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One might think that by encouraging remote work, by its very nature, it will have a positive impact on the amount of travel. Is this the case?

"We researchers are very cautious about the impact of remote work on mobility. In absolute terms, if you stay at home one, two or three days a week to work remotely, it will mean fewer home-to-work journeys. But we also know that remote workers are people who live much further away from their main workplace than other categories of workers. They may therefore come to the company less often, but this raises questions of trade-offs in terms of transportation subscriptions, for example: if one only travels two days a week, is it not in one's interest to no longer pay for this annual subscription and rather to commute systematically by car? Moreover, all other things rarely being equal, it is not enough to remove a trip to work – as this could create another trip elsewhere. For example, remote working does not annul the need to take one's child to day-care… which was chosen, ideally, on the way to work. In England, surveys measure all journeys over a week, which show the correlations between remote working and the amount of traveling. These surveys were generally conducted before Covid-19. What we could already see was that remote workers were living much further away from their workplace than non-remote workers. And, over a period of a week, when their work-related journeys (home-work and work-related) and their personal journeys (all other reasons) were aggregated, they were amongst the most mobile categories. We even saw that they emitted as much CO_2 as the most mobile workers that were travelling for work purposes. While it is true that they travel less for the purpose of commuting (from home to work and back), they make many more short personal trips on days when they do not work remotely, and they do so by car. These findings cannot be transposed to France or to other countries, and these are data from before the health crisis, but the employment structure of remote workers in France, for example is quite similar. There is every reason to believe that the results would be quite similar. And Covid seems to have only increased this reality. However, we are in a period which is not yet stabilised, and it is therefore difficult to have measures on the new realities of work collectives."

What levers can the HRD use to act on carbon emissions linked to travel between home and work?

"The factors linked to mobility behaviors are well known: social category, gender (on average, men have structurally longer home-to-work journeys than women, which is explained by the fact that women take on more domestic and parental activities), place of residence (city, suburban or rural areas), etc. Work is one of the main reasons for travel, or even the main reason depending on the country or region. For HR, the first challenge is to divide-up areas of competences: can we, for example, 'force' someone to live in a place where his or her journey would be sustainable or, in any case, more virtuous than elsewhere? This contradicts other social phenomena, notably the importance of home ownership for households - which, for the middle classes, can entice them to live quite far from their work. Furthermore, property is seen as a safe haven: while one can change jobs every five years, one does not expect to change property over the same period, especially as a homeowner. On the other hand, even if you recruit 'locally', there is no guarantee that the employee, after a while, will not move elsewhere because he or she will want to buy a house in the country, looking for a better lifestyle... especially if you allow him or her to work remotely. Moreover, I don't think that the company has the capacity to impose living locations to its employees, except by providing accommodation as part of the employment contract. It is therefore complicated for employers to influence this home-work distance. On the other hand, they are better able to choose a location that is accessible for their workers by more sustainable means than the car."

If, beyond this choice of location, they cannot influence the distance, can HRDs act on the means of travel?

"In a way, yes. A first question would be whether, for example, there is a need to allocate company cars to employees? That said, it depends a lot on the sectors: in several of them, there are associated issues of status and representation, or even attractiveness and loyalty, which may need to evolve, but that is difficult. We can work on the type of vehicle, even if we know that the environmental impact of an electric vehicle is not neutral either. We can encourage carpooling. However, there is still a general problem here, which is that, in order to facilitate soft or shared modes, the flexibility of working hours does not work in their favour: flexibility is one of the first reasons cited for not carpooling between colleagues. A study showed that in the day-to-day informal practice of carpooling, the fact of not having the same working hours was a limiting factor, especially when personal constraints - picking up the children, having to run errands, etc. - were added to this. The impact analysis of the mobility plans shows that having a project manager, who with a table and a pencil, records journeys and matches them up, has positive effects. If you leave it up to people to arrange it between themselves, it's more complicated. If you leave it to an application, it's complicated too. As much as these digital tools work very well for long distances, they are not as effective for short distances, recurring and daily use. It is therefore necessary to rely on intermediaries. An interesting lever in France is to be found in the *Forfait Mobilité Durable* (Sustainable Mobility Package): in the same way that public transport is covered for employees, this scheme offers a form of compensation for those who come to work using so-called virtuous modes such as cycling or carpooling, for example."

If you were an HRD and you had this environmental ambition, what would be your bet ?

"If you want to discourage the use of cars to go to work, there is a very simple lever to activate: you remove reserved parking spaces in companies. Well, 'very simple' - let's be clear about that - it is of course very restrictive and there are many factors to take into account. But if all employees are almost guaranteed a space at their destination, they will use the car much more to commute to work than if they did not. Many studies in urban planning around the world attest to this. More diplomatically, I would try to promote modal shift so that people minimise the role of the car in their journeys. People who live in sparsely populated, peri-urban areas may be able to reduce the use of the car if they use other modes of transportation in addition to the car. This is multimodality: for example, taking the car to the station, then the train to work, which presupposes having a job that is accessible by train. We can also look at how people travel to their workplace and offer them alternatives, by means of individualised marketing actions. There is a whole process of diagnosis and support for people to show them that the car is not necessarily the most efficient way to move around. This dependency to the car stems from an attachment to the mode of transport itself, but also from a very strong belief that it will remain the most efficient tool for getting around and carrying out activities. A more in-depth analysis (by following people for several days) can show them that there are other ways of doing things, less motorised, more economical, etc. But this requires support that takes time, can be costly, and is dependent on the goodwill of employees. It is not enough to hire a mobility advisor, because mobility remains the expression of individual freedom outside of any service constraints. After all, from an individual freedom perspective, the normative role of the car remains very important. There is therefore a lot of convincing and educating to be done."

How do digital technologies impact on mobility issues?

"Many researchers in transport sciences are trying to understand the impact of digital technology on travel... Without necessarily taking into account the environmental impact of digital technology itself - in particular all the servers needed to run the system, which have become the world's biggest energy consumers, far ahead of transports. One of the promises - which we heard a lot with Covid-19 - is that remote work would reduce travel. This hypothesis of substitution has not been much verified. Overall, everything indicates that digitalisation is not taking us in the direction of less travel. Sometimes it is even the opposite: digital technology generates other types travel. We can see this, for example, with easier access to tourist offers. Part of low-cost plane travel has developed on the basis of digital technology and the fact of having easier access to plane tickets without intermediaries. E-commerce and its development during the health crisis is another example of the impact that digital technology can have on the environment. People can shop online, saving trips to the supermarket. But what we forget is that in France, the main method of collecting online shopping is the drive-through. Thus, that does not cancel the trips: we still go to the supermarkets, but we stay there a shorter amount of time. Not to mention all the trips that are not accounted for of in e-commerce, namely product returns and all the after-sales service flows. In the United States, research has shown that people have several items of clothing delivered to them and rather than send back the ones that don't fit, they take them back to the store... which generates additional trips."

Can digital technology also provide tools to support more virtuous travel?

"Of course. A simple tool is the multimodal itinerary platforms that can show you the different options and allow you to realise that travelling by car will be less efficient than with other modes of transportation. Having said this, it is important that people actually use these alternatives. Some of these tools display the CO_2 emissions associated with different modes of travel. But here's the thing: what digital technology allows us to save in travel - and remote working is a good example of this - we don't know how it will be reinvested elsewhere. If people travel less for one reason, they can take advantage of it to travel more for other reasons, or in another way. They may travel more by bicycle or by walking. But it is not automatic. It varies greatly depending on where we live, the social category, the family situation, etc. Travelling less by car for work can lead to travelling more by car for other reasons: to go shopping, to accompany children to extracurricular activities, etc. These trade-offs at household level are not always easy to control and even less so to change. The impacts of digital technology on travel are not so easy to measure, and their effects on the environment have multiple dimensions."

In conclusion?

"The fields of action for HRDs exist and there are different ones, but they also depend a lot on the goodwill of people and the way they use technologies to actually have more sustainable behaviours. Having done a lot of work on deliveries, we realise that the models that say that e-commerce is a way of reducing emissions because deliveries are done by drivers equipped with more performing vehicles are based on a central assumption. These models assume that the consumer will not travel from home, when in fact we don't know about that. Or rather, we know that they use the internet as a complementary channel, but that does not prevent them from going to the shop for other reasons, for example to see what they are going to buy next online. By analogy, remote working raises the same questions: HRDs can act on travel related to work (for example in the transport sector or if the company employs mobile employees), but it will be more difficult for the home-work commute, which partly touches the private sphere. They are then much more dependent on people's goodwill or on what people are willing to do, consciously or unconsciously."