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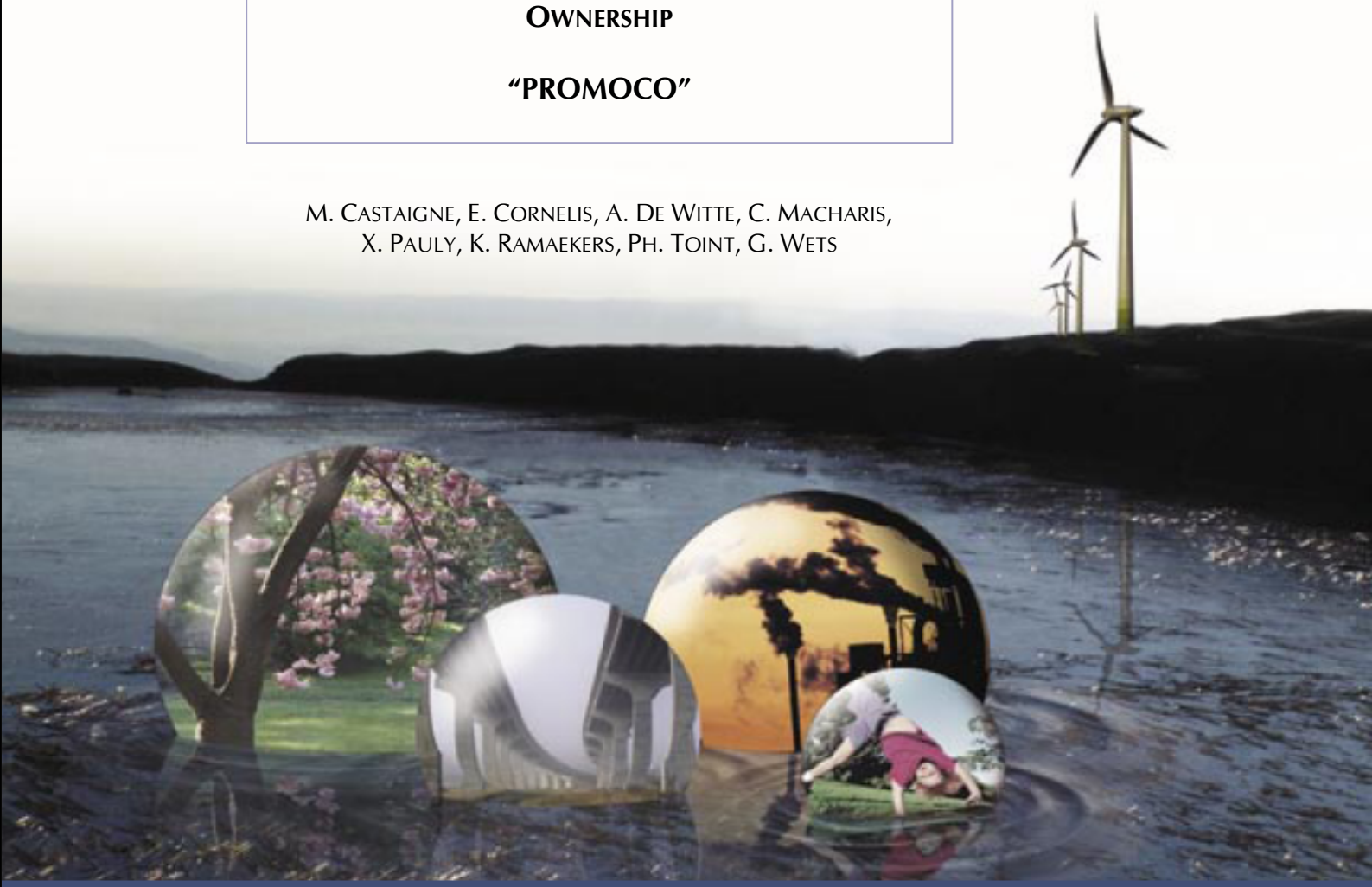
SCIENCE FOR A SUSTAINABLE DEVELOPMENT

PROFESSIONAL MOBILITY AND COMPANY CAR OWNERSHIP

"PROMOCO"

M. CASTAIGNE, E. CORNELIS, A. DE WITTE, C. MACHARIS,
X. PAULY, K. RAMAEKERS, PH. TOINT, G. WETS



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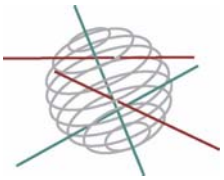

Transport and Mobility

FINAL REPORT

PROFESSIONAL MOBILITY AND COMPANY CAR OWNERSHIP "PROMOCO"

SD/TM/06A

Promotors

Eric Cornelis & Philippe Toint
Facultés Universitaires Notre-Dame de la Paix (FUNDP)
Groupe de Recherche sur les Transports (GRT)

Geert Wets
Universiteit Hasselt (UH)
Transportation Research Institute (IMOB)

Cathy Macharis
Vrije Universiteit Brussel (VUB)
Mathematics, Operational research, Statistics and Informatin systems (MOSI)

Authors

Marie Castaigne, Eric Cornelis & Xavier Pauly – FUNDP (GRT)
Katrien Ramaekers – UH (IMOB)
Astrid De Witte – VUB (MOSI-T)

BELGIAN SCIENCE POLICY

Rue de la Science 8
Wetenschapsstraat 8
B-1000 Brussels
Belgium
Tel: +32 (0)2 238 34 11 – Fax: +32 (0)2 230 59 12
http://www.belspo.be

Contact person: Georges Jamart
+32 (0)2 238 36 90

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ABSTRACT

The PROMOCO project aimed to analyse the impact of company cars on mobility with focus on the analysis of the behaviours that are induced in households in which company cars are available. A second issue which has been investigated is the description of the relations between workplace accessibility and company cars availability. In the framework of this research, by company car we only meant *vehicle whose initial cost is supported by the employer, which is awarded to an employee for his personal, professional and/or private trips, and which can be used by the employee without the authorization of his employer*.

This report begins with a contextualisation of the thematic where it is reminded that more and more companies make companies cars available for the employees. One of the explanations of this phenomenon can be found in the specific legislation existing in Belgium about company cars. The COCA project gave a whole information about this legislation, and we come back on the main issues, on one hand, from the point of view of the employee, and on the other hand, from the point of view of the employer.

To reach our objectives (first determining whether company car availability induces specific mobility patterns, and, if this is the case, how these specific patterns contribute to the impact of the general mobility on a sustainable society and then defining the potential relationship between the use of company cars and the relative localizations of the households and work places), we first had to collect data in the field. So we designed surveys: a first one for the firms, a second one for the employees. The idea was to recruit workers inside companies participating to the firms' survey, allowing making links between employees' behaviours and mobility policies inside firms. The sample was built at the firms' level (with geographic and size stratifications) in order to get 200 employees having a company car for each of the three regions of the country. To avoid getting to many respondents without company cars, we only selected companies among NACEBEL sectors where we are more likely to find company cars. This information was available thanks to the FEBIAC data analysed during the COCA project. Sectors chosen were financial activities, real estate, hiring and services to companies, wholesale and of detail, repair of motor vehicles, motor bicycles and of domestic articles and manufacturing industry. People without company cars were also asked to go through the questionnaire, so we get a control-group allowing comparisons with workers having company cars.
Once the questionnaires were achieved, invitations to participate were sent. All companies were first contacted by traditional mail, then by phone if we did not register any participation (at least once for non-participating firms). The questionnaire for companies could be filed in either on the Web, or by a pencil and paper way or even by phone. The one for workers was only available on the Web.
Facing low response rates, additional surveys were conducted at the employees' level (with only respondents having a company car). A first one thanks to a regional grant of the Flemish Government enabled recruiting (by a research market firm – TNS Dimarso) some 700 more

respondents living in Flanders and a second one asking contacts of researchers and contacts of these contacts, and so on (viral dissemination) to fill in our questionnaire. Both surveys were slightly adapted to get some important information from the firms' questionnaire, unavailable since firms were not questioned.
Finally we got 4 samples of respondents: a first one that we call "original noCC" with people without a company car who have been contacted through their employers (N = 213); a second one that we call "original CC" with respondents having a company car and who were also contacted through their employers (N = 237); a third one that we call "additional-TNS" with respondents having a company car and being recruited by a market research company (TNS – Dimarso) within its existing panel (N = 720) and a fourth one that we call "additional-contacts" with respondents having a company car and being recruited from the researchers' contacts through a viral dissemination process (N = 440).

Once the cleaning of the databases was achieved, descriptive analyses were performed.
Regarding the firms surveyed (N = 181), they are mainly from the private sector (93%), most are located in the Walloon Region (60%), while the amount of Flemish companies is about the same as for the ones from the Brussels Capital-Region (respectively 22 and 18%) and they are mostly small ones (3 on 4 having less than 50 employees – 1 on 5 having more than 100 employees). In order to get a more representative sample (better representation of the actual population), a process of weighting was applied. The coming results are related to this weighted sample. From the descriptive section of the firm's general mobility policy of our questionnaire, we discover that more or less half of the surveyed companies are declaring being located close (26%) or very close (29%) to a public transport stop but a minority of companies indicate that there is a high (10%) or very high (13%) frequency at their nearest public transport stop. Car accessibility is assessed in terms of available parking facilities and 75% of the companies provide such facilities for their employees. Answers to our questions highlight that companies consider accessibility, especially in terms of accessibility by car, as an important issue when deciding on the company location. Accessibility with public transport is very less important. About the sustainable transport modes, it appears that giving them no support is more common among the sampled companies than giving support; the sustainable transport modes receiving the most support are public transport (40%), bicycle use (35%) and car sharing (35%).
When focusing on the description of the company car policy, we observe that only 9% of the companies belonging to the sample declared that they do not have company cars. The most important incentive for companies to give company cars to their employees is to motivate them and to increase their loyalty to the company. Job specific reasons are the second most important determinant whereas attributing company cars for financial reasons is the third most important factor. Regarding accessibility, a lot of companies indicate that this factor does not play any important role in the attribution of company cars (92% of negative answers). About the costs relative to company cars, most of them are not charged to the employee, except for costs related to penalties for traffic offences (75%) and to the franchise in case of an accident (24%).

Concerning the data collected from the workers, we present specific figures for each sample as they were recruited by different ways. Furthermore no weighting process could be applied as we have no information about the whole population of people having a company car. Therefore in order to avoid mixing data collected with several methodologies, it had been decided to keep samples isolated. Nevertheless, findings are often the same among the samples. So it is the case for socio-professional profiles of our respondents: figures show that company car users are more frequently men than women and that the possession of a company car is more common among younger people (especially those younger than 40) but not for the youngest (less than 24). The odds to find a person with a company car also increases with the education level. People in management functions are the ones with the highest rate of company car possession while the lowest rate is found among the workmen. We proportionally find more people working part time in the sample of people without company cars. Respondents with company cars have more likely special timetables, meaning that they are proportionally more to work out of the office hours. It also appears that proportionally more respondents with company cars than those without company cars declare to live very close to their work place (less than 2 km), but it does not concern a large part of the samples. For the longest distances, people with company cars are more represented. The surveys also inform us that company cars (most often diesel cars) have higher annual mileages than private cars. Less common findings concern the data about the contributions of the different kind of displacements to the annual mileage: people participating to the original survey mainly use their company cars to reach their workplace and go back home; they also make more professional trips than private ones. The respondents recruited by the research market company behave in a different way: the principal contribution to their annual mileages is (on average) generated by the professional displacements, before home-wok trips. Private trips have also the smallest influence on the annual mileage. Researchers' contacts have yet a different order of importance for the repartition of the displacements. Similar to the respondents of the original survey, their kilometres are mainly related to home-work trips and are of the same magnitude, but contrary to the original survey respondents, they make more private trips than professional displacements. Concerning the private displacements in Belgium, they are very often allowed and even refunded by the company. For the importance of professional displacements we have much more numerous respondents within the samples of people having a company car at their disposal to travel for their work "every day" and "very often" than in the sample of people having no company car. Concerning the usual mode to go to work, a great majority of the respondents with company car actually use their company car to go to work whereas people without company car go to work with their private car for only around half of them (59.2%). Nevertheless, for these people, the train is used by more than 1 respondent out of 4, while this mode is rarely used by people having a company car (less than 5%). Going to the displacements recorded in the questionnaires (all the displacements achieved the day before the filling of the questionnaire, i.e. the *reference day*), the average number of trips is higher for people with a company car than for those without. Besides, these trips are longer for people having a company car than respondents without company cars. About the mode used for the recorded trips, respondents without a company car use public transport in 14% of all trips whereas respondents with a company car in the original survey only take public

transport in 1.3% of their trips. Respondents without a company car use the car in 80% of their trips, what represents much less than persons with a company car (94% of all trips in the original survey are made by car). Regarding the purpose of these declared trips, persons without a company car make only 2.68% of their trips for professional reasons while, for persons with a company car, only one trip out of ten is a professional trip. Few respondents (about 8.5%) declare that somebody else used their company car during the reference day. When it is the case, the distances travelled by these people are around 30 km.

Some modelling works are then reported in this final report. First, an accessibility related model is presented. This one tries to predict if a company gives company cars to its workers and relies on the accessibility indicators collected thanks to the firms' survey. The model (logistic regression) built is significant and only identified one of the included variables as a significant predictor of company car attribution, namely parking support: companies with parking facilities are more likely to attribute company cars. As far as the public transport accessibility is concerned, this does not seem to play a role in the company car policy.

Then, company car ownership is analysed. The socio-demographic profiles of employees are analyzed in order to find out which of the factors constituting these profiles determine the likeliness of people being attributed a company car. Next, attention is paid to the difference in annual mileage between company cars and private cars. The results presented are based on the data collected with the original sample, where we contacted employees through their employers.
In order to identify the impact of the socio-demographic profile on the company car availability of employees, a binary logistic regression is used. Findings are that people who are most likely to have a company car are higher educated males, who are younger than fifty years old, and who are occupying a management or board function in a company located in the Flemish Region.
Analyses also show that company car users drive significantly more kilometres than employees without a company car. Thanks to a multilinear regression model, it appears that home-work distance and company car ownership are the largest contributors, followed by professional trip frequency and gender.

Cluster analysis is then performed on the data collected thanks to the Flemish subsidy in order to determine different kind of company cars' users. 3 clusters are identified: the 'commuters', the 'representatives' and the 'enjoyers'. The 'commuters' are employees with a company car whose professional trip frequency is moderate, who tend to live further from their workplace compared to other employees and who almost exclusively use their company car to make the home-work commuting trip. The 'representatives' frequently have to make professional trips and spend a lot of their time being on the road in their company car. The 'enjoyers' are employees with a company car who make significantly less professional trips than the 'representatives' and who live significantly closer to their work than the 'commuters'. Repercussions are obvious on the annual mileage: the annual mileage is highest for the 'representatives', who have an average

annual mileage of more or less 37.600km. This is about 5.600km above the average annual mileage of the 'commuters', which stands at about 32.000km. Both these average annual mileages are significantly above that of the 'enjoyers', which equals approximately 22.400km,. However all these mileages are above the average mileage of a private car.

Asking which mode they would use to go to work if they would not have a company car to the respondents having such advantage allows us to analyse substitution effects. In such situation, the proportion of people who would go to work by train relies between 10 to 17% which is only half of this modal part for people without company car (more than 26%). Nevertheless only 72% of the people will still make their home-work trip by (private) car if they no more have a company car. Since several characteristics of respondents may have some influence on the choice of the mode for their home-work displacements, we then achieve analyses with distinctions for gender, age and diploma.
A useful information for deciders is the reasons why people would not use public transport even if they had no company car: the most important reasons cited by the respondents for not using public transport in case they would not have a company car are the insufficient network and the slowness of public transport.
Closing this section and in order to further investigate the substitution effect, persons with the same socio-demographic characteristics with and without a company car are compared. Only the original survey is used since we only have a control group without company car in the original survey. The average number of trips per day, the mode of transportation used and the purpose of the trips are so analysed.

Eventually, the report is concluded with some methodological recommendations (e.g. to get a statistically representative sample) and a support to decision section (specific legislation, interest of determining kinds of users…)

INTRODUCTION

Context

More company cars are registered every year in Belgium. Moreover, existing analyses (see, e.g. COCA final report[1]) indicate that the annual mileage covered by company cars is very significantly above the one of private cars. This phenomenon and its effects on mobility in general can thus be considered as important elements of any realistic mobility analysis or policy in the country.
Can the impacts of this trend be estimated, both on sustainability issues and on the more general evolution of mobility behaviours? This is the key question in the PROMOCO project.
The company cars problematic is at the intersection of private and professional mobilities. If private mobility has already been the subject of a descriptive analysis in Belgium (see the MOBEL survey), the professional mobility remains, to our knowledge, relatively ignored[2]. But as it also causes negative externalities, a better knowledge of this kind of mobility is a potentially crucial objective. If the ambition of the project is not to cover this goal in its entirety, the network partners nevertheless feel that understanding the effects of the "company cars trend" is a useful first step.

Definition of the Company Car

The definition of a "company car" can be variable, and it was important, for this project, to rely on a common and unique definition. We decided to use the one of the COCA report, understanding a company car as "a vehicle whose initial cost is supported by the employer, which is awarded to an employee for his personal, professional and/or private trips, and which can be used by the employee without the authorization of his employer". With this definition vehicles registered in the name of the company which are exclusively being used for professional purposes, such as transport and service vehicles, are being excluded.

Any company car analysis can not be achieved without taking into account the specific legislation existing in Belgium on this thematic. This legislation had been described into details in the COCA project, but we propose to recapitulate the main issues regarding the company car rules.

Legislation

In Belgium, the classical car tax legislation falls under the authority of the Regions and principally consists of the registration tax and a circulation tax. Although it concerns a regional authority, there are agreements to tune the fiscal system of the car among the three Regions. Company cars are not only subjected to the classical tax legislation, but also to company car specific taxation rules. The fiscal treatment of company cars is twofold. On one hand there are fiscal rules applying to the user of the company car (the employee-side) and on the other hand, there are regulations imposed to the employer providing the company car (the employer-side). We will briefly describe them here below.

The Employee-side

When the employee has a company car at his/her disposal that is also being used for private displacements; this private use represents a taxable fringe benefit. The taxation system relies on

[1] "Company cars analysis", 2005-2007, project funded by the Belgian Science Policy and led by GRT and IMOB.
[2] They are existing surveys about general topic of professional mobility, but professional trips remains unstudied at this day in Belgium.

fixing a lump sum for the estimation of the total amount of private kilometres, based on the distance between a person's residential location and the fixed location of his/her employment.
If the employee pays no contribution to his employer for the private use of his company car, this private use is considered as a fringe benefit and is therefore subjected to personal taxes. If the employee pays a contribution that covers at least the amount of the value of the private use of the company car, the fringe benefit does no longer exist and the employee is no longer being charged for it. In case the contribution of the employee does not compensate the entire value of the fringe benefit, a combination of both rules applies: the fringe benefit is only subjected to personal taxes for the part that has not been compensated by the contribution paid by the employee.

The Employer-side

Granting company cars also has important fiscal implications for the employer. An advantageous feature of assigning company cars is the fact that the costs related to a company car (purchase, rent, repair and maintenance) are fiscally deductible. This deductibility used to be 75% for all company cars, but as from 1 April 2007 the deductibility is linked to the Carbon Dioxide (CO_2) emissions. This reformation of fiscal deductibility of costs related to company cars was first only applicable to new cars, but as from April 2008 it has been extended to all other company cars. This proportional deductibility of company car costs does not apply to fuel expenses. These costs are still 100% deductible.
Next to this fiscal advantage of deductibility of company car related costs, the employer is also confronted with taxes related to the allotment of company cars. There is Value Added Tax (VAT) that has to be paid on the private use of the company car. The calculation of the VAT depends on whether the employee pays a contribution to compensate for this private use.
In addition to the payment of Value Added Taxes, the employer is also being confronted with the payment of a solidarity contribution related to company cars. Formerly this solidarity tax amounted to 33% of the taxable fringe benefit, but as from 1 January 2005 it has been replaced by a contribution based on the CO_2 emission of the car. Under the old regime, the employer could avoid paying the 33% solidarity tax by having the employees pay for the private use of their company cars, reducing the fringe benefit to zero. This new contribution is applicable to all cars an employer puts at the disposal of his employees and is calculated by considering the fuel type of the car and its CO_2 emission. Each year an indexation takes place based on the health index number, with the year 2004 as reference year.
The only company cars being excluded from being subjected to the payment of this solidarity contribution are company cars being used exclusively for professional trips. Moreover, in contrast to the taxable fringe benefit where the burden of proof is carried by the Treasury, in this case the Treasury assumes that all company cars assigned to employees are used for private displacements unless the employer can prove otherwise.

Objectives and expected outcomes

Amongst different items, the PROMOCO project considers two major issues:

- The first is whether company car availability induces specific mobility patterns, and, if this is the case, how these specific patterns contribute to the impact of the general mobility on a sustainable society.
- The second question is the potential relationship between the use of company cars and the relative localizations of the households and work places.

The research project's ambition is to clarify these key issues, and therefore to provide the necessary background information needed for deriving realistic mobility oriented, land-use or fiscal policies for a more sustainable society.

In particular, the project focuses on:

- the analysis of the mobility behaviours that are induced in households in which company cars are available;
- the description of the relations between workplace accessibility and company cars availability.

These questions cannot directly be answered, mainly because some important information is missing and because crucial parameters are unknown (e.g. the fraction of the company cars mileage effectively related to professional use or the actual conditions of their usage by the households). Consequently, these issues had to be further explored during this PROMOCO project.

The first objective of the project also covers the analysis of substitution effects between transport modes and the modifications of the household activity patterns in relation to a more sustainable use of the transportation system. More generally, it is the objective of the research to produce an argued appraisal of the global impact of company cars on sustainable mobility.

The results provided by this project and presented in this report can be divided in three main categories:

1. descriptive analysis based on the data collected;
2. analysis of the relations between work accessibility and company cars.
3. results from the models including the analysis of the substitution effects from the car ownership model and the analysis of new trip generation, modal shifts and impacts of the conditions of company car use from the induced activities model;

Structure of the report

In the next section, we will first describe the main methodological aspects for the data collection. Given that our project could not use existing data sets (relevant ones were not available), we needed to organize a survey in order to collect the necessary data for the research project. Therefore we went through all the phases related to organizing a survey: from the building of the sampling frame to the cleaning of the databases, through the design of the questionnaires, the implementation as a Web survey and the contacts with the firms.
Next, we will present the descriptive analyses performed on the collected data. We will start with a description of the profiles of the surveyed firms, their motivation to provide company cars to their employees, the usual use and choice of company cars and their more general mobility policy. After that, the workers participating to our survey will be described as well as their usual mobility behaviours. As we asked people to register their displacements on a reference day, an analysis of these data will also be performed.
Subsequently, attention will be paid to the modelling work performed within this research project: as we obtained data on the accessibility of the firms (parking facilities, distance to the nearest public transport stop and transit frequency at this stop), we were able to model the influence of these covariates on the recourse to company cars. A second model that was also designed based upon the data gathered by means of the survey describes the socio-demographic determinants of company car ownership and the common use of such cars.
Next, we will focus on the substitution effect; as we asked people to indicate the transport mode they would use (for their home-work displacements) if they had no company cars, we are able to analyse the choices made in such a case more in-depth. Kinds of company car users will be then presented. These are defined thanks to a cluster analysis and their influence on the annual mileage will be highlighted.
Finally, conclusions will follow with some methodological recommendations and a support to the decision section. The main references will be listed at the end of this report.

METHODOLOGICAL ASPECTS OF THE DATA COLLECTION

This methodological section will be divided in six sub-sections corresponding to the chronological steps of the implementation of the methodology used to acquire data on the studied phenomenon. First, we will comment the sampling frame, then we will go through the design of the questionnaires, give several explanations on the survey protocol and on the cleaning of the databases. Finally, we will make comments on the participation to our surveys and we will perform a critical analysis of the survey exercise.

Sampling

As no accurate data on the use of company car existed before this project, the first step to take was to collect these data in the field. To do so, we had to organize a survey on a sample of company car owners. One of the main issues we had to deal with, is the fact that there is no sampling frame for this population available. The only exhaustive data sources we could think about is the list of company car owners from the Ministry of Finance[3], but it was not possible to have any access to this database. Therefore we had to find a way to contact potential company car owners. Given that all of the company car owners can be assumed to be workers, it seemed feasible to reach them through their employers. In addition, such a protocol would also allow us to link company's mobility policies as well as company's location with data related to their employees having a company car at their disposal. Another element in favour of such a methodology was that firms databases were currently available.

The survey protocol was thus decided to be as follows: In a first step, firms would be contacted and in a second step, workers (with or without company cars[4]) would be recruited within and via the contacted companies.

With this approach, the only part of the sampling we had (and also were able) to control is the one concerning the firms. Indeed, conducting a survey among the employers and, through them, also one among the employees means that we had to sample the firms. Going further and sampling the workers in each firm seemed unrealistic because it would imply that each firm communicates its list of employees, which would probably have reduced the willingness to participate to our survey.

Nevertheless, drawing a random sample of firms is a necessary stage for getting data as reliable as possible. Moreover, to allow a disaggregated analysis, it was decided to stratify the firms sample according to three main dimensions: region, firm size and activity sector.

Regarding the number of employees in the firm, we classified the companies into three classes:

- firms with 5 to 49 employees,
- firms with 50 to 99 employees and
- firms with 100 employees and more.

The question was raised about "how to consider self-employed workers?" If we do not take into account the (company) cars these people own, we would treat "1 person-companies" and self-employed workers in a different way, whilst both are actually performing the same type of activities. That is why we decided to include only companies with more than 4 employees in our sample in order to avoid this problematic issue. This will not answer the question, but will permit to work with homogeneous cases.

[3] Such a list exists for taxation purposes.
[4] Respondents without company cars will be "used" as control panel.

Another considered dimension is the activity sector of the firms. Thanks to the COCA project and the data from FEBIAC, we know the sectors where we are more likely to find company cars (namely cars registered by a firm, which is slightly different from the definition used for the PROMOCO project) according to NACEBEL classification (Figure 1)

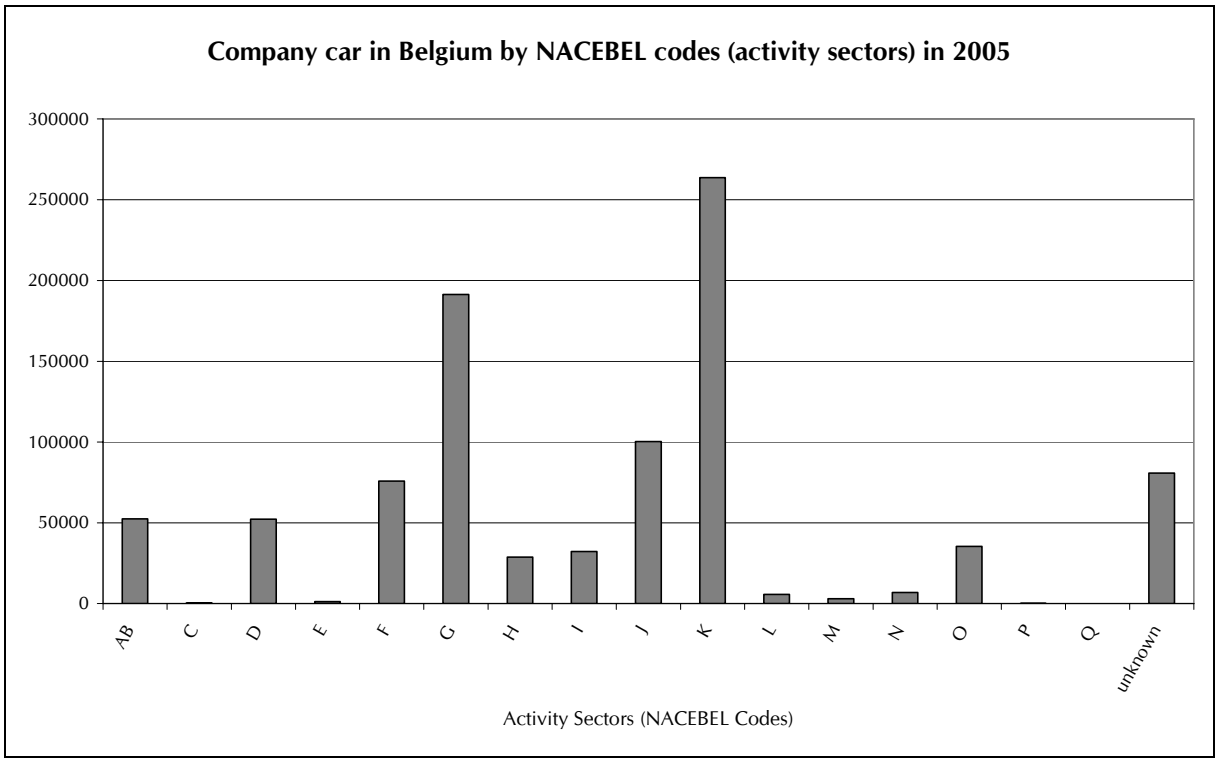

Figure 1: Company car in Belgium by NACEBEL codes (activity sectors) in 2005
Source: COCA, COmpany Cars Analysis, Rapport final, Avril 2007

From this graph, we derived that we should focus on the K (real estate, hiring and services to companies), G (wholesale and of detail; repair of motor vehicles, motor bicycles and of domestic articles), J (financial activities), F (construction), D (manufacturing industry) and AB (agriculture, hunting, forestry, fishing and fish farming) sectors. By doing so, we increase the probability that surveyed employees (from these categories of firms) will have a company car at their disposal and consequently that their answers will be (more) relevant for the goals of our project. However, it is necessary to point out that, if such a choice increases the relevance of the sample, it also decreases its randomness. Therefore, cautions should be made regarding the representativeness of the sample.

Finally, for practical reasons, we only focused on the four following sectors:

- J (financial activities),
- K(real estate, hiring and services to companies),
- G (wholesale and of detail; repair of motor vehicles, motor bicycles and of domestic articles) and
- D (manufacturing industry).

We dropped the other potential sectors (AB and F) because the amounts of company cars (see Figure 1) were drawn from FEBIAC data about firm registered cars (and not actually company cars at the disposal of an employee). It can be expected that numerous vehicles registered by firms from sectors F and AB are, for a significant part, not company cars as defined in our project, but rather utility vehicles, vans or pick-ups.

The graph below (Figure 2) provides the average amount of employees to intercept for finding one possessing a company car. Clearly, the sectors we decided to focus on have high rates of company cars per employment. For example and on average, we would only have to survey one employee in the financial activities sector (J) to "find a company car". Whereas if, on another hand, we had decided to sample inside the M sector, we would have had more "chances" to survey many employees without a company car and therefore we would have needed a bigger survey for fitting the project goals which was 200 employees with company car from each region.

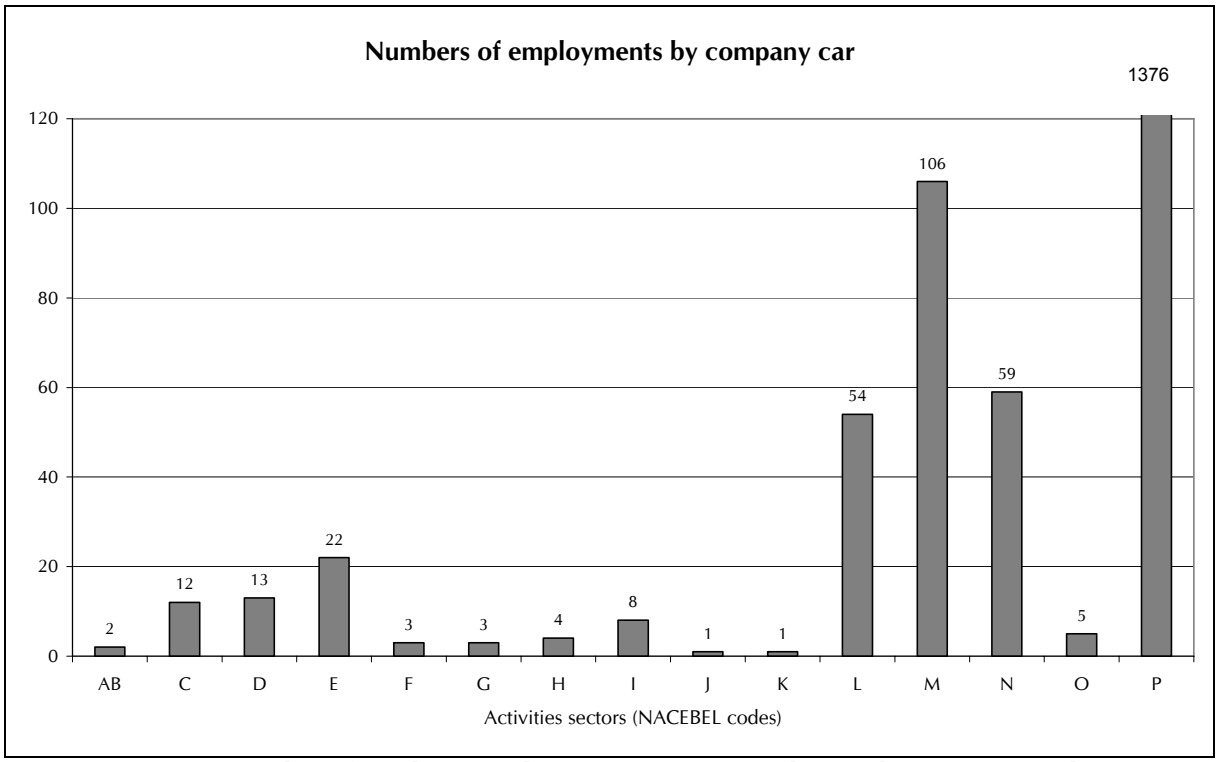

Figure 2: Number of employments by company car according to the NACEBEL codes
Source: COCA, COmpany Cars Analysis, Rapport final, Avril 2007

Following demands from follow-up committee members, we also included some public (or public like) companies in our sample allowing us to sketch the use of company cars within theses sectors. That is why in the tables presented later on, the L sector will also be considered (nevertheless, some problems appeared with this sector – public administrations – because some public enterprises are classified within other activity sectors in the considered databases).

The firms sample has been drawn from the BEL-FIRST (Financial Reports and Statistics on Belgian and Luxembourg Companies) dataset which takes into account the assessments and income statements on the last 10 exercises of more than 290.000 Belgian and Luxembourg companies. We first thought about drawing our sample from other datasets like the Top 100 000 (Trends) but we discovered that these sets were not exhaustive enough and we could not find a way of avoiding this bias.

In order to obtain a sample reproducing as much as possible the reality of the Belgian economy, we took into consideration the distribution of employment for the selected sectors, according to the firms' sizes. Therefore we calculated:

- the proportions of the employees according to the sector, the region and the size of the firm (starting from the BEL-FIRST data) and

– the average employment rate per company according to the sector, the region and the size (also starting from BEL-FIRST data).

These two figures allow determining how many firms needed to be drawn in our sample for each sector, region and company size class (in order to fit the project objectives of 200 respondents per region).

To perform these computations, we considered the two following assumptions:

- We assumed the response rate from the companies to be approximately 20%;
- We assumed the response rate from the employees to approach 5% for small companies (5 to 49 employees) and 10% for companies belonging to the two other classes.

Following these assumptions, we got 550 firms for the Flemish Region, 650 for the Walloon Region and 320 for the Brussels Capital-Region in our sample. In the table below (Table 1), we can observe the different distributions of employment in the three regions: we have less small enterprises (5 to 49 employees) in the Brussels Capital-Region. In this Region employment is apparently mainly concentrated in bigger companies.

# enterprises	**Brussels Capital-Region**					
in the sectors	**D**	**G**	**J**	**K**	**L**	*Tot*
5 to 49 employees	35	100	25	105	5	*270*
50 to 99 employees	5	5	5	5	5	*25*
100 employees & more	5	5	5	5	5	*25*
Total	***320***					

# enterprises	**Flemish Region**					
in the sectors	**D**	**G**	**J**	**K**	**L**	*Tot*
5 to 49 employees	140	225	15	105	5	*490*
50 to 99 employees	10	5	5	5	5	*30*
100 employees & more	10	5	5	5	5	*30*
Total	***550***					

# entreprises	**Walloon Region**					
in the sectors	**D**	**G**	**J**	**K**	**L**	*Tot*
5 to 49 employees	180	285	20	100	5	*590*
50 to 99 employees	10	5	5	5	5	*30*
100 employees & more	10	5	5	5	5	*30*
Total	***650***					

Table 1: Sample of firms for the survey

For contacting the employers and conducting the interviews, MOSI-T has focused on the Brussels Capital-Region, IMOB on the Flemish Region and GRT on the Walloon Region.

To have an overview of the geographical distribution of the selected companies, we insert here below a map (Figure 3) of the locations of these companies. One can observe that the sampled firms are well spread among the whole country: some of them are in urban municipalities, others in rural areas. This random distribution will be useful to determine the influence of the accessibility on the recourse to company cars.

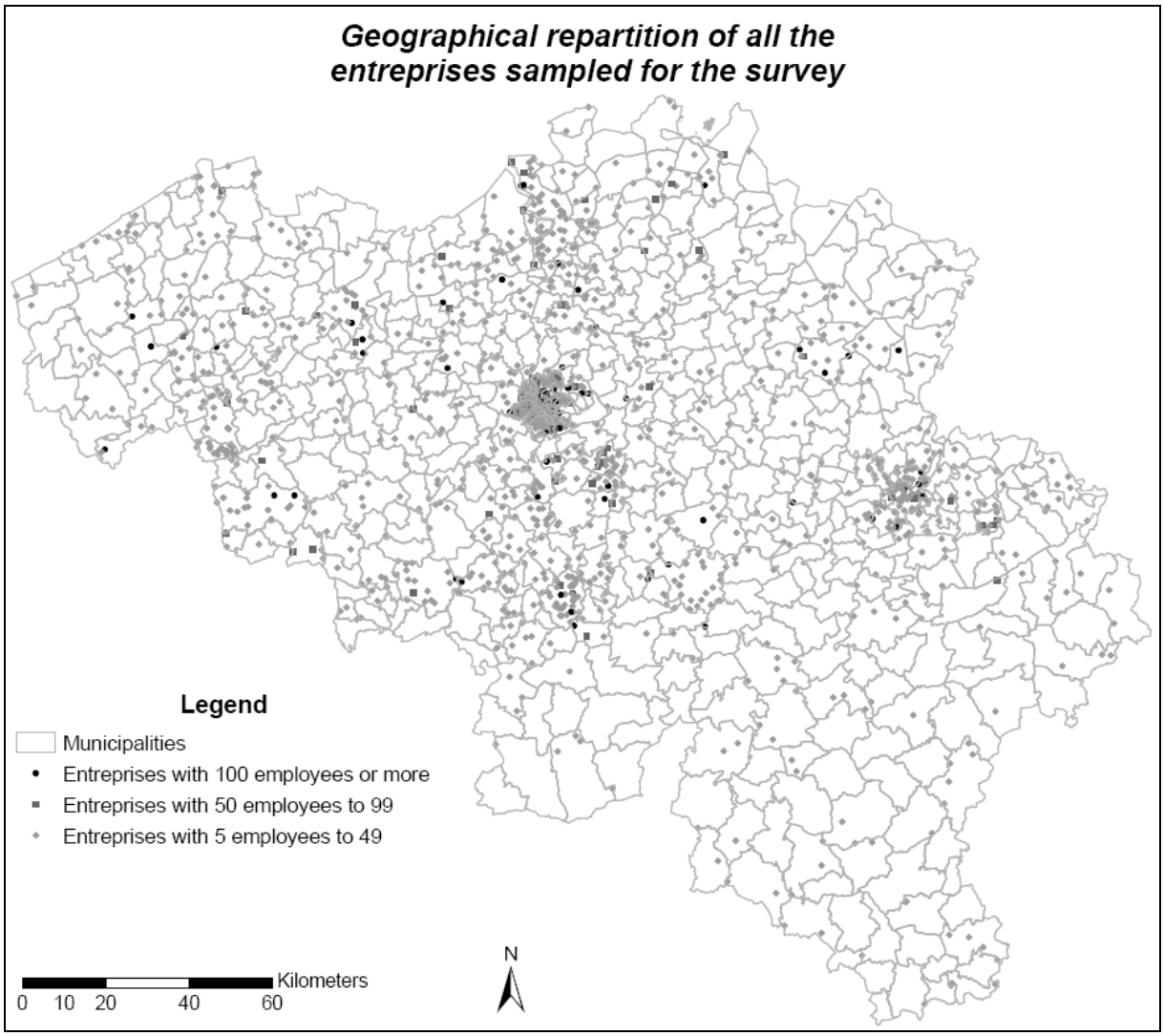

Figure 3: Distribution of all the firms sampled for the survey

Let us remark that because of the low response rate in the Walloon Region (see below "Comments"), which could be expected considering the spread of company cars throughout Belgium (see Figure 4 below, from the COCA report), we drew an additional sample of 20 big enterprises in this region, for the K et J sectors (the ones where we could meet the highest rates of respondents with company car). The original sample was also increased by the answers of some firms directly contacted by the UWE (Union Wallonne des Entreprises), thanks to the precious collaboration of its mobility cell.

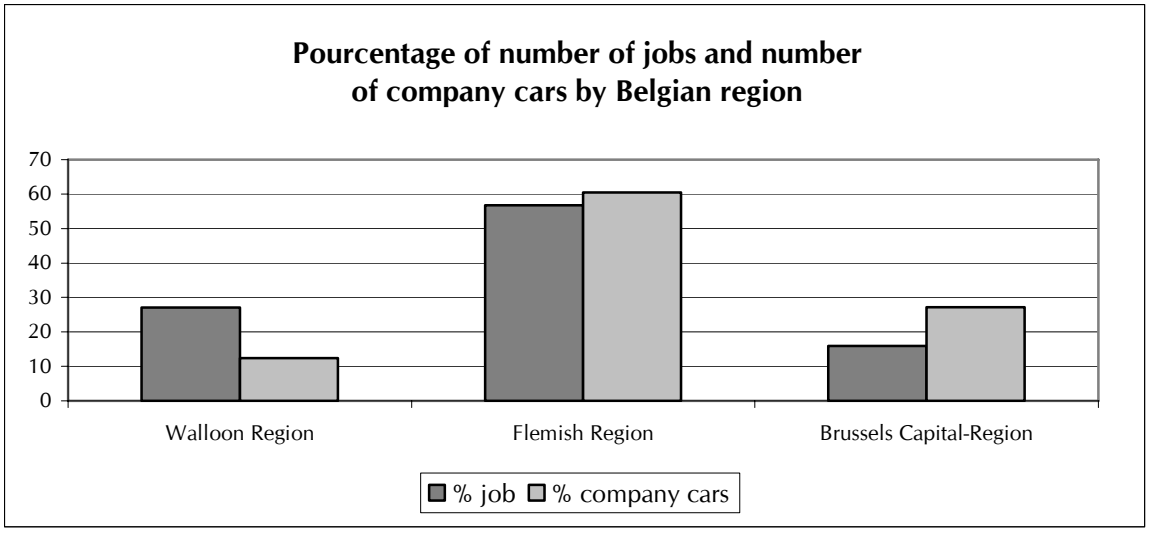

Figure 4: Percentages of company cars and employment according to the Region
Source: COCA, COmpany Cars Analysis, Rapport final, Avril 2007

Questionnaires

With regard to the data collection, it was decided to prepare two questionnaires:

- one for firms, to gain information about their mobility policy (in order to measure the impact of mobility policies on practices) and
- another one for the employees of these firms.

The goal was to keep a link between both questionnaires, allowing crossings between variables from both.

The part dedicated to firms was oriented to questions about their current management of mobility (including accessibility of the company, location choice, car-pooling, refunding of the public transport use, promotion of alternative modes for displacements…), and then more in particular to questions about the company car policy of the firm (attribution criteria, fuel, models choice, conditions of use of the cars…). And if the firm does not provide any company car, we asked an additional question to find out why it is so.

The survey for the employees includes several sections: personal (socio-demographic) characteristics, type of company car (if relevant), usual displacements, and displacements on a reference-day with all displacement characteristics recorded (mode, departure time, arrival time, distance covered, travel purpose….). This questionnaire is intended to learn more about the mileage share between trips for professional reasons and those for private purposes and also to confirm facts which have been highlighted in the COCA project, such as the categories of vehicles which are met in the field, the fuels used, etc. But it also provides new information like the refunding scheme for the fuel expenses, the transport mode employees would use if they would not have a company car (substitution effects), and the actual user of the provided company car. Even if respondents do not have a company car, it is also useful to collect their data so that it will be possible to make comparisons between their mobility behaviours and the ones of those getting a company car from their employer.

The two questionnaires (first one for employers, second one for employees) have been sent to the follow-up committee members to get their remarks and comments which have been taken into account in order to improve the questionnaires. Obviously, it has not been possible to agree with all suggested adjustments since it would have led to too heavy questionnaires and, *ipso facto*, to lower response rates. We also had to keep in mind a need for clearly focusing on the objectives of the project (the displacements section); despite the fact that some of the issues we

were asked to include were quite interesting, we had to focus on the impacts of company cars on the mobility and the link that could exist between accessibility of the working places and the provision of company cars to employees. After making these final adjustments, we had two finalised survey questionnaires, both available in French and Dutch.

In annex, a copy of these questionnaires can be found (Annex 2: copy of the questionnaire for the employers (which was available on paper and on the Web – Dutch version), Annex 3: copy of the questionnaires for the employees (which was only available on the Web – French Version).

Additional surveys

We also added an "isolated" questionnaire (related to the additional surveys, see below) aimed at employees for which it was not possible to establish a link with the firm employing them since they were contacted directly and not through their employers. This has allowed a market research company to contact an additional sample of persons, with an extra budget provided by the Flemish Government. (*Indeed, the Flemish administration decided to provide a grant allowing to obtain 600 additional respondents living in the Flemish part of the country)*. In this additional survey, some questions about the firm of the respondents were added to remedy for the fact that there is no link with data provided by the firm itself.

Given that it was available, this survey has also been administrated to other contacts (e.g. alumni of FUNDP), to increase the amount of responses. All the people directly contacted by the research teams were asked to forward the invitation to participate to the survey to their "social network". Hence this additional survey can be described as a "viral disseminated" survey.

All these additional responses (both from the sample funded by the Flemish Government and from the viral dissemination action) have been kept apart from the original sample to avoid mixing different samples[5]. It is also worthwhile to mention that these additional surveys were only conducted on workers having a company car at their disposal (a filter at the beginning of the questionnaire rejected people who did not match these characteristics).

Given the different approaches used to recruit the respondents, we actually have 4 samples of employees that we used to derive results from:

- a first one that we can call "original noCC" with people without a company car who have been contacted through their employers;
- a second one that we can call "original CC" with respondents having a company car and who were also contacted through their employers;
- a third one that we can call "additional-TNS" with respondents having a company car and being recruited by a market research company within its existing panel (TNS – Dimarso) and
- a fourth one that we can call "additional-contacts" with respondents having a company car and being recruited from the researchers' contacts through a viral dissemination process.

[5] We tried to neutralize some socio-demographic factors in those samples in order to "mix" them, but the lack of observations in some categories avoids that kind of analysis. So, for methodological reasons, we prefer to keep the samples separated (see document in annex : "Neutralisation of socio-demographic factors").

Survey protocol

The data collection is a crucial step within this project since all analyses carried out afterwards rely on the answers gathered from the workers and employers. Therefore, the first twelve months of this project were dedicated to the building of the methodology we planned to use for collecting these data, the quality of this methodology conditioning all the analyses going to be performed.

The mobility policies of companies have impacts on the use of company cars by the employees. Therefore, it was decided from the beginning of the project to meet the administration of surveyed firms (either a representative for the fleet of vehicles, often in the human resources team, or somebody responsible for mobility – these persons sometimes being more involved in the company cars problematic than the manager himself) to acquire the information on their mobility policy. To do so, we proposed to every surveyed firm a face-to-face appointment, in order to ask the questions we prepared, and especially to convince them to participate to the survey, but also encouraging their employees to fill out the employee questionnaires. As we had no other way to contact employees, the contact with the firms was a key point of our protocol. Although face-to-face is the best way to convince firms, it was not often possible. Therefore we also planned phone contacts, and the possibility for the companies to fill out the firm questionnaire on the web, at a convenient moment for the involved person in the firm. All these opportunities were described in a first contact letter sent to each firm in our sample.
Indeed, we tried finding a way of contacting every firm from our sample, with as less bias as possible. As phone numbers or e-mail addresses were not available for every firm, the only way to actually contact each of them was, in a first step, by post. Therefore, we started by sending (by postal mail) an invitation to every firm to answer to the questionnaire available on Internet. In this letter, explanations were provided on the objectives of the project as well as on the ways proposed to participate to the survey (face-to-face, by phone, or by web). It was also clearly indicated that, if they agreed to participate, they were not only asked to fill in the questionnaire about the firms but also to send an e-mail to their employees to motivate them to participate to the questionnaire aimed at employees. An example of mail intended to be sent to all employees of the firm was included in this letter, as well as a template for a small poster, intended to be stuck up in the company, e.g. in a cafeteria, to reach a maximum of people.

After the postal sendings, the research teams began to contact the firms located in their region. There were some regional particularities in the application of the methodology to contact the firms, but the main process remains the same for Belgium as a whole. It is important to notice that all existent firms from the sample were contacted at least once, a great majority twice, and some of them even more, especially when it concerned firms with more than 100 employees.

Two weeks after the first post mailing, GRT started calling every firm of the Walloon sample, taking in account the letters returned to sender (move, failure) and answers possibly already received. On the phone with a representative (manager, person in charge of mobility) or by default, with an employee, we made sure of the reception of the letter. In case of non-reception, we explained the subject of the survey, asked if the firm would possibly like to participate in it, and in case of a positive answer, we sent the letter again. If they agreed to participate, we proposed them to fill in the questionnaire via the web site, directly by phone, or to meet them. Some of the firms were visited by researchers to try to convince them to participate to the survey.
For the Walloon Region, the necessary time to re-contact all the firms was longer than envisaged, recalls having been performed by the members of the GRT working on the survey, and not by an external firm or a specialized cell.

MOSI-T decided to work with an external call centre to contact the firms. They called the firms included in the sample of the Brussels Capital-Region, asked to speak to the person responsible for the mobility policy (in many cases some someone from human resources department), explained the objectives of the project and asked whether the contacted firm would be willing to participate. If so, they registered the name and the email address of this contact person and mailed these contact data to MOSI-T together with a daily report and progress of the phone calls. Next, MOSI-T sent an email with the link to the surveys and instructions to fill them out to the company.

Since IMOB has its own call centre, contacting the Flemish firms was achieved by this call centre. They did the same job that the market firm in the Brussels Capital-Region: they called the firms of the sample, requesting to speak to the person responsible for the mobility policy. After explaining the objectives of the research, the firm was asked whether they wanted to participate in the study. If they agreed, the email address was registered and an email was sent to them with the link to the questionnaires and the instructions to fill them out.

For the Walloon Region, we also received help from the mobility cell of the « Union Wallonne des Entreprises » (UWE) who contacted additional firms not belonging to the original sample from BEL-FIRST, allowing us to collect some additional answers from employers and from employees. Finally and as explained in the sampling section above, faced with a lack of answers in the category of biggest firms (more than 100 employees), we also decided to draw an additional sample of 20 big firms from J and K sectors.

To get data from employees, it was decided to conduct a web-based survey. In order to be able to perform a disaggregated analysis, we aimed at reaching in each region two hundred respondents having a company car. Therefore we chose this web-based protocol to survey as many employees as possible within the time and budget devoted to our project. On one hand, it would not have been possible to meet all the employees face to face and, on the other hand, it is easier to use data directly from an on line survey than data from "pencil and paper" filled forms which need to be encoded after their collection. Another advantage of the web-based survey is that the respondent could be guided through the questions in function of his/her previous answers. Some automatic checking and consistency tests are also possible and were implemented so that some errors have been immediately detected and reported to the respondent, giving him/her the opportunity to correct it on the fly. We can also mention the fact that a web-based survey is relatively cheap as the main item is the development of the website which was, in our case, home made. If we had to ask a consultant company to execute the data collection, it would not have been possible to get such an important sample within the budget devoted to our project. We also were of opinion that this protocol could improve the response rate of the "employees" questionnaire, as it was aimed at people who are supposed to have a high Internet access rate (regarding to the sectors in which we selected the sample).

The development of the websites (for employees but also for employers) was achieved using PHP and MySQL languages allowing to build dynamic WebPages according to the context (essentially the answers to previous questions) and therefore avoiding, as much as possible, to burden the respondents and also allowing direct recording of data in appropriate databases. Moreover, an underlying process allows recording answers on the fly at given key points in the questionnaire. So, even if the respondent leaves the site without answering all the questions, his/her questionnaire is not completely lost and some filled parts can be validated.

Cleaning of the databases

Before any use of the collected data, we first had to check their quality and clean the database if necessary.

With regard to the firm database, the first step of the cleaning procedure consisted of eliminating multiple occurrence firm records. Based on the name and the location of the companies we were able to detect the records referring to the same company. In order to determine which records would be eliminated, it was decided to follow a two steps procedure. In a first step the most complete records were extracted and in a second step the record with the earliest time of entry was selected.

For each of the multiple choice questions, there was a possibility to indicate an "other" option where the respondent was asked to clarify this "other" option. It was verified whether this clarification corresponded with one of the suggested multiple choice options. In case it did, the answer was changed to one of the proposed options. In case it did not, an additional answer option was created. For the open questions, for instance reasons for changing or staying at the same location, influence of location on company car policy, etc. the answers to the open questions were turned into multiple choice answers.

Concerning the employee database, the first step consisted in deleting respondents having several occurrences. Indeed, some of them filled out the survey twice or three times. We detected them by observing identical IP addresses, coupled with the same workplace and residence municipalities, the same car and the same socio-economic profile. If one of the observations was of better quality (full participation to the survey, coherent responses...) we selected this one and deleted redundant one(s). Sometimes, the multiple observations for the same respondent were of similar quality and we had to make a random choice to only keep one observation.

Another field we checked was the distances recorded for the displacements. Many were unfilled or incoherent and we had to complete or correct these observations. We achieved this task thanks to the ViaMichelin.com Website computing itineraries (with the options by default). As we also had fields about the duration of the displacement and the mode used, some problematic observations were spotted by an inappropriate speed. E.g., it is not possible to imagine a displacement made on foot with an average speed of 20 kph, or a trip by train at 2 kph.

Comments on survey participation

The data collection was closed on June 20 2008. At that time, there were almost no new participations recorded, so we decided to stop the survey and focus on the descriptive analyses based on data collected up to this moment.

The figure below (Figure 5) illustrates the geographical repartition of the 181 participating firms which are mainly (72%) small companies with less than 50 workers.

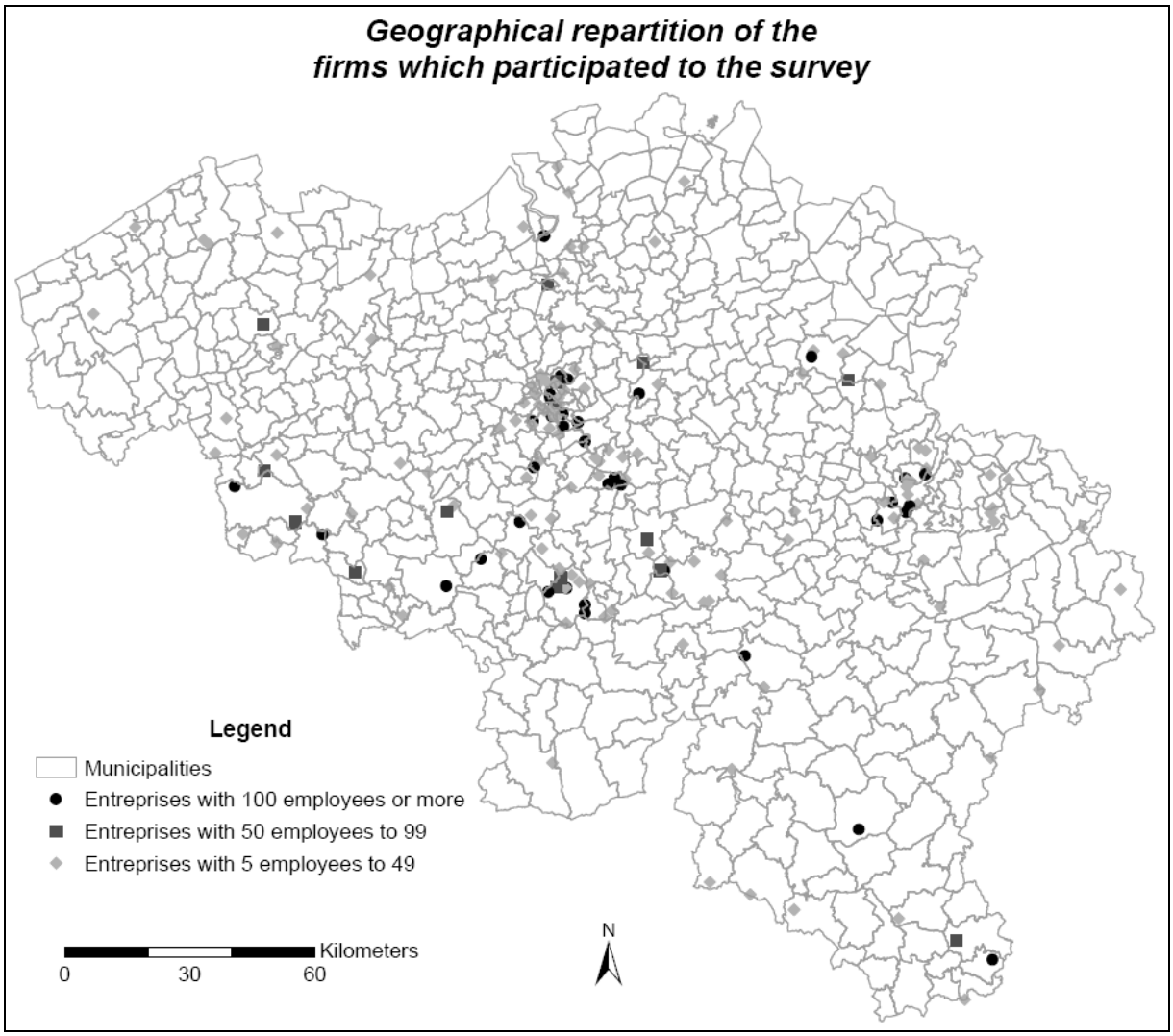

Figure 5: Distribution of the firms participating to the survey

It must be admitted that the data collection encountered some difficulties in recruitment: the response rate was lower than foreseen (although the a priori response rate was already considered as very pessimistic). We aimed at collecting responses from 200 employees with a company car in each region, and we eventually got:

- 96 employees working in the Flemish Region
- 62 employees working in Brussels
- 79 employees working in the Walloon Region

In the original sample we also collected responses of 213 employees without company car (104 in the Walloon Region, 27 in the Flemish Region, and 82 in Brussels).

We have to mention that these figures do not include the additional surveys conducted in the Flemish Region (or more precisely to Dutch speaking people) (from 7th to 19th of May 2008) by a subcontractor firm (made possible thanks to an extra budget from the Flemish Government) nor the ones conducted with direct contacts (university alumni, etc) throughout the whole country. We were indeed able to increase our amount of responses with these direct contacts, but we avoided combining both collecting data protocols (on one hand with random sample and on the other hand with non random sample). It is already sure that with this second wave of surveys, we miss some information on the firm (e.g. localisation choice, attribution criteria for company cars, etc.). Here below we present the final figures about participations to the different

surveys. The first one takes into account the workplace of the employees[6] (Figure 6), the second one considers the place of residence (Figure 7).

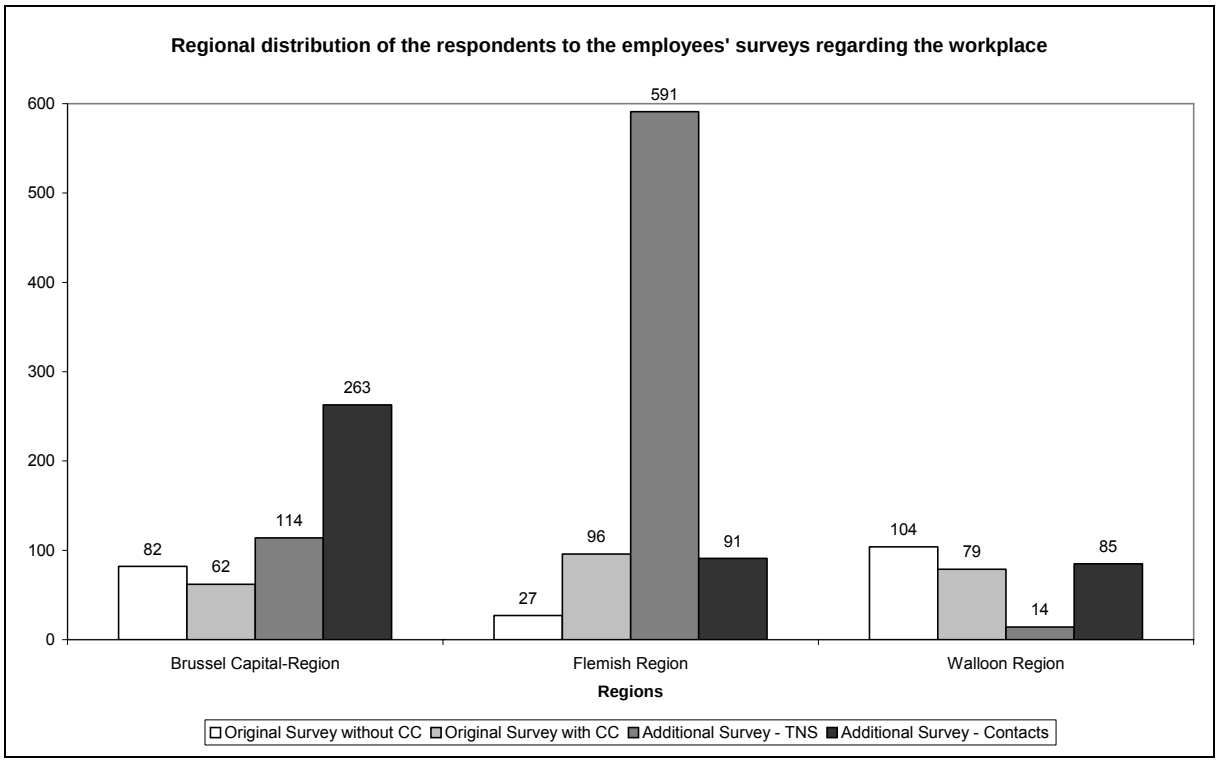

Figure 6: Distribution of the employees participating to the surveys (according to the workplace)

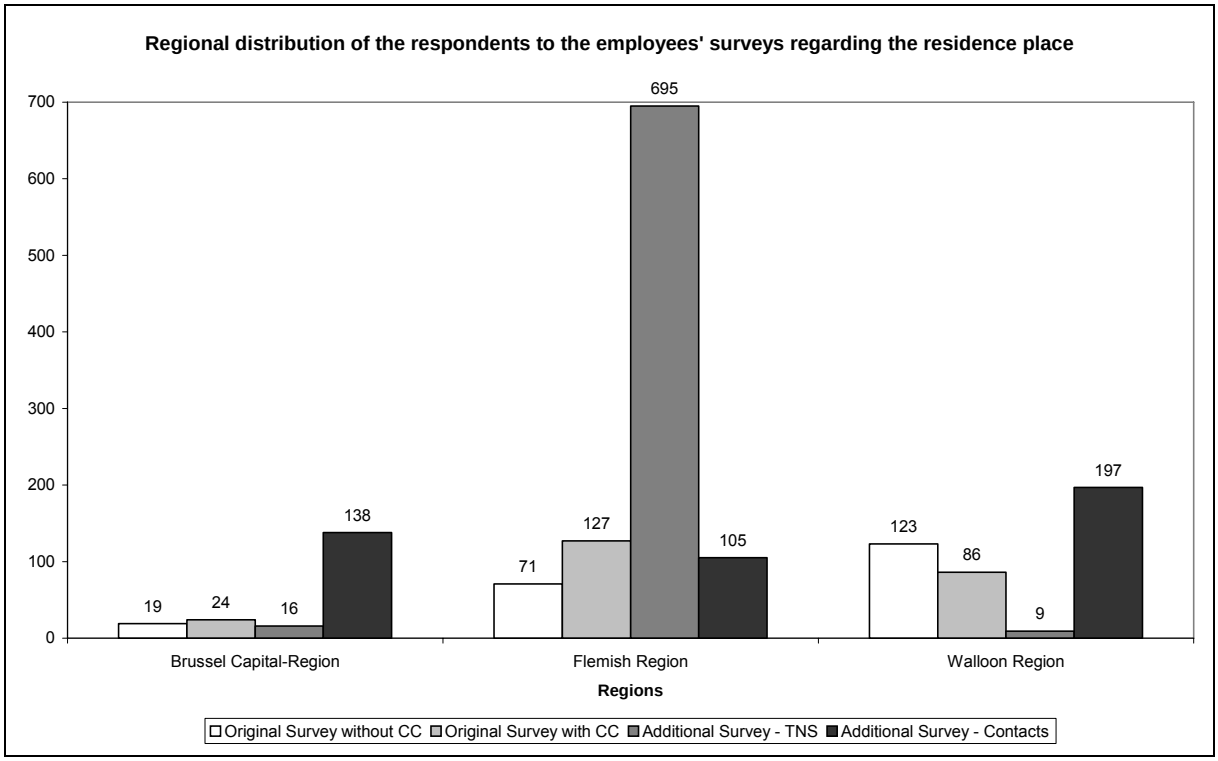

Figure 7: Distribution of the employees participating to the surveys (according to the residence place)

[6] Remark that we did not get information about the workplace municipality of two respondents (one from the survey subsidized by the Flemish Region and one amongst the researchers' contacts).

The question rose about explaining this low response rate. It seems that the heaviness of the questionnaires does not fully explain the low response rate: we saw from our databases that the time needed to answer all questions was not too long and in any case not more time consuming than what was announced in our introduction letter (about 10 minutes for one questionnaire, whether by web or by phone).

The target public of our survey itself probably provides the best explanation: we had to work with a (often) very busy public, i.e. firms in the private sector, for whom time is very precious ("time is money"). For small enterprises, the reduced number of employees makes time much more compressed, and for the biggest ones, we were confronted to another problem: although it was easier to find someone in charge of human resources (even sometimes of mobility), the problem was the administrative rigidity. In big structures, once the human resources responsible was won over to our cause, it was very difficult in many cases to convince the direction to give the authorization of spreading the information about our survey among the employees, because of non interest, of legacy protection questions, or of refusal to allow the employees to spoil their time by responding to this survey or of the fact that company cars are a delicate subject especially in the context of social elections (which took place in the period from 5 to 18 May 2008, i.e. quite close to our survey), etc.

The decision to contact employees through firms obviously made our task hard, but it seemed to us the only reliable way of contacting employees following a random sample scheme, and to gather at the same time information from firms and from employees.
Even if we are quite confident in the quality of the data collected since meticulous care was brought in the sampling frame, in the protocol and in the conducting of the surveys, it is worthwhile to mention that the statistical representativeness of the respondents could not be accurately proved at least since no clear information on the base population (of company car owners) and its characteristics are available. Nevertheless we deeply analyzed the collected data sets and tried to detect any bias. No bias could be clearly pointed out. Therefore our assumption is that the analyses which will be presented in the following sections really highlight possible trends.

DESCRIPTIVE ANALYSES

Company-related results

This section pays attention to the mobility policies pursued by the companies. Both the general policy and the company car specific policy will be addressed. Although companies not attributing company cars were also admitted to filling out the questionnaire, the key objective was to reach firms where company cars are granted to the employees. For this reason, the drawing of the sample focused primarily on activity sectors with a higher likeliness of using company cars. Before presenting the results of the descriptive analysis executed on the companies, first the weighting procedure performed on the company data will be described.

Description of the sample of companies

Before passing on to the description of the mobility policies of the companies, both the general and the company car specific ones, this section makes a description of the company sample in terms of the regions were the companies are located, the company sizes and the activity sectors.

For a large part, the companies being part of our sample have their location in the Walloon Region (60%). Of the remaining companies, 22% is located in the Flemish Region and 18% in the Brussels Capital-Region (Figure 8).

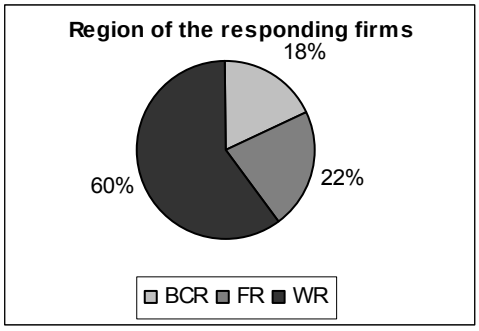

Figure 8: Region of the firms participating to the survey

As far as the size of the companies is concerned, three categories are being distinguished based on the number of employees being on the payroll of the company: companies with 5 to 49 employees are being labelled as small firms, companies with a number of employees ranging from 50 to 99 are considered to be medium-sized companies and companies with 100 or more employees are categorized as large companies. Note that companies with less than five employees are excluded. This was inspired by the desirability to avoid the issue of self-employed workers and 1 person-companies. As Figure 9 shows, our sample mainly consists of small companies (72%), as the medium-sized and large companies respectively represent 8 and 20%.

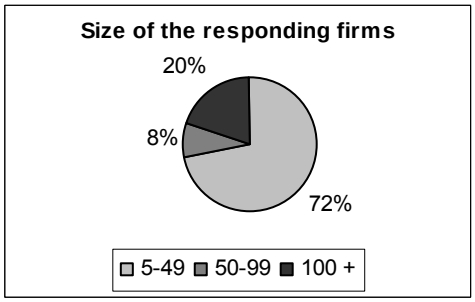

Figure 9: Size of the firms participating to the survey

As for the classification of companies according to their activity sector, companies were asked to indicate whether their activities are situated in the private or public sector. Figure 10 shows that the majority of the companies in the sample are private companies (93%).

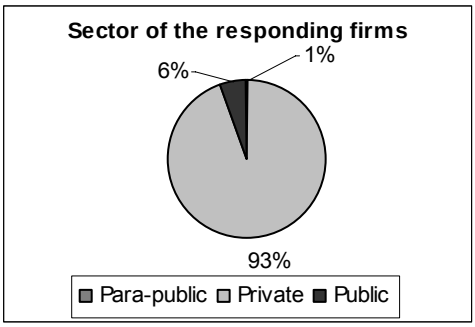

Figure 10: Sector of the firms participating to the survey

Weighting of the sample

In total, there were 181 companies who participated to the online survey. Given that the selection of this sample was done randomly from a large database on Belgian companies (BEL-FIRST) it is possible to weight the collected data in order to make the sample a better representation of the population of Belgian companies. It was decided to use the size and the Region of location of the companies as weighting criteria. Both of these variables consist of three categories (Size: 5 to 49 employees, 50 to 99 employees and 100 or more employees; Region: Brussels Capital-Region, Flemish Region and Walloon Region). Combined, this results in a total of nine possible categories (Table 2).

Category	Population (P)	Sample (p)	Weight (P/p)
Brussels-Capital Region 5-49 employees	13%	13%	1
Flemish Region 5-49 employees	56%	17%	3,25
Walloon Region 5-49 employees	21%	42%	0,49
Brussels-Capital Region 50-99 employees	1%	1%	0,79
Flemish Region 50-99 employees	3%	2%	1,56
Walloon Region 50-99 employees	1%	5%	0,22
Brussels-Capital Region 100 or more employees	1%	4%	0,27
Flemish Region 100 or more employees	3%	2%	1,48
Walloon Region 100 or more employees	1%	13%	0,07

Table 2: Calculation of weights according to size and Region

Based on the proportion of companies belonging to each of these categories, the weights that have to be applied in order to turn the sample into a better representation of the actual population can be calculated by dividing the proportions of the population of Belgian

companies (BEL-FIRST database) by the proportions resulting from the sample. Applying these weights allows evening out over- and underrepresented categories by attributing them respectively lower and higher weights. For instance, in the category of small companies located in the Flemish Region, the sample proportion is 17% whereas the proportion of the population is actually 56%. As the proportion of the sample is too low, a weight of 3.25 is applied in order to increase the representativeness of this category with respect to the actual situation. All of the company-related results presented hereafter are derived from the weighted data.

Description of the general mobility policy

Before going deeper into the company car specific mobility policies, this section will focus on the general mobility policy of the company. In order to get an idea of their current mobility management, questions were asked concerning the company's accessibility, its location choice and its support to sustainable transport modes.

The assessment of the accessibility of the companies is twofold: on one hand, it is determined by the availability of public transport and on the other hand, it depends on the accessibility by car. The first form of accessibility is being assessed in terms of the distance to and the frequency at the nearest public transport stop. For the assessment of the car accessibility it was chosen to rely on the availability of parking facilities. Figure 11 illustrates how the surveyed companies perceive their accessibility in terms of distance to the nearest public transport stop. It appears that **more or less half of the surveyed companies are declaring being located close (26%) or very close (29%) to a public transport stop**. 18% indicates that the nearest stop is at medium distance and the others claim that it is far (15%) or even very far (12%).

It is worthwhile to mention that the answers of the firms related to the distance to the nearest public transport stop were checked through a geolocalization process and that no bias was highlighted. Thus even if we are facing "declarative" answers, we could trust them for qualifying the public transport accessibility.

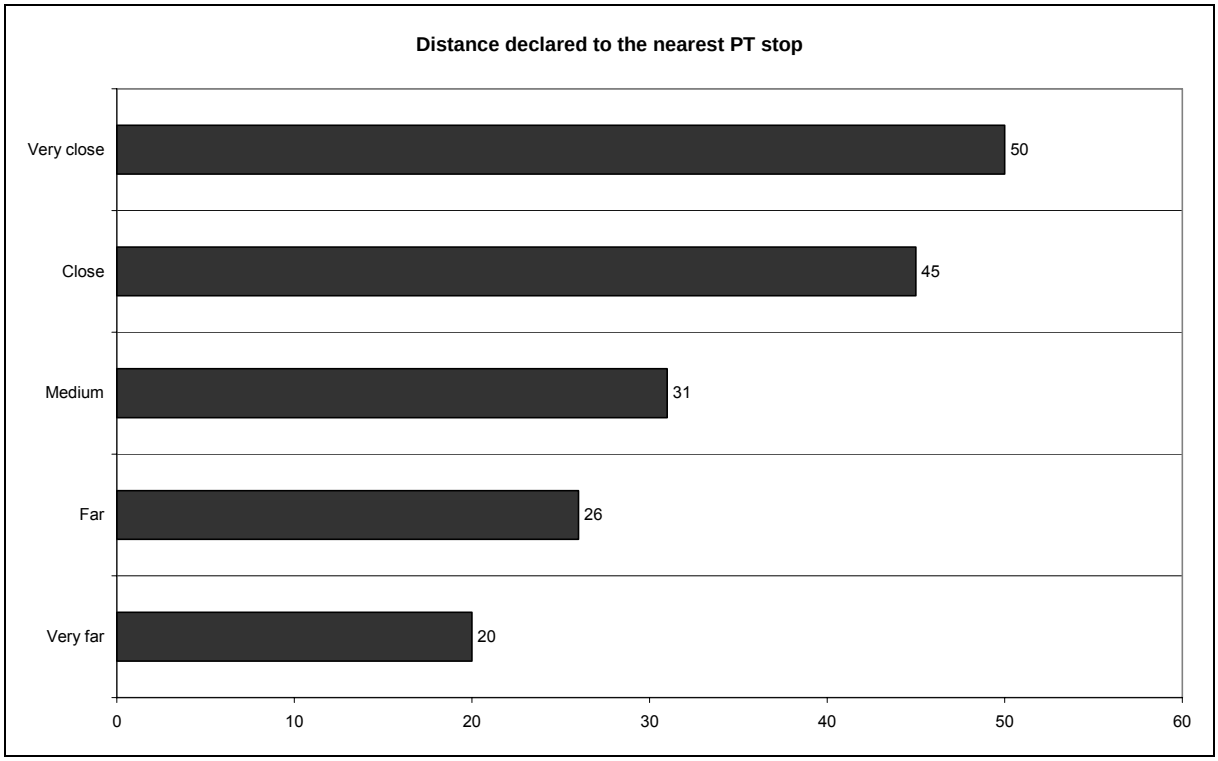

Figure 11: Distance to the nearest PT stop

Although a lot of companies are located nearby a public transport stop, this does not necessarily imply that it concerns a stop with a high transit frequency. Figure 12 shows that only **a minority of companies indicate that there is a high (10%) or very high (13%) frequency at their nearest public transport stop**. 29% of the responding firms are of opinion that the frequency is average and in almost half of the cases the frequency is being labelled as low (25%) or very low (23%).

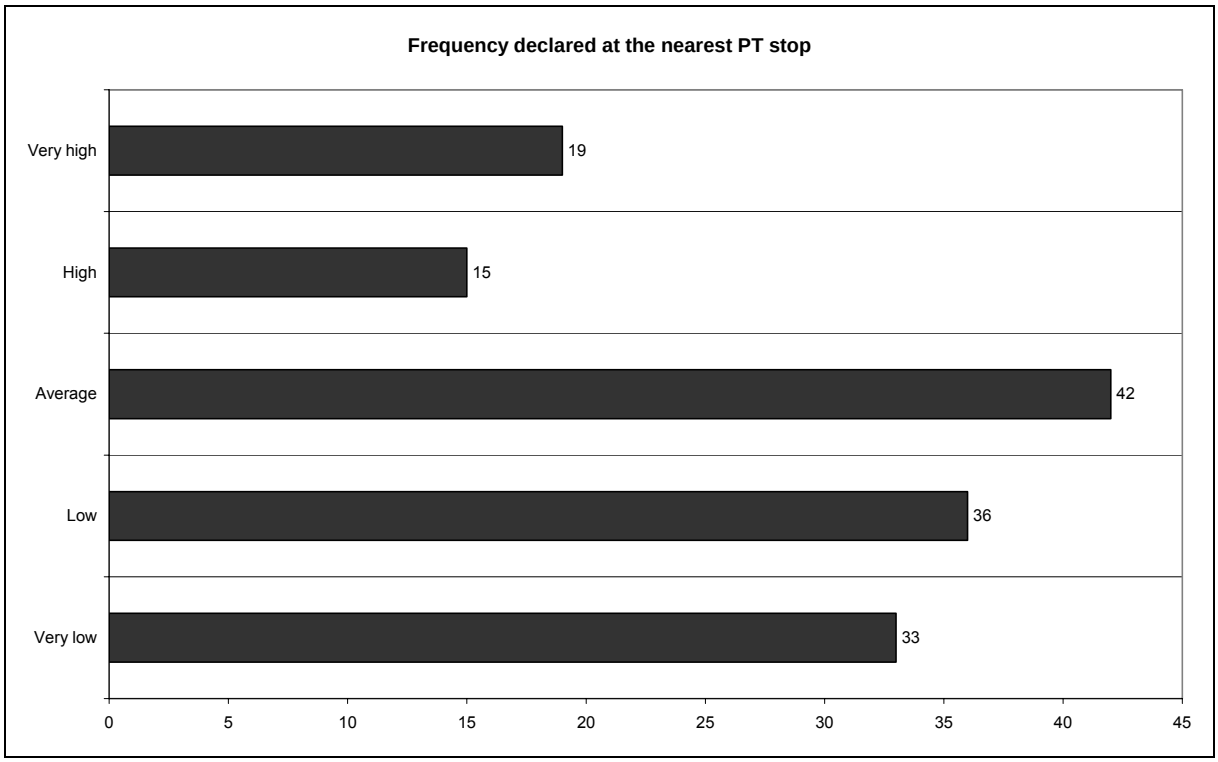

Figure 12: Frequency at the nearest PT stop

Car accessibility is being assessed in terms of the available options for parking a car. The companies were asked to indicate whether and what kind of parking facilities they provide (free or payable, internal or external, owned or hired). Their answers revealed that in case there is parking support, it usually concerns free internal parking spaces. Consequently, the parking related options have been reduced to two: parking support and no parking support. **In our sample, 75% of the companies provide parking facilities for their employees** (Figure 13).

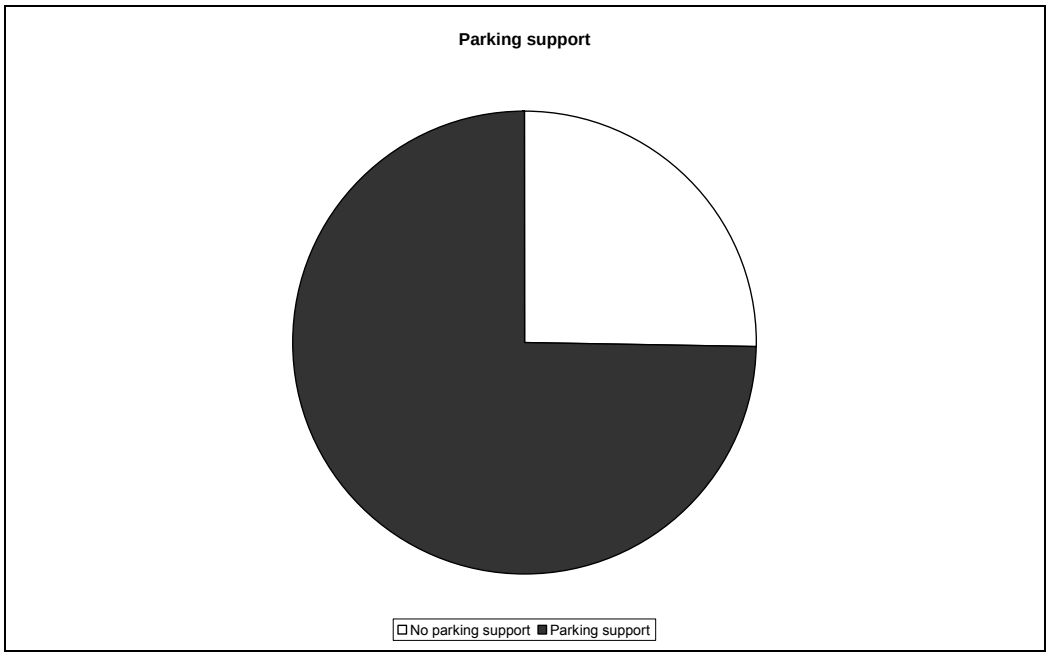

Figure 13: Parking support for the employee

Another aspect of a company's general mobility policy is its location choice, and more in particular whether they consider accessibility (by public transport as well as by car) as an important factor in their company location decision process. In order to investigate this, the surveyed companies were first asked to indicate whether they would stay at the current location or rather change location if they had the opportunity to reconsider their current location. Next they were asked to point out the upsides (in case of preferring to stay) and downsides (in case of wanting to change) of this current location. Only 19% of the sampled companies would consider changing location. The others (81%) are satisfied with their current location (Figure 14).

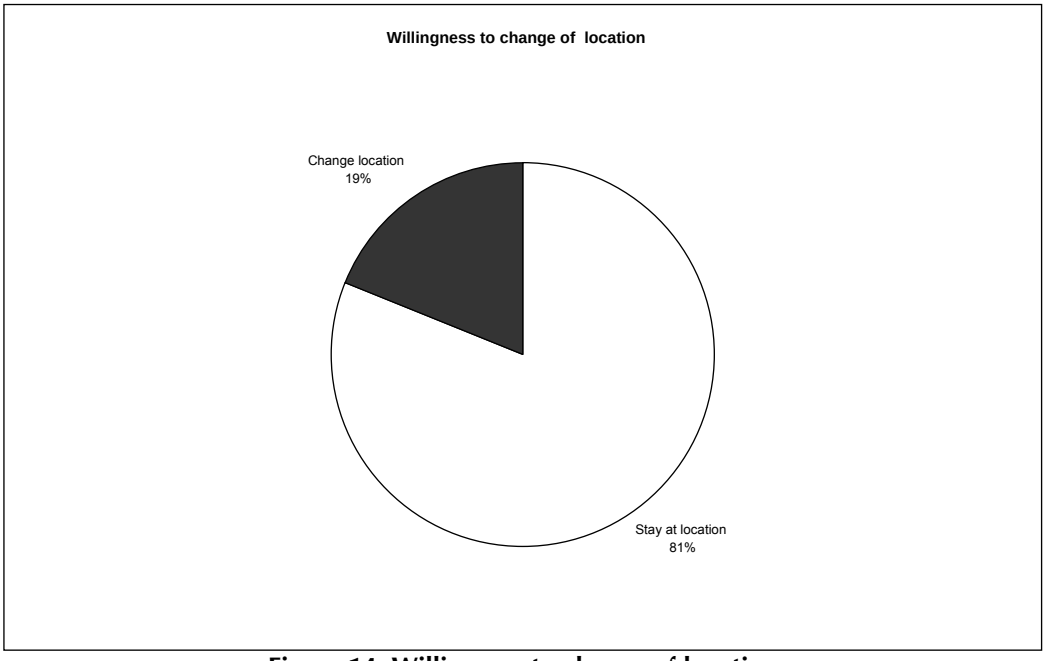

Figure 14: Willingness to change of location

For companies considering changing location, the three main reasons to do so are (in order of importance): the lack of available parking spaces (31%), issues with car accessibility (26%) and location-specific reasons (26%). For companies wanting to stay at their current location, the

most mentioned location benefits are: the good car accessibility (40%), the accessibility in general (27%) and the commercially advantageous features of the location (24%). Therefore we could conclude that, in general, **companies consider accessibility, especially in terms of accessibility by car, as an important issue when deciding on the company location**. **Accessibility with public transport is much less important** and can be found at the bottom of the listing of aspects being important in the location decision (Figure 15).

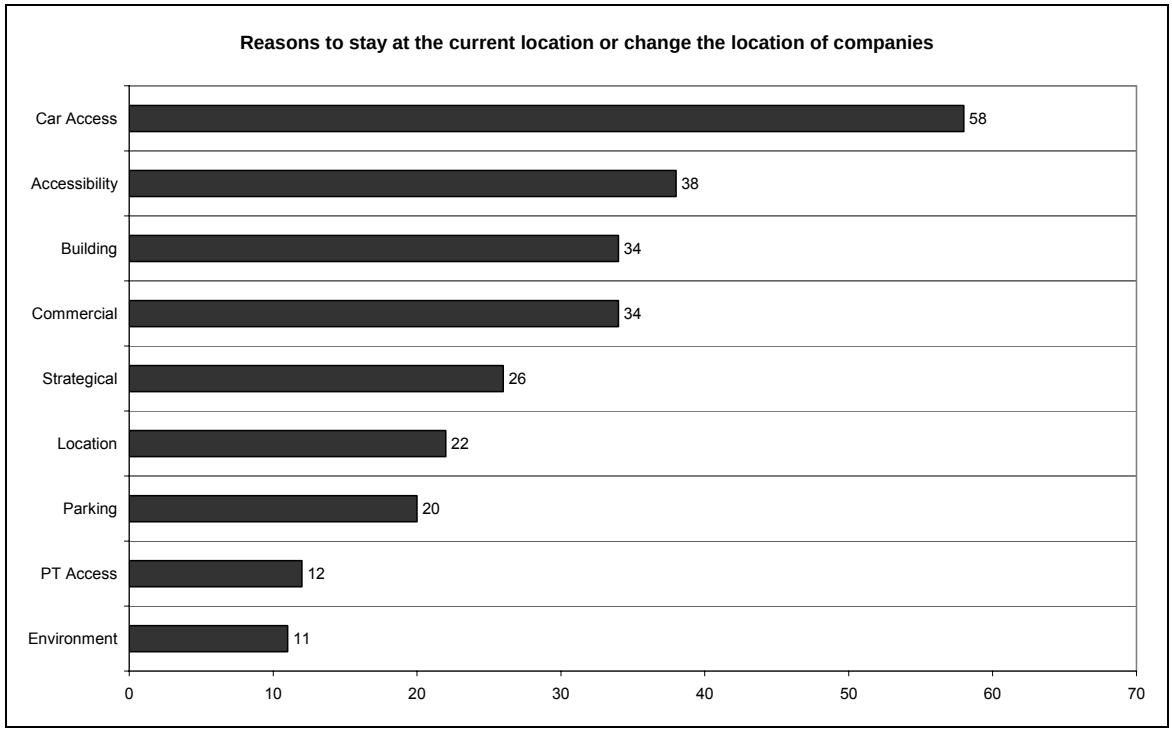

Figure 15: Reasons to stay at the current location or change the location of companies

A third and final element that was addressed with regard to the general mobility policy of the company is its support of sustainable and more environmental-friendly transport options. In our survey, we focused on the following sustainable mobility options: carpooling, bicycle use, public transport, collective transport organized by the company and car sharing, and asked companies whether they currently take action to support these kinds of transport solutions. Figure 16 illustrates that **not supporting sustainable transport modes is more common among the sampled companies than giving support.**

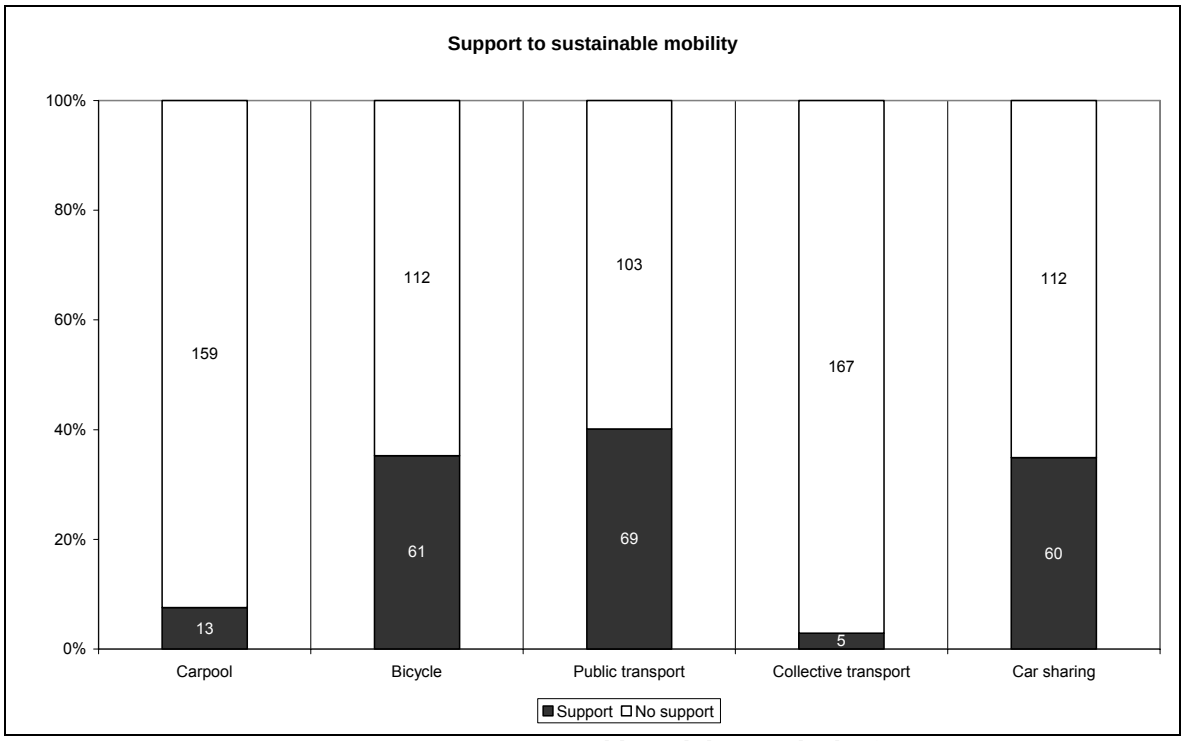

Figure 16: Support to sustainable mobility inside the firms

The sustainable transport modes receiving the most support are public transport (40%), bicycle use (35%) and car sharing (35%). The support to public transport mainly concerns the repayment of (a part of) the season ticket. In case of the bicycle, supporting initiatives include giving a compensation for the use of the bicycle (usually 0.15 euro/km), supplying bicycle parking facilities and providing company showers. Car sharing refers, in this context, to the availability of 'company cars' not attributed to a single employee, but placed at the disposal of several employees for their professional trips.

Description of the company car policy

In order to get an idea on the company car policy of the company, questions were asked concerning the amount of company cars, the factors determining company car attribution, the conditions for choosing a company car and the costs charged to the employee.

Each of the sampled companies was asked to indicate the number of company cars constituting their company car fleet. **Only 9% of the companies belonging to the sample declared that they do not have company cars**. This percentage is a result of the fact that we primarily focused on finding companies with company cars and should not be interpreted as an indication of the proportion of company car using companies compared to companies not using company cars. When focusing on the companies with company cars (N = 155), it appears that the majority of companies in our sample have less than 30 company cars within their company car fleet (Figure *17*): 52% of the sampled companies has less than five company cars, 30% has a company car fleet with 5 to 10 company cars, for 9% of the surveyed firms with company cars, the number of company cars lies between 10 and 30, 7% indicate that they have 30 to 100 company cars and the remaining 3% has a company car fleet consisting of more than 100 company cars. The lower rates for companies with more than 30 company cars are linked to the fact that the majority of companies in the sample are small companies with less than 49 employees.

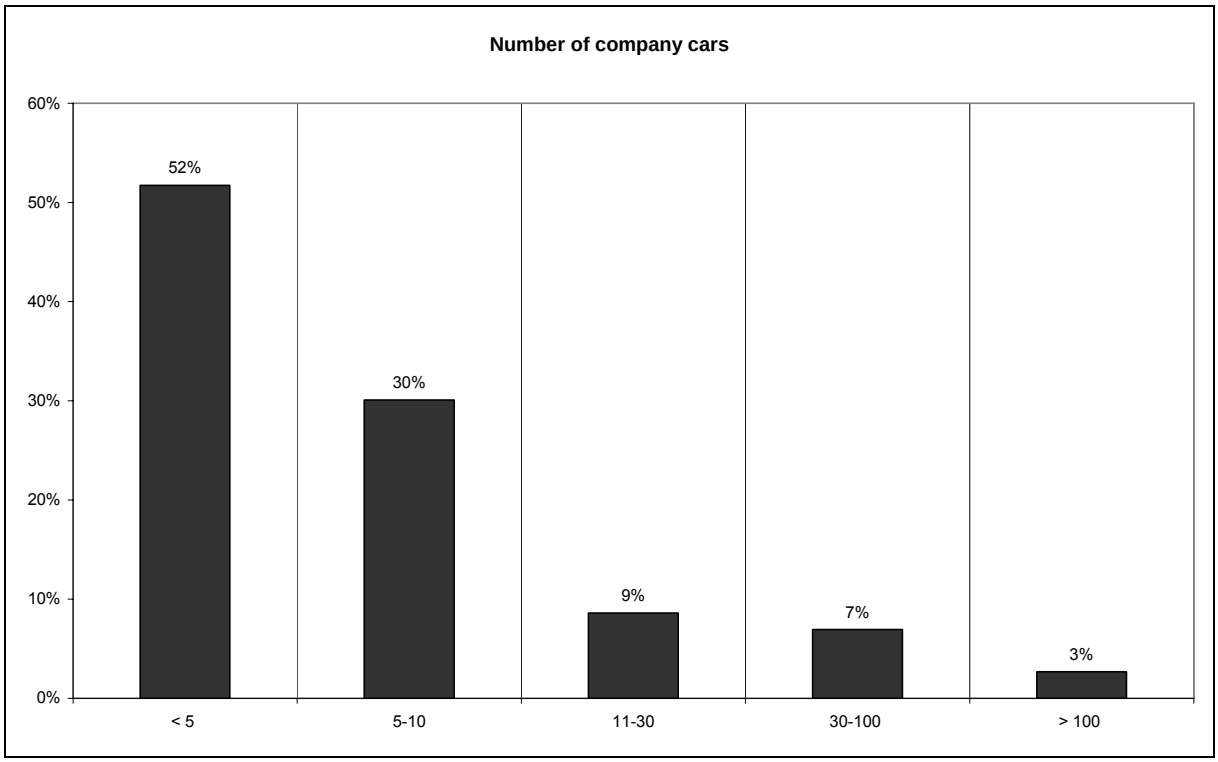

Figure 17: Number of company cars inside the firms

The following sections describe the findings resulting from questions concerning the company car policy. These questions were only proposed to the companies where company cars are being used (N = 155).

Before going into detail about the conditions related to company car choice and use, attention is paid to the factors determining the attribution of company cars. From a listing of nine potential determining factors, the companies were asked to indicate the importance of these factors in their decision to attribute company cars to their employees. A factor analysis was used to reduce the number of nine variables to a smaller amount of five factors (see Figure 18).

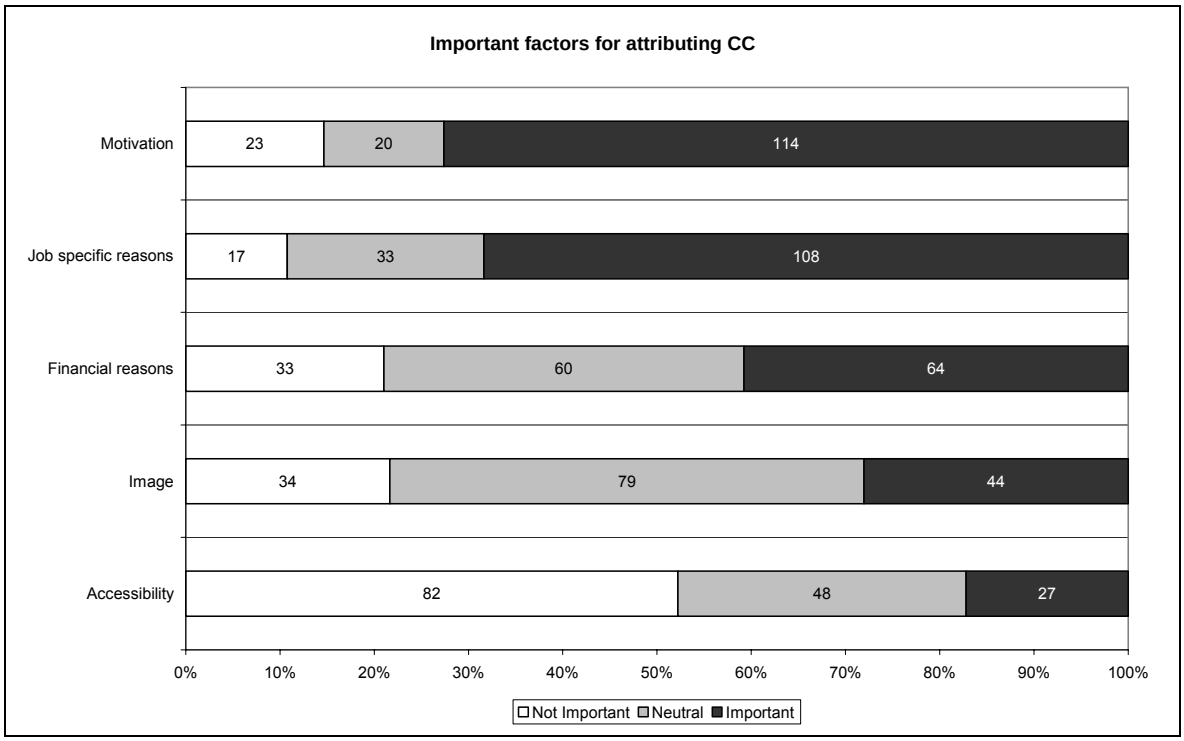

Figure 18: Important factors to attribute company cars

According to our findings, **the most important incentive for companies to give company cars to their employees is to motivate them and to increase their loyalty to the company. Job specific reasons are the second most important determinant** of company car attribution. They include the fact that the job requires a lot of professional displacements, but also that company cars are given as from certain function levels to support the status related to that function level. **Attributing company cars for financial reasons is the third most important factor**. These financial reasons comprise the use of a company car as an incentive to attract new qualified personnel, as an alternative for a salary increase and because of the advantageous fiscal treatment of the company car. The use of company cars to attract talented people can especially be observed in sectors where the demand for qualified personnel is high and the supply scarce (e.g. Information Technology sector).

The image of the company does not really have an impact on the company car policy, as this factor is generally considered to be neutral. **As for accessibility, a lot of companies indicate that this factor does not play an important role in the attribution of company cars**. This last finding is also being confirmed when companies were explicitly questioned about the impact of the company location on their company car policy. In 92% of the cases the answer was negative.

After deciding who receives a company car and for what reason, a choice has to be made with regard to the type of company car that will be attributed. In most cases, it is the employer who has the final decision on the brand and the model of the car. Figure 19 shows to what extent they allow the employee to be involved in this decision. In 28% of the cases the employee has nothing to say in the decision on the type of company car. In 65% of the cases, the employee is being involved in the decision process, but his/her choice is limited. The most common limitation concerns the budget (41%). Other limitations are related to the type of brand (18%) and the model of the car (6%). In the remaining cases (7%) the choice of the company car is based on a joint decision making process.

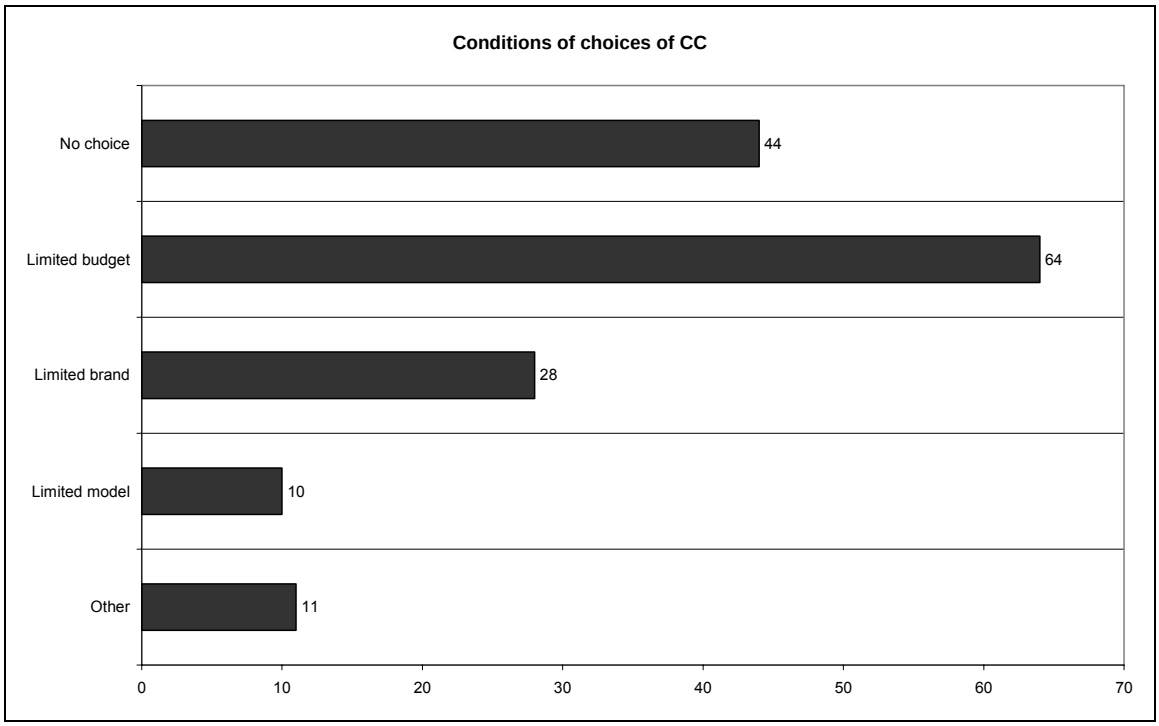

Figure 19: Conditions for the employees of choice of their company cars

Some of the costs related to the use of a company car are to be carried by the employee. Figure 20 points out that **most of the costs are not charged to the employee, except for costs related to penalties for traffic offences (75%) and to the franchise in case of an accident (24%)**. In the occurrence of a car accident, the person responsible for causing the accident is also responsible for paying the accident costs. In case it is the company car user who caused the accident, the company in which name the car is registered is bound to paying the accident related costs. However, depending on the internal company policy and the agreements made with regard to the use of the company car, the company can decide to charge these costs to the employee.

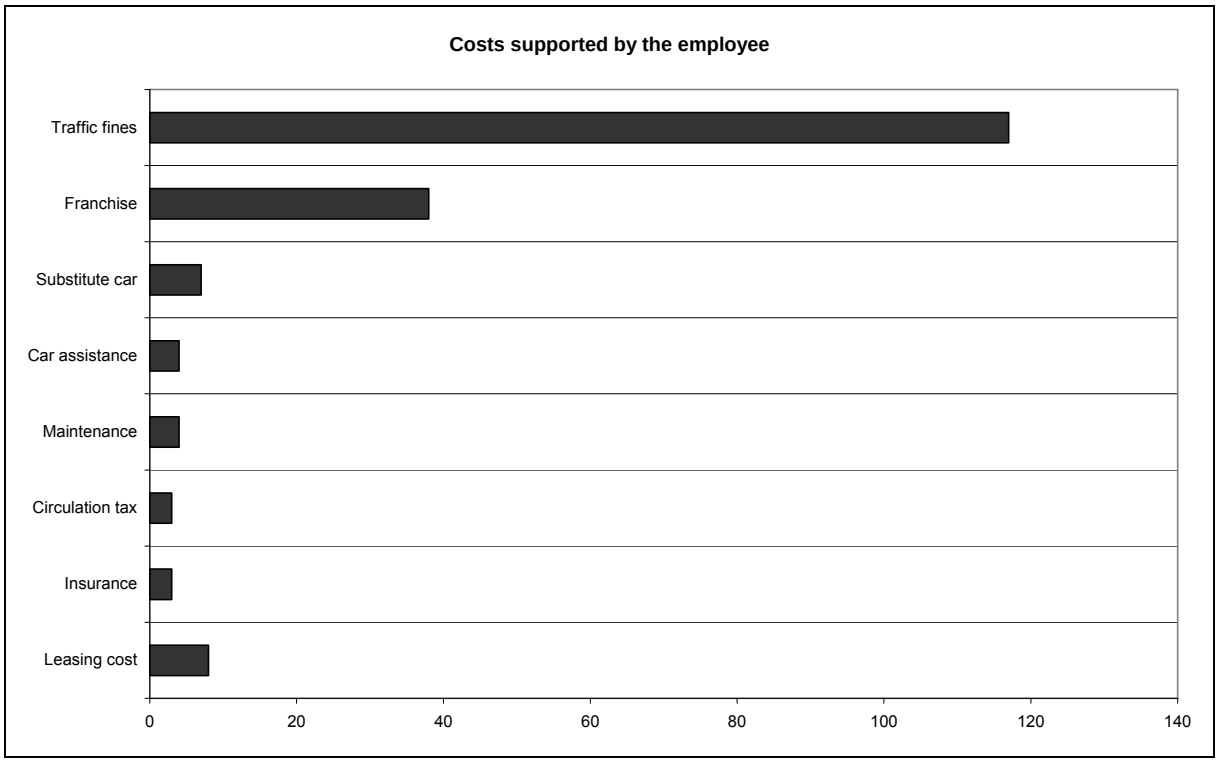

Figure 20: Costs supported by the employee

An explanation for the fact that most of the costs related to company car use are not to be paid by the employee can be found in the financing method and the fiscal context. In case of operational lease, the costs related to the use of the company car are included in the lease contract and in the other cases; there is the fiscal deductibility of the costs of a company car for the employer.

Employees-related results

This part of the report will be divided into three sub-sections. First, we will describe our respondents regarding their socio-economic profiles: gender, age, diploma, kind of employment, etc. Then, we will focus on their usual displacements: home-work distances, usual mode to make this kind of trips, annual mileage, importance of the private trips for this mileage, refunding of the fuel expenses, etc. We will then finish this section by analysing the trips recorded by the respondents on a reference day (the day before they fill the questionnaire): number of displacements, modes used, times of departure, purposes of the trips, etc.

Socio-economic profile

As explained before, we start by describing the participants to our different surveys according to their socio-demographic profiles. Are the respondents to the employees' survey younger when they have a company car? Are there proportionally more women or men having such cars? Are they higher educated? Do they have specific kind of employment in the firms? Are they full time worker?

Concerning the gender (Figure 21) of the respondents, If we look at the graph below, it is obvious that we meet proportionally more male respondents in the three samples of people with company cars: more than four respondents without company cars on ten are women (43.7 %) whereas less than three respondents with company cars on ten are women (respectively 26.6 % for the original sample, 30% for the sample funded by the Flemish Region and 20.5% for the sample composed by contacts of the research teams). Let us remark that these figures are quite similar to the observations available from the Mobel survey (1999), where 77% of the people

having a company car were men (for your information, there were 209 respondents with a company car in the Mobel survey). We can support that **company car users are more frequently men than women** according to the different sources we can refer to.

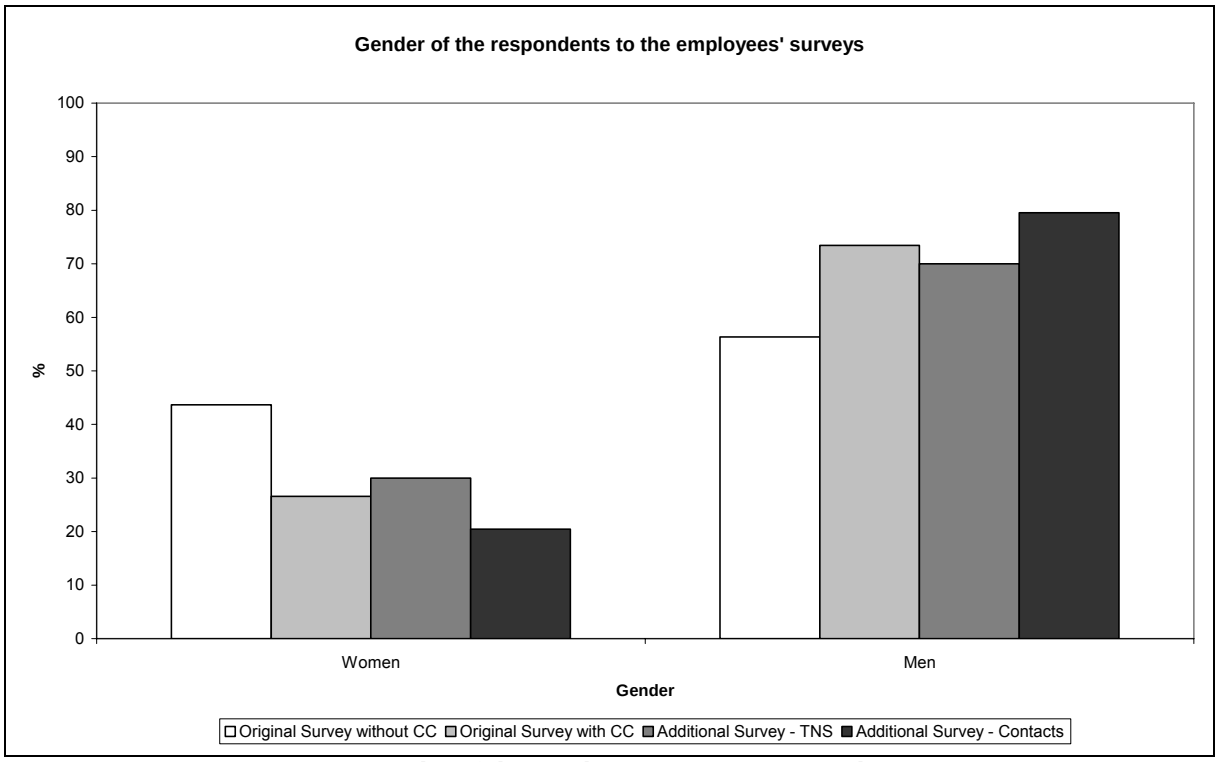

Figure 21: Gender of the employees participating to the surveys

If we then consider the age of the people filling in our questionnaires, the repartition is more uniform for people having no company car. **The possession of a company car is more common among younger people (especially those younger than 40) but not for the youngest (less than 24)**. We can remark that we find numerous respondents being aged from 25 to 29 in the fourth sample. It can certainly be explained by the way of recruiting these people (this group is for a large part constituted of people having the same profile than the researchers). In Figure 22, it can be observed for samples with a company car (original and both additional surveys) that we find **less people above 50**. Nevertheless we must keep this last lesson *cum grano salis* since this situation is **perhaps a bias due to the fact that elderly people are more reluctant to answer online surveys**.

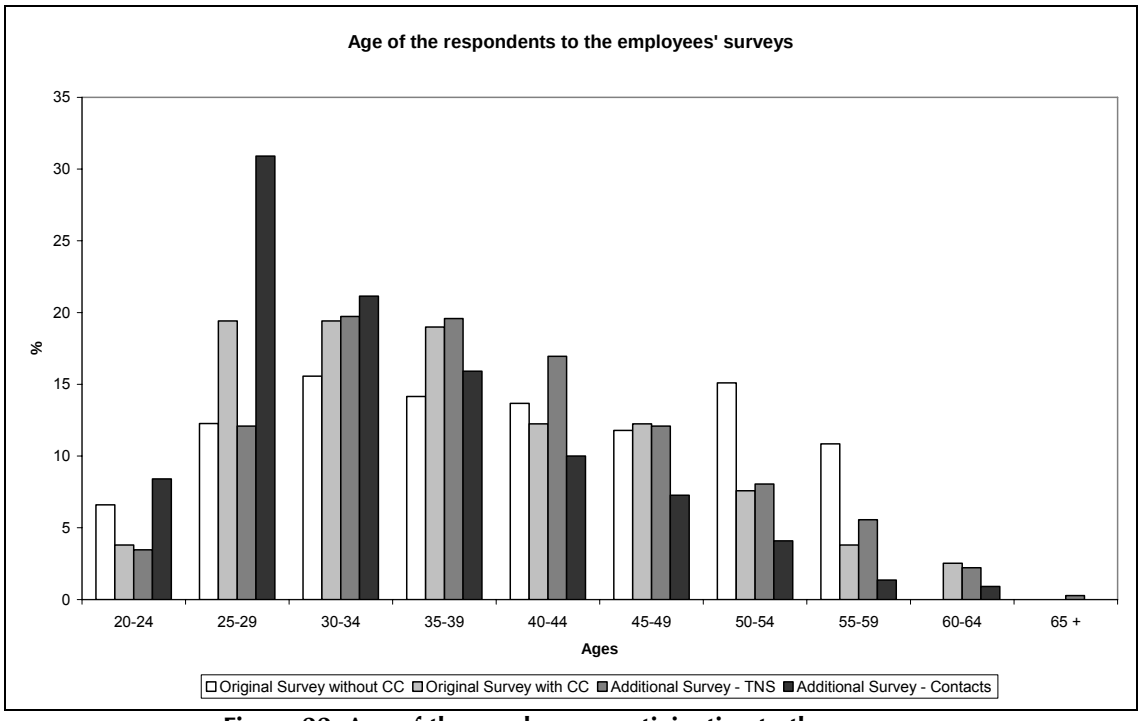

Figure 22: Age of the employees participating to the surveys

Regarding the diploma (Figure 23), **the odds to find a person with a company car increases with the education level**. Indeed, we have proportionally more respondents with a company car among those who went to a High School or a University, whereas respondents without company cars are generally lower educated: less than 70% of the respondents without company cars pursue studies at a High School or at a University whereas this ratio stands at 86.5% for the original survey with company cars, 76.8% for the sample recruited with the Flemish subsidy and 96.6% for the researchers' contacts sample. The high proportion of people with an academic degree in the fourth sample can be explained again by the way we recruited people for this survey.

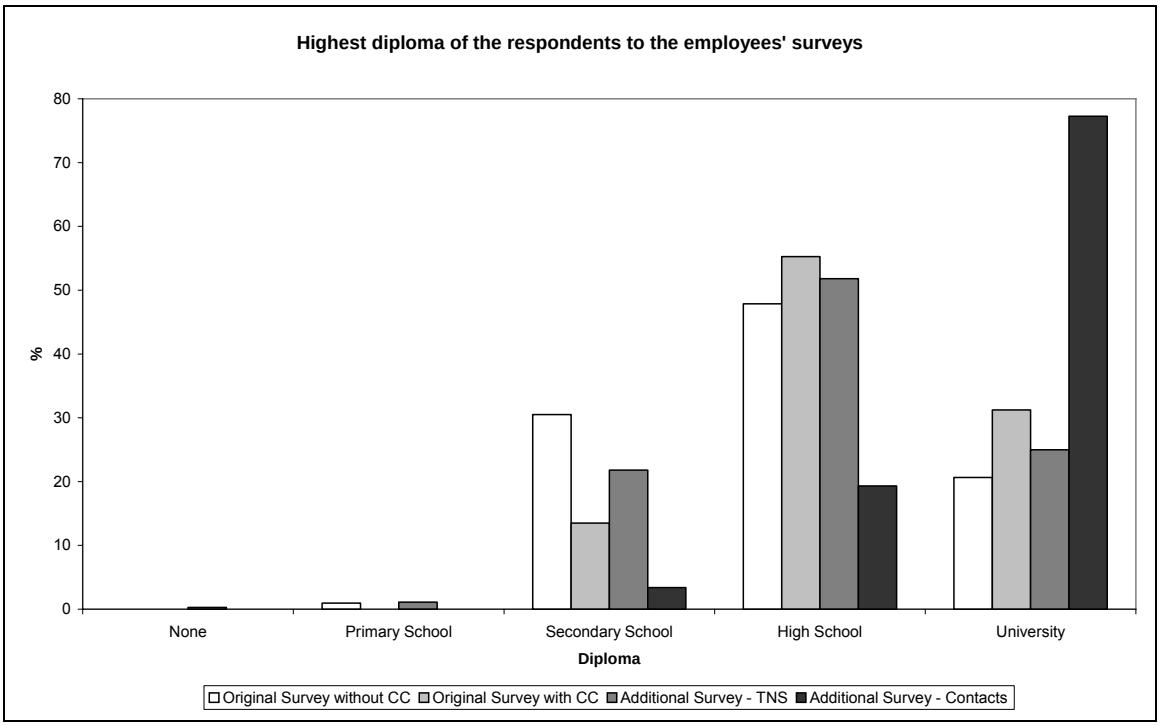

Figure 23: Highest diploma of the employees participating to the surveys

When we observe the kind of employment of our respondents (Figure 24), it becomes apparent that we mainly questioned employees. It could be linked to the fact that the majority of workers in general are employees. So we could focus on the rates of possession of company car by kind of employment. We can determine that **people in management functions are the ones with the highest rate of company car possession while the lowest rate is found among the workmen.**
To avoid different interpretations of the terms used for the different kinds of employment, we clearly defined the underlying meaning of each modality of jobs in the questionnaires.

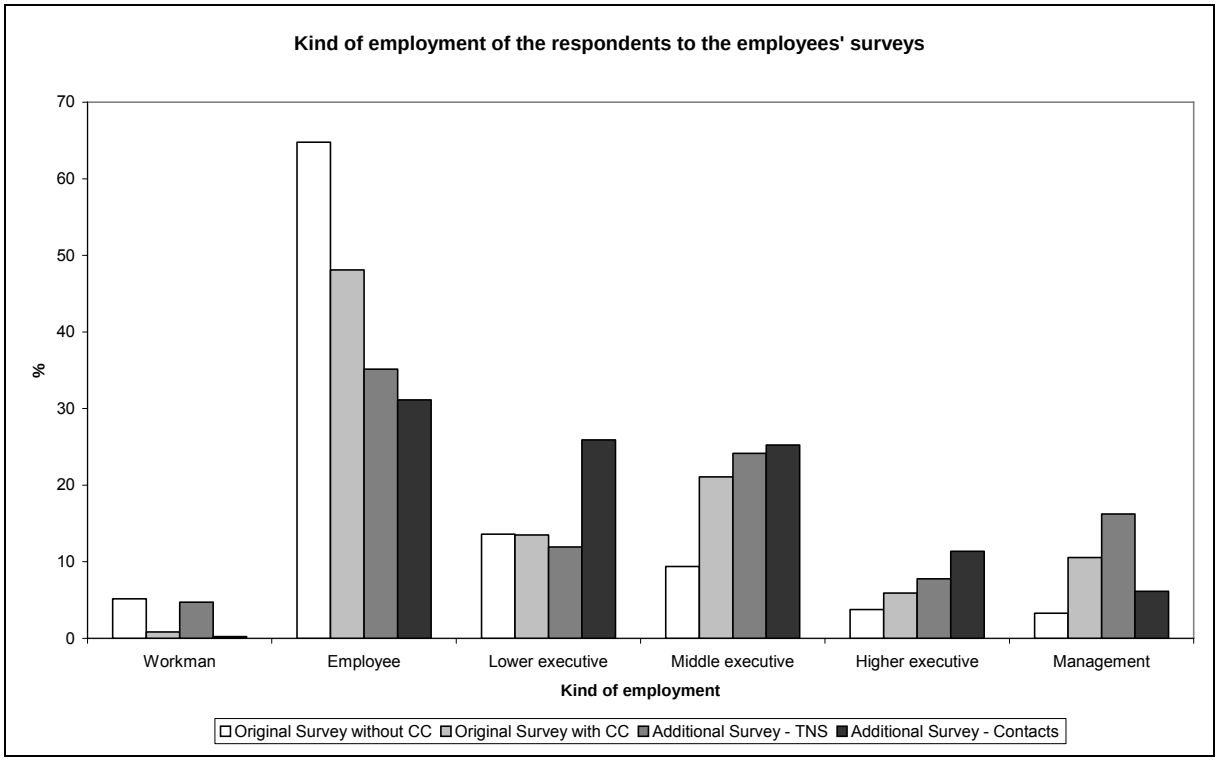

Figure 24: Kind of employment of the workers participating to the surveys

There is almost an increase of this rate with the usual typology of employment: from workmen to management with intermediate situations (employee, lower executive, middle executive and higher executive).

We can observe in Figure 25 with regard to the time of work that we proportionally find **more people working part time in the sample of people without company cars** (21.6% of the respondents of this sample). They are only about 5% in the original sample with company car and in the sample of researchers' contacts. This ratio rises to 11.7% in the third sample (the one recruited thanks to the Flemish Region grant).

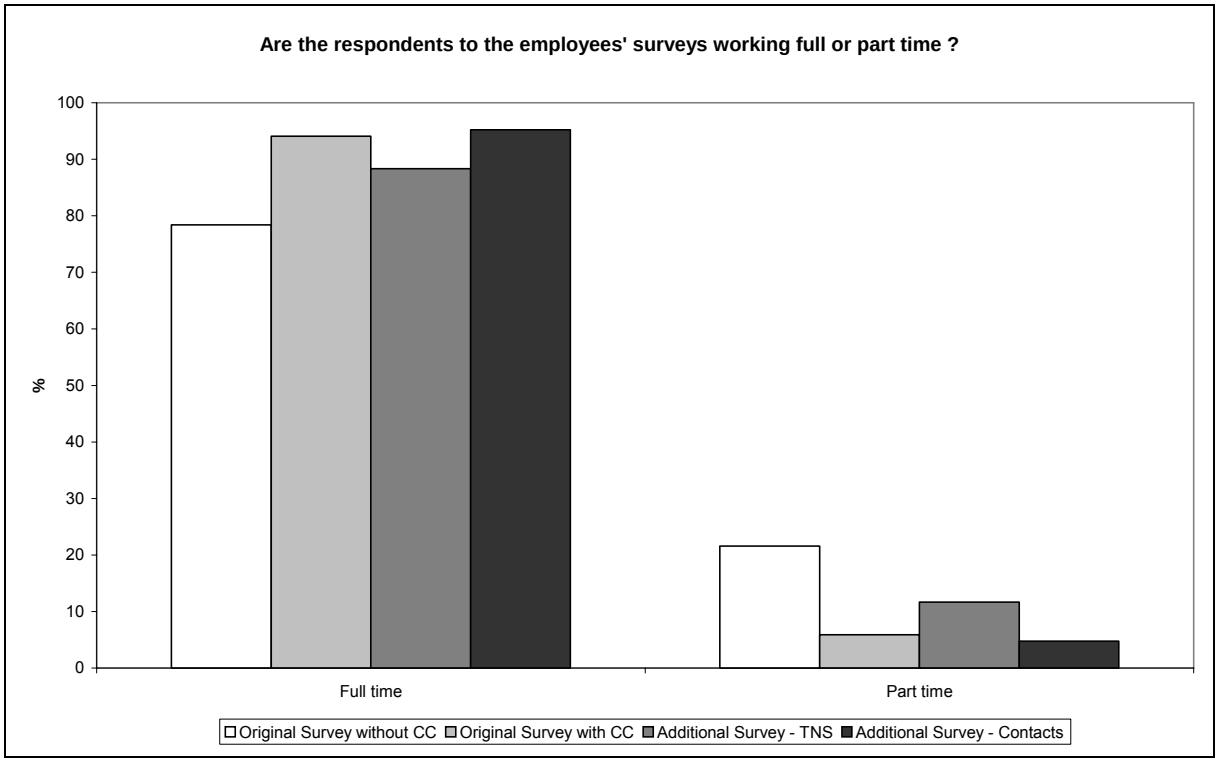

Figure 25: Time of work of the employees participating to the surveys

It can be observed in Figure 26 below that **respondents with company cars** (particularly the ones from the sample funded by the Flemish Government) **have special timetables, meaning that they are proportionally more likely to work out of the office hours.** The proportion of people working out of the office hours equals 4.2% among the respondents without company car, whereas it grows to 5.5% for the researchers' contact, 8.5% for respondents of the original survey with company car and even about 25% for the people recruited by the private research market company. If we assume that public transport supply is less extensive outside the "classical" office hours, we can imagine that those people have fewer public transports options to go to work. This could partly explain the possession of a company car.

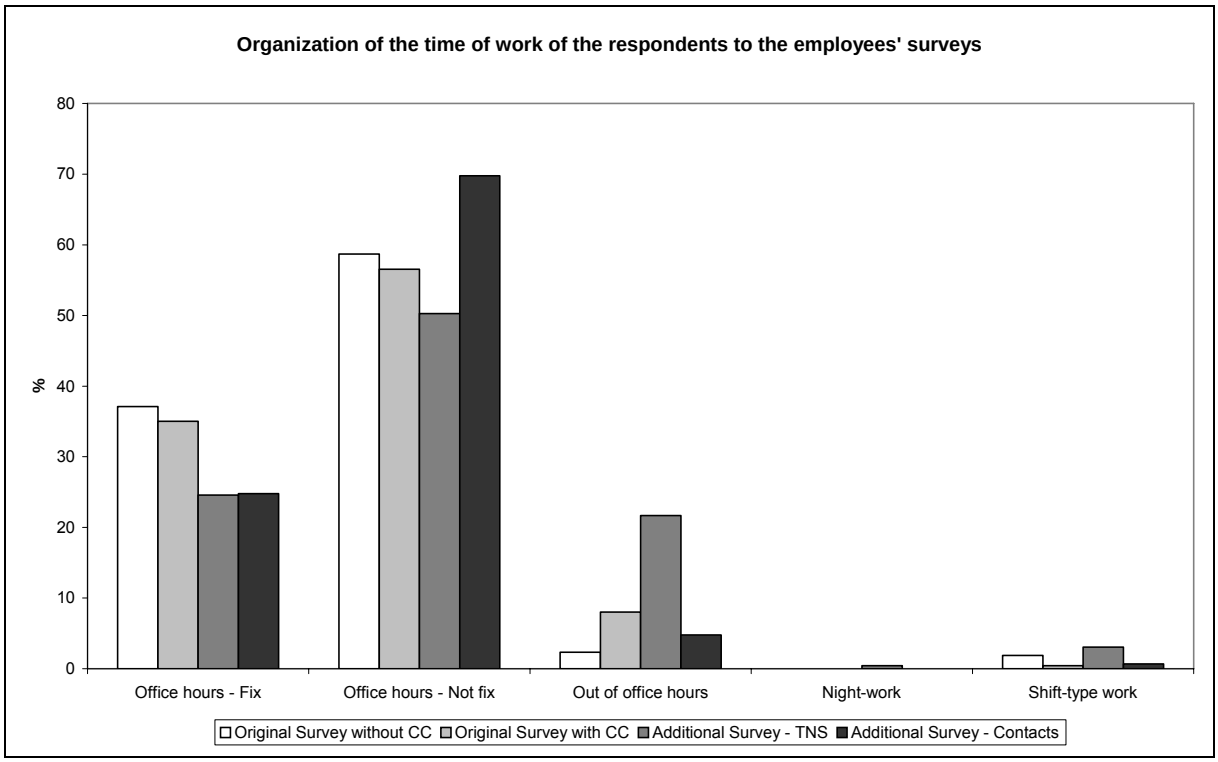

Figure 26: Organization of the time of work of the employees participating to the surveys

After these considerations on the socio-economic profiles of the people participating to our surveys, we can carry on with their usual mobility behaviour. Do these respondents work far from their residence places? How do they reach their workplaces? Which kind of fuel are their cars using? Do they cover many kilometres each year? Do they mainly use their cars to make professional or private trips? Are they allowed to make trips abroad? Are they refunded for the fuel expenses? All these questions will be answered in the coming section.

Usual mobility behaviour

Concerning the home-work distance (Figure 27), it appears that **proportionally there are more respondents with company cars than there are respondents without company cars who declare to live very close to their work place (less than 2 km), but it does not concern a large part of the samples**. **For the longest distances, people with company cars are better represented**; while a little less than 80% of the respondents drives less than 50 Km to go to their workplaces when they do not have a company car, they are more numerous when they have a company car to drive more than 50 Km to reach their work places (23.9% for the additional survey realised thanks to the subsidy of the Flemish Region, and especially 30% for the additional surveys conducted on researchers' contacts and 31.2% for the original survey).

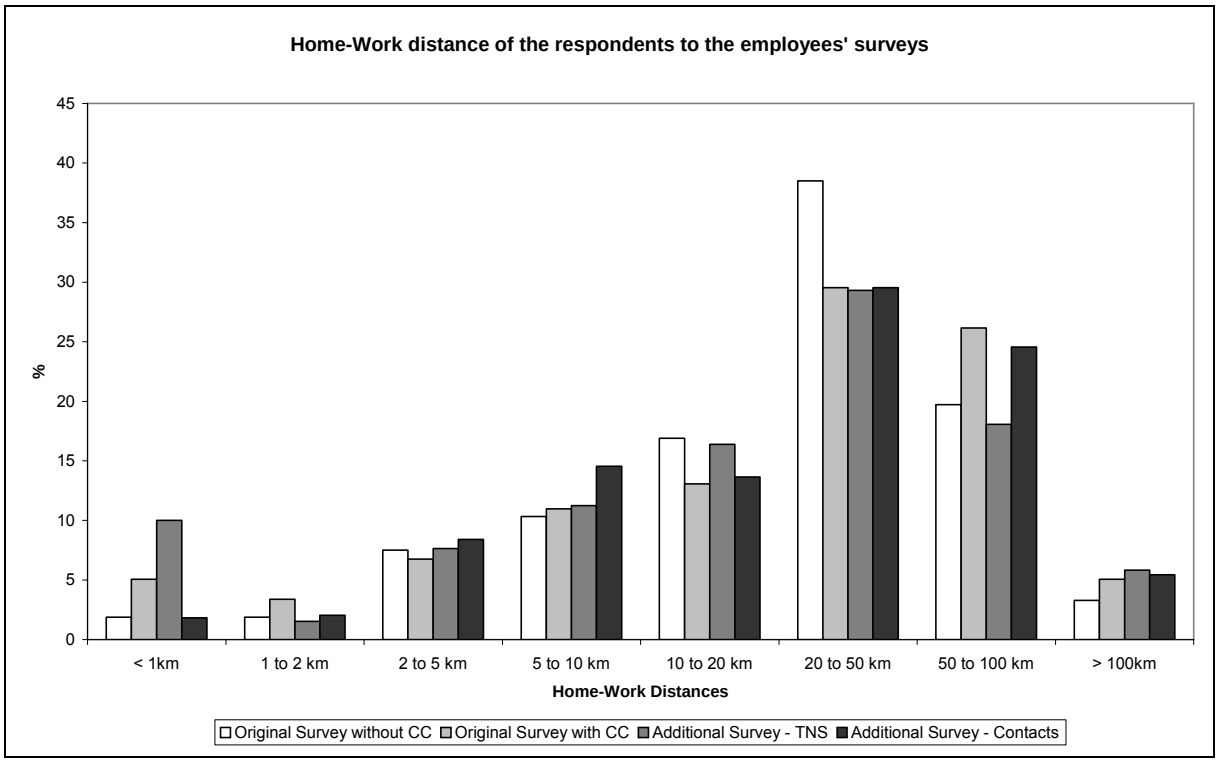

Figure 27: Home-work distances of the employees participating to the surveys

Figure 28 focuses on the fuel of the company cars. If we make a comparison with the respondents who declare having no company car, we can see that **company cars are more often diesel cars**. Only 7 cars on 237 (3%) have gasoline as fuel in the group of respondents with company car of the original survey, all others having diesel as fuel. In the additional surveys, this prevalence for diesel can also be observed. In the COCA report, the ratio of company cars using diesel was not so high: only 79% in 2005 from the DIV and 87% from FEBIAC (2005 too) and in 1999, only 69% from the Mobel survey. But we have to keep in mind that the definitions of the company cars are not always the same for these sources. In addition, these comparative figures are less recent (especially for the Mobel survey) and the success of diesel engines tends to develop with time. We can assume that this last fact can have an influence on the compared figures.

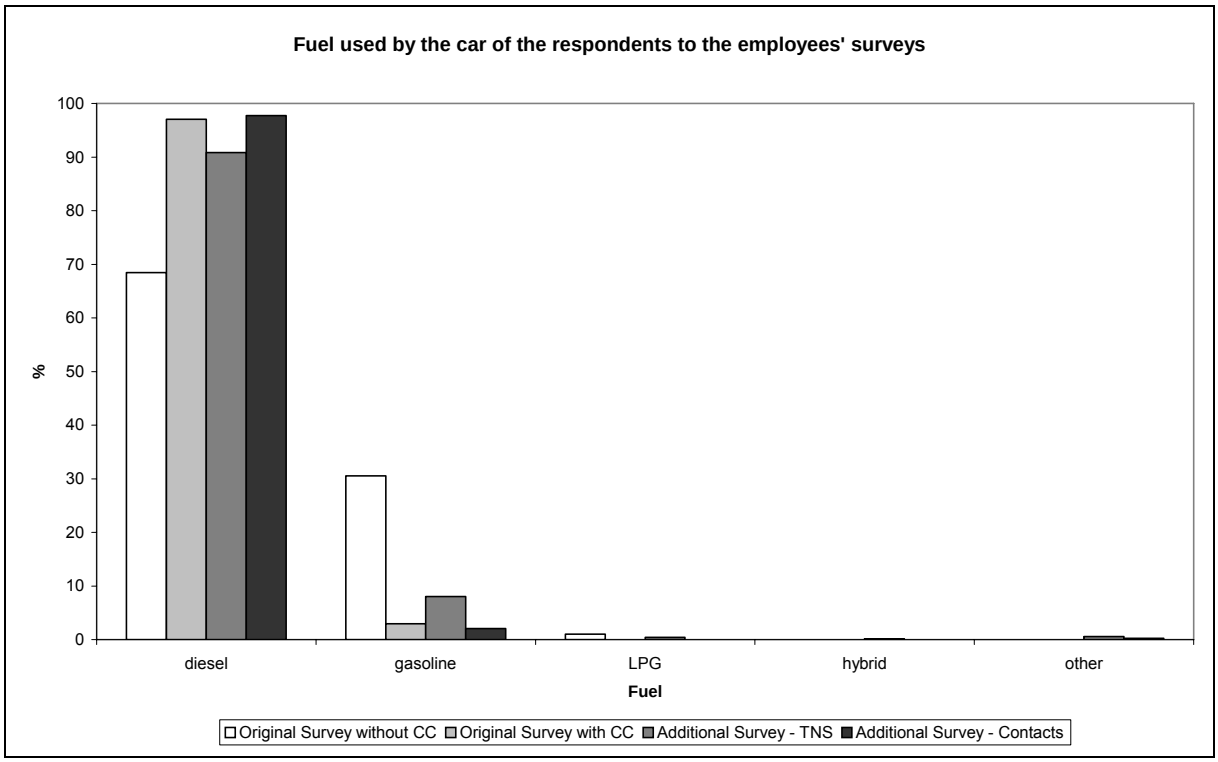

Figure 28: Fuel used by the car of the employees participating to the surveys

In general, the surveys inform us that **company cars have higher annual mileages (Figure 29) than private cars**. The average annual mileage is close to 19 700 Km for the original survey without company cars, whereas it is around 32 500 Km for the three samples with respondents having a company car.

Only a fourth of the company car user respondents drive less than 20 000 Km per year while 2 private cars on 3 are below this annual mileage. There is only 1 company car on 236 (one no-response) with an annual mileage under 5 000 Km in the original survey. The figures are quite similar for the additional surveys with almost 70% of the company cars driving more than 20 000 Km each year. When we look at the COCA report (referencing to Mobel data), we observe that the results are really close: in both cases (our surveys and Mobel survey), something like 1 person on 2 having a company car drives more than 30 000 Km a year while this ratio falls down to 12.5% for people without company cars.

Let us remark that we can only make comparisons of sub-samples inside a given survey and not between samples presenting the same characteristic (having or not a company car) of different sources. Indeed the data collections (survey protocol) and questionnaires are different. Hence results can not be scientifically compared.

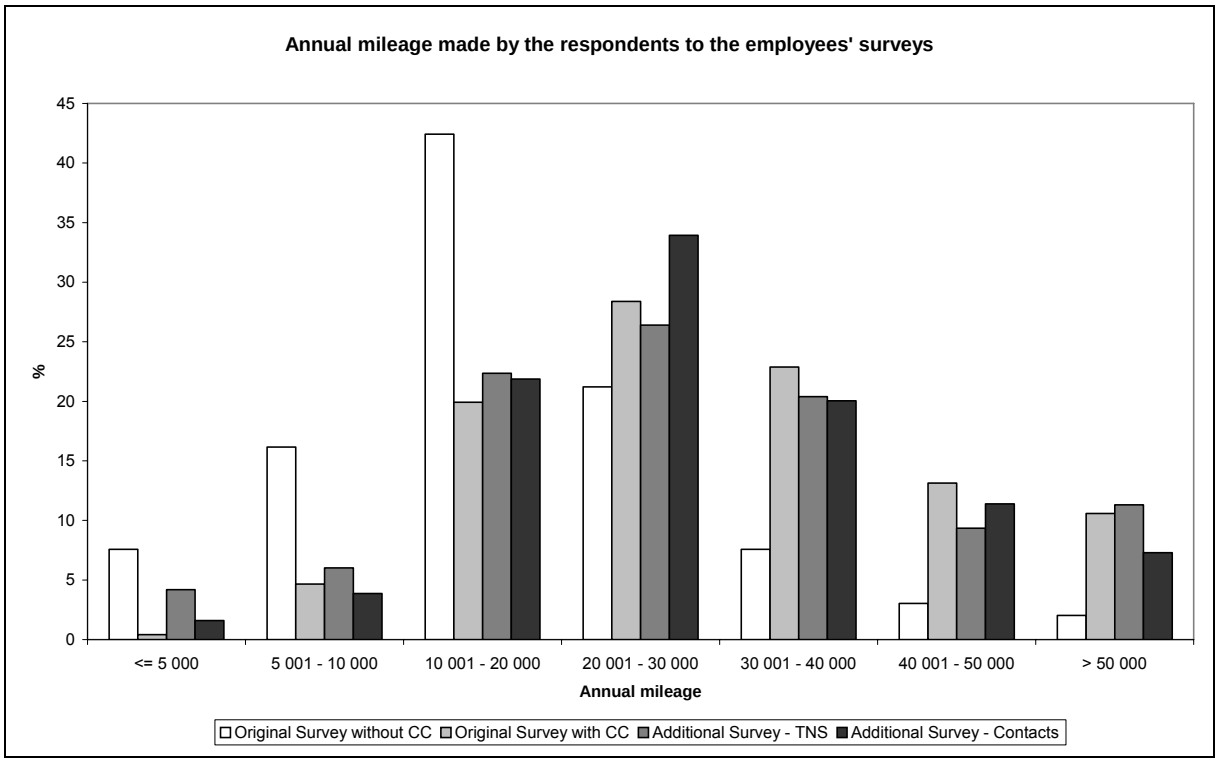

Figure 29: Annual mileage made by the employees participating to the surveys

Then we asked the respondents (only the one with company cars) to split their annual mileage into three categories of displacements. It is an important issue which can be analysed thanks to our survey: the distribution of this mileage between home-work displacements, professional journeys and finally private ones.
To ensure a harmonised consideration of the different kinds of trips, we made three categories, although home-work displacements are legally also being considered as private ones. Indeed, some respondents might be inclined to (erroneously) consider their home-work displacements as professional ones, while others might have considered these as private. This more complete distinction allows to avoid this confusion.

Below, we present the percentages of these displacements in the total annual mileage for people having a company car.

With regard to home-work displacements (Figure 30), about 50% of the respondents of the additional sample recruited by the market research company indicate that home-work displacements represent less than 30% of their annual. Inside the original sample with company cars, for one person on two the home-work trips represent more than 50% of their annual. This percentage is the same for the researchers' contacts participating to the survey. Let us also remark that 4 people (on 720) from the TNS- Dimarso sample declare that they only use their company cars for home-work trips.

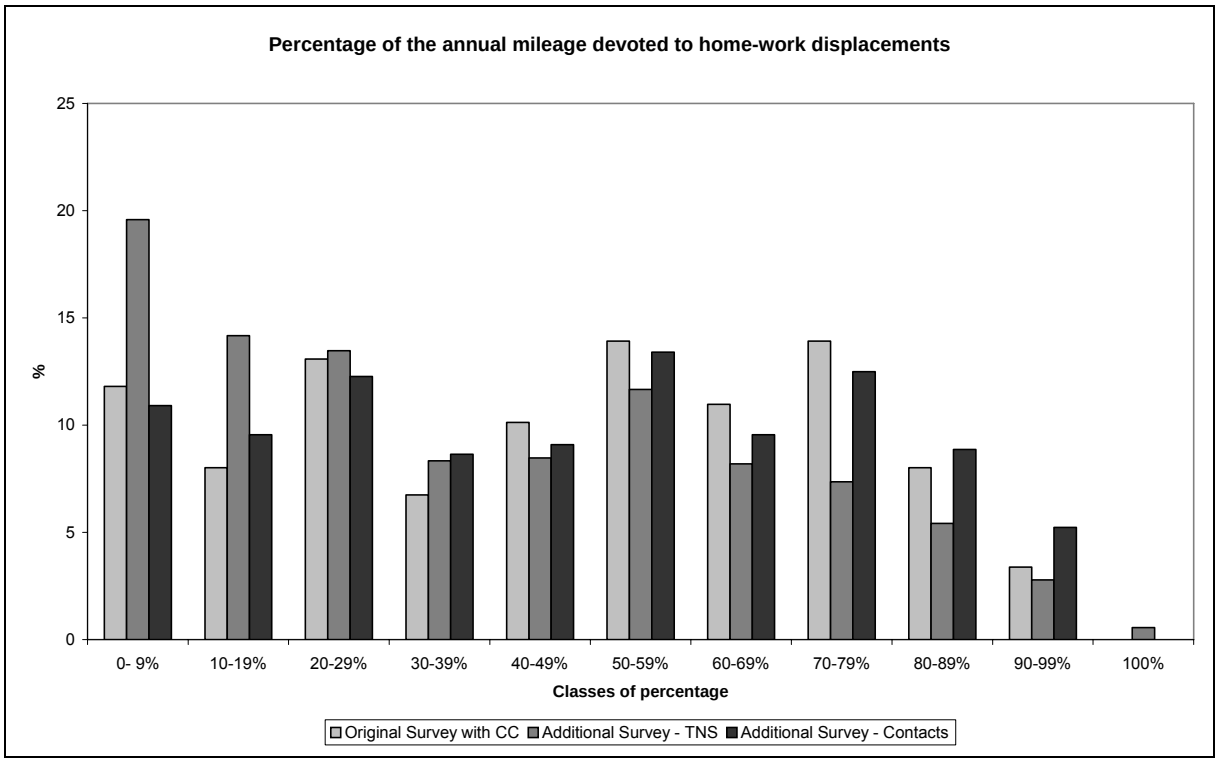

Figure 30: Contribution of the home-work trips to the annual mileage of company cars

The most striking thing in Figure 31 about the importance of professional displacements in the annual mileage is the numerous amount of respondents of the researchers' contacts (some 37.5%) declaring to attribute less than 10% of their annual mileage to professional reasons. Inside this sample, only 15% of the respondents attributes more than 50% of their annual mileage to their work. This proportion rises to 25% in the original sample whereas approximately 40% of the respondents from the third sample drives half of their annual kilometres in the framework of professional trips.

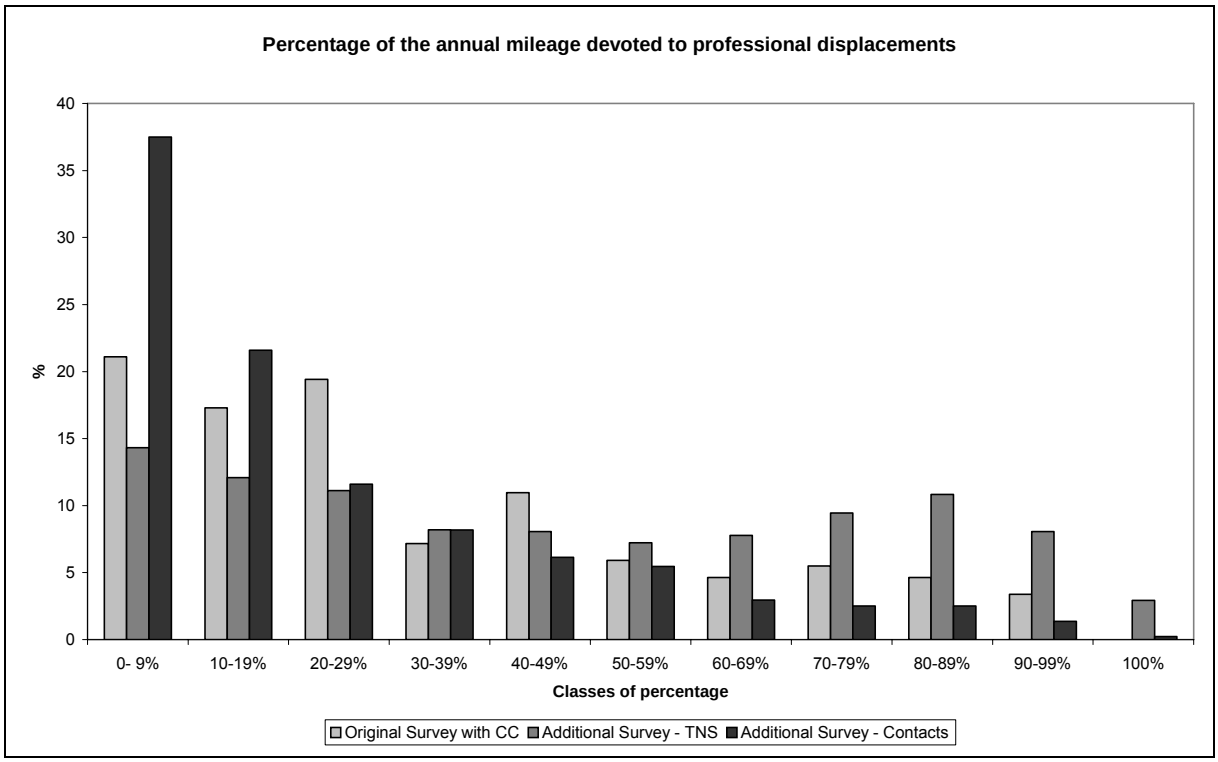

Figure 31: Contribution of the professional trips to the annual mileage of company cars

When considering the contributions of the private displacements to the annual mileage, it appears that they differ between the different samples (Figure 32). 28.4% of the researchers' contacts assign more than the half of their kilometres to private reasons whereas in the original sample and in the sample recruited by TNS-Dimarso, the proportions of respondents attributing more than half of their kilometres to private purposes is lower and stands at respectively 15.2% and a little more than 10.
We can point out that there are 5 respondents (on a total of 440, i.e. 1.1%) from the researchers' contact sample who declare that they only use their company cars for private displacements.

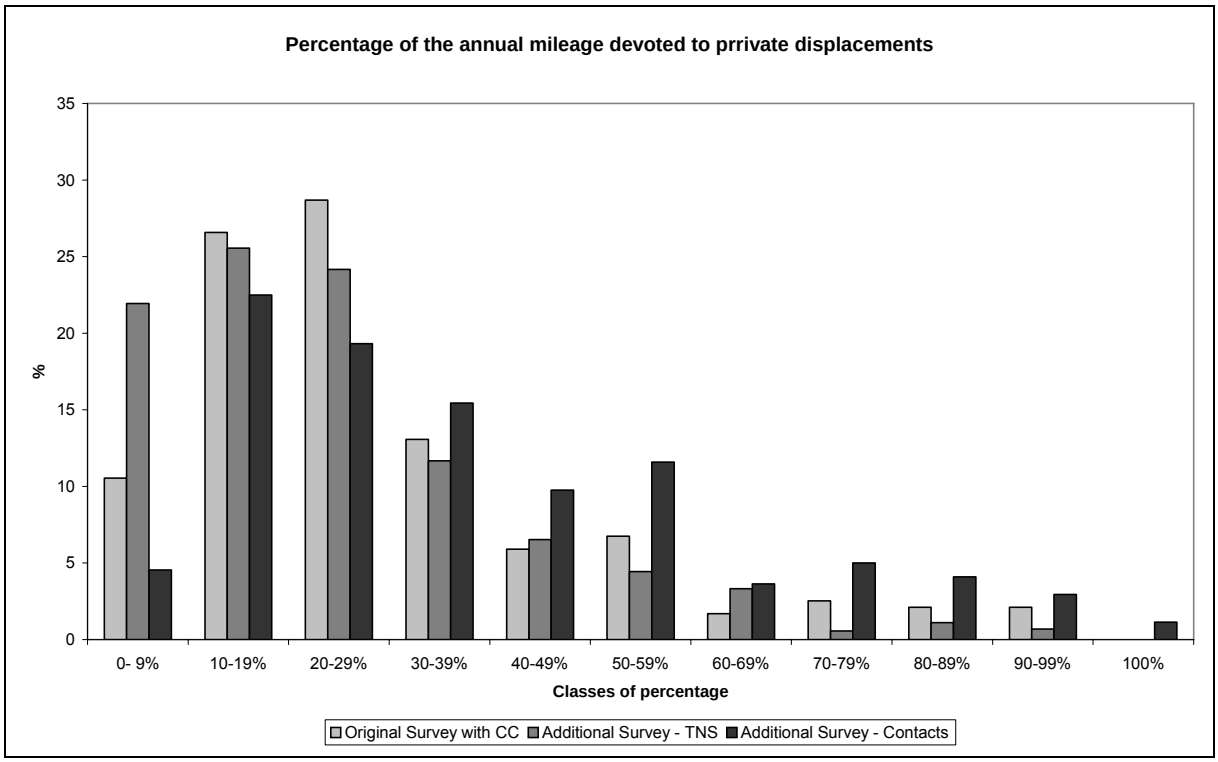

Figure 32: Contribution of the private trips to the annual mileage of company cars

In order to resume the last three items, we calculated the average contribution of each kind of displacements to the annual mileage for each sample (Table 3). **People participating to the original survey mainly use their company cars to reach their workplace and go back home; they then make more professional trips than private ones. The respondents recruited by the research market company behave in a different way: the principal contribution to their annual mileages is (on average) generated by the professional displacements, before home-wok trips. Private trips have also the smallest influence on the annual mileage. Researchers' contacts have yet a different order of importance for the repartition of the displacements. Similar to the respondents of the original survey, their kilometres are mainly related to home-work trips and are of the same magnitude, but contrary to the original survey respondents, they make more private trips than professional displacements.** There can be several explanations for this finding: remember that the people of the last sample are proportionally higher educated and younger, and one knows these are two characteristics of people being more mobile, especially for private reasons.

	Average contributions to the annual mileage (in %)		
Sample	**Home-work trips**	**Professional trips**	**Private trips**
Original survey with CC	43,7	30,2	26,1
Additional Survey | TNS	34,5	44,4	21,1
Additional Survey | Contacts	44,1	20,8	35,1

Table 3: Average contribution to the annual mileage of home-work trips, professional trips and private trips according to the sample

These repartitions have to be influenced by what is allowed by the firms and by the refunding of the fuel expenses. One could think that professional displacements are always allowed and refunded, but even if it is so in the majority of the cases, some people may not use their company cars for such displacements or are not refunded for the fuel. There are even some respondents who declare that they are not allowed to use their company car to go to work (2 on

237 in the original survey - Figure 33, i.e. less than 1%, 29 on 720 in the additional survey resulting of the Flemish Government's grant - Figure 34, i.e. 4% and 4 on 440 among the researchers' contacts - Figure 35, i.e. 0.9%).
We can observe that, as expected, private displacements abroad are less allowed by the employers, and when they are allowed, fuel expenses are rarely refunded. **Concerning the private displacements in Belgium, they are very often allowed** (almost 100% in the original survey and the researchers' contacts sample and 90% in the additional survey funded by the Flemish Region), **and even refunded by the company** (respectively 88.2, 92.5 and 71.1% of the cases).

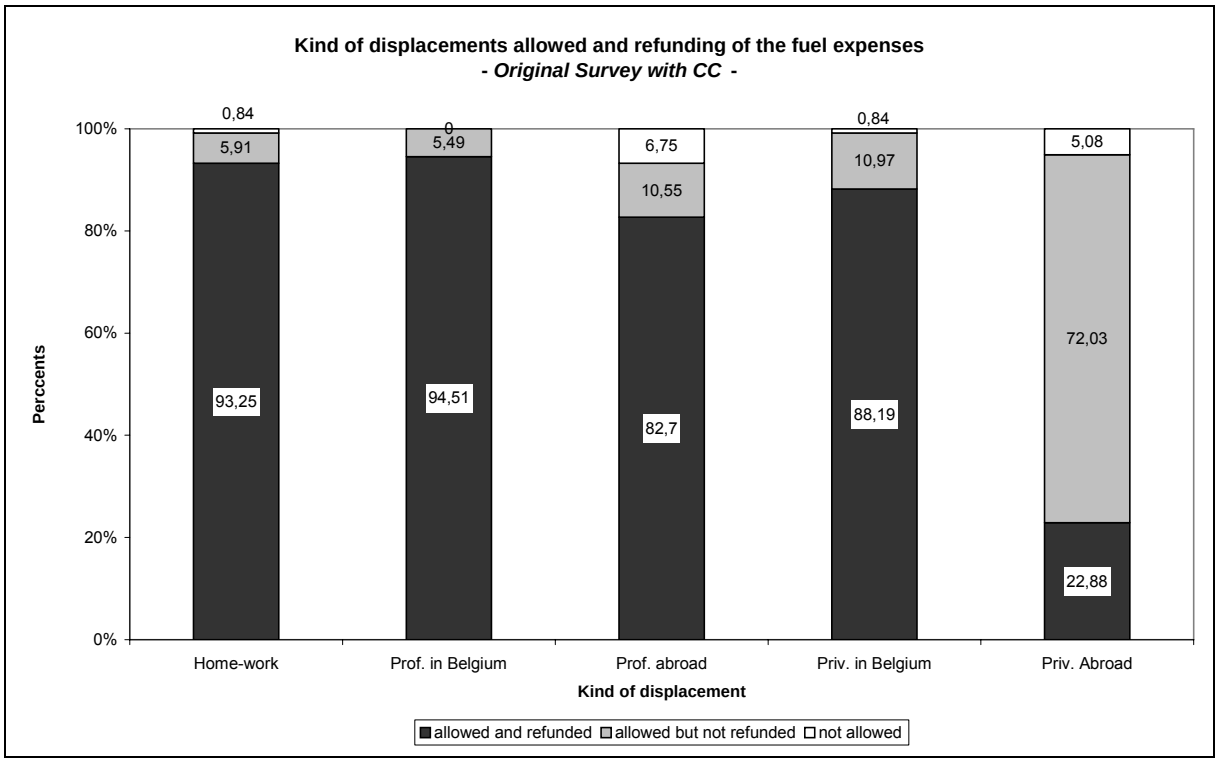

Figure 33: Kind of trips allowed and refunding of the fuel expenses (original survey with company car)

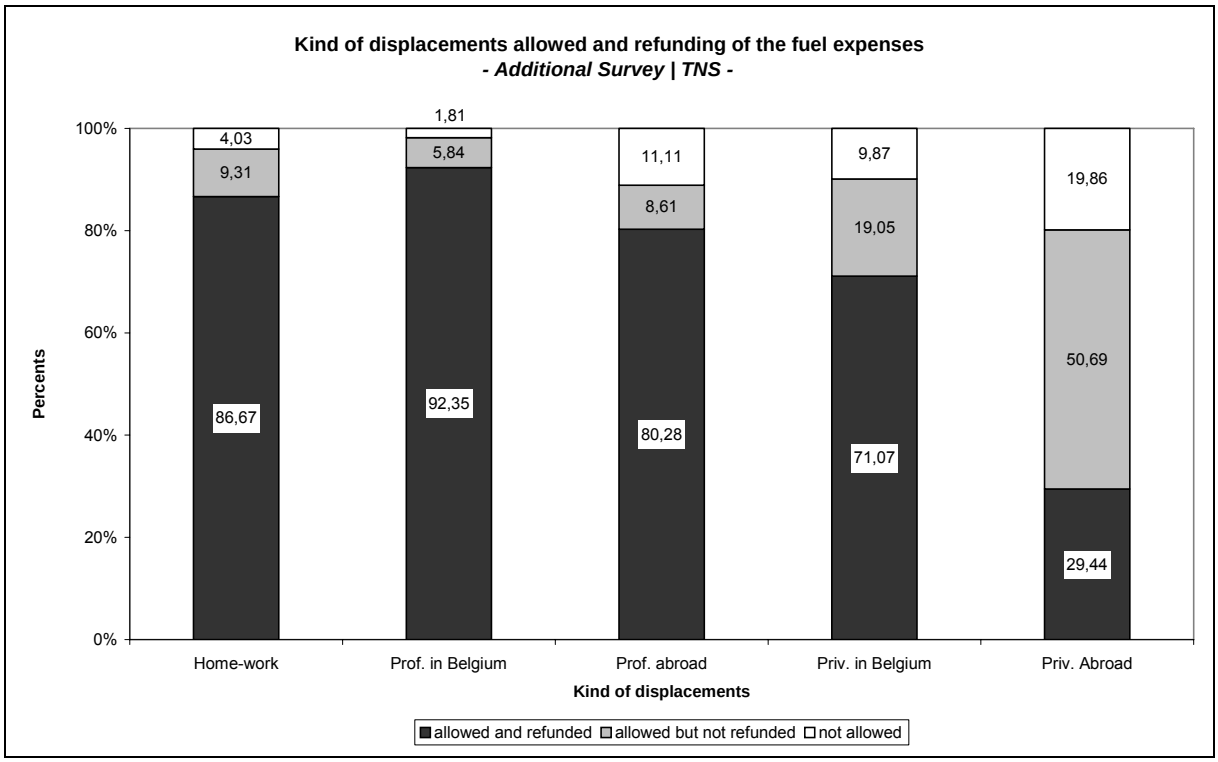

Figure 34: Kind of trips allowed and refunding of the fuel expenses (additional survey | TNS)

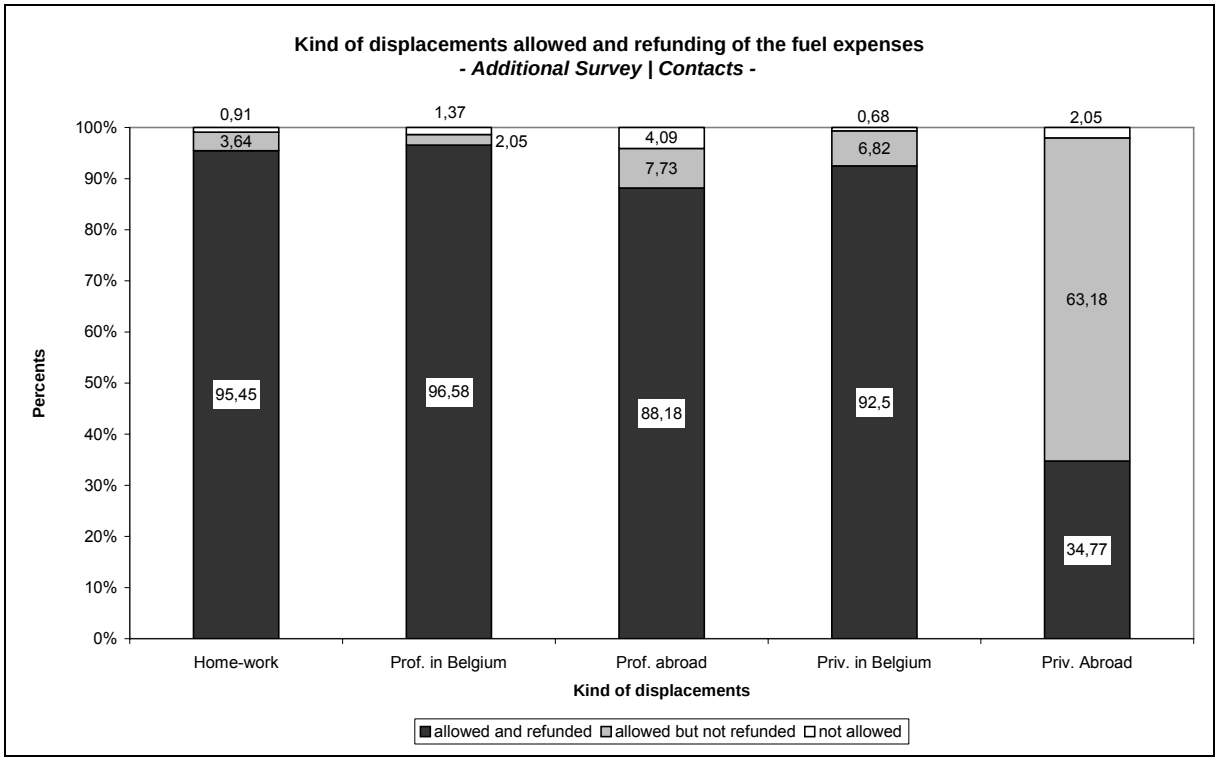

Figure 35: Kind of trips allowed and refunding of the fuel expenses (additional survey | Contacts)

One could think that workers need a company car at their disposal if they often have to make displacements for their jobs. That is what is learnt from the Figure 36 below. We can observe that there is no respondent of the original survey with company car who declares never having to make professional displacements. If we aggregate the responses "rarely" and "never", these have been indicated by 64.7% of the respondents in the original sample without company cars, whereas in the original sample with company car, only 10.7% has indicated that they never or

rarely have to make professional trips, 9.5% in the additional survey funded by the Flemish Region and 24.9% among the researchers' contacts. *A contrario*, **if we consider the respondents having to travel for their work "every day" and "very often", these are much more numerous within the samples of respondents having a company car at their disposal**: it concerns 2 out of 3 respondents in the additional survey funded by the Flemish Government (65%), 1 out of 2 in both the other samples with company car (52.6% for the original one and 49.7% in the second additional one), whereas they are only 1 out of 8 in the sample without company car (12.3%).

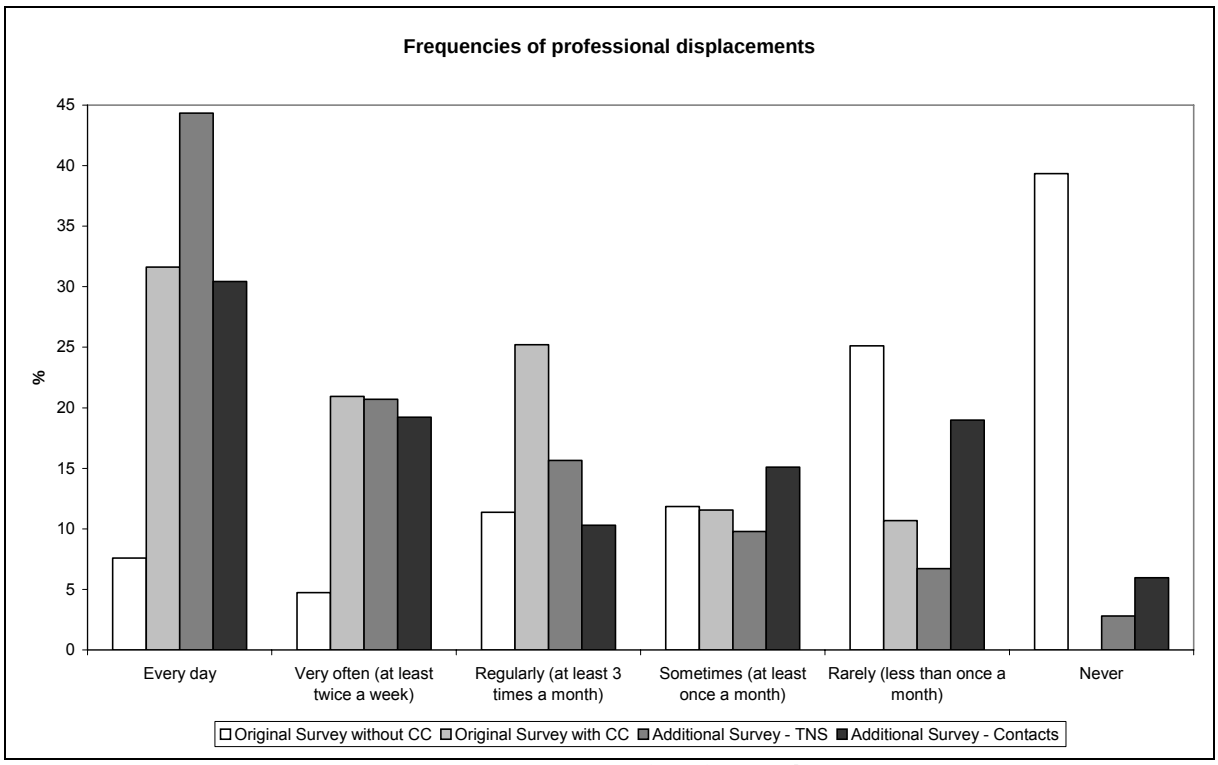

Figure 36: Frequencies of professional trips

Concerning the usual mode to go to work, **a great majority of the respondents with company car actually use their company car to go to work** (see Figure 37 below): 93.4% in the original sample, 85.7% among the people recruited by the research market company and 84% among the researchers' contacts. A few of them in the additional survey "contacts" use their own private car despite having a company car. **People without company car mainly go to work with their private car (59.2%). Nevertheless, for these people, the train is used by more than 1 respondent out of 4, while this mode is rarely used by people having a company car** (maximum 5.3% among the researchers' contacts). In the additional survey subsidized by the Flemish government, about 5.6% of the respondents make the displacement between their house and their workplace on foot.

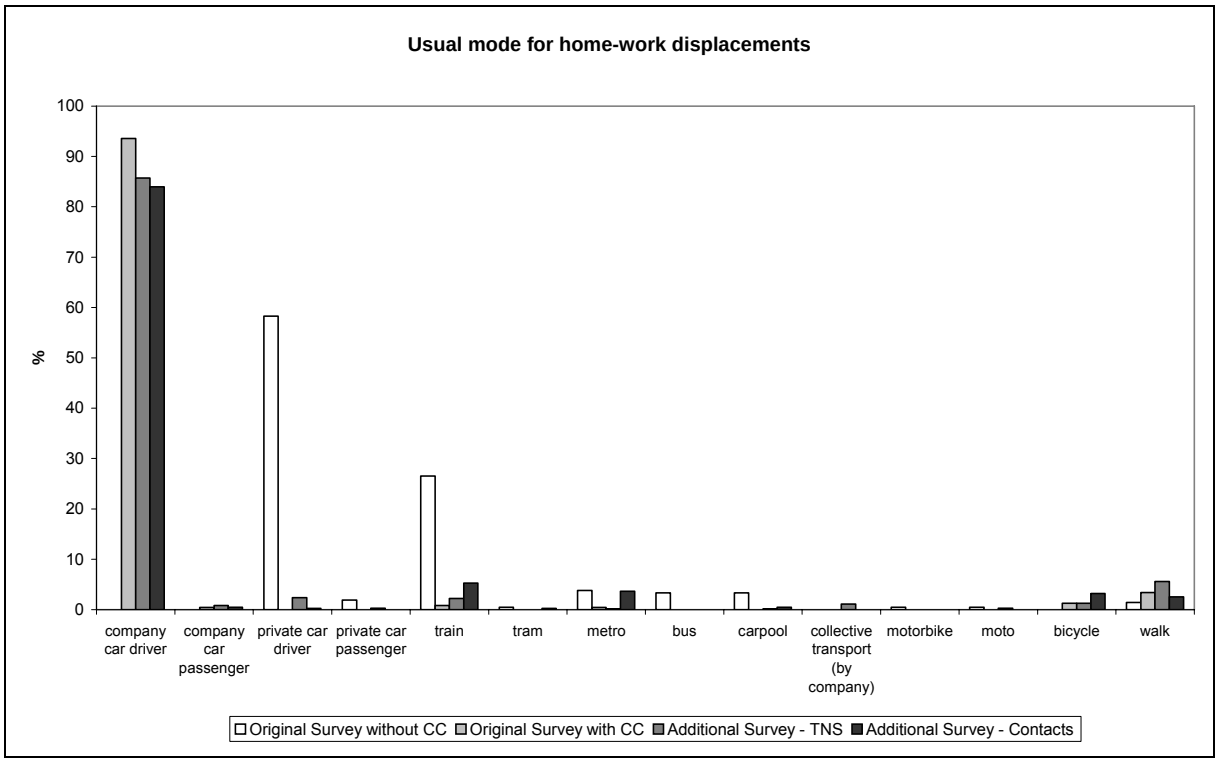

Figure 37: Usual mode for home-work trips

Trips recorded

The last part of the descriptive analyses concerns the trips that were reported by the respondents. Remark that for this sub-section, we use the data collected thanks to our survey but we only keep trips schemes from people recording at least a round trip (with possible intermediary stops). Indeed many respondents recorded one displacement and then gave up filling the questionnaire (so we got many people without return at home). These data were probably incomplete and were deleted for the trips analyses, in order to rely on higher-quality data.

First, the number of trips is analyzed (Figure 38 and Figure 39). The most frequent number of trips is 2 (first, I go to work, then I return back home). Around 70% of persons without a company car report to have made 2 or less trips on the reference day. For persons with a company car in the original survey this percentage is only 54% so persons in this group are more likely to make more than 2 trips a day. The additional surveys confirm this result, although less outspoken for the personal contacts: 56.6% for the TNS survey and 67% for the personal contacts survey.

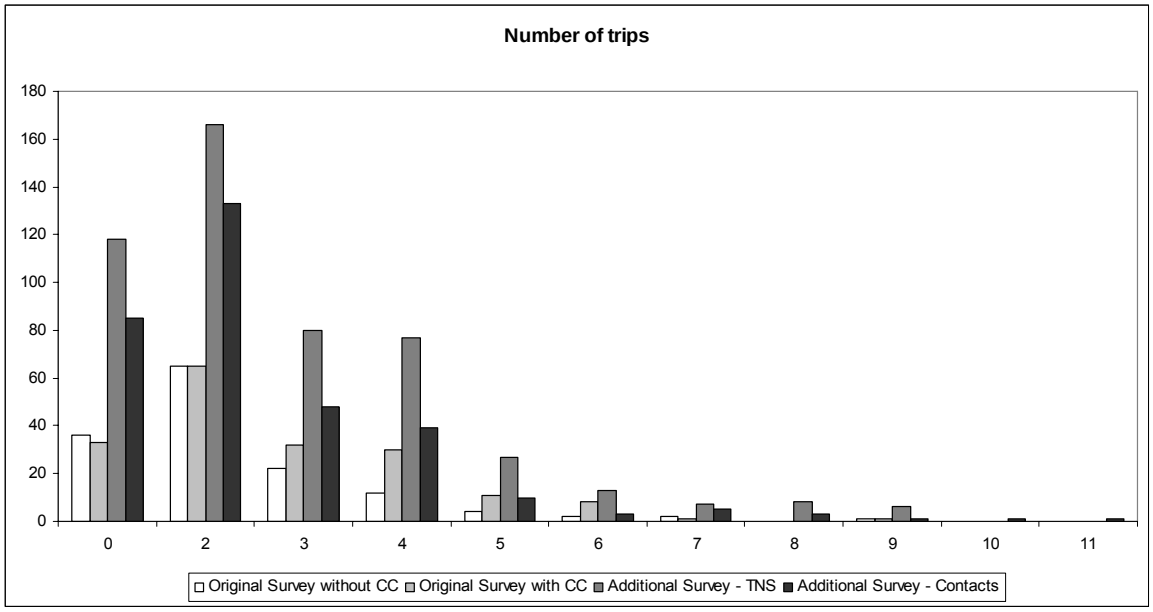

Figure 38: Number of trips recorded for the reference day

Next, we have a look at the average number of trips made on the reference day (Figure 40). For persons without a company car, the average number of trips per day is 2.07; for persons with a company car in the original survey, this number equals 2.57. In the additional survey TNS the average number of trips is 2.49 and in the additional survey with personal contacts the average number is 2.2. Based on these results, we can conclude that **the average number of trips is higher for people with a company car than for those without**. However, we would like to remark that these average figures are quite low in comparison with other surveys, we will have to be careful in the exploitation of our results in any comparison with other surveys using different methodologies.

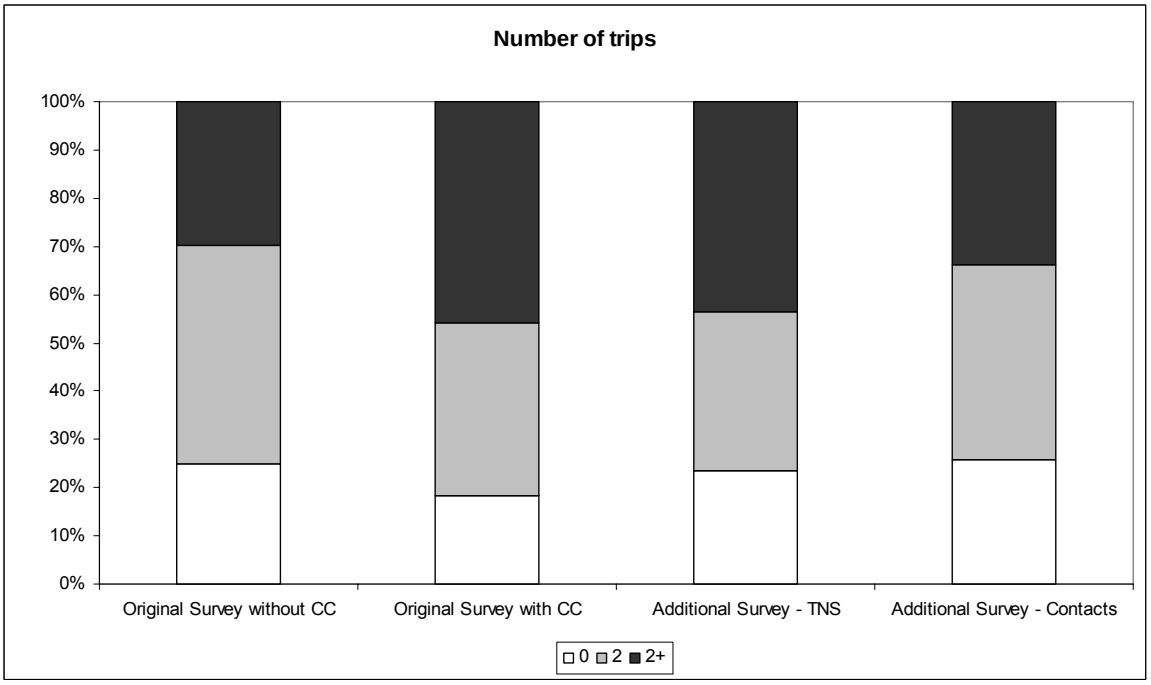

Figure 39: Number of trips recorded for the reference day (0, 2 or 2 and more)

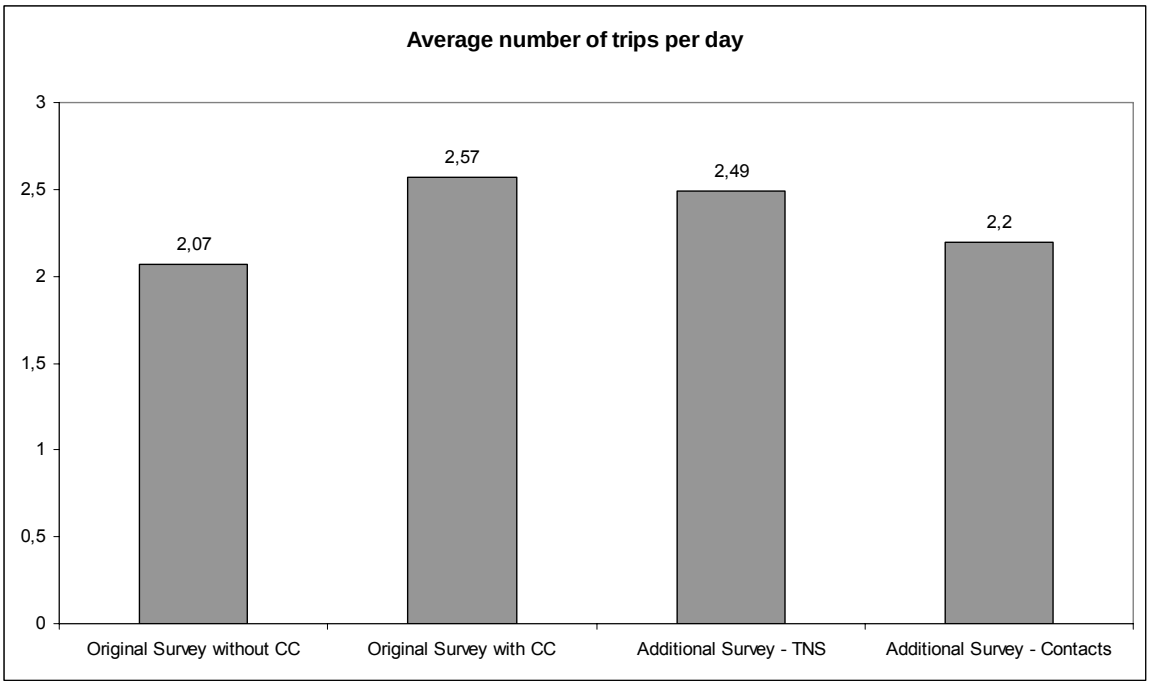

Figure 40: Average number of trips per day according to the survey

When comparing the average number of trips on a weekday or in the weekend, Figure 41 shows that there are on average more trips on a weekday than on a day in the weekend, both for persons with a company car as for persons without a company car.

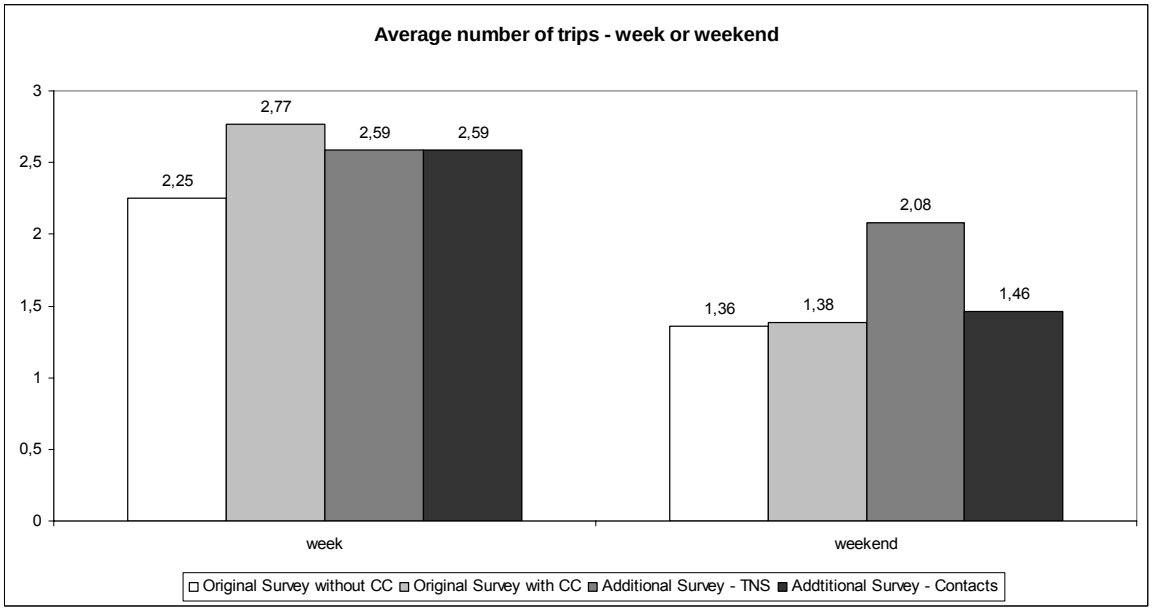

Figure 41: Average number of trips on a weekday or in the weekend

In Figure 42 and Figure 43, the distance of all trips is analysed. When comparing the results of the original survey for persons with and without a company car, 53.5% of all trips is less or equal to 20 kilometres for persons without a company car while only 45% of all trips is less or equal to 20 kilometres for persons with a company car. For the additional surveys, the difference is less distinct.

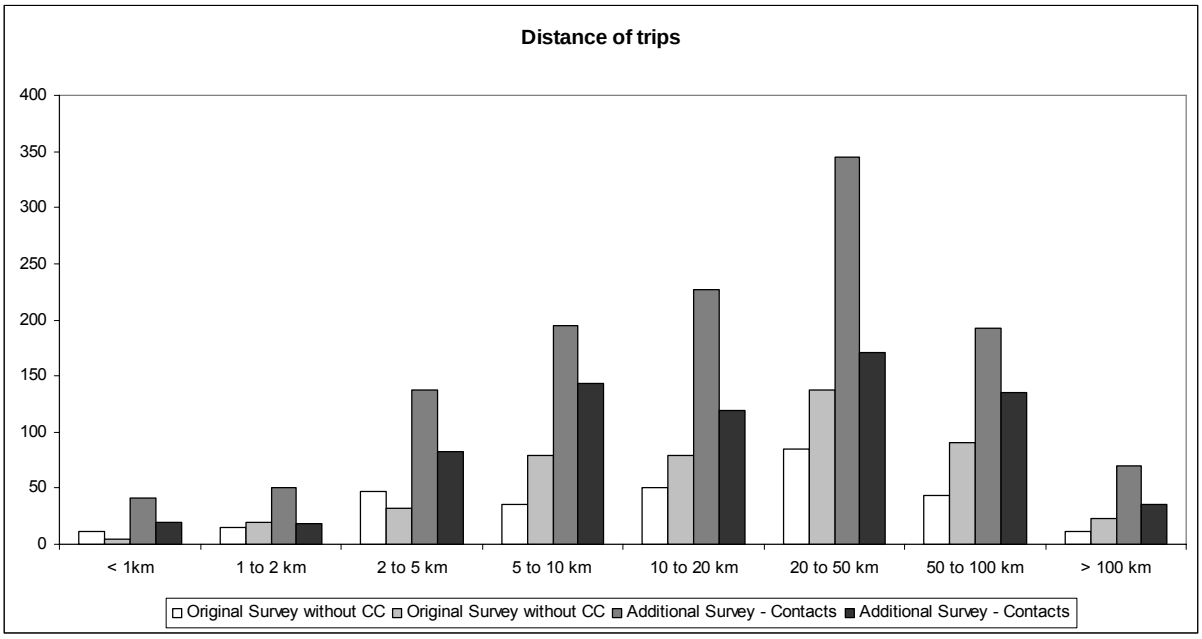

Figure 42: Distance of recorded trips

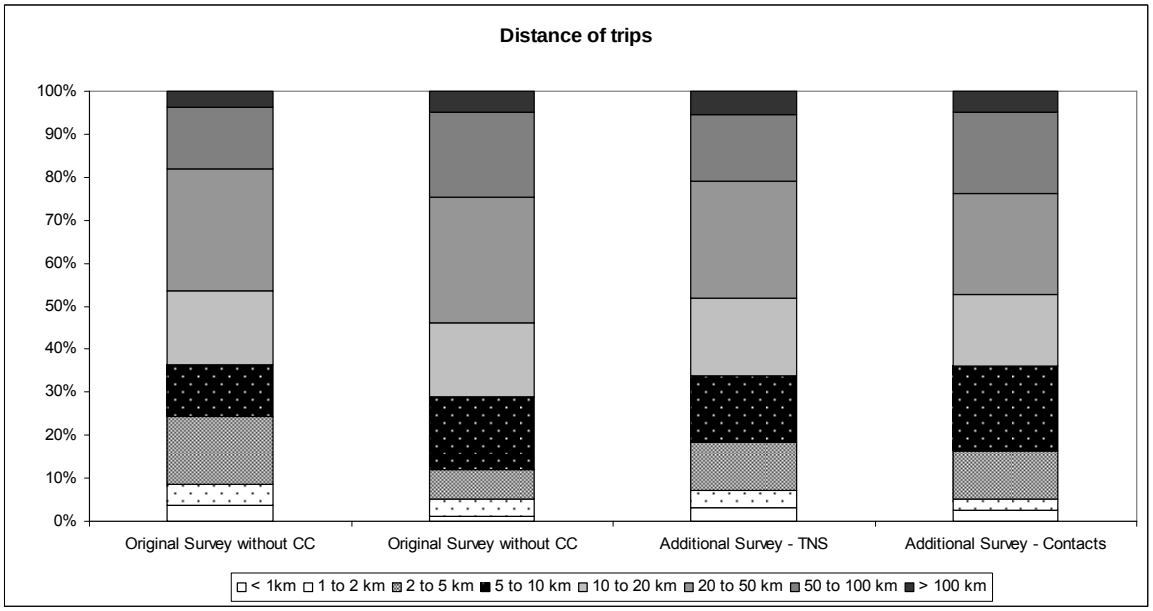

Figure 43: Distance of recorded trips (percentages)

Next, we analysed the distribution of the departure hours (Figure 44 and Figure 45). For persons without a company car the two peak hours are clearly dominant. However, for persons with a company car, the trips are more spread over the whole day.

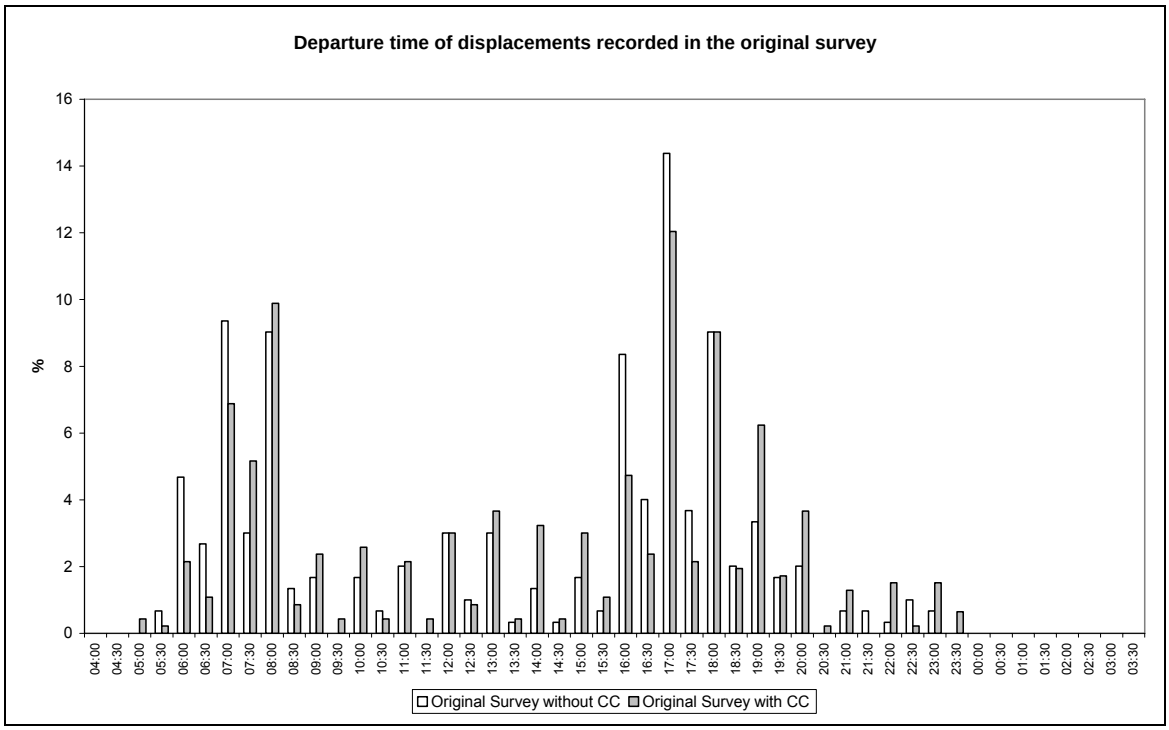

Figure 44: Departure hours of trips recorded for the original samples

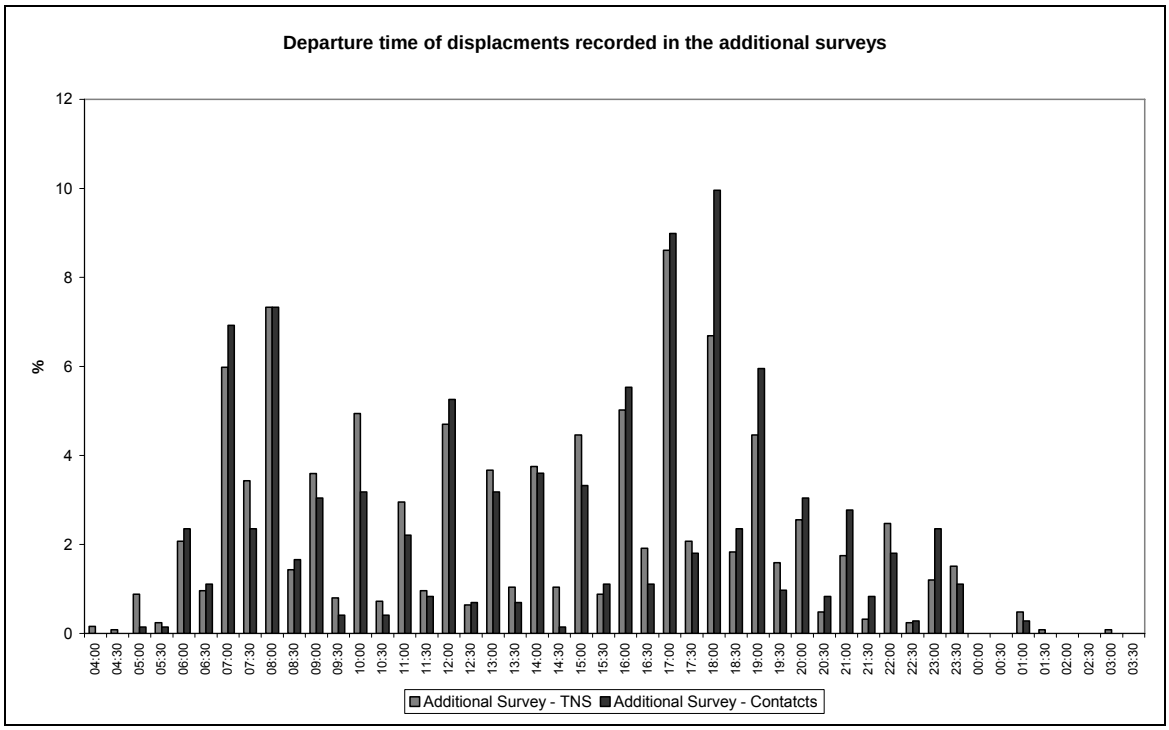

Figure 45: Departure hours of trips recorded for the additional samples

When investigating the mode of transport used for the reported displacements (Figure 46 and Figure 47[7]), the most important finding is the difference in use of public transport. **Respondents without a company car use public transport in 14% of all trips. Respondents with a company car in the original survey only take public transport in 1.3% of their trips**. The additional surveys show comparable results: 1% public transport in the TNS survey and 3.6% public

[7] For this figure (and some following) we grouped the different modes in order to get readable graphs and because several of these modes had really little sizes.

transport in the personal contact survey. **Respondents without a company car use the car in 80% of their trips, persons with a company car in the original survey use the car in 94% of all trips**. The additional surveys (TNS and personal contacts) confirm these findings: respectively 95% en 92% of all trips are done by car.

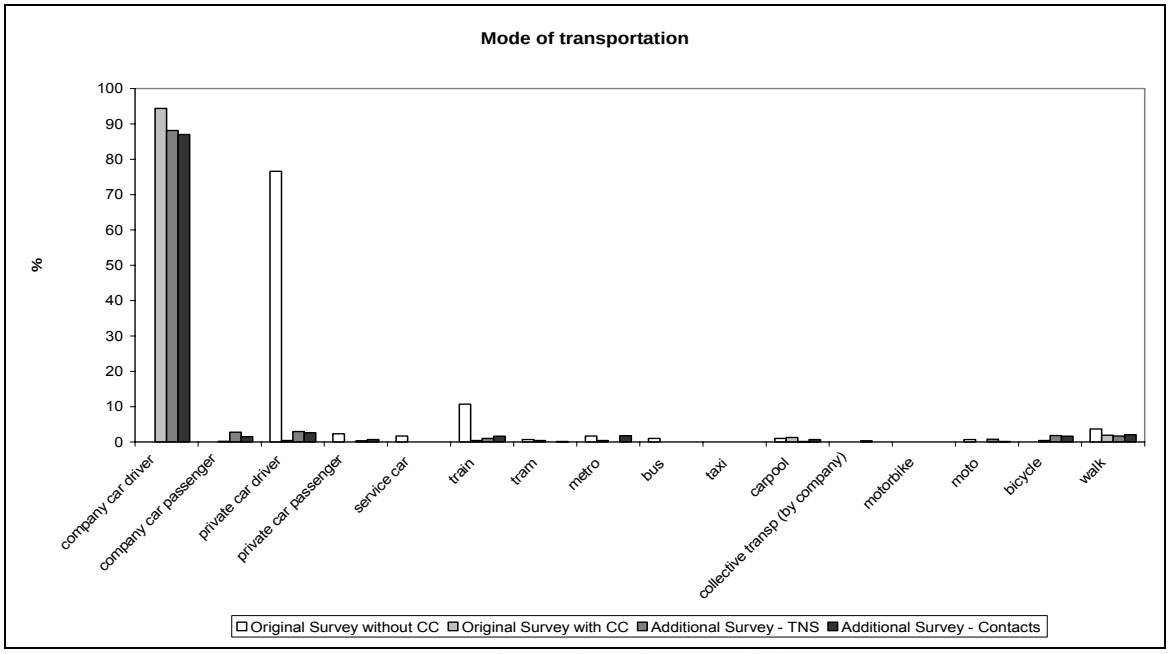

Figure 46: Modes used for the recorded trips

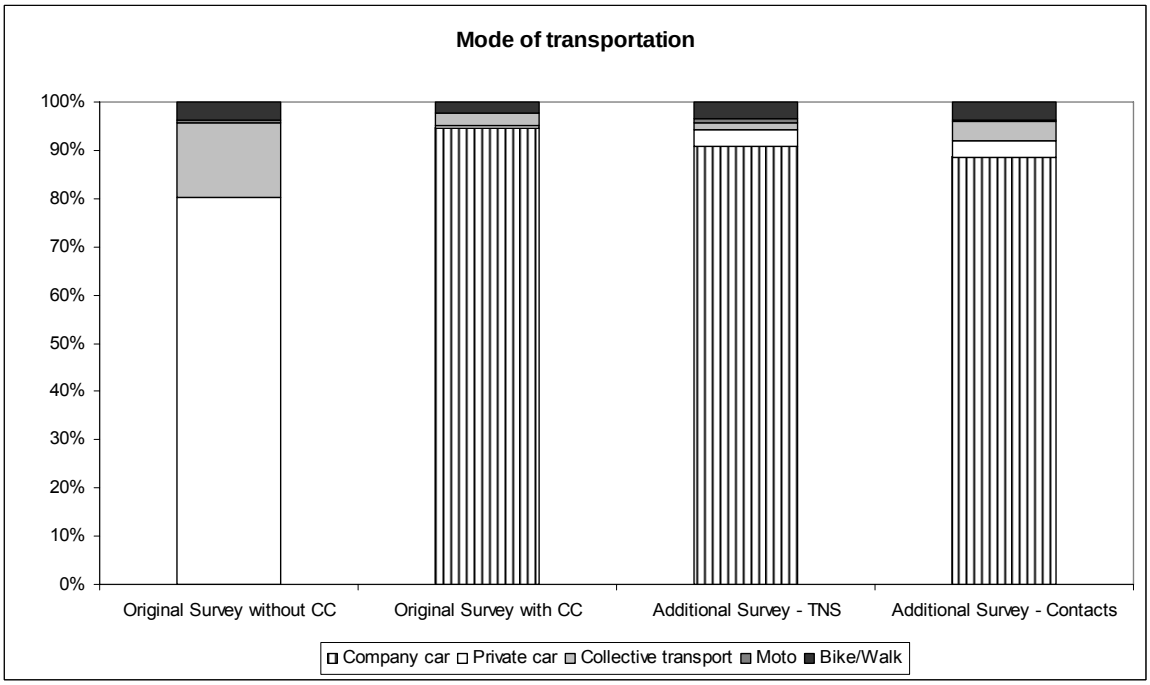

Figure 47: Modes used for the recorded trips (percentages)

Finally, the purpose of the trips is analyzed (Figure 48[8]). **Persons without a company car make only 2.68% professional trips while for persons with a company car one trip out of ten is a professional trip.** For the additional surveys (TNS and personal contacts) the percentages are

[8] For the figures about the purpose of trips we grouped the proposed modalities to respondents to avoid working with too little sized groups

respectively 7.41 and 6.78. Private trips are 20% of all trips for persons with a company car and 23.41% of all trips for persons without a company car. For the additional surveys (TNS and personal contacts) the percentages are respectively 23.82 and 29.88.

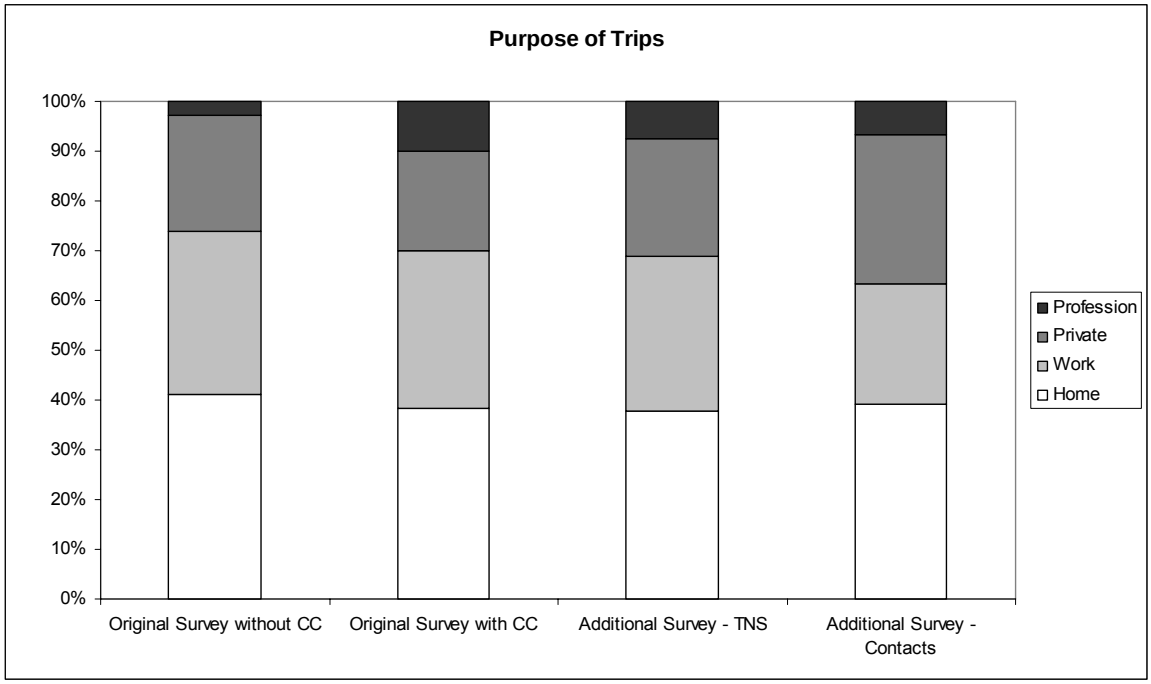

Figure 48: Purpose of the trips recorded

When only looking at the trips that were made with a company car (Figure 49), 20% of these trips are for private purpose in the original survey. In the additional survey, the percentage of private trips is 22.61% for TNS and 29.22% for the personal contacts. Professional trips make out 10.71% of all trips in the original survey and 7.98% and 7.19 in the additional surveys (TNS and personal contacts respectively).

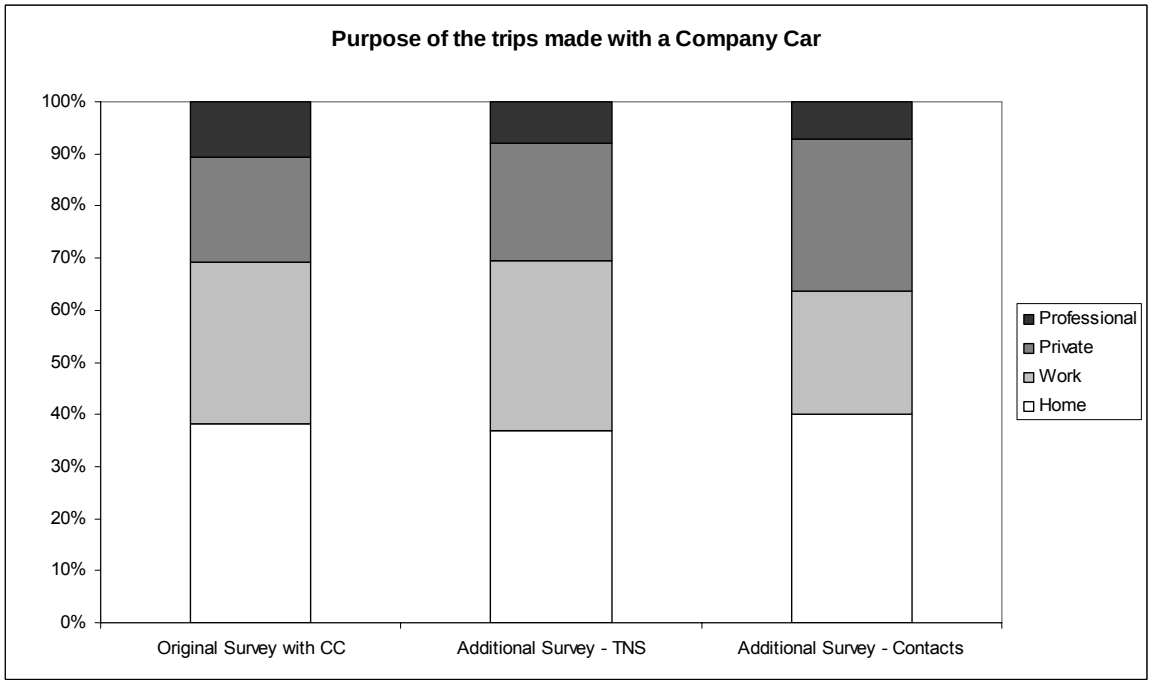

Figure 49: Purpose of the trips made with a company car

The surveys finished with questions about the use of company car by someone else than the respondents and during the weekend before the reference day (this last question was not proposed to people having a Saturday or a Sunday as their reference day). In the Table 4 below, we can observe that **few respondents (about 8.5%) declare that somebody else used their company car during the reference day. When it is the case, the distances travelled by these people are around 30 km**.

	Use of the company car by someone else than the employee for the reference day		
Samples	**No**	**Yes**	**If yes, average mileage (km)**
Original Survey with CC	91,71%	8,29%	24,1
Additional Survey - TNS	91,37%	8,63%	29,9
Additional Survey - Contacts	91,35%	8,65%	35,8

Table 4: Use of the company car by somebody else than the respondent during the reference day

The Table 5 gives the information about the use of company cars during the weekend. **Respectively 86.4%, 72.6% and 87.8% of the respondents of the samples with company cars declare to use their company car during the weekend**. And they drive about 125 km for the two first samples concerned and 170 km for the researchers' contact sample. For your information, the respondents without company car for which the reference day was a Saturday or a Sunday declare to drive 65 km during this reference day with their private cars. This last figure can not really be compared as it was not collected *via* the same question and only reflects the behaviour of 14 respondents without company car.

	Use of the company car during the week-end		
Samples	**No**	**Yes**	**If yes, average mileage (km)**
Original Survey with CC	13,56%	86,44%	126,9
Additional Survey - TNS	27,44%	72,56%	127,5
Additional Survey - Contacts	12,18%	87,82%	166,8

Table 5: Use of the company car during the weekend

MODELLING

In this section, we will first describe a model on the impact of the accessibility of the firms on the attribution of company cars. Then, the factors influencing the ownership of a company car will be analysed from the point of view of the employee; which people have the most of chance to get a company car? We will also focus on the differences in annual mileage between private cars and company cars taking into account the home-work distance and the professional trip frequency. The different kinds of company car users will alos then be defined.
Finally, we will analyse the substitution effect. Thanks to a question in our questionnaire about the mode people would use to reach their workplace if they had no company car, we will be able to analyse how people would behave without company cars. If they would not use public transport to make such displacements, we will study the reasons leading them to not have recourse to the public transport.

Accessibility Model

Based on the accessibility indicators discussed in the descriptive analysis of the companies, it was analyzed whether accessibility, both in terms of public and private transport, plays a role in the company car policy of the company. It should be pointed out that the accessibility perceived and declared by the companies was verified by comparing their answers on public transport availability to the actual situation. For this, we looked up each of the company locations and checked whether the declared distance to and frequency at the nearest public transport stop matched the actual distances and frequencies. After it was confirmed that the declarations of the company's representatives corresponded to the actual situation, a binary logistic regression model was built up in order to identify the accessibility variables predicting the likeliness that the company attributes company cars. This regression model can be used for prediction of the probability of occurrence of an event and makes use of several predictor variables that may be either numerical or categorical. The logistic regression applies maximum likelihood estimation after transforming the dependent into a logit variable. This way, logistic regression estimates the odds of a certain event occurring. In this case, it is used to identify the accessibility variables predicting the probability that a company attributes company cars. For this analysis, a re-categorization of the variables indicating the public transport accessibility was performed in order to enhance the interpretation of the outcome of the logistic regression. The variables initially included into the model were distance to the nearest public transport stop (with subcategories: far, medium and close), transit frequency at the nearest public transport stop (with subcategories: low, average and high) and a binary variable indicating whether the company provides parking support or not.

The method used for entering the significant predictors is the forward stepwise likelihood ratio method. This method automatically drops the variables from the model that are not significantly contributing to predicting the outcome of the dependent variable, which is in this case the likeliness that a company attributes company cars. A variable is considered to be a significant predictor in case the significance level is lower or equal to 0,05. The final model is selected by means of the last step rule, where adding an additional variable to the model would not significantly contribute to improving the model.

The model here developed is significant (Chi square = 8,532; p = .003), implying that the data adequately fits the model. The final model only identified one of the included variables as a significant predictor of company car attribution, namely parking support (Sig. = 0,004). The public transport accessibility indicators, distance and transit frequency, were dropped from the model as their significance level is above 0,005, implying they do not significantly contribute to improving the model and to predicting the outcome of the dependent variable (Table 6).

Impact of accessibility factors on the attribution of company cars		B	Sig.	Exp (B)
Parking	Parking support No parking support	 -1,613	 0,004	 0,199
Distance	Far Medium Close		0,122 0,106 0,384	
Transit frequency	Low Average High		0,052 0,207 0,277	

Table 6: Logistic regression parameters for accessibility factors predicting the attribution of company cars. The reference category for parking is set on parking support

From this logistic regression model, it can be concluded that **companies with parking facilities are more likely to attribute company cars. As far as the public transport accessibility is concerned, this does not seem to play a role in the company car policy**. This finding corresponds to the answers given by company's representatives with regard to the importance of accessibility and location within the attribution of company cars. A majority of companies indicated that accessibility does not play an important role in the attribution of company cars (see previous section). And when the surveyed company representatives were explicitly questioned about the impact of the company location on their company car policy, 92% of them answered negatively, indicating that their company location does not influence their company car policy.

Company Car Ownership

In this sub-section, the employee-side of the story will be explored. First, the socio-demographic profiles of employees will be analyzed in order to find out which of the factors constituting these profiles determine the likeliness of people being attributed a company car. Next, attention will be paid to the difference in annual mileage between company cars and private cars. The results presented within this section are based on the data collected with the original sample, where we contacted employees through their employers. This sample consists of 450 employees, of which there are 53% with a company car and 47% without a company car.

Socio-demographic determinants of company car ownership

In order to identify the impact of the socio-demographic profile on the company car availability of employees, a binary logistic regression was used. Based on characteristics such as age, gender, educational level, professional status, work location and home location, a logistic regression model could be composed. The method used for entering the significant predictors is again the forward stepwise likelihood ratio method and the final model is selected by means of the last step rule. The model is significant (Chi square = 97,023; p = .000), implying that the data adequately fits the model. The outcome of this logistic regression is shown in Table 7.

		B	Sig.	Exp (B)
Age	20-29 years 30-39 years 40-50 years 50 years and more	-1,073 -0,898 -0,672	0,003 0,006 0,042	0,342 0,407 0,510
Gender	Male Female	 0,876	 0,000	 2,402

Educational level	Lower educational level Higher educational level	0,706	0,010	2,026
Professional status	No management function Management function	0,842	0,000	2,320
Workplace Region	Flemish Region Brussels-Capital Region Walloon Region	 1,362 1,488	 0,000 0,000	 3,905 4,429

Table 7: Logistic regression parameters for socio-demographic factors determining company car attribution. The reference category for age is set on 50 years and more; for gender on male; for educational level on higher educational level; for professional status on management function and finally for workplace region on the Flemish Region.

With regard to the influence of age, it appears that the reference category of the eldest group (50 years and more) is less likely to have a company car compared to all the other age categories. A significant influence can also be observed with respect to gender: men tend to be more likely to have a company car compared to women. An explanation for this inequality can be found in the fact that there are more men occupying the jobs and functions where the use of company cars is more likely (Verreet, 2001 & Salarisenquête, 2004). As far as the educational level is concerned, a distinction is made between lower and higher educational levels corresponding respectively to high school (lower level) and college and university (higher level). The regression model outcome indicates that the odds of having a company car increase if the employee is higher educated. With respect to the professional status, the results show that employees without management functions are more likely not to have a company car compared to people in management or board functions. This finding confirms that function level is indeed one of the most important factors determining the attribution of company cars (SD Worx, 2006). Finally, also the influence of the workplace and home region was investigated. Home region did not appear to contribute significantly to predicting the likeliness of having a company car (Sig. = .090) and was therefore dropped from the logistic regression model. The workplace region on the other hand does appear to have an influence on company car attribution. The logistic regression indicates that, compared to the other two regions, the odds of being able to use a company car increase if the workplace is located in the Flemish Region (see also Cornelis et al., 2007).

From this binary logistics regression model it can thus be concluded that the **people who are most likely to have a company car are higher educated males, who are younger than fifty years old, and who are occupying a management or board function in a company located in the Flemish Region**.

Differences in annual mileage

Existing empirical researches (e.g. Hubert & Toint, 2002; Zwerts & Nuyts, 2004) suggest that the annual mileage covered by company cars is very significantly above that of private cars. Our analysis confirms that there is indeed a statistical significant difference in the amount of kilometres covered on a yearly basis between employees with and without company car ($F(1;428,265) = 110,388$; $p < .001$): **company car users drive significantly more kilometres than employees without a company car** (Figure 50). Moreover, based on the measurement of the association between both variables, their relationship can be described as being relatively strong (Eta = .443).

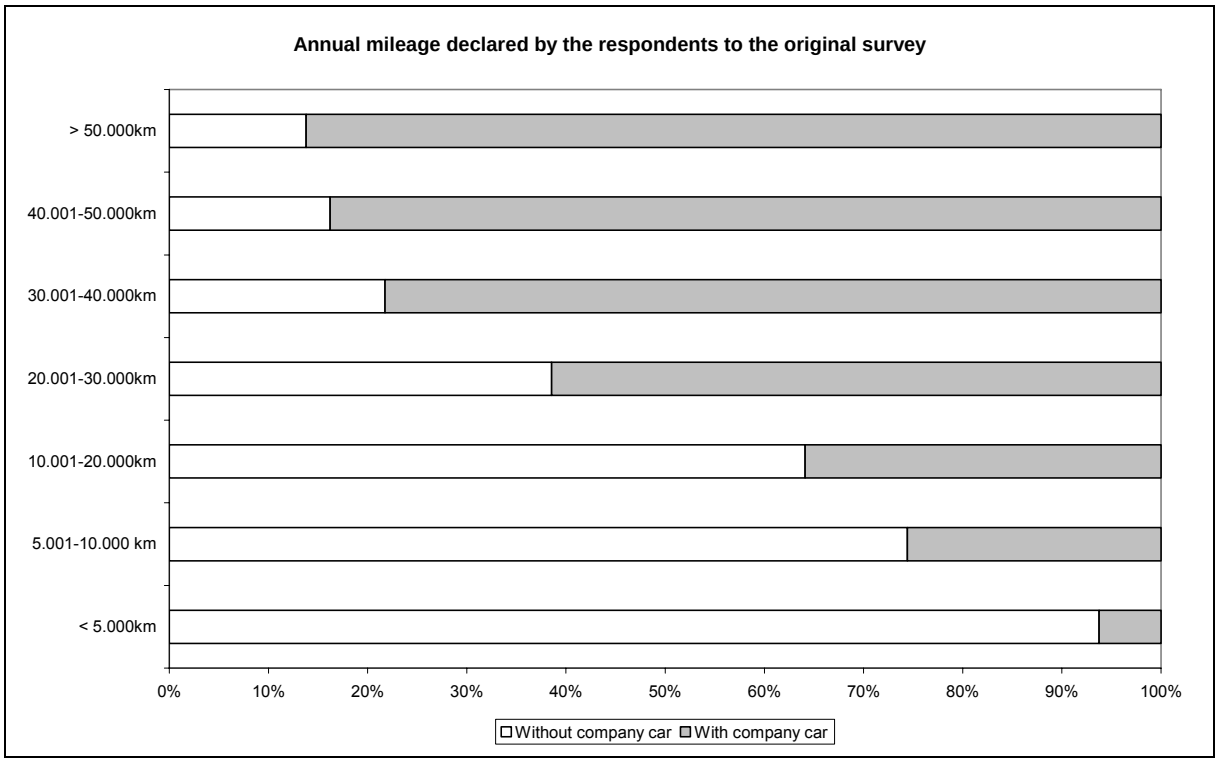

Figure 50: Comparaisons of the annual mileage inside the original survey

Zwerts & Nuyts (2004) estimated that the average amount of annual kilometres covered by company cars was 30.000kms, whereas private car owners only drove more or less 16.500kms per year. More recently, Vacature (2007) made notion of 36.000 annual kilometres for company cars and 16.700kms for private cars. Based on our collected data (original survey), we found an average of 33.000kms per year for company cars and almost 20.000kms for private cars. Company cars indeed appear to cover more kilometres per year than private cars.

Determinants of the annual mileage

In this section it will be analyzed which factors determine the annual mileage of cars (both company cars and private cars). To this end, a multilinear regression model was built taking into account socio-demographic factors as well as travel related factors. This linear regression will not only allow identifying the variables being significant predictors of the annual mileage, but it will also provide information on the relative contribution of each variable in the model to the outcome of the annual mileage. Studies on travel behaviour have already established that certain socio-demographic factors, such as age, gender and education, influence a person's degree of mobility. From these studies it could be derived that men tend to travel more than women, that higher educated people usually travel more than lower educated people and that younger adults are more likely to travel more than older people (Hubert & Toint, 2002; Dijst et al., 2002; Mérenne-Schoumaker et al., 1999). These three socio-demographic factors are included into the linear regression model as independent variables together with function level, home-work distance, frequency of professional trips and company car ownership.

	B	Sig.	Beta
Constant	29.513,075		
Gender	-3.472,238	0,004	-0,107

Home-work (HW) distance	< 5km	-17.417,222	0,000	-0,383
	5-10km	-18.876,354	0,000	-0,382
	11-20km	-15.298,964	0,000	-0,354
	21-50km	-9.458,429	0,000	-0,291
Frequency professional trips	Daily	8.805,063	0,000	0,231
	Regularly	5.604,517	0,013	0,125
	Sometimes	3.991,554	0,048	0,102
	Rarely	868,116	0,611	0,026
Company car ownership		9.196,119	0,000	0,299

Table 8: Multilinear regression parameters for variables predicting the annual mileage. The reference category for home-work distance is set on >50km and for professional trip frequency on never.

In the final multilinear regression model, 48.3% of the variance of the dependent variable (annual mileage) is being explained by the independent variables gender, home-work distance, professional trip frequency and company car ownership. The socio-demographic variables age, education and function level have been dropped as they do not contribute significantly to predicting the outcome of the dependent variable. The parameters resulting from the multilinear regression are presented in Table 8. The standardized Beta coefficients (last column of the table) allow comparing the contributions of each variable to the outcome of the annual mileage. The higher the absolute value of this coefficient, the larger the contribution of the corresponding variable. It appears that **home-work distance and company car ownership are the largest contributors, followed by professional trip frequency and gender**. Based on the parameters presented in Table 8, a linear regression equation for predicting the annual mileage can be constructed.

Annual mileage = 29.513,075
+ (-3.472,238)*(Gender)
+ (-17.417,222)*(HW<5km) + (-18.876,354)*(HW5-10km)
+ (-15.298,964)*(HW11-20km) + (-9.458,429)*(HW21-50km)
+ 8.805,063*(Daily) + 5.604,517*(Regularly)
+ 3.991,554*(Sometimes) + 686,116*(Rarely)
+ 9.196,119*(Company car)

From this multilinear regression equation, it can be derived that company car ownership has a considerable impact on the outcome of the annual mileage. Based on the results of the linear regression performed on the data available from our sample, the impact of company car ownership on the annual mileage of comparable respondent profiles in terms of gender, home-work distance and professional trip frequency is estimated to be about 9.200km. It can thus be concluded that merely company car ownership induces more travel and that company car ownership is an important determinant of the difference in annual mileage between company cars and private cars.

In addition, other travel related annual mileage contributors might also play a role in explaining the difference in annual mileage between company cars and private cars. The linear regression analysis showed that higher home-work distances induce higher annual mileages and that more frequent professional trips lead to more kilometres driven per year. In combination with company car ownership, these variables might increase or decrease the difference in annual mileage between company cars and private cars. In the next section this issue will be further examined for home-work distance and professional trip frequency.

Determinants of differences in annual mileage

In order to analyze whether home-work distance and professional trip frequency play a role in determining the difference in annual mileages of company cars compared to private cars, in addition to company car ownership itself, it will be examined whether there is a relationship between these two variables (home-work distance and professional trip frequency) and company car ownership.

Home-work distance

In order to investigate whether the divergence in annual mileage between company cars and private cars is also determined by home-work displacements, it was analyzed whether there are significant differences in home-work distances between these two groups of respondents. Before achieving this comparison, the data collected from our sample was first weighted to make it a better representation of the actual division of the Belgian car users' population among the different home-work distance categories. The weighting was based on data available from the Socio-Economic Survey conducted in 2001 (Verhetsel et al., 2007). According to this survey, the average home-work distance for people commuting to work by car equals 20,1kms. The calculation of the weights is shown in Table 9.

Category	Population (P)	Sample (p)	Weight (P/p)
< 5 kms	15,4%	13,3%	1,15
5 – 10 kms	20,9%	10,7%	1,96
11 – 20 kms	26,8%	14,9%	1,80
21 – 50 kms	27,7%	33,8%	0,82
> 50 kms	9,2%	27,3%	0,34

Table 9: Calculation of weights according to Home-work distance

After this weighting procedure it could be established that there is **no statistical significant difference between employees with a company car and employees without a company car with regard to their home-work distance** (Chi square: $p = .206$). This means that in general, employees with a company car do not necessarily live further from their work location than employees without a company car (Figure 51), which indicates that the overall divergence in annual mileage between company car users and private car users is not really being determined by differences in their home-work distances.

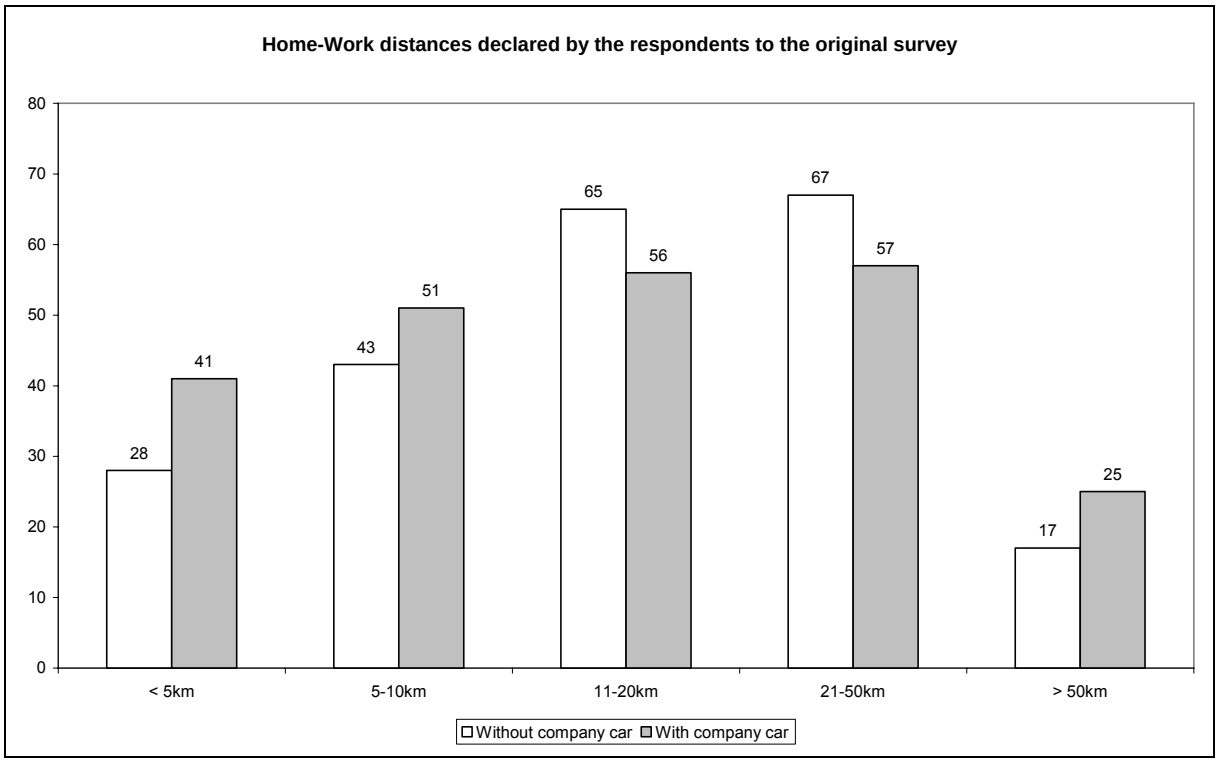

Figure 51: Home-work distances for the respondents of the original survey

Another path which can be examined with regard to the home-work displacements next to the home-work distance is the transport mode used to make the home-work trip. Figure 52 shows that company car owners almost exclusively use their company car to commute between their home and workplace. For people without a company car, the private car is the most used transport mode for the home-work displacements (61%), but also other transport modes are being considered, such as the train (27%) and other public transport modes (8%).

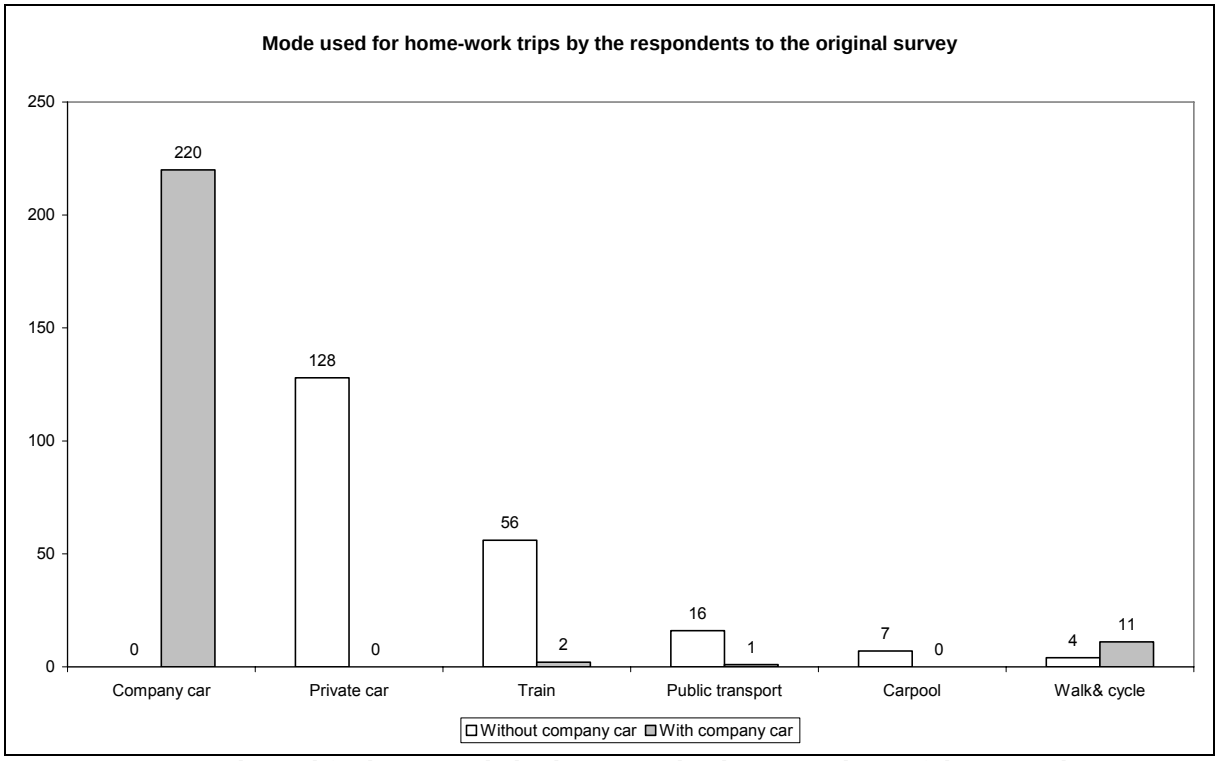

Figure 52: Mode used for home-work displacements by the respondents of the original survey

The fact that people without a company car do not necessarily use their private car to make the home-work displacement explains a part of the overall difference in annual mileage between company cars and private cars. In case people use public transport or a 'soft' transport alternative to commute between their home and workplace, their home-work kilometres do not contribute to the annual mileages of their private cars. As respondents with a company car usually use this transport mode to commute between home and workplace, the home-work distance is generally accounted for in the calculation of their annual mileages. The home-work transport mode can thus be considered as a factor influencing the difference in annual mileage between company cars and private cars.

Professional trip frequency

To find out whether the divergence in annual mileage between company cars and private cars is also determined by professional trip frequency, it was verified whether there is a relation between company car ownership and the number of times professional trips have to be made. Figure 53 shows that of all the employees having to make professional displacements every day, at a regular basis or sometimes, respectively 82%, 83% and 71% have a company car at their disposal. When employees only rarely have to travel for the sake of their profession, the proportion of employees without company cars is larger (60%) than the proportion with company car (40%). Among the employees not having to make professional trips at all there are no company cars. There are two possible explanations for this outcome. One is that company cars are indeed only attributed when the employee has to make at least some professional trips, even if it is only rarely. Another explanation might be that company car users are reluctant to admit that they actually do not have to make any professional trips because of the sensitive nature of the company car topic. But this last assumption could not be relied on any scientific sources.

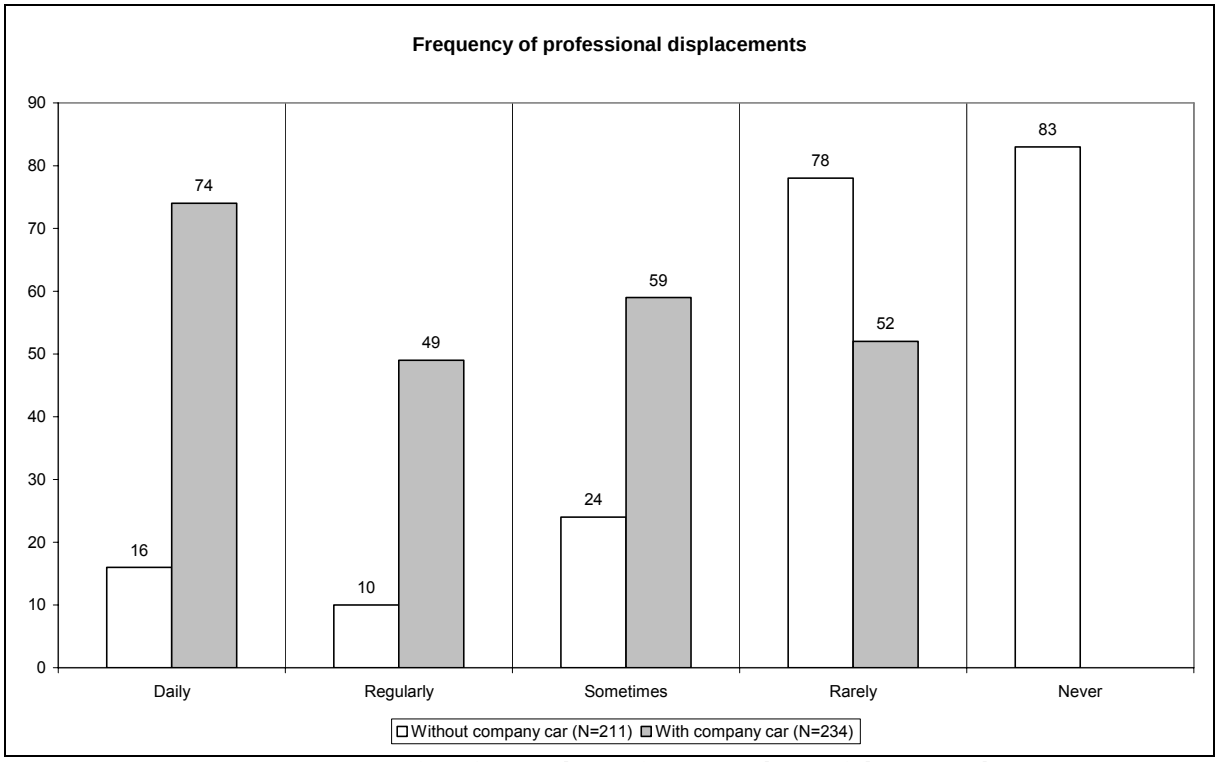

Figure 53: Frequency of professional trips for respondents of the original survey

Statistical analysis confirms that there is indeed a difference between employees with a company car and those without a company car when it comes to the frequency of having to make professional displacements (chi square = 165,369: $p < .001$). Moreover, **the relationship that**

exists between professional trip frequency and company car use can be labelled as strong (V=.610)[9]. This implies that employees with a company car make more professional trips than those without. These findings indicate that the professional trip frequency contributes to explaining the difference in annual mileage between company cars and private cars.

Company car users

In this section, the emphasis is on identifying the nature and constitution of the kilometres driven by company car users. Here, the travel behaviour of company car users will be further analyzed in order to find out what the actual proportions of home-work, private and professional kilometres are within their total annual mileage and how the distribution of these proportions influences the average number of kilometres driven per year by company cars. The results presented in this section are based on the data collected among the additional TNS sample, which is constituted only of Flemish employees with a company car (N=720). The average number of kilometres driven per year by the company car users constituting this sample equals 32.774km. This number is more or less in line with the findings of existing empirical researches (Hubert & Toint, 2002; Zwerts & Nuyts, 2004; Vacature, 2007). The previous section, where the annual mileage of company cars was compared to the annual mileage of privately owned cars already provided evidence to support that company cars drive more kilometres per year than private cars. Although there were indications that home-work displacements and professional trips play a role in the constitution of these additional kilometres, further research was required into the constitution of the annual mileage of company cars. To this end, this section is dedicated to analyzing the impact of the proportions of private, professional and home-work kilometres on the annual mileage of company cars. First, an overview will be given of the overall distribution of private, professional and home-work kilometre proportions. Next, a cluster analysis will be performed in order to identify groups of respondents with homogeneous proportion distributions. Based on the results of this cluster analysis, different types of company car users will be defined. To end this section, the repercussions on the annual mileage will be examined by analyzing whether certain types of company car users have higher annual mileages than others.

Private, professional and home-work proportions

Figure 54 shows the number of times a certain proportion was indicated for each type of displacement (home-work, professional and private). It appears that with regard to the private trips, a majority of the respondents (N=516 or 72%) attributes less than 30% of their total amount of kilometres to private displacements. As the proportion of kilometres accredited to private purposes increases, the number of respondents indicating these options decreases. Only 2% of the respondents acknowledge that private trips constitute 70% or more of their total amount of kilometres. This means that for a majority of company car users the kilometres driven for private displacements only represent a small proportion of their total amount of annual kilometres.

[9] For the interpretation of the measure of association (Cramer's V), guidelines by Rea & Parker (1992) were used.

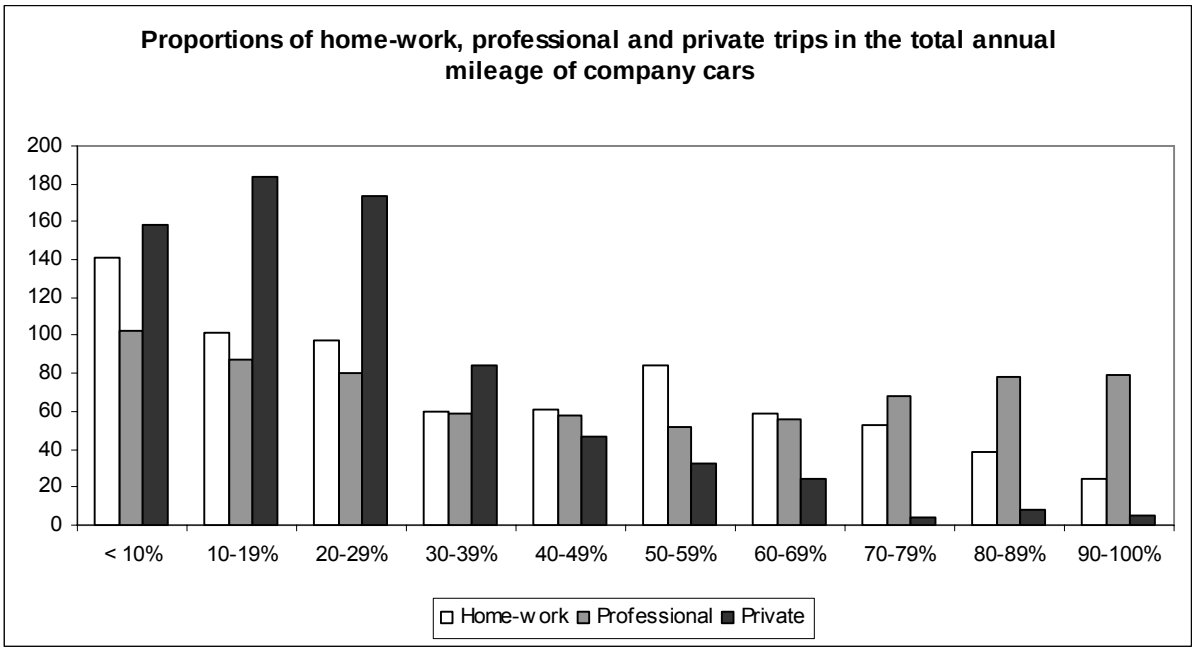

Figure 54: Proportions of home-work, professional and private trips in the total annual mileage of company car users (N = 720)

Compared to the private trips, the professional trip proportions follow a different pattern. Although there is still a large but smaller number of respondents indicating that less than 30% of their annual mileage is due to professional displacements (37.5%), there is also an important share (31%) of the company car users in our sample pointing out that kilometres driven for professional purposes constitute 70% or more of their total amount of kilometres driven per year. This means that for almost a third of the respondents, the kilometres driven for professional displacements constitute a large part of their total amount of annual kilometres. The contribution of home-work trips to the annual mileage lies somewhere in between the contributions of private and professional trips. 47% of the respondents attribute less than 30% of their annually driven kilometres to home-work trips, and for 16% of the surveyed company car users these home-work displacements represent 70% or more of their annual mileage. For the remaining 37%, the home-work proportion varies somewhere between 30 and 70%.

Observing the private, professional and home-work proportions learns that there are three main categories of respondents: those who mainly use their company car to drive private kilometres, those who principally use it to drive professional kilometres and those who mostly use their company car to make home-work related kilometres. In the following section, these categories will be further explored by means of a cluster analysis.

Clustering proportion profiles

A k-means cluster analysis was performed in order to identify homogeneous subgroups of cases in the sample, based upon the proportions of home-work, professional and private kilometres in the total amount of annual mileage. Although they are separate variables, they are mutually dependent as the total sum of the three proportions should equal 100%. The k-means cluster analysis uses Euclidean distance to minimize within-cluster variance and maximize between clusters. As indicated before, three clusters were indentified for further examination: one with a dominance of home-work kilometres, one where the proportion of professional kilometres prevails and one with a substantially higher proportion of private kilometres.

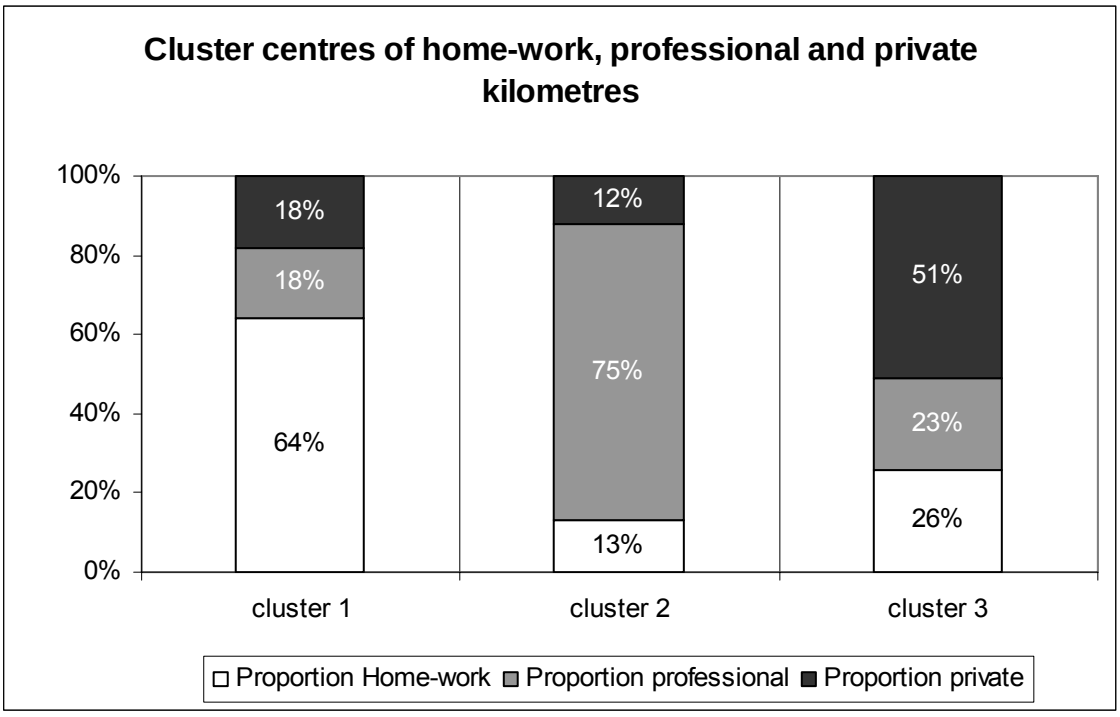

Figure 55: Cluster centres of home-work, professional and private kilometres (N = 720)

Figure 55 shows the three clusters with their respective cluster centres. The first cluster groups respondents who have indicated that their home-work kilometres contribute the most to their annual mileage (N = 274 or 38%). Within this cluster the average proportion of home-work kilometres amounts to 64%, whereas the average proportions of professional and private kilometres both equal 18%. The second cluster entails respondents who pointed out that their proportion of professional kilometres in their total annual mileage is much larger than their proportions of home-work and private kilometres (N = 318 or 44%). In this cluster, the average proportion of professional kilometres represents 75% of the total amount of kilometres, leading to much lower proportions of home-work kilometres (13%) and private kilometres (12%). The third cluster represents the respondents for whom the private kilometres constitute the largest part of their yearly amount of kilometres driven (N = 128 or 18%). In this group, the dominance of the proportion of private kilometres is less pronounced and has an average value of 51%, leaving room for relatively higher proportions of home-work kilometres (26%) and professional kilometres (23%).

Defining different types of company car users

Based on the three clusters identified in the previous section, different types of company car users can be defined. To this end, it will first be analyzed how home-work distance, professional trip frequency and home-work transport mode contribute to defining the different company car user types.

Home-work distance

It can be expected that the dominance of home-work kilometres in cluster 1 is generated by higher home-work distances. Therefore, it was verified whether cluster 1 respondents generally have higher home-work distances compared to the respondents of the other two clusters. As illustrated in Figure 56 this indeed appears to be the case: cluster 1 respondents live significantly further from their workplace than respondents belonging to cluster 2 (Chi square: $p < .001$) or cluster 3 (Chi square: $P < .001$).

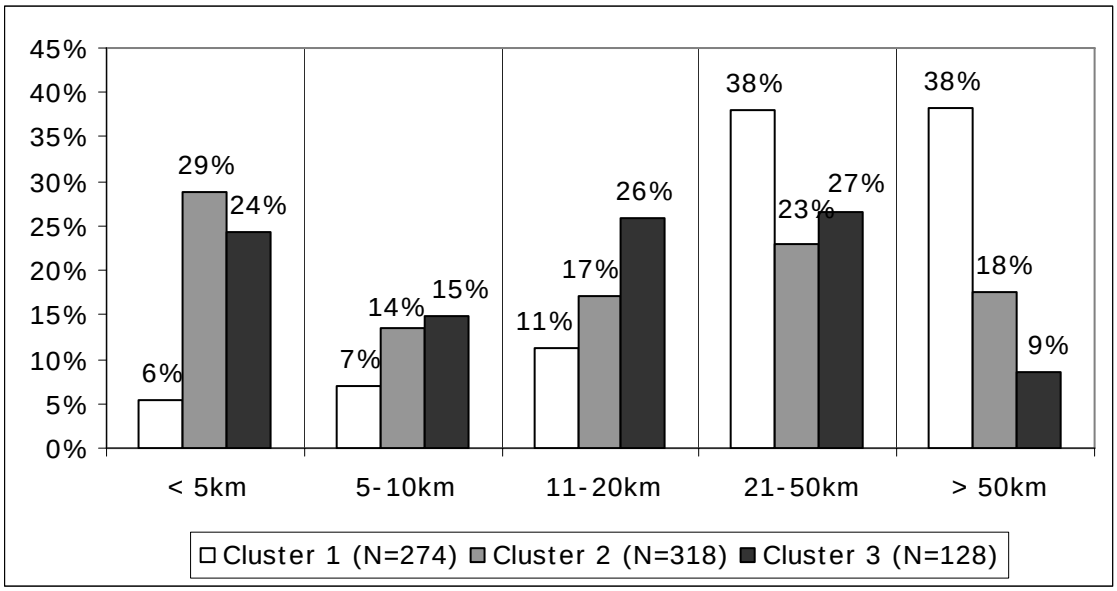

Figure 56: Distribution of clusters according to home-work distance (N = 720)

The relationship between cluster membership and home-work distance is moderate when comparing cluster 1 to cluster 2 (V = .387) and relatively strong when comparing cluster 1 to cluster 3 (V = .429). More than three quarters (76%) of the cluster 1 respondents indicate that their home-work distance is above 20km. For the two other clusters the share of respondents living further than 20km from their workplace is much lower and stands at 41% for cluster 2 and 36% for cluster 3.

Professional trip frequency

As far as the professional trip frequency is concerned, it can be expected that respondents belonging to cluster 2 have higher frequencies of professional trips than the respondents belonging to the other clusters. Figure 57 confirms that the professional trip frequency is indeed higher among the cluster 2 respondents compared to the cluster 1 respondents (Chi square: $p < .001$) as well as to the cluster 3 respondents (Chi square: $p < .001$). Moreover, the measure of association indicates that the relationship between cluster membership and professional trip frequency is relatively strong when comparing cluster 2 to cluster 1 (V = .489), and strong when comparing cluster 2 to cluster 3 (V = .629).

No less than 91% of the respondents belonging to cluster 2 have to make professional trips at a daily or regular basis. This percentage is far above the percentages of the respondents belonging to the other clusters who also have to make professional trips this frequent. For cluster 1 the percentage of respondents having to make professional trips at a daily or regular basis stands at 50% and for cluster 3 only at 36%.

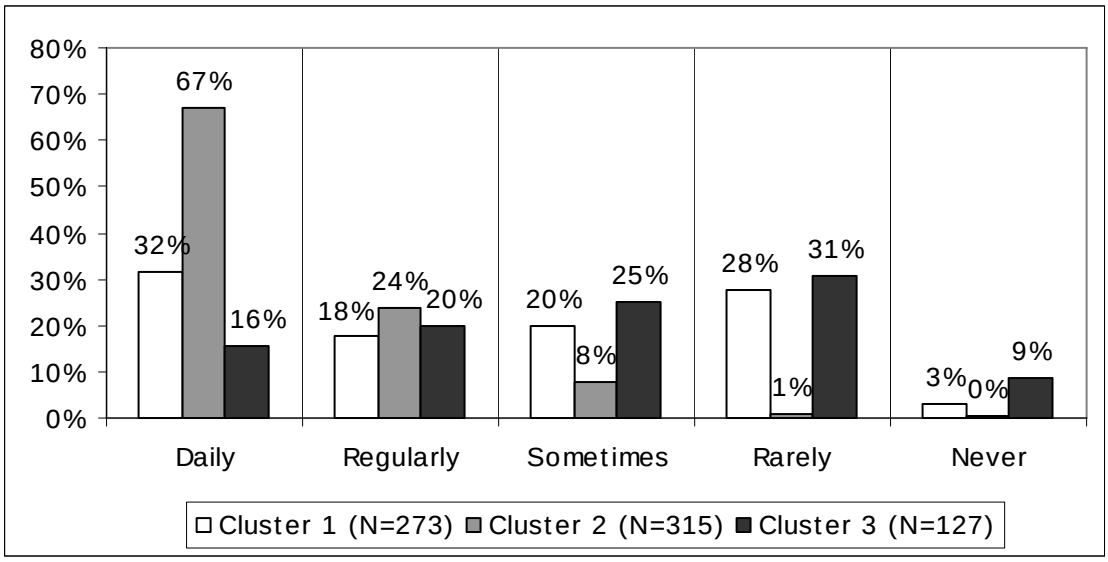

Figure 57: Distribution of clusters according to professional trip frequency (N = 715)

Home-work transport mode

The reason for including the home-work transport mode into this analysis is to verify whether there are employees who have been granted a company car but who prefer using another transport mode to make the home-work displacement. Figure 58 shows that the use of the company car for the trips between the home and workplace is most imperative in cluster 1, where 94% of the respondents use the company car to drive to work. Among the two other clusters, where the home-work displacement does not contribute the most to the total of company car kilometres, also a dominance of company car usage for the home-work displacement can be observed, but in these cases there is room left for other transport modes too.

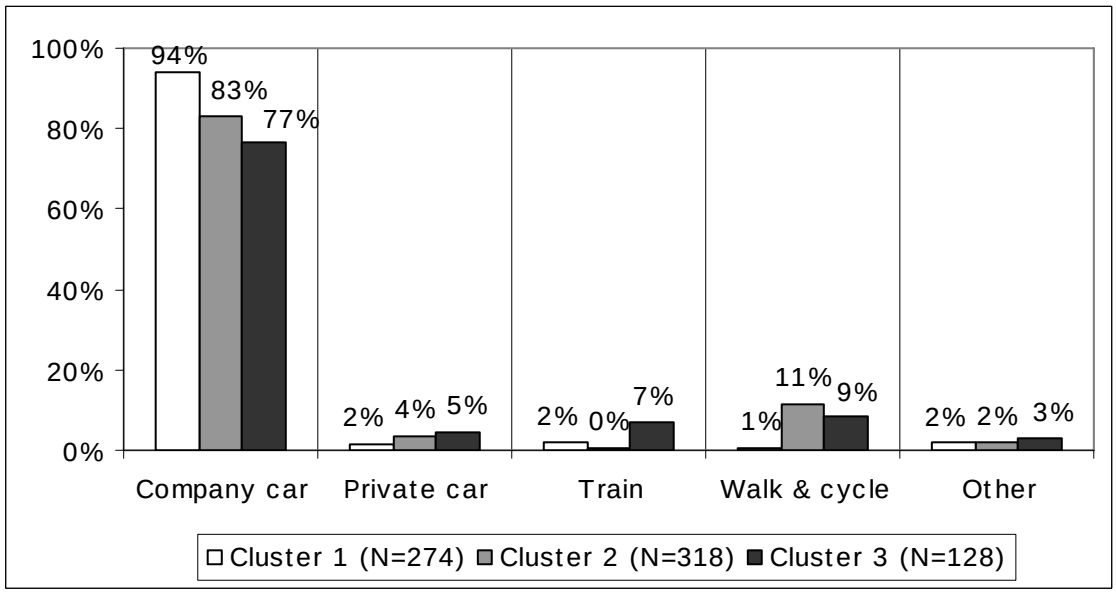

Figure 58: Distribution of clusters according home-work transport mode (N = 720)

Among cluster 2 respondents, who mainly use the company car for making professional trips, 83% commutes by company car, 11% walks or cycles to work, 4% uses a private car instead of the company car and 2% chooses another transport option. Among the respondents belonging to cluster 3, where the company car is mostly used for private kilometres, the proportion of

employees using their company car to commute to work even decreases to 77%. The remaining 23% chooses not to use their company car to go to work: 9% walks or cycles, 7% takes the train, 5% uses a private car and 3% opts for another transport alternative.

Three Company car user types

Based on the cluster analysis and on the variables discussed above (home-work distance, professional trip frequency and home-work transport mode), three main groups of company car users can be defined: the 'commuters', the 'representatives' and the 'enjoyers'.

The 'commuters' are employees with a company car whose professional trip frequency is moderate, who tend to live further from their workplace compared to other employees and who almost exclusively use their company car to make the home-work commuting trip. 'Commuters' do not necessarily need a company car for the execution of their job. Nevertheless, the company car plays an important role in their salary negotiations, because being offered a company car compensates for the longer commuting trips they have to make.

The 'representatives' are employees with a company car for whom the company car use is necessary for the execution of their job, in a way that it helps the employee to contribute to the productiveness of the company. The 'representatives' frequently have to make professional trips and spend a lot of their time being on the road in their company car. They tend to live closer to their workplace than the 'commuters', which leads to lower home-work kilometres (cfr. Figure 56). In addition it can also be expected that they do not always drive to their fixed workplace before they start making professional visits to clients, which also contributes to them having attributed lesser proportions of their annual mileage to home-work kilometres. For the 'representatives', being offered a company car fits into the requirements of the job.

The 'enjoyers' are employees with a company car who make significantly less professional trips than the 'representatives' and who live significantly closer to their work than the 'commuters'. In fact, 'enjoyers' do not necessarily need a company car for the execution of their job and also not to compensate for long commuting distances between their home and workplace. Moreover, almost a quarter of the 'enjoyers' actually not uses the company car to commute to work, but prefers to walk or cycle, or to take the train. 'Enjoyers' mainly use their company car to make private trips. In this case, it is more likely that the attribution of a company car is inspired by financial considerations of the company, inducing them to offer a company car instead of a cash benefit.

Repercussions on the annual mileage

After having defined different types of company car users, this section will concentrate on analyzing whether the type of company car user influences the annual mileage of the company car. As each of the company car user types corresponds to higher kilometre proportions for a particular trip motive, comparing the annual mileages between the different company car user types will allow to gain information on the extent to which home-work, professional and private kilometres contribute to the overall average annual mileage of company cars.

Figure 59 illustrates that the average annual mileages are significantly different for all three types of company car users ($F(2,713) = 16{,}712$; $p < .001$). Moreover, the annual mileage is highest for the 'representatives', who have an average annual mileage of more or less 37.600km. This is about 5.600km above the average annual mileage of the 'commuters', which stands at about 32.000km. Both these average annual mileages are significantly above that of the 'enjoyers', which equals approximately 22.400km, and is respectively 9.600km and 15.200km lower than the average annual mileages of the 'commuters' and the 'representatives'.

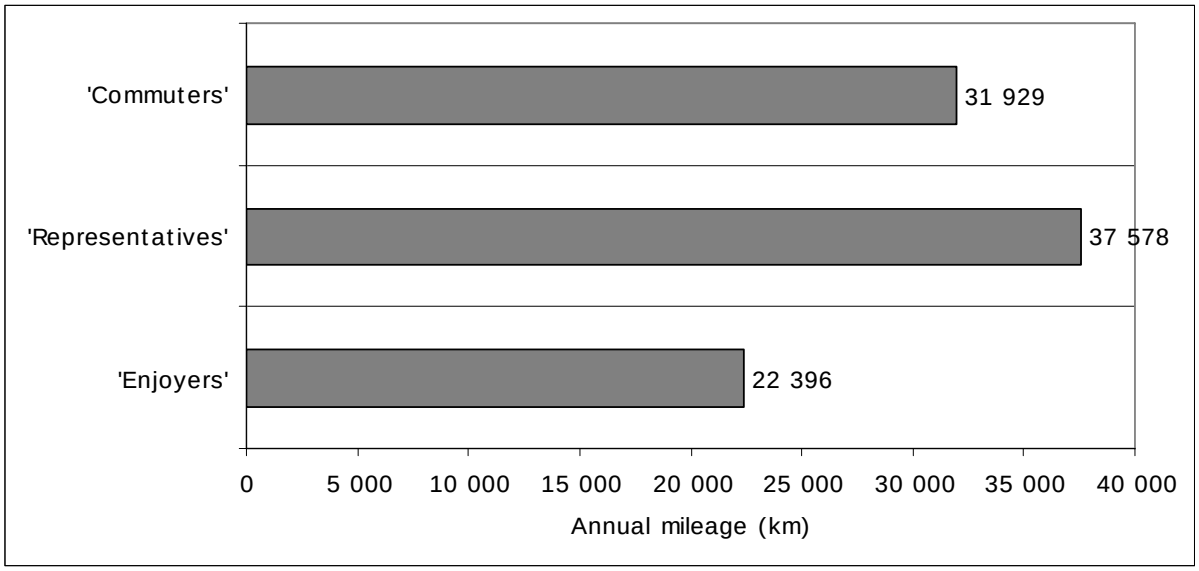

Figure 59: Comparison of the average annual mileages between the three types of company car users (N = 720)

Substitution effect

In this section, we will have a look at the substitution effect.

An important question of our survey is the mode people would use for their home-work displacements if they had no company car (Figure 60). Most of them would use a private car (74% in the original survey and 71% in the additional one of TNS and 66% in the additional one of personal contacts). **The proportion of people who would go to work by train (10 to 17%) is only half of the proportion for people without company car (more than 26%) taking the train to go to work**. Especially for the additional contacts of TNS, bicycle is a popular alternative mode of transportation (what has to be linked to the fact that this sample is mainly composed by people living in the Flemish Region where the use of bicycles is more frequent in general). Other characteristics of respondents may have some influence on the choice of the mode for their home-work displacements. Therefore, we made a distinction for gender (Figure 61, Figure 64 and Figure 67), age (Figure 62, Figure 65 and Figure 68) and diploma (Figure 63, Figure 66 and Figure 69).

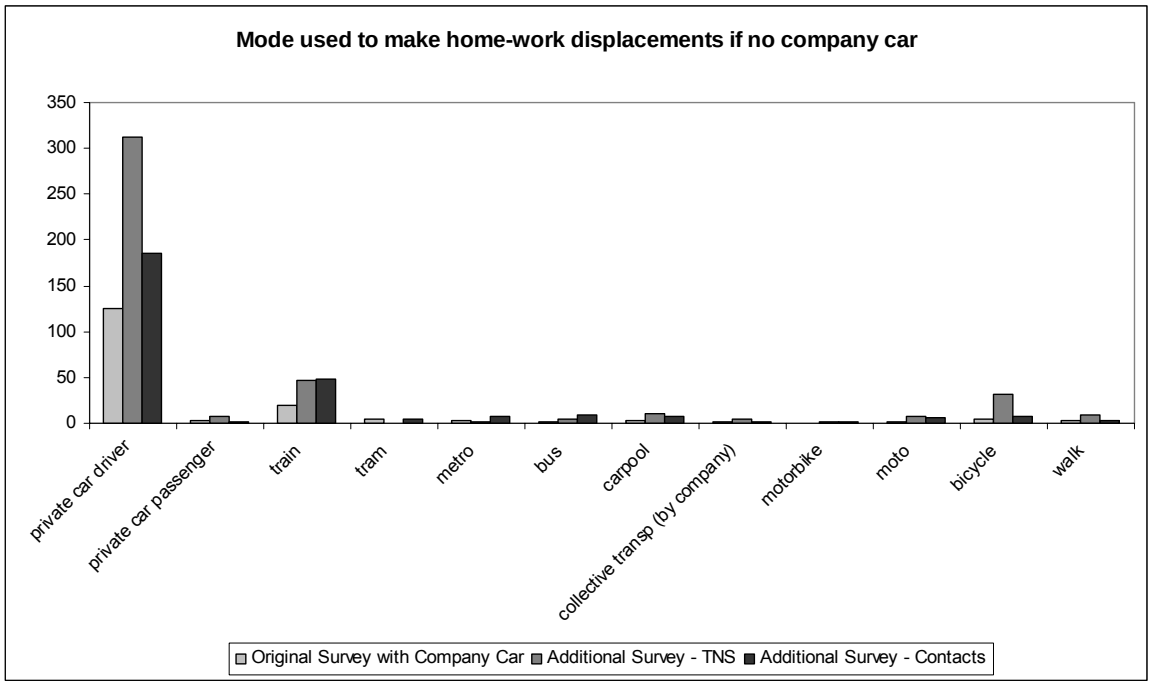

Figure 60: Mode used for home-work trips if no company car

For the four age classes, no specific differences in choosing an alternative mode could be detected. When comparing the results for men and women, more men indicate that they would bike or walk for their home-work displacements. In the additional surveys, the proportion of men willing to take the train to go to work is also higher than the same proportion for women. If we look at the influence of the diploma, persons with a higher education (high school or university) are more likely to use a private car as alternative for the company car for their home-work displacements. In the additional survey of TNS, persons with a higher education are more willing to take the train to go to work than persons with a lower education (maximum secondary school).

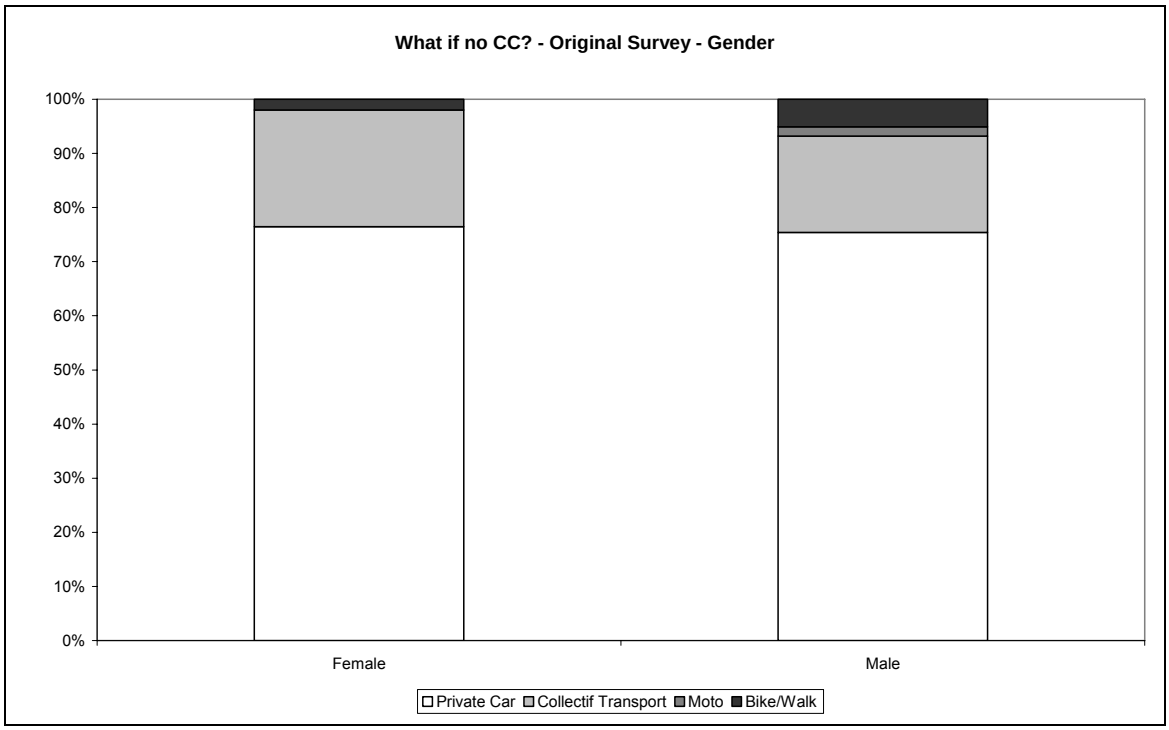

Figure 61: Mode used for home-work trips if no company car according to the gender for the original survey

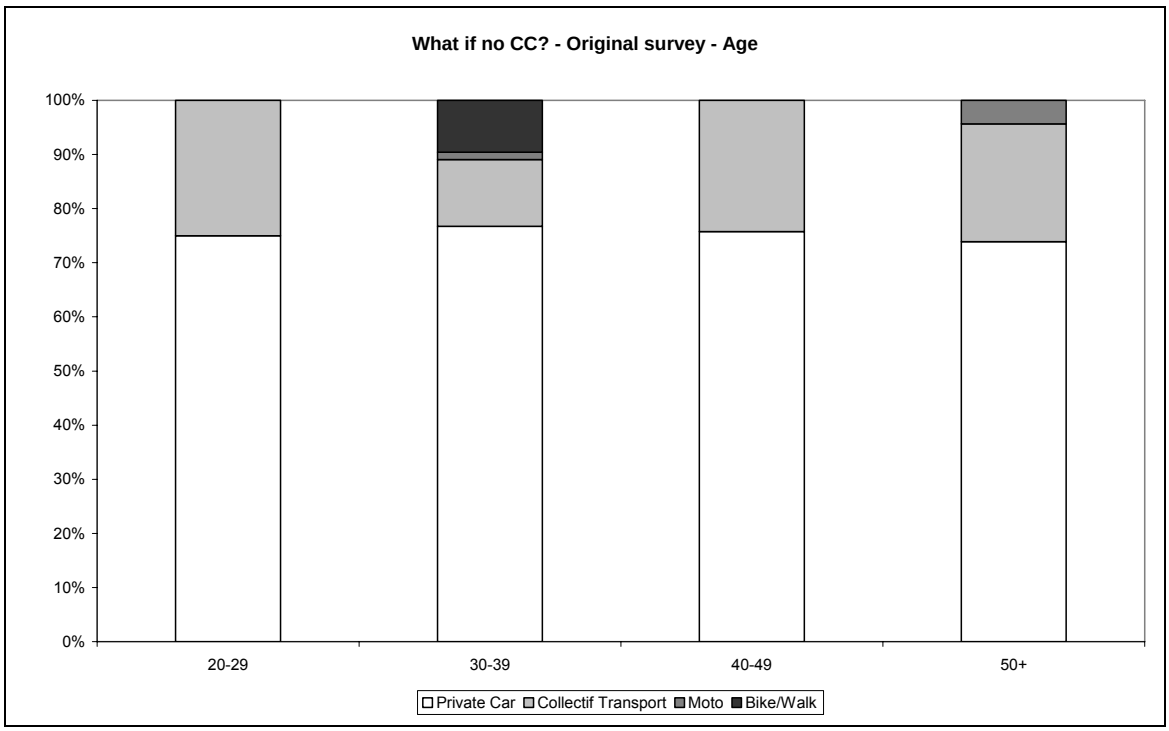

Figure 62: Mode used for home-work trips if no company car according to the age for the original survey

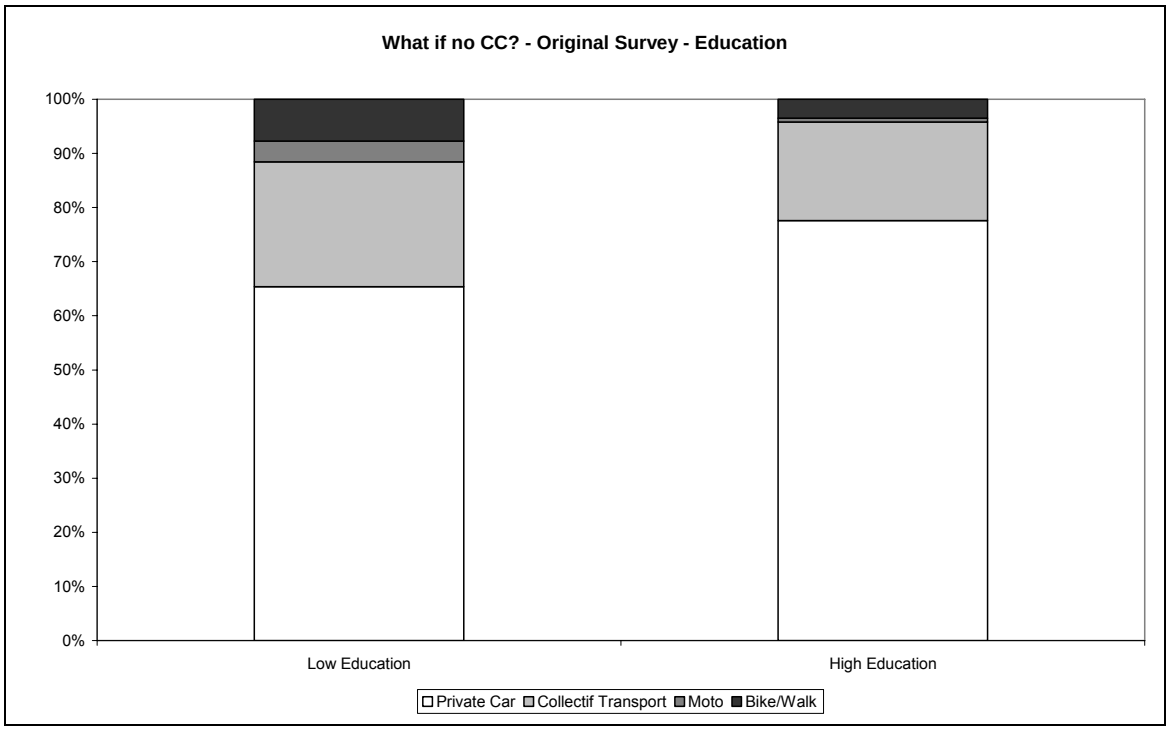

Figure 63: Mode used for home-work trips if no company car according to the level of education for the original survey

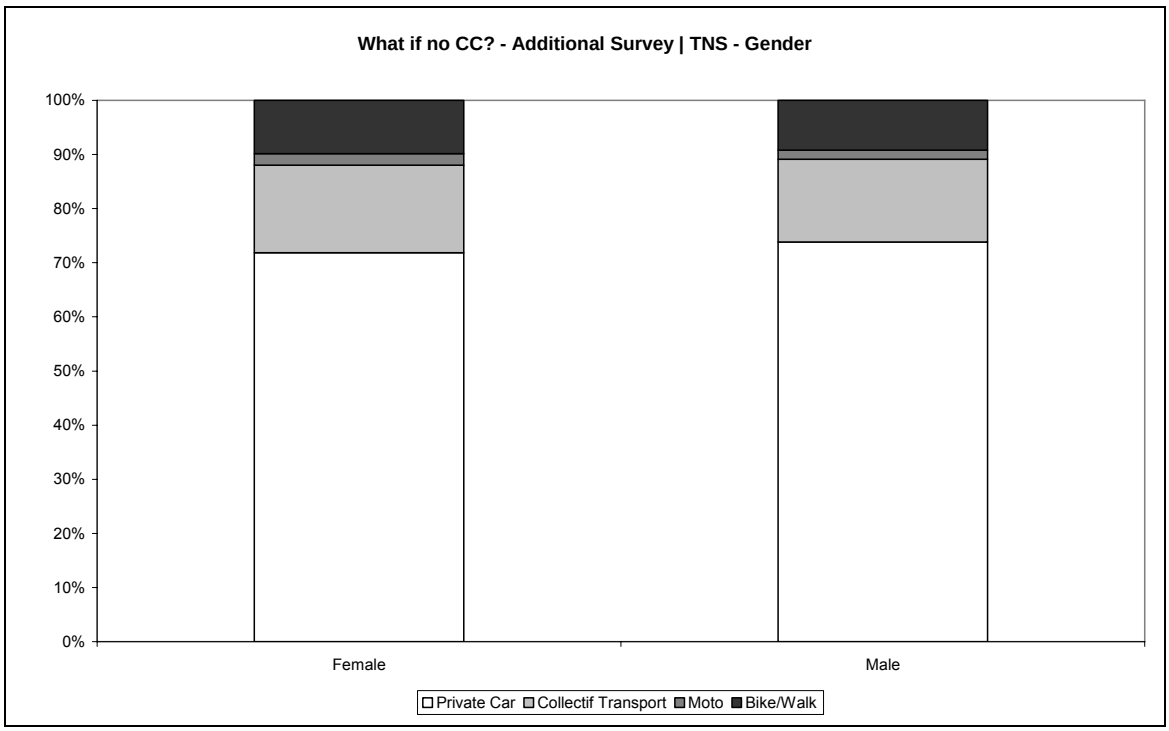

Figure 64: Mode used for home-work trips if no company car according to the gender for the additional survey | TNS

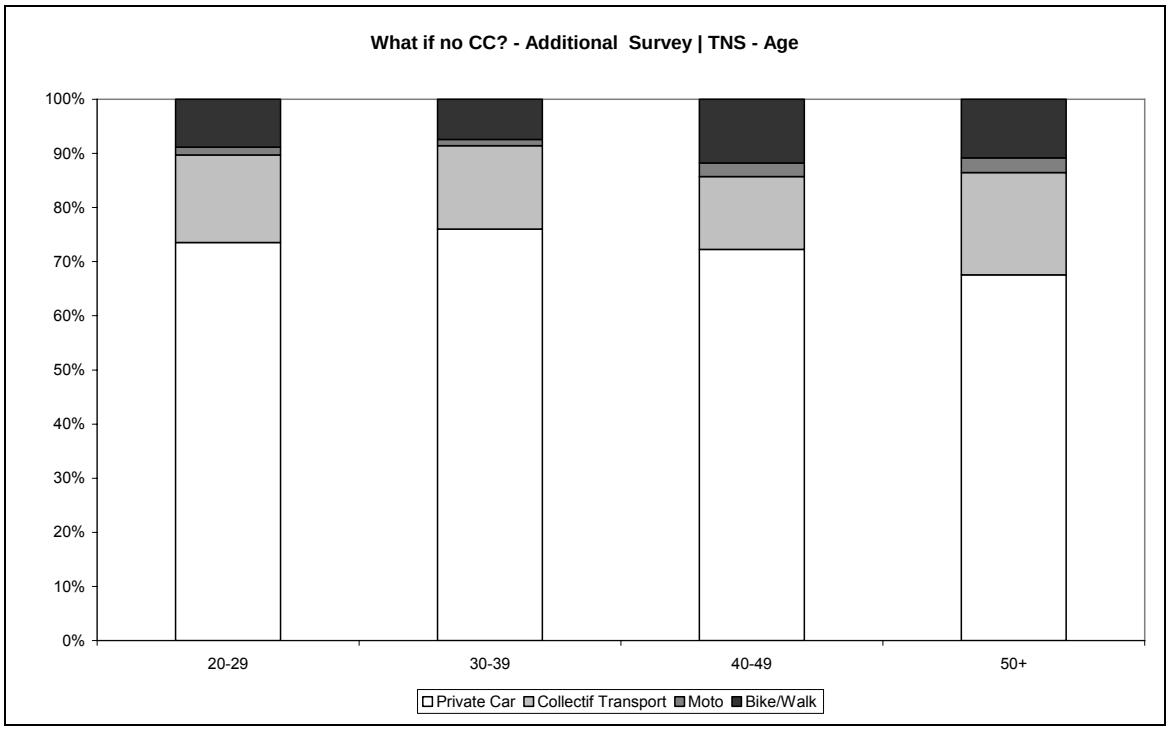

Figure 65: Mode used for home-work trips if no company car according to the age for the additional survey | TNS

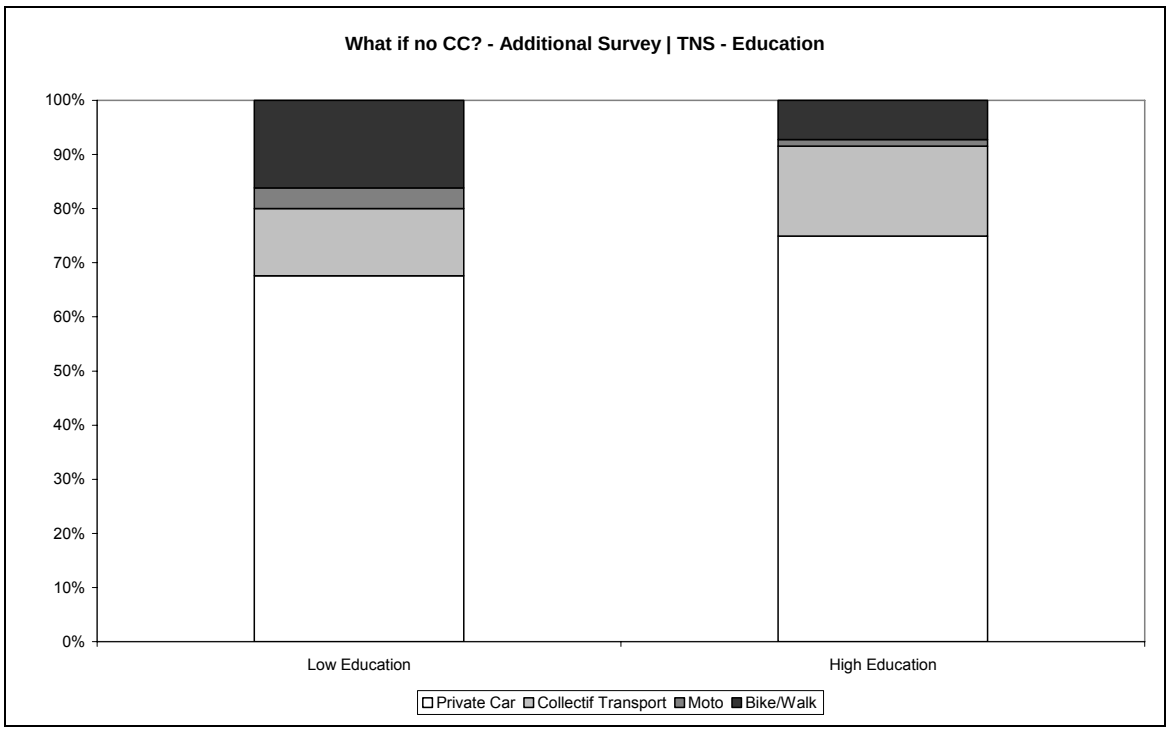

Figure 66: Mode used for home-work trips if no company car according to the level of education for the additional survey | TNS

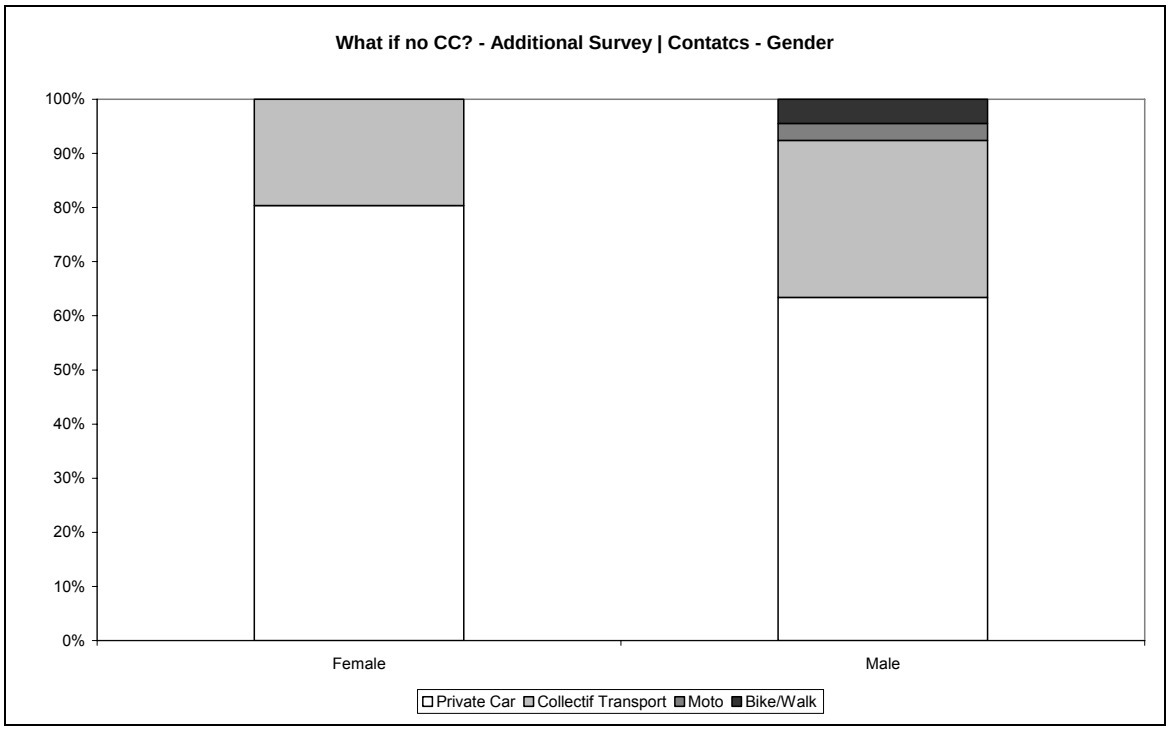

Figure 67: Mode used for home-work trips if no company car according to the gender for the additional survey | Researchers' contacts

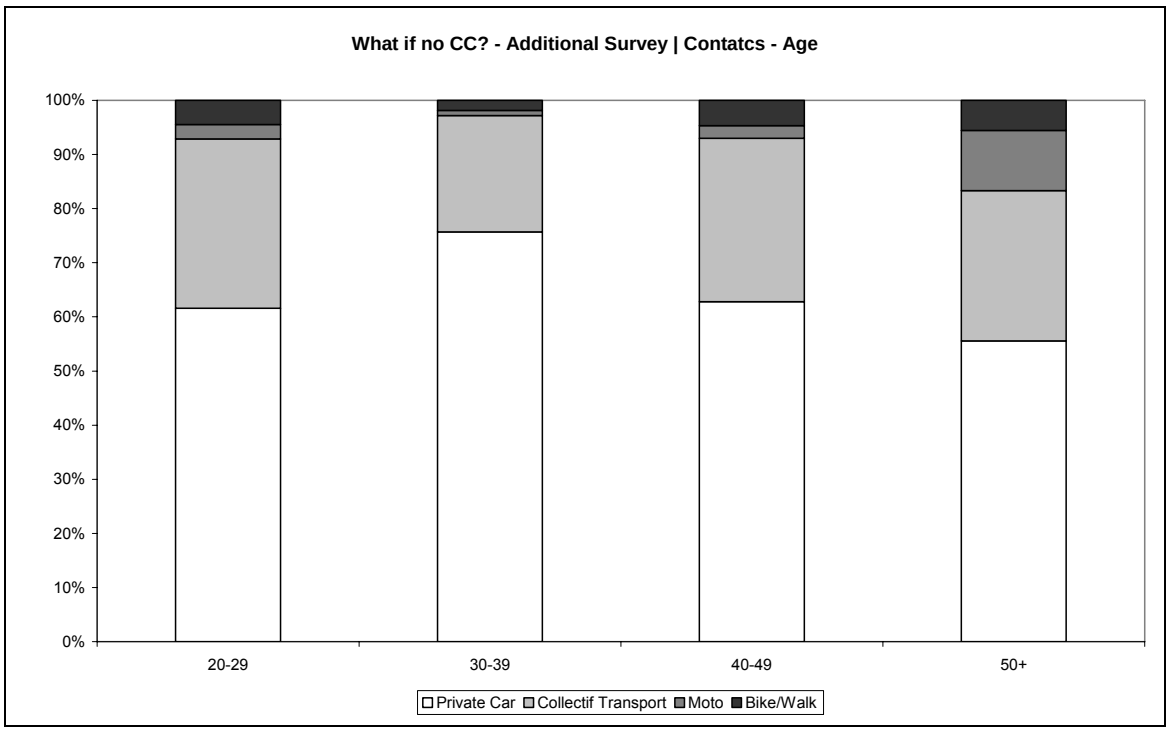

Figure 68: Mode used for home-work trips if no company car according to the age for the additional survey | Researchers' contacts

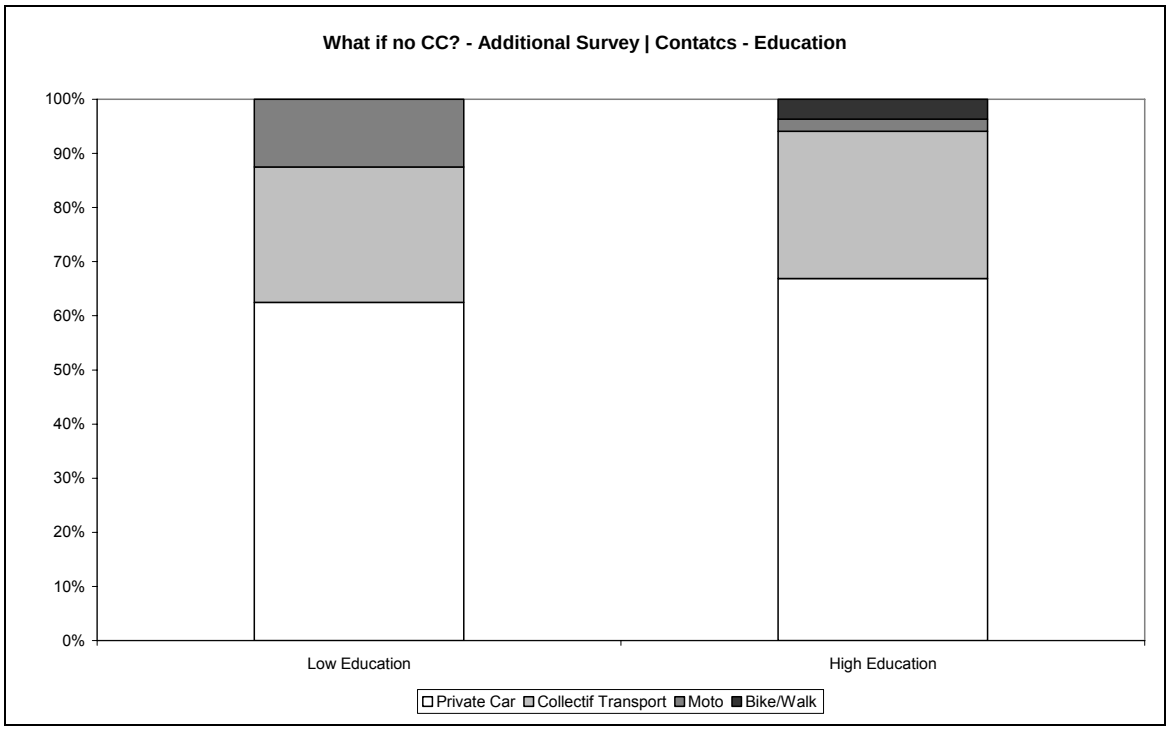

Figure 69: Mode used for home-work trips if no company car according to the level of education for the additional survey | Researchers' contacts

T**he most important reasons cited by the respondents for not using public transport in case they would not have a company car (Figure 70) are the insufficient network and the slowness of public transport**. Other reasons that are frequently indicated are the large waiting times, the unadapted timetable and the accessibility of the stop. Prices of public transport do not represent a problem to use it, nor does its cleanliness, lack of space and (un)safety.

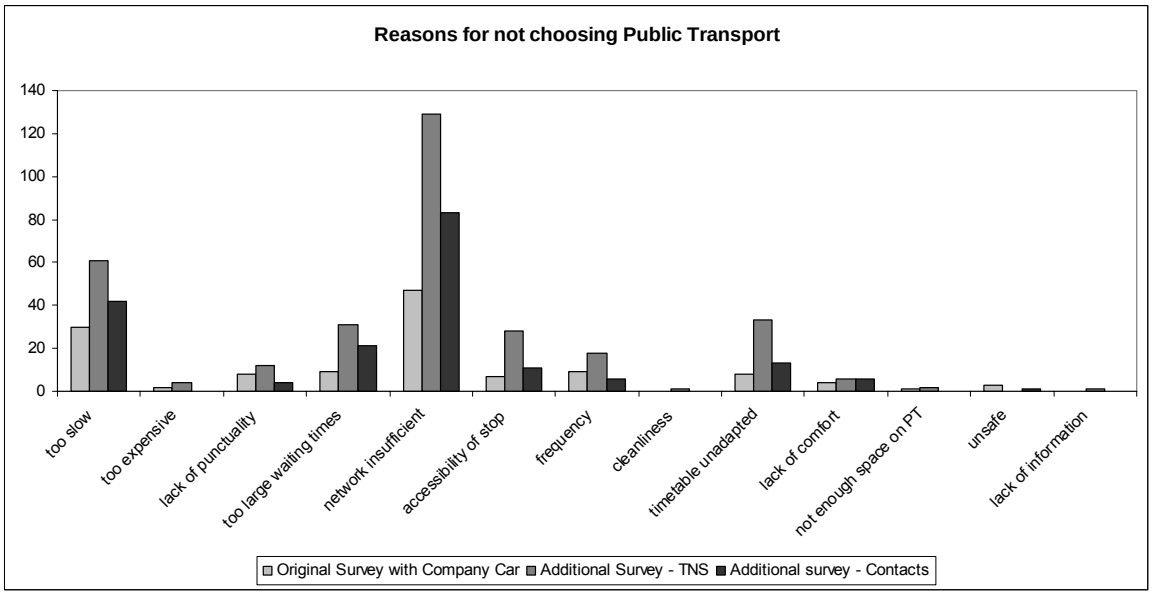

Figure 70: Reasons to not choose public transport even if no company car

Older people tend to have more problems with the insufficiency of the network, while younger people tend to find public transport too slow. In the original survey, persons with a higher education indicate the insufficiency of the network as the most important reason for not choosing public transport, while persons with a lower education do not find this an important

reason at all. In the additional surveys (TNS and personal contacts), however, these findings are not confirmed. (Tables 10, 11, 12, 13, 14, 15, 16, 17, 18 in annex 1)

To further investigate the substitution effect, persons with the same socio-demographic characteristics with and without a company car are compared. Only the original survey is used here since we only have a control group without company car in the original survey. The average number of trips per day (Figure 71, Figure 72, Figure 73 and Figure 74), the mode of transportation used (Figures 75 to 81) and the purpose of the trips (Figures 82 to 88) are analysed.

For persons without a company car, the average number of trips per day is 2.07; for persons with a company car, this number equals 2.57. When looking at the influence of the age, the average number of trips per day is highest in the age class 30-39 and lowest in the age class 50+ for persons without a company car. For persons with a company car, most trips per day are registered for persons above 50 and the least trips for persons in the age class 40-49. An analysis of the influence of the gender indicates that, with or without company car, females make on average more trips per day than males. The analysis of the influence of the diploma shows some interesting results: when not having a company car, persons with a higher education make on average more trips (2.21) than persons with a lower education (1.77). However, when assigned a company car, persons with a lower education (secondary school maximum) make on average more trips (2.89) than persons with a higher education (2.51). Based on these results we can say that diploma and age are the most important socio-demographic characteristics to have an effect on the substitution effect.

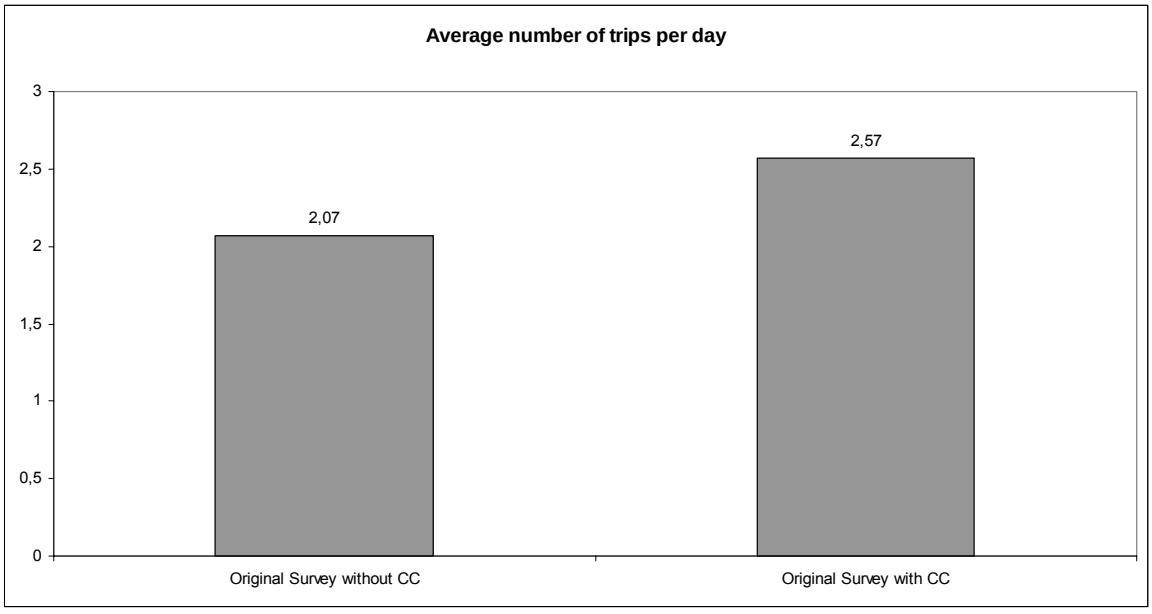

Figure 71: Average number of trips per day in the original survey

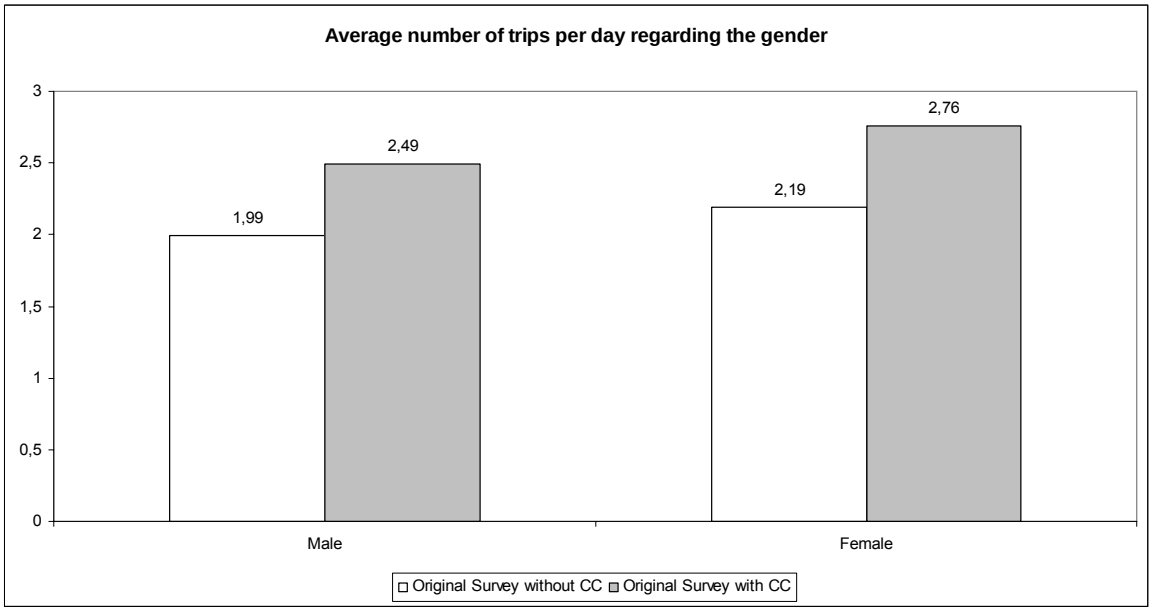

Figure 72: Average number of trips according to the gender in the original survey

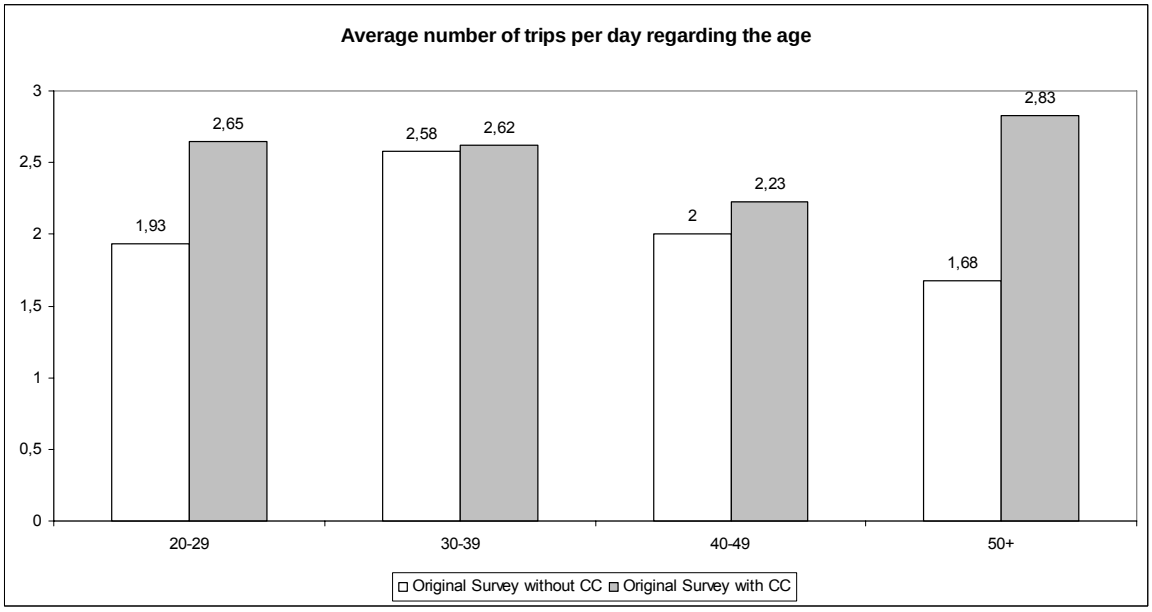

Figure 73: Average number of trips according to the age in the original survey

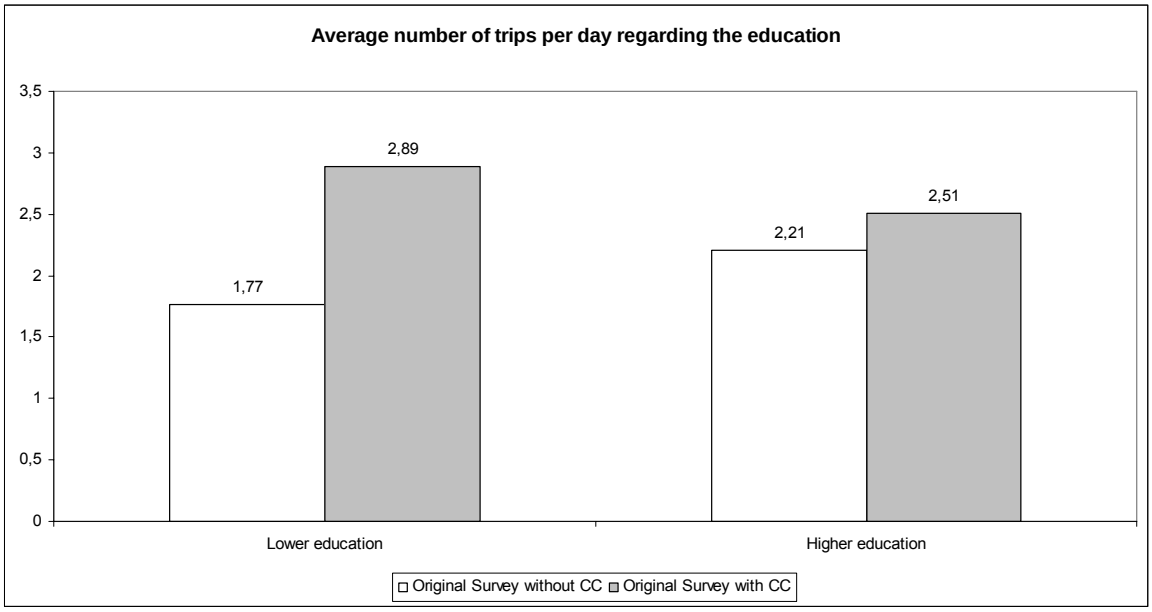

Figure 74: Average number of trips according to the level of education in the original survey

When comparing the mode of transportation used for all trips, persons without a company car take public transport (train, tram, metro and bus) in 14% of all trips. Persons with a company car take public transport in only 1.3% of all trips. This difference in taking public transport is compensated in the use of a car. For the modes carpool, bicycle and walk only very small differences between company car drivers and non-company car drivers are detected. When making a distinction for age, gender and diploma, the most important result is found for the company car drivers: no female company car driver is taking public transport for a trip and no company car driver with a lower education is taking public transport for a trip. But let us remain the need to be cautious with such disaggregated results.

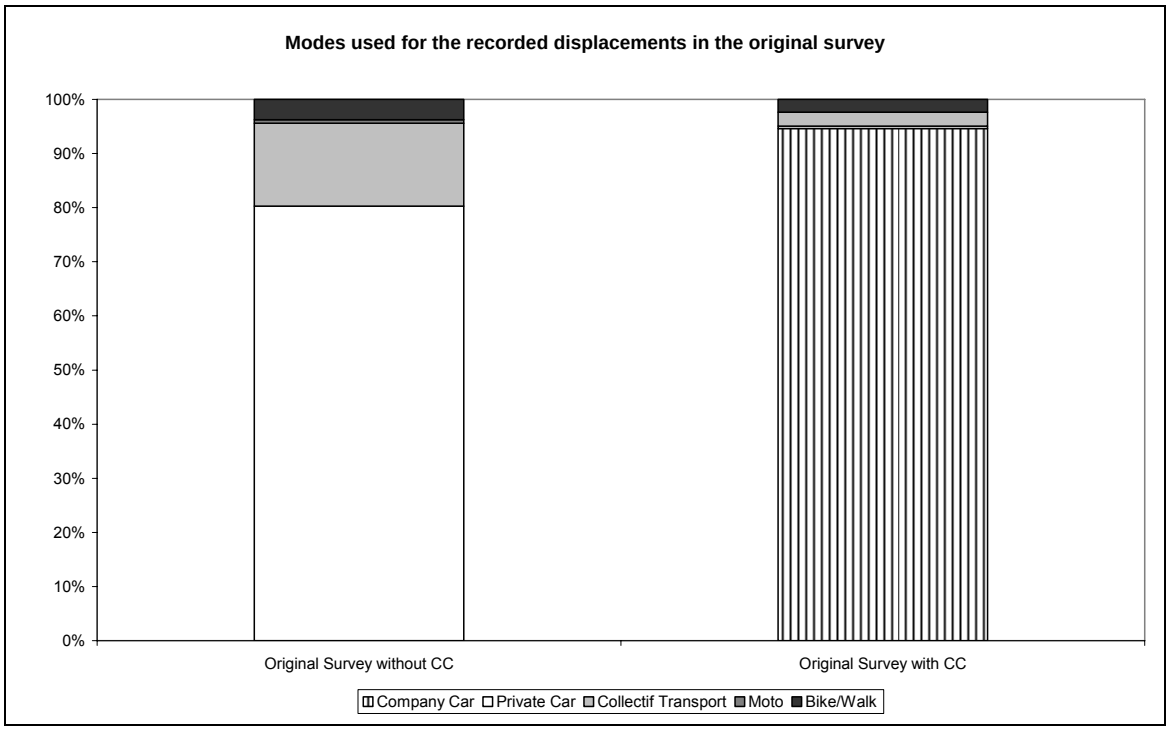

Figure 75: Mode used for the recorded trips in the original survey

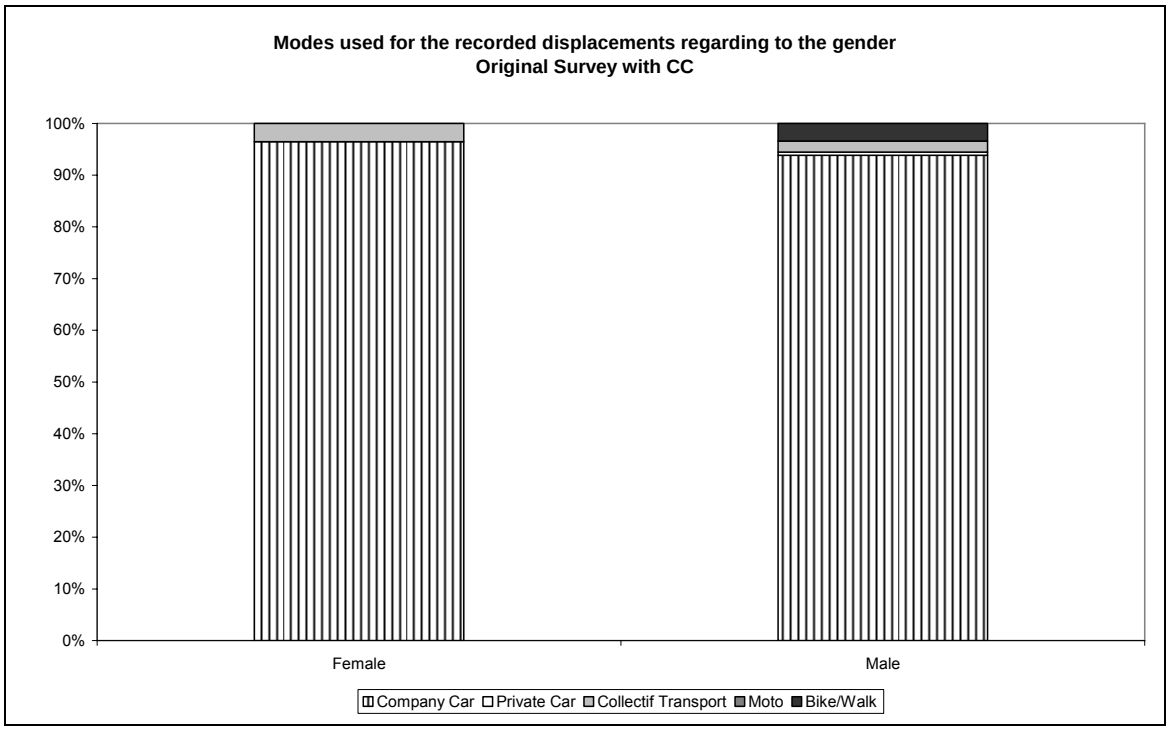

Figure 76: Mode used for the recorded trips in the original survey with company car according to the gender

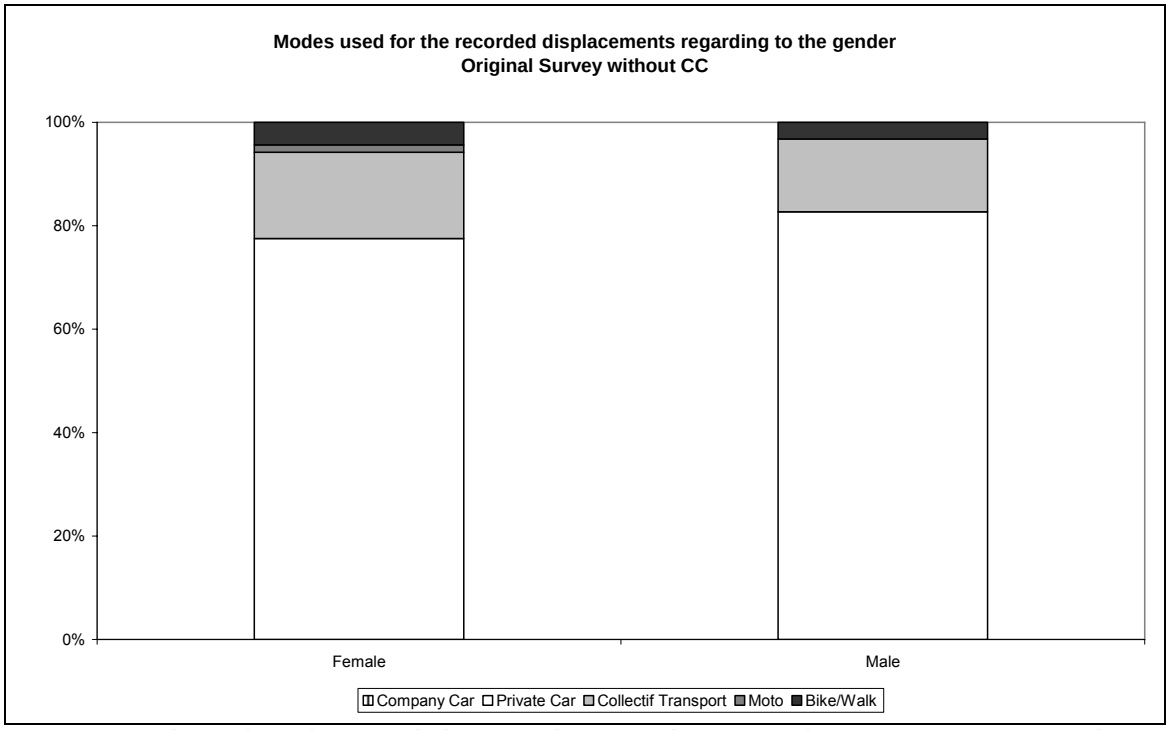

Figure 77: Mode used for the recorded trips in the original survey without company car according to the gender

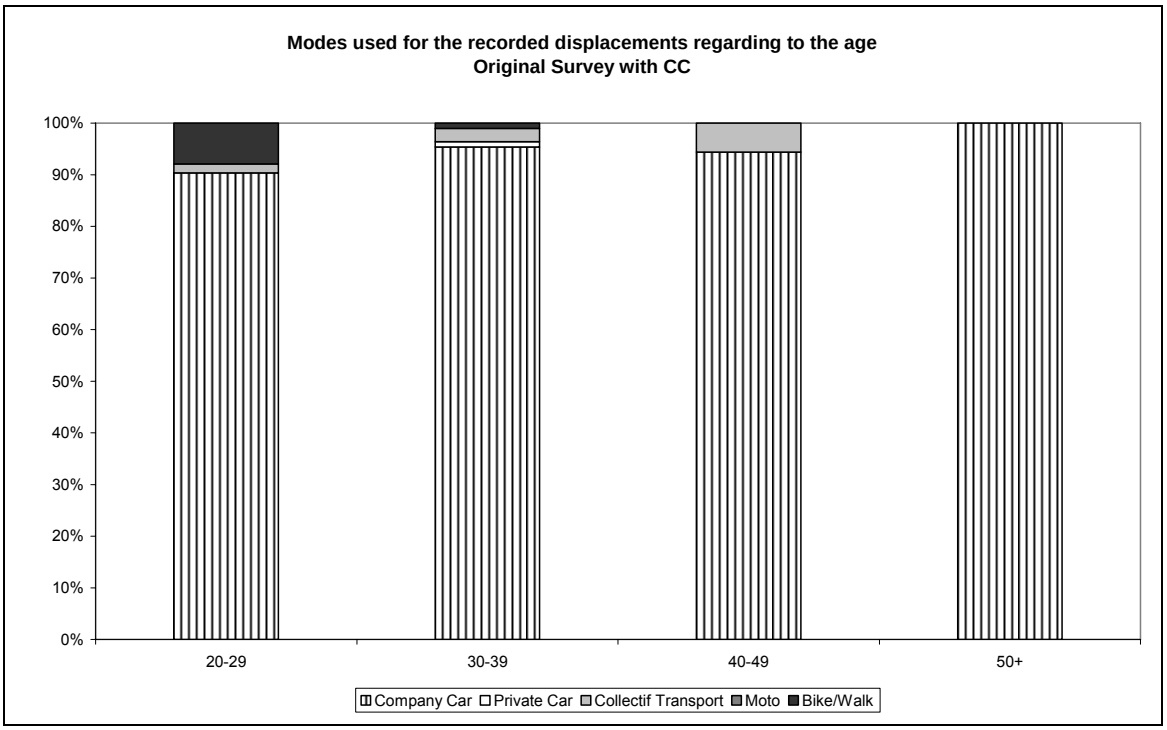

Figure 78: Modes used for the recorded displacements according to the age in the original survey with company car

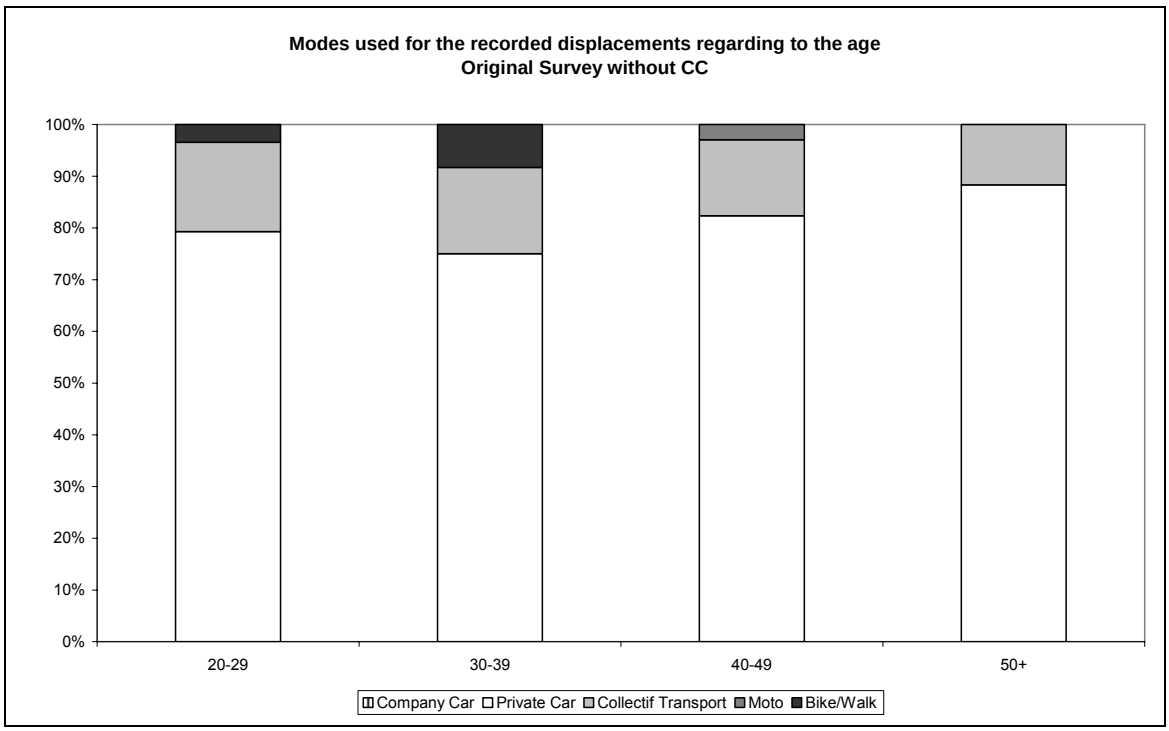

Figure 79: Modes used for the recorded displacements according to the age in the original survey without company car

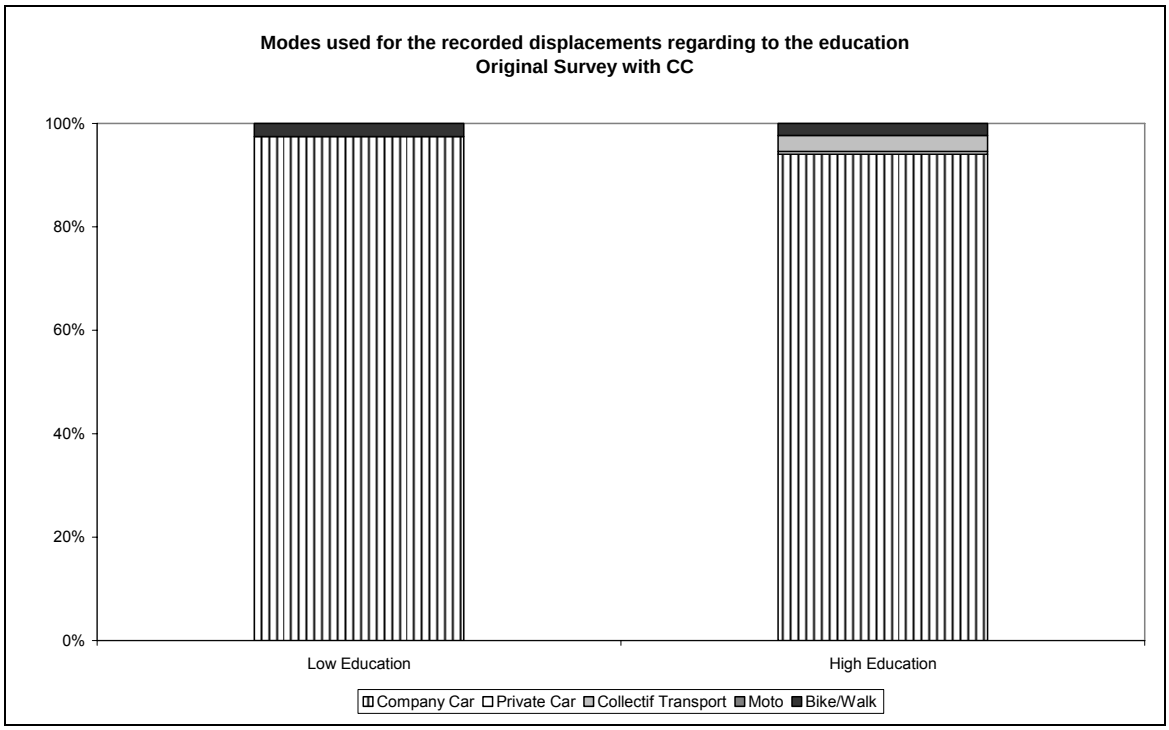

Figure 80: Modes used for the recorded displacements according to the education level in the original survey with company car

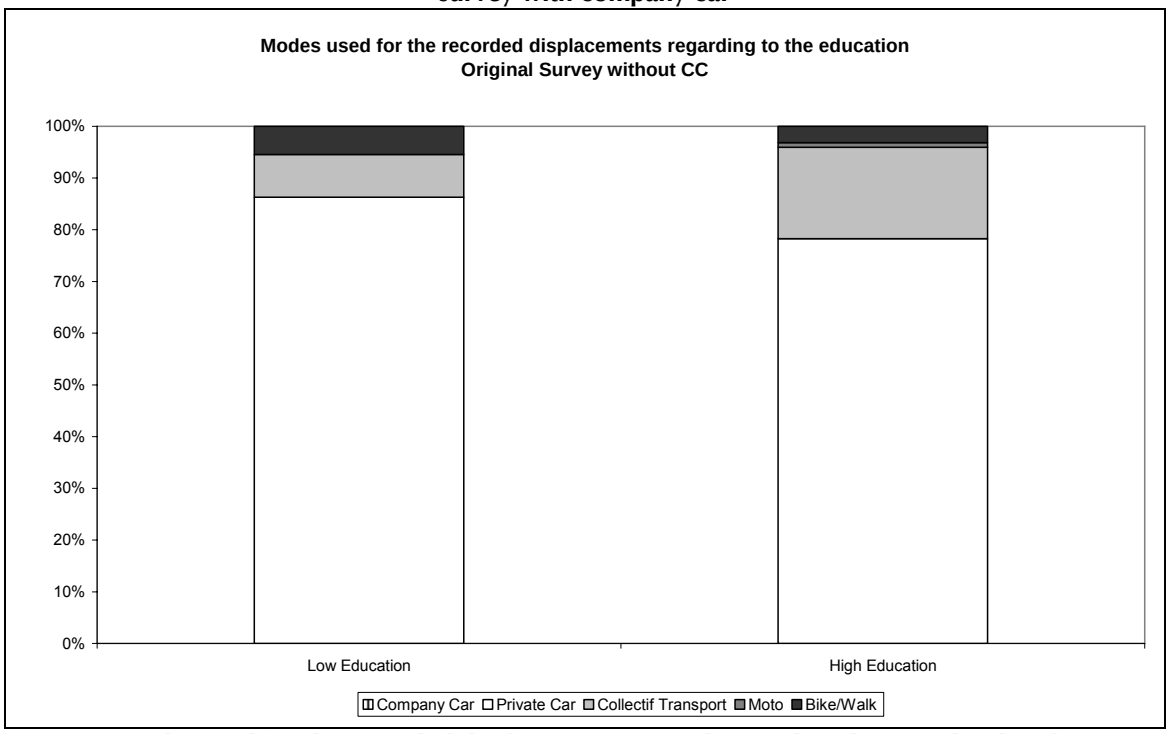

Figure 81: Modes used for the recorded displacements according to the education level in the original survey without company car

In the last part of this section, the purpose of the trips is analysed. Persons without a company car make only 2.68% professional trips while for persons with a company car one trip out of ten is a professional trip. For the additional surveys (TNS and personal contacts) the percentages are respectively 7.41 and 6.78. Private trips are 20% of all trips for persons with a company car and 23.41% of all trips for persons without a company car. For the additional surveys (TNS and researchers' contacts) the percentages are respectively 23.82 and 29.88. For the persons without a company car, persons with a higher education make more private trips than persons with a

lower education. For age and gender, the distribution among purposes is quite equal. For persons with a company car, gender shows the most interesting results: females make 22.7% private trips, while males make only 18.8% private trips. Professional trips only make up 4.96% of the trips made by a female and 12.35% of the trips made by a male. The additional surveys confirm these findings. The only exception is in the survey of personal contacts where male and female have almost the same percentage of professional trips.

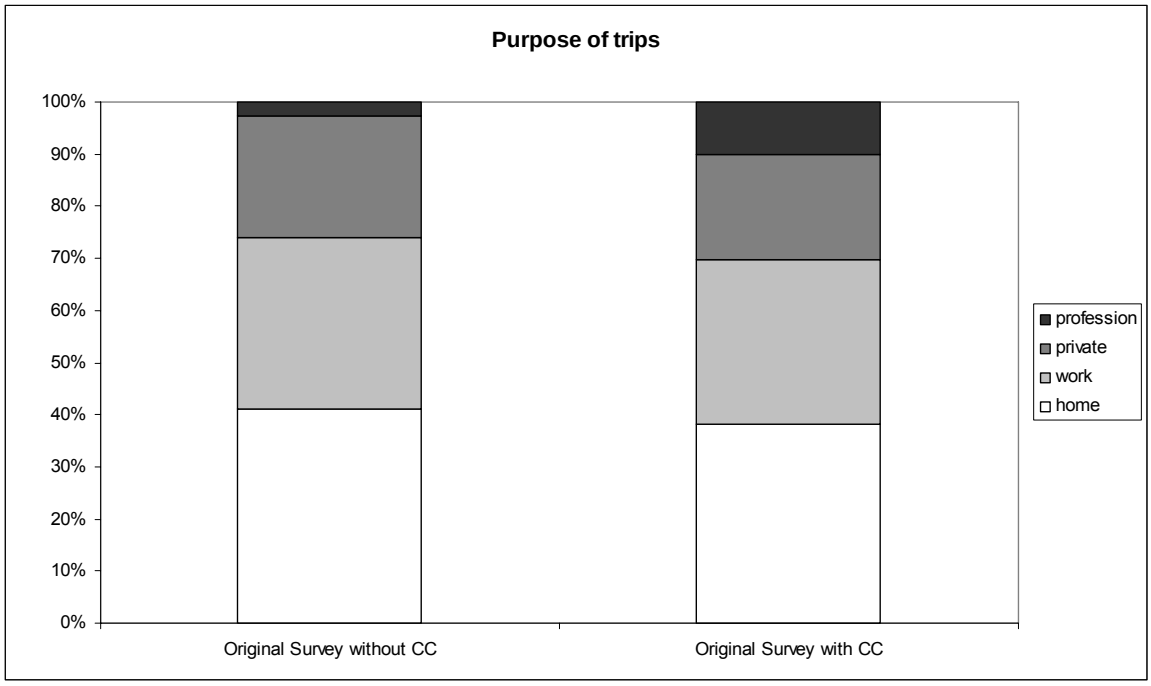

Figure 82: Purpose of trips recorded in the original survey

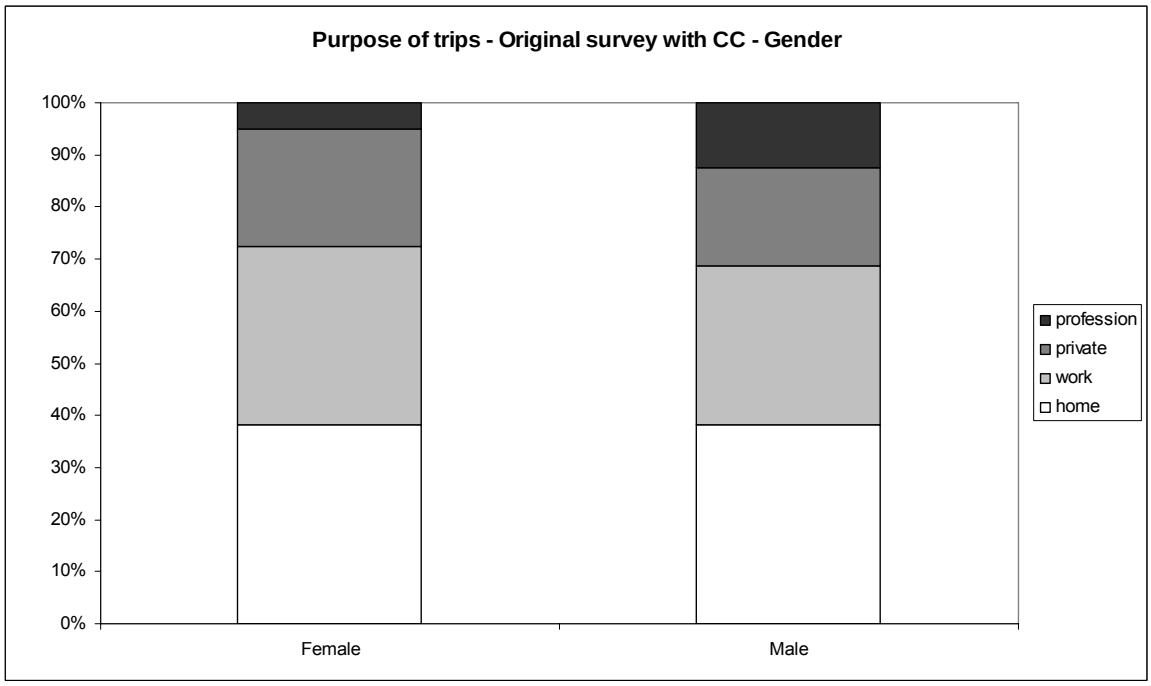

Figure 83: Purpose of trips recorded in the original survey with company car according to the gender

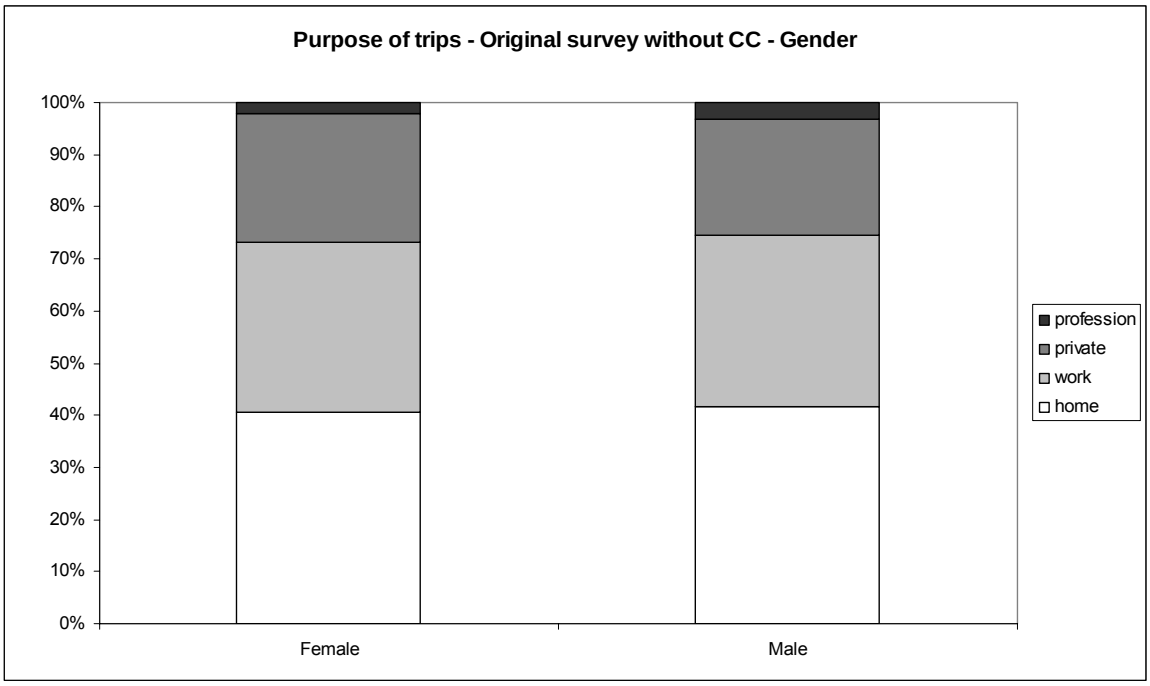

Figure 84: Purpose of trips recorded in the original survey without company car according to the gender

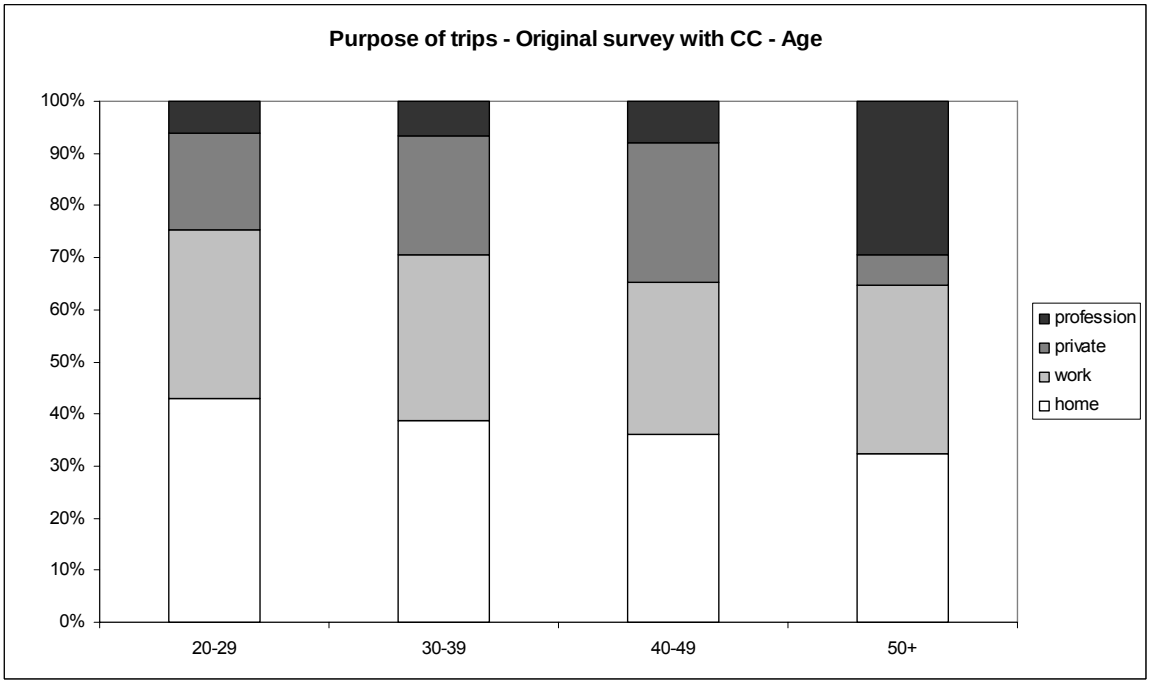

Figure 85: Purpose of trips recorded in the original survey with company car according to the age

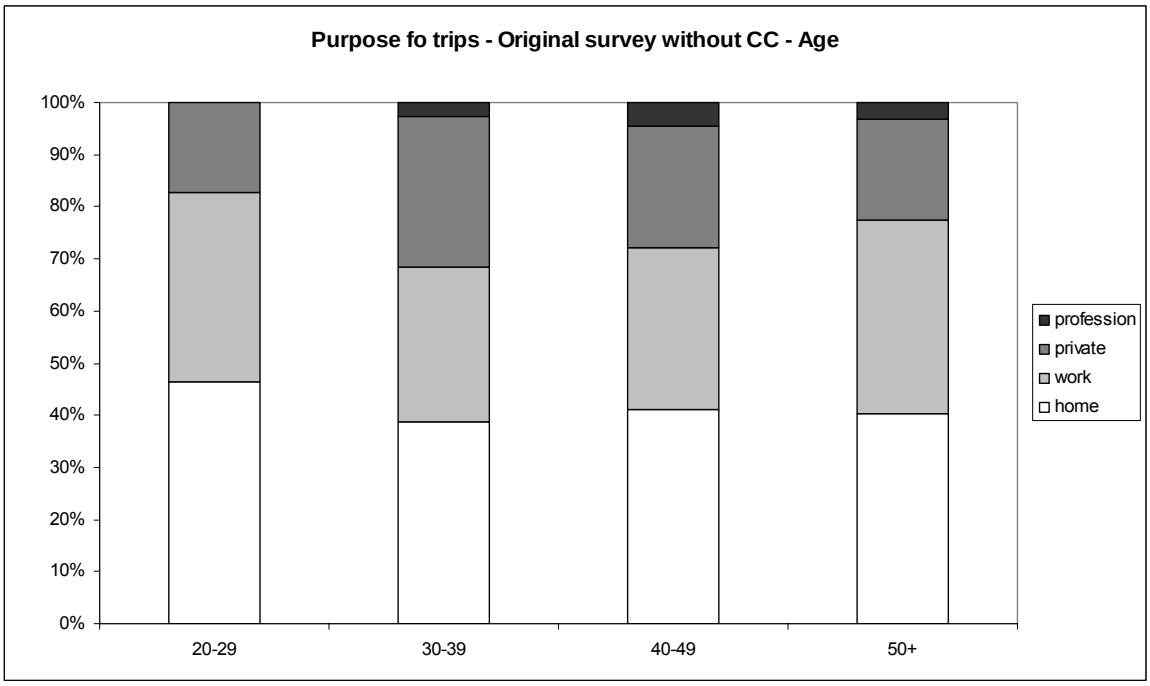

Figure 86: Purpose of trips recorded in the original survey without company car according to the age

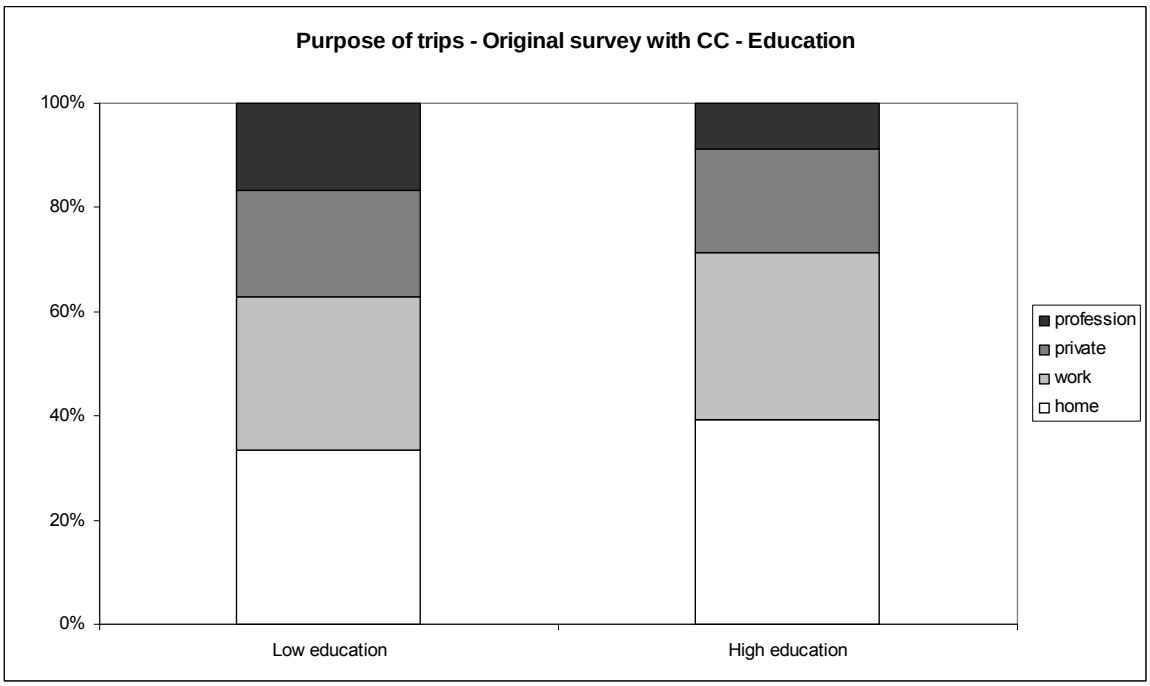

Figure 87: Purpose of trips recorded in the original survey with company car according to the level of education

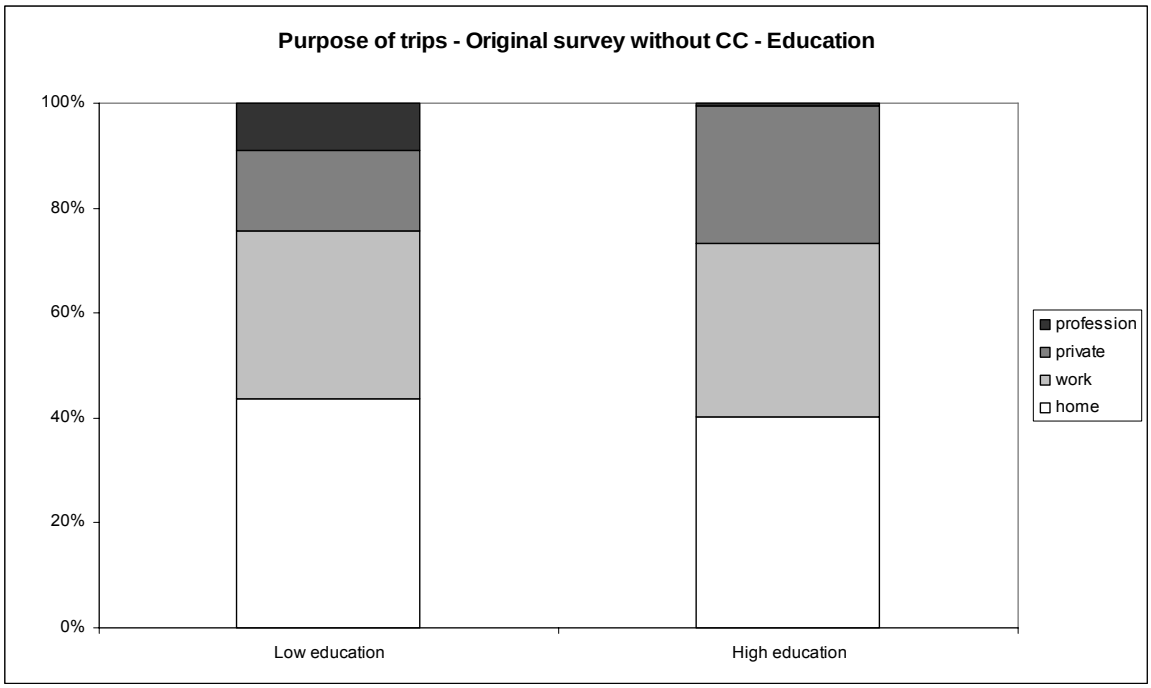

Figure 88: Purpose of trips recorded in the original survey without company car according to the level of education

CONCLUSIONS & SUPPORT TO THE DECISION

As we could notice since the beginning of the project, the subject of company cars is not neutral at all in political and economical spheres. It constitutes a very much debated question in a period of ecological awareness. What this project can offer to the debate is a rather scientific measurement of the phenomenon. Many things are said about company cars without any fundament, and it is very important to have a precise knowledge of the company cars phenomenon and especially of their impacts on mobility before taking any decision about them. A first step in this knowledge was already undertaken within the COCA project, with among others a review of the park of company cars in Belgium. The PROMOCO project proposed to go deeper in the study of this topic with the analysis of trips made by company car users, of substitution effects and of links between their use and the location of the firms.

Our results show how these cars are used and especially highlight that we can observe different mobility behaviours among company car users. The division of company car use between private and professional trips is also a useful output of this project. All the information resulting from this research should help to take the most appropriate decisions for this type of cars, being a social phenomenon which can not longer be forgotten when setting up mobility policies. In this section, and following the results we obtained in our survey, we will divide the recommendations in two parts: methodological recommendations for further scientific work on company cars, and support to the decision.

Methodological recommendations

If we would have had access to an exhaustive list of people having a company car at their disposal, we could have had a direct contact with company car users and be able to recruit them more easily. Moreover, we would be able to ensure the drawing of a statistically representative sample of this population. The fact that our respondents were contacted by their employers has certainly had a negative impact on the response rate: the more data you got, the more confident you can be in your analyses. Our low response rate encourages us to stay cautious with our findings.

Knowing the population (of company cars users) would also allow us to apply a process of weighting on our sample. Furthermore, no confidence intervals could be calculated because of too low response rates. It appears that a database on company car users should exist at the Ministry of Finances, but we were not able to get precise information about that. Our research would have been more relevant with this source of data, and we can only recommend the administration to allow researchers getting access to such a very useful information in order to perform more accurate research.

Another way to perform analyses on the use of company cars in a random and scientific way is to do it on a random sample of the Belgian population. This sample would have to be very large to obtain the information on the reduced group of company cars users. But this aim can be reached via other national surveys, especially the national household's travel survey. The difficulty with such surveys is the reduced number of observations. We strongly encourage public authorities to put more budgets in such surveys to extend the sample size and therefore allow analysis on smaller groups. In those surveys, we also recommend making it possible to establish the link between a trip and the car (in the household) used to achieve this trip, in order to study the mobility (trips) made by company car users with their company car (e.g. in the previous mobility survey, MOBEL, we did not have this link, and so if there were several cars in a household, which is often the case, we could not attribute a car to a trip).

Support to decision

In recent years, the issue of company cars has gained a lot of importance. The use of company cars has evolved from being a status symbol for board members and a necessary mean for employees who have to make a lot of professional displacements, to a common practice in the composition of the salary package and a popular incentive to attract motivated personnel. This evolution has mainly been triggered by the fiscal advantageous treatment of company cars and the heavy tax burden on labour forces, making it often more interesting for the employer to grant a company car instead of a salary increase generating the same monetary value for the employee. Our research confirmed that the motivation of employees is the most important reason for companies to attribute company cars. Second most important are specific job reasons, such as the regularity of professional trips and the employee's function level. Ranked third are financial incentives: the company car can be used for recruiting qualified people, as an alternative for a salary increase and to benefit from its fiscal advantages.
In most cases there is almost no limitation as to which trips the employee is authorized to make with his company car. On the top of that, the company car is usually accompanied by some form of fuel refunding (mostly a fuel card), which make it a 'free' transport mode that can be used for all kinds of displacements (home-work trips, professional trips and private trips). Consequently it can be expected that company car users, not being confronted with the costs of their car usage, make more displacements than private car users and that they also contribute to the current transport problems induced by excessive car usage. Our research confirms that company car ownership indeed affects the annual mileage in a way that company cars drive significantly more kilometres per year compared to privately owned cars. These higher annual mileages are for a part related to merely company car ownership, as our research indicated that the availability of this 'free' transport mode on its own already stimulates the use of it, but also professional displacements and home-work displacements appeared to contribute to the difference in annual mileage. Also, the frequency of professional trips and company car ownership are connected: the more regular professional trips have to be undertaken, the more likely the employee has a company car at his/her disposal. With regard to the home-work displacements, it appeared that although home-work kilometres contribute the most to the annual mileage of cars (both company cars and private cars), it is the home-work transport mode choice that helps explaining a part of the difference in annual mileage between company car users and private car users. The home-work distances do not differ significantly between company car users and private car users, but as people without a company car do not necessarily use their private car to commute from home to work, the home-work kilometres are not necessarily included in the calculation of the annual mileage of their private cars. People with a company car on the other hand almost exclusively use their company car to make the home-work displacement, so that these kilometres are generally accounted for in the calculation of their annual mileage.

We can conclude that company cars indeed drive more kilometres than private cars. Professional kilometres contribute the most to the average annual mileage of the entire company car fleet, closely followed by home-work kilometres. Private kilometres also play a role in the average annual mileage of company cars, but to a significantly smaller extent than professional and home-work kilometres. This finding contrasts with the general image that exists about the use of company cars, namely that there are many cases where the company car is not necessary for the execution of job and principally used for private displacements. There is indeed a part of the company car users to whom this general image applies (the 'enjoyers'), but they do not constitute the majority of company car users. However, it is important to point out that the interpretation of the results on company car studies should be done with care. First of all because, given the particular sensitive nature of the company car topic, it might be that respondents are inclined to somewhat more favourable for themselves. In this case, this would mean exaggeration the amount of professional kilometres while minimising the private use of

the company car. Second, due to the unavailability of a reference scenario with regard to company car users, no statements can be made concerning the representativeness of the samples used for performing the research. Given that there is no information on the company car user population or a database on company car attributing firms, there was no other possibility than to rely on other sources, like focusing on activity sectors where the attribution of company cars is more likely or relying on the contacts of a market research company, in order to recruit enough useful respondents to collect data on the phenomenon of company cars. Nevertheless, these encountered difficulties do not prevent that the researches provide a useful and interesting insight into the company car topic.

From a policy perspective, these results imply that company cars should be taken into account by policy makers when they are considering measures to direct the travel behaviour of individuals towards a more sustainable mobility behaviour.
From a sustainable mobility perspective, where the excessive car use generates detrimental effects on our society, economy and liveability, it is necessary for policy makers to take measures affecting the use of the car in general and of the company car in particular. When considering measures aimed at reducing company car attribution and hence company car use, policy makers should take into account that there are different types of company car users each using their company car for different purposes and thus each requiring a different type of policy approach.

The measures aimed at reducing the attribution of company cars should in particular be focused on people not having to make a lot of professional trips as in case of people heavily travelling for professional reasons, their company car can be justified as a means for the execution of their job, contributing to the economic activity of the company. Nevertheless, from a sustainable mobility perspective these company car users should be targeted with measures further increasing the environmental-friendliness of the company car in order to reduce their contribution to the exhaust of polluting emissions. Current policy measures aimed at promoting the use of more environmental-friendly company cars are of a stimulating kind, mainly consisting of linking the fiscal deductibility of the costs related to company cars to their CO_2 emission level. These measures should be made more stringent in a way that only cars being ranked at the top of environmental-friendliness turn out to be fiscally attractive to be attributed as company cars.

As far as the company cars owners using it especially for private trips are concerned, policy makers should take measures to promote and stimulate the use of other means as an alternative to company-car use for their home-work commuting trips. Due to its specific nature, home-work trips are trips were public transport is able to compete against the car and where there are opportunities for modal shifts from a car use towards public transport. However, in order to make public transport a viable alternative for car use the policy support should not only focus on the financial aspect of public transport, but also on quality and availability issues. Other alternatives that should be considered to reduce company car use among the 'commuters' are for instance offering Internet connections in order to allow teleworking and to avoid the home-work commuting trip, or tax benefits for people reducing their commuting distance by moving closer to their workplace, etc. In any case, as long as the company car enjoy a fiscal advantageous treatment, these measures should also be accompanied by important fiscal benefits to increase their attractiveness compared to the attribution of a company car. In order to increase their effectiveness, the policy measures aimed at stimulating these alternatives for company car attribution should be taken at company level, redirecting the mobility policy orientation of the company away from (company) car use.

For those using mostly their company cars for private cars, business or commuting motives do not play a role in the decision to be attributed a company car and the company car is actually

being considered as a part of the salary package. In this case the policy approach should focus on finding and stimulating more sustainable incentives as an alternative for the use of company cars as a compensation for monetary benefits. However, this will not be an easy task as company cars are perceived as very attractive incentives, being far more attractive than other monetary benefits like additional pension schemes, life insurances, saving plans, etc. Another option would then be to tackle the issue of using company cars as a financial compensation at its root by reducing the heavy tax burden on labour forces, making it more interesting for a company to grant cash benefits instead of company cars.

To conclude, it should be pointed out that in any case, one should keep in mind that there is no such thing as a free lunch, implying that even if something appears to be free, there is always someone paying for it. In the case of company cars, the benefits for both the employer and the employee are evident, but from a society point of view, the fiscal system stimulating the use of company cars creates additional external costs and represents an obstacle for measures intended to promote a modal shift away from car use. The real challenge for policy makers is thus to manage this topic in a way that the benefits they bring along for companies and employees do not exceed the costs they generate for the society as a whole.

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ANNEXES

Annex 1: Reasons for no public transport

	female	male
too slow	10	20
too expensive	0	2
lack of punctuality	2	6
too large waiting times	3	6
network insufficient	13	34
accessibility of stop	4	3
frequency	2	7
cleanliness	0	0
timetable unadapted	1	7
lack of comfort	1	3
not enough space on PT	0	1
unsafe	3	0
lack of information	0	0

Table 10: Reasons for no public transport – Original survey – Gender

	20-29	30-39	40-49	50+
too slow	9	12	3	6
too expensive	0	1	1	0
lack of punctuality	5	2	1	0
too large waiting times	3	6	0	0
network insufficient	7	22	12	6
accessibility of stop	4	2	1	0
frequency	1	5	1	2
cleanliness	0	0	0	0
timetable unadapted	0	2	4	2
lack of comfort	0	2	1	1
not enough space on PT	0	1	0	0
unsafe	1	1	1	0
lack of information	0	0	0	0

Table 11: Reasons for no public transport – Original survey – Age

	low	high
too slow	4	26
too expensive	1	1
lack of punctuality	1	7
too large waiting times	0	9
network insufficient	1	46
accessibility of stop	3	4
frequency	2	7
cleanliness	0	0
timetable unadapted	4	4
lack of comfort	1	3
not enough space on PT	0	1
unsafe	0	3
lack of information	0	0

Table 12: Reasons for no public transport – Original survey – Education

	female	male
too slow	11	50
too expensive	1	3
lack of punctuality	6	6
too large waiting times	9	22
network insufficient	43	86
accessibility of stop	14	14
frequency	4	14
cleanliness	0	1
timetable unadapted	11	22
lack of comfort	3	3
not enough space on PT	1	1
unsafe	0	0
lack of information	0	1

Table 13: Reasons for no public transport – Additional survey TNS – Gender

	20-29	30-39	40-49	50+
too slow	11	33	10	7
too expensive	1	0	2	1
lack of punctuality	4	5	2	1
too large waiting times	6	16	8	1
network insufficient	19	45	42	33
accessibility of stop	6	13	7	2
frequency	4	6	3	5
cleanliness	0	1	0	0
timetable unadapted	2	11	12	8
lack of comfort	1	4	0	1
not enough space on PT	0	1	0	1
unsafe	0	0	0	0
lack of information	0	1	0	0

Table 14: Reasons for no public transport – Additional survey TNS – Age

	low	high
too slow	8	53
too expensive	0	4
lack of punctuality	7	5
too large waiting times	8	23
network insufficient	28	101
accessibility of stop	4	24
frequency	5	13
cleanliness	0	1
timetable unadapted	11	22
lack of comfort	0	6
not enough space on PT	1	1
unsafe	0	0
lack of information	0	1

Table 15: Reasons for no public transport – Additional survey TNS – Education

	female	male
too slow	8	34
too expensive	0	0
lack of punctuality	0	4
too large waiting times	7	14
network insufficient	17	66
accessibility of stop	3	8
frequency	3	3
cleanliness	0	0
timetable unadapted	5	8
lack of comfort	1	5
not enough space on PT	0	0
unsafe	1	0
lack of information	0	0

Table 16: Reasons for no public transport – Additional survey contacts – Gender

	20-29	30-39	40-49	50+
too slow	20	16	4	2
too expensive	0	0	0	0
lack of punctuality	2	2	0	0
too large waiting times	7	8	4	2
network insufficient	23	41	14	5
accessibility of stop	5	5	1	0
frequency	3	1	2	0
cleanliness	0	0	0	0
timetable unadapted	6	5	2	0
lack of comfort	4	1	0	1
not enough space on PT	0	0	0	0
unsafe	0	1	0	0
lack of information	0	0	0	0

Table 17: Reasons for no public transport – Additional survey contacts – Age

	low	high
too slow	0	42
too expensive	0	0
lack of punctuality	1	3
too large waiting times	0	21
network insufficient	4	79
accessibility of stop	1	10
frequency	0	6
cleanliness	0	0
timetable unadapted	0	13
lack of comfort	0	6
not enough space on PT	0	0
unsafe	0	1
lack of information	0	0

Table 18: Reasons for no public transport – Additional survey contacts – Education

Annex 2: Copy of the questionnaire for the employers (Dutch version - available on paper and on the Web)

A. INFORMATIE OVER UW BEDRIJF

Naam van het bedrijf	……
Adres	- Straat : …… - Postcode : ……..
NACE[1] Code	……
Sector	* private sector * publieke sector * para-publieke sector
Aantal werknemers	* tussen 5 en 49 * tussen 50 en 99 * 100 en meer

B. BEREIKBAARHEID VAN UW BEDRIJF

1. Hoe beoordeelt u de bereikbaarheid van uw bedrijf met het openbaar vervoer?[2]

Geef aan door een kruisje te zetten in de gepaste kolom hoe u de bereikbaarheid van uw bedrijf met het openbaar vervoer in termen van afstand en frequentie aan de dichtstbijzijnde halte beoordeelt.

	Zeer ver (1)	*Ver (2)*	*Gemiddelde afstand (3)*	*Dichtbij (4)*	*Zeer dichtbij (5)*
Nabijheid van de halte					
	Zeer lage frequentie (1)	*Lage frequentie (2)*	*Gemiddelde frequentie (3)*	*Hoge frequentie (4)*	*Zeer hoge frequentie (5)*
Doorgangs frequentie					

2. Voorziet uw bedrijf parkeerplaatsen voor de werknemers?

* ja, gratis parkeren binnen het bedrijf
* ja, betalend parkeren binnen het bedrijf
* ja, gratis parkeren op een parking gehuurd door het bedrijf
* ja, betalend parkeren op een parking gehuurd door het bedrijf
* nee

[1] Gegevens afkomstig van Belfirst bevestigen

[2] Parallel met deze vraag en op basis van de locatie van het bedrijf kunnen we zelf via internet opzoeken of er openbaar vervoer in de buurt van het bedrijf beschikbaar is

3. Moest u opnieuw de locatie van uw bedrijf bepalen, zou u dan dezelfde locatie kiezen?

* ja (→ vraag 3a)
* nee (→ vraag 3b)

3a. Waarom zou u dezelfde locatie kiezen?

……
……..

3b. Waarom zou u een andere locatie kiezen?

……
……..

4. Beïnvloedt de locatie van het bedrijf uw bedrijfswagenbeleid?

* ja (→ vraag 5)
* nee (→ vraag 6)

5. Op welke manier beïnvloedt de locatie van het bedrijf uw bedrijfswagenbeleid?

……
……..

C. <u>BEDRIJFSWAGENBELEID</u>

6. Hoeveel bedrijfswagens zijn er in uw bedrijf?

- aantal:……. (als antwoord = 0 → vraag 6')

6'. Waarom zijn er geen bedrijfswagens in uw bedrijf?

……
……

7. Hoeveel percent van de werknemers beschikt volgens hun status over een bedrijfswagen?

	percentages
Arbeiders	…….%
Bedienden	…….%
Lager kader	…….%
Middenkader	…….%
Hoger kader	…….%
Directie	…….%

Opmerking :

Met hoger kader bedoelen we iemand die:
- een grondige kennis heeft van managementtechnieken
- op de hoogte is van externe factoren zoals de markt
- over het algemeen lange termijn beslissingen neemt
- verantwoordelijk is voor strategische beslissingen
- de toekomstplannen definieert en test op hun uitvoerbaarheid

Met middenkader bedoelen we iemand die:
- gespecialiseerd is in bepaalde taken van het management
- verantwoordelijk is voor het uitvoeren van de beslissingen die door het hogere kader genomen worden
- verantwoordelijk is voor tactische beslissingen
- toeziet op het werk van het lager kader en rapporteert aan het hoger kader

Met lager kader bedoelen we iemand die:
- er voor zorgt dat de beslissingen genomen door het midden en hoger kader uitgevoerd worden
- korte termijn beslissingen neemt
- verantwoordelijk is voor operationele beslissingen

8. Welke zijn de keuzemogelijkheden voor de werknemer met betrekking tot de keuze van de bedrijfswagen?

* Vrije keuze op basis van een bepaald budget
* Vrije keuze uit een beperkte lijst van modellen van verschillende merken
* Vrije keuze uit een beperkte lijst van modellen van 1 bepaald merk
* Geen vrije keuze: de werkgever beslist
* Andere:…….

9. Welke van deze gebruiksvoorwaarden zijn van kracht bij het gebruik van een bedrijfswagen? (meerdere antwoorden mogelijk)

* Werknemer betaalt zelf een deel van de leasingkost
* Werknemer betaalt zelf de autoverzekering
* Werknemer betaalt zelf de verkeersbelasting
* Werknemer betaalt zelf het onderhoud
* Werknemer betaalt zelf de pechverhelping
* Werknemer betaalt zelf een vervangwagen
* Werknemer betaalt zelf de franchise bij een ongeval
* Werknemer betaalt zelf verkeersboetes
* Geen van bovenstaande

10. Hoe belangrijk zijn volgende factoren bij het ter beschikking stellen van een bedrijfswagen?

	Helemaal niet belangrijk	*Niet belangrijk*	*Neutraal*	*Belangrijk*	*Zeer belangrijk*
Slechte bereikbaarheid van het bedrijf met openbaar vervoer					
Fiscale gunstige behandeling van bedrijfswagens					
Motiveren van de werknemers					
Buitenfunctie van werknemers/ Professionele verplaatsingen					
Alternatief voor loonsverhoging					
Aantrekking competente werknemers					
Imago van het bedrijf					
Anciënniteit van de werknemers					
Functieniveau van de werknemers					
Andere : …… …… ……					

D. HUIDIG MOBILITEITSMANAGEMENT

11. Op welke manier wordt carpoolen ondersteund in uw bedrijf?

* Geen ondersteuning
* Verspreiding van informatie over carpooling
* Ter beschikking stellen van een carpooldatabank binnen het bedrijf
* Ter beschikking stellen van een carpooldatabank in samenwerking met een of meerdere naburige bedrijven
* Toetreding tot Taxistop
* Voorbehouden parkeerplaatsen voor carpoolers
* Extra verplaatsingsvergoeding voor carpoolers
* Gegarandeerde thuisrit voor carpoolers in geval van onvoorziene omstandigheden[3]
* andere :…… ……..

12. Op welke manier wordt fietsen naar het werk ondersteund?

* Geen ondersteuning
* Kilometervergoeding
  ~ Hoeveel bedraagt deze vergoeding? ……€/Km[4]
* Ter beschikking stellen van bedrijfsfietsen
* Aanwezigheid van fietsenstallingen
  ~ Zijn de fietsenstallingen overdekt?
  * ja
  * nee
  ~ Zijn de fietsenstallingen gescheiden van de parkeerplaatsen voor de auto's?
  * ja, de fietsenstallingen zijn enkel toegankelijk voor fietsers
  * nee, de fietsenstallingen bevinden zich bij de parkeerplaatsen voor auto's
  ~ Zijn de fietsenstallingen beveiligd?
  * ja
  * nee
* Aanwezigheid van opfris-/omkleedruimte
* Andere……

13. Op welke manier wordt openbaar vervoer gebruik ondersteund door uw bedrijf?

* Geen ondersteuning
* Terugbetaling van een deel van de abonnementskost
  ~ Hoeveel percent van de abonnementskost wordt er terugbetaald? %[5]
* Volledige terugbetaling abonnementskost
* Andere:

……

[3] Voorbeeld van een mogelijke oplossing: openbaar vervoer ticket
[4] In veel gevallen bedraagt de kilometervergoeding 0,15€/Km
[5] De terugbetalingen kunnen variëren naargelang de betrokken openbaar vervoermaatschappij

14. Organiseert uw bedrijf collectief bedrijfsvervoer voor het woon-werkverkeer?

* Ja
* Nee

15. . Maakt uw bedrijf gebruik van autodeelsystemen (bedrijfswagens niet toegewezen aan 1 werknemer, maar beschikbaar voor alle werknemers voor professionele verplaatsingen)?

* Ja
* Nee

Annex 3: Copy of the questionnaire for the employees (French version - only available on the Web – questions in grey were only in the additional survey)

A. DONNÉES PERSONNELLES

Sexe	* homme * femme
Age	* moins de 20 ans * 20 à 24 ans * 25 à 29 ans * 30 à 34 ans * 35 à 39 ans * 40 à 44 ans * 45 à 49 ans * 50 à 54 ans * 55 à 59 ans * 60 à 64 ans * 65 ans et plus
Diplôme le plus élevé dont vous disposez	* aucun * primaire * secondaire * supérieur non universitaire * universitaire
Vous êtes actuellement (si vous avez plusieurs emplois, veuillez indiquer votre activité principale)	* ouvrier * employé * cadre inférieur * cadre moyen * cadre supérieur[1] * direction * autre :……
Vous travaillez	* à temps partiel * à temps plein
Vous travaillez	* uniquement durant la journée ~ durant les heures de bureau ~ en horaires décalés

[1] Par *cadre supérieur*, nous entendons une personne qui :
- a une connaissance étendue des rôles et techniques de gestion
- est consciente de facteurs externes tels que le marché
- prend généralement des décisions à long terme
- est responsable des décisions stratégiques
- définit les plans futurs et vérifie leur efficacité

Par *cadre moyen*, nous entendons une personne qui :
- est spécialisée dans certaines tâches de gestion
- est responsable de la mise en place des décisions prises au niveau supérieur
- est responsable de décisions tactiques
- surveille le travail des subalternes et rédige des rapports pour les supérieurs

Par *cadre inférieur*, nous entendons une personne qui :
- s'assure que les décisions prises par les niveaux supérieurs sont effectuées
- prend des décisions à court terme
- est responsable des décisions opérationnelles

	* uniquement durant la nuit * en équipe (en pauses) sans service de nuit * en équipe (en pauses) avec service de nuit * autre :……
Vous disposez d'un permis de conduire	* oui * non
Adresse de votre domicile	- Rue :……. - Code Postal :……. - Commune :……..

B. QUESTIONS À PROPOS DE VOTRE SOCIÉTÉ

1. Société pour laquelle vous travaillez ?

- Nom :……
- Code Postal :…….

2. Quelle est la distance en kilomètre entre votre domicile et l'endroit où vous travaillez ? (distance « aller »)

Remarque : si vous travaillez à différents endroits, veuillez la distance vers le lieu principal (c.-à-d. celui vers lequel vous allez le plus souvent)

* moins de 1 Km
* entre 1 et 2 Km
* entre 2 et 5 Km
* entre 5 et 10 Km
* entre 10 et 20 Km
* entre 20 et 50 Km
* entre 50 et 100 Km
* 100 Km et plus

NB: Respondents of the original survey go to question12 (section C)

3. Quel est le code NACE de votre société ? (Si inconnu, décrivez succinctement l'activité principale de votre société)

4. Votre société est issue du :

* privé
* public
* para-public

5 Combien de travailleurs comptent votre société ?

* entre 5 et 49
* entre 50 et 99
* 100 et plus

6. Votre société prévoit-elle des places de parking pour ses employés ?

* oui, parking gratuit en interne
* oui, parking payant en interne
* oui, parking gratuit que la société loue
* oui, parking payant que la société loue
* non

7. De quelle manière le covoiturage est-il encouragé au sein de votre société ?

* rien n'est envisagé
* diffusion d'information sur le covoiturage
* mise à disposition d'une banque de données interne à la société
* mise à disposition d'une banque de données en collaboration avec une(d') autre(s) société(s)
* adhésion à Taxistop
* places de parking réservées pour les personnes participant au covoiturage
* compensation supplémentaire sur les frais de déplacement
* en cas de circonstances imprévues, une solution est envisagée pour le retour vers la maison[2]
* autre :……

……..

……..

……..

8. De quelle manière les déplacements à vélo pour se rendre au travail sont-ils encouragés ?

* rien n'est envisagé
* compensation financière
  ~ à combien s'élève cette compensation ? ……€/Km[3]
* mise à disposition de vélos de la société
* présence de places de stationnement pour les vélos
  ~ ces places sont-elles à l'abri ?
    * oui
    * non
  ~ parking spécifique aux vélos ou avec les voitures ?
    * spécifique pour les vélos
    * même parking que les voitures des travailleurs
  ~ parking sécurisé ?
    * oui

[2] Exemple de solution envisagée : ticket de transport en commun
[3] Fréquemment, cette compensation s'élève à 0,15€/Km

* non
* présence de vestiaires et/ou douches
* autre :……

……..

……..

9. De quelle manière l'utilisation des transports en commun est encouragée au sein de votre société ?

* rien de spécial n'est fait
* remboursement d'une partie de l'abonnement
  ~ à hauteur de combien de %[4] ?
* remboursement total de l'abonnement
* autre :……

……..

……..

10. Votre société organise-t-elle un système de transport collectif pour les déplacements domicile-travail pour ces travailleurs ?

* oui
* non

11. disposez-vous des voitures de service qui ne sont pas accordées à un seul travailleur, mais qui peuvent être utilisées à l'occasion par différents travailleurs pour des déplacements professionnels ?

* oui
* non

C. QUESTIONS À PROPOS DE VOTRE VOITURE

12. Avez-vous une voiture de société[5] ?

* oui (→ question 15)
* non (→ question 13)

13. Avez-vous une voiture ?

* oui (→ question 15[6])

[4] Les remboursements peuvent varier selon les sociétés de transport considérées

[5] Par « voiture de société », nous entendons : un véhicule dont le coût initial est supporté par l'employeur, et qui est octroyé à un employé pour ses déplacements professionnels et/ou privés, et dont celui-ci peut disposer sans solliciter une autorisation de son employeur

* non (→ question 14)

14. Disposez d'une voiture de service ?

* oui
* non

→ question 23

15. Quelle est la marque (par exemple : Ford, Volkswagen, Audi, …) de votre voiture de société ?

- marque :……

16. Quel est le type ou le modèle (par exemple : Focus, Golf, A4, ….) de votre voiture de société ?

- modèle :…….

17. Quel type de carburant utilise cette voiture de société ?

* diesel
* essence
* gaz
* hybride
* autre :…….

18. Combien de kilomètre effectuez-vous par an en moyenne avec votre voiture de société?

- Kilomètre par an :……..

19. En prenant en considération les trajets respectifs réalisés, quels pourcentages représentent ces différents déplacements :

- déplacements domicile-travail[7] : …….%
- déplacements professionnels[8] : …….%
- déplacements privés[9] : …….%

20. Veuillez remplir le tableau ci-dessous en cochant les solutions adéquates en ce qui concerne vos déplacements :

[6] On pose alors uniquement les questions 15, 16, 17 et 18 en remplaçant « voiture de société » par « voiture privée », ainsi que la section D en retirant les options relatives aux déplacements réalisés avec une voiture de société.

[7] Les *déplacements domicile-travail* représentent les déplacements entre votre domicile et votre lieu de travail

[8] Les *déplacements professionnels* sont des déplacements que vous réalisez dans le cadre de votre travail, comme des visites auprès de clients par exemple

[9] Les *déplacements privés* sont des déplacements qui n'ont aucune relation avec votre travail

	Pouvez vous utiliser votre voiture de société pour ce type de déplacements ?		**Vos frais de carburant sont-ils remboursés pour ce type de déplacements ?**	
Types de déplacements	*Oui*	*Non*	*Oui*	*Non*
Déplacement domicile-travail				
Déplacements professionnels à l'intérieur du pays				
Déplacements professionnels à l'étranger				
Déplacements privés à l'intérieur du pays				
Déplacements privés à l'étranger				

21. Comment se fait le remboursement des frais de carburant[10] ?

* carte carburant
* note de frais
* carte de crédit au nom de la société
* pompe à essence au sein de la société
* autre :……..

22. Existe-t-il une limite imposée par la société sur le kilométrage annuel pour les déplacements privés réalisés avec la voiture de société ?

* oui
  → Kilométrage :…….
* non

D. VOS DÉPLACEMENTS HABITUELS

23. Etes vous amené à vous déplacer dans le cadre de votre profession ?

* oui, tous les jours (→ question 24')
* oui, très souvent (au moins deux fois par semaine) (→ question 24')
* oui, assez souvent (au moins trois fois par mois) (→ question 24')
* oui, parfois (au moins une fois par mois) (→ question 24')
* oui mais rarement (moins d'une fois par mois) (→ question 24')
* non, jamais (→ question 25)

[10] Question à poser uniquement si le répondant indique au moins un remboursement des frais de carburant à la question précédente

24'. La majorité de ces déplacements est effectuée

* avec votre voiture de société[11]
* avec votre voiture personnelle
* avec un véhicule de service, de flotte
* en transport en commun

25. De quel manière vous rendez-vous le plus souvent à votre lieu de travail ? (Veuillez indiquer le mode de transport principal)[12]

* avec votre voiture de société comme conducteur (→ question 26)
* autre :
  ~ avec votre voiture de société comme passager (→ question 26)
  ~ avec votre voiture privée, comme conducteur (→ question 27)
  ~ avec votre voiture privée, comme passager (→ question 27)
  ~ avec le train (question 28)
  ~ avec le tram (→ question 28)
  ~ avec le métro (→ question 28)
  ~ avec le bus (→ question 28)
  ~ avec un taxi (→ question 28)
  ~ avec le moyen de transport collectif mis en place par la société (→ question 28)
  ~ avec un cyclomoteur (→ question 28)
  ~ avec une moto (→ question 28)
  ~ à vélo (→ question 28)
  ~ à pied(→ question 28)

26. Si vous ne possédiez pas de voiture de société, comment iriez-vous travailler ?

* avec votre voiture privée, comme conducteur (→ question 27)[13]
* avec votre voiture privée, comme passager (→ question27)
* avec le train (→ question 28)
* avec le tram (→ question 28)
* avec le métro (→ question 28)
* avec le moyen de transport collectif mis en place par la société (→ question 28)
* avec un cyclomoteur (→ question 27)
* avec une moto (→ question 27)
* à vélo (→ question 28)
* à pied (→ question 28)

[11] Proposition évoquée si et seulement si le répondant a dit avoir une voiture de société
[12] Donner les propositions adéquates en fonction des réponses données aux questions 12 et 13
[13] la question 27 ne sera posée que si le répondant opte pour un véhicule privé motorisé

* autre :……. (→ question 28)

27. Pour quelle raison principale ne vous rendriez-vous pas au travail en utilisant les transports publics ?

* pas assez rapide
* trop cher
* manque de ponctualité
* trop de temps d'attente lors des correspondances
* absence de réseau/réseau insuffisant
* accessibilité des arrêts
* fréquence de l'offre
* pas assez de place dans les trains/bus/trams/métros
* horaires non adaptés
* manque de confort
* pas assez de propreté
* manque d'information
* insécurité
* autre :…….

E. VOS DÉPLACEMENTS LORS D'UN *JOUR RÉFÉRENCE*

Quelques informations : nous souhaitons obtenir quelques informations relatives aux déplacements que vous avez effectués hier. Par *déplacement*, nous entendons tout mouvement sur la voie publique ou le réseau ferroviaire entre deux endroits (l'origine et la destination) dans le but d'effectuer une activité[14] et ce via un quelconque mode de transport[15].

28. Avez-vous effectué au moins un déplacement hier?

* oui (→ question 30)
* non (→ question 29)

29. Veuillez indiquer pour quelles raisons vous n'avez pas effectué de déplacement hier :

* travail à la maison
* obligations à la maison (passage du plombier, garde d'un enfant,…)
* malade ou handicap
* météo
* pas eu besoin de sortir
* autre :……..

→ question 32

30. Premier déplacement

a) origine :

[14] Les activités peuvent être de tout type : aller travailler, faire des courses, rendre visite à quelqu'un, faire du sport, aller chercher quelqu'un quelque part,…

[15] Nous demanderons aux employés de signaler le mode de transport principal utilisé. Au cas où celui-ci s'avèrerait être le train, nous lui demanderons comment il s'est rendu à la gare.

* adresse du domicile[16]
* autre :
  - Rue :…….
  - Code Postal :…….
  - Commune :……..

b) heure de départ :……

c) raison du déplacement (donnez s'il vous plaît la raison principale) :

* aller à la maison
* aller travailler
* faire des courses/du shopping
* visite pour le travail
* prendre un repas à l'extérieur
* rendre visite à la famille ou à des amis
* aller à l'école
* se promener, faire un tour
* déposer/ chercher quelqu'un
* loisirs, sport, culture
* raison personnelle (docteur, banque,…)
* autre :……..

d) destination :

- Rue :……..
- Code Postal :…….
- Commune :……..

e) comment vous êtes vous rendu à cet endroit ? (Veuillez indiquer le *mode de transport principal*[17])

* avec votre voiture de société comme conducteur
* autre :
  ~ avec votre voiture de société comme passager
  ~ avec votre voiture privée, comme chauffeur
  ~ avec votre voiture privée, comme passager

[16] Dans le cas du premier déplacement nous indiquerions l'adresse du domicile comme choix de réponse ; s'il s'avérait que le répondant ne partait pas de son lieu d'habitation, il lui sera permis de le spécifier via la possibilité de réponse « autre »

[17] Encore une fois, les possibilités de réponse seront fonction des réponses données aux questions 12 et 13 (possession d'une voiture de société ? possession d'une voiture privée ?)

~ avec le train
- comment vous êtes-vous rendu à la gare ?
* avec votre voiture de société comme passager
* avec votre voiture privée, comme conducteur
* avec votre voiture privée, comme passager
* avec le tram
* avec le métro
* avec le bus
* avec un taxi
* avec un cyclomoteur
* avec une moto
* à vélo
* à pied
* autre :…….
~ avec le tram
~ avec le métro
~ avec le bus
~ avec un taxi
~ avec le moyen de transport collectif mis en place par la société
~ avec un cyclomoteur
~ avec une moto
~ à vélo
~ à pied
~ autre :…….

f) heure d'arrivée : ……

g) distance parcourue : …….

h) avez-vous réalisé un autre déplacement ensuite ?

* oui (→ on repart vers la question 30 (ou 30' si l'on préfère) en indiquant **« deuxième déplacement »**, et comme lieu d'origine on impose le lieu de destination du premier déplacement)
* non (→ question 31)

31. Votre dernier déplacement s'est donc terminé à heure d'arrivée du dernier déplacement = 30 f)

* oui (→ questions 32 à 35 si répondant possède une voiture de société, dans le cas contraire → fin du questionnaire)
* non (→ repart vers question 30)

32. Une autre personne a-t-elle utilisé votre voiture de société hier (ou plusieurs autres personnes) ?

* oui (→ question 33)

* non (→ question 34 *si* le jour de référence est un jour de semaine, dans le cas contraire → section E)

33. Combien de kilomètres a(ont) effectués cette(ces) personne(s) avec votre voiture de société ?

- kilomètres :…… (→ question 34 *si* le jour de référence est un jour de semaine, dans le cas contraire, questionnaire terminé)

34. Avez-vous utilisé votre véhicule de société au cours du dernier week-end ?

* oui (question 35)
* non (→ questionnaire terminé)

35. Combien de kilomètres avez-vous effectués avec votre voiture de société au cours du week-end précédent?

- kilomètres :……

Annex 4: Neutralisation of the socio-demographic factors

One of the problems we faced in our analysis was to identify the number of private (vs home work or professional) trips. Moreover this question is really crucial as one of the main questions of our project, but also as a "politically-oriented" question. This figure varies largely amongst our four different samples (see Figure 1)[1]. Therefore the purpose of following pages is: first, understanding the factors which can influence this figure (does this figure really differ amongst our different samples, or are the differences due to sociodemographic characteristics of these samples?); and second, if we get to identify such relevant sociodemographic factors, trying to find a way to neutralise their influence on our dependant variable.

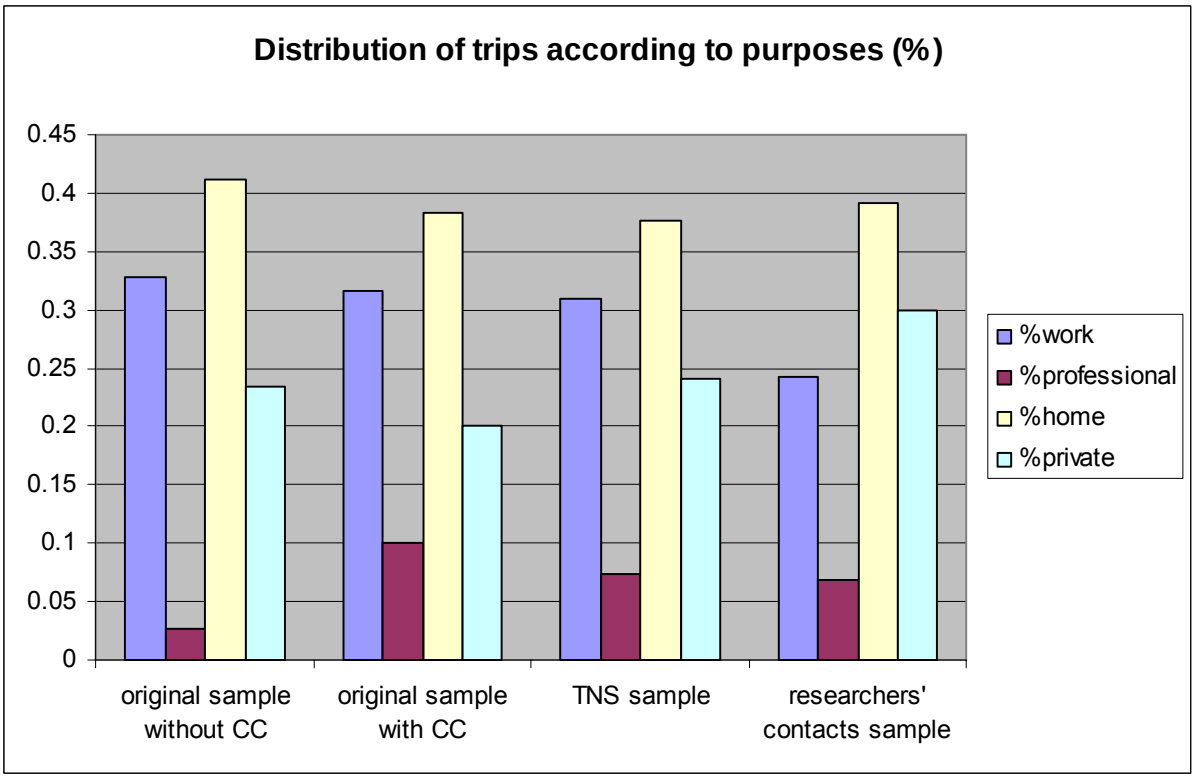

Figure 1: distribution of trips according to purposes (in %)

The first factors we thought about were education, gender and age. Indeed as we saw in previous analysis that the fourth sample (additional researchers' contacts) presents a younger and more graduated population (and to a less extent so are also the other CC[2] samples), it is possible to imagine that people from our 3 CC-samples achieve more private trips than people without CC because there are younger with higher diplomas, and not because of their disposal of a company car[3].

The method we choose to use is a weighting for each of the 3 CC-samples following the distribution of gender (male, female), age (4 classes: 20-30, 30-40, 40-50, 50+) and diploma (not high school, high school) in the first sample (no CC sample). This weighting has been

[1] All analyses reported in this paper have been undertaken on the database « promoco.completetrips », i.e. the base of selected complete trips. The % of private/professional trips have been calculated for each individual.
[2] Company Cars
[3] This point was raised by a member of the users' committee.

realised with CALMAR, a SAS macro developed by INSEE. The used calibration method is "raking ratio method"[4], as this method gave the best weight ratios.

What we have to verify, once this method applied, is the coherence of our 3 CC-samples, which is supposed to become closer if we neutralise relevant factors. We have to specify that we only made checking controls for coherence on the variable "purpose of trips", because this was at the origin of the identified problem, but other analysis could be undertook on other variables if we need more results.

1. Neutralising age, gender and diploma effects

The first element we were aware after the weighting according to these variables was the really huge weight ratios, even if we choose the method minimizing at most these ratios. Nevertheless, we tried to analyse if we remark any change in the distribution of our dependant variable after using those new weights:

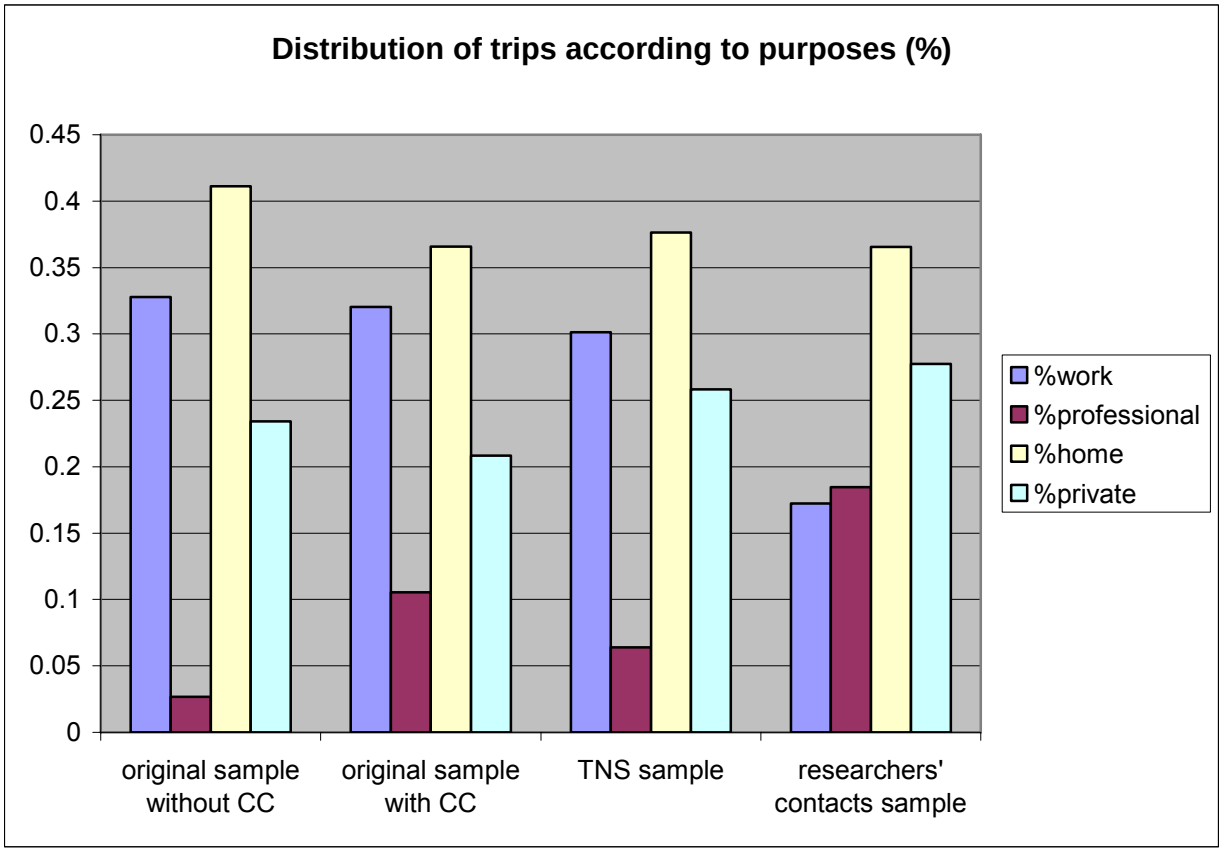

Figure 2: distribution of trips according to purposes, after suppressing the influence of age, gender and diploma (in %)

The result was rather unexpected, and huge differences were remaining amongst our 3 CC-samples, which indicated that those variables we thought the more relevant at a first glance are probably not the best to choose.

[4] Technical information about this method can be retrieved in « La macro CALMAR : redressement d'un échantillon par calage sur marges », Olivier Sautory, 1993 (Document de travail INSEE. Direction des statistiques démographiques et sociales num. F 9310).

More precise investigations indicate that the large weight ratios are probably due to the very low number of "non high school" diplomas in the fourth sample (10 on 329 in total). So we decided, in a second step to re-use the same weighting but only for high graduated people, which gave us a smaller number of observations, but also a smaller number of weighting variables, as we didn't use anymore the "diploma" variable.

2. Neutralising age and gender effects on "high graduated" individuals

Figure 3 presents the distribution of trips according to purpose, only for high graduated people (high school or university), before any weighting on data:

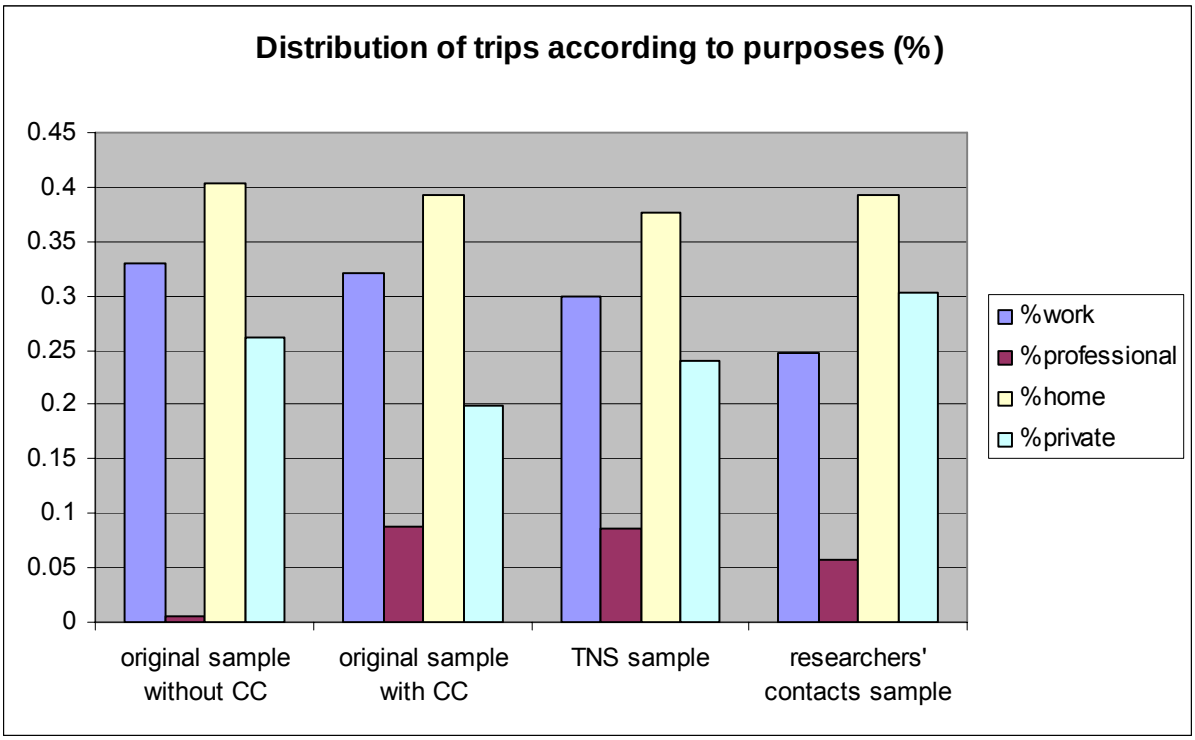

Figure 3: distribution of trips according to purpose, for high graduated people (%)

Here below is the result of this second manipulation (weighting according to the distribution of age and gender for high graduated people):

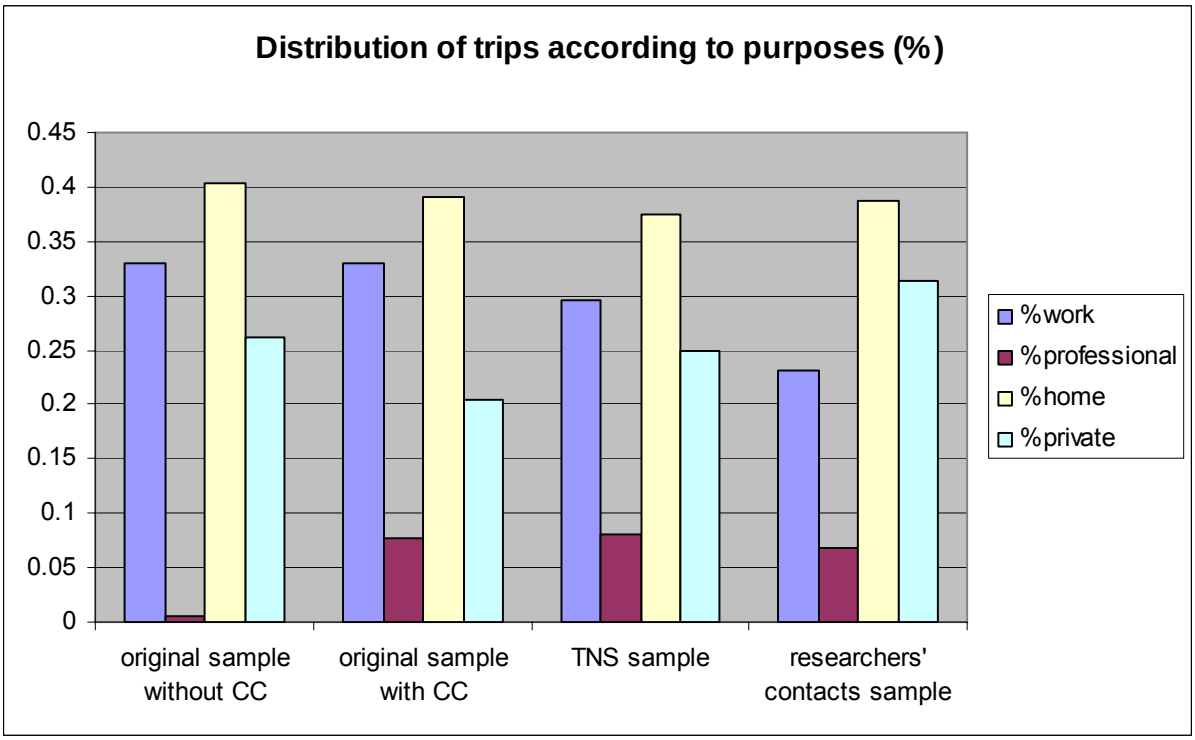

Figure 4: distribution of trips according to purpose, for high graduated people, suppressing the influence of age and gender (%)

As seen from last figure, it appears that this second method gives no better results for reducing differences amongst samples.

Therefore we decided to try a weighting on other variables to reduce differences amongst samples. The Variable "type of day" (week-day – school or holiday period - or weekend-day) was used at this time.

3. Neutralising "type of day" effects

As we can see on the graph below the neutralisation of "type of day" effects seemed to make the 3 CC-samples "behave" in a more coherent way. Hence we decided to conduct a more complete analysis on the data to identify which are the variables that most influence the differences amongst samples.

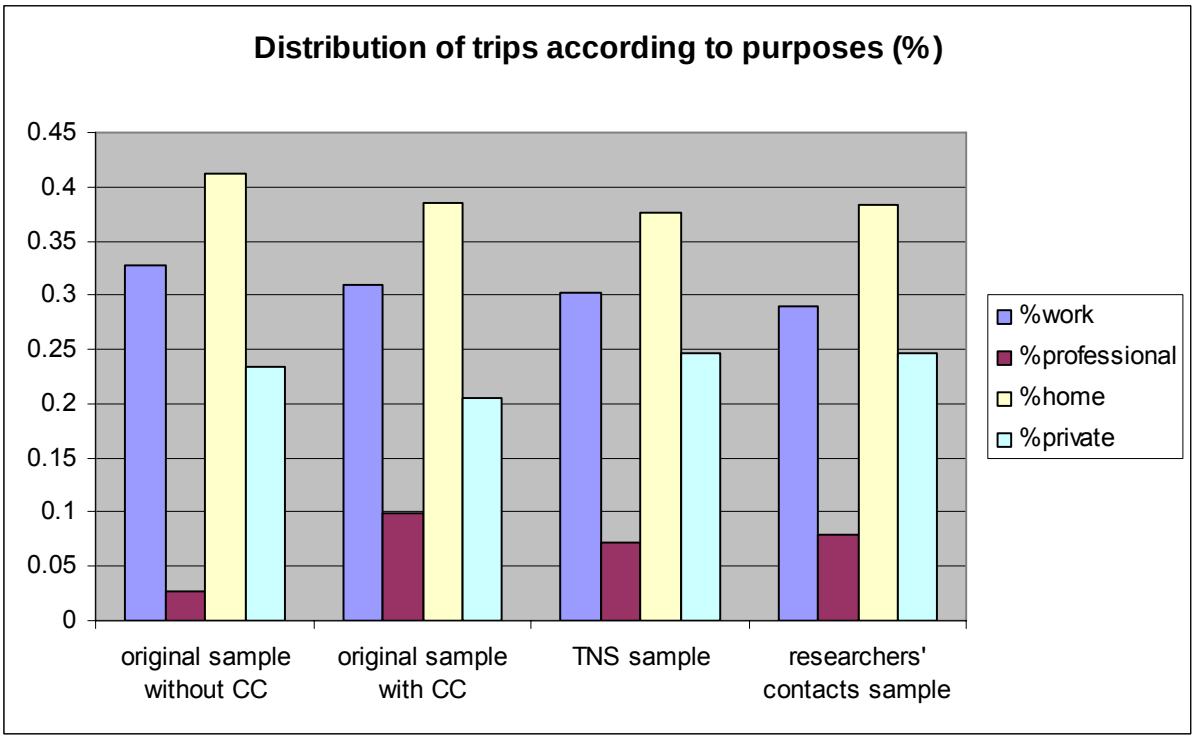

Figure 4 : distribution of trips according to purpose, suppressing the influence of "type of day" (%)

4. Identification and selection of relevant variables

To identify relevant variables, we put the percentage of private trips realized during the reference day as the dependant variable, and tried to see which are the most explicative variables among a series of variables.
To reach this objective, we used ANOVA procedures, with the proc GLM in SAS (Generalised Linear Models), first with a rather complete whole of variables, for the three CC samples:

model:
%_private_trips = sample + age + sex + diploma + function + time_working + type_of_day(3pos) + type_of_day(2pos) + region_work + region_home

The table below presents the p-values for these variables:

Source	DF	Type III SS	Mean Square	F Value	Pr > F
sample	2	641.26896	320.63448	0.71	0.4917
age	9	6120.56960	680.06329	1.51	0.1404
sex	1	2888.77877	2888.77877	6.40	0.0115
diploma	3	1065.77659	355.25886	0.79	0.5011
function	5	4619.97631	923.99526	2.05	0.0697

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Time_work	9	3097.38609	344.15401	0.76	0.6513
type_of_day1	2	10762.16641	5381.08321	11.92	<.0001
type_of_day2	1	71.16029	71.16029	0.16	0.6914
Region_work	2	212.67841	106.33921	0.24	0.7901
Region_home	2	664.83062	332.41531	0.74	0.4790

From these results we noted that the type of day was the best explicative variable, and that diploma and age, we though relevant variables, seem not so good to explain the differences in the amount of private trips in our 3 CC-samples.

We tested some other models, to end with this, presenting the best p-values for each term of the model:

model:
*% _private_trips = sample + sex + function + type_of_day + sample*type_of_day*

(sample type_of_day being the interaction between those 2 terms).*

Here below are the p-values of this model:

Source	DF	Type III SS	Mean Square	F Value	Pr > F
sample	3	6192.06653	2064.02218	4.62	0.0032
sex	1	4985.37574	4985.37574	11.15	0.0009
function	5	4857.73282	971.54656	2.17	0.0548
type_of_day	2	55729.73459	27864.86729	62.35	<.0001
sample* type_of_day	6	7555.53246	1259.25541	2.82	0.0100

We can see that gender, function and type of day explain quite well the percentage of private trips made by individuals, but also that "sample" remains an important explicative variable. Even if we put in evidence some variables having influenced our results in different ways through our different samples, we do not have to forget that differences coming from the samples themselves can remain, differences which we can not explain with the variables we have in our database (e.g. the context in which questionnaires are filled, a random effect,...). What we also learn from the significativity of the interaction term is that the percentage of private trips may vary in a different way according to the type day, within the different samples.

5. Neutralising "type of day" and function effects

Having identified which variables can offer a better explanation of such differences between samples, we tried to use them to achieve a new weighting of our data (i.e. neutralising the influence of these variables). We quickly leave the idea of using all those 3 variables because of too huge weights ratios, as we have too many categories to perform the weighting. Hence we made the weighting only with 2 variables: the type of day and the function. Even if we also obtained too large weights ratios with these 2 variables, here below are the results of the distribution of trips purposes after neutralising the influence of these 2 variables:

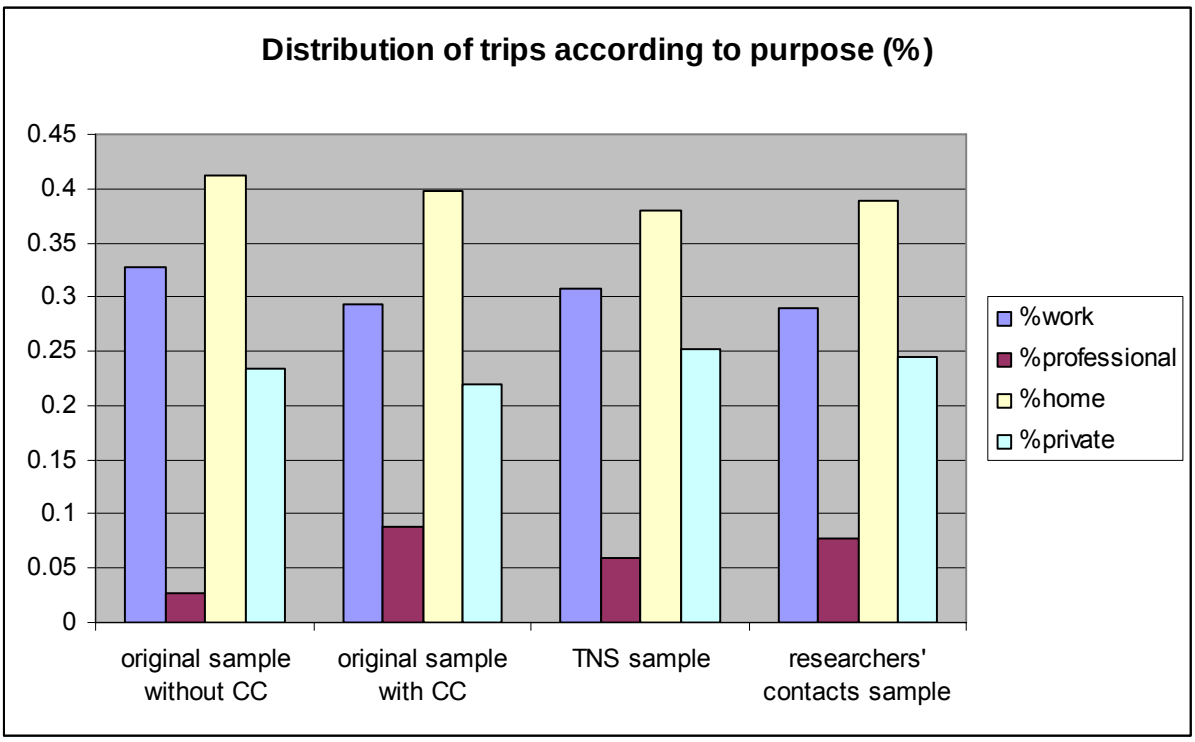

Figure 5 : distribution of trips according to purpose, suppressing the influence of type of day and function (%)

Because of large weights ratios we cannot perform our analysis using these weights, and the main reason of this is the lack of data, we have too small effectives in some categories (this can also be the consequence of a particular profile of company car users). But the trend shown by this last graph is a more homogeneous profile of private (and other) trips made by company car users.