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The Trinity of walking, cycling and public transport must be at the heart of ecological transition policies



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Chapô

While emissions from the transport sector remain at a very high level, all hopes are currently pinned on the “magic Trinity” of electric cars, shared cars and connected cars, which are soon to become “autonomous.” However, everything suggests that this focus on cars will be insufficient, considering that their rebound effects and various nuisances (consumption of space, transformation of land through infrastructure and car parks, direct and indirect pollution, etc.) are largely underestimated. Consequently, a different Trinity will be necessary: walking, cycling and public transport, in creating new synergies.

Présentation longue

One thing is clear: in France as elsewhere, the transport sector remains the biggest emitter of greenhouse gases, at a level higher than in 1990^[1]. Considerable resources are being deployed to ensure that “tomorrow everything will be better,” but emissions still aren’t really going down. And beyond the issue of climate change (which is rightly gaining traction), the ecological transition in the transport sector is proving to be more complex and problematic than we may have expected. Let’s limit ourselves here to three overlapping aspects. First, the priority given to decarbonisation, which masks the importance of other aspects (consumption of space, biodiversity loss, various forms of pollution, scarcity of materials, social and environmental problems due to their extraction, etc.). Second, the excessive focus on

cars, which causes alternative modes to be disqualified. Finally, the predominance of technological solutions, that have perverse and rebound effects, all the while neglecting organisational aspects and the location of activities^[^2].

Individual motorised transport: hopes for improvement that must be put into perspective

The 1970s, people started to dream of more individualised public transport, with modes imagined to be as attractive as they were efficient: this was the PRT (Personal Rapid Transit). Half a century later, this dream has taken a diametrically opposed direction, with the collectivisation of individual cars (carpooling, shared cars). Meanwhile, people keep championing the imminent arrival of one particular radical innovation, autonomous cars, all the while getting excited about an old idea that was fashionable at the end of the 19th century: battery-fuelled electric cars (in 1899, the *Jamais Contente*, equipped with lead-acid batteries, was the first car to reach speeds of 100 km/hour). It's true that, decade after decade, technical progress has been made; I myself took part, from the early 1980s, in investigations on electric vehicles, in particular within the framework of the European Expert Group COST 302^[^3]. It's also true that France's electricity production is largely carbon-free, but are we sure that we possess the miracle solution that can be put into general use everywhere from 2035? Certainly, depending on their uses and sizes, electric vehicles could gradually become a good solution from a technical standpoint, but their mass use for individual transport will become problematic, reinforcing how society organises itself in their favour (meanwhile there are smarter niche areas to apply electromobility: utility vehicles, urban delivery vehicles, electric bicycles, etc.). The problem is global (world wide): if all cars become electric, that represents one billion vehicles, then later two billion or more. Clearly, the issue of the quantity of materials cannot be fully resolved through recycling and circular economy^[^4].

Already, in the current situation, cars don't pay for all their costs^[^5], and indirect costs are underestimated^[^6]; the development of electric cars is likely to significantly worsen the balance sheet by adding several factors: incentives for purchase and conversion, mass deployment of charging stations, shortfall in TICPE (internal consumption tax on energy products) with electricity taxes being lower than fuel taxes, etc. Electric cars don't lessen the need for infrastructure and parking spaces; on the contrary, the ecological alibi, with the financial aid it brings, has

become an incentive to not restrict the excessive use of cars, and even to increase it further. Obviously, electric cars eliminate the air pollution connected to exhaust fumes (just as newer diesel vehicles were promoted as being 'clean', which they really aren't), but advances in scientific knowledge are revealing other previously neglected sources of pollution: brakes, tires, coatings. Beyond atmospheric pollution, it's worth considering the microparticles caused by the billions of tires and brake pads in circulation, that also pollute the oceans and other natural environments. Moreover, while it's true that cars aren't the only source of atmospheric pollution, we must not forget that there are particles deposited on the ground, including those emitted by other sources than transport, that are likely to be rendered dangerous by the circulation of thermal or electric vehicles, through the phenomenon of resuspension. The problem is therefore more complex than one might think. The point here is not to overestimate the importance of this phenomenon, one that depends on many factors (rainfall, type of coating, vehicle speed, etc.), but to take stock of the ramifications, which includes a further argument in favour of lowering metropolitan speed limits. The same goes for the noise reduction induced by electric motors, which is only of benefit if you also reduce speed, otherwise the noise of tires moving along the road will replace the initial nuisance.

High stakes for diversified non-motorised modes

In such a context, the development of alternatives to individual cars isn't being sufficiently taken into account. The Mobile Lives Forum recently published an advocacy piece in favour of walking^[7], which was well argued and supported, but which revealed a certain "rivalry" between cycling and walking, while other authors sometimes have a tendency to oppose cycling and public transport. In this regard, the debate would benefit from being extended to cover all alternatives and particularly to synergies between the most ecological modes of transport. This would allow us to go well beyond the current fashion for shared vehicles, which highlights specific practices implemented by large and globalised private firms, as a recent book explains^[8]. Among the alternatives, there is, of course, walking and its multiple variations, whose popularity varies depending on time and place: roller skates, roller blades, skateboards, scooters, etc. Currently, electric scooters are a hot topic in the media as a "new mobility." It remains however a motorised vehicle (admittedly poorly motorised), which depending on its speed can be a nuisance to pedestrians - one more, since in some areas, walking is hampered by a lack of

suitable infrastructure, and in others it's disturbed or rendered dangerous by vehicles. There's nevertheless a variety of much less publicised non-motorised scooters, including "hybrids" (in the sense of "composites"), combining a central part comparable to that of a classic scooter and a front part resembling that of a bicycle (a large wheel and handlebars equipped with brakes).

Bicycles are also widely available, with various types that could broaden their uses and reach, and therefore their potential: Classic or fast electric bikes (speedelec), self-service bicycles, fast recumbent bicycles, delivery bikes, cargo bikes, bicycles with fairings, etc. Just as with walking, or even more so (walking could also increase its potential outside cities with the right planning and layouts), to assess its potential, we must consider how it could be adapted to all kinds of territories, whether urban, peri-urban or rural. As with walking, to truly realise its potential as a means of transport, there needs to be targeted measures to promote cycling, combined with a whole set of measures aimed at reducing car traffic and its infrastructure. Here is just one of many examples: unlike mini-roundabouts in cities, which are sometimes well adapted, large roundabouts designed to improve car traffic flow (and improve safety in the absence of other speed moderation measures) - the proliferation of which is very expensive in France - practically render cycling and walking impossible, and also hamper the circulation of public road transport (coaches and buses), because these modes weren't included in discussions around their design.

Public transport adapted to many scenarios

Contrary to popular belief, public transport has an important role to play not only in dense areas, but in all types of territories. Of course, the network and frequency of services cannot be the same everywhere, but a few examples from abroad prove that, provided there's a coherent set of measures for the short, medium and long terms (hence the importance of planning), sparsely populated areas can be much better served. While not exhaustive, we'll shed particular light on the complementarity between active modes and collective and rail transport, it is important to insist from the start on the need to intervene at all levels so as to both increase the contribution of public transport and manage the costs.

There are several pitfalls to avoid. We shouldn't place too much faith in simplistic solutions such as increasing the number of spaces in park-and-ride facilities: beyond a certain threshold, this solution becomes costly, disqualifies other feeder modes and

has perverse effects on urban planning (of course, there are schemes that are “even worse” than park-and-ride facilities, such as when carpooling, cloaked with many virtues, becomes a pretext for building new car parks called “carpooling areas” everywhere). We should also avoid jumping on the bandwagon: after being neglected for decades, buses have, for ten years, often been presented as a universal solution, while in certain segments, different kinds of guided transport (rail or urban) have a role to play, provided there’s long-term planning. For example, the popular idea of running buses or coaches on the motorway isn’t necessarily the right solution when we could take advantage of railway networks, especially if thinking in the medium or long term. Meanwhile, urban planners must bear in mind the need to keep costs under control, but the problem shouldn’t be exaggerated (let’s not forget the avoided costs): reductions in transport offers which induce “vicious circles” must be avoided, and whenever possible, it would be desirable to implement cyclic scheduling of public transport to improve its readability. Given the required investments, free public transport is to be avoided and, more broadly, under-pricing isn’t desirable either, even though it’s worth noting that if public transport is relatively under-priced, it’s partly as a response to the under-pricing of individual motorised transport.

Technological improvements aren’t necessarily the most fundamental aspect, but they do have a role to play; for example, the automation of certain lines can make public transport more attractive, including during off-peak hours, or even at night, all the while controlling operating costs.

Urban planning measures become more difficult in a context where, for several decades, road infrastructures have increasingly influenced the location of housing, shops and businesses (often chosen based on the possibilities of building parking lots and access to major roadways). But if we choose to do so, a certain number of levers can be implemented over time, drawing inspiration from different concepts that favour (or at least don’t disqualify) the use of public transport and active modes^[9]. Considering that, despite the possible improvements, urban planning will never be “perfect” everywhere, there’s huge potential for people to use public transport with cycling as a feeder^[10] ^[11].

An underestimated complementarity between public transport and non-motorised modes

In France, the complementarity between cycling and public transport has long been neglected. The PREDIT “passenger intermodality” report, for example, released in 2000, simply “forgot” to talk about bicycle / public transport intermodality^[12], whereas in other countries, work on this subject were carried out in the 1990s. In Germany, the first international conference entirely devoted to this issue (more complex that it seems) “the interdependence of bicycle and public transport” was organised by the University of Dresden in 2008^[13].

More generally, beyond intermodality alone, beyond cycling and its variations, when optimizing networks, the synergies and complementarities between active and collective modes, across different types of territories, should be considered together. It would then be possible to act on three major issues:

1. The economy of public transport is sometimes handicapped by variation in demand: some lines are overloaded in their central zone and underloaded at the peripheries. The development of active modes, if necessary in synergy with other measures (pricing, information, incentives, facilities), can relieve the pressure on the most crowded sections and increase the load on the less crowded ones, by setting up feeder options for bikes and pedestrians in a more intensive and less expensive way than with park-and-ride facilities for cars. Likewise, the loads can also be managed according to the time period or the day.
2. The greater the distance between stations, the higher the commercial speed increases and consequently the more the public transport becomes attractive and the costs fall (investment costs and operating costs). This criterion of commercial speed is of course very well known, but interstations have remained too short based on claims that can now be put into perspective or questioned, such as the arduousness of terminal journeys for the elderly. Indeed, the criterion for accessing stations should no longer be the distance but a combination of journey time and ease of the journey. By making cities more walkable and more cyclable, we can win on both counts. The work carried out within the framework of the Franco-German BAHN.VILLE project^[14], “Rail oriented development and intermodality in German and French urban regions” showed that a significant percentage of people can walk over 1.5 kilometres to

reach a railway station if the pedestrian routes are well developed.

3. A similar problem to the previous one concerns the 'bendiness' of certain bus or tram lines, which has an impact on commercial speed: there has sometimes been a tendency to make "catch-all" lines to serve different traffic-generating hubs as close as possible, when the situation could be improved by implementing greater complementarity with active modes.

Conclusion

A highly-coordinated development of walking, cycling and public transport is not currently on the agenda, at least not at a sufficient level to significantly reduce the use of private cars in conjunction with territorial planning and activity organisation. Some trends are even going in the "wrong" direction and there are many obstacles. In the coming years, it will be important to consider alternative scenarios for the ecological transition of transport^[15], and to not be satisfied with the traditional scenarios or 'going with the flow'. A paradigm shift could become possible if several factors were brought into play:

- supporting, among the younger generations, an increased awareness of the seriousness of all sources and types of environmental harm;
- rejecting the insidious greenwashing that suggests that improving cars will solve all our problems;
- highlighting public health considerations that would encourage people to make longer journeys on foot or by bike, and to use public and rail transport more often in all types of territories thanks to efficient, ecological and economical non-motorised feeder options;
- Viewing the employment criterion in a different way, by promoting the creation of non-relocatable jobs in alternative modes and associated services;
- leveraging planning strategies to implement coherent sets of measures in the short, medium and long term.

The interactions between the different criteria to be satisfied are complex. In recent years, the need to consider social equity has been used as a pretext for not increasing fuel taxes, and therefore an incentive (one more) for everyone to drive a lot, with windfall effects for the richest, when it would be possible to implement

redistributive means. However, purchasing power problems have not yet been resolved, with an increased dependence on cars in certain areas - in particular due to the elimination of local services - as well as incentives to buy new, more expensive vehicles. For my part, I spent the first part of my life in a rural area in a farming family who couldn't afford a car. Of course, the context was very different then, but this taught me not to underestimate the potential of alternatives to cars outside urbanised areas. For example, many trips can be done by bicycle, sometimes covering distances of well over 10 or 20 kilometres, even without the help of technology. Nowadays, the development of modern gear mechanisms and increasingly powerful electric assist systems should allow people to perform even longer journeys. But the main obstacle remains that roads are still predominantly designed for cars, coupled with the fact that road traffic is often offputting to cyclists and incentive policies favouring other alternative modes are too weak.

<!-- Notes -->

[^1]: Comment économiser l'énergie dans les transports et réduire la dépendance automobile ? [How to save energy in transport and reduce automobile dependence?], Jean-Marie Beauvais, Transports, Infrastructures et Mobilités, number 513, January 2019. [^2]: Des visions contrastées pour la ville économe et ses équipements, basées sur une réflexion multimodale, pluridisciplinaire et multihorizons [Contrasting visions for the sober city and its facilities, based on multimodal, multidisciplinary and multi-horizon thinking], Claude Soulas, International Symposium of the Labex Futurs Urbains, Marne-la-Vallée, January 2013. [^3]: Cost 302. A - Conditions techniques et économiques de l'utilisation des véhicules routiers électriques (EUR 11115) [Cost 302. A - Technical and economic conditions for the use of electric road vehicles (EUR 11115)] - Final report - 1987 - 486 p. [^4]: Illustration, à travers la légende classique des grains de blé placés sur un jeu d'échecs, des limites incontournables de la croissance de la consommation des métaux et de la contribution du recyclage à leur approvisionnement [Using the classic legend of grains of wheat on a chess board to illustrate the unavoidable limits of the increasing consumption of metals and of the contribution of recycling to their supply], Jean François Labbé, Annales des Mines / Responsabilité Environment, July 2020. [^5]: Les usages de la route paient ils le juste prix de leurs circulations ? [Do road users pay the fair price for their travels?], Bergerot et al., Direction Générale du Trésor [French Treasury], April 2021 [^6]: Shoup D (2011), The High Cost of Free Parking, Donald Shoup, APA / Panners Press, 2011. [^7]: In the post-Covid world, have we forgotten about walking again?, Jean-Marc Offner, Opinions, Mobile Lives Forum, July 7, 2021. [^8]: Les mobilités partagées

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