponed dream.

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- *« Routes de la République : une reconnaissance et, au minimum, un débat », *Transports. Economie, politique, société*, March-April 2016, p. 21-23.
- *L'automobile au temps des Trente Glorieuses. Un rêve d'automobilisme**, Loubatières, 2016.

Notes

1 I borrow this expression from Georges Amar, who used it during one of our discussions.

2 I don't think I ever showed any weakness in my (sa ?). See my introduction to The Automobile Forum (April 2016).

3 For example, it is very questionable to see "communities" of road user take positions that legitimate arguably anti-civic behaviors (the case of radar signaling is exemplary here).

4 The largely itinerant traveling seminar of the P2M (Past-Present-Mobility) research group, one of whose goals and trademarks has always been to exist multimodally beyond schools of thought.

5 Some references are enumerated at the end of this text to justify me thus, without omitting the first time in which I perceived and expressed truly the hiatus that I have only then stressed and deepened: "Essai de démonologie contemporaine: la desserte des villes nouvelles, l'automobile, Paul Delouvrier et les dirigeants du District," in *Gouverner les villes nouvelles. Le rôle de l'État et des collectivités locales (1960-2005)*, Paris, Le Manuscrit, 2005, p. 83-101.

6 Cf. fr.forumviesmobiles.org/projet/.../lautomobile-desir-xxe-siecle-2602, November 18, 2014.

7 Gijs MOM, *Atlantic Automobility. Emergence and Persistence of the Car 1895-1940*, Berghahn, New York, Oxford, 2015.

8 Laurent Quessette's works on the topic ("Ceux qui m'aiment prendront le Ouigo", "l'usager du train confronté au low cost", *Transports. Economie, Politique, Société*, May-June 2016, p. 16-27) are edifying as are the reasons for the recurrent failure of modal shift policies; see Thomas BUHLER, *Déplacements urbains: sortir de l'orthodoxie. Plaidoyer pour une prise en compte des habitudes*, Presses Polytechniques et Universitaires Romandes, 2015, 123 p. The same could be said of issues related to rail freight or the revelation of major issues linked to "periphery" France, which has finally emerged from contempt: see Paul CARY, Sylvie FOL, "Du périurbain stigmatisé au périurbain valorisé?", *Géographie, Economie, Société*, 18, 2016, p. 5-13.

9 cf. Jean-Michel ESPITALIER, *Tourner en rond. De l'art d'aborder les ronds-points*, PUF, 2016.



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¹ <http://en.forumviesmobiles.org/directory/people/2017/01/16/francis-papon-engineer-3414>

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