



Transport
Innovation
Gender
Observatory

Towards inclusive mobility: Women's needs and behaviours in the Paris Region

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Acronyms

APF France Handicap	Association des Paralysés de France
DRIEA	Direction Régionale et Interdépartementale de l'Équipement et de l'Aménagement
EAF	Entrepreneuriat au Féminin
EGT	Enquête Globale Transport
FF	Free Floating
FNAUT	Fédération Nationale des Associations d'Usagers des Transports
GDP	Gross Domestic Product
IAU	Institut d'Aménagement et d'Urbanisme
IdF	Ile-de-France
IdFM	Ile-de-France Mobilités
INSEE	Institut National de la Statistique et des Etudes Economiques
IT	Information Technology
LGBTQI+	Lesbian, Gay, Bisexual, Transgender, Queer, Intersex and Plus
MA	Metropolitan Area
NGO	Non-governmental organization
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Co-operation and Development
OMNIL	Observatoire de la mobilité IdF
OPTILE	Organisation Professionnelle des Transports d'Ile-de-France

OPTL	Observatoire Prospectif des métiers et des qualifications dans les Transports et la Logistique
PPP	Public-Private-Partnership
QR	Quick Response
RATP	Régie autonome des transports parisiens
SD'AP	Schémas directeurs d'accessibilité - agendas d'accessibilité programmée
SDA	Schémas directeurs d'accessibilité
SNCF	Société nationale des chemins de fer français
STIF	Syndicat des transports d'Île-de-France
VTC	Voiture de transport avec chauffeur
Wave	Women and Vehicles in Europe

Executive summary

“Towards inclusive mobility: Women’s needs and behaviours in the Paris Region” aims at presenting the main issues related to gender and mobility in the Paris region. Looking at the socio-economic context of the region, it provides elements of analysis to a foreign and English-speaking audience that does not have access to national and regional literature written in French.

This report extrapolates the main trends and practices from the General Transportation Survey of 2010 and integrates them with more recent data in order to highlight the different mobility behaviours of the female population living in Île-de-France. Results indicate that women tend to: rely more on public transport and walking, travel shorter distances and for shorter time, travel more during the day, dedicate their trips more to shopping and to the accompaniment of others, and finally tend to use less shared mobility solutions than men.

These practices are a result of gendered societal roles and socio-economic conditions that structure women’s everyday lives as they are more likely to hold part-time job positions, earn lower salaries and take care of domestic chores and care-giving tasks.

In an effort to reveal the challenges faced by women on their daily trips, this report further underlines the central role played by safety and security issues in influencing mobility practices of female users as they are more likely to be victims of assault and harassment.

This document finally shows that safety and security are indeed key factors in women’s mobility beyond public transportation. Fear for assaults or potential traffic accident generates apprehension for alternative mobility modes like bicycles, motorcycles and e-kick scooters, and it affects women’s behaviours beyond their transportation choices, forcing them to change the way they are dressed or the time they go out. Addressing these issues is key in order to enhance women’s freedom of movement and ensure equal access and comfortable user experiences to all vulnerable people in the Île-de-France region.

Introduction – About TlnnGO

TlnnGO – the Transport Innovation Gender Observatory – is a European project financed by the European Commission under the Horizon 2020 programme. The project brings together leading research institutions, consulting firms, private and public actors working in the transportation sector to tackle significant gender inequalities existing in European mobility. More specifically, the project seeks to explore how new modes of smart mobility can mainstream gender-related concerns, through policy mechanisms and inclusive planning approaches. In line with this goal, TlnnGO has worked to gather knowledge about how gender influences patterns of mobility access, as well as the causes, consequences, and solutions to gender inequalities related to employment in the transportation sector. The project goal is not simply to understand gender inequalities in mobility but to reduce them by developing Gender Action Plans. These plans present targeted actions and best practices that can be taken up by key stakeholders at a variety of levels.

This ambitious work has been carried out by 10 National Hubs, working to gather and implement knowledge about gender and mobility in countries across Europe. National hubs provide a platform for key mobility stakeholders to engage in a constructive dialogue about gender inequalities, intending to create a window for transformative policies aimed at promoting gender smart mobility across the European continent.

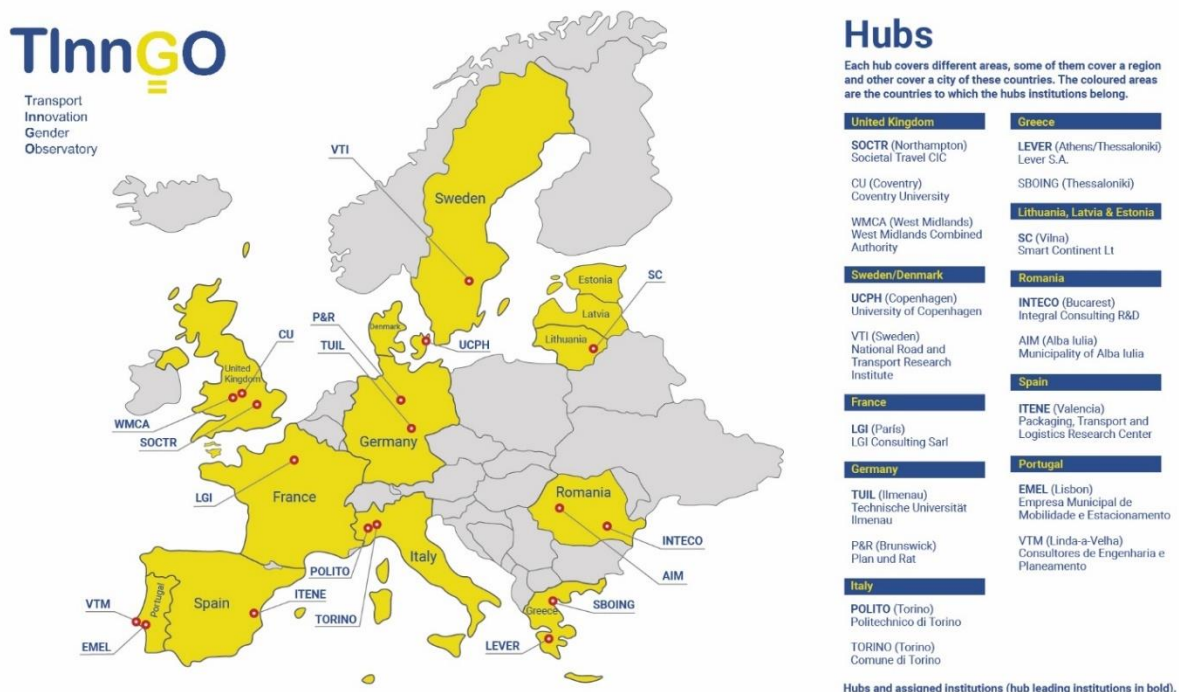


Figure 1. The TlnnGO Hubs

As part of the network, the French Hub operates in the Ile de France Region (IDF), and its work is dedicated to women's safety and security. The Paris region was chosen as a site for the Hub and as a living lab for pioneering solutions in transportation mainly due to the high prevalence of harassment and perceived insecurity in public transport systems. The Hub is analysing, exploring and developing different aspects of women's mobility in the region of Paris. Beyond the public transportation system, the French Hub is also focusing on the

analysis of new forms of mobility involving the use of bicycles, e-kick scooters, motorcycles, and private and shared cars, enhancing knowledge on the economic and socio-cultural constraints of new mobility modes. Safety and security in shared mobility are therefore also addressed as part of the activities of the Hub. Finally, new employment opportunities and relevant skills needed in the sectors of transport and mobility in the Paris region are explored.

In the framework of its research and stakeholders engagement activities, the French Hub has developed the present report, investigating and illustrating the state of the art of the mobility sector in the Paris region. This report follows and documents the activities developed by the Hub throughout the project and reports results from expert interviews, gender action planning workshops, stakeholders engagement, and exploratory walks.

1. Structure of the report

This report presents the key initial findings of the French National Hub, with a specific emphasis on gender and mobility in the Ile-de-France (IdF), a region which includes and surrounds the capital of France, Paris.

The report begins by presenting the geographic and socio-economic features of the Paris Region to contextualize the mobility sector in the region. This includes an overview of key stakeholders governing mobility in the region, as well as key facts and figures related to gender inequalities in the sector.

The second part of the report takes a closer look at the causal mechanisms behind identified gender mobility inequalities in IdF. Here, specific attention is paid to women's victimization and perceptions of (in)security in transportation.

Finally, the report analyses the research gaps relating to women's mobility in the Paris region and provides results of qualitative research detailing Parisian women's perceptions of shared mobility. It concludes by detailing the next steps that will be taken by the French Hub, and the promising areas for intervention which can be taken to reduce identified mobility inequalities.

2. Methodology

a. Mobility trends research

The present study predominantly relies on desk research to provide an overview of the mobility patterns and behaviours in the Paris region. A literature review and a consultation of milestone studies, as well as datasets on mobility, was performed. Coupled with the analysis of existing research, the study further extrapolates the findings resulting from the qualitative analysis of 10 structured interviews with mobility experts, selected for their active role in the transport and/or gender field in the Paris Region. Seeking to fill some gaps in qualitative data collection and gendered analysis of new mobility solutions in Paris, this report also integrates the results of 4 exploratory walks organized by the TInnGO French Hub in September 2020, in four different neighbourhoods of the City of Paris.

While attempting to draw a comprehensive and accurate picture of the mobility sector in the Île-de-France region, this report presents some limitations due to the sometimes outdated

datasets¹, or the absence of gendered data, a factor that proves how gender mainstreaming in the transport sector is all the more essential. Without adequate data, steering policy and business behaviours toward more inclusive transportation become even more challenging.

b. TInnGO Exploratory Walks: a tool for understanding shared mobility practices in Paris

Seeking to deepen the research on mobility patterns in the Paris Region, the TInnGO French Hub has developed a methodology that will allow to better grasp the reasons behind women's mobility choices in Paris. Thanks to a partnership with the association Womenability, the French Hub has adapted the well-known 'exploratory walks' methodology to the transportation realm.

Originally experimented in Toronto and Montreal, Canada in the 1990s, these walks follow a simple logic: gather a group of women that will comment, criticize and express their sensations with regards to public space by following a given itinerary in the city [1]. This methodology allows local associations and communities to voice their concerns and share their experiences when it comes to walking in the city. As demonstrated by years of research in urban studies, the planning and use of public space are not neutral. The dynamics they engender are embedded in power structures, and especially so in racial, gender and class biases.

On the one hand, exploratory walks represent a participatory approach to city-making that allows marginalized groups to re-appropriate public space and further shape the way it will be planned in the future. On the other hand, these walks allow for local representatives and operators to understand the sociological implications of urban planning. In this way, this tool helps shaping local strategies towards a more just and inclusive organization of public spaces.

France has known multiple experimentations of this method through the years. Between 2014 and 2016, the association France Médiation has coordinated exploratory walks in 12 French cities, mainly aiming to tackle women's feeling of insecurity in public spaces. Other associations have led exploratory walks over the country such as A Places Egales, Womenability, and Genre et Ville. In the case of Genre et Ville, the methodology was further developed by switching from 'exploratory walks' to 'sensory walks' to focus on the perceptions of the senses of participants in a given space and time and go beyond a functionalist approach to public spaces [1].

French transport operators like the SNCF and RATP have also appropriated this approach to improve transport infrastructures. Since 2015, SNCF and RATP have organized exploratory walks in their train stations in order to collect the opinions and security perceptions of women service users in order to improve the planning of their stations.

On a similar quest as Genre et Ville and its 'sensory walks', the French Hub has attempted to focus on women's perceptions and sensations when it comes to their mobility choices by

¹ In particular, the 'Enquête Globale Transport (EGT)' represents a key survey for understanding mobility patterns in the region. Conducted by STIF in partnership with DRIEA as part of the Omnil (Observatory of mobility in Ile de France), the EGT reports data on mobility in the Region every 10 years. Due to the delay in the release of the 2020 EGT, this report will draw on the results of the 2010 survey.

basing the reflection on the following questions: why are 90% of motorbike users in Paris men? Why are 60% of subscribers to shared-bicycles men? Why are women underrepresented among carsharing and e-kick scooter users? Why are these means mainly used by people with a high educational baggage ?

Understanding women's barriers to mobility choices and patterns in the Paris Region is one of the main goals of LGI Sustainable Innovation as the partner in charge of TInnGO's French Hub. By adapting the sensitive walks approach to the research questions, a new version of this famous methodology was developed to focus the walks on mobility concerns.

Six different walks were originally planned on being carrying out, two at night and four during the day, organized taking into account the socio-economic characteristics of visited neighbourhoods (Paris vs cities in the Grand Paris region) in order to end up with a diverse sample of responses. The current sanitary restrictions due to the COVID-19 crisis have unfortunately limited options and forced to reduce the number of planned walks and participants. Four walks were therefore organised, three during the day and one at night:

1. Paris, 12th district with elderly women from the neighbourhood;
2. Paris, 20th district in partnership with the association DiivinesLGBTQI+;
3. Paris, 16th district in partnership with the local Associations Council;
4. Paris, 11th district with younger participants and at night.

These walks allowed for the collection of 14 surveys, of which the results are presented in this report.

Part I: The Paris Region context

1. The region, transport services and stakeholders of gender equality in mobility

a. Ile-de-France region

Île-de-France is the name of the region² in which the city of Paris is located. It is the most populous region (18% of France population) and accounts for 30% of the country's GDP. The region is composed of eight administrative sub-divisions called "départements": Paris (which holds the double status of a municipality and "département"), Essonne, Hauts-de-Seine, Seine-Saint-Denis, Seine-et-Marne, Val-de-Marne, Val-d'Oise and Yvelines.

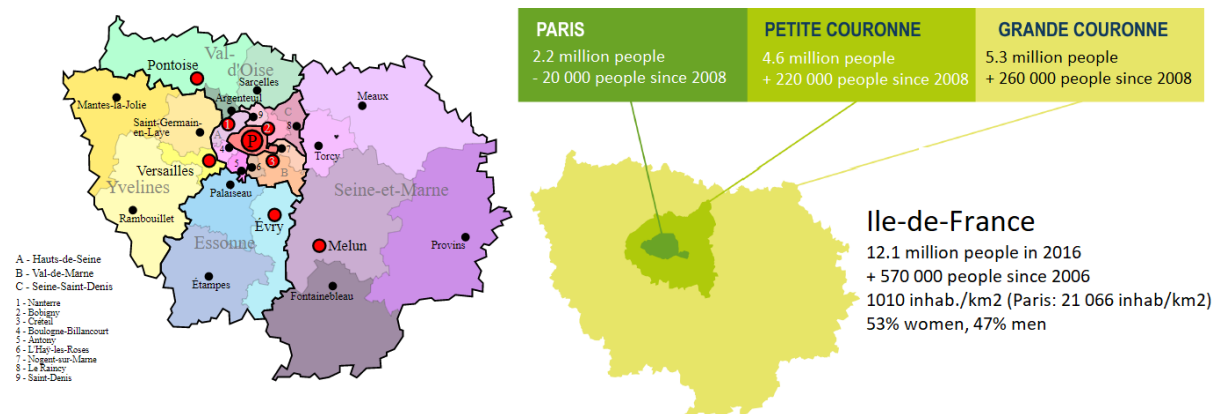


Figure 2. Map of Île-de-France, its administrative and demographic sub-divisions "Paris", "Petite Couronne", "Grande Couronne". Adapted from OMNIL by LGI [2]

Administratively speaking, **Paris** is a city, a département, the capital of France and the centre of a metropolis. With 2.2 million inhabitants, it is the most populated city in France and one of the densest cities in Europe with 21 066 inhabitants per square kilometre. To distinguish this area with the rest of the metropolis, it is often called "Paris intra-muros", as it used to be located within defensive walls.

Petite Couronne is a non-administrative term referring to the combination of the three départements directly adjacent to the limits of Paris: Hauts-de-Seine, Seine-Saint-Denis, Val-de-Marne.

Grande Couronne is a non-administrative term referring to the combination of départements located in the Île-de-France region beyond the Petite Couronne: Essonne, Seine-et-Marne, Val-d'Oise and Yvelines.

² Regions (or régions) are French administrative territorial entities (NUTS2) below the national level. There are 18 régions in France and all have a local government and are composed of several départements (NUTS3) which in turn are divided into communes, the lowest administrative level.

The **metropolitan area of Paris** is a statistical term referring to a vast area of local economic influence composed of communes located in the surroundings of Paris. 12 million people live in the metropolitan area of Paris which goes beyond the limits of the Île-de-France region.

The **Métropole du Grand Paris** (not to be confused with the, larger, metropolitan area of Paris) is an administrative entity created to enhance cooperation between the municipalities that make most of the urban fabric of the metropolitan area of Paris. The Métropole came into existence in 2016 and comprises 131 municipalities: the City of Paris, all 123 cities in the surrounding inner-suburban départements of the Petite Couronne, and 7 cities in the Grande Couronne. About 7 million people live within the limits of the Métropole du Grand Paris. In this sense, the area of the metropolis mainly covers Paris and the Petite Couronne.

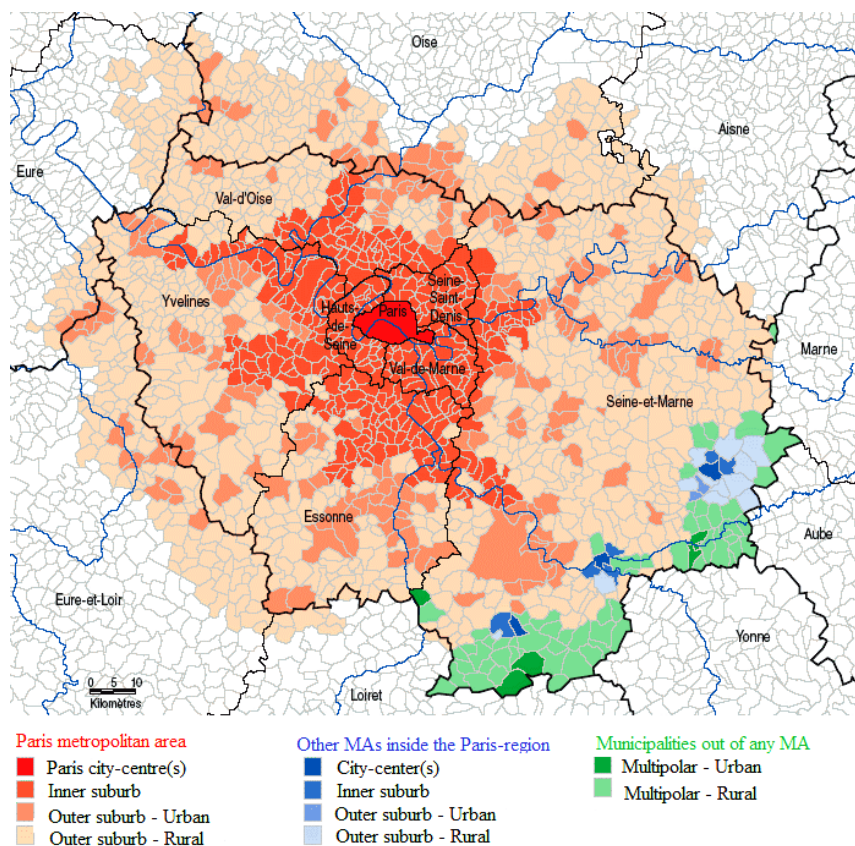


Figure 3. The Metropolitan area (MA) of Paris. The smallest spatial units are French Municipalities; The urban pole of Paris is the sum of its 20 city-centres (dark-red area) and of its inner suburbs (dark salmon-red areas); the blue lines are rivers (the Seine and its tributaries) and the black lines the border of NUTS2 and NUTS3 regions.
Source: Paris School of Economics (2020) [3]

b. Socio-economic context

Population density

The metropolis of Paris is concentrated around the city of Paris with a very high density in the city's limits which decreases as we move further away from the centre (Figure 4). The density remains high in the Petite Couronne with often more than 20 000 inhabitants per km². Fewer people are living in the Grande Couronne, where smaller cities are separated by rural areas.

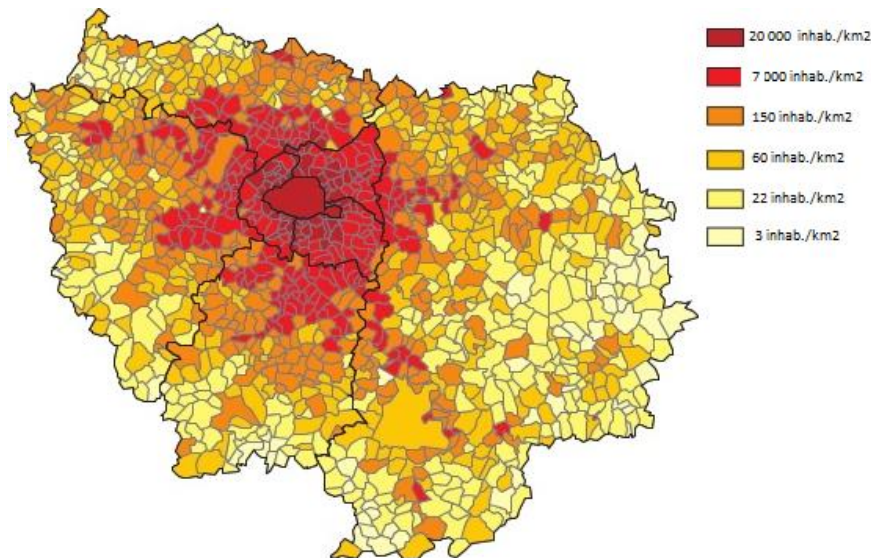


Figure 4. Population density in Île-de-France. Source: INSEE (2018)

Economic disparities

Île-de-France is the richest region of France with a median standard of living³ of 22 639 euros. However, high inequalities exist as large concentrations of “poor” households deviating by -40% from the median standard of living live near other concentrations of “rich” households whose standards deviate by +50%. Poorer households tend to live in the north-east (especially in the département of Seine-Saint-Denis) and south-east of the metropolis. Wealthier households are living

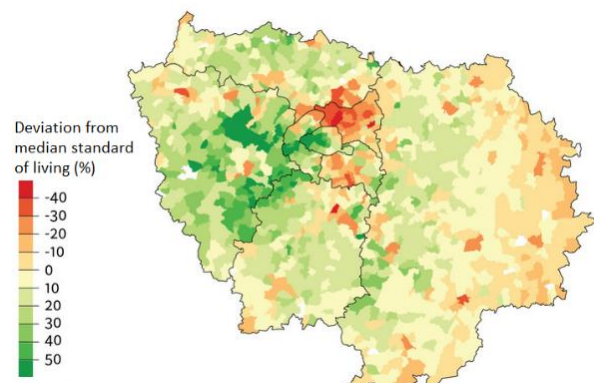


Figure 5. Distribution of economic inequalities in Île-de-France relative to the standard of living. Source: INSEE (2019)

³ **Standard of living** is equal to the household's income divided by the size of consumption units in this household. The size of the consumption unit represented by the household unit is indicated as the sum of the weights of its members. In accordance with international recommendations, the value of each member of a household-dwelling unit is determined as follows: first adult aged 18 and over = 1.0, subsequent adults aged 18 and over = 0.7, each person aged under 18 = 0.5. If all persons in the household-dwelling unit are aged under 18, the weight of the first member is 1.0 and that of subsequent members 0.5 (OECD).

in Paris and the West of the metropolis (Figure 5). The rest of the region has households living with standards closer to the regional median, with the exception of some pockets.

Origin of population

The population of the region is very diverse in terms of origins and nationalities. The share of French domestic immigrants in Île-de-France is 25%. The share of the foreign immigrant population in Île-de-France is 18.5% of the total population. This share accounts for people living in France who were born with foreign nationality and outside of France⁴. Half of the immigrants were born in Africa, 27% in Europe and 18% in Asia. The geographical distribution of the immigrant population is higher in the northern, eastern and southern areas of the Petite Couronne (Figure 6). The concentration is especially high in the north where the share of immigrants is in some places above 40% of the global population, leading to an apparent correlation between foreign origin and impoverishment.

Overall, 44% of Île-de-France residents were born outside the region: in the rest of France or in the rest of the world [4].

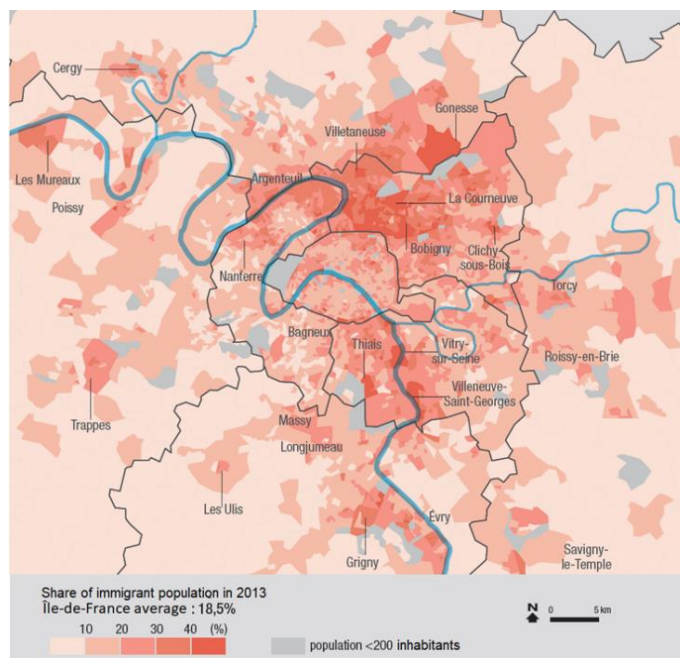


Figure 6. Distribution of the immigrant population in Île-de-France, 2013. Source: IAU and INSEE (2017)

The socio-economic profile of the Île-de-France region represents an important factor in understanding the challenges, needs and behaviours of the region's inhabitants when it comes to mobility. Especially when juxtaposed with the geographic coverage and type of offer of mobility services in the region, these contextual elements help us to reflect on the inequalities at play in the region.

⁴ Definition by INSEE.

c. Existing transport services and governance in Île-de-France⁵

A myriad of transport services, public and private, are available for commuters in Île-de-France and this profusion puts the region apart from the rest of France or Europe. Trains, metros, trams, buses, boats, taxis, shared bikes, shared cars, shared motorcycles or shared e-kick scooters, all allow for inhabitants and visitors to travel across the metropolis. A detailing of their description and governance is given in the section that follows.

Public transport

Public transport (trains, metros, buses, tramways) in the Paris region is primarily organised by one entity: Île-de-France Mobilités. Île-de-France Mobilités (IdFM) gathers the Île-de-France region, its subdivisions (départements) and the City of Paris to coordinate the development, maintenance and improvement of transport services. It is chaired by the President of the Île-de-France Regional Council.

IdFM organises regular public passenger transport services, including river transport. It can also organise transport on-demand services. In this capacity, it is responsible for setting the routes to be served, appointing operators and determining fare policy.

Existing lines are operated by RATP (Paris public transport operator), SNCF (the national railway operator) and private operators within the OPTILE association ("Organisation Professionnelle des Transports d'Île-de-France"). In compliance with European regulations, these services will gradually be put out to tender and the operation of new lines will be awarded to operators selected following a competitive bidding process.

Shared bicycles

A few public and private initiatives operating in Paris region can be categorized as shared bicycles services. Vélib' is the largest with over 12 000 bicycles, 1 300 docking stations and 400 000 subscribers for over 150 000 daily trips in September 2020. The service was launched



Figure 7. Main transportation services in the Paris Region and their operators

⁵ For more information and a more complete list of transport services see **Error! Reference source not found.** as well as the public transport maps in the Appendix

in 2007 and was initially quite successful in attracting users, supported by a gradual expansion of the served area which now spans over every city bordering Paris. It works as follows: users can subscribe to an annual, weekly or daily membership, pick up a bike at one of the docking stations and leave it at another one. Annual subscriptions start at €37.2 per year and fees start after 30min of use during one trip. In 2017, after being run for 10 years by JCDecaux, the service was granted to Smovengo by public authorities. The new operator introduced new docking stations and new bikes including electrically assisted ones. However, the deployment of the new system was slow and tedious and experienced malfunctions, with the system only fully recovering its pre-2017 average ridership in the autumn of 2019.

Véligo is the second shared bicycle service and functions in a quite different way than Vélib's. Users get their own electrically assisted bicycle by Île-de-France region for a maximum period of nine months by subscribing to the service for €40 per month. The purpose of the service is to allow people to test an e-bike on their daily commutes before taking the step of buying one for their personal use. The advantage of the service is the relatively low price (maintenance is guaranteed by the operator), and the unlikelihood of theft. Cost, fear of theft and being overwhelmed by traffic being three of the biggest barriers to personal bicycle adoption, Véligos present clear advantages and are in part contributing to recent a reconsideration of the bicycle as a proper transport mode⁶ for Paris. As of September 2020, more than 10 000 Véligo bikes were in use throughout the metropolis and the fleet is expected to grow by 5 000 additional bikes in the following months

Swapfiets, launched in Paris in September 2020, is the most recent shared bicycle service present in the French capital. It operates similarly as Véligo: users get a rental bicycle by paying a monthly subscription and maintenance costs are partly covered by the company. However, it is run by a private entity, there is no time limit for rental and clients can choose between a mechanical or electric version for €19.9 or €74.9 per month respectively.

Finally, Jump, operated by share mobility giant Lime, is a shared bicycles service for which users pay by the minute and may leave the bicycle wherever within the limits of the operating area which consists only of the city of Paris

Shared e-kick scooters

Three shared e-kick scooter companies are sharing the Parisian market. This type of service arrived in Paris in the summer of 2018 and first attracted many companies (up to 13 different competing operators at a certain period) before that the City of Paris passed a call for tender limiting the operations to a maximum of three. Lime, Dott and TIER won the bid and may now dispatch up to 5 000 devices each which can now only be left at designated parking areas within the limits of the city of Paris. The price for using a free-floating e-kick scooter start at €1 and €0.15 for every additional minute.

Shared motorcycles

Cityscoot is a private company that provides an app-based electric motorcycle service since 2016 with vehicles dispatched across the city of Paris and some Petite Couronne areas. The

⁶ More in Focus 1: Changes in mobility behaviours after the lockdown

fleet consists of more than one thousand light and electric motorcycles and fees start at €0.34 per minute.

Shared cars

There are many different shared cars services in Paris, whether in carsharing (ShareNow, Ubeeqo, Communauto, Zity) or carpooling (Blablacar, Klaxit, Mobicoot). A unique feature of Paris is the presence of 1 200 “Mobilib” charging stations provided by the city for carsharing systems. Two types of carsharing services exist: loop ones (cars must be returned to their initial station) and one-way (the user can park the car at a destination station). Mobilib’ inherited of the infrastructure built for Autolib’ a PPP electric carsharing service that was cancelled in 2018 due to a lack of profitability.

Taxis and VTC (ridesharing services)

Taxis’ activities have historically been depending on the limited emission, by local or national governments, of licenses required for the legal practice of taxi drivers who may be registered at a company. The main taxis operator in Paris is called G7, and users are required to pay the driver after each trip. Taxis benefit from a legal status in Paris which allow them to use bus lanes, designated taxis stations in the city and be stopped by a hailing client.

VTC (Voiture de Tourisme avec Chauffeur) is a common acronym used to refer to app-based ridership services which include Uber, Free Now or Marcel. VTC in France have become increasingly regulated and drivers must now obtain a specific license after following a particular training. Contrary to taxis, VTC cannot access bus lanes and must be called through an app.

d. Stakeholders: gender equality in mobility

The main actors concerned by the questions of gender and diversity in Paris region transport can be put in six main categories:

- Public institutions
- Transport services
- Private observers
- Research & academia
- Lobbies & unions
- NGOs

In order to make the understanding of the ecosystem easier, the Hub pinpointed the main stakeholders concerned by a greater gender and diversity equality in mobility in the visualisation that follows.

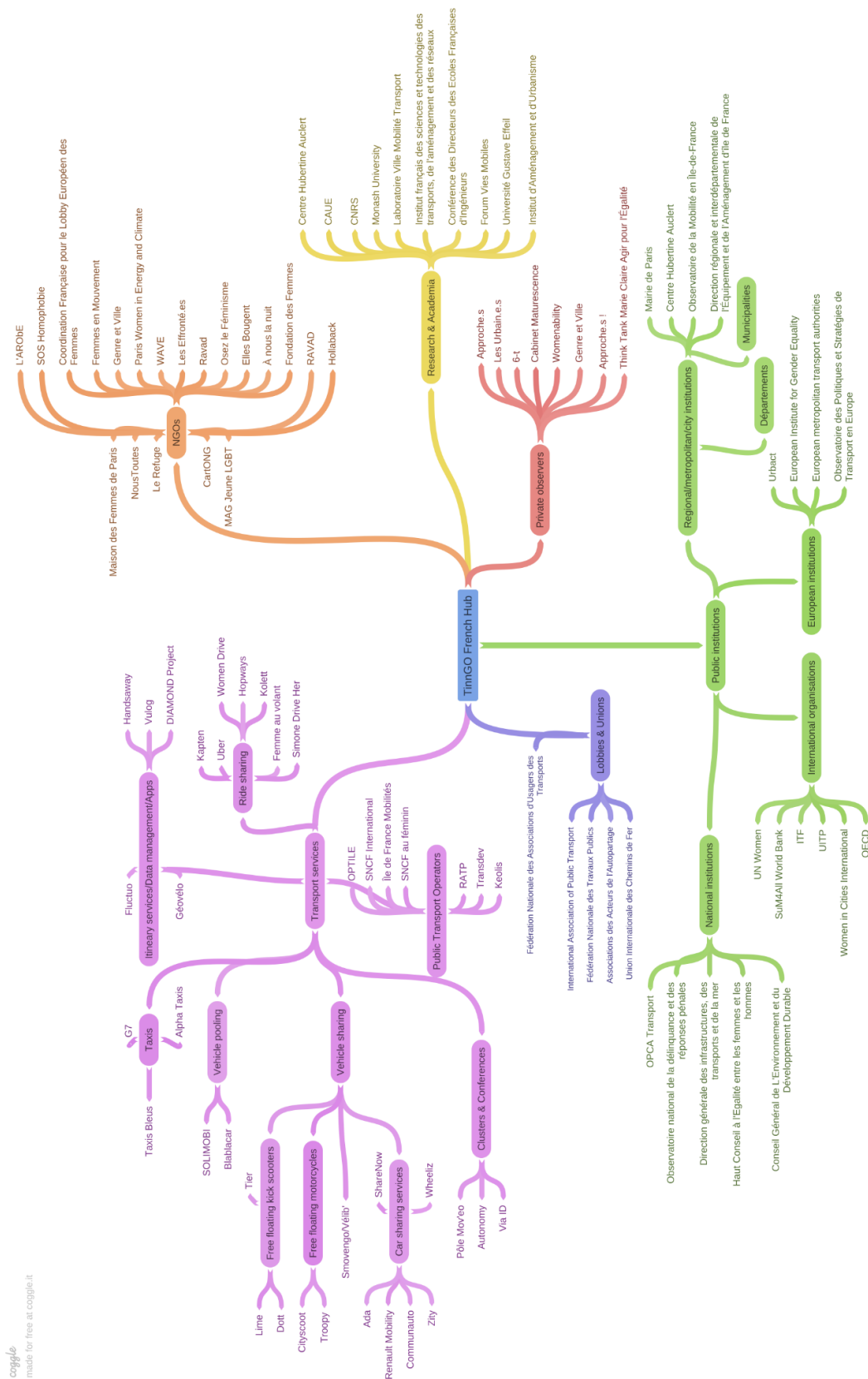


Figure 8. Stakeholders mapping of Île-de-France TInnGO Hub

2. Women mobility behaviours and challenges in the Paris region

The paragraphs that follow offer an overview of mobility trends and challenges regarding gender inequalities in the city of Paris and its surroundings. General figures on the issues at hand are presented first, before detailing data and challenges specific to each transport mode in a second part.

a. Modal shares

Regarding mode of transport preferences among the population in Île-de-France as a whole, personal car use (38% of trips), public transport (20% of trips) and walking (39% of trips) are favoured over other transport modes by a large margin (Figure 9).

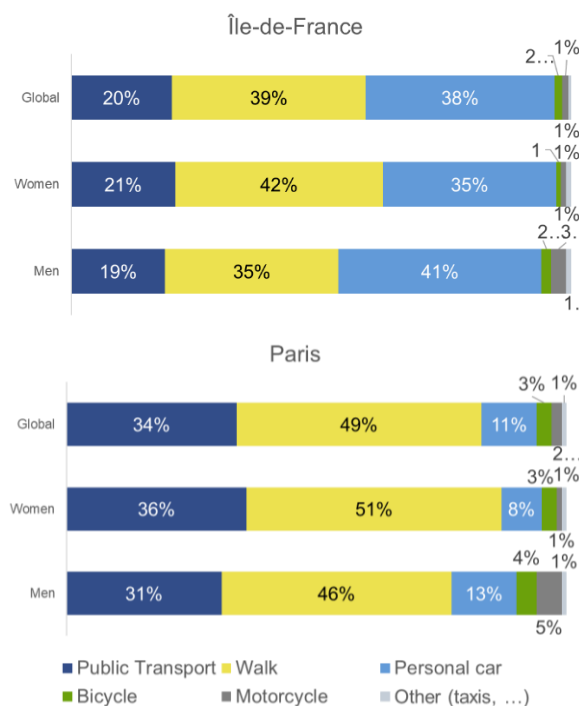


Figure 9. Modal split in Île-de-France and Paris in 2010 [5]

However, modal choices differ within the region. In 2010⁷, in the city of Paris, car use was limited to “only” 11% of trips as Parisians preferred walking and public transport use for their commutes. Both in the region and Paris specifically, a marginal share of all trips was done by cycling and taxis.

⁷ As previously mentioned in the methodology section, this data was collected by the Ile-de-France mobility observatory, the main reference in terms of transport data in the region. Every decade, the Observatory conducts an in-depth origin-destination survey research. This data was gathered during the 2010 research and may be outdated. Notably, shared mobility, inexistent at the time, doesn't appear in the results. Additionally, it is known that bicycle and public transport shares have increased over the past years, particularly in inner Paris and petite-couronne area.

As the data presented hereabove dates from 2010, it is important to indicate that a few changing trends have been occurring since then according to more recent studies that have not been completely divulged yet. Over the past 10 years, there has been a clear trend of decreasing use of cars (-5%) while public transport (+14%) and active modes (+9%) saw the numbers of trips increase [2], [6].



Figure 10. Evolution of mobility use in the Paris Region 2010-2019

Regarding gender differences, mobility patterns between men and women differ in choices of modes, purposes, trip frequency, length and duration. Women are more likely to walk and ride public transport for their trips than men. Men rely on personal vehicles use (car, motorcycle, bicycle) more than women [5], [6].

Shared services in Paris started appearing in 2007, with the launch of the public shared bicycle services but proliferated after 2016 with the introduction of a new car, motorcycle, bicycle and e-kick scooter services. Their relative recent existence explains a lack of data on their usage, but shares presented in Figure 11 highlight strong gender differences. On average, taking into account all services, only 36% of shared mobility solutions users are women. Women make up only 40% of shared bicycle users, 33% of e-kick scooters users, and only 16% of shared motorcycles users.

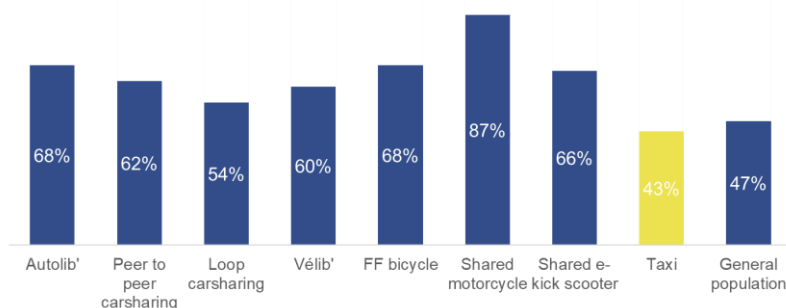


Figure 11. Share of men users for selected transport modes, 2020 [7]⁸

b. Trip frequency, length and purposes

Gender differences in mobility are also apparent in both trip frequency, length and purposes.

Throughout the week, Parisian women tend to travel less frequently and less long (both in time and distance) than men. They spend an average of 1 hour 45 minutes a day travelling while men dedicate 1 hour 49 minutes [5] as women tend to work closer to home.

⁸ Part of this data was shared by a representative of the Mobility Agency of the City of Paris

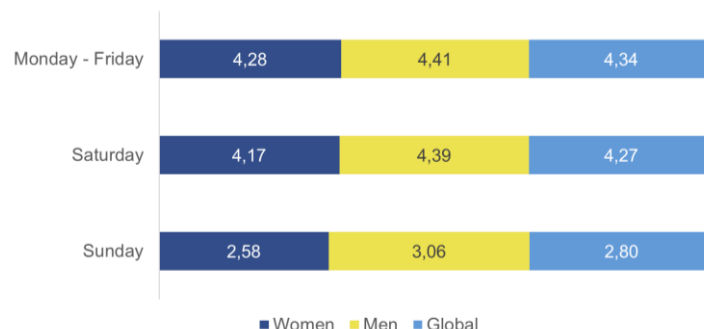


Figure 12. Number of trips per day per gender in 2010

At the national level, 24% of women usually make a detour on their way to work to drop off or pick up a child or run errands. This number is of 13% for men [8]. At the national level, 24% of women usually make a detour on their way to work to drop off or pick up a child or run errands. This number is of 13% for men [8].

Another gender difference in transport concerns reasons for travelling. Men's trips⁹ are more likely to be work-related while women tend to travel for domestic chores purposes (shopping, accompanying purposes) (Figure 13).

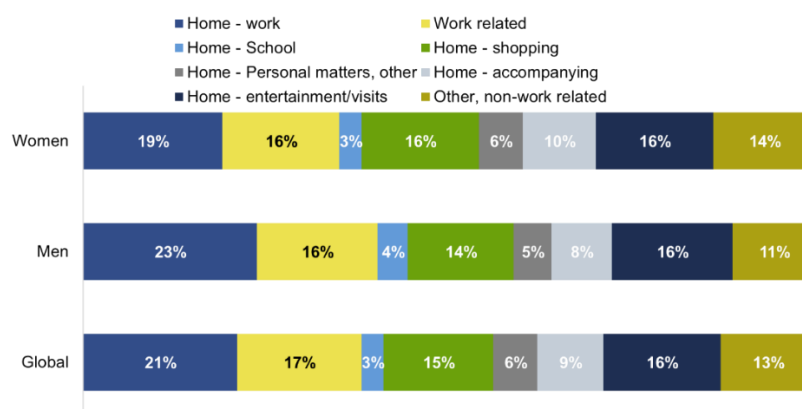


Figure 13. Reasons for trips per gender in Île-de-France in 2010 [5]

In Paris, differences in mobility trends between men and women are similar to those in the rest of the country. However, personal car use is much lower in Paris as inhabitants of inner Paris favour public transport and walking over personal vehicles.

Regardless of their place of residence, 67% of women and 55% of men have their workplace in the City of Paris, and men are more likely to work in the Petite and Grande Couronne (Figure 14).

⁹ A trip is defined here by a purpose at the origin and a purpose at the destination, regardless of the mode(s) of transport used. For instance, if someone goes from point A to point B by car and then by train, it is accounted as 1 trip. It is the case of someone going from home to work, for example. However, if this person goes by car to point B for a specific reason and then goes to point C by car and by train for another reason, we count 2 trips. It is the case of someone going from home to a school to drop children off at and then go to work [2].

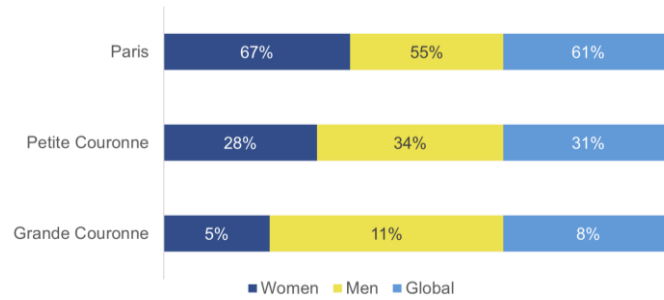


Figure 14. Location of workplace per gender in 2010

To sum up, in comparison with men, women in Île-de-France tend to:

- Rely more on public transport and walking;
- Travel shorter distances;
- Travel for a shorter time;
- Dedicate their trips to domestic chores;
- Working in central areas of the metropolis;
- Use less shared mobility means, especially shared e-kick scooters and shared motorcycles.



Focus 1: Changes in mobility behaviours after the lockdown

In mid-March 2020, looking to effectively stop the spread of the COVID-19 pandemic, the French government imposed a social isolation measure on the entire country, restricting any movement that was not considered essential. Traffic, public transport use and any other mode ridership dropped significantly until the official end of the lockdown on May 11th, 2020.

Since the end of the lockdown, observers have noticed differences in people's mobility behaviours in major cities, as many frequent users reported being fearful of contagion¹⁰. The number of people preferring walking and cycling over collective transport use increased significantly: in major cities, bicycle ridership numbers were 33% higher than a year before in the May - September 6 month period [9]. In Paris, the increase is a lot higher than the national average with 67% more daily cyclists than during the same months one year prior. On some major transport axis, such as rue de Rivoli or boulevard de Sébastopol, numbers of cyclists regularly exceed cars transit and records are beat every week.

These changes were supported by the public authorities through a variety of interventions including the tactical planning of cycling paths, the laying of broader sidewalks, the pedestrianization of entire streets or financial aid to people seeking to buy or repair a bicycle. More than 500 km of cycling paths were built in a short period around the country while regional authorities claim to have built 50km in Paris. These measures are meeting high popularity [10] and helped convince a certain number of new cyclists to consider bicycles as a proper means of transport. For women especially, safe infrastructure is crucial to cycling adoption as they have a more acute perception of risk due to the social construct of femininity which nurtures girls into not exposing themselves to danger [11]. First reports of the profiles of new cyclists highlight an important increase of female ridership. Although not yet quantified, this current trend underlines the importance of a safe cycling system in reducing the gender gap in bicycle use.

¹⁰ According to a September 2020 survey, 57% of frequent bus and metro users worry of COVID -19 contagion due to their transportation. This number is of 68% among frequent train users [6].

Part II: Women's mobility in the Paris Region: main challenges

1. Mobility behaviours

a. Impact on users and type of use

Studies on European mobility identify different mobility behaviours between men and women [12], [13]. Such findings are confirmed by statistics on mobility patterns in the Paris Region. As illustrated in the first part of this report, women make more trips per day, often travelling for shorter and faster journeys. Compared to men, women's trips are more often non-work related and therefore outside peak hours. As for their choices of mode of transport, women in the Paris region, like in many other cities around Europe, make up the majority of public transport users and walkers [14]. What are the reasons behind these mobility patterns?

The literature clearly shows the impact of gendered socialization coupled to socio-economic factors when it comes to mobility behaviours. Labour conditions, demographics and social roles are key determining factors in mobility choices and travel patterns. Taking a look at the socio-economic conditions of women in the Île-de-France region helps understand the reasons behind their mobility choices and behaviours as identified in Part I of this report:

Factors and trends affecting gender differences in mobility



Women make up 51,8% of the Ile-de-France population (1st January 2020 estimates) [15]



Women constitute 19,5% of part-time employees in Ile-de-France (vs 8,3% for men) [16]



Women represent 51% of the unemployed population in Ile-de-France [16]



Women's average wage gap with men's is equal to -15,8% for all socio-professional categories (hourly net salary) and is particularly high for executive positions and above 50 years old [16]



15% of families in Ile-de-France are composed of single mothers and children compared to only 3,1% of single men with children [16]

The data above highlights some important differences in the socio-economic conditions of men and women in the Île-de-France region. Mobility practices that we have presented in the first part of this report are therefore partly dependent on the fact that women, regardless of their profession, earn less than their male counterparts and are more likely to hold part-time jobs positions than men [17]. Their trips are therefore less work-related, less linear, shorter

and at different times of the day. The data from 2010 clearly shows that women travel more for shopping and care-giving activities than men, especially so within heterosexual couples with children, and their journeys are shorter, favouring proximity [18].

Lower wages coupled with higher risk aversion and the gender representations of transportation modes result in lower use of cars, motorcycles and bikes, in favour of walking and public transportation. Despite their need for flexible solutions for shorter, circular trips, their mobility habits are therefore slower and less adaptable. When it comes to cars and motorcycles, the gap between their potential utility for women and the actual use is striking. The unequal use of these means is partly linked to a gap in skills: the success rate in driving tests is almost 10 points higher for men and fewer women hold driving licences in France. This is, however, not the only reason for which women drive less than men in any given region of France. As we previously mentioned, socialisation, stereotypes and gendered representations play a key role in all mobility solutions, including the automotive sector [19].

By looking at the data, several questions come to mind: as there is an increasing number of mobility alternatives available in Paris, more flexible and adaptable to users' needs, and potentially more adapted to women's short and faster trips, why do women continue to be underrepresented among shared mobility users? Can shared mobility be considered as a positive alternative to more classical modes of transport and a more inclusive mobility solution? Why are men, commonly from upper-middle-class and higher education backgrounds, the main users of these new services?

b. For a more inclusive shared mobility, beyond gender

The first part of this report identified an issue of representativity among shared mobility solutions users. Beyond the considerable gap that divides men and women users, an analysis of the clients' profiles further highlights the existence of a very specific client type for these new modes of transportation.

The few studies available on the characteristics of users were conducted by the French consulting company 6-t. They draw an unequivocal picture of the issues at stake: **the standard users of shared services in France are men, young people, students and executives.**

A national study on shared e-kick scooters practices in 2019 shows that 58% of users are locals, 9% are French tourists and 33% are foreign tourists. The profile of local users highlights some main trends:

- 66% of local users are men;
- They have a higher standard of living than the rest of the French population, especially so when it comes to users in Paris;
- More than half of the local users are less than 35 years old;
- Students represent 19% of local users;
- Among the users in the working population, 53% hold executive positions [20].

A study commissioned by the e-kick scooter company Dott highlights similar results [21].

As for carsharing, the user profile hasn't changed since 2016 and it highlights a male clientele (62% in the Île-de-France region compared to 55% nationally), with 81 % of users belonging to the working population and mostly in full-time jobs. They are in majority (61%) executives and live in urban city centres (75%) [22].

If we look at the shared motorcycle provider, CityScoot, the statistics on users don't change:

- 87% of users are men;
- The majority (55 %) holds executive positions;
- The users are much younger than the population of the Paris region.

What could be the reasons behind these users' profiles?

The expert interviews conducted as part of the TInnGO project allowed us to identify the following trends on the barriers to the uptake of shared mobility solutions:

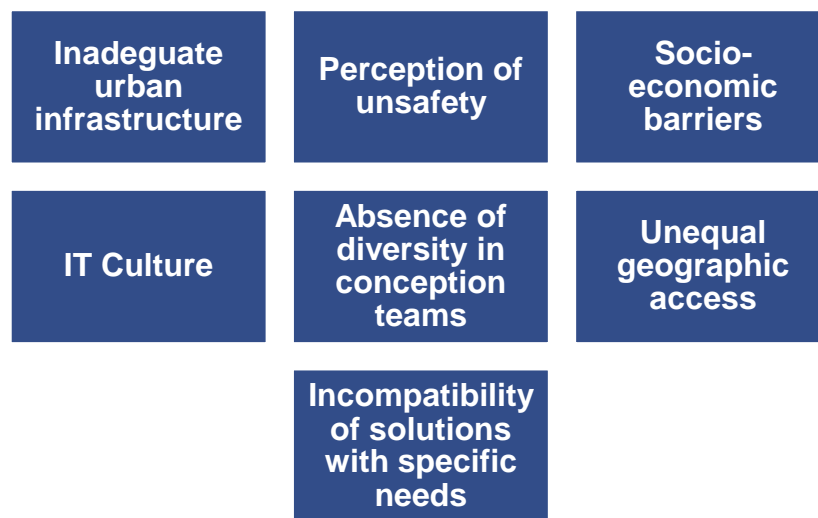


Figure 15. Identified obstacles to women's use of shared mobility solutions in the Paris region

Infrastructure

Safe cycling infrastructure planning (and the lack thereof) plays a key role in determining the accessibility of shared solutions in cities. Considered as a major element of safety, bike paths, street lighting and urban planning designs that take into account the most vulnerable improve the perception of the safety of shared mobility users.

Safety and Incompatibility

Beyond urban planning, safety is one of the factors that influence women's behaviours the most. In the imagination of users, these modes entail dangerous practices and represent a source of stress in Paris. Higher apprehension for safety and risk aversion make these means unsuited (especially bikes, motorcycles and e-kick scooters) for people who consider them unstable, too heavy or too fast.

Moreover, different mobility practices among women and people with disabilities result in different needs that are often unmet by alternative mobility solutions. Considering some of the reasons behind women's trips, we realise that these means often lack luggage space and child seats. These means are moreover often inaccessible to people with disabilities or reduced mobility. Such features and lack of tailored services often originate from the absence of diversity in design teams and the prioritisation of a standard "one-size-fits-all" model.

Socio-economic and geographic barriers

Shared mobility solutions require users' ability to pay higher fares. Looking at the prices of some of these means, we realise that by default, they are not accessible to all. These are the

prices for a random trip from Gambetta to the Louvre-Rivoli metro station on a week evening in Paris (5km)¹¹.

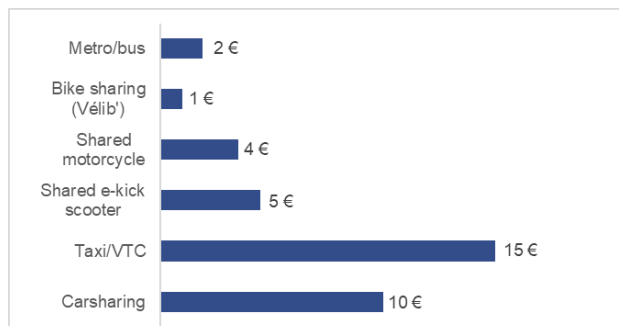


Figure 16. Indicative prices per transportation mode for a random Parisian trip

Moreover, looking at the geographic availability of shared solutions highlights an inherent barrier to their use (see maps in the Annex). Alternatives and smart mobility services are often only available in the City of Paris and not its surrounding metropolitan areas. Except for Velib' stations (bike sharing), the remaining shared mobility solutions only allow for trips within the city. If we go back to some of the socio-economic features of the Ile-de-France population and their spatial distribution (Figure 5), we realise that the population living outside of the City of Paris (Petite Couronne) has lower standards of living, especially so inhabitants of Seine-Saint-Denis and Val-de-Marne. Moreover, these are the areas where the geographical distribution of the immigrant population is higher (northern, eastern and southern areas of the Petite Couronne - Figure 6). The concentration is especially high in the north where the share of immigrants is in some places above 40% of the global population. This part of the region's population has, therefore, much lower access to alternative mobility solutions near their homes.

IT Culture – Access and use of apps

« Early users » of smart mobility services are generally men. The heavy reliance on apps and QR codes often constitutes a barrier for users with lower familiarity with digital devices. Women tend to experience what the literature calls gender-based digital exclusion. The causes behind the digital gap between men and women are multiple: challenges in access, affordability, gaps in education and technological literacy, as well as socio-cultural norms that result in the persistence of unconscious biases about the capacities and opportunities related to each gender [23]. Statistics on ICT-related education and careers in Europe clearly underline a gender divide:

- “There are four times more men than women in Europe with ICT-related studies. There is a decrease in women taking up ICT related higher education when compared to 2011.
- The share of men working in the digital sector is 3.1 times greater than the share of women. [...]

¹¹ Calculated through the Citymapper app in October 2020 at 5pm.

- Although female owned start-ups are more likely to be successful, there is decrease in participation, leadership and investment in the entrepreneurial digital sector” [24].

2. Safety and Security Issues in the Paris Region

"Women make up the majority of public transport users and are particularly vulnerable to all types of assault. This overexposure to aggression degrades the travelling conditions of women users, hinders their mobility and creates a breach of equality between women and men"

Harcèlement sexiste dans les transports collectifs routiers et les pôles d'échanges multimodaux : l'analyse de la FNAUT, 2017

Women's everyday mobility practices are extremely conditioned by the level of safety and security of the transportation services they use. As the predominant users of public transportation and avid walkers, women face higher exposure to harassment and aggressions that happen both in the public space and inside stations, on metro platforms and in buses, trams and metro cars.

Aware of these risks, women develop perceptions of (in)security associated with different types of transportation and adapt their mobility habits to avoid the situations that are considered more unsafe.

Below, we first report the main studies related to violence and harassment in the region, and later point to the importance of understanding women's feeling of insecurity in order to better design solutions and services to make transportation safer for all.

a. Sexual violence and harassment in public transportation

A majority of sexual aggressions against women in Île-de-France happen in public transportation (v. graph below).

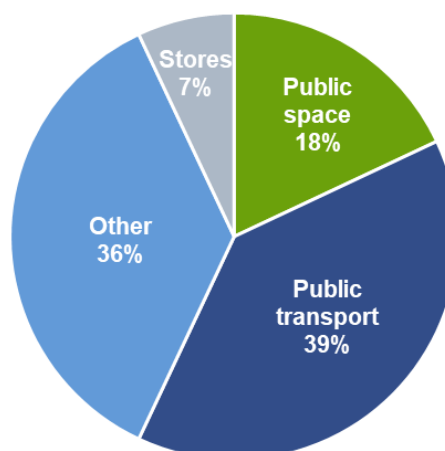


Figure 17. Localisation of sexual aggressions against women in public areas in the Île-de-France region [1]

These phenomena have been studied by several institutions and, despite the differences in sample size, surveys and methodologies, they all point to an extremely critical situation faced

by women in public transportation every day. In Île-de-France, the rate of victimization of women when it comes to sexist or sexual violence and harassment in public transport is higher than the national average, and especially so for younger women, in part due to more widespread use of public transportation [25].

Nationally, the High Council on Equality between Women and Men has conducted a landmark consultation in 2015 that clearly shows the magnitude of the issue: out of a sample of ca. 600 people, 100% of the women users of public transportation interviewed declared having already been victims of sexual harassment once in their lives [26]. The following year, more than 6000 respondents to a study by the National Federation of transports' users' associations (FNAUT) reported similar experiences: 87% of women respondents say they have already been victims of sexual harassment on public transportation [27]. These instances of harassment are perpetrated by a majority of men (95%), in the majority of cases inside the vehicles (metro car, bus etc. 84%), and during the day as well as in the evening and at night [27].

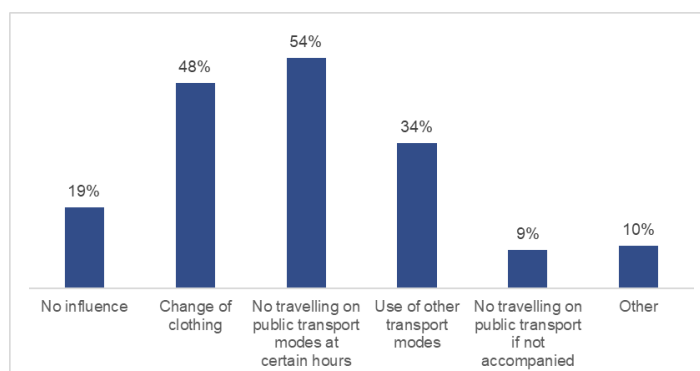


Figure 18. Shares of different answers to the question: "Does the phenomenon of harassment have an impact on your use of public transport?" [36]

The occurrence of harassment engenders a conscious behavioural change for victims, who therefore declare to limit their use to certain hours of the day, adapt their clothing choices, or avoid using public transportation if unaccompanied. Is this an issue that concerns only public transportation?

b. Sexual violence and harassment in other mobility modes

It is not a surprise to see that women's transportation choices in the Paris Region change at night. A study commissioned by Uber to Harris Interactive shows that 52% of women choose to return home by car with friends and family after a night out, and 23% of them choose drivers platforms like Uber, Kapten and Bolt. Only 11% of respondents choose public transportation [28]. Indeed, as confirmed by a 6-t study from 2016, ridesharing services are widely used for personal everyday practices like going out at night. Compared to other alternative mobility services, these platforms record a much higher use by women: they represent 51% of users [29], [30].

Even if considered a safe means of transportation for many women, these platforms have also been at the centre of multiple awareness campaigns due to the occurrence of several episodes of sexual harassment and aggression. In November 2019 for instance, the hashtag #Ubercestover has populated Twitter feeds in France and exposed the stories of many female users who had suffered from such harassment and aggressions while using the service. While Uber had started to introduce new policies to ensure safety and security to its users before this campaign, the #Ubercestover hashtag pushed the company to take additional measures

and improve the functionalities of the app to ensure the security of its passengers. Since the beginning of 2019, Uber has been accompanied by the association Handsaway in its process to improve the platform functionalities and ensure the implementation of adequate support procedures for victims.

c. Feeling of insecurity

Beyond actual assault, women's mobility behaviours are highly affected by perceptions of insecurity. As we have seen, the literature identifies the feeling of insecurity as a key factor, determining, for instance, the choice of transportation preferred, based on the time of the day, the fluxes, reason for travelling (going out, doing sports, groceries, etc.). On top of conditioning the choice of transport, such feeling also modifies women's behaviours, for instance influencing their clothing style and desired appearance.

Data from the Paris Region Institute shows that women in Île-de-France tend to have higher levels of fear. 65% of women feel insecure compared to only 35% of men (2017). This fear is also present in their neighbourhood of residence, where 32% percent of women compared to 7% of men are afraid of being alone at night. This feeling of insecurity affects their behaviours during the day but especially so at night: going out remains a male practice regardless of age; women that are afraid of being alone in their neighbourhood at night have the tendency to go out less; among the women who go out at night, a majority holds executives positions and liberal professions[31].

Zooming in the transportation domain, **51,4% of women, compared with 23,3% of men declare to experience fear and insecurity in public transportation** (2017) [31] This data goes up to 54% in the 2019 survey [32]. Looking at different modes of transport, the RER trains (connecting Paris to its surrounding cities) are considered the most anxiety-provoking, and the metro follows behind in the second place.

Even if the level of fear in public transportation can be considered to be stable over the last decade, recent surveys show new trends and confirm alarming levels of insecurity for women in public transportation. The Paris Region Institute together with 'Île-de-France Mobilités' and the 'Observatoire national de la délinquance dans les transports' conducted a tailored survey in October 2019 with more than 50 000 subscribers of the Navigo and Imagine R transport cards to better understand the causes behind this feeling of insecurity.

The survey shows a clear pattern in the geographical location of such perception of insecurity. IDF transport users indicate a prevalence of fear in the metro and inside the vehicle (tram car, metro car, etc.), more than on the waiting platform: 65% of women identify the vehicle as the most anxiety inducing place. Such findings could potentially be related to the improvements applied by transport operators to the station infrastructures. It is important to note moreover that when it comes to the type of aggression experienced, sexual assault or harassment are reported almost exclusively by women. The main factors of fear in transportation are uncivilized and altered people, as well as deserted spaces. As for the criteria of vulnerability, women cite 'sex' as one of the main elements determining their likeliness of being victims of theft or aggression. Unsurprisingly, the evening hours constitute moreover a factor of fear for a larger part of female respondents. As we have previously seen, experiencing such a higher level of fear forces women to develop alternative practices: comparatively, women tend to choose to adapt their appearance as a coping strategy much more than men [33].

Focus 2: Mobility for all? Public transport accessibility and the case of Wheeliz



Figure 19. Awareness campaign by APF France Handicap highlighting the only 9 stations over the Paris metro accessible to people requiring a wheelchair, 2018

The accessibility of public spaces and transportation for people with disabilities is still today a major issue all over the world. In big cities and rural areas alike, the mobility of this part of the population is severely constrained by a set of physical barriers as well as by the absence of tools, infrastructure, tailored designs and solutions. Planning for accessibility in transportation is even more important to allow freedom of movement and equal opportunities to all, despite their physical or mental conditions. Indeed, accessibility concerns all people with disabilities (visual and hearing impairments, mental, cognitive, physical disabilities) but also the elderly, parents with strollers, pregnant women, people with crutches, sticks or support devices as well as people with communication disabilities. It is therefore estimated that one-third of the French population is concerned by some kind of impairment [34].

A recent study by APF France Handicap and Ifop further shows an alarming picture when it comes to accessibility in France. Out of a sample of 12 000 respondents, 72% of people travelling with a stroller declare encountering accessibility barriers in their journeys and 72% of the inhabitants of rural counties are unsatisfied with their local public transport services in terms of accessibility. When we look at accessibility rankings among French metropolitan areas, the Parisian metropolis ranks second to last in terms of accessibility with only a 9% of respondents declaring that they never encounter any problem during their journeys [35].

Public transportation in the Paris region is indeed lagging in terms of accessibility, suffering from a lack of infrastructures and services especially when it comes to its rail and metro systems. To comply with French national laws, transport network operators have had to elaborate an accessibility plan, the "Schéma Directeur d'Accessibilité" (SD'AP). Ile-de-France Mobilités, the regional transport authority for Ile-de-France, has established its SD'AP in 2015, setting up the region's strategy in terms of public transport accessibility. The Olympic Games coming up in 2021 are also a major driver for the implementation of accessibility measures. Transport operators are hard at work and several services exist today to allow for the free movement of all the inhabitants in the region. However, the road ahead is still long. Below we draw a picture of the status of regional transportation accessibility in Ile-de-France, as identified by a recent study of Apur [34]:

- **Trains and RER:** At the end of 2019, 172 of the 383 stations that make up the network were accessible in Ile-de-France. According to the SD'AP of 2015, 268 stations of the SNCF and RATP network should become accessible by 2021 representing almost 95% of all rail traffic in the region. The operators have implemented training programs for their agents and provided assistance services on demand for people with reduced mobility.
- **Metro:** only 9 of the 302 stations of the Parisian metro are accessible to people on a wheelchair. The accessibility to people with wheelchairs and reduced mobility remains a tremendous challenge. Its network is however accessible for people with visual and hearing impairments.
- **Tramway:** The totality of the 10 lines and 2016 stations of the tramway network is accessible to people with disabilities or reduced mobility.
- **Bus:** At the end of 2019, more than 500 lines are accessible in Ile-de-France. In the City of Paris, all buses are accessible to people with physical, hearing and visual impairments, and 90% of stops are accessible to people on wheelchairs (sometimes access is limited due to sidewalks design and steep streets).

Facing the restricted access to transportation for people with reduced mobility, French entrepreneur Charlotte de Vilmorin funded the [Wheeliz](#), the first website dedicated to the rental of vehicles adapted to people with reduced mobility between private individuals. The online platform puts people who make their vehicles available for rent in contact with people looking to rent them.

Part III: Results of exploratory walks

1. Experience, perception and obstacles of participants to the use of shared mobility modes

a. Social and mobility profiles of participants

The TInnGO exploratory walks gathered 14 participants in four different Parisian neighbourhoods. Among them, 13 were identifying as women and 1 as a man. 12 of the participants are living in inner Paris, while 2 in Seine-Saint-Denis, an area at the north-east of Paris. The age groups were mixed, ranging from 22 to 70 years old (Table 1). 9 participants had both parents who were French nationals while 5 others had respectively parents of Italian, Polish, Brazilian, Nigerian or Canadian nationalities. Far from being representative of the Parisian population, this sample of respondents however provided interesting qualitative insights that helped understand and confirm some of the trends identified throughout the literature review.

Age groups	Number of participants
18 – 25	3
25 – 40	5
40 – 60	4
+60	2

Table 1. Age distribution of participants

The most often used transport modes, according to participants, are walking (cited 6 times), the bicycle (cited 5 times) and the metro (cited 4 times).

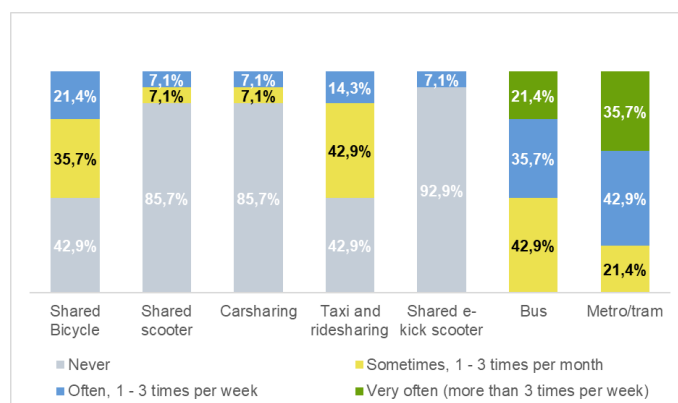


Figure 20. Participants' transport mode use frequency (shares of answers to the question "how often do you use ...?")

With regards to public and shared mobility means, participants rely in majority on the metro and the bus for their daily routines. Half of the participants answered that they used at least 3 times per month taxis or VTC and shared bicycles. However, shared motorcycles, carsharing and shared e-kick scooters are seldom used by the people who joined in the exploratory walks.

The reasons that were cited for not using some shared mobility solutions were:

- ownership of a personal vehicle (bicycle, motorcycle, car),

- high cost,
- lack of interest,
- lack of subscription,
- perceived as dangerous,
- complexity of usage,
- lack of correspondence to particular needs,
- exposure to bad weather,
- lack of comfort.

The most favoured transport mode (Table 2), regardless of purposes, is the metro as it was the most cited when answering the question “what do you usually use when you are in this situation.” The bicycle comes in second for every purpose except buying groceries for which walking is favoured.

Participants' preferred modes for specific purposes	
Cultural activities	Metro, bicycle, walk
Commuting to work	Metro, bicycle, bus, walk
Getting groceries	Walk, bicycle
Accompanying a child/elderly person	Metro, car, taxi/ridesharing, bus
Night-time travels	Metro, bicycle, car, taxi/ridesharing

Table 2. Preferred modes for specific purposes with answers ordered from most cited to least

b. Strengths, barriers and proposals for better inclusiveness of shared mobility solutions

Each shared mobility solution analysed has been given an overall satisfaction evaluation by participants. It appears that the two services with the highest satisfaction ratings are taxis and ridesharing services, and carsharing services. On the contrary, shared e-kick scooters and shared motorcycles services were viewed relatively poorly by participants. However, it is important to note that many participants were not familiar with these two services and that many did not answer this question for all services.

	Overall satisfaction	
Vélib	3,17	★★★★☆
Carsharing	3,33	★★★★☆
Shared e-kick scooters	2,40	★★★☆☆
Shared motorcycle	3,14	★★★★☆
Taxi and ridesharing services	3,83	★★★★★

Table 3. Overall satisfaction of participants of shared services on a scale of 1 to 5

The participants were asked to identify the advantages and obstacles to the use of each shared mobility solution as well as possible improvements that could be made to make the service more inclusive. The results of these questions are presented in the tables below.

Shared bicycles (Vélib')

Strengths	Obstacles
Flexibility Interoperability Vélib + Public transport pass Ease of intermodality Affordable Less exposure to harassments Can be used by visiting friends	Unreliable Possibility of an absence of available bikes Possibility of an absence of free docking spots Locked bicycles Broken bicycles Heavy Not adapted to all sizes No children seat Perceived as dangerous Lack of safe infrastructure Increased fear Exposure to traffic Docks panels are hard to navigate The necessity for a bank card
Proposals for improvement	
Wider distribution across the metropolitan area Better maintenance Lighter bicycles More robust bicycles Rear-view mirrors More intuitive docks terminals Better/safer cycling infrastructure	

Table 4. Summary of strengths, obstacles and proposals for improvement for the shared bicycle service Vélib' gathered during the exploratory walks

Shared e-kick scooters

Strengths	Obstacles
Fun, playful Effort-less Convenient when available	Expensive Perceived as dangerous The necessity of having a smartphone Tedious apps Too unstable Too fast No subscription possibility Lack of safe infrastructure Increased fear Exposure to traffic
Proposals for improvement	
More stable and robust devices Wider distribution across the metropolitan area Better/safer cycling infrastructure	

Table 5. Summary of strengths, obstacles and proposals for improvement for shared e-kick scooters services gathered during the exploratory walks

Shared motorcycles

Strengths	Obstacles
Fast Quiet (electric) Convenient when available	Expensive Heavy Not adapted to everybody's physical characteristics Perceived as dangerous Absence of a driving licence and/or inability to drive motorcycles
Proposals for improvement	
Wider distribution across the metropolitan area Suggest the first ride to be free Offer two helmets	

Table 6. Summary of strengths, obstacles and proposals for improvement for shared motorcycles gathered during the exploratory walks

Carsharing

Strengths	Obstacles
Comfort Capacity Safe Useful for non-car owners	The necessity of having a smartphone Tedious apps Requires a driving license Slow Difficult to access and try the first time
Proposals for improvement	
Wider distribution across the metropolitan area More intuitive apps Suggest the first ride to be free so that we can test the different services	

Table 7. Summary of strengths, obstacles and proposals for improvement for carsharing services gathered during the exploratory walks

Taxis and ridesharing

Strengths	Obstacles
Comfortable High capacity Well suited to accompanying children or elderly Favoured for night-time needs and travelling from/to airports or train stations	Tedious apps (taxis) Some participants' reluctance to be in a closed space Expensive Harassment
Proposals for improvement	
Taxis should align their convenience with ridesharing apps Awareness of discrimination Greater control on drivers' profiles Greater sanctions for drivers who were the subject of complaints Convert the fleet to electric and hybrid vehicles	

Table 8. Summary of strengths, obstacles and proposals for improvement for taxis and ridesharing services gathered during the exploratory walks

2. Insecurity in transport: participants' perceptions and experiences

Safety was discussed during the exploratory walks through a dedicated questionnaire tackling the topic on two dimensions: personal perception and personal experience.

a. Perception

To assess the feeling of insecurity, participants were asked to grade their perception of safety in a particular mode on a scale from 1 to 4 with 1 being “very unsafe” and 4 “very safe” (Figure 21). Results show a clear day/night contrast as the feeling of insecurity was declared more severe at night than during the day for almost all modes.

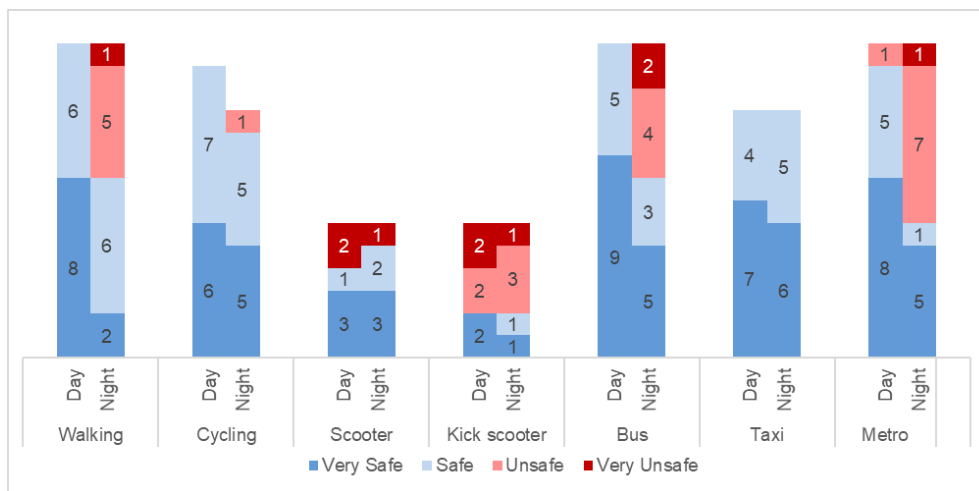


Figure 21. Respondents' perception of insecurity per transport mode: results of answers to the question “from 1 to 4 how safe do you feel using this transport?”

According to participants, the “safest” overall mode is the taxi/ridesharing (Table 9). The bus and walking are also cited as safe but only during the day as their average “safe score” drops for night-time.

Table 9. Ranking of transport modes from safest to least safe based on the average grade given by respondents

Transport mode	Time of the day	Average
Bus	Day	3,64
Taxi	Day	3,64
Walking	Day	3,57
Taxi	Night	3,55
Metro	Day	3,50
Cycling	Day	3,46
Cycling	Night	3,36
Motorcycle	Night	3,17
Motorcycle	Day	2,83
Bus	Night	2,79
Metro	Night	2,71
Walking	Night	2,64
E-kick scooter	Day	2,33
E-kick scooter	Night	2,33

Reasons cited for the feeling of insecurity are perceptions of risk of assault and harassment, especially for the bus, metro and walking. However, traffic is cited as a fear factor for individual modes such as bicycle, motorcycle and e-kick scooter. In that respect, the only two modes for which day use is more feared than night use are motorcycles and e-kick scooters as respondents declare a higher worry due to heavier traffic.

b. Experience with violence and harassment

Among the 14 participants to the walks, 10 declared having been harassed or assaulted (physically or verbally) at least once during a commute. The location of the latest event was cited eleven times as “the metro”, twice “on a bus”, once “on a tram”, and once “while using a shared bicycle.”

Five of the respondents who were victims of assault/harassment declared to have changed their behaviours or mindset towards mobility, in a large part due to these events. Cited behavioural changes were: “avoiding certain hours”, “using headphones”, “cycling more, as it makes me less exposed”, and “avoiding certain metro lines.” If respondents didn’t all adopt avoiding strategies, many victims were affected at a mindset level as they reported the following: “I don’t feel safe in the public transport”, “I am a bit more worried about taking public transportation when I am by myself at night”, “I worry when I am in a crowded metro or bus”, and “I fear intoxicated passengers.”

In the event of an assault, respondents answer that they would go to the police to file a complaint depending on the gravity of the events. However, the following reasons for not reporting were given: “lack of trust in the justice system”, “belief that it would not result in anything”, and “administrative procedures deemed too heavy”. These results are in large part complementary to the findings of the studies reported in this report.

Focus 3: Women in transport: employment and entrepreneurship

Women represent only 26% of the employees in the French transportation sector according to Eurostat [36]. Compared to most countries in Europe however, France has the fourth-highest percentage for women employment in transportation. Within the field, the aeronautical branch seems to outdo all other sectors with a feminization rate as high as 40%. The evolution of the sector has been steady and from 2007 to 2018 the percentage of women occupying a role in the industry has moved from 18% to 25% [37].

The conditions in road transport are however different and women employment remains low. According to the 'Observatoire Prospectif des métiers et des qualifications dans les Transports et la Logistique' (OPTL), this underrepresentation is constant. The feminisation rate in driving positions has remained stable at 10% for many years. Despite a percentage of 19% in the road transport and its auxiliary activities (2015), women employment is highly heterogeneous within the branch: passenger road transport employs 28% women; healthcare transport employs 40% women and the road transport of merchandise only employs 10% women. Women finally represent one-third of the executives, technicians, and supervisors [38]. Women finally represent one-third of the executives, technicians, and supervisors [38].

When it comes to entrepreneurship, the rate of women entrepreneurs in France has slowly improved in the last decade. Even if women represent the majority of the active population in France and constitute a much higher educated workforce (72% of women hold a Master and/or a PhD compared to the 62% average), their integration in the entrepreneurial world continues to face major cultural and socio-economic barriers. Specific data on woman entrepreneurship in the transport sector is unfortunately not available but national statistics give us an idea of the general context. From 2012 to 2016, the total number of women entrepreneurs increased from 141 227 to 212 520. In 2015, 40% of individual enterprises were created by women, compared to 38% in 2014 and 2013. The entrepreneurial index, that is, the percentage of French citizens who are undertaking or have undertaken an entrepreneurial experience reached 27% for women in 2016 [39]. These statistics show that France is still lagging behind other countries when it comes to equality in the entrepreneurial world, despite recent improvements. The entrepreneurial index, that is, the percentage of French citizens who are undertaking or have undertaken an entrepreneurial experience reached 27% for women in 2016 [39]. These statistics show that France is still lagging behind other countries when it comes to equality in the entrepreneurial world, despite recent improvements.

To tackle the systemic inequalities of the entrepreneurial sector in the country, the French government launched in 2013 the "Entreprendre au Féminin" plan, working to improve the number of women entrepreneurs and enhance women's contribution to economic development. The plan was then developed and channelled into the 1st inter-ministerial plan in favour of professional equality (2016-2020). On top of national policies and government strategies, many associations and professional networks exist to support women entrepreneurship, showcase women careers to provide positive role models, promote mentoring activities and campaigning for a more equal access to careers in the scientific, tech, engineering and transport sector. Some examples are: Elles Bougent, Femmes en Mouvement, Women and Vehicles in Europe (WAVE), and Entrepreneuriat au Féminin (EAF).

Despite a political awareness of local and national authorities and associations, the main socio-cultural barriers encountered by women on the workplace of many other professional sectors persist. TInnGO interviews with women professionals in the transport sector in France show that women often lack models to look up to and seldomly resort to professional networks to enhance their career opportunities. Stereotypes, sexism and complications related to their family responsibilities, including maternity leaves, all contribute to hinder women's professional development. In the transport sector, executive and managerial positions are overwhelmingly occupied by men (especially in major companies), on the one hand making career progression harder for women and on the other hand affecting the company choices, designs and strategies [40].

Conclusion

“Towards inclusive mobility: Women’s needs and behaviours in the Paris Region” aimed at **introducing the main issues at stake when it comes to gender and mobility in the Paris region**. Looking at the socio-economic context of the region and considering the heterogeneity of its transportation offer, it provided elements of analysis to a foreign and English-speaking audience that does not have access to national and regional literature written in French.

After describing the metropolitan context and identifying the main stakeholders of gender equality and diversity in transport acting in the region, the first part of this research highlighted the main gender differences in mobility. **In comparison with men, women in Île-de-France tend to:**

- Rely more on public transport and walking;
- Travel shorter distances;
- Travel for a shorter time;
- Dedicate their trips to domestic chores;
- Are more likely to work in central areas of the metropolis and in proximity to their home;
- Use less shared mobility means than men, especially e-kick scooters and shared motorcycles.

These practices **are a result of gendered societal roles and socio-economic conditions that structure women’s everyday lives** as they are more likely to hold part-time job positions, earn lower salaries and take care of domestic chores and care-giving tasks. Lower wages coupled with higher risk aversion and the gender representations of transportation modes result in lower use of cars, motorcycles and bikes, in favour of walking and public transportation. Despite their need for flexible solutions for shorter, circular trips, their mobility habits are therefore slower and less adaptable. When it comes to cars and motorcycles, the gap between their potential utility for women and the actual use is striking.

In addition, **the underrepresentation of women among shared mobility solutions users in Paris is noteworthy**. The few studies available on the characteristics of users draw an unequivocal picture of the issues at stake: **the standard users of shared services in France are men, young people, students and executives**. This trend, stable for a majority of shared mobility solutions, urged us to go a step further and understand why, in a context of extensive offer of mobility alternatives, more flexible and adaptable to users’ needs, and potentially more adapted to women’s short and faster trips, do women continue to prefer more traditional transportation modes.

The expert interviews conducted as part of the TInnGO project allowed for the identification of **a set of barriers that play a central role in limiting the uptake of shared mobility solutions among women:**

- Absence of adequate infrastructure;
- Perception of (un)safety;
- Socio-economic barriers as these solutions often have higher costs;
- IT culture;
- Absence of diversity in conception teams resulting in one-size-fit-all designs;
- Unequal geographic access;
- Incompatibility of solutions with specific needs.

In an effort to reveal the challenges faced by women on their everyday trips, this report further underlined **the central role played by safety and security issues in influencing mobility practices of female users**. Both the perception of insecurity and the actual phenomena of assault and harassment constitute a major obstacle in women's freedom of movement in public transportation and alternative modes. The majority (39%) of sexual aggressions against women happening in public areas in Île-de-France takes place in public transportation. Multiple studies highlight how episodes of assault and harassment are common occurrences for Île-de-France public transportation users, especially so if they are young women. Even the results of TInnGO Exploratory Walks show that the location of the latest aggression event was cited eleven times as "the metro", twice "on a bus", once "on a tram", and once "while using a shared bicycle". Among the 14 participants to the walks, 10 declared having been harassed or assaulted (physically or verbally) at least once during a commute. The TInnGO walks highlighted higher rates of anxiety for public transportation than for other modes, and a clear day vs. night contrast when it comes to security.

The occurrence of harassment indeed engenders a conscious behavioural change for victims, who therefore declare to limit their use to certain hours of the day, adapt their clothing choices, or avoid using public transportation if unaccompanied. It also fuels the development of a feeling of insecurity, a factor that greatly affects women's experiences in transportation: 51,4% of women, compared with 23,3% of men declare to experience fear and insecurity in public transportation, as reported by the Institut Paris Region. Shared mobility solutions are not spared, even if less concerned by these issues, partly due to their lower use.

The third part of this report presented the main findings of the TInnGO Exploratory Walks, organised in the framework of TInnGO's research activities. These walks were the opportunity to assess women's mobility preferences in a more qualitative approach.

	Public transport	Shared bicycles	Shared e-kick scooters	Shared motorcycles	Carsharing/pooling	Taxis/ride sharing
Accessibility to all						
Application dependent / failing IT user experience						
Domestic roles and social expectations determining transport choices						
Exposure to harassment/assault						
Gendered differences towards IT						
Geographical barrier to adoption						
Inadequate infrastructure						
Ownership/Responsibility of Personal Vehicle						
Practices considered unsafe						
Socio-economic barriers						
Unreliable/unstable						

Table 10. Summary of identified obstacles to inclusivity in analysed transport modes. Key findings from the exploratory walks in yellow. Results confirmed the trends highlighted in Part 1 but also complemented them by highlighting obstacles that have not been previously identified. Obstacles identified throughout this study and the modes they belong to are listed in the Appendix.

To resolve the obstacles and improve the accessibility of these mobility modes, we highlight the following recommendations (Table 11):

Shared bicycles	<ul style="list-style-type: none"> • Wider distribution across the metropolitan area • Better maintenance • Lighter bicycles • Rear-view mirrors • More intuitive docks terminals • Better/safer cycling infrastructure • Lower reliance on the app
Shared e-kick scooters	<ul style="list-style-type: none"> • Wider distribution across the metropolitan area • More intuitive apps and lower reliance on it • Suggest the first ride to be free so that we can test the different services
Shared motorcycles	<ul style="list-style-type: none"> • Wider distribution across the metropolitan area • Suggest the first ride to be free • Offer two helmets • Lower reliance on the app
Carsharing	<ul style="list-style-type: none"> • Wider distribution across the metropolitan area • More intuitive apps • Suggest the first ride to be free so that we can test the different services
Taxis/ridesharing	<ul style="list-style-type: none"> • Taxis should align their convenience with ridesharing apps • Awareness of discrimination • Greater control on drivers' profiles • Greater sanctions for drivers who were the subject of complaints • Convert the fleet to electric and hybrid vehicles

Table 11. Proposals for improving the inclusivity of the transport modes analysed throughout this study

To implement these changes, **the French Hub is working with local stakeholders, transport operators and public authorities to push for the adoption of a gender and diversity approach when it comes to the design of mobility services in Paris.** Beyond shared mobility, and as identified by this report, safety and security issues represent a major obstacle to women's mobility in the region. The activities of the Hub are therefore focused on gathering a diverse set of actors around the table, and fostering the development of science-based, collaborative solutions to improve the inclusivity of the transportation offer in the Region.

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Appendix

1. Figures, trends and challenges per transport mode



Public Transport

Figures and trends

Public transport gained shares in the modal split over the last decade. The number of trips made with public transport increased by 14% from 2010 to 2019 [2]. Compared to men, women rely more on public transport for their daily trips [5].

Challenges for a more inclusive and higher female usership

Exposure to harassment/assault

Aggression and harassment are especially common in public transportation vehicles and infrastructures, generating fear and feelings of insecurity among users.

Accessibility for people with disabilities

The accessibility to public transport in the Parisian metropolis is notoriously poor as the metro is hardly accessible with only one line fully equipped (line 14). Other modes perform better (buses, trains, tramway).



Shared mobility

Figures and trends

Shared mobility is especially popular among younger people with 58% of users being under 35 years old [7].

On average, only 36% of shared mobility solutions users are women [7].¹²

Challenges for a more inclusive and higher female usership

Inadequate infrastructure

Bicycle infrastructure planning plays a key role in improving the accessibility of shared solutions in cities. Inadequate infrastructure hampers the adoption of some shared mobility services such as bicycle and e-kick-scooter.

Socio-economic barriers

Shared solutions such as shared e-kick scooters, after a certain usage frequency, are more expensive than most transport modes which represents a barrier to adoption.

Geographic location of shared mobility means

Most shared mobility solutions in the Paris region are only available in the City of Paris and not in its surrounding municipalities, determining unequal access to the mobility offer in the region (Vélib' is the only exception).

¹² An average calculated by considering figures from the following solutions: Autolib', peer to peer carsharing, loop carsharing, Vélib', free-floating bicycles, free-floating motorcycles and free-floating e-kick scooters.

Gendered differences towards IT

Men are often the early users of new devices due to a gendered conception of technology categorizing it as part of masculine attributes, contributing to an over-representation among users of innovative devices due to them being largely dependent of smartphones applications [23], [41], [42].

Practices considered unsafe

In the view of users, micro-mobility modes are dangerous. There is strong evidence among the literature that women generally have a more acute perception and aversion to risk, they will be more reluctant than men to use such modes [11], [43].

Domestic roles determine transport choices

Shared solutions do not satisfy women's specific needs that are often determined by socially constructed roles.

Absence of gender perspective in the design process

A lack of diversity of perspectives in design would explain why certain modes fail to take into account gender differences, leading to low adoptions.



Bicycles

Figures and trends

Six out of ten personal bikes and docked bikes users are men [2].
Seven out of ten free-floating bicycles users are men [44].

Challenges for a more inclusive and higher female usership

Inadequate infrastructure

Bicycle infrastructure planning plays a key role in improving the adoption of cycling for women in particular [45].

Domestic roles and social expectations determine transport choices

Shared solutions do not satisfy women's specific needs that are often determined by socially constructed roles. Attention to physical appearance and reluctance to appear sweaty in a professional environment were also cited as barriers to adoption by some women.

Practices considered unsafe

In the view of some potential users, cycling remains dangerous. There is strong evidence among the literature that women generally have a more acute perception and aversion to risk, they will be more reluctant than men to use such mode [11], [43].



Shared e-kick scooters

Figures and trends

There is an over-representation of men among e-kick scooters users with them making 66% of the customer base.
Users also tend to be under 25 years old and a significant part of them are foreign tourists our visitors.

Challenges for a more inclusive and higher female usership

Inadequate infrastructure

Bicycle infrastructure planning plays a key role in improving the accessibility of shared solutions in cities, including kick scooters, and inadequate infrastructure design hampers adoption by a wider group.

Socio-economic barriers

Shared e-kick scooters, after a certain usage frequency, are more expensive than most transport modes which represents a barrier to adoption [21].

Gendered differences towards IT

Men are often the early users of new devices due to a gendered conception of technology categorizing it as part of masculine attributes, contributing to an over-representation among users of innovative devices due to them being largely dependent of smartphones applications [23], [41], [42].

Practices considered unsafe

In the view of some potential users, e-kick scooters are dangerous. There is strong evidence among the literature that women generally have a more acute perception and aversion to risk, they will be more reluctant than men to use such mode [11], [43].



Shared motorcycles

Figures and trends

There is a strong over-representation of men among shared motorcycles users with men making up to 84% of riders.
80% of shared motorcycles users are business executives.
Shared motorcycles are mainly used to go to a workplace (it is the case in 2/3 of trips).

Challenges for more diversity and higher female usership

Gendered differences towards IT

Men are often the early users of new devices due to a gendered conception of technology categorizing it as part of masculine attributes, contributing to an over-representation among users of innovative devices due to them being largely dependent of smartphones applications.

Practices considered unsafe

In the view of some potential users, motorcycles are perceived as dangerous. There is strong evidence among the literature that women generally have a more acute perception and aversion to risk, they will be more reluctant than men to use such mode [11], [43].

Socio-economic barriers

Shared motorcycles, after a certain usage frequency, are more expensive than most transport modes which represents a barrier to adoption [21].



Carsharing/pooling

Figures and trends

Only 38% of carsharing or car-pooling users are women [46].
Carsharing and pooling trends differ between central and peripheral areas as car ownership decreases the more an individual resides in the city centre.

Challenges for a more inclusive and higher female usership

Exposure to harassment/assault

In the case of carpooling, sharing a confined space with a stranger is perceived as a barrier to adoption for some women.

Specific constraints

The required trip planning involved in carsharing and carpooling use is perceived as constraining and not adapted to the gendered daily needs of some women [47].

Ownership/Responsibility of Personal Vehicle

In a heterosexual household, the responsibility for a personal vehicle is often carried by the man, hampering women's ability to share the vehicle on a carsharing platform.

Gendered differences towards IT

Men are often the early users of new devices due to a gendered conception of technology categorizing it as part of masculine attributes, contributing to an over-representation among users of innovative devices due to them being largely dependent of smartphones applications [23], [41], [42].

Domestic roles and social expectations determine transport choices

Carsharing and pooling do not satisfy women's specific needs that are often determined by socially constructed roles. The absence of multiple seats in carsharing (often only 2 people) or the absence of kids seats hinder the possibility of women with children to use these services.



Ridesharing services / Taxis

Figures and trends

The userbase of ridesharing services and taxis have a smaller gender gap than other transport solutions [48]. Higher socioeconomic groups are overrepresented among these services' customers.

Challenges for a more inclusive and higher female usership

Socio-economic barriers

Taxis and ridesharing services are more expensive than most transport modes which represents a barrier to adoption.

Geographical barrier to adoption

Less dense areas outside of the metropolis centre generally have a limited car availability which leads to higher fees.

Exposure to harassment/assault

An experience or perception of unpleasantness or vulnerability in a taxi or VTC affects one's confidence in those services. Recent events and social media campaigns have highlighted the presence of a security risk for women riders [49].

2. Existing transport services

Modes present in Île-de-France	Main operators	Service status	Number of lines/stations/stops/vehicles/length of the network	Estimated daily weekdays ridership	M/W users shares
Regional trains (trains Transilien)	SNCF RATP	Public	15 lines 383 stations 1 299 km long	3.5 million (2014)	46%/54%
Subway	RATP	Public	16 lines 302 stations 219.9 km long	5 million (2019)	
Tramway	SNCF RATP	Public	10 lines 205 stations 126.4 km long	1.1 million (2019)	
Bus	RATP SNCF Keolis Transdev Procar	Public and private	1 500 lines 32 000 stops 25 000 km long	5.2 million (2018)	
Taxis	G7 Taxis Bleus Alpha Taxis	Private	17 924 declared taxi drivers (2018)		43%/57%
Ridesharing services	Uber Kapten Marcel Felix	Private	19 700 declared drivers (2018)		Data not found
Shared Bicycles	Vélib' Bolt Jump	PPP (Vélib') Private	Vélib': 12 000 bicycles, 1 314 docking stations Bolt: between 500 1000 bikes Jump: Between 500 and 2000 bikes		60%/40%
Shared Cars	Sharenow Ubeeqo Communauto Zity		1213 reserved parking charging spots Sharenow: 800 Smart EQ Ubeeqo: around 1 000 cars Communauto: 200 cars Zity: 500 Renault Zoé		32%/68%
Shared Motorcycles	Cityscoot Troopy	Private	Cityscoot: 4 300 mopeds Troopy: 250 mopeds		87%/13%
Shared kick scooters	Lime Dott TIER Mobility	Private	Lime: 5 000 devices Dott: 2 300 devices TIER: 500 devices		66%/33%

3. Maps of Paris transport

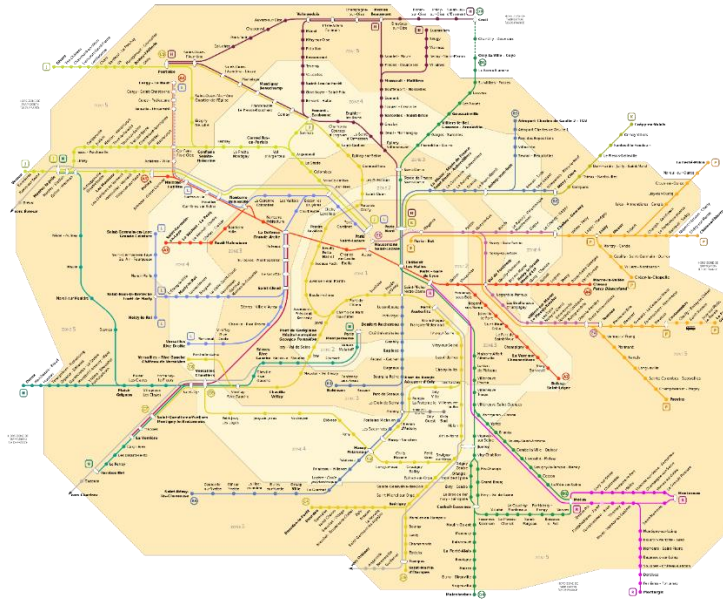


Figure 22. Map of the regional train (Transilien) network

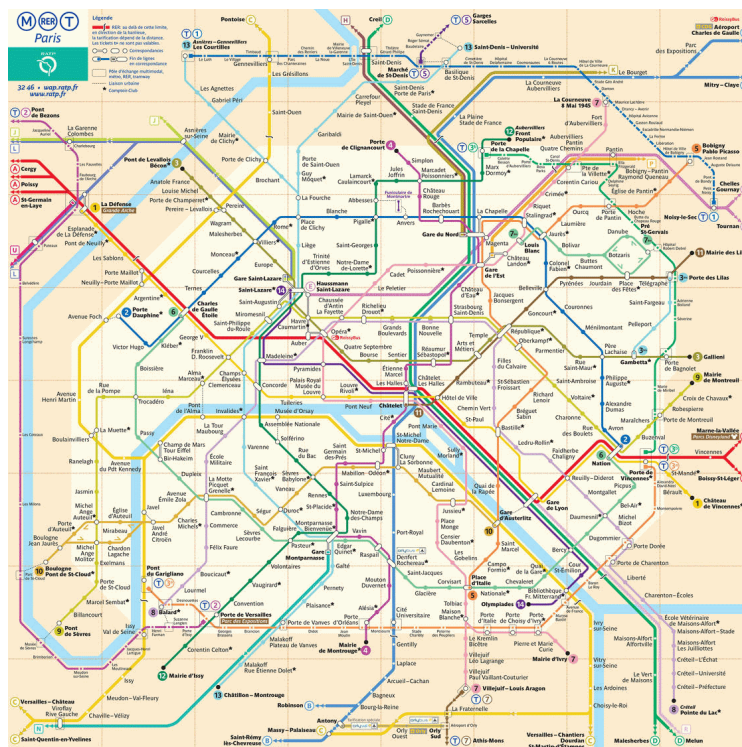


Figure 23. Map of the metro network

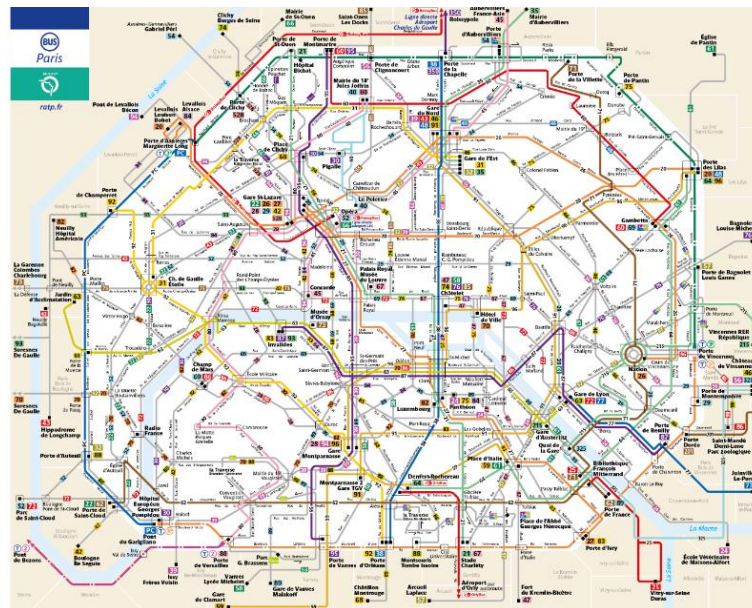


Figure 24. Map of the bus network in Paris. Other networks cover peripheral areas of the metropolis.



Figure 25. Map of the night bus network

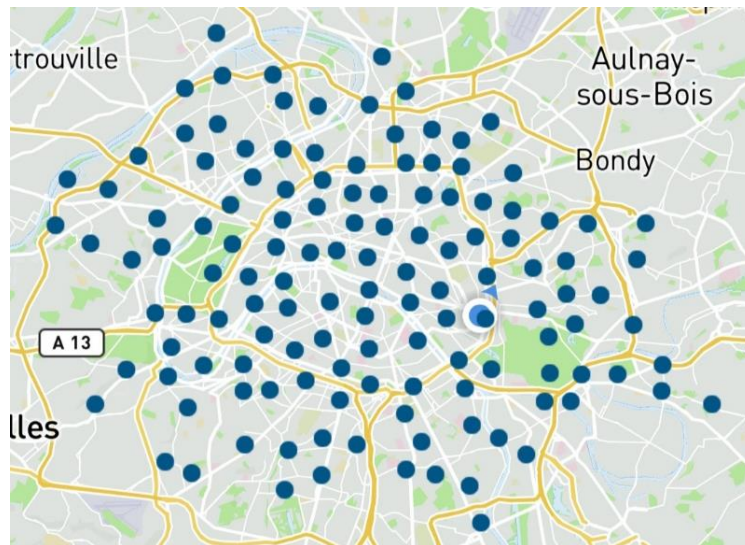


Figure 26. Locations of Vélib' stations (09/2020)

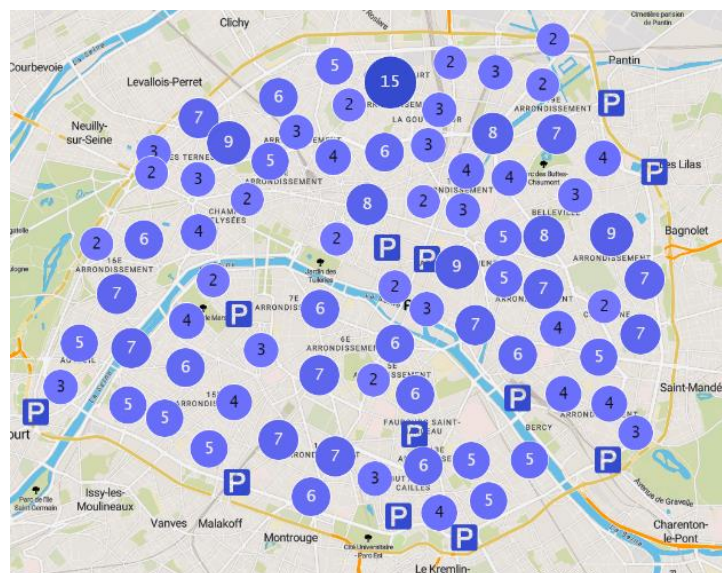


Figure 27. Locations of Mobilib' (carsharing electric charging stations) stations (09/2020)

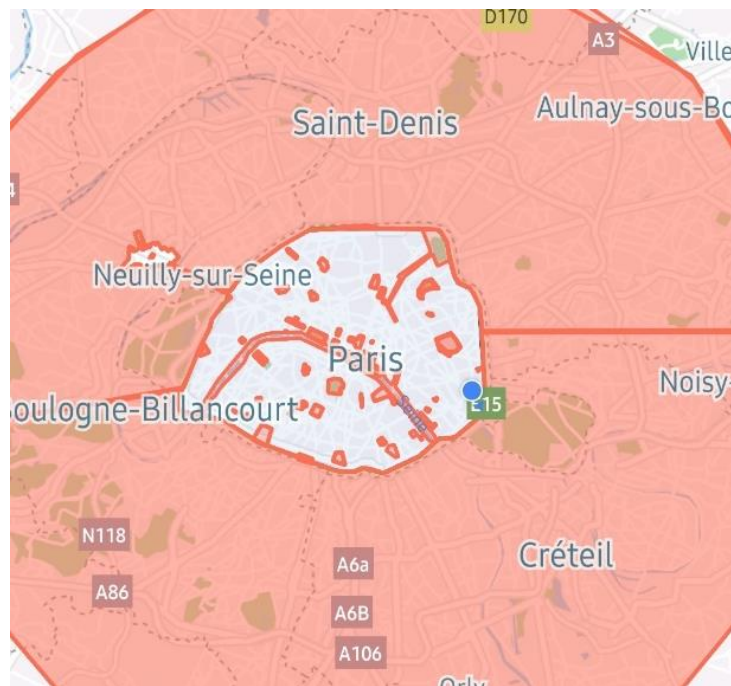


Figure 28. Map of Lime coverage (09/2020)

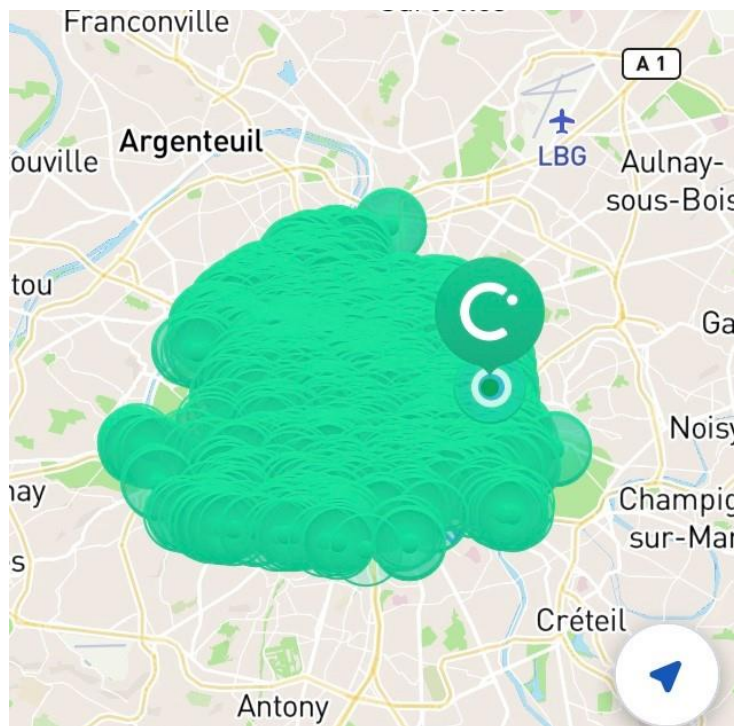


Figure 29. Map of Cityscoot coverage (09/2020)

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