

ANALYSIS OF THE MOBILITY OF POWERED-TWO WHEELERS IN FRANCE

Regis de SOLERE, Certu, France. regis.de-solere@developpement-durable.gouv.fr

ABSTRACT

Powered two-wheelers (PTWs) represent an attractive alternative to the car. They allow those who live and/or work in the city to retain their independence, and provide a rapid means of transport; furthermore, they can be easily parked (often illegally) very close to the user's final destination, and are cheaper to acquire and maintain than a car. These advantages are, however, counterbalanced by high accident rates, conflicts with other road users, and noise and air pollution.

Knowledge about users of powered two-wheelers and the journeys they make using these vehicles on weekdays in urban areas is of particular importance in light of increasing traffic congestion in urban areas on the one hand, and the high accident rates associated with this mode of transport on the other.

The analysis presented here highlights un certain number of interesting points:

- few journeys are made using PTWs in urban areas in France (around 1.5% of all journeys on average), but these journeys concern a significant number of people (around 3% of all users);
- this mode of transport is used more in urban areas in south-eastern France: the modal shift here for PTWs is three times higher than in urban areas elsewhere in France;
- PTW users travel a lot: the average number of journeys they make each day is higher than for the rest of the population;
- users of mopeds (i.e. PTWs with an engine displacement of less than 50 cc) are generally young (school pupils and students) and male (75% of all moped users); "typical" users of motorcycles (i.e. PTWs with an engine displacement of 50 cc or more), on the other hand, are men aged between 25 and 50 in full-time employment, in an "intermediary" or liberal profession or in an executive post;
- PTWs are most often used to get to work or to one's place of study;
- the average distance of a journey made using a PTW is between 5 and 6 kilometres, which is similar to the average distance of a journey made by car or urban public transport.

Keywords: powered-two wheelers, mobility, journey, user, household travel survey

INTRODUCTION

Why carry out research into powered two-wheeler mobility?

Powered two-wheelers (PTWs) represent an attractive alternative to the car. They allow those who live and/or work in the city to retain their independence, and provide a rapid means of transport; furthermore, they can be easily parked (often illegally) very close to the user's final destination, and are cheaper to acquire and maintain than a car. These advantages are, however, counterbalanced by high accident rates, conflicts with other road users, and noise and air pollution.

Studies of mobility among users of PTWs have only rarely been undertaken. The absence, inadequacy and inaccuracy of data on this subject are regularly bemoaned by those involved in the sector, and make it difficult to analyse certain specific features relating to PTW users, particularly in terms of road safety.

In a context of increasing congestion in major European cities coupled with an increase in the proportion of PTW users involved in road traffic injuries, a detailed knowledge of PTW travel trends and changes in these trends would appear to be of vital importance. Let us not forget that Paris City Council's *Observatoire des Déplacements* (Mobility Observatory) has noted continuous growth in PTW traffic since 1998 and a 10% increase between 2006 and 2007.

The aims of research of this kind are summarised in Figure 1.

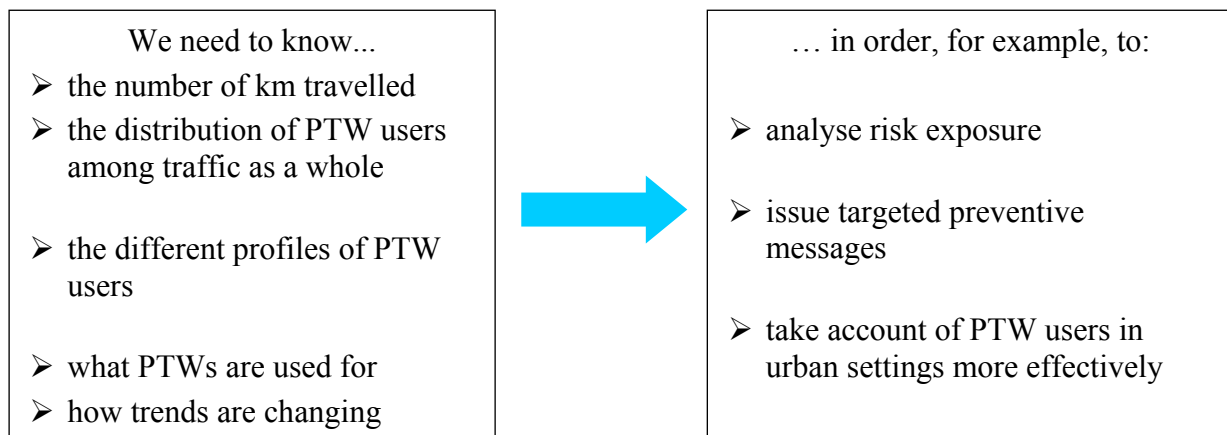


Figure 1 – Why a better understanding of PTW mobility is necessary

A little methodology...

Certu – in conjunction with road-user representatives and technical experts – has steered a study led by CETE Nord-Picardie (the civil engineering research centre for the Nord-Pas-de-Calais and Picardy regions). Its aim is to find out more about and analyse PTW mobility in urban areas, by identifying the following key features:

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- PTW user profiles: sex, age, socio-economic group, household motorisation rate, frequency of PTW use, etc.;
- PTW journeys made: reason, duration, average distance and speed, times of day, intermodality habits, etc.

Most of the data used in this study comes from household travel surveys, which have been carried out for over 30 years in French urban areas, in accordance with a standard method recommended by Certu. This standardised method enables comparisons to be made between different urban areas and different moments in time. These surveys represent an invaluable source of knowledge with regard to the travel practices of urban populations.

More specifically, household travel surveys concern the journeys made by people living within a given study perimeter. Surveys are carried out between Tuesday and Saturday, and concern all journeys made on the day before the survey. They are carried out at the home of the family/household concerned, and all resident members of the household aged five years and over are surveyed. "PTW users" are defined as persons that have made at least one journey using a PTW on the day before the survey. The term "frequent riders", used later in this document, refers to persons surveyed who said they use a PTW at least twice a week.

Some methodological difficulties were nonetheless encountered in carrying out this study, notably because PTW mobility is relatively low in French urban areas. Consequently, the number of journeys recorded in household travel surveys is often too low to be used for any sort of fine analysis (as the results would not be sufficiently representative in statistical terms). To try to remedy this situation, results from several surveys were combined in order to pool a sufficient number of PTW journeys, and thus draw conclusions from the figures.

Other methodological limitations associated with the survey method must also be specified here:

- household travel surveys do not provide information on weekend travel;
- weather conditions during the survey period, between October and April, can have an impact on PTW use.

The urban areas studied are presented below in Table 1.

Table I – List of surveys selected for the PTW mobility study

Urban area	Year of survey	Population of survey area
Grenoble	2002	385,000
Toulouse	2003	935,000
Lille	2006	1,092,000
Lyon	2006	1,243,000
Reims	2006	228,000
Rennes	2007	392,000
Rouen	2007	396,000

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Toulon	2008	575,000
Strasbourg	2009	439,000
Bordeaux	2009	881,000
Nice–Côte d’Azur	2009	1,052,000
Marseille	2009	1,178,000

The Paris region (Île-de-France) is something of a special case within France, not just for PTW use but with regard to mobility in general. Unfortunately, the last survey in the Paris region dates from 2002, and as the situation has changed considerably since then, PTW mobility in Île-de-France shall not be dealt with here.

PTW USE IS HIGHER IN SOUTH-EASTERN FRANCE

On average, French people make 3.6 journeys per day each, of which just 0.05 of a journey – or 1.5% of all journeys – is made using a PTW (see Table 2). However, the figures for PTW use vary enormously between urban areas in the south-east of France and those in the rest of the country. In Toulon, Marseille and Nice, PTW mobility is close to 0.1 journey per day per person, representing a modal share of around 3%. In the rest of France, the modal share for PTWs accounts for less than 1%, except in Bordeaux and Toulouse, where the figure stands at around 1.5%.

Table II – Mobility and modal shares for journeys in the urban areas studied

Urban area	Mobility (number of journeys per day per person)		"Market share" for each mode of transport				
	Total	PTWs	PTWs	Car	Public transport	Walking	Others (including cycling)
Grenoble	4.03	0.02	0.5%	52.8%	13.4%	30.0%	3.4%
Toulouse	3.89	0.06	1.6%	64.4%	8.8%	21.4%	3.7%
Lille	3.76	0.03	0.7%	55.9%	9.5%	31.5%	2.3%
Lyon	3.39	0.02	0.5%	49.2%	15.3%	32.5%	2.5%
Reims	3.80	0.02	0.5%	57.5%	10.4%	29.8%	1.8%
Rennes	3.74	0.02	0.6%	53.7%	12.6%	28.2%	5.0%
Rouen	3.53	0.03	0.7%	62.7%	8.3%	25.8%	2.5%
Toulon	3.60	0.10	2.7%	62.1%	5.2%	27.5%	2.5%
Strasbourg	3.73	0.03	0.8%	58.2%	8.1%	25.2%	7.7%
Bordeaux	3.68	0.05	1.4%	63.5%	9.3%	20.9%	4.9%
Nice–Côte d’Azur	3.27	0.13	3.9%	53.4%	8.1%	32.6%	2.1%
Marseille	3.49	0.09	2.6%	50.4%	11.4%	34.1%	1.6%
All urban areas	3.61	0.05	1.5%	56.7%	10.0%	28.4%	3.3%

We should point out here that although PTWs represent only 1.5% of journeys, they concern a greater proportion of the population: 3.2% of people aged five years and over are "frequent riders", i.e. they use PTWs at least twice a week. This proportion of "frequent riders" is as high as 6% in the three south-eastern urban areas identified above.

MOBILITY-RELATED BEHAVIOUR SPECIFIC TO PTW USERS

PTW users travel a lot

As we have already seen, French people make an average of 3.6 journeys each per day. However, for PTW users (i.e. all those who used a PTW on the day before the survey), this figure is around 33% higher than the average (see Figure 2). This "overmobility" is slightly more pronounced for users of PTWs with engine displacements of 50 cc and more (+35%) than for users of PTWs of less than 50 cc (+29%).

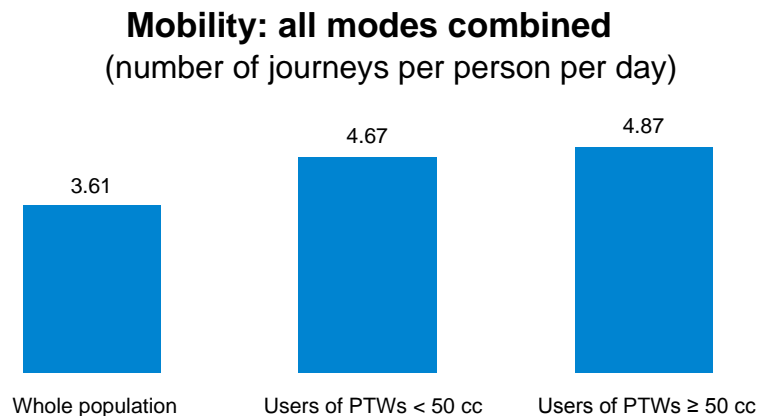


Figure 2 – Mobility of PTW users – all modes combined

PTW users also use other modes of transport!

On days when PTW users travel using their PTW, the modal split for all their journeys throughout the day is necessarily quite different from that of the rest of the population (see Figure 3). On these days, they use their motorcycle (PTW ≥ 50 cc) or moped (PTW < 50 cc) for 64% of their journeys. But they also use private cars (for around 17% of their journeys, compared with almost 57% of journeys for the population as a whole). They do not, however, travel a great deal on foot, as this mode is used for only 13% of journeys, compared with 28% for the population as a whole. This means that PTW users turn to their motorcycles or mopeds even for short journeys, many of which could be made on foot. It is no doubt the ease of parking offered by PTWs that in part explains this behaviour.

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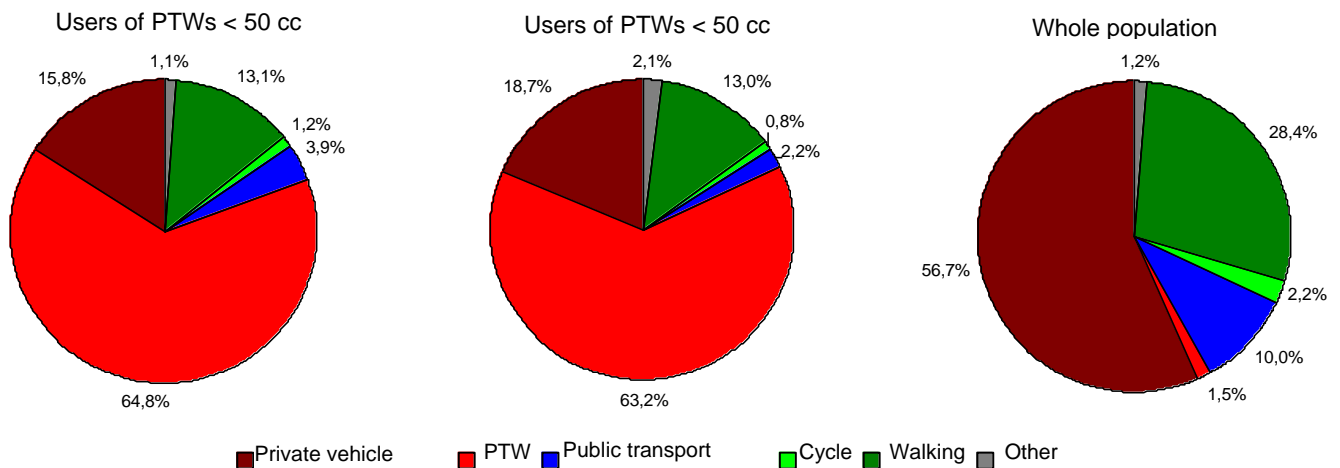


Figure 3 – Modal split of journeys made by PTW users

It should be noted that users of motorcycles (PTW ≥ 50 cc) also make greater use of their car and less use of public transport and cycling than users of mopeds (PTW < 50 cc), although the differences between the two groups are only slight. As we will see later, this can be explained in part by the socio-economic profile of the users concerned.

PTW USERS: SPECIFIC PROFILES

PTW users are mainly men

It may sound like a cliché, but most PTW users are men (see Figure 4). This is particularly true for motorcyclists, 86% of whom are male. A considerable proportion of moped users, however, are women (25%): as we will see later, most of these are students.

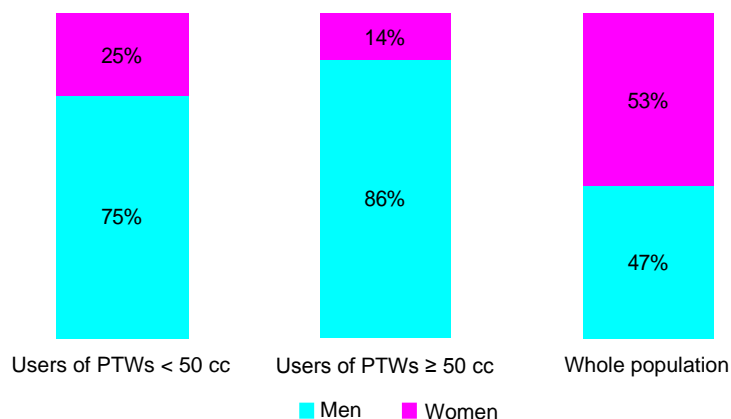


Figure 4 – Distribution of PTW users by sex

We have already highlighted the high PTW usage levels in the three urban areas of south-eastern France. In these urban areas, the proportion of female PTW users is higher than in cities in the rest of the country. In particular, women represent 17% of motorcyclists in these south-eastern cities, compared with 9% in urban areas elsewhere in France.

French regulations regarding PTW use

In France, the legal requirements for PTW use are as follows:

Vehicle	Age	Certificate/Licence
Moped < 50 cc	14	No licence, but must have a BSR (<i>Brevet de Sécurité Routière</i> – Road Safety Certificate)
Light motorcycle < 125 cc	16	Category A1 licence or Category B (car) licence with 2 years' experience
MTT1 motorcycle ≥ 125 cc Power < 25 kW Power/mass < 16 kW/kg	18	Category A licence
MTT2 motorcycle ≥ 125 cc Power ≥ 25 kW Power/mass ≥ 16 kW/kg	21	Category A licence, held for at least 2 years

Quad bikes and three-wheeled vehicles are not included here.

Moped users are younger than motorcyclists

In all, 28% of moped users are aged between 5 and 17 (more specifically, between 14 and 17), and a further 25% are aged between 18 and 25, while these age groups represent 18% and 11%, respectively, of the population as a whole (see Figure 5). It is therefore mainly young people who use PTWs of less than 50 cc.

By comparison, 75% of motorcyclists are aged between 26 and 60, whereas this age group represents only 49% of the population. A more detailed breakdown of this age group shows that it is above all those aged 35 to 50 who use motorcycles.

Finally, and this will come as little surprise, the over-60s do not use PTWs a great deal.

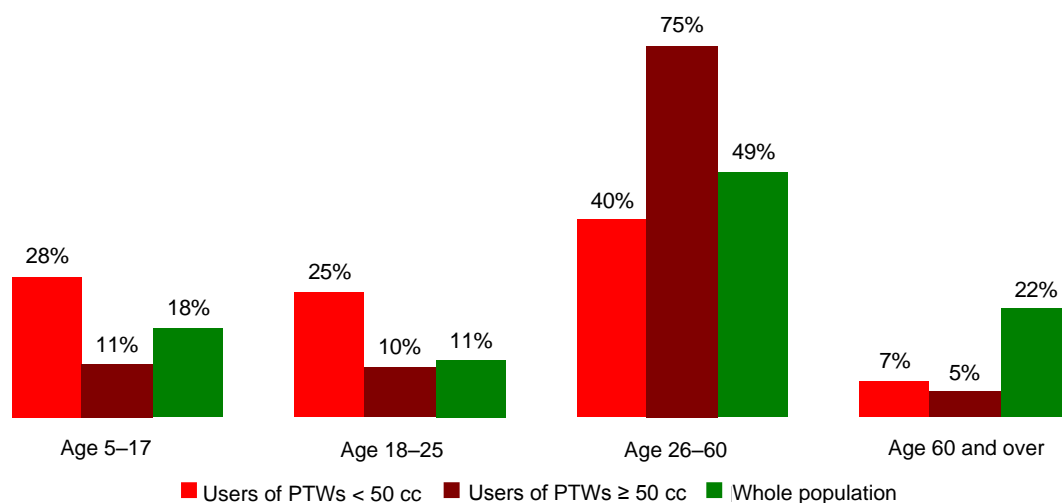


Figure 5 – Distribution of PTW users by age

There are no major differences in the age distribution of PTW users between the three south-eastern urban areas and the other urban areas in France, other than the fact that motorcycles are used by noticeably more people over 60 in the south-east.

The socio-professional category of PTW users varies with engine displacement

We have already seen that moped users are mainly young people. This is confirmed in Figure 6: 41% of moped users are school pupils or students – categories that account for just 25% of the population.

Motorcyclists, on the other hand, consist mainly of people in employment: manual workers, office workers, people in so-called "intermediary professions" (middle managers, teachers, health professionals, social workers, etc.) and executives. However, it is executives and those in the liberal professions that make particular use of PTWs, as they represent 22% of all motorcyclists for just 13% of the population.

One final note: the "Other" category includes socio-professional categories that make little use of PTW: those not in employment (including retired people), craftspeople, shopkeepers, etc.

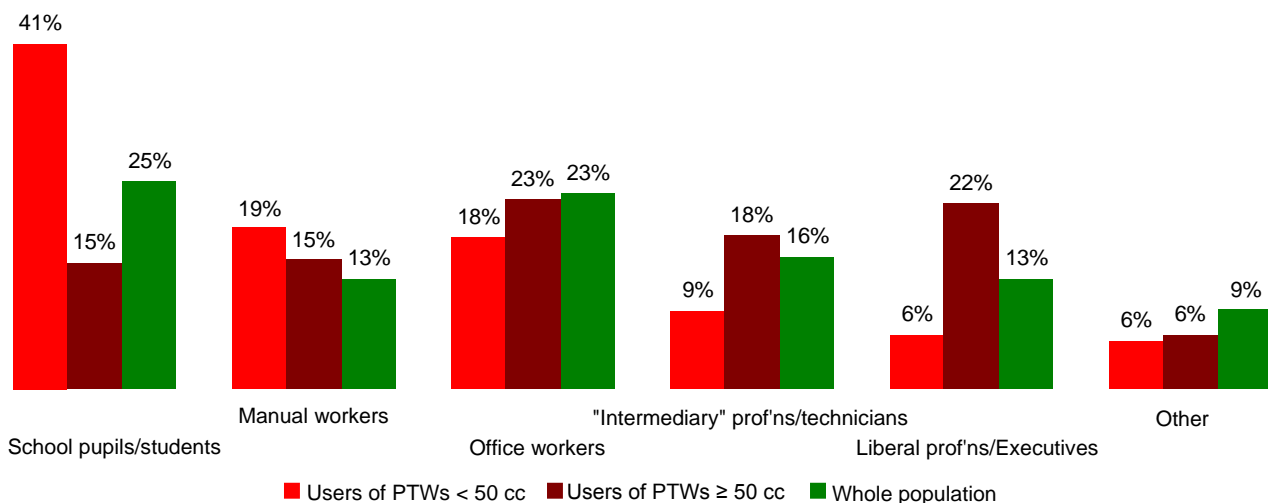


Figure 6 – Distribution of PTW users by socio-professional category

These average values should, however, be qualified for manual workers and office workers, as major differences exist between the three south-eastern urban areas on the one hand, and the remainder of the French urban areas on the other (see Figure 7): in particular, manual workers use PTWs less in the three south-eastern urban areas than in the other urban areas. By contrast, office workers, who are more numerous in the south-eastern urban areas, use PTWs more than in other urban areas, especially motorcycles.

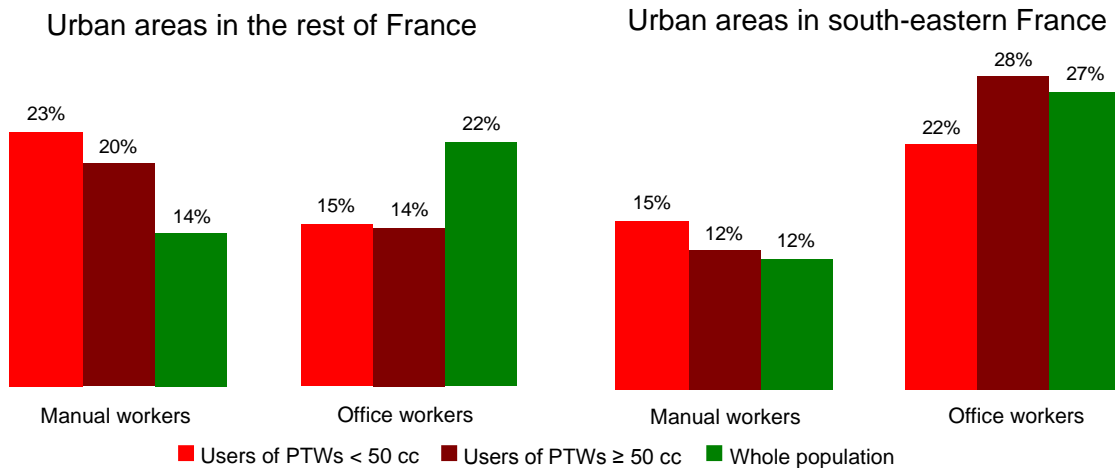


Figure 7 – Distribution of manual and office workers that use PTWs by location of urban area

Finally, it should be noted that 69% of motorcyclists are in full-time employment, whereas this category represents just 35% of the total population. From a more anecdotal standpoint, 8% of moped users are apprentices – a category that represents just 1% of the total population.

What is a typical PTW user profile?

By grouping the parameters analysed above, profiles of the "typical" PTW user can be constructed.

Moped users are often young and in full-time education.

Motorcyclists are often men aged between 25 and 50, with a full-time job in an "intermediary" or liberal profession, or in an executive post.

WHAT SORT OF JOURNEYS ARE PTWS USED FOR?

PTWs are used, above all, for getting to work, school or university...

Motorcycles are mostly used for travelling to work: in all, 47% of journeys made using PTWs of 50 cc or more are work-related; for comparison, this type of journey represents just 23% of all journeys made (all modes combined) (see Figure 8).

For mopeds, 50% of journeys made are for work (30%) or study (20%) reasons, while these journeys account for 23% and 11%, respectively, of all journeys made (all modes combined). As far as study-related journeys are concerned, this is to be expected, as we have already established that mopeds are mainly used by young people of school or university age. The high number of work-related journeys reflects the not insignificant numbers of manual and office workers who use this type of vehicle.

Unsurprisingly, PTWs are not often used for shopping trips or to transport other people. However, they are used relatively frequently for visiting friends and family.

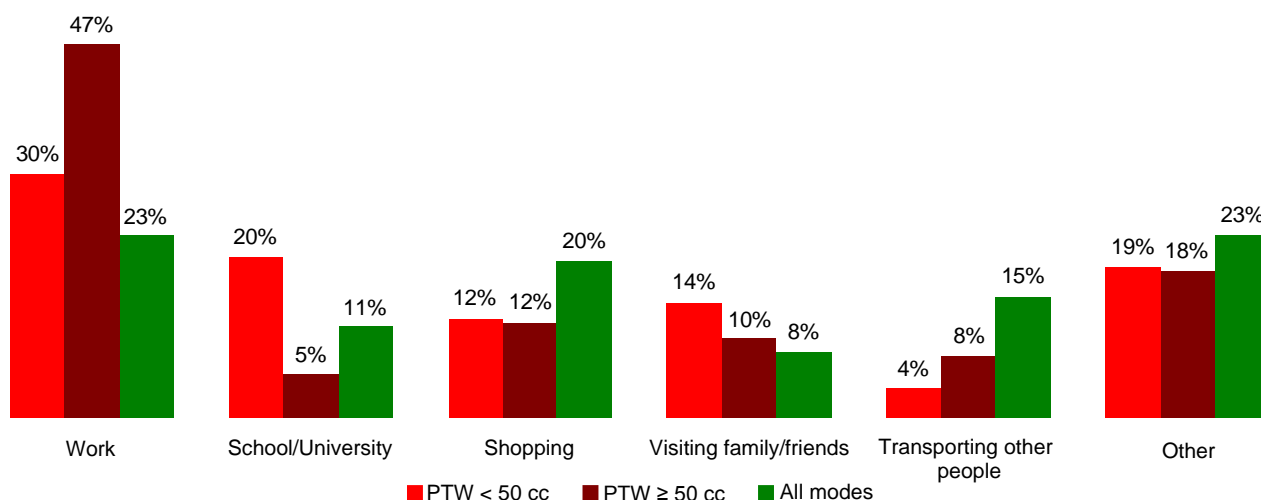


Figure 8 – Distribution of journeys by reason/destination (excluding return journeys home)

Here, it is important to remember that the results presented concern weekdays only (from Monday to Friday). PTW use for leisure (e.g. biking trips) at weekends will therefore not appear in these results.

... especially in south-eastern France

The increased PTW use already observed in the three urban areas in the south-east of France (Marseille, Toulon and Nice) is confirmed for all types of journey. Nonetheless, this high level of usage is particularly prominent for journeys to work and school/university: almost 5% of journeys to work are made by motorcycle in these urban areas, compared with a modal share of 1% for the other urban areas in France. Similarly, almost 3% of journeys to university are made by moped in these south-eastern cities; this compares to a modal share of 0.4% in the other urban areas. Finally, 1% of all vehicles used for the school run are motorcycles in the three south-eastern urban areas, compared with 0.1% in urban areas in the rest of the country.

Five to six kilometres travelled per journey on average

The average distance travelled by a PTW varies according to engine displacement (see Figure 9): 4.7 km for mopeds, and 6.3 km for motorcycles. This difference can be explained by the respective capacities of the vehicles in question, and the types of journey that each is used for: motorcycles are often used for work-related journeys, which are generally quite long, whereas mopeds tend to be used for shorter journeys to school or university.

For comparison, the average length of car journeys in the urban areas studied is 5.5 to 6.5 km, depending on whether the user in question is a passenger or the driver of the vehicle. The average for journeys made using city public transport is of the same order of magnitude.

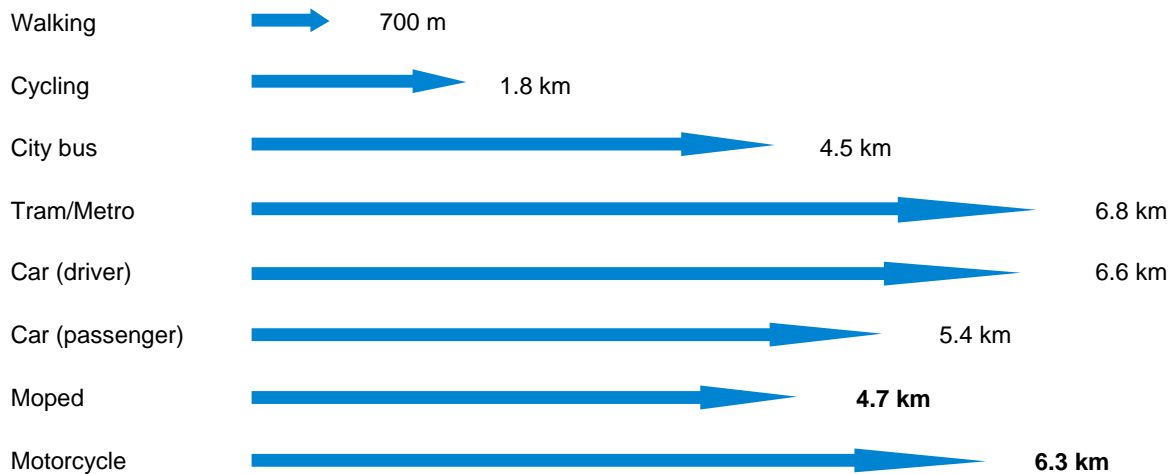


Figure 9 – Average distance travelled per journey by mode of transport

CONCLUSION

Knowledge about users of powered two-wheelers and the journeys they make using these vehicles on weekdays in urban areas is of particular importance in light of increasing traffic congestion in urban areas on the one hand, and the high accident rates associated with this mode of transport on the other.

The analysis presented here highlights un certain number of interesting points:

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- the average distance of a journey made using a PTW is between 5 and 6 kilometres, which is similar to the average distance of a journey made by car or urban public transport.

Although these results are interesting, a certain number of elements are not dealt with here. In the Île-de-France region, and the city of Paris in particular, PTWs are frequently used. Furthermore, it would appear that this usage is developing rapidly. However, as the last survey is not especially recent, the decision was taken not to include the Paris urban area in this study.

At a time when mobility in large urban areas in France is undergoing significant changes, it will be interesting to see how PTW use, in particular, evolves. Work on this is currently under way, and will be presented during the WCTR in July 2010.

Finally, the surveys used in this study do not make a distinction between light motorcycles (< 125 cc) and motorcycles with an engine displacement of 125 cc or more. And yet, in the context of urban usage, it is a distinction that could have been useful, and which could have produced more detailed results. Similarly, it was not possible to make a distinction between scooters and conventional motorcycles, which would have been interesting in terms of both use and accidentology.

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