

Point of view

Mobility and Covid-19: what impacts on transport behaviour and policies?

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Introduction

What does the Coronavirus crisis tell us about the mobility patterns of the French? Is it possible to learn from this crisis about the control of greenhouse gas emissions in the transport sector?

The Covid-19 viral pandemic, with the resulting lockdowns, has produced unprecedented restrictions on freedom of movement and, to a lesser degree, on commercial exchanges. These changes have at times proved to be hinderance to a large portion of society, and to the national economy as well. Indeed, the conditions of the pandemic have dramatically confirmed the role of mobility in society as defined by the needs and practices of movement. While the health and economic consequences have not yet been fully assessed, it is also necessary to analyse the potential effects of this major crisis on mobility practices, which are, after all, the source of nearly 30% of greenhouse gas (GHG) emissions in France. To achieve carbon neutrality by 2050, the call for more restraints on mobility will no doubt remain acute despite technological advances such as the electrification of vehicles. This necessitates modifications at once complex and variable in time of individual behaviour and collective organisation. In what way is the current health crisis an accelerating, or conversely, an aggravating factor? What lessons can be drawn for public policy?

There are two major time factors for clarifying the critical issues in this exceptional situation:

- *Short- and medium-term crisis and post-crisis period:* this period is marked by the slow recovery of mobility after the restriction of movement during the lockdowns, by the management of the pandemic according to the immunity of the population, and by the asynchronicity between French regions and between countries.

This management imposes certain restrictive health measures: physical distancing and systematic barrier gestures; compulsory mask wearing; employer certification at peak transport times; tracking and isolation of patients and contact persons, and so forth. All these issues have random or cyclical effects on mobility, depending on the occurrence of new waves of contamination, a possibility that can lead to partial or general shutdowns.

Some initial observations over this critical period have already made it possible to identify the nature of some of the consequences on mobility.

- *Long-term period integrating perennial changes*: the duration of the destabilised period determines the actual effect of this crisis in the long term. The variable level of virus circulation, the more or less rapid deployment of a treatment, or a possible vaccine will affect whether the observed changes in behaviour are temporary. And this consideration will affect the long-term development of the demand for mobility, as well as the uses and the necessary adaptation of service offers (and in parallel the control of GHG emissions in this sector). At this stage, only predictions are possible.

We aim to offer some insights and enlightenment on the most salient effects of this crisis, those that could have an enduring influence on mobility behaviour, that may require either the support of public authorities, or the modification of these changes, to promote the most carbon-free mobility.

1. Can greater temperance in travelling become a reality?

Can the sudden and dramatic impact of sanitary lockdown, followed by a progressive relaxation of the conditions of the shutdown, have a lasting impact on the demand for mobility, and influence the needs of changes in travel by encouraging new ways of working, living, shopping, or travelling?

- **WORK: Are we moving towards a lasting change in remote working modes linked to the digitisation of society?**

In the short and medium term :

Different surveys (CCI IdF, Insee/Acemo-Dares, *Forum Vie Mobile*) have evaluated that about 30% of the workforce declared to be teleworking full time during lockdown¹. The proportions vary from 10% to 60% depending on the sector of activity² and maintained a significant proportion of assets during the period of progressive unlockdown. This massive situation, imposed by the health emergency, offers a real test of the potential of teleworking, now technically possible because of the strong tertiarisation of the French economy, the level of digital equipment among employees, and the deployment of the corresponding infrastructures. Thus what was merely anecdotal before the health crisis with less 7% of the workforce affected has since become a much more significant reality.

No one can say, however, whether this exceptional and constrained situation will be lasting, given the various material and psychosocial limitations of this mode of organisation depending on personal circumstances. It should be noted that more than one in two working

¹ "One third of those in employment (33%) continue to work from home by teleworking ; 40% have completely stopped working. And, despite the risks to their health, more than one in four working people continue to go out to work (27%). [...] Moreover, 70% of the most qualified people continue to work from home": "Impact du confinement sur les mobilités et modes de vie des français" (Impact of shutdown on the mobility and lifestyles of the French), Survey, Forum Vie Mobile, April 2020.

² Conditions for the exercise of a professional activity according to the Acemo Covid survey of the Dares of April 2020. As an illustration, in an operational services group such as Suez, which employs nearly 90,000 employees, nearly 53,000 of them were on site during the shutdown ; 10,000 were placed on short-time working ; 24,000 on teleworking ; 2,500 on childcare leave ,because they are at risk ,and 500 were infected by Covid-19, or suspected of being so: see the interview with Isabelle Calvez, HR Director, Suez Group, AEF Info dispatch n° 627563 of 15 May 2020.

people - the vast majority of whom discovered telework during the lockdown- seem to have enjoyed the experience during this period³.

Two observations can be made about the impact on mobility needs:

- On the *employee/personnel side*: beyond the continuation of the activity despite travel restrictions, an established telework offers the active population a reduction in the financial charges, and loss of time involved in commuting⁴. It is likely that there will be a stronger desire by employees for a professional organisation that combines teleworking days (at home or at a co-working site), and days spent in the office or on business trips over the week or even the month, depending on the internal agreements of the companies or branches;
- On the *employers' side*: While some reservations or managerial uncertainties have remained until recently on the capacity to manage this activity at a distance, the generally observed involvement of teleworkers during this exceptional period seems to have allowed the maintenance of a level of national activity that was more sustained than expected. The economic and budgetary benefits of this method of work organisation, with greater control of fixed property charges for business premises, are now clearly identified by certain large employers. The PSA Group, therefore, wishes to make it a focus of development for the organisation of its support services⁵. Moreover, if teleworking situations were to become widespread in the short term, a debate could arise on the methods for setting up the sustainable mobility package⁶ included in the Law on Mobility (LOM), of which the implementing decree was recently put forward to curb a probable increase in the use of private cars after lockdown.

In the long term

For education in the long term, without repeating here the numerous studies on telework, the current health crisis:

- undeniably creates new possibilities for this mode of work organisation by removing some of the barriers to social standards observed at low noise levels until now⁷;
- allows a better understanding of the total proportion of "teleworkable" workers by 20% to 40%⁸ (with stable economic organisation and without prejudging the terms and

³ "Impact du confinement sur les mobilités et modes de vie des français", Enquête, Forum Vie Mobile, April 2020.

⁴ "French people in lockdown appreciate spending less time in transport (62%) [...]. 39% of French people would like to spend less time travelling in general and even, for 48% of working people, less time travelling to work": "Impact du confinement sur les mobilités et modes de vie des français" (Impact of confinement on the mobility and lifestyles of the French), Survey, Forum Vie Mobile, April 2020.

⁵ With a possible underlying social question: could there be a risk in the long term of employment linked to a greater temptation for companies to relocate part of their support staff to countries with lower wage costs, offsetting the trend towards the relocation of certain production jobs at the end of the crisis?

⁶ Possibility for employers to cover the cost of transport between home and work for all employees using an alternative mode to the private car (carpooling, cycling, etc.) that can be combined with participation in public transport season tickets to a maximum annual lump sum of 400 euros exempt from taxes and social security contributions. etc.) that can be combined with participation in public transport season tickets up to a maximum annual lump sum of 400 euros exempt from taxes and social security contributions.

⁷ See "Taking time into account in mobility", Tempo Territorial, 2019.

conditions of acceptability over time⁹). Yet this means, that most workers are unable to telework, because of the essentially face-to-face nature of their activities, or the lack of digital equipment¹⁰;

- suggests a smoothing out of peak hours favourable to the decongestion in the most saturated areas¹¹, and a gradual reduction in the number of home-to-work journeys made chiefly by private car. But the health crisis says nothing about the possible long-term rebound effects of telework, widely noted in the scientific literature, nor about its ambiguous effect on global GHG emissions. In fact, the greater freedom of choice for the location of their home offered to employees by telework can also lead to an increase in home-work distances¹².

It should be noted that the effects of this crisis on distance education and learning modalities affecting home-to-study trips remain much more uncertain, considering the pedagogical importance of the physical presence of teachers, especially for primary and secondary education ; higher education and vocational training, too, may benefit more from it.

- **HOUSING: the more strongly perceived links between urban density and health risks may contribute to a reorientation of the way in which the territory is occupied and developed.**

In the short and medium term

An impact of the health crisis on town and country planning is highly probable in the medium term, since it is more deeply anchored in the experiences and aspirations of persons, particularly in large cities.

Beyond the media coverage of the "flight" of 11% to 17% of Parisians to less restrictive areas when the news of a lockdown was announced¹³ the health crisis and its strongly heterogeneous conditions of lockdown seem to confirm a major trend likely to have a lasting

⁸ According to a Deskéo study, "nearly 4 out of 10 jobs would be compatible with teleworking in the private sector".

⁹ Already in force in some companies, telework has recently been put on the agenda of national discussions between employers' and employees' trade unions. The CGT research institute has conducted a rather extensive survey on telework, which tends to show major differences in the perception of the subject and the experience of telework according to employees and employers, with a tendency for it to be felt more negatively by women and less favoured social strata.

¹⁰ In 2019, 12% of individuals aged 15 or over living in France excluding Mayotte will have no Internet access from home, regardless of the type of device (computer, tablet, mobile phone) and connection: see Insee Première No. 1780, October 2019.

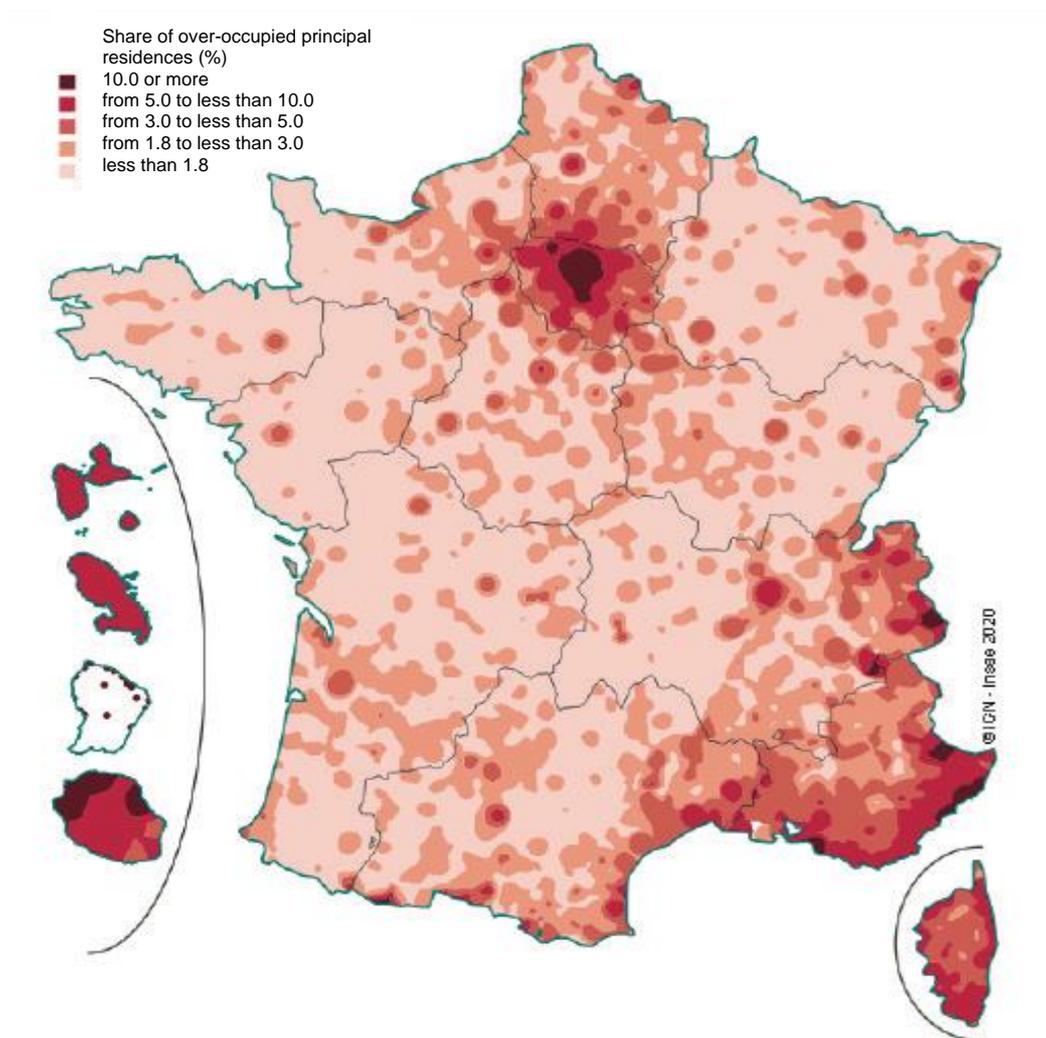
¹¹ Between 5% and 11% of home-to-work journeys could be avoided in the Greater Paris metropolitan area ("Télétravail et mobilités dans le Grand Paris. What impact will tomorrow's transport networks have?" APUR, note no. 181, July 2020). Staying at home one to three days a week for an employee making the round trip during rush hour thus generates a socio-economic economy in the most congested areas which could encourage public policies in favour of teleworking.

¹² Teleworkers may travel more for personal reasons, increasing CO2 emissions if services are not close by and modes are decarbonated, or they may make less frequent but much longer home-to-work journeys and potentially emit more GHGs depending on the modes used, once the decision has been made to live away from the main office of their professional activity.

¹³ The figure of 17% published in the press and taken up by AP-HP Director Martin Hirsch during the first week of lockdown was based on an estimate linked to the drop in electricity consumption and production of household waste, as well as the tracking of geolocalised mobile phone data transmitted by the Ministry of the Interior and the operator Orange. It was then re-evaluated by INSEE at around 11% for Paris residents alone (figures published by INSEE on 8 April and 18 May 2020 combining information from Orange and Bouygues Telecom).

effect on the phenomenon of metropolisation, or more precisely, on urban hyper-concentration, above all in Paris and the Ile-de-France region. "For 23% of French people, the current episode of lockdown is the cause of a desire to move. One in ten French people say they are seriously considering moving in the coming years¹⁴", reveals the *Forum Vie Mobile* survey, carried out in the conditions of lockdown. It should also be remembered that nearly five million people live in "over-occupied" housing, a housing condition that effects more than before the quality of daily life, above all in large cities¹⁵ (see map).

Share of "over-occupied" residences in 2016



Source: Insee Focus n° 189, April 2020

¹⁴ "Among the individuals most strongly seized by this desire to relocate: young people (35% among those under 25 years old), people living in the Ile-de-France region (36%), people working in teleworking (31%), but above all people living in small areas (48% among those living in a studio, 32% among those living in a two-room apartment)": "Impact du confinement sur les mobilités et modes de vie des français" (Impact of confinement on the mobility and lifestyles of the French), Survey, Forum Vie Mobile, April 2020.

¹⁵ "Living conditions of households in a period of lockdown, Insee Focus n° 189 published on 28 April 2020. A dwelling is "over-occupied" when it lacks at least one room by standards of "normal occupation" defined as follows: one living room for the household, one room for each reference person in a family, one room for persons outside the family who are not single or single people aged 19 or over. The over-occupancy rate is calculated from the population census by relating the number of over-occupied dwellings to the total number of principal residences.

In a recent article¹⁶, the architect and urban planner Jacques Ferrier stated somewhat radically: "The awakening after the Covid crisis¹⁹ is likely to be difficult: we must expect great disillusionment with regard to the metropolises which, in adversity, have betrayed their inhabitants. [...] The lockdown revealed the fragility and weaknesses of a built environment, whose technical sophistication and performance were thought to make it invulnerable, if not friendly." History reminds us that cities and town planning have been able to reinvent themselves in the wake of cataclysms or major epidemics caused by overcrowding. For instance, the hygienist movement at the end of the nineteenth century and the Haussmannian works in Paris such as the functional urban planning of Le Corbusier and the Charter of Athens at the beginning of the twentieth century still attest to this resilience today. These ways of looking at the city as a whole, including its sanitary facilities, however, seem to have been slightly eroded over time in favour of a more fragmented management of development operations.

In the long term

On the theme of planning, the health crisis could, therefore, have a long-term impact on two territorial scales:

- **On the one hand**, locally, with the need to rethink the design of large cities for considerations of proximity, neighbourhood life, and a better sharing of public space, those theoretically more favourable to soft mobility than to private car use. During the lockdown period, having some of the basics just outside the house door - the joy of running in the street, hearing the birds with the window open¹⁷, or discovering the living space afforded by an additional room, or a balcony terrace - has had and will have unquestionably an effect on the aspirations of city dwellers, as well as on the perception of urban planners at the beginning of the twenty-first century.
- Similarly, "tactical urban planning" measures, as in Paris¹⁸, with the real-time implementation of several kilometres of cycling paths or the widening of pavements, are suggesting different ways of sharing the road network for the benefit of active modes of transport. The timing and level of citizen acceptance may in fact seem ideal for the continuation of these temporary measures¹⁹
- **On the other hand, on a national scale**, with stronger individual aspirations to live under different conditions²⁰, the deployment of teleworking will eventually make it possible to achieve a certain, no doubt significant, demographic rebalancing in favour of less densely populated areas, though subject to the implementation of necessary logistical and digital infrastructures. Uncertainty persists about

¹⁶ Ferrier J. (2020), "The dense city has betrayed its inhabitants", *Métropolitiques*, 27 April.

¹⁷ "91% of the population appreciates the positive effects on the environment of the decline in human activity": "Impact of confinement on the mobility and lifestyles of the French", Survey, Forum Vie Mobile, April 2020.

¹⁸ "La marche et le vélo plébiscité en période de crise sanitaire", APUR, Note n° 182, July 2020.

¹⁹ "In terms of mobility, 38% of the individuals questioned said they had become aware that part of their journeys could be made more in close proximity (on foot or by bicycle)," emphasises the Forum Vie Mobile survey, corroborated by the sharp increase in the use of cycle paths (+87% over the first three weeks of the deconfinement compared with the average for the period before the confinement from 1 January to 17 March 2020, according to the bimonthly bulletin monitoring cycle use set up by the Vélo & Cité association). Territoires) and the explosion in bicycle sales.

²⁰ Following either the difficult experience of lockdown in a small dwelling in a metropolis, or, by contrast, the more comfortable experience in a city on a human scale, or even the "unforgettable" experience in the countryside in a house with a garden and swimming pool, confirming in all cases a minimum of living space necessary in a perspective of resilience to future epidemic and climatic crises.

the degree of such a development, as well as its possible differentiation between a "loosening up" towards medium-density areas (medium-sized and small towns, peri-urban areas²¹, or a search for "isolation/autonomy" towards areas of low or even very low density (rural, very remote peri-urban areas). The repercussions would not be the same for demands for mobility, and could hinder the achievement of the Biodiversity Plan's objective of zero net artificialisation (ZAN).

The other uncertainty deals with the nature of this impact on demographic change in the Île-de-France. Like other metropolises, the capital region must develop in greater synergy with its surrounding territories. But the scale of the densities and volumes involved within Greater Paris may now raise questions. Beyond the construction of the Grand Paris Express metro, the definition and choices that have not yet been completely realized for the project, together with its territorial influence, this issue could again be the subject of debate because of this questioning of hyper-concentration rather than of the urban reality itself, with regard to the resilience of the Ile-de-France metropolis and the persistence of its socio-demographic imbalances.

Thus, once a consensus has been reached nationally and locally for urban planning in large cities and for regional planning and rebalancing, it might be that in turn mobility systems could be adapted accordingly²².

- **BUY/CONSUME : the methods of using e-commerce confirm a basic trend**

In the short and medium term

After an increase in home deliveries at the beginning of lockdown, this trend appears to have reversed afterwards. The above-mentioned *Forum Vie Mobile* survey observed in April: "Against all expectations, [...] the fact of being confined does not lead the French to make greater use of delivery services [...] Not only is the delivery of food products, whether to relay points or to homes, stagnating, but other forms of delivery are decreasing." In addition to these indicators measured in a general context of falling consumption, a survey carried out by the Fédération du e-commerce (Fevad) from 23 to 25 March confirmed, despite a significant maintenance of activity during the confinement, a contrasted situation with, in particular, a more positive effect for retailers offering the possibility of remote orders than for "pure players" only on the Internet.

In the long term

Despite the real fear of being contaminated during deliveries, or Amazon's legal difficulties in France during lockdown, the marked trend in e-commerce development over recent years in large metropolitan areas does not appear to be challenged by the health crisis. Paradoxically, it must be noted that in this extreme situation of "domestic retreat," a possible limit could arise for the massive and systematic recourse to home deliveries, because the physical need for business contact persists. And many local retailers have adapted to this

²¹ According to Olivier Sichel, director of the Bank of the Territories: "It is possible that this crisis will be favourable to medium-sized cities that have very affordable real estate, that are known for their quality of life, that have good telecommunications networks and very high speed broadband... But will the gigantic experience of teleworking far from the dense areas that we have seen during the containment be going to reshuffle the cards between metropolises and medium-sized cities? It is too early to say, but the trend is strong. »

²² "This crisis could be the starting point for a radically new and different policy for spatial planning and rural development. The time has come to question obsolete or inefficient operations which are never questioned because habits are so deeply rooted by routine, lack of time, by mimicry, and because, deep down, it's comfortable": "The Covid crisis19. The dawn of a new area for the territories? "The Conversation, 23 April 2020.

situation by adopting their own forms of e-commerce beyond the large platforms alone. It should be remembered that for the environment, even if few studies have undertaken a comprehensive and detailed carbon assessment of e-commerce, the reduction in individual customer journeys is offset by the proliferation of deliveries (and packaging) which increases the short distance journeys of "urban logistics" which are still high in carbon emissions²³.

- **TRAVEL: the strong impact on world tourism and international travel questions the air transport model**

In the short and medium term

The substantial halt in world tourism is probably the most spectacular aspect of this health crisis. The extremely rapid spread of the pandemic by the global exchange of peoples was immensely facilitated by the increase in air traffic in recent decades. Hence, the resulting closing of national borders, as well as the episodes of contamination on board cruise ships, have had a major, most probably lasting, impact on international tourism, which is one of the economic sectors most gravely affected by the health situation, in addition to culture. This crisis has undermined a whole section of the mass tourism economy on which the air market was largely based, and whose model now seems to be reconsidered, despite the uncertainties.

Similarly, many very long-distance business trips such as the organisation of international seminars are cancelled, postponed, and drastically reduced; the economic urgency of certain exchanges are being usefully replaced by remote communications.

In the long term

Until the pandemic is contained and the borders are reopened, world trade and international air traffic will be affected.

But the question remains: for long-distance leisure travel, apart from the short-term impact recorded this summer 2020, how will different social categories react to the end of this pandemic once all borders have been reopened, and how will this affect the tourist industry? Will the tourist operators concentrate on a domestic market to adapt to the lower purchasing power of households, and the inevitably higher cost of air transport? What will be the consequence in emerging countries, and what will be the reactions of the younger generations in Western metropolises?

If the pandemic is eventually controlled or disappears, international tourism could resume, especially with a demand from the middle classes in emerging countries that have been developing rapidly, and would like to (re)take the plane to explore the world, most notably China and India.

In the Western countries, the continuing demand so far, particularly among a young clientele, will be highly dependent on the price levels, and on the increasingly pressing social and ecological context.

²³ Even if tomorrow some of these deliveries will be done by drone or cargo bike, the major challenge remains the greening of the fleets of delivery companies. In one of the few studies published in 2019 the estimation of the environmental impact of e-commerce showed that the CO2 emissions of express delivery companies in the United States (UPS, FedEx, etc.) were equivalent to the pollution generated over a full year by more than seven million cars. This effect adds up to the ecological impact of digital technologies themselves. In urban areas, this would tend to limit express home deliveries and favour more withdrawal centres in busy places, such as train stations.

At the same time, companies will certainly reduce their long-distance business trips, because of their more limited travel budgets, and because of the digital tools tested and approved during lockdown, limiting the need for face-to-face meetings.

Thus, despite an expected recovery in the operational capacity of air traffic, the nature of the needs of both business and leisure customers may well change. The air transport sector would then inevitably undergo major restructuring to rebuild a business model adapted to this new demand, and simultaneously integrating respect for carbon neutrality.

Similarly, a revival of domestic tourism, both national and European, can not be overlooked, and could influence the demand for medium/long-distance mobility in favour of a more sustainable modal split between cars, trains (day and night) and planes.

Summary of the impacts of the health crisis on mobility behavior and their potential effects on GHG emissions

	Short and medium term	GES	Long-term	GES
Working	General decrease in the number of journeys partly because of teleworking and fear of travelling. Reduced use of public transport, and a majority shift to private cars for solo driving and, to a lesser extent, to soft mobility in large cities	↘ ↗	Decrease and smoothing of home-to-work commuting related to teleworking. Flexibility in the lifestyles of a category of the population favouring proximity, but with the risk of an increase in private travel and/or longer business trips.	↘ 0
Living	Little impact apart from a possibly more frequent use of second homes by teleworking employees and managers without school children	0	Paris Region and metropolises with: - a more homogenous national demographic distribution between towns and cities, favouring greater proximity; - or reinforcement of imbalances towards the coasts or dispersion towards isolated areas or in remote peri-urban areas.	↘ ↗
Buying	Increase in local businesses using e-commerce, with reduced distance in delivery.	↘	No consumption.	0
Travel	Ending or very strong limitation of world tourism and international travel according to the more or less opening of borders.	↘	A reexamination of the growth and development model of air traffic, the model of mass tourism linked to it, and to a lesser extent long-distance business travel.	↘

Source: France Stratégie

2. Essential support from the public authorities

This health context is likely to have an effect on the collective awareness, both civic and economic, concerning the vulnerability of human societies to global risks - a vulnerability potentially exacerbated by mobility and galloping urbanisation. However, the stunning effects of lockdown, which implies an almost general halt to mobility, and therefore, a significant drop in greenhouse gas emissions, must not be replaced by a "spring effect" during the progressive end of the restrictions imposed by the lockdown with a denial of both climate and health constraints. This could lead to ill-considered use of polluting and CO2-emitting modes, already observed with a major shift from public transport to private cars, even though the general context of climate emergency and ecological transition now seems to be understood more broadly. The public authorities should rely on a temporarily more

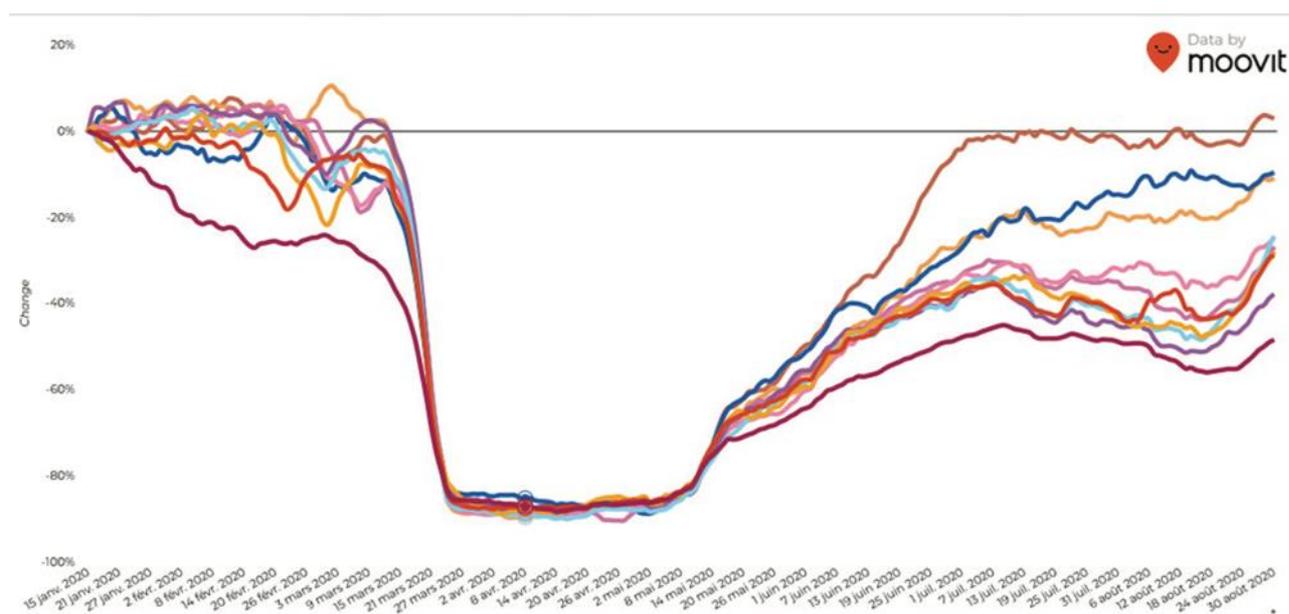
sensitive opinion to implement behavioural guidelines of sobriety favourable to an ecological transition of mobility. Coherent transport supply policies should be supported, either within the framework of measures already initiated (LOM), or within that of ongoing recovery plans, and adapted or even renewed land use planning policies.

In this context, what can or should be supported?

- **SUPPORTING PUBLIC TRANSPORT: this support for public transport networks, which remain an immediate and largely carbon-free response to urban and interurban transport needs, appears essential to avoid a shift away from private cars.**

The impact of lockdown measures has been strikingly abrupt for public transport. During this period, most urban, interurban and regional transport networks sharply reduced their supply to about 30% of their nominal capacity, while maintaining urgent or essential transport (care staff, employees unable to telework, etc.)²⁴. Similarly, the SNCF has drastically reduced its transport plan, adapting it to the severe restrictions on travel and, conversely, to regulate flows (in particular for interurban journeys of more than 100 km)²⁵.

A gradual recovery: analysis of the impact of Covid-19 on public transport ridership in ten French conurbations, 15 January 2020-30 August 2020



Source: based on user data from the Moovit route planning application (www.moovit.com)

²⁴ Contribution of France Urbaine and GART to the preparation of deconfinement, April 2020.

²⁵ Capacity has been reduced to 7% of the TGV offer and 30% of the Transilien and TER offer depending on the region. While 60% of freight trains continued to run, passenger traffic was at an exceptionally low level: in mid-April, the SNCF carried only 1% of regular TGV customers (apart from exceptional health-related traffic linked to the medical TGVs), 2.5% of TER customers and 3.5% of Transilien customers.

The apprehension of the lockdown period is much more palpable, and the resumption of traffic is very gradual²⁶. It is a matter of managing flows, particularly the densest flows in the metropolitan areas and Île-de-France, given the partial saturation of its network²⁷. It is a matter also of guaranteeing (or regaining) customer confidence in the use of public transport. In addition to government decisions on mandatory mask wearing in public transport, operators have been exceptionally mobilised, demonstrating a responsiveness and innovation in support measures such as distance marking on the ground, systematic disinfection of trains and station equipment, train composition, occupying one seat out of two in Île-de-France and in interurban trains, real-time flow management systems in stations, and so forth. Transport operators also rely on the sense of responsibility of their customer-users. For instance, the SNCF has drawn up a national charter "By train, all responsible" based on reciprocal commitments made by both the SNCF and passengers, the impact of which seems to be positive.

With conventional transport, operators continued to be paid by the Mobility Organising Authorities (AOM)²⁸. The economic impact of the health crisis will have delayed repercussions on the financing of public transport - 410 million per month for all public transport operators at the height of the crisis during the lockdown period, including 300 million for Île-de-France²⁹ and the impact of this crisis on the general finances of local authorities, the loss of business activity has a direct impact on the amounts of Mobility Payments (VM) received by the AOMs. While this effect on the finances of the AOMs will depend heavily on the local economic fabric, the Senate Finance Committee³⁰ estimated at the end of April that the loss would be between 860 million euros and 1.9 billion euros out of a total income from the VM estimated at 9.4 billion euros in 2020³¹. For interurban transport, the economic strains for the finances of the SNCF caused by strikes end of 2019 were compounded by the health crisis of 2020, resulting in more than €4 billion in lost income (€3.9 billion linked to the health crisis and €250 million linked to the strike in January 2020). However, since the government has confirmed its support for rail transport as part of its ecological transition policies, the future financial balance for which the SNCF CEO requested specific assistance must be placed within larger discussions about the organisation of

²⁶ The ridership statistics for the provincial networks provided by the UTP show a drop of almost 95% during the shutdown, a ridership of barely 50% one month after the shutdown in mid-June, and a recovery of about 80% (outside the Ile-de-France region) during the summer months ; these changes reflect that the French have rarely gone on holiday, and then mostly on French soil. The ridership of the public transport networks having benefited both from the mobility of the inhabitants who have remained in the towns, and from French tourists who have (slightly) replaced foreign customers. Uncertainty naturally remains at the start of the new school year.

²⁷ Mainly the North and East of the Île-de-France region, which has in fact seen large flows of unconfined workers.

²⁸ Because of the continuity of the overall public transport service.

²⁹ Contribution of France Urbaine and GART to the preparation of deconfinement, April 2020.

³⁰ Note n° 3 on the economic situation and monitoring of the emergency plan to deal with the Covid-19 health crisis, April 13, 2020.

³¹ The Amending Law No. 3 promulgated on 30 July 2020 extended the financial support provided to local authorities and their transport authorities to Île-de-France Mobilités (IDFM) by recording an initial advance payment of After warning for several weeks, considering that this compensation was much lower than the cumulative reduction in the mobility payment (estimated at €1 billion) combined with the reduction in passenger revenue (estimated at €1.6 billion), the President of the Île-de-France region put the State under pressure by stopping the payment to the RATP and SNCF operators as of July. An agreement was finally reached on 8 September 2020 between the presidency of the Île-de-France region and Matignon: this agreement is based, on the one hand, on the State's assumption of responsibility at the beginning of 2021 for losses in mobility payments up to the figures that will actually be recorded at the end of 2020 (probably around €800 to €900 million) and, on the other hand, on the allocation of financial advances partially compensating for the commercial losses for a total amount of around €1.2 to €1.45 billion, repayable from 2023 onwards.

domestic transport and the place of rail for both passengers and freight, particularly involving the recovery plans³².

Thus, the health crisis is reviving some long-standing fears about public transport and its environment now perceived at higher risk for contagion. In the short term, this preoccupation weakens the use and operation of public transport. However, the medium-term impact remains uncertain, and may be worrisome depending on how long health measures are maintained for the profitability and development of the networks. The risk would be to seriously undermine – or even

to destroy - the trends observed in recent years in favour of public transport, particularly within large conurbations, in favour of increased use of private cars³³. A shift towards soft modes - walking, cycling - is certainly a solution to be promoted during lockdown to lighten the use of public transport and road networks in large cities, and to condition new behaviours. Yet the volumes at stake in conurbations mean that the development, and the use of public transport should be maintained as the main alternative to the private car, in line with the directions taken (or to be taken) in terms of town and country planning.

- **SUPPORT THE GROWTH OF GENTLE MOBILITIES: the sustainability of pedestrian and bicycle facilities in both urban and rural areas takes on its full value with a more marked policy of limiting the use of thermal cars in urban areas.**

The lockdown brought an awareness of the impact of road traffic on the quality of the immediate urban environment for air pollution, the occupation of public space, and noise levels. Such a consideration could have a double positive impact - on the acceptance by city dwellers of the low-emission zones instituted by the LOM, and on the demand for more sober means of transport, provided that the latter are simultaneously more affordable and more practical.

Following the Volkswagen scandal and the rigged assessments of nitrogen oxide (NOx) emissions in September 2015, several major European cities such as Paris, Berlin, Madrid and Rome have already announced their intention to limit the circulation of the most polluting diesel cars. Citizens' awareness of this health crisis will undoubtedly strengthen reinforce the official choice, accelerating the planned agenda. This is especially true if the temporary cycle paths that have been set up in most major cities to avoid a massive return to private cars are maintained.

Having benefited from the public transport strikes, the bicycle could at the end of this crisis become an enhanced form of urban transport with appreciable, beneficial effects on the environment for - CO2 emissions, particulate and nitrogen dioxide emissions, noise emissions, traffic jams, parking – and at the same time minimise risks of spreading the virus through physical distancing.

³² The context of the reform for a new railway pact adopted in 2018, which leads the State to eventually take over 35 billion euros of SNCF debt, naturally conditions the discussions, even if this debt comes essentially from SNCF Réseau's investment in new infrastructure and lines, and not from SNCF's commercial losses. The "France relance" plan announced by the government on 3 September contains a rail component with a budget of €4.7 billion that will enable the company to preserve investments to regenerate the structuring network without incurring further debt and increase those on the country's fine service lines, and to help relaunch rail freight and maintain its production facilities.

³³ According to a CSA survey at the end of confinement, more than two out of ten public transport users (22% for metro / RER users) did not intend to reuse them, mainly to the benefit of the car for 70% of them. At the same time, however, two thirds of users thought they would be back on public transport "as before" in less than three months, with 40% of them considering it necessary to apply health measures for six months to regain their confidence. In short, a sort of very slow return from summer holidays...

For example, the construction in Île-de-France of a major regional express bicycle network (RER V)³⁴, similar to the RER, consisting of 9 lines linking the region's centres with 650 km of cycle paths, would cost 500 million, less than 2% of the future Grand Paris Express metro. In 2012, the city of Copenhagen launched a major 14-year plan to improve the quality, safety, and comfort of cycling ; it has succeeded in increasing the modal share of cycling to work or school from 36% in 2012 to 62% in 2019³⁵, confirming the potential of cycling for certain journeys in the city, provided that the infrastructure - cycle paths and parking - is sufficiently developed.

Temporary cycle paths in Greater Paris and the Ile-de-France region



Source: Métropole du Grand Paris and Collectif Vélo Île-de-France

- **LIMITING INDIVIDUAL CAR USE AND ACCELERATING THE ELECTRIFICATION OF THE FLEET:** the ecological impact of the rebound in car use can be controlled by encouraging new alternative modes (carpooling) and accelerating the switch to electric vehicles, especially for households with no alternatives the private car.

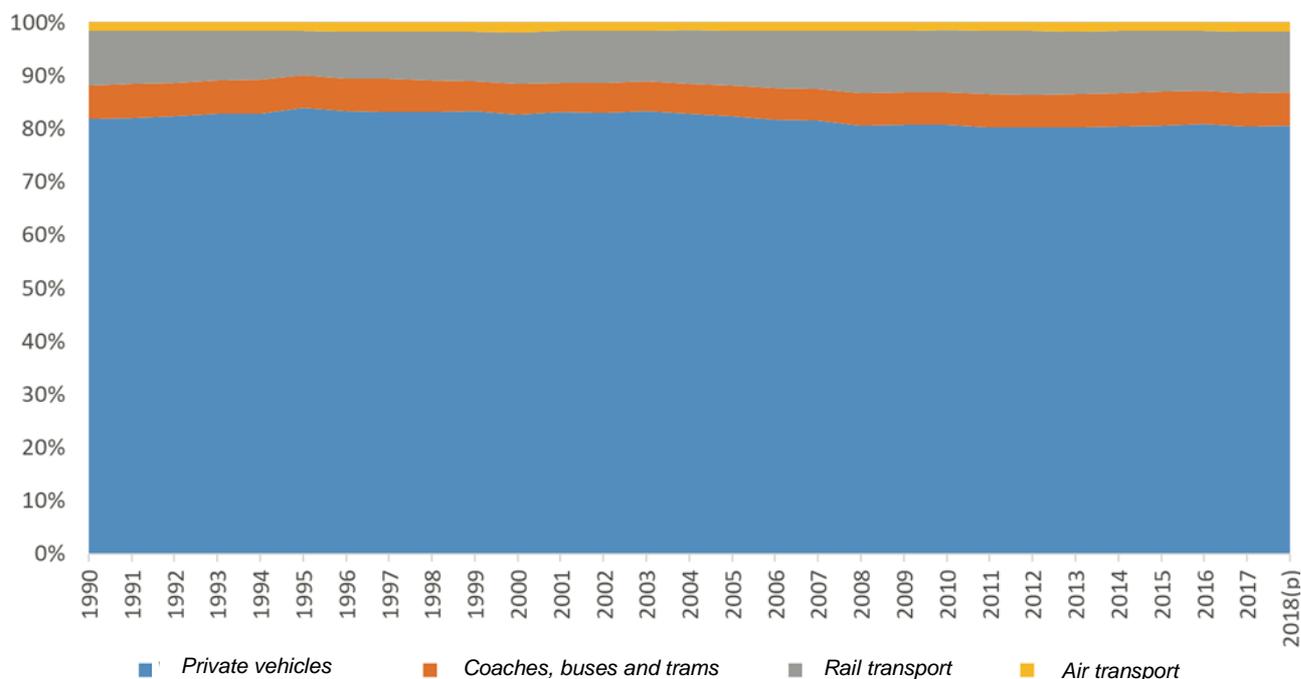
The health crisis is undeniably increasing the use of private cars out of fear of using a mode of public transport without proper physical distancing. The use of a private car remains the

³⁴ <https://rerv.fr/>

³⁵ "Copenhagen has taken bicycle commuting to a whole new level", Los Angeles Times, août 2019.

sole means of transport for a large portion of the urban population, even though many alternatives exist that favor decarbonised mobility by 2020³⁶.

Changes in modal shares of domestic passenger transport as a percentage of passenger-kilometres, 1990-2018



Source: *Transport accounts in 2018, SDES*

Decarbonising the use of private cars, therefore, is essential to achieve carbon neutrality. The context of the end of the health crisis, and its sectoral recovery plans is an opportunity to set in motion this transition in the automotive industry, so that people, without an alternative to the private car, can equip themselves with lighter, electric vehicles that emit less CO₂³⁷.

At the same time, carpooling in support of the recent measures of the Loi d'orientation des mobilités may represent an alternative to public transport during the pandemic to curb the spread of the virus³⁸ while limiting the externalities associated with the exclusive private car use. There is a large pool of available places in cars, with an average occupancy rate of only 1.1 people per car when commuting³⁹. Businesses and local authorities could encourage car

³⁶ The transport accounts in 2018 - 56th report of the Transport Accounts Committee of the Nation.

³⁷ Meilhan N. (2019), "How can we finally reduce CO₂ emissions from cars?" La Note d'analyse, No. 78, France Stratégie, June.

³⁸ Although there is also a certain reluctance to use a stranger's car. A national survey conducted by Karos indicates that 35% of their own customers consider carpooling less after confinement. See "What post-covid mobility", a national survey conducted via an online form between 24 and 26 April 2020 (4,356 responses collected in the Karos database).

³⁹ CGDD (2014), " Le covoiturage pour les déplacements domicile-travail : quel potentiel ? ", August.

sharing - through the mobility package or the strengthening of dedicated lanes⁴⁰ - so that the private car becomes the "public transport" for those without one.

- **ACCOMPANYING AIR TRANSPORT TRANSITION: the collapse of the tourist market during the period of lockdown combined with the advent of indispensable ecological transition measures is encouraging a reconsideration of the global business model of air transport, particularly that of low-cost air transport.**

Before the health crisis, 4.54 billion⁴¹ air passengers were carried worldwide each year. In October 2018, IATA estimated that if the policy framework remained unchanged, trends would suggest a doubling of passengers to 8.2 billion⁴² in 2037, an annual growth rate of 3.5% for 20 years. But the Covid-19 health crisis with the lockdown of populations in many countries, and the closing of borders has forced airlines to a standstill, with world air traffic falling by 90 per cent⁴³.

As long as the pandemic is not contained worldwide, and health measures compromise aircraft occupancy rates⁴⁴, air traffic will be unable to resume fully. The various players in this sector agree on a minimum period of 5 to 10 years before returning to a level of traffic and a growth trajectory close to those of 2019⁴⁵.

Yet the air travel demand for tourism or professional reasons is likely to evolve appreciably. However, the ecological impact of this development linked to a strong growth in air traffic is no longer tenable within the framework of institutional policies of carbon neutrality, a reality that would lead inevitably to an increase in the price of air tickets. Thus in all likelihood only the most major airlines will survive this difficult period and invest in greener aircraft (sustainable biofuels, electric or hydrogen engines) that consume less energy and emit less CO₂ - an indispensable effort to respond to this new context of ecological transition and now demanded by a new post-Covid-19 clientele.

At the same time, alternatives to domestic air travel, particularly the use of trains, should be carefully studied, placing the cursor as wisely as possible between the need for air travel and its ecological impact.

Economic measures can facilitate this development by integrating the cost of externalities into the price of the air ticket, or by adopting more social measures such as the regulation of business travel in companies or by the compliance with an annual carbon emission quota recently put forward by the Citizens' Climate Convention.

⁴⁰ The rebound effect of car-sharing linked to the fluidity of other traffic remains to be controlled with the help of the road infrastructure capacities offered for different uses.

⁴¹ <https://www.iata.org/contentassets/36695cd211574052b3820044111b56de/2019-12-11-01-fr.pdf>

⁴² <https://www.iata.org/contentassets/db9e20ee48174906aba13acb6ed35e19/2018-10-24-02-fr.pdf>.

⁴³ During the first week of the lockdown, while waiting for the borders to reopen, Air France, for example, only operated 5% of its programme - between 30 and 40 flights a day compared to 1,000 to 1,200 before.

⁴⁴ As with the 70% threshold for high-speed TGV trains, physical social distancing for sanitary reason on board aircraft makes most airlines financially unviable, as it is impossible to reach the economic equilibrium threshold at the 77% occupancy rate (<https://www.iata.org/en/iata-repository/publications/economic-reports/social-distancing-would-make-most-airlines-financially-unviable/>).

⁴⁵ Boeing's CEO hopes to reach the 50% level of business only by the end of 2020. The executive chairman of Airbus expects a recovery between three and five years. The Archery Consulting firm estimates that even in an optimistic scenario, it would take three years to return to the 2019 traffic level and at least ten years to catch up to the pre-crisis trajectory.

- **PROMOTE LAND DEVELOPMENT AND URBANISM POLICIES: policies in favour of medium and small towns must be accompanied by transport policies (in particular peri-urban and interurban rail services to these towns⁴⁶).**

Finally, it seems more essential than ever to strengthen territorial planning exercises. These will support a demographic rebalancing movement to correct imbalances from the hyperdensification and specialisation of the metropolises and the Île-de-France region.

It is a question of supporting a strong desire for local anchoring and proximity, in line with any government guidelines in this area, with a view to making the national territory more resilient⁴⁷.

Considering mobility and despite the likely impact on the short-term use of both urban and interurban public transport, these guidelines for urban planning and development afford an opportunity to reinforce the strategic role of this transport for a harmonious and ecological development of cities and territories. It is necessary to avoid abandoning to individual motorised transport an excessively large share of journeys, a source of dispersion of housing and activities⁴⁸. In the extension of the LOM establishing mobility basins, this context of health crisis would strengthen the interest of a comprehensive regional approach to mobility, integrating private cars and regulated public transport more closely into a multimodal vision. Thus it would be possible not only to approach the management of flows in a global way, but more generally to avoid any counter-productive action with regard to the rebalancing between modes and to accompany a more volatile demand in the future with flexibility⁴⁹.

The situation thus seems to offer an extremely brutal, but also almost providential, opportunity to confirm certain decisive orientations in terms of demand for mobility as well as the ecological and industrial transition of the most carbon-intensive and polluting modes of transport. The crisis could result in the introduction of more balanced policies for ecological mobility. This could also take place within the framework of a competitive domestic transport market, one that is already witnessing some car manufacturers shift to the practice of shared mobility services. No less, the future may even see certain airlines form partnerships to invest in the rail market.

⁴⁶ On this subject, consult the working document of France Stratégie to be published at the end of 2020 on mobility in peripheral and sparsely populated areas.

⁴⁷ "We will have to build a strategy in which we find the long term, the possibility of planning for carbon sobriety, prevention and resilience, which alone can enable us to face the crises to come," the President of the Republic said on Monday evening, 13 April 2020.

⁴⁸ As the SNCF CEO argued before the National Assembly's Sustainable Development and Planning Commission on 19 May: "Mobility habits will be questioned through what we are experiencing. I hope that we are not going to witness a regression towards the individual car or the truck. We have to be very careful that we are sufficiently voluntarist so that at the end of this period, it is the modes that protect the planet, and notably the railways, that will find themselves helped to ensure the mobility of the French."

⁴⁹ On this subject, it is useful to note that a regulated collective system is by nature more capable of controlling the supply, and therefore, the flow of journeys, as was clearly observed during this health crisis, with operators adapting their transport plans in real time at the request of the public authorities.