By the end of May, morning commutes had only reached 60% of their usual level

As well as recording the changes of place of residence that occurred at the start and end of lockdown, mobile phone data have been used by INSEE since the start of the health crisis to estimate the numbers of residents present on the national territory each night, thus also providing a picture of the extent of daily travel. Morning trips in particular, which may be described as commutes to the workplace, provide an indication of local-level daily activity. After falling to around a quarter of their usual volume during lockdown, by the end of May morning commutes had only risen to about 60% of their level of early February. This reflects how gradual the upturn in activity has been, but probably also the large extent to which certain professions and people in certain areas have continued to work remotely.

The most densely populated zones saw a far more marked reduction in commuting than sparser regions. During lockdown in large urban areas, morning travel towards business and shopping districts was distinctly lower than that towards more residential areas. These contrasting local situations still held true at the end of May, after lockdown had been lifted.

### Understanding commutes via mobile phone data

The results presented in this focus article are based on mobility estimates made by Orange Business Services France through its existing Flux Vision service, which Orange decided to share with INSEE in view of the unprecedented health crisis. After publication of estimates on the number of residents present on the territory each night, potential morning commutes are identified in order to track the variation in activity since the start of the crisis. The algorithms used by Flux Vision guarantee irreversible anonymisation by deleting all personal data and making it impossible to identify any physical person. This statistical tool measures the multiple trips made by the resident population of France between 1st January and 31 May 2020. The distances travelled and the travel times vary, potentially reflecting different reasons for those trips. In order to narrow this travel down to morning commutes – which are made directly for the purposes of professional activity – the only trips considered here are those that ended between 7 am

and 9 am followed by a 3-hour period of immobility. The indicators we analysed add together all the distances travelled during these commutes. These indicators were adjusted beforehand by Orange in order to make them representative of the resident population rather than just Orange mobile users. All the results given here to reflect a given level of activity during the health crisis are plotted against a reference working week in which activity was considered as "normal". This reference working week ran from Monday to Friday and was the first week of February 2020 (working week 6); it preceded the winter school holidays and was no longer affected by the transport strikes that had lasted until the end of January.

Geographically, the trips are attributed to their place of arrival, which in most cases are assumed to be the workplace. Next, they are aggregated at the level of each inter-municipality cooperation institution (EPCI). Once sorted by EPCI of arrival, the travel data are then spatially smoothed (for

1 - Morning distances travelled by mobile phone users
index 100 on average from 3 to 7 February 2020
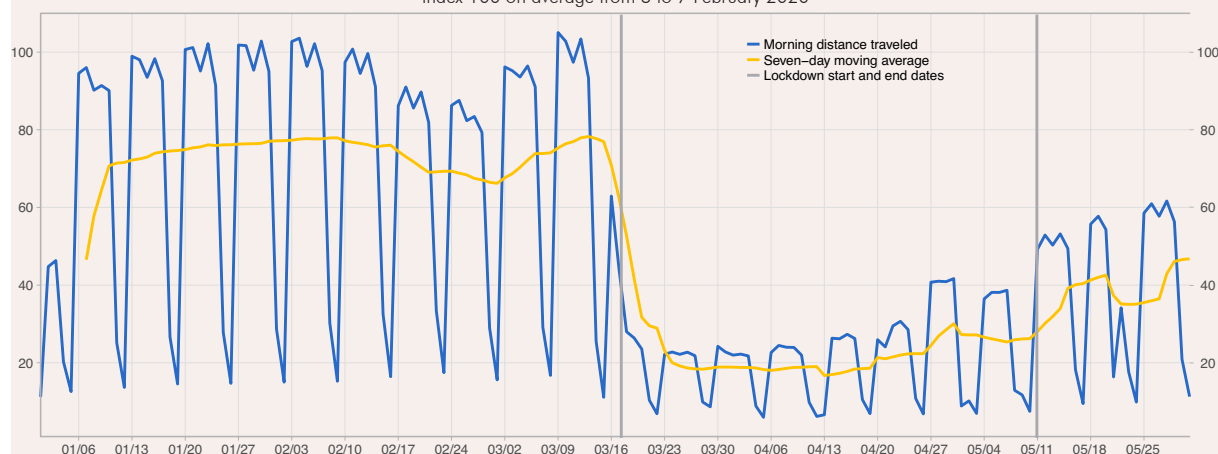
How to read it: on Friday 29 May, the distance travelled between 7 am and 9 am by mobile phone owners in France represented 56% of the average observed from Monday 3 to Friday 7 February.
Source: Orange, calculations by INSEE. Data available between 1st January and 31 May

maps 1.a and 1.b)[1] in order to attenuate the impact of the administrative division of the territory on the proposed measurement of travel intensity. The indicator obtained and exploited here thus reflects daily variations in the average volume of distances travelled towards the site of arrival. The variations in the number of commutes (rather than their distance) provide very similar results to those presented here.

Morning commutes fell to one-quarter of their usual volume during lockdown and rose to 60% of this level at end May

The first two full weeks following the start of lockdown (23 March to 5 April) were those in which morning commutes by French residents were the most limited (see *Graph*), representing less than a quarter of their usual volume. While the week preceding lockdown was comparable to a normal week's activity, commutes slumped from 17 March. From mid-April, morning commutes picked up slightly and gradually reached 40% of normal activity by the end of lockdown.

After 11 May, morning commutes rose above half the level observed in early February, reaching 60% at the end of the month, excluding national holidays and long weeks, which reduced activity.
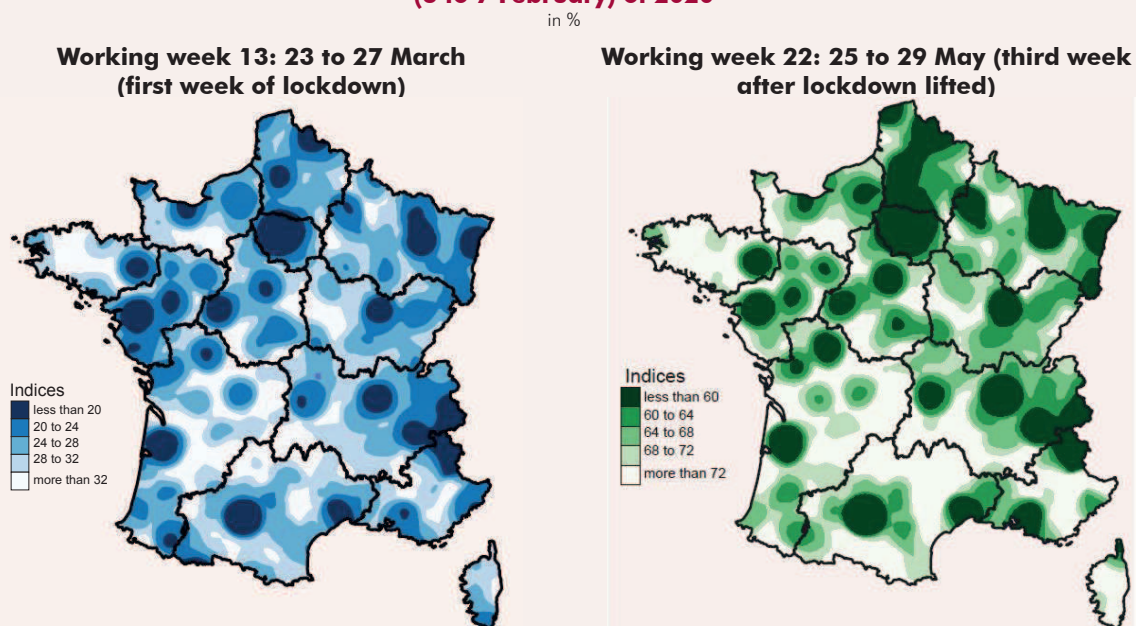
Commutes were most reduced in urban areas, both during lockdown and when it was lifted

During lockdown, the scale of morning commutes was proportionally more reduced in metropolitan areas than in less densely populated zones: in Paris, Lyon, Toulouse, Bordeaux and Nantes the index fell to below 20% of the usual volume. This was observed for the working days of the first full week of lockdown (23 to 27 March, week 13) relative to the first week of February (3 to 7, week 6, *map 1 a*.). This gap was maintained after the end of lockdown (25 to 29 May, week 22, *map 1 b.*), within the nationwide trend towards recovery.

The amplitude of commuting can be interpreted as reflecting activity: the large urban areas appear to be the zones where, at the end of May, the activity gap relative to usual levels remained the biggest. This finding seems to be independent of the categorisation of these metropolitan areas into "green" and "red" zones (low-risk and high-risk). In addition to the activity gaps, these geographical contrasts may also be explained by the breakdown of job types between metropolitan areas and less densely occupied zones. Remote working, which had been extensively used since mid-March (a quarter of all employees, according to the Acemo-Covid survey

---

1. The data were smoothed over a 50-km radius using a biweight kernel. This type of kernel takes into account only those observations within a distance of 50 km, while weighting the closest observations more heavily.

Maps 1 a. and b. – Ratio of distances travelled in the mornings of working days to those of week 6 (3 to 7 February) of 2020

in %

Working week 13: 23 to 27 March (first week of lockdown)

Working week 22: 25 to 29 May (third week after lockdown lifted)

Indices
- less than 20
- 20 to 24
- 24 to 28
- 28 to 32
- more than 32

Indices
- less than 60
- 60 to 64
- 64 to 68
- 68 to 72
- more than 72

How to read it: morning commutes to Rouen in working week 13 (respectively 22) were between 20% and 24% (respectively under 60%) of their average level in week 6. For comparison purposes, over Metropolitan France as a whole, morning commutes fell to 22% of their early February volume in week 13, and 59% in week 22.
Source: Orange, calculations by INSEE. Note: the indices are calculated according to place of arrival of morning commutes.

conducted by the DARES), mainly concerned certain types of jobs most frequently encountered in large cities (administrative services, digital professions, etc.). Conversely, numerous activities that are more common in rural areas (agriculture, crafts, micro-enterprises) were less affected by the health restrictions and contributed to the higher level of commuting in these less dense areas.

After the lifting of lockdown, morning commutes to metropolitan centres remained lower than those towards suburban areas

Similar observations to those made at regional level can be made for the metropolitan areas: trips to central, business and shopping districts fell far more sharply than those towards more residential suburban areas. For example, the majority of Paris arrondissements saw their volume of morning commutes reduced: during the first full week of lockdown, this volume fell to 16% of the level observed in early February (*map 2 a.*). More
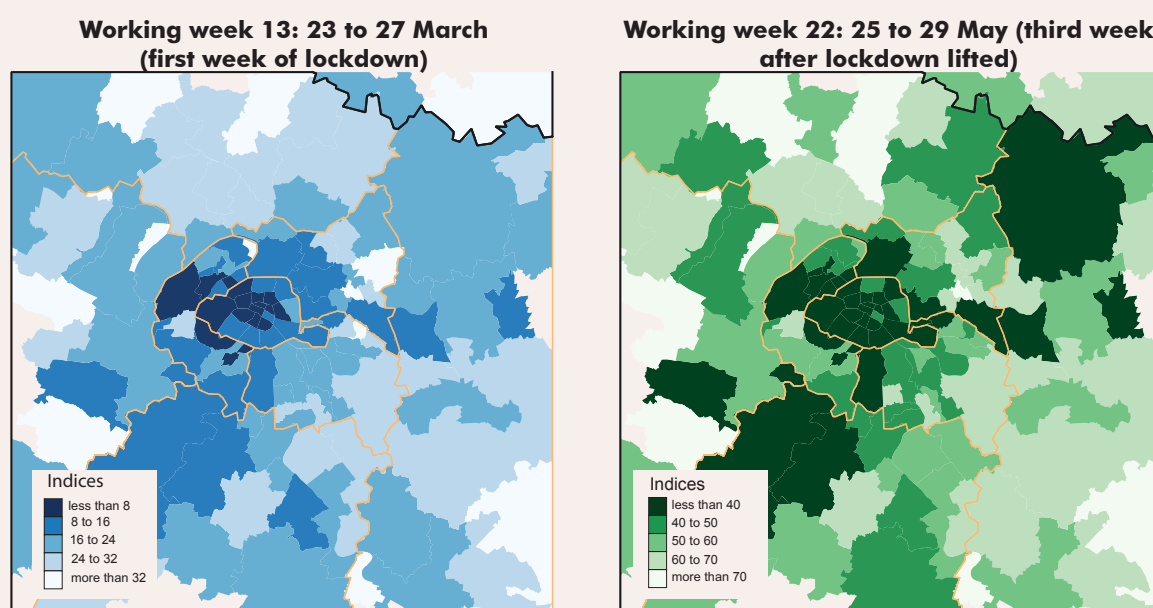
generally, the areas in which a significant proportion of office space is concentrated, most notably the Hauts-de-Seine and the centre and west of the capital, experienced the largest drop in volume, probably because the majority of employees working in those areas could work remotely.

After 11 May, these areas with a large volume of office space retained this specific feature, i.e. a bigger reduction in commuting compared to normal (*map 2 b.*). The resumption of commuting was also less marked towards the large business zones further out of Paris, such as the Courtabœuf Paris-Saclay business park southwest of the capital and the Paris-Nord 2 international business park to the northeast.

Similarly, in the large cities in the rest of France, lower levels of commuting towards central business districts during and after lockdown were also observed. By the end of May in these metropolitan areas, the average volume of commutes had not risen above half that observed in early February. ∎

Maps 2 a. and b. - Ratio of distances travelled in Île-de-France on the mornings of working days to that of week 6 (3 to 7 February) of 2020

in %

Working week 13: 23 to 27 March (first week of lockdown)

Indices
less than 8
8 to 16
16 to 24
24 to 32
more than 32

Working week 22: 25 to 29 May (third week after lockdown lifted)

Indices
less than 40
40 to 50
50 to 60
60 to 70
more than 70

How to read it: morning commutes in the 13th arrondissement of Paris in working week 13 (respectively 22) were between 8% and 16% (respectively under 40%) of their average level in week 6.
Note: the indices are calculated according to place of arrival of morning commutes.
Source: Orange, Insee calculations