JOTE RAPIDE



MOBILITY

2 billion

ANNUAL NUMBER OF MASS TRANSIT PASSENGERS IN PARIS REGION

MEANS OF TRANSPORT BETWEEN PARIS AND SURROUNDING AREA







WHAT IS THE ROLE OF MASS TRANSIT IN THE PARIS REGION **GIVEN THE HEALTH CRISIS?**

THE NUMBER OF PASSENGERS USING PUBLIC TRANSPORT, ESPECIALLY MASS TRANSIT RAIL NETWORKS. HAS FALLEN OVER A PERIOD OF SEVERAL MONTHS DUE TO THE COVID-19 HEALTH CRISIS. AS EFFORTS ARE MADE TO RESTART THE ECONOMY, SUPPORT FROM PUBLIC AUTHORITIES AND CONTINUED INVESTMENT ARE MORE VITAL THAN EVER TO THE DEVELOPMENT OF AN ATTRACTIVE, COMPETITIVE AND SUSTAINABLE REGION. THE FOLLOWING FACTS AND FIGURES EXPLAIN WHY.

ifestyles and travel habits have been transformed by the Covid-19 epidemic: teleworking, online shopping, cycling, etc. A 'new normal' is upon us, and passengers are gradually returning to public transport networks that have adopted heightened health and safety procedures. A study carried out on the initiative of L'Institut Paris Region, the Mass Transit Academy, Transilien SNCF and the consultants Kisio and Sustainable Mobilities, sheds new light on the role of mass transit in the Paris region and the service it provides. The study uses simulations to demonstrate the potential impact of changing behaviour relating to the health crisis on mobility in the region and thus on its economic vitality. It relies in particular on a detailed analysis of GPS coordinates on smartphones used by passengers in four major transport corridors just before the crisis (see methodology p.6). It adds new and complementary information to that provided by the latest Enquête Globale Transport¹, the baseline survey on mobility in the Paris area.

MASS TRANSIT AS THE BACKBONE OF REGIONAL MOBILITY

A capital region on a global scale

As the leading capital region in Europe, Île-de-France has mobility requirements comparable to those of major world cities: with a population of 12.2 million and 6.3 million jobs, it represents 31% of France's GDP and is the largest employment base and the leading economic zone in Europe. It is also the world's leading tourist destination.

Moreover, the distribution of jobs in the Paris region is highly polarised-68% of jobs in the region are concentrated in 6% of the area—while housing is more evenly distributed. This gives rise to very

WHAT DO WE MEAN BY "MASS TRANSIT"?

In the Paris region, "mass transit" refers to rail transport, namely the Transilien and RER train networks and the Metro and tram networks. It does not include bus networks.

MASSTRANSIT IN THE PARIS REGION:

- 23,000 trains (Transilien, RER, Metro and trams) daily
- 900 stations
- 1800 km of lines
- 1 metro every 85 seconds on line 14
- 1 train every 2 minutes at Juvisy station on RER C during rush hour
- 1 train leaves Gare Saint-Lazare every 28 seconds during rush hour

intense passenger flows towards the dense heart of the city and long daily commutes (12 km on average).

Mass transit as the backbone of the Paris transport network

Paris region rail networks (Transilien trains, RER, metro and trams) carry 2 billion passengers annually²: this is ten times more than air travel in France, and is equivalent to half of the world's total air traffic. The Paris region mass transit network is the third largest in the world after Tokyo and Seoul; it is larger than those of Shanghai, London and New York.

Every day 6 million journeys are made thanks to mass transit (over a third of journeys to and from work and two thirds of journeys to and from academic institutions). Almost 40% of the total number of kilometres travelled in the Paris region are via mass transit.

Thanks to population growth, improved mass transit offerings and reduced space given over to cars in densely populated areas, this type of mobility tends to increase: in less than ten years, the proportion of public transport in motorised travel has risen from 34% to 38%.

Cycling and mass transit are complementary

Though bike use has grown rapidly in the health crisis, it remains largely restricted to short journeys: the average distance covered by bike in the Paris region is 2.5 km. The average distance covered in mass transit is over 15 km, and only one journey in five is less than 5 km. The two modes of transport are thus clearly complementary.

This complementarity could be further enhanced given that 90% of homes and jobs (outside Paris) are less than 3 km from a station—13 minutes by bike on average—, and that only 2% of mass transit users cycle to the station. Many car journeys could be made by bike as 50% are less than 3 km.

THE CRUCIAL ROLE OF MASS TRANSIT AT RUSH HOUR

These very high rates of use of mass transit conceal sharp disparities in both geographical and temporal terms. Although most casual journeys within the outer suburbs are made by car, mass transit is much more often used by on key access routes, generally towards the dense heart of the city. Mass transit thus accounts for 71% of motorised journeys between Paris and the outer suburbs and 63% between Paris and the inner suburbs.

Detailed analysis of GPS tracking on smartphones carried out in 2020 in four major corridors in the Paris region (Argenteuil/Colombes - Paris, Aulnaysous-Bois/Blanc-Mesnil - Paris, Juvisy/Vallée de l'Orge - Paris, Cergy-Pontoise - western Paris/ La Défense) made it possible to fine-tune these figures by factoring in times of day: during rush hour, mass transit accounts for 66-80% of journeys and thus plays a fundamental role where "obligatory" journeys are concerned (for work, study, etc.). Very large numbers of commuters use mass transit, whereas car journeys are spread out more evenly through the day and fulfil a specific service at times when public transport is less efficient, especially at night.

A simulation was carried out to assess the impact of increased telecommuting on peak mass transit ridership. Based on the hypothesis of two days' teleworking per week for everyone whose job allows it, the simulation showed that rush hour passenger flows would fall by 6% to 13%. This phenomenon would make it possible to flatten peak-time travel and achieve more acceptable levels of use. It would also help to improve service, passenger comfort and physical distancing when public transport is most crowded. It does not, however, challenge the usefulness of peak-time mass transit as passenger volumes remain very high.

Shorter and more reliable rush hour journey times

Analysis of GPS tracking on smartphones also made it possible to calculate actual door-to-door journey times in the four corridors studied. During rush hour, mass transit offers a faster alternative to cars and, more importantly, provides a lesser margin of uncertainty where journey times are concerned. For example it takes 55 minutes on average to drive to the 8th arrondissement of Paris from Argenteuil between 7 and 9am (including time to park). The same journey can be made door to door in 38 minutes via mass transit (including the time it takes to get to the station from home and from the Gare Saint-Lazare to your destination): that's 17 minutes less. Moreover, if someone in Argenteuil has to arrive at the office in Paris by 9am and take possible delays into account, they must leave home at 7.35am if they go by car and 8.17am if they use mass transit.

The difference between the time taken via mass transit and by car is now 40 minutes because of a level of uncertainty that is four times lower in the case of mass transit.



Means of transport are complementary according to distance travelled

Proportion of journeys shorter and longer than 3 km per means of transport

Mass

transi

© L'INSTITUT PARIS REGION 2020 Source: EGT 2010 (Île-de-France Mobilités - OMNIL - DRIEA)



87%

Passenger volumes vary depending on means of transport





Car



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Mass transit is essential to the equilibrium of the road network

Despite the predominance of mass transit at rush hour in the four corridors studied, the road network is already saturated, as evidenced by the actual speeds observed. For example, in the Argenteuil – Paris corridor, with an average time of 55 minutes to cover 10 kilometres, the average speed for car journeys is 11 kph, which is less than cycling, for example. While congestion penalises workers' dayto-day time management, increases fatigue, etc., it has a direct financial impact on the numerous

Shorter, more predictable journey times

economic sectors that are completely, or almost completely, tied to road travel: not only urban logistics firms, but also tradespeople who have to transport equipment, taxis and minicabs.

Because of the health crisis, some public transport users have begun using their cars. In June 2020, 24% of public transport users in the Paris region said they were thinking of changing their means of transport³. If this trend continues and if the overall volume of journeys returns to 2019 levels, the increase in car use will cause heavier congestion on the region's roads (si box opposite).



Average door-to-door journey time (in minutes)
Variability of times observed (standard deviation)

© L'INSTITUT PARIS REGION 2020 Source: Kisio VisioPulse, datalake GPS 2020



1st means of transport between Paris and suburbs Modal share, morning rush hour



Source: Kisio VisioPulse, datalake GPS 2020

MODAL SHIFT: THE BUTTERFLY EFFECT

For Paris-bound transport, given the preponderance of mass transit at rush hour, the DRIEA⁴ estimates. based on models, that a modal shift of 10% of passengers towards cars would increase the number of vehicles on the roads by 40 to 80% depending on the *département*. For example on the Argenteuil - Paris route, such a modal shift would increase car journey times by 50%: almost 30 minutes. As well as making journeys more difficult, such an increase would have adverse economic effects. For the 2.5% of vehicles taking one of the routes connecting Paris and Argenteuil for direct professional reasons identified by Kisio (deliveries, self-employed, taxis, etc.), the extra journey time would represent an annual loss of 390 million euros (calculated according to the hourly costs of these professions in the Paris region⁵). However, because parking is so limited in Paris, the feasibility of a modal shift from public transport to cars remains purely hypothetical.



To be on time for a 9 am appointment,

Source: Kisio VisioPulse, datalake GPS 2020

A MODE OF TRANSPORT THAT IS HIGH-CAPACITY, FAST, AND TAKES UP LITTLE LAND

As illustrated by the study carried out on the four corridors, the main advantage of mass transit, as a complement to the other motorised means of transport, is its carrying capacity, which means it can carry a very large number of passengers while occupying a small amount of land. In urban areas, it allows passenger flows 17 times higher than those of cars in normal conditions of use. A 28-lane motorway would be needed to replace the RER A suburban train link alone, for example. This flow plays a structure-building role in the Paris region, where land is often scarce and very constrained. The efficient footprint of mass transit also translates into low occupation of space in densely populated zones, as trains leave again very soon after they arrive in the city. Conversely, if people commuting to Paris using mass transit drove into the city instead, their parked cars would occupy 500 hectares: an area equivalent to the 14th or 17th arrondissements.

SIGNIFICANT CONTRIBUTION TO THE CARBON NEUTRALITY OF PUBLIC TRANSPORT

With 4 grammes of CO, per passenger-kilometre (compared to 138 grammes⁶ for thermal-engine vehicles), mass transit is a major lever for reducing the carbon footprint of travel. Moreover, six times less energy is required to carry a passenger 1 km via mass transit than by car and four times less than by bus, due to the very low rolling resistance of rails compared to roads, the higher performance of electric engines, and the lower weight of the vehicle compared to the number of people carried.

This means that the 30 billion kilometres travelled annually by people in the Paris region via mass transit represent a saving of 4 million tonnes of CO₂ per year. With average emissions in France reaching 5 tonnes per year per capita⁷, this figure is equivalent to the total emissions of a city the size of Bordeaux. Mass transit also helps to improve air quality owing to low local pollutant emissions such as fine particulates and nitrogen oxides.

A MEANS OF TRANSPORT ESSENTIAL TO RESIDENTS OF THE PARIS REGION

With a monthly pass for public transport costing 75.20 euros in 2020. mass transit allows residents of greater Paris to travel very cheaply. By comparison, the total cost of using a car (Renault Clio or similar) is estimated to be 500 euros per month⁸. Public transport is thus essential for most travellers in the Paris region. According to the EGT, 59% of mass transit users in the Paris region do not have the opportunity to use a private vehicle. Moreover, 56% of 18-25-year-olds do not have a driving licence. Large mass transit projects in progress (Eole, Grand Paris Express, extensions to the metro and new tram lines) will further enhance the service provided by mass transit by significantly reducing journey times and increasing the number of

Passenger flows 17 times higher than travel by car...



Passenger flow (1 point = 1,000 passengers) per hour and per direction on a road/rail route 3.5 metres wide in an urban area with maximum rates of use observed in the Paris region.

and occupation of space 27 times lower

To carry 1,700 people, you need:



Development of rail network by 2030



accessible jobs. By 2035, 53% of people in the Paris region will have access to half of the region's jobs in less than an hour via public transport, compared to 41% today. Some 1.5 million people in the inner and outer suburbs will benefit.

A SECTOR THAN GENERATES EMPLOYMENT

Last but not least, mass transit is beneficial to employment. The mass transit activities of Transilien, SNCF Réseau and RATP account for 50,000 direct permanent jobs in the Paris region: this is equivalent to the number of jobs in the region's car industry. The creation of the Grand Paris Express represents 15,000 to 20,000 extra jobs per year, without taking into account other projects currently under way.

PRIORITY INVESTMENTS

Mass transit is thus a component of the transport system that is essential to effective and sustainable mobility. In the Paris metropolitan region, it provides fast, high-capacity, eco-friendly, safe and affordable travel over long distances. It makes a significant contribution to enhancing the structure and attractiveness of all aspects of the Paris region. It plays a major role not only in terms of regional dynamism and competitiveness, but also in terms of quality of life. It must be one of the main priorities in future decision-making processes, even if changes take place in the health environment.

Such investments are essential for the decarbonisation of mobility in the Paris region and to ensure its sustainable development, especially as the

4 GRAMMES

of CO₂ emitted per km and per passenger in mass transit, compared to 138g by car

50,000 direct recurring jobs in the Paris region

region's population is set to grow by one million by 2035. In concrete terms, major rail projects under way such as Eole and the Grand Paris Express will make it possible to respond more effectively to mobility requirements, to relieve pressure on the busiest existing lines, to reduce journey times (especially between suburbs), and to improve access to the region's major employment hubs. These projects are also vital to the improved structural planning of the capital region as they will limit urban sprawl and reduce greenhouse gas emissions.

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GPSTRACKING METHODOLOGY

Detailed analysis of GPS tracking data collected by apps installed on smartphones has been carried out with the help of Kisio VisioPulse datalake GPS based on a sample taken from a panel of 700,000 users in the Paris region who generate several tens of millions of GPS traces every day. The collection period ran from 1 February to 7 March 2020. This anonymous GPS data made it possible to reconstitute door-todoor journeys made by these smartphone users and to identify means of transport, connections and reasons for travel based on behaviour, with 24/7 visibility.

1. Enquête Globale Transport (EGT) transport survey run by Île-de-France Mobilités in partnership with DRIEA Île-de-France. Depending on the availability of information, the results of EGT 2018 or EGT 2010 were used.

- 2. Omnil 2019 data, adjusted for average connection time. 3. Survey "Les Franciliens et le Covid-19" carried out from 5 to 19 May 2020 by Médiamétrie for L'Institut Paris Region, among a sample of 3,028 people representative of the population of the Paris regions aged between 18 and 75.
- 4. Direction régionale et interdépartementale de l'équipement et de l'aménagement (regional planning and development body). 5. Insee, Labour Cost Survey (LCS) - 2016.
- 6. Greenhouse gases in transport services Methodology and indicators used by Île-de-France Mobilités, RATP and Transilien SNCF, May 2020. The values correspond to direct emissions based on energy consumption and rates of use of modes of transport. These values do not take into account indirect emissions due to the full life cycle of energy and modes of transport necessary for travel.
- Citepa, carbon dioxide emissions (Secten format), year 2020. 7
- 8. Le Budget de l'Automobiliste © Automobile Club Association, March 2018.

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