

# **HOUSEHOLD TRAVEL DEMAND SURVEYS IN FRANCE**

## **TELEPHONE / FACE-TO-FACE: CONSEQUENCES ON MOBILITY INDICATORS**

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### **ABSTRACT**

The paper deals with the different methodologies of household travel demand surveys in France and the consequences on mobility indicators of telephone surveys compared to face-to-face surveys.

For a few years in France, the share of households who cannot be reached on the phone has increased, due to two main reasons: a rising share of people owning only a mobile phone, and households changing for a new phone operator (consequently the phone number cannot be obtained in the historic operator phone user file). For instance, in the Lille urban community, the share of households without phone increased from 6% en 1998 to 22% in 2006. On average in France, this share has increased by 1% per year over the past 10 years.

At the same time, new methodologies of household travel demand surveys have been developed in France: since a few years, telephone has been used for surveys in middle-sized cities and also in the rural parts around large urban centres.

Using the most recent face-to-face surveys undertaken in France (in Toulouse and Montpellier 2003, Lille and Lyon 2006, Rouen 2007, etc.), the research shows that households who don't own any landline have different mobility patterns than households with a phone. On average, the mobility of "landline holders" in terms of number of trips per day is

equal, but their use of transport modes is different: they travel more by car, but less by public transport means and walking. Consequently, there is a risk of overestimating car mobility and underestimating public transport use.

Among those people, a diversity of profiles can explain these differences: one of them is people who replaced a landline by a mobile phone. They are mostly young households, students, and are more mobile than the average population, particularly on foot and by public transports. Another profile is people who have no phone at all, in which unemployed and workers are over-represented. They are less mobile than the average.

The rising share of households who cannot be reached on the phone is a growing issue regarding the quality and reliability of telephone household travel demand surveys. However, the highest shares of “non equipment” concern the large urban areas, where the surveys are still face-to-face interviews.

The CERTU, which guarantees the reliability of the methodologies of household travel demand surveys in France, will follow very closely the evolution of households phone equipment in middle-sized cities, rural and suburban areas and re-evaluate its consequences on mobility data quality.

*Keywords: Household travel demand surveys – Telephone/Face-to-face – Mobility analysis – Mobility patterns*

## **HOUSEHOLD SURVEYS IN FRANCE: TWO METHODOLOGIES**

In France, two types of household surveys have coexisted since the 1960's:

- National Travel Surveys (NTS) – five national surveys have been conducted with a similar methodology (1966-1967, 1973-1974, 1981-1982, 1993-1994 and 2007-2008).
- Local Household Travel Surveys (LHTS) conducted since the 1970's at the local level, in urban areas for both large agglomerations and medium-sized cities in the most recent years

The paper deals with local surveys, since the telephone methodology has been introduced only for medium-sized cities and suburban areas of the local surveys.

The National Survey is conducted by face-to-face interviews (one person in each household of the sample).

### **History of local household travel surveys in France**

In the early 1970's, French engineers, learning from the American experience of the first surveys about transport, launch a few experimentations of household surveys in Rouen, Nice and Grenoble. The writing of a first guide of standardized methodology in 1975 follows these tests.

Since then, more than one hundred local household travel surveys have been conducted in more than 50 different urban areas in France with a similar method. Although it evolved a few times, it still enables spatial and temporal comparisons.

The following map shows all the surveys conducted in France with the standard face-to-face methodology since the first ones Lille, Lyon and Marseille in 1976:

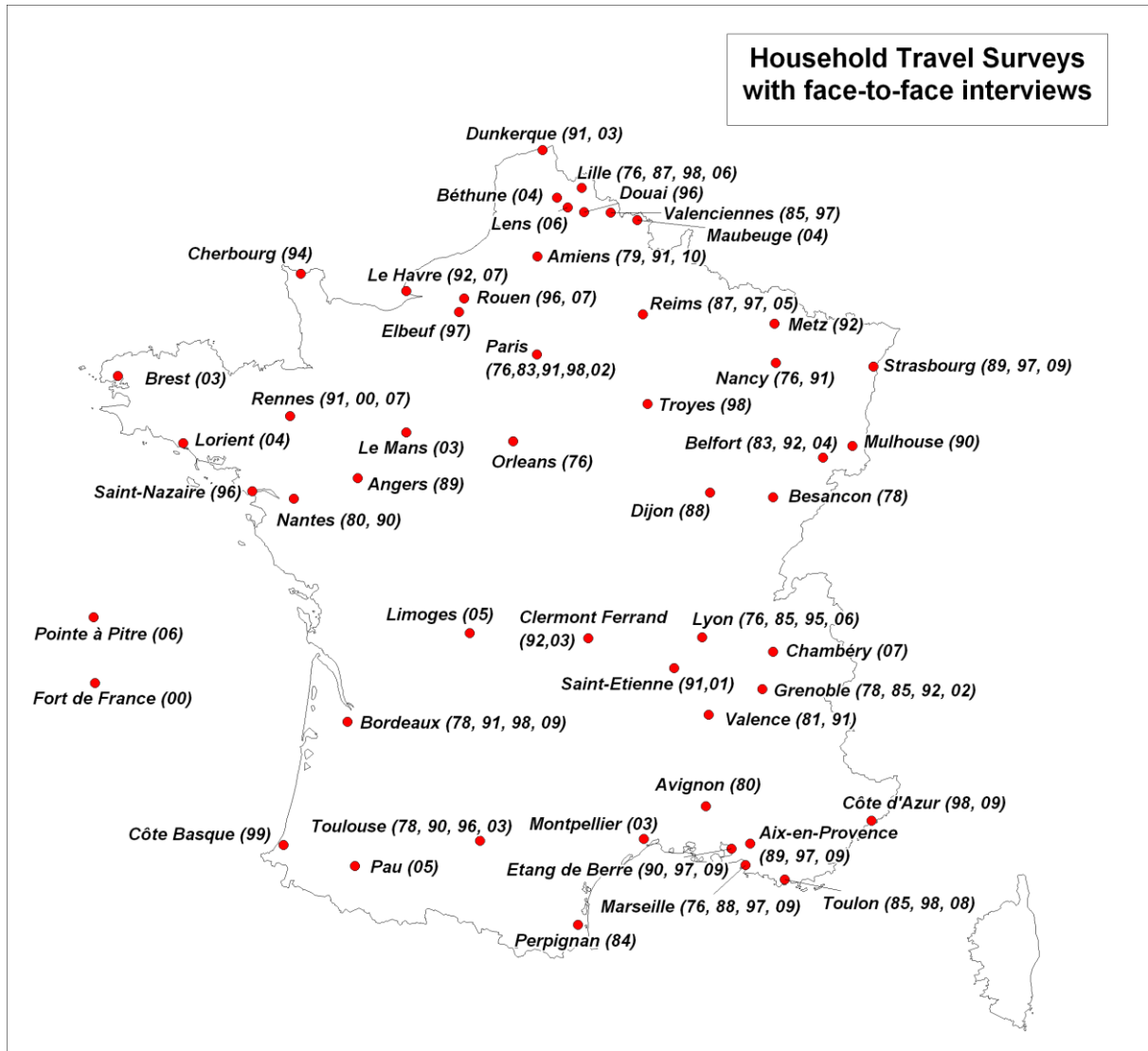


Figure 1: Map of standard “face-to-face” household travel surveys in France

## Methodology of standard face-to-face surveys

The main points of the face-to-face methodology are the following:

- Face-to-face interviews at households’ home
- All individuals aged at least 5 years are interviewed
- Individuals asked about their trips of the day before the interview
- All purposes and modes taken into account, including walking trips
- Only weekdays except school and public holidays

The information collected can be divided in 5 parts:

1. Household's characteristics: type of household and flat ownership or renting, internet connection and landline equipment, precise description of all vehicles' characteristics which are at the household's disposal (type, energy, age, engine rating, place and type of night parking)
2. Individuals' characteristics: (gender, age, holding of driving license, mobile phone and email address, main occupation, level of degree, holding of public transport season ticket, workplace and parking constraints at the workplace, travel habits for each mode)
3. Trips: origin and destination (purpose, location, time) including all trips (very short walking trips and stops on the way to work are considered as trips, e.g. to drop children at school or buy cigarettes)
4. Stages: for each stage of each trip, mode of transport, location of origin and destination of stage, walking times, place and type of parking for car trips, number of persons in the car and number of the vehicle used
5. Opinion: the most important issues regarding local everyday life, the most important issues regarding urban transports, opinion on different statements ("cycling is the future of urban transport", "it is necessary to keep building car parks in city centres", etc.) and qualifying the different transport means.

### **The need for a new methodology: telephone surveys**

In 1997, the CERTU together with the Scientific and Technical Network (CETEs) of the French Ministry of Transports, decided to elaborate a new methodology for medium-sized cities in order to achieve the following goals:

- reduced cost which fits with the budget of medium-sized cities (the cost should not exceed 50 000 €)
- amount of data collected reduced and adapted to the needs of medium-sized cities

Experimentations were conducted in Roanne in 2000 and in Colmar in 2001.

In Roanne, a mixed method was tested, with both face-to-face (453 households) and telephone interviews (1213 households), but the cost was higher than the target.

Finally, tests showed that the telephone methodology reached both goals and did not show important bias in the results. Since then, 14 surveys have been conducted by phone in medium-sized cities.

The telephone methodology was also used in the most recent years for suburban areas of large agglomerations where the most important trips are long-distance trips to the urban pole (9 surveys between 2006 and 2009).

The map shows the cities and years of telephone surveys:

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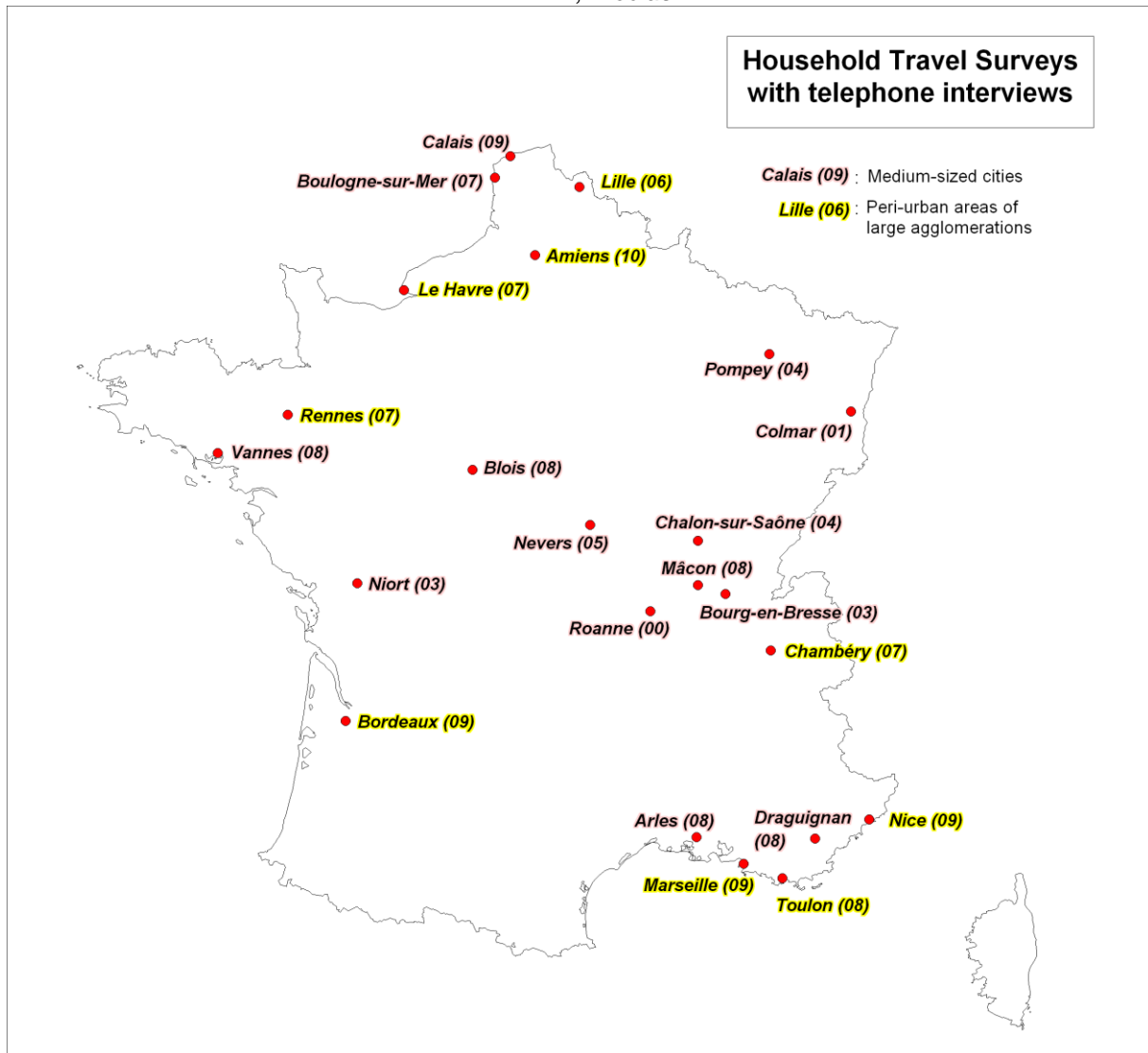


Figure 2: Map of standard “telephone” household travel surveys in France

The methodology of telephone surveys, like face-to-face surveys, follows strict rules that are summarized in the following section.

## Methodology of telephone surveys

In telephone surveys as well as in face-to-face ones, only residents of the area are interviewed. All their trips made the day before the interview are collected except trips made outside the survey perimeter:

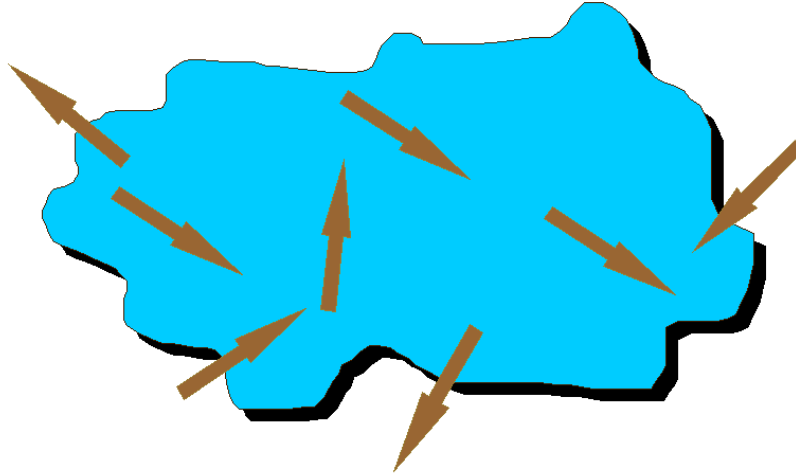


Figure 3: Trips collected in household surveys

The survey perimeter is divided into at least 8 geographical sectors, and in each sector, at least 160 individuals must be interviewed (the sample is distributed at random, except for spatial distribution). At least 1280 individuals are interviewed.

The sample base used is the phone book (landline only).

- Where? by phone, in the evening (17h30 – 20h30) and Saturday mornings
- Who? 1 or 2 individuals aged at least 11 years and selected at random:
  - 1 individual in households of 1 or 2 individuals
  - 2 individuals in households of at least 3 individuals
- When? interviews from Tuesday to Saturday about trips made the day before
- During? at least 7 weeks between October and April (outside holiday periods)
- What? socio-demographic characteristics of households and individuals, frequency of use of all modes of transport, trips made the day before, including walking trips

The differences between the standard face-to-face methodology and telephone-based surveys are mainly due to a shorter questionnaire, because it is considered that an interview cannot last more than 20 minutes.

When it lasts more, persons tend to hang up before interview's end.

- Household's characteristics: it concerns only the number of vehicles at the household's disposal (privately owned and company cars), and internet connection
- Individuals characteristics: gender, age, driving license, main occupation and main profession, level of degree and travel habits for each mode
- Trips made the day before the interview: origin and destination, purpose, location, time and the list of modes used, including all trips

Telephone household travel surveys are conducted in urban areas that count less than 100 000 inhabitants in the urban centre, definition given by the French national statistical office (INSEE). For more populated urban areas, face-to-face interviews are required by the “standard Certu” method.

The cost of the telephone travel surveys is between 35€ and 45€ per person (about 50 000 € for 1300 people). This is about twice cheaper than the face-to-face surveys, but the information collected is less comprehensive and the spatial location of trips and households residence less precise.

The other main issue that is raised by telephone surveys is the sampling base, which is the directory of France Telecom.

A certain number of households cannot be reached for different reasons (they don't have any landline or they don't wish to communicate their number in the directory).

The paper answers these questions:

How many households in the different categories? And how has it evolved?

Who are they, in terms of socio-demographic characteristics?

What are the mobility profiles of these categories?

Does it bias the mobility indicators of telephone surveys? How?

What can we expect in the next future and how can we improve the methodology of telephone surveys?

## **THE TELEPHONE SAMPLE BASE**

### **Which households can we reach by land phone?**

At the moment, only households who subscribed to a landline to the historic operator (France Telecom) are on the lists of numbers that can be used for telephone surveys.

The following households are excluded from the phone lists:

- Households who refuse to publish their phone number in the directory
- Households who refuse the use of their number for marketing purposes
- Households who subscribed to another operator and do not have a France Telecom number any more
- Households who do not have any land phone

These four different categories are heterogeneous, as we will note in the following sections.

## What are the legal obligations of telephone operators?

The telecommunications in France are regulated by:

- The Code of Posts and Electronic Communications
- ARCEP: Regulating Authority for Electronic Communications and Post office service

The only obligation for landline operators is to provide services of directory enquiries or universal directory with their list of telephone numbers to a regulated fare.

There is no obligation for operators to sell their lists for other purposes, such as marketing, surveys or research.

## How many households in each category?

The standard face-to-face surveys are a good source of data to answer this question. Indeed, in the household's characteristics, there is a question about landline:

Do you have any landline?

- Yes       No

If yes, what type of subscription?

- Number out of the directory
- Number that cannot be communicated for marketing purpose or surveys
- Number without restrictions, in directory

Four face-to-face surveys, conducted between 2001 and 2003, have been used to provide most of the results presented in this paper:

Table 1: Description of the four travel surveys used

	Grenoble	Saint-Étienne	Toulouse	Montpellier
Year of survey	2001	2001	2003	2003
Population at least five years old	662 207	486 657	879 973	417 783
Total population	711 584	509 896	935 112	445 365
Number of households	295 390	209 623	426 721	205 557
- living in the UTP*	57% and 11% <sup>1</sup>	74%	88%	88%
- living outside the UTP	32%	26%	12%	12%
Total area surface	3 502 km <sup>2</sup>	1 314 km <sup>2</sup>	1 976 km <sup>2</sup>	725 km <sup>2</sup>
- in the UTP	6% and 11% <sup>1</sup>	28%	46%	82%
- outside the UTP	83%	72%	54%	18%

\* UTP: Urban Transport Perimeter

<sup>1</sup> Urban transport perimeters of Grenoble (57%) and Voiron (11%)



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In these four urban areas, the share of the different categories of households previously described is the following:

Table 2: Share of households according to landline equipments (Grenoble, Saint-Etienne, Toulouse and Montpellier)

	Grenoble 2001		Saint-Étienne 2001		Toulouse 2003		Montpellier 2003	
No land line	31 508	11%	16 120	8%	46 343	11%	35 470	17%
Ex-directory	46 580	16%	36 252	17%	37 893	9%	27 440	13%
No marketing	3 315	1%	2 273	1%	5 571	1%	3 234	2%
In Directory	213 318	72%	154 183	74%	336 914	79%	139 414	68%
Total population	295 390	100%	209 623	100%	426 721	100%	205 557	100%

The share of households with no landline varies from 8% to 17%. The survey shows that most of them live in the central urban area. The suburban zones, where telephone surveys are sometimes conducted in large agglomerations, have a smallest number of households without land phone (between 4% and 7%).

In Rouen (face-to-face survey conducted in 2007 which covers three different urban transport perimeters – UTP), households having subscribed to another operator were identified. The different categories are:

Table 3: Share of households according to landline equipments (Rouen)

	Rouen 2007	
No landline	41 823	15%
Ex-directory	40 336	14%
No marketing	4 681	2%
Other operator	23 522	8%
In Directory	168 441	60%
Whole population	279 912	100%

In the most recent years, the number of households on the phone list has decreased. On average, in the Rouen area, only 60% of households can be reached by phone. Among them, 15% do not have any land phone, 14% are not in the directory, and 8% subscribed to another operator.

### **How has it varied?**

The following chart is based on 38 face-to-face household surveys conducted in France from 1995 to 2008. It gives the share of households who do not have any landline.

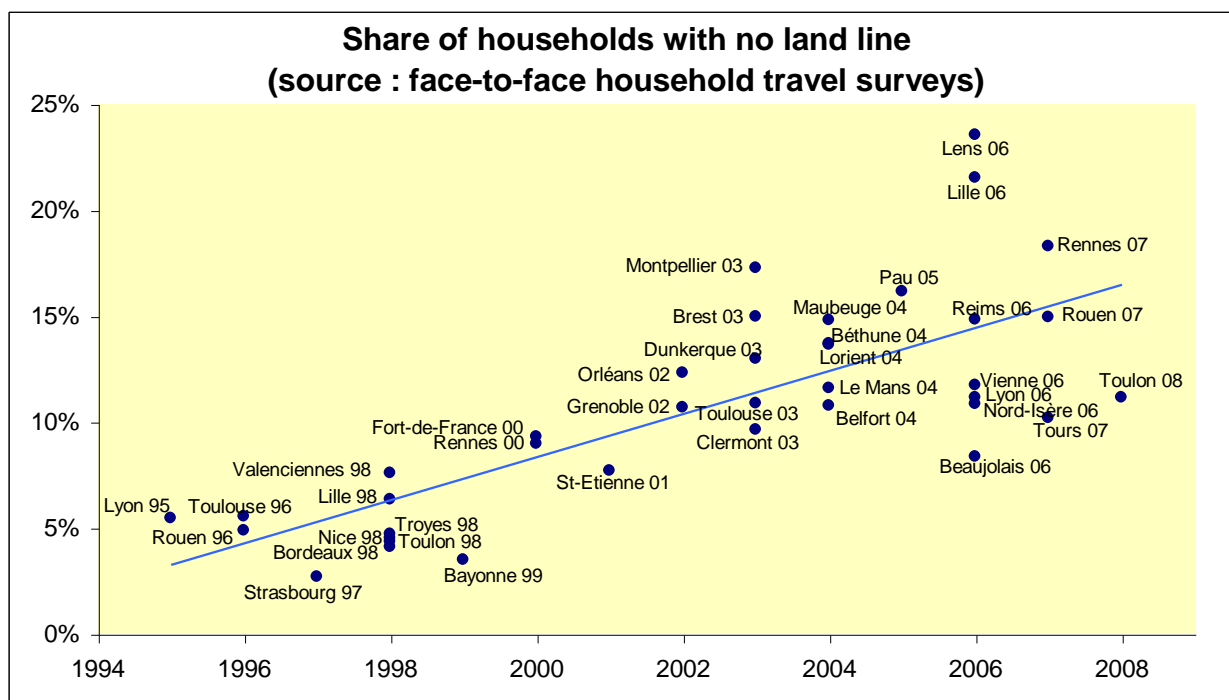


Figure 4: Evolution of the share of households with no landline

In the mid 1990's, the rate of households with no landline was about 4 to 5%. It grew in the late 1990's and early 2000's to an average of 15% to 16% in 2007-2008. The average growth is about 1% per year.

If we focus on six urban areas where two households surveys were conducted in the 1995-2000 and 2003-2008 periods, the growth of these rate is:

Table 4: Evolution of the share of households without any land phone in 6 face-to-face surveys

	1995-2000	2003-2008	Growth rate
Lyon	5%	11%	104%
Rouen	5%	15%	207%
Toulouse	6%	11%	96%
Lille	6%	22%	240%
Toulon	4%	11%	157%
Rennes	9%	18%	104%
<b>Average</b>	<b>6%</b>	<b>14%</b>	<b>146%</b>

In three urban areas, the rate doubled in seven to ten years. It was multiplied by almost four in Lille between 1998 and 2006. The six surveys average growth rate is about 150%.

## Where do they live?

The geographic location of households has a great influence on the share of those who are land phone holders.

The Rouen survey, which covers three urban areas and a suburban and rural zone, shows that it is more difficult to reach urban households by land phone:

Table 5: Share of households according to landline equipment (Rouen 2007)

	UTP of Rouen		UTP of Elbeuf		UTP of Louviers		Outside the UTP		Whole area	
No land line	28 515	16%	4 217	18%	3 742	18%	3 315	6%	41 823	15%
Ex-directory	26 121	15%	3 720	16%	4 029	19%	6 466	11%	40 336	14%
No marketing	2 931	2%	263	1%	696	3%	791	1%	4 681	2%
Other operator	19 819	11%	605	3%	982	5%	2 117	4%	23 522	8%
In Directory	96 253	55%	14 258	62%	11 894	56%	45 776	78%	168 441	60%
Ensemble	174 414	100%	23 093	100%	21 342	100%	58 769	100%	279 912	100%

In the suburban area, almost 80% of households have a phone number in the directory, but this share falls to 55% in the Rouen UTP.

In the main urban area, 11% of households subscribed to another operator, which is 7% more than in suburban areas.

The following map gives this information on a more detailed geographical scale:

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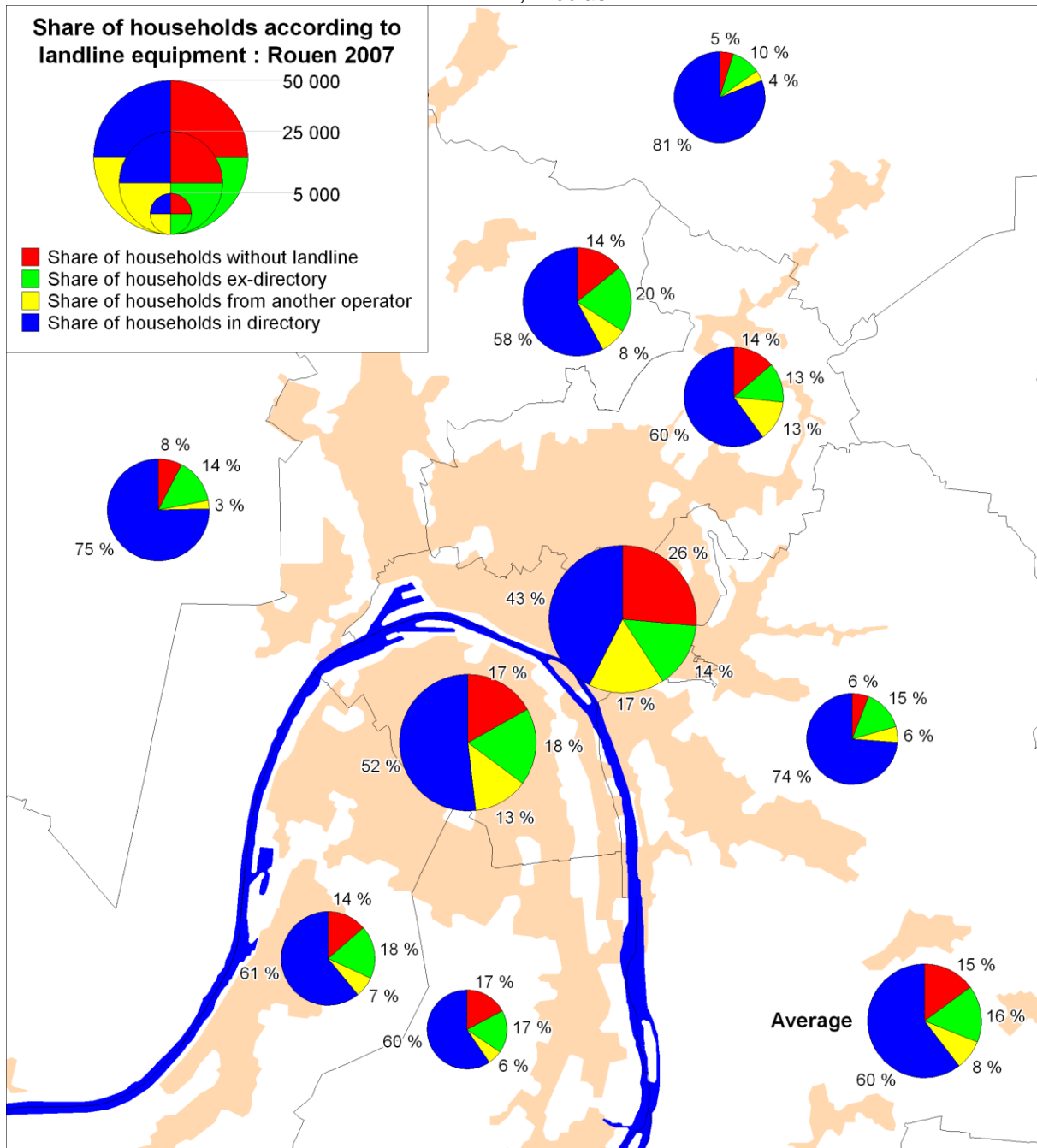


Figure 5: Map of the different categories of land line equipment (Rouen 2007)

The share of households in the directory varies from 43% in the most central area to 80% in the suburban and rural areas.

The same type of geographical distribution is observed in Lille (survey conducted in 2006).

## What are their socio-demographic profiles?

The face-to-face surveys give information about the socio-demographic profiles of the different categories of individuals according to their landline equipment:

Table 6: Socio-demographic profiles of individuals according to landline equipment

	Categories over-represented		Categories under-represented	
	Profession	Age	Profession	Age
<b>Households without land line</b>	Workers Students	18-34 years	Workers (slightly)	35 and more
<b>Households ex-directory</b>	/	35-64 years	/	18-34 years
<b>Households who refuse marketing</b>	Workers Students	/	Executives (strongly)	/
<b>Households with subscription to another operator</b>	Executives Students	18-34 years	Workers Employees	50 and more

On average, individuals who are not in the phone list used for surveys have a profile close to general population. But sub-categories show different profiles:

- Among households without land phone, workers, students and young individuals are over-represented.
- Those who refuse to publish their number in the directory are quite similar to the whole population, with a slight over-representation of individuals aged 35-64 years.
- Those who subscribed to a different operator than France Telecom are mostly young households, either students or executives.

If we focus on households with no landline, two sub-categories can be identified:

- Individuals with no land phone but with a mobile phone
  - o Mostly students (25% of this category, compared to 5% of students in the whole population) and young people (60% of 18-34 years compared to 26% on average)
  - o They represent only 6% of the whole population
- Individuals with no phone at all
  - o Over-representation of the lowest incomes
  - o Only 2% of the whole population

Another source can be useful to draw a profile of households without landline: the survey called "Living conditions and aspirations of French people" and conducted every year by the French National Institute of Statistics and Economical Studies (INSEE).

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Table 7: Rate of landline equipment according to socio-demographic profiles

	Landline equipment			
	Highest rates		Lowest rates	
<b>Income</b>	Lowest income category	67%	Highest income category	97%
<b>Profession</b>	Workers	73%	Retired Senior executives	96% 95%
<b>Age</b>	Young adults (18-24 years)	76%	More than 70 years	97%
<b>Size of household</b>	One individual	77%	Four individuals	94%

According to the survey, individuals with no landline are mostly the low incomes, workers, young adults and small households (1 or 2 persons).

On the contrary, the highest rates are among the high incomes, executives or retired, the elderly and large households (4 and more persons).

The following two tables show the details of the distribution of professions and age categories on average in the four surveys of Grenoble, Saint-Etienne, Toulouse and Montpellier according to landline equipment (red italic is for under-represented categories and green bold for over-represented categories):

Table 8: Distribution of professions and age categories according to landline equipment

	No landline	Ex-directory	No marketing	In Directory	Whole population
Employees	20%	22%	23%	21%	21%
Workers	<b>17%</b>	14%	<i>9%</i>	13%	14%
Executives	<i>18%</i>	31%	<b>40%</b>	34%	33%
Students	<b>20%</b>	<i>3%</i>	<i>3%</i>	<i>4%</i>	5%
Pupils	21%	23%	20%	21%	21%
Unemployed	<b>1%</b>	<i>1%</i>	<b>1%</b>	1%	1%
Non-working	<i>3%</i>	<b>5%</b>	<i>3%</i>	4%	4%
<i>Whole population</i>	196 714	339 344	31 641	1 875 466	2 446 620

	No landline	Ex-directory	No marketing	In Directory	Whole population
5-12 years	<i>7%</i>	11%	<b>13%</b>	11%	11%
13-17 years	<i>4%</i>	<b>9%</b>	<i>6%</i>	7%	7%
18-24 years	<b>36%</b>	<i>10%</i>	<i>7%</i>	<i>9%</i>	12%
25-34 years	<b>24%</b>	<i>10%</i>	14%	14%	14%
35-49 years	<i>17%</i>	26%	25%	24%	23%
50-64 years	<i>7%</i>	<b>21%</b>	<b>20%</b>	19%	18%
> 65 years	<i>4%</i>	14%	15%	16%	15%
<i>Whole population</i>	196 714	339 344	31 641	1 875 466	2 446 620

The following chart shows the rate of landline equipment according to income categories:

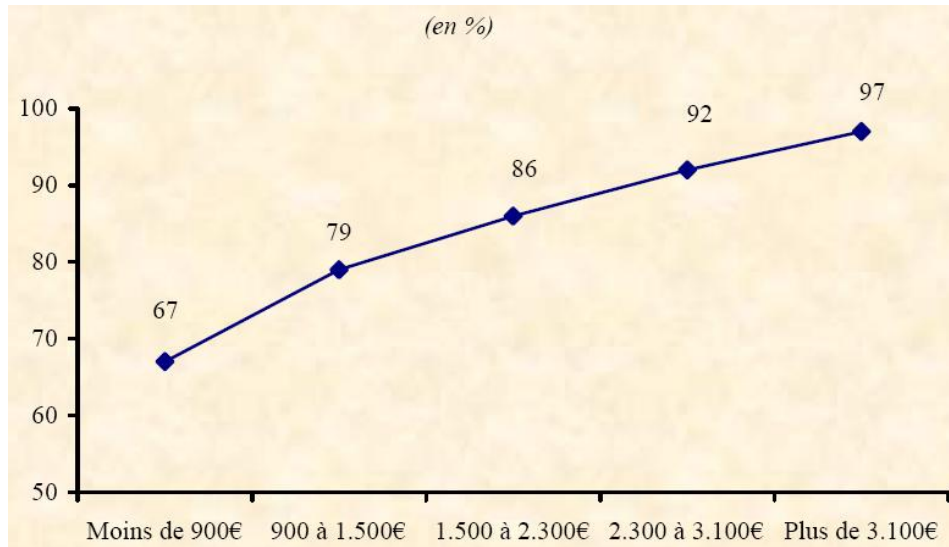


Figure 6: Rate of landline equipment according to income

Landline equipment is clearly related to the level of income: only two thirds of the poorest households (less than 900€ per month) have a land phone. This rate increases to 79% for the next category (900-1500€) and up to 97% for the richest households (more than 3100€ per month).

This survey also gives information about households who have subscribed a land phone to other operators (package with telephone, television and internet).

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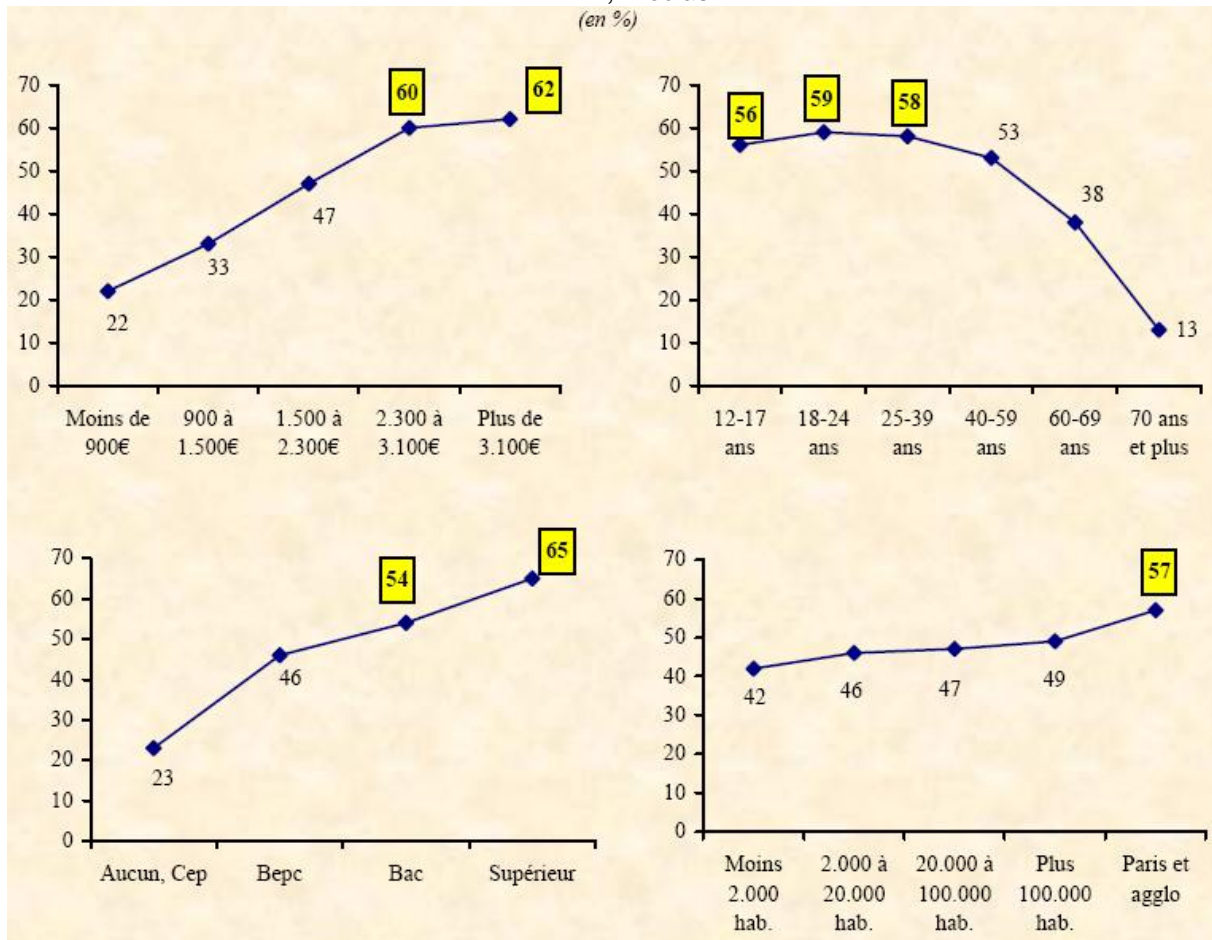


Figure 7: Socio-demographic profile of households who subscribed to another operator

The profile of individuals who have a land phone combined to an Internet access differs from the profile of households with no landline.

The rate of equipment is also related to the level of income, but age categories are very different: the landline access through Internet decrease with age. Whereas 97% of individuals aged over 70 years have a land phone (88% on whole population), only 13% have an Internet access combined to telephone (48% on whole population).



## Mobility according to socio-demographic profiles

The previous section identified several socio-demographic profiles either over-represented or under-represented in the households without land phone, ex-directory, refusing marketing or who subscribed to another operator.

This section draws mobility profiles of these different categories, before measuring the consequences on mobility indicators in the following section.

It is still based on the aggregated results of four face-to-face surveys conducted in Grenoble, Saint-Etienne, Toulouse and Montpellier.

The indicator measured is “mobility”, which is defined by the average number of trips made per person per day. It includes all types of trips and all modes and it covers only weekdays.

These two tables detail mobility by mode of transport according to profession and age categories (in green bold, above average; in red italic: under average):

Table 9: Mobility according to professions and age categories

Mode of transport	Employees	Workers	Executives	Students	Pupils	Unemployed	Non-working	Whole population
Car	2.72	2.41	<b>3.33</b>	<i>1.70</i>	<i>1.56</i>	<i>1.92</i>	<i>1.52</i>	2.51
UPT <sup>2</sup>	0.26	<i>0.20</i>	<i>0.16</i>	<b>0.90</b>	<b>0.42</b>	<b>0.52</b>	<i>0.21</i>	0.29
Other PT	<i>0.03</i>	<i>0.03</i>	<i>0.02</i>	<i>0.07</i>	<b>0.29</b>	<i>0.03</i>	<i>0.01</i>	0.08
2-wheels	<i>0.09</i>	<i>0.11</i>	0.14	<b>0.23</b>	<b>0.18</b>	<i>0.06</i>	<i>0.04</i>	0.13
Walk	1.03	<i>0.82</i>	<i>0.81</i>	<b>1.28</b>	<b>1.24</b>	<b>1.39</b>	<b>1.16</b>	0.99
All modes	4.15	3.67	<b>4.51</b>	4.19	3.71	3.94	<i>2.97</i>	4.05
Number of individuals	518 980	336 175	797 148	132 354	514 030	14 849	105 127	2 446 620

Mode of transport	5-12 years	13-17 years	18-24 years	25-34 years	35-49 years	50-64 years	> 65 years	Whole population
Car	<i>1.90</i>	<i>0.97</i>	<i>2.04</i>	<b>3.15</b>	<b>3.67</b>	2.72	<i>1.37</i>	2.51
UPT	0.10	<b>0.65</b>	0.74	<i>0.23</i>	<i>0.19</i>	<i>0.20</i>	<i>0.22</i>	0.29
Other PT	<b>0.19</b>	<b>0.47</b>	<b>0.11</b>	<i>0.02</i>	<i>0.03</i>	<i>0.02</i>	<i>0.01</i>	0.08
2-wheels	<i>0.11</i>	<b>0.27</b>	0.17	0.13	0.15	<i>0.10</i>	<i>0.05</i>	0.13
Walk	<b>1.34</b>	<b>1.17</b>	1.06	1.00	0.82	<i>0.83</i>	1.06	0.99
All modes	3.66	<i>3.56</i>	4.14	<b>4.58</b>	<b>4.92</b>	3.90	<i>2.74</i>	4.05
Number of individuals	262 579	175 620	283 093	347 926	573 647	445 961	357 790	2 446 620

<sup>2</sup> UPT : Urban Public Transport ; Other PT: Other Public Transport

The main points of these results are:

- Workers are less mobile than the whole population (-0.4 all modes) with all modes of transport (-0.1 trips by car, -0.1 by UPT, -0.2 on foot)
- Students have a mobility similar to the whole population, but very different by mode (-0.8 trips by car, +0.6 by UPT and +0.3 on foot)
- Executives are more mobile (+0.5 all modes), particularly by car (+0.8)
- Young adults (18-24 years) are less mobile by car (-0.5), but more by UPT (+0.5)
- Individuals aged between 25 and 34 years travel more than average (+0.5 trips), mostly due to a greater car use (+0.6)
- The elderly (more than 65 years) travel less than the whole population (-1.3 trips), mainly by car (-1.1) but also by UPT (-0.2)

## CONSEQUENCES OF TELEPHONE SURVEYS ON MOBILITY INDICATORS

### Mobility profiles according to landline equipment

The following charts present mobility indicators according to the different categories of landline equipment of individuals.

- Mobility all modes
- Mobility by car
- Mobility by Urban Public Transport (UPT)
- Mobility on foot

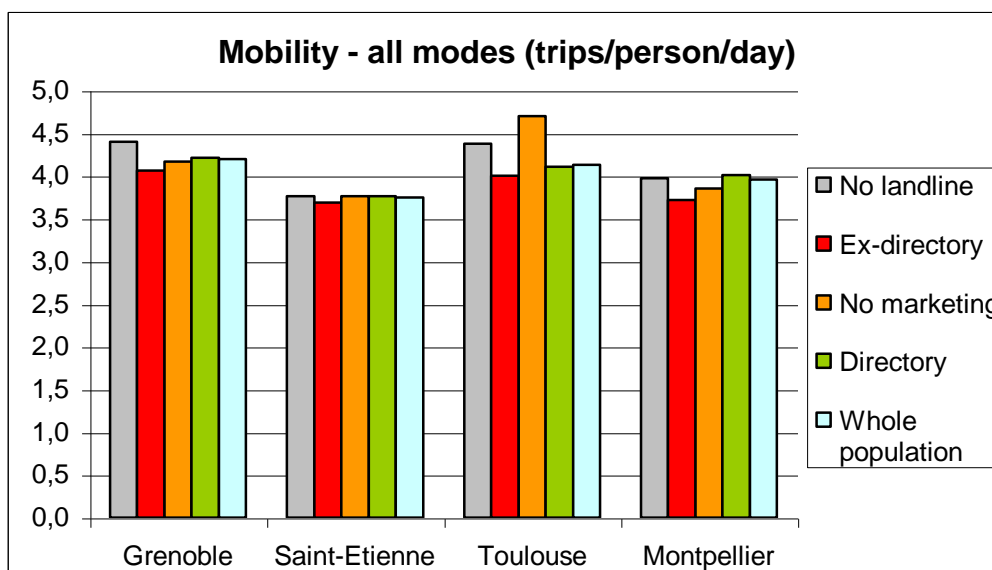


Figure 8: Mobility (all modes) according to landline equipment

- Individuals in the directory make almost the same number of trips per day as the whole population.
- Individuals with no landline tend to travel a little less, and individuals ex-directory to travel a little more.

The detail by mode shows greater differences:

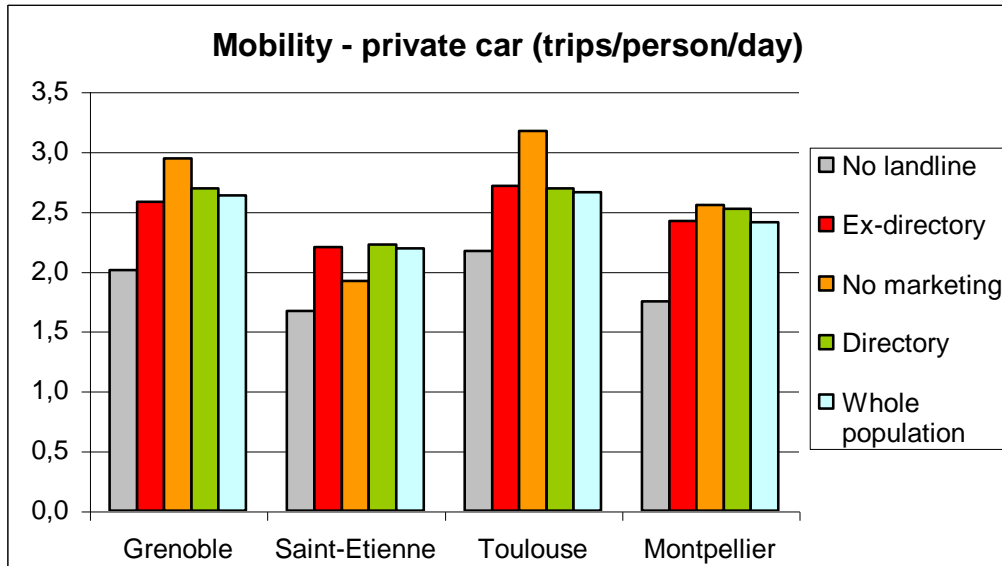


Figure 9: Car mobility according to landline equipment

Car mobility is lower for individuals without landline compared with the whole population (between -20% to -30% of trips).

On the contrary, ex-directory individuals have slightly higher car mobility.

For individuals who refuse marketing use, the small sample size of this category cannot guarantee the statistical significance of results.

On average, individuals whose number is available in directory travel a little more by car than the whole population.

Public transport and walking mobilities are presented in the two next charts:

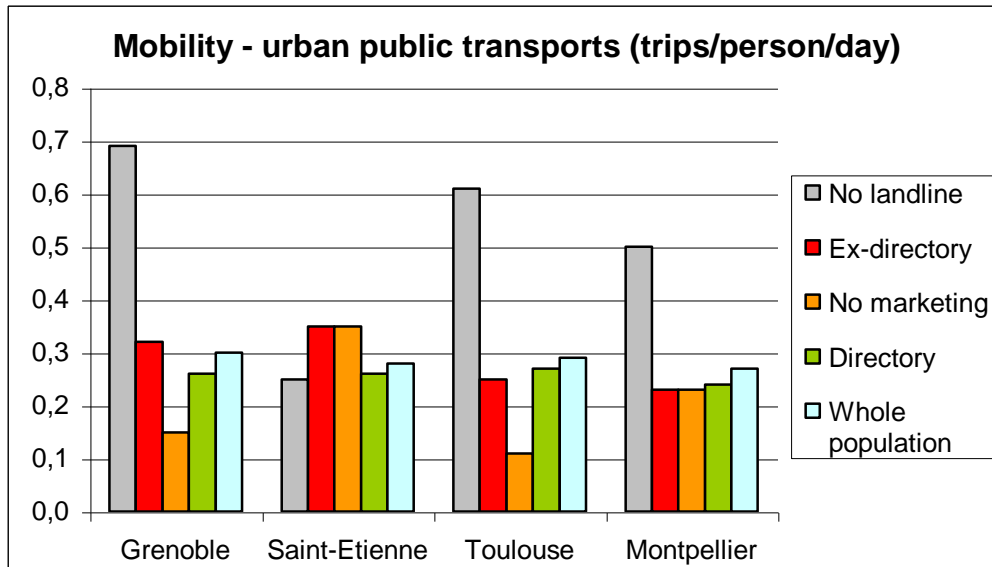


Figure 10: Urban public transport mobility according to landline equipment

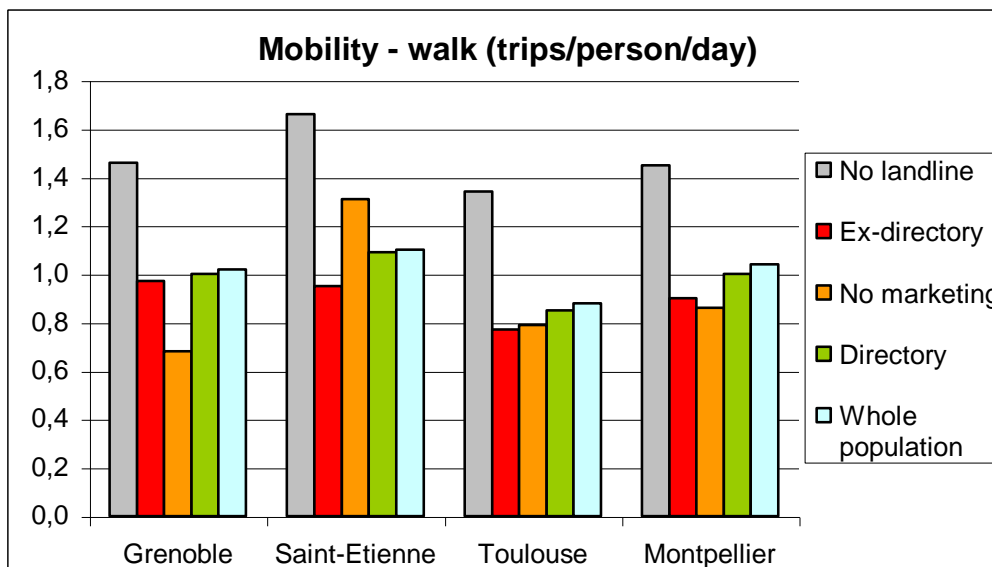


Figure 11: Walking mobility according to landline equipment

Individuals without land phone travel more by urban public transport and walk more than the whole population.

UPT mobility of ex-directory persons is close to average whereas their foot's one is slightly lower.

As a consequence, individuals in the directory travel less by UPT and walk less than the whole population, but differences are small (respectively -10% and -3%).

### Mobility profiles according to combined equipment (land phone and mobile phone)

The previous sections identified two sub-categories among the individuals with no land phone: those who have no phone at all and those who have only a mobile phone.

Their mobility profiles are quite different:

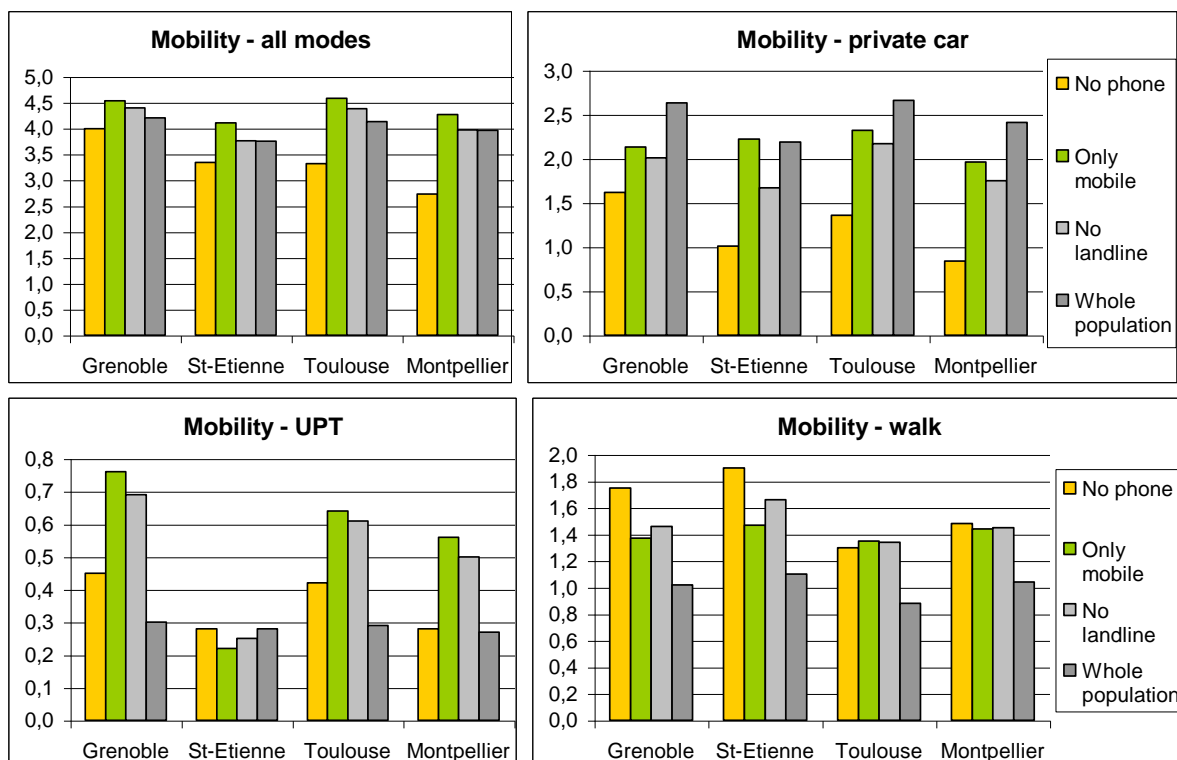


Figure 12: Mobility (all modes, by car, UPT and walk) according to combined land and mobile phone equipment

The individuals without phone at all (neither land phone nor mobile phone) travel less, by any modes, and the difference varies from -5% in Grenoble to -30% in Montpellier.

By car, they travel a lot less than all other categories. This behaviour is related to the lowest levels of income. Their foot mobility is much higher than the average.

By public transport, they are less mobile than the population of individuals with no land phone, but more than the whole population.

On the contrary, exclusively mobile phone holders travel more than without landline population, and also more than the whole population. This is mainly due to a greater use of car and public transport (young adults and students).

These four surveys cannot give information on individuals who subscribed to another operator with a combined access to land phone and Internet. The following section gives this type of information with the Rouen survey conducted recently, for which data are available.

## Mobility of households with Internet/telephone combined access

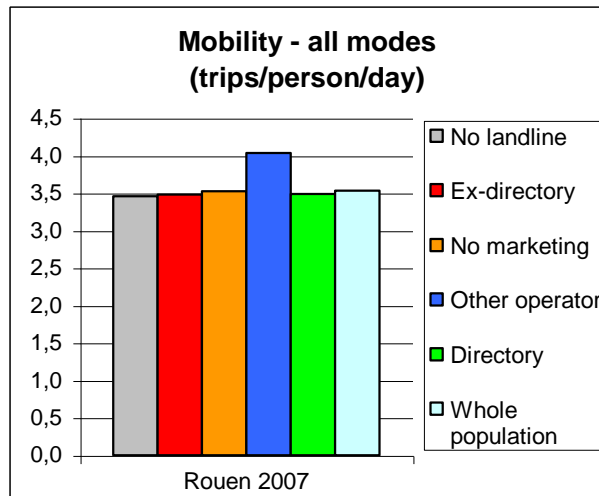


Figure 13: Mobility (all modes) according to landline equipment - Rouen 2007

In Rouen, one of the more recent surveys, only one category of population has a different mobility rate than the average: the individuals who have a combined access Internet/land phone from other operators than France Telecom.

They travel more, and by each mode:

- by car: +0.25 trips
- by urban public transport : +0.05 trips
- by walk: +0.20 trips

It seems that their socio-demographic profile is close to the individuals that used to have no land phone, and particularly the ones with only a mobile phone:

- Over-representation of:
  - o Young adults (18-34 years): 31% compared to 20% in the whole population
  - o Executives: 31% compared to 25% in the whole population
- Under-representation of:
  - o The elderly (more than 65 years): 2% compared to 13%
  - o Workers: 9% compared to 13%

## Conclusion on results of telephone surveys

The difference on the mobility figure (all modes included) seems to be very small: over-mobility of some categories is balanced by under-mobility of others.

Interviewing households by telephone can lead to a slight over-estimation of car mobility and under-estimation of public transport and mobility on foot.

However, in the suburban areas of large agglomerations, where telephone interviews can be conducted, the number of without land phone households is smaller than in urban areas, and the mobility results are less variables. In medium-sized cities, it is more difficult to conclude for sure that the bias is small, but the number of students is often quite small, and they are the most differentiated profile in terms of mobility patterns.

## FOLLOW-UPS AND IMPROVEMENTS

### Recent improvements in landline equipment

The survey conducted every year by INSEE on new technologies and telecommunications shows the following results:

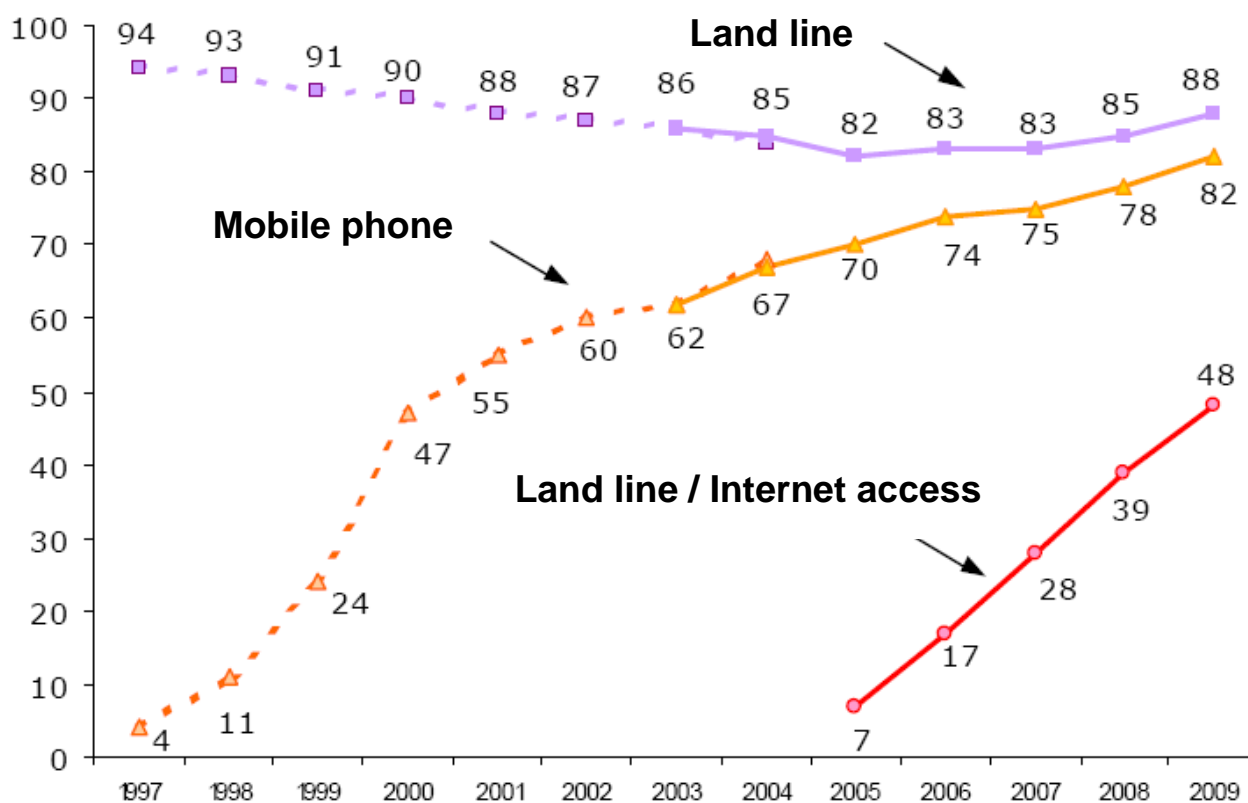


Figure 14: Evolution of land line and mobile phone equipment between 1997 and 2009

In 1997, the rate of households with landline was about 94% and decreased to 82% in 2005. These results confirm the figures of face-to-face surveys conducted in France in this period.

But in the most recent years, this rate has increased again to reach 88% last year. It seems that combined access to land phone and Internet has had a great influence on the growth of average equipment rate.

For medium-sized cities; for 2008 to 2009, the rate of landline equipment has grown from 79% to 86%.

More and more households can be reached by land phone. The main issue is the access to the lists of telephone numbers of all the operators.

There is also a need for evolution of the legal constraints to include in the telephone lists:

- Numbers ex-directory
- But also phone numbers of households who refuse marketing use

Surveys are conducted for public purposes. In Denmark, households have the possibility to accept publication of their number for research purpose and to refuse for purely marketing purposes.

### **What can be done before evolution of regulation?**

In a recent medium-sized cities survey conducted by phone in Calais in 2008, there was an important over-representation of the elderly in the database.

It was decided to include age categories in the sample weighting procedure. It increased the average mobility by 0.2 trips per person (all modes included).

More recently, in the Beauvais survey that started in December 2009, a sort of quota was introduced after 3 weeks of survey, because the share of individuals aged more than 60 was 47%, compared to 21% in the census. It was decided to stop interviewing individuals aged more than 60 years in households of 1 or 2 individuals.

But these measures must be temporary.

It is necessary to improve the sample base by including all land phone numbers in order to guarantee that the random samples from the phone lists are representative of the whole population.



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