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## Mobility data across the EU 28 member states: results from an extensive CAWI survey

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### Abstract

The EU-wide survey presented here was carried out in 2014 with the objective of gathering in order a number of transport and mobility indicators on transport user preferences at both urban and long-distance level in a uniform way, with emphasis on the potential of emerging transport technologies and the acceptability of various transport policy measures.

The CAWI (Computer Aided Web Interview) survey covered all 28 Member States of the European Union with the same questionnaire translated in the local languages. Samples of 1000 individuals in each country reflected the composition of adult population (from 16 years on) in terms of gender, age class, employment status, education level and living region.

The survey provided a rich and comparable picture of mobility across the 28 EU countries; many similarities across countries were found together with some differences. In a way, the findings suggest that, despite some national peculiarities, mobility habits and behaviour are relatively homogenous in Europe and are determined especially by socio-economic drivers.

The result of the survey confirmed that passenger mobility in EU is heavily centred on personal car, which is the most used transport mode also for long distance trips. Relatively higher modal share in East European countries appears to be driven mainly by the lower car availability rather than higher quality of public transport services.

Europeans' trips are essentially local, even though there is a share of citizens travelling frequently over longer distances. In particular, individuals with highly qualified jobs travel significantly more than others above 1000 km not only for business but also for leisure.

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According to the survey results, the attitude towards electric vehicles is rather positive: one third of EU citizens declared to be willing to consider purchasing a battery or hybrid car in the next future. The picture for car sharing is more blurred: only a minority is interested in this service and, interestingly, half of those interested do not see this service as an actual alternative to car ownership. Opinions in relation to policy issues such as the measures for the internalization of environmental effects of transport are quite differentiated but in general regulatory restrictions seem to be more acceptable than pricing measures.

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## 1. Introduction

Transport is a key field for the European policy. When looking in detail at its multifaceted world, the overall goals of the European transport policy can be further defined in specific objectives and targets and the policy success depends on its capability to attain such targets. In order to understand whether these targets are being reached, it is essential to find evidence addressing current status and trends in the transport sector are essential.

The main purpose of the survey, carried out by TRT *Trasporti e Territorio* and IPSOS Italy on behalf of the Joint Research Centre – Institute for Perspective and Technological Studies (JRC-IPTS), was to investigate several aspects of mobility at the European level. The overall objective was to collect information that could potentially help monitor the progress towards the goals of EU transport policy, as expressed in the 2001 White Paper (European Commission, 2011). National surveys gathering information on personal mobility exist in various European countries, but their outcomes are not necessarily comparable because of differences in scope and definitions. Also, not all the desirable information is collected. In order to fill in gaps and achieve comparable data a EU wide survey is helpful (Ahern et al., 2012).

The survey focused on the use of transport modes for both daily and long distance mobility as well as on some other policy relevant issues (e.g. the attitude towards internalisation of road external costs by means of road charging). Such information cannot be collected through conventional statistics at EU level and a user survey can be an effective alternative solution.

The survey was administered using the CAWI (Computer Aided Web Interview) methodology during June 2014. The CAWI methodology allowed savings on direct costs (logistics and interviewers) with respect to phone interviews granting at the same time a high (or higher) level of quality in terms of sampling procedures, data collection, field monitoring and data processing.

The survey involved all 28 European countries. In each country the sample was of 1000 individuals (500 in Cyprus, Luxembourg and Malta). The sample was randomly drawn from the panels administered by IPSOS in each country. These panels are continuously monitored in order to ensure that participants are representative and committed to participate in the surveys. The sample was segmented according to socio-economic characteristics: age and gender, employment status and education level. For each of these characteristics sample quotas were defined. The resulting samples were in general very close to the population composition (with a few exceptions). Anyway, to correct sample imbalances weights have been computed through a procedure constrained to respect the distribution according to each of the segmentation variables.

The questionnaire was the same in all countries, translated in the local languages. It included four sections:

- General information on the respondent (e.g. age, gender, living area) as well as details on availability of cars and public transport service;
- Everyday mobility in terms of mode used, frequency of trips, duration, distance, inter-modality, also collecting judgments on main problems experienced;
- Long distance trips (between 300 km and 1000 km and over 1000 km) by purpose and by mode made in the last 12 months;
- Attitude towards innovative transport services and transport policy issues (road charging, internalization of external costs, etc.).

More information are provided in Fiorello and Zani (2015). The purpose of this paper is to give an overview of some key results of the survey. Chapter 2 deals with information collected on personal characteristics; Chapter 3 presents data on the most frequent trip; Chapter 4 introduces results on long distance mobility and; Chapter 5 shows the attitude of respondents towards innovative transport and transport policy. The last chapter provides some final considerations.

## 2. Individual characteristics

A high share of Europeans, 82%, considers that the location where they live is well served or relatively well served by public transport and only 5% of the respondents replied that their area is not served by public transport. As expected, the level of public transport service is linked to the living area type: in metropolitan areas the percentage of population not served or badly served by public transport is less than 5%, while this share increases in smaller cities and rural areas, where it amounts to almost 40%.

The good overall level of satisfaction with public transport services cannot be directly linked to the degree of urbanisation. In this respect, the share of respondents living in rural areas (24%) is not a proxy of the share of respondents not well served by public transport. Indeed, according to the survey, the majority of those living in rural areas are well or relatively well served by public transport (with clear differences among countries). For instance Austria has one of the largest shares of inhabitants in rural areas (around 40%) but one of the smallest shares of population not served by public transport. Contrastingly, the share of respondents living in rural areas in Lithuania is not particularly high but the share of those complaining of poor public transport service is double than the EU average.

The wide majority of respondents (82%) has a driving licence. In general though, the share of driving license holders is lower in East Europe, while among Western Europe countries only UK and Sweden stay below the EU average. Among respondents between 18 and 30 years old<sup>1</sup>, around 75% hold a driving license. The lower share of driving license holders for younger respondents is a pattern across most of the countries covered by the survey, a fact that may suggest that the younger generation in Europe is less keen (or has lower possibilities) to drive a car than earlier cohorts.

On average in the EU there are 1.4 cars available per each household and 0.7 per adult<sup>2</sup>. Most of the countries above this average are Western Europe countries but also some Eastern Europe countries are above the average (e.g. Estonia and Slovenia) and several West Europe countries are below the average (e.g. Denmark, Sweden, UK). Only in Romania there is less than one car available per household. As expected, the average number of available car per adults varies with the living area type, i.e. it increases moving from metropolitan areas to rural areas, thus reflecting the different availability of public transport. Larger differences are found in terms of average number of cars available for different income groups (Figure 1).

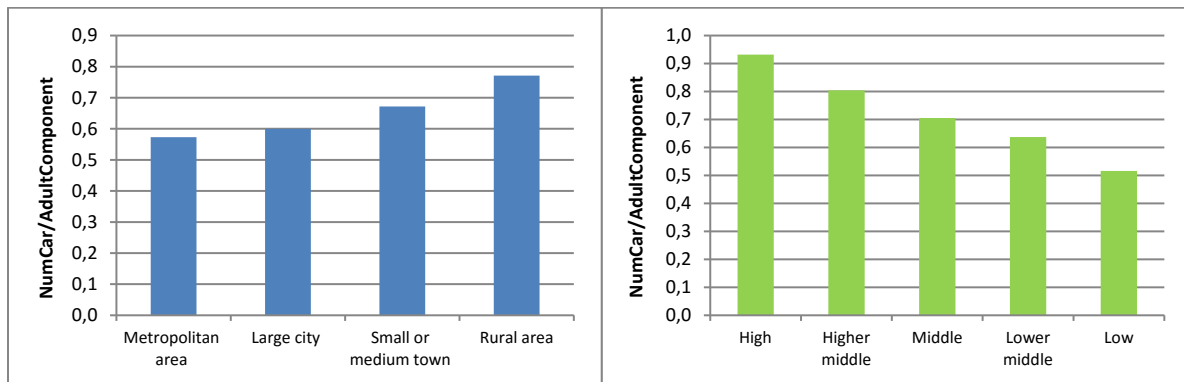


Fig. 1. Car ownership depends on living area (left) but even more on income (right).

<sup>1</sup> The minimum age to hold a driving license in the EU is 18 years.

<sup>2,3</sup> In case the respondent reported the use of more transport modes, the main mode has been defined according to a functional hierarchy. E.g., when train is used together other modes the latter usually have an ancillary role (e.g. to reach the station), so any combination of modes including train was associated to main mode “train”.

Individuals belonging to high income households do have a higher number of cars available in comparison to those living in low income households. Interestingly, especially in West Europe countries, the number of available cars is larger in the class “higher-middle income” than in the class “high income”. The role of income could explain why especially in some East Europe countries (e.g. Bulgaria, Estonia, Latvia, Romania) more cars can be found among those living in large urban areas than in rural population.

### 3. Daily mobility

The most frequent trip is made by car by the majority of respondents (56%). Public transport is used by one respondent out of five. Train is the main mode<sup>3</sup> for the most frequent trip only for 7% of respondents, while cycling and walking add to 16%.

Car is below 40% in Czech Republic, Hungary, Romania; since the availability of cars in these countries is well below the average, it can be said that motorisation rate seems a key factor of transport mode choice. The share of public transport and train together is above 30% more likely in East Europe, but also in Austria, Greece and Sweden among West Europe. In general, there is a correlation between the share of public transport and the level of service in the living area.

The survey confirms that bicycles are used more frequently in Northern Europe. Denmark and the Netherlands are largely at the top of the rank (in both countries bike is the second most used mode) and also Sweden, Finland and Hungary are above the average (see figure 2). Interestingly, in Denmark and the Netherlands bike seems principally an alternative to urban public transport, whose share is very small. Actually, if the shares of public transport and bike are summed, the result for these two countries is below 30%, in line with other West Europe countries (e.g. Austria, Germany, Greece) and well below many East Europe countries.

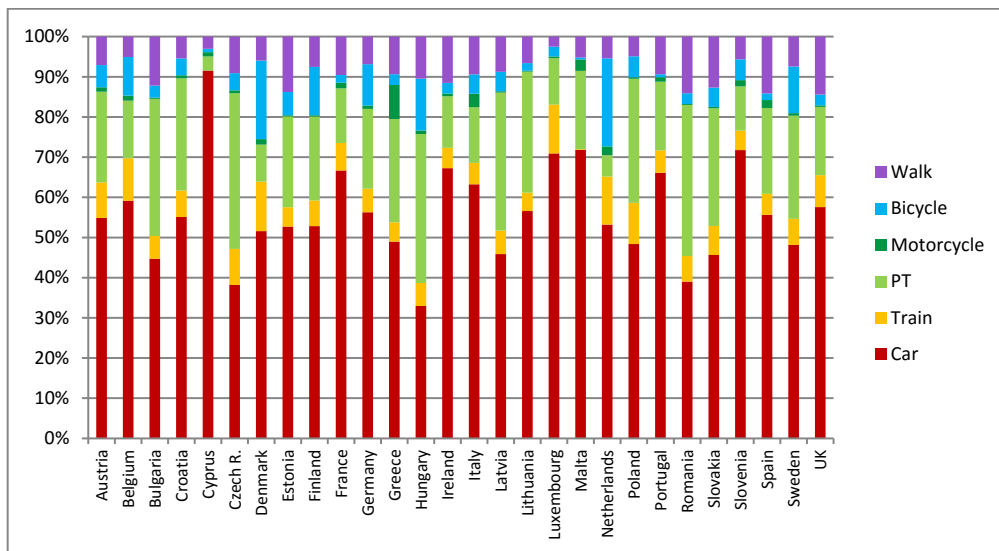


Fig. 2. Main Transport Mode used for the most frequent trip by country.

<sup>3</sup> In case the respondent reported the use of more transport modes, the main mode has been defined according to a functional hierarchy. E.g., when train is used together other modes the latter usually have an ancillary role (e.g. to reach the station), so any combination of modes including train was associated to main mode “train”.

As expected the use of car for the most frequent trip is much lower in urban areas than in rural areas whereas the opposite holds for public transport and train. In metropolitan areas car is used less than public transport and sustainable modes cater for the majority of the most frequent trips of respondents in large cities as well.

Less than one quarter of the respondents use intermodal combinations for their usual trip (78% declared to use only one mode during their most frequent trip, 14% use two modes and 8% use three or more modes) and is more common in Eastern Europe countries.

The average occupancy rate of most frequent car trips is 1.7 persons/car. The varies, however, from a minimum of 1.4 in Denmark to a maximum of 2.7 in Romania. Comparing this data with the average number of available cars per adult in the household, it emerges that countries with a high occupancy rate are those with a low car availability. This suggests that car is widely perceived as an individual mean of transport and pooling cars seems more a necessity than a deliberate choice.

On average the most frequent trip is 17 km long, with limited variability across countries. Train trips are the longest ones, 38 km on average, as they take into account some relatively long distance trips made not on a daily basis. Trips by car are on average 20 km long, while trip by public transport are shorter (13 km). Walking trips are nearly 3 km long.

Considering all modes together, including pedestrian trips, the most frequent trip average duration is 39 minutes. The average duration of trip is not that different across modes. This evidence seems to support the idea that faster transport modes are used not to save time but to travel longer.

Congestion and parking difficulty are the main problems experienced by car users (both drivers and passengers) in relation to their most common trip. 22% of respondents do not report any problem and this share is smaller in Bulgaria, Croatia, Italy, Malta, Poland and Romania; with the exception of Poland, these are all South Europe countries.

Car users residents in the metropolitan areas experience congestion and difficulty of parking almost as twice as residents in rural areas. Conversely, lack of or infrequent public transport services are suffered in rural areas much more than in urban areas. At the same time, nearly one third of respondents living in rural areas do not report any significant problem while the larger the city the higher the probability of problems with congestion or parking.

Interestingly, 20% of respondents complain about poor quality of public transport (too low frequency or lack of coverage) and 7% of respondents reported the lack of bicycle lanes as a problem. Since these answers come from car users, the perception of problems concerning public transport suggests that they consider travelling with alternative modes and could switch to public transport if service were better.

## 4. Long distance trips

### 4.1. Trips over 1000 km

Three quarters of the employed and students in EU28 do not travel longer than 1000 km for work/business/study purposes. Nearly half of the remaining 25% made only 1 trip over 1000 km per year. Less than 3 respondents out of 100 in this group travelled over 1000 km for business or studying purposes more often than once every two months. The picture is quite similar across the EU countries. Interestingly, the largest shares of students that travelled at least one time above 1000 km in the last 12 months are found in peripheral countries such as Bulgaria, Greece, Ireland and Lithuania. Managers and other individuals employed in highly qualified positions are those who travelled more for working purposes: nearly 40% of individuals in this group made at least one trip over 1000 km in the last 12 months.

The situation is different for trips over 1000 km for leisure and personal purposes, as these are more frequent than business trips. The share of respondents who did not travel longer than 1000 km for leisure in the last 12 month is 60% and 33% is the share of those who did one or two trips. On the other hand, long trips (>1000 km) for visiting purposes are even less than those for work/business/study. Whereas differences across countries are relatively limited, individuals employed in highly qualified positions not only made more business long distance trips, as mentioned earlier, but also made more leisure and personal trips over 1000 km than any other group based on job type.

Car is the favourite mode for long distance trips: more than half of these trips were made by car both for leisure and for business purposes (figure 3). This result, somewhat unexpected, is in line with data collected by national surveys in the recent past: the French national travel survey of 2008 reported that 52% of trips over 1000 km were made by car (ENTD, 2008) and in the same year the German national survey MiD (Mobilität in Deutschland) came

up with a share of 40% (MiD, 2008). Plane is the second most used alternative: one third of leisure long distance trips and one fourth of business trips are made by plane. Third is train (including High Speed Rail) which is used for nearly 10% of trips above 1000 km.

The split by transport modes is more differentiated across countries than the overall number of trips. In most of the West Europe countries plane is used more than average, conversely, in several East Europe countries, coach is used by a significant share of travellers. Somewhere (Bulgaria, Czech Republic, Latvia, Romania) coach is even more used than plane for long distance trips, especially for working and studying purposes (actually students explain most of this data).

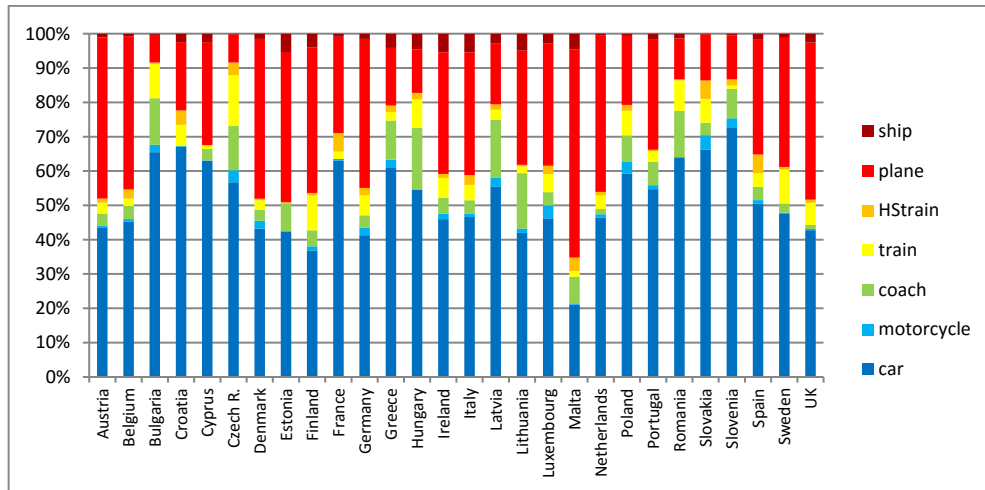


Fig. 3. Modal split of trips > 1000 km for personal purposes by country.

#### 4.2. Trips between 300 and 1000 km

The share of employed or students that travelled for working or studying purposes between 300 and 1000 km is significantly higher than the share of those who travelled over 1000 km for the same purposes: 38% of individuals made at least one trip in the last 12 months and nearly 10% of respondents made 3 trips or more.

The majority of respondents travelled between 300 and 1000 km for leisure and personal purposes in the last 12 months: some 40% of them made one or two trips and more than 20% made 3 or more trips. Finally, two respondents out of 100 travelled over 300 km more than one time per month. Again, the trips made to visit relatives and friends are less: only one third of respondents travelled between 300 and 1000 km in the last 12 months. In brief, personal trips are made for both leisure and visiting purposes but the latter trips are made less frequently.

Car is still the favourite mode for 300 to 1000 km trips: nearly three quarters of such trips are made by car. Train here is the second most used mode, especially for working and studying trips where its share is 16% (considering also High Speed Rail), but also for personal trips (12%). Car is preferred everywhere but especially in East Europe countries: the share of car is above the average in 8 East Europe countries out of 13 and only in 7 West Europe countries out of 15. Train is used especially in North and Centre Europe: Finland, France, Germany, UK. In some countries – especially in East Europe – coach is used more than train to travel between 300 and 1000 km: Bulgaria, Estonia, Greece, Hungary, Latvia, Lithuania, Portugal, Romania, Slovenia.

Among all respondents that used plane at least once in the last 12 months, half of the sample reported the use of rail transport to access airport or to reach the destination from the arrival airport. One quarter of individuals reported to use rail always or most of the times, the other quarter sometimes or occasionally (figure 4). Rail is used more by travellers of Austria, Denmark, Germany and The Netherlands. Given that the use of rail connection to plane was considered both at origin and destination of the air trip, its use seems independent from the city type as well as of the country of origin.

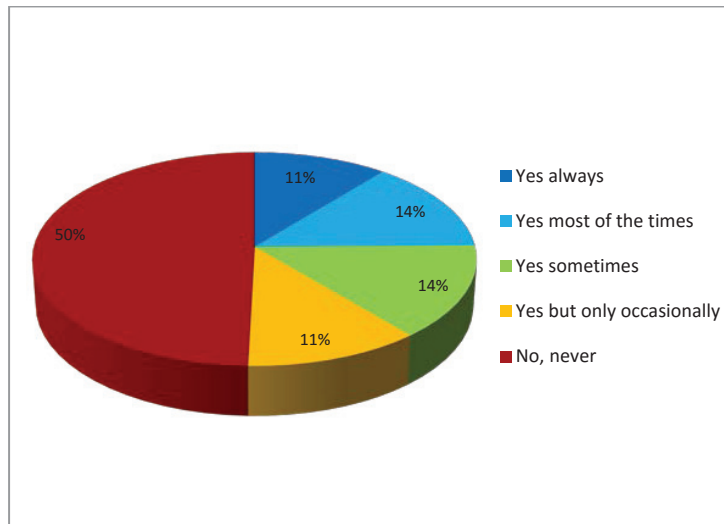


Fig. 4. Frequency of the use of rail to or from airports, EU28.

## 5. Attitudes towards innovative transport and transport policy

The last section of the questionnaire included questions related to the perception of innovative transport services and technologies as well as of transport policies such as road pricing.

### 5.1. Electric vehicles

From the survey it emerges that the largest share of respondents (31%) does not have a clear position on the possibility to purchase a hybrid or an electric car in the near future. Those who would certainly or probably consider purchasing a hybrid or an electric car are respectively 11% and 23%, while the rest is either “probably not” (17%) or “certainly not” (9%) or “don’t know” (9%).

Taking into account that currently hybrid and especially battery electric cars are significantly more expensive than comparable conventional cars, this outcome can be seen as representative of a fair level of acceptance, although there might be a free-riding component. Propensity towards electric cars varies among countries going from a maximum of 56% of “yes” or “probably yes” in Italy to a minimum of 14% in Denmark. The propensity is generally higher in South Europe countries (e.g. Italy, Greece, Portugal) and often lower in North Europe (e.g. Belgium, Denmark, Sweden). Different propensity levels could be in principle affected by public incentives but the outcome of the survey does not support this assumption. Interestingly, propensity does not vary much with gender or age and in fact younger individuals do not show more interest than other age categories for innovative cars. Most likely the economic factor (electric cars are more expensive and youngsters have generally lower incomes) plays a significant role.

### 5.2. Car sharing

Nearly two thirds of the respondents in EU28 know what car sharing is. However this average share is the result of wide differences at country level: the knowledge of this type of service is very high mostly in North and Centre Europe countries (Austria, Denmark, France, Germany, Luxembourg, the only South Europe country where the knowledge is above the average is Portugal) where car sharing services have been in place for some years. Instead, in most of the East Europe countries, much fewer individuals know what a car sharing service is: sometimes only the share is 20% or even lower.

The limited knowledge of car sharing could be one explanation of the little interest shown by respondents for subscribing such a service, although individuals who show knowledge of car sharing are not significantly more

inclined towards it. One third of the sample is simply not interested (figure 5). A small share of respondents (3%) is already client of a car sharing system and another 20% would in principle become a client. Noteworthy, half of those interested in car sharing do not see this type of service as an alternative to car ownership and only 3% of the sample declared that using a car sharing service would give up a car they currently own. Of course conclusions might be different when a specific car sharing scheme is assessed but in terms of general attitude it seems that individuals do not consider car sharing like a mobility model alternative to car ownership but rather like a mobility solutions complementary to traditional ones.

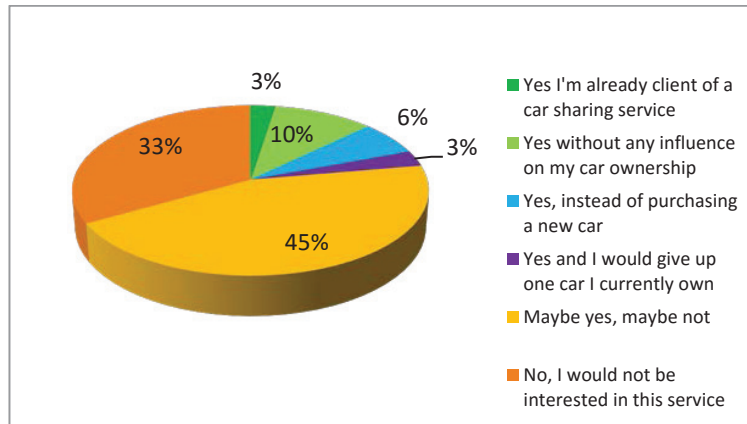


Fig. 5. Propensity to subscribe a car sharing system, EU28.

In a minority of countries respondents interested in car sharing are prevailing (net of unresolved individuals): Bulgaria, Croatia, Greece, Poland, Portugal, Romania, Slovakia and Slovenia. In 6 out of these 8 countries the availability of cars per adult is below the EU average. This might suggest that where individual motorisation rate lags behind a certain level, a model based on sharing rather than owning vehicles is considered an alternative way forward. This conclusion is however challenged by the observation that in other countries with a car ownership below the average the level of interest for car sharing is quite low, e.g. Czech Republic, Estonia, Hungary, Latvia, Lithuania.

The level of interest for car sharing seems not influenced by elements like gender, age or living area (even though respondents living in rural areas seem slightly less inclined to become clients of car sharing systems than residents in urban areas). Interestingly, different attitudes can be found across groups based on the main transport mode used for the most frequent trip: car drivers, car passengers and pedestrians are less interested than the average (for opposite reasons probably), whereas propensity is higher among those who use car in combination with public transport and train. This result suggests that car sharing is not necessarily perceived like a solution to optimise the use of car but like an additional mobility opportunity sometimes more convenient than public transport.

### 5.3. Road charging

Concern about the environmental damages caused by the use of cars is quite uniform across the EU: On a scale from 1 (not concerned) to 10 (very concerned) the average EU28 rate is very close to 7, with limited variability among countries.

Asked about the preference for alternative policy instruments to fight congestion and environmental damages caused by cars (either road charging or traffic limitations), more than 40% of the respondents do not take position while traffic limitations is twice as popular as road charging among those who have a preference. Actually only 16% of respondents explicitly support road pricing measures. Since traffic limitations and road charging are measures affecting especially the use of car, it is interesting to note that the opinions of car drivers do not differ much from the average. The largest share of respondents opposing road charging motivates their opinion with the already high tax



burden for car users. Other three reasons (unfairness and ineffectiveness of taxes, lack of alternatives) have a similar relevance on average. There are differences at country level, although without any apparent pattern.

Assuming that the car use is charged, tolls modulated on the level of pollution (environmental charging) or on the level of traffic (congestion charging) are preferred to fixed taxes. For this question, almost 40% of the respondents have no preferences. Restricting the analysis to the minority that declared to prefer road charging to traffic limitations, the picture is somewhat different: the share of respondent without opinion clearly decreases and the share of those in favour of congestion charging is almost double than in the overall sample.

With respect to the possible alternative uses of road charging revenues respondents did not show clear preferences. The favourite alternative was to use revenues to improve public transport, followed by improvements to roads and parking areas. These two alternatives collect more than half of the preferences. Some 16% of respondents did not express a preference. The remaining responses are split into identical shares between reduction of road vehicle taxes and reduction of other taxes.

The hierarchy of preferences is different across countries. In most of West Europe countries and in Croatia the improvement of public transport is the most preferred option, while East Europe countries and Greece respondents would rather see revenues earmarked for improving roads and parking areas. Nowhere respondents wish to see other taxes reduced to balance the introduction of road charging. Again, if only the preferences of those who support road charging instead of traffic limitations are considered, there are some differences. More people express a preference and the use of revenues to improve public transport or roads is supported by two thirds of this subsample. The different inclinations observed between West Europe and East Europe countries are confirmed and somewhat emphasised.

## 6. Final considerations

The EU Survey on issues related to transport and mobility provided a wide range of elements to describe some key aspects of mobility in the EU countries and to compare countries to each other. Having in mind relevance for transport policy the main considerations emerging from the data seem the followings:

- Passenger mobility in EU is heavily centred on personal car. Car is largely the most used transport mode for everyday mobility but also for long distance trips. Public transport is relatively more used in East Europe countries but this seems mainly due to lower car availability than to better public transport services, i.e. the link between car ownership and car use. Assuming that in East Europe motorisation rate will continue to increase the role of public transport and of other sustainable modes would be reduced.
- Local car trips are longer than local trips made with alternative modes (with the exception of train) but their duration is similar. This evidence supports the case that car is used to travel farther rather than faster and that transport mode choice is part of several decisions concerning aspects like residential and job location. Such decisions are partly a matter of preferences but partly are taken under external constraints (e.g. cost of residences, availability of jobs). Transport policy aimed at supporting sustainable mobility probably needs to frame the use of car in this multidimensional context to be effective.
- Electric cars and car sharing can play a role to improve the sustainability of transport. However these options are currently seen more like a possibility than a real alternative. Furthermore both these solutions confirm the role of private mobility. Also car sharing, in fact, seems perceived more like a complementary option rather than an alternative model where sharing replace owning a personal car. For that reason and considering as well that electric cars can reduce pollution (provided that power is produced by renewable sources) but not congestion, these solutions are probably insufficient for an effective sustainable oriented transport policy.
- Internalisation of environmental effects of transport is not very popular among EU citizens. A large share of individuals do not have a clear preference for one strategy or another, but among those who express themselves road charging is definitely less appreciated than command and control measures. If policy makers want to extend internalisation as policy instrument should be aware that acceptability is largely to be built.
- Should road charges become widely used there is a clear difference of perspective between East and West Europe. The latter would mainly use revenues to improve public transport whereas the former asks especially for more and

better roads and parking spaces. This evidence bring back to the initial remarks in this summary: car is still very attractive, especially for those who so far have had less opportunity to drive a personal vehicle. Even measures conceived to promote sustainable transport could eventually lead to improve the conditions for using private solutions.

From a methodological point of view, the survey was able to reach a balanced and representative sample in all the 28 countries without missing any relevant social group and with quite a good coverage also of the European territory (sample segmentation by living region). The survey obviously reflects a snapshot of user behaviour and preferences in a given moment in time. Several of the differences among countries may be explained by structural or geographic aspects. The usefulness of the survey could be increased if it is repeated periodically, in order for the trends in changing behaviour to be captured. The indicators computed using the results of the survey could be used to monitor transformations of mobility over time by repeating the survey in future years with a comparable sample and questionnaire. For instance it could be very interesting to monitor the role of car in East Europe countries to see whether motorisation rates will evolve towards closing the gap with West Europe countries and, in that case, whether the use of public transport will suffer.

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