Ex ante evaluation -
Area of Kreis Euskirchen
Deliverable 6.2

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January 2016

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1 Introduction

1.1 Background

The SmartMove project addresses key action on energy-efficient transport of the Intelligent Energy Europe programme (STEER). In line with the Transport White Paper it focuses on passenger transport and gives particular emphasis to the reduction of transport energy use.

1.2 The SmartMove project

The delivery of public transport (PT) services in rural areas is faced with tremendous challenges: On the one hand the demographic dynamics of ageing and shrinking societies have particular impacts on the PT revenues depending on the (decreasing) transport demand. On the other hand, PT stops density and the level of service frequency are often of insufficient quality. Thus, there is a need for the development of effective feeder systems to PT stops and for the adaptation of the scarce PT resources to user needs. For the SmartMove project, feeder systems are the different ways of linking a specific region with the back bone PT system, usually a bus or train network or a combination of both. This can be done by improving the walking and cycling facilities to and around the stations, by implementing flexible bus systems or by promoting carpooling or car sharing etc.. However, even if sufficient rural PT systems are available, large parts of the population face diverse subjective barriers to use PT. This is even more relevant for PT feeder systems: in many cases citizens are not even aware of their existence or, if they are aware of them, there exist subjective barriers to their use.

These problems are addressed within SmartMove by implementing "Active Mobility Consultancy" (AMC) campaigns for PT lines and their feeder systems in eight rural and peripheral areas. The objective of the AMC campaigns within the project aims at promoting the use of PT via personalised travel marketing approach. The word 'active' in the term "active mobility consultancy" has a twofold meaning. On the one hand, it refers to the active process of informing people on PT: it is not PT users, who have to inform themselves about PT services; rather the PT operators that have to inform their (current and potential) customers according to their individual needs. For this purpose, current and potential PT users are contacted to provide them with demand based information via different communication channels. The second meaning refers to several active measures aimed at decreasing subjective barriers such as overestimating prize and travel time whereas underestimating the supply and options to the use of rural PT systems.

The AMC campaigns are more than purely the provision of information: active measures will be offered in addition to the written information and the consultancy talks that are usually applied in similar campaigns. This might include actions like practical traveller training, citizen participation in planning or guided tours for PT feeder schemes. Additionally, information and feedback on user needs can be collected within the AMC campaign. This supports the adjustment of PT offers in line with users' requirements.

The AMC concept used in SmartMove builds on existing approaches, which will be further developed through SmartMove based on the exchange of experience and mutual learning. In particular, we will develop existing AMC approaches along 4 lines:

  (i)   the adaptation of the existing approach to recent developments,
  (ii)   the consideration and inclusion of feeder systems into the AMC campaign,
  (iii) the development and application of a common monitoring and evaluation method and,
  (iv)   the adaptation of the AMC concept to specific requirements of the implementing regions.

The result is an easy to use AMC concept that can be applied by PT operators all over Europe. The aim is to solve the specific, significant challenges of PT schemes in rural areas.

A main pillar of the concept is the extension of the AMC concept to PT feeder systems as they are crucial factors for rural PT systems. Better knowledge gained on this subject helps to improve public transport in rural areas. From a scientific point of view, the information attained about a feeder system based AMC campaign makes an important contribution to the further development of personalized travel marketing approaches. Even more important, by implementing a large range of dissemination activities, such as webinars and take-up seminars, not only the SmartMove partners, but also a broad range of stakeholders are informed about the manifold possibilities and advantages of an AMC campaign.

Eight rural and peripheral regions in Europe prepare, implement and evaluate a local Active Mobility Consultancy campaign. PT operators achieve insight into the demands of both current PT users and those who do not currently use PT systems, by applying the AMC campaign. If the non-use of PT is caused by hard facts – e.g. the location of the PT stops or schedule organization – PT operators can adapt their services to the demand of potential users. This will increase opportunities to make PT systems attractive for new passengers. Each of the AMC campaigns to be conducted through SmartMove will be based on a shared methodological approach which will then be tuned in practice to the needs of the local specific situation. These include the specific target groups, the specific cultural barriers, barriers and enablers, the type of PT feeder system (a possibility to reach PT stops by individual or public means), the spatial aspect (e.g. compactness vs spread, topography and geography, environment), the socio political aspects at the appropriate decision making level, the administrative aspects, the economic aspect and the planning aspects. Within each region, we have defined targets of several hundreds of households to be contacted. As a result, we expect a substantial mode shift to public transport, which in turn will lead to a substantial increase on energy efficiency, a decrease of resources consumed and a reduction of the greenhouse gas emissions caused by road traffic.

1.3 Content of this Deliverable

The impacts of the AMC campaigns are evaluated in a process- and output evaluation. Output evaluation refers to the measurement of the direct quantitative effects of the campaigns, e.g. mode shift or the number of additional public transport passengers. This information is used as input to calculate secondary effects of the campaigns, e. g. the reduction of CO_2 emissions. Based on this, a cost-benefit analysis and a cost-effectiveness analysis are calculated. Statistical figures of the process are collected at each stage of the campaign, e. g. number of people contacted, response rate, figures about materials ordered etc., in order to identify factors of success or failure of the AMC campaigns (process evaluation). Interviews with current and potential public transport users give additionally information to public transport operators about customer satisfaction and the needs of improvement.

The aim of this deliverable is to present and evaluate key figures that had been collected before the AMC campaigns were conducted. The profile of the implementation area contains relevant information on socio demographic factors and the existing mobility behaviour of the inhabitants and participants. These framework conditions may help to explain divergent campaign impacts amongst the different implementation areas in the later stages of the project. The variables describing the characteristics of the participants of the campaign are the core elements of evaluation. Furthermore this deliverable presents the participants' diverse motivations to use or not to use public transport services as well as the responses obtained from the people who chose not to participate prior to the campaign.

2 Data collection

2.1 Data collection – profile of implementation area

A literature review was carried out to obtain the relevant information for the profile of the implementation area. The sociodemographic figures have been retrieved from the "Wegweiser Kommune" (www.wegweiser-kommune.de), the study Mobilität in Deutschland (www.mobilitaet-in-deutschland.de) and the "Landesdatenbank NRW" (www.landesdatenbank.nrw.de), which offers most of the required data for the implementation area.

2.2 Data collection - situation before

An MS-Excel-based data sheet has been prepared to collect all information from the interviews. Data are collected for each person individually, i.e. data of a person are entered individually in one row of the data base.

The information was collected from the participants primarily by personal interviews by phone. Additionally, the participants of the active measure bustraining were asked to participate at the AMC campaign. If they were willing to take part they were asked by the staff of the bustraining, namely the authors of Deliverable 6.2, Birgit Strecker, Bernd Knieling, and Katja Naefe. The asked questions were the same questions asked at the personal interviews by phone. The obtained information was afterwards entered into the MS Excel input form.

3 Profile of implementation area

The implementation area Kreis Euskirchen consists of 11 municipalities covering together around 1.248 km^2. Kreis Euskirchen is provided in the south-west of Northrhine-Westphalia, next to Rhineland-Palatinate and Belgium, the mid-west of Germany.

The municipalities are Euskichen (City), Mechernich, Zülpich, Bad Münstereifel, Weilerswist, Schleiden, Kall, Blankenheim, Hellenthal, Nettersheim, and Dahlem. It constitutes an area with a population density of just 188.158 permanent inhabitants (according to the 2011 census). The area of Kreis Euskirchen is predominantly served by public transport. The poles of attraction are exploited.

SmartMove focused its activities on the municipalities Bad Münstereifel, Kall, Schleiden, and Hellenthal.

The communities Hellenthal, Schleiden and Kall are located in the west of the Kreis Euskirchen. They're located next to each other in a row and are connected by Bundesstraßen B 266 and B 265. While Hellenthal consists of 60 villages from 2 up to 589 inhabitants, the other two communities aren't as fragmented as Hellenthal. Schleiden consists of 18 villages (smallest 67 inhabitants, biggest 3.886 inhabitants), and Kall comprises of 23 villages from 19 up to 5.033 inhabitants. The surface of Kall is half as large as the surface of Hellenthal or Schleiden while the density of inhabitants is in Hellenthal with 58 less than half as much as in Kall.

Bad Münstereifel is located in the east of the Kreis Euskirchen. There are 48 villages of different size. The smallest one has 20 inhabitants, the biggest more than 6.000.

For the Kreis Euskirchen the annual disposable income is 19.958 € per inhabitant [destatis 2013].

Table 3-1: **Profile of the implementation area Kreis Euskirchen (population and transport demand)**
[Source: Landesdatenbank NRW; Bundesagentur für Arbeit, IT NRW 2015; Mobilität in Deutschland 2008]]

Category	Variable name	Variable label	[Unit]
Implementation Area	Area	Area total	1.248 [km²]
Population	Population	Inhabitants total	187.437 [number]
		Population change over the last half decade	0 [%]
	Gender	men	49 [% of total number]
		women	51 [% of total number]
	Age	age class (< 18 years old)	17 [% of total number]
		age class (18 - 64 years old)	62 [% of total number]
		age class (> 64 years old)	21 [% of total number]
	Professional status	employed	46 [% of total number]
		unemployed / home duties (incl. pensioners)	36 [% of total number]
		in school / training	17 [% of total number]
	Educational status	primary education	26 [% of total number]
		secondary education	61 [% of total number]
		higher education	13 [% of total number]
Transport demand	Modal split	Car incl. motorcycle drivers [1]	50 [%]
		Motorcycle riders (available only in combination with car)	*n.a [%]*
		Car or motorcycle passengers [1]	17 [%]
		Public transport	6 [%]
		Cycling	5 [%]
		Walking	23 [%]
	Trip rate	Number of trips per workday and person	3.4 [trips/day]

[1] Users of motorcycles contributes with a very small amount only

Table 3-1 presents the sociodemographic figures of the implementation area. Relating these data to the average of Northrhine-Westphalia, it is noticeable that the population increase stagnated during the last five years while in Northrhine-Westphalia it increases about 0.5%. Looking to the future, the population will decrease in Kreis Euskirchen. The gender ratio matches the Germany-wide figures while the age distribution of the implementation area shows a slight shift towards an older population. 17% of the population are under 18 years and 62% are between 18 and 64 years in the implementation area, which is below the national average of 16% and 63%,

respectively. In the implementation area, 21% are over 64 which are the same figures as to Germany. The next years will show a shift to an older population because of the german baby-boomers (born in the 60s), when the change to pensioners. The Kreis Euskirchen figures in the categories 'employed' and 'unemployed' 46% of the population are employed and 36% are unemployed.

Looking at the figures for 'transport demand', it is noticeable that a clear majority of almost 2 out of 3 times the private car is used. Motorised private transport is used with a share of 67% (50% as a driver and 17% as a passenger). The modal split for Germany shows lower numbers, with 43% of the trips made by car as a driver and only 15% as a passenger. The share of the implementation area of 6% for public transport use differs greatly from the 9% from the nation-wide survey. For the VRS-region only 39% of the trips made by car as a driver and 15% as a passenger, and the share of PT is at 11%. This results can be attributed to the specific geographical factors and the bus services provided in the implementation area.

Considering the figures for 'cycling', it is apparent that the modal share for the Germany (10%) exceeds the 5% of the implementation area. The percentage of 'walking', however, is almost the same, 23% for the particular implementation area and 24% for the nation-wide modal split. The average trip-rate per day in Kreis Euskirchen is at 3.4. Figure 3.1 show the mobile split in the implementation area Kreis Euskirchen.

Figure 3-1: Modal Split of modes used in the implementation area [Landesdatenbank NRW]
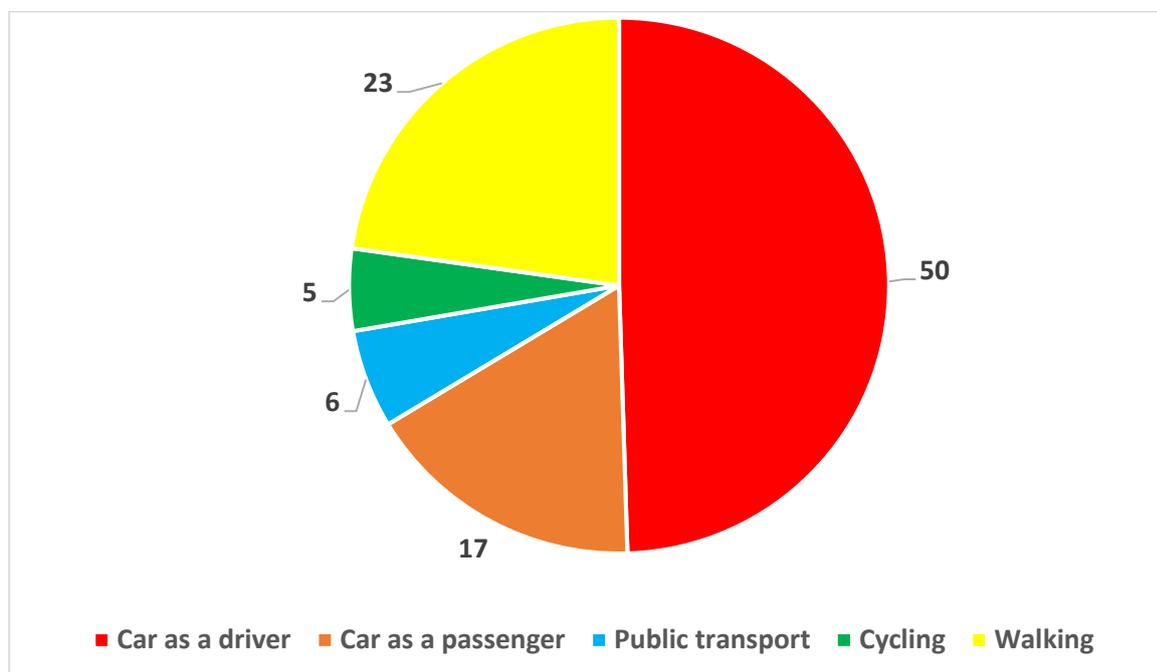
Table 3-2: **Profile of the implementation area Kreis Euskirchen (public transport)**
[Own data]

Category	Variable label	[Unit]
Public transport	Number of TaxiBus/bus-lines in the area	17 [number]
	Number of bus-lines served only by bus	3 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 801	16 / 10 / 4 [number]
	Number of connections per line, direction and workday / Saturday / Sunday – SB 82	8 / 9 / 9 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 829	20 / 18 / 6 [number]
	Number of bus-lines served by bus and TaxiBus	12 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 819	13 / 7 / 0 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 821	14 / 7 / 0 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 822	14 / 7 / 0 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 824	12 / 8 / 0 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 826	6 / 0 / 0 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 828	13 / 7 / 0 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 831	13 / 13 / 6 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 835 (two diff. paths of service)	26 / 16 / 0 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 836	14 / 11 / 6 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 837	16 / 11 / 7 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 838	16 / 11 / 7 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 839	15 / 12 / 7 [number]
	Number of bus-lines served only by TaxiBus	2 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 816	10 / 11 / 6 [number]
	Number of connections per line, direction and workday / Saturday / Sunday - 879	14 / 13 / 14 [number]

Table 3-2 shows the public transport figures of the implementation area Kreis Euskirchen. All in all there are 17 bus-lines. Three of them are served only by bus. Twelve bus-lines are served in a mix from bus and TaxiBus. Most of the trips are taxiBus – during the times of pupils use there are additional buses. Two lines are served only by TaxiBus. Except for the three bus-lines on Saturday and Sunday only TaxiBus is offered.

Table 3-3: **Profile of the implementation area Kreis Euskirchen (private car)**
[Mobilität in Deutschland 2008, Umweltbundesamt]

Category	Variable name	Variable label	[Unit]
Private car		car ownership rate	611 [cars/1,000 inhabitants]
		average trip length	11,5 [km]
		Average fuel consumption per car [1]	0.055 [l/km]
		Average CO2 emission per car	110 [g/km]
		Average trip duration	23,7 [min]

[1] This variable is related to whole Germany, no detailed information is available here.

The key figures for the category 'private car' can be seen in Table 3-3 above. The car ownership rate of the implementation area at 611 cars per 1000 inhabitants significantly exceeds the Austrian average of 517 cars [destatis 2013]. Within the implementation area, the average trip length is 11.5 km. The average trip duration of the implementation area is nearly 24 minutes per trip.

4 The situation before the implementation

Before the campaign different varaibles describing the characteristics of the participants of the campaign were collected.

4.1 Participants of the campaign

Variables collected from participants are the core elements of evaluation of the campaign. The following information was collected to enable an impact analysis after the campaign has been carried out. To document a change in the participant's mobility pattern, their use of different modes of travel have been documented before the campaign takes place. Furthermore the participants have been asked to name their reasons for using or not using the available public transport services in the implementation area. The participants were also asked to list possible improvements of the bus line services.

Table 4-1:   Variables for reporting situation before – modal split of participants

Category	Variable name	[Unit]
Modal split of participants	Car and motorcycle drivers	3.74 [average days per week] n=408 persons
	Motorcycle riders (available only in combination with car drivers)	*n.a. [average days per week]*
	Car or motorcycle passengers	0.65 [average days per week] n=408 persons
	Public transport	0.26 [average days per week] n=408 persons
	Cycling	0.36 [average days per week] n=408 persons
	Walking	1.76 [average days per week] n=408 persons

Table 4-1 presents the data obtained by the answers to the questions inquiring after the weekly usage of the specific travel modes, which is also illustrated in percentage shares in figure 4-1 below. Motorised private transport definitely is the most popular travel mode. The average participant uses the car 3.74 days per week as a driver and 0.65 days per week as a passenger, which converts into a 55% and a 10% share of the modal split. The second most popular travel mode is walking with a 26% modal share and an average of 1.76 days per week. On average the bicycle is used 0.36 days per week, which converts to a 6% cycling share. Public transport is only used 0.26 days a week by the participants and amounts to a 4% modal share.

In comparison to the modal split of the implementation area, shown in figure 3-1, it is apparent that the participants have a higher percentage in private car use as a driver but a lower percentage as a passenger. Equally notable, the ex-ante usage of public transport (4%) exceeds the average percentage of the implementation area (6%).

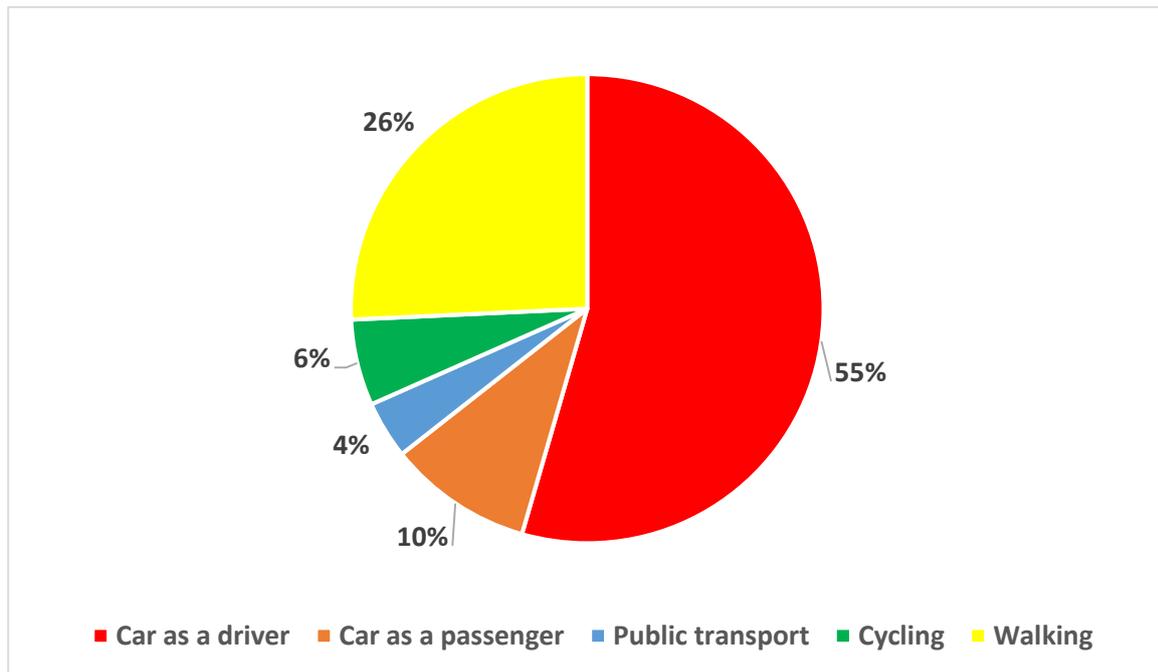**Figure 4-1: Modal Split of participants (weighted after number of usage per week)**

Table 4-2: **Variables for reporting situation before – bus and railway usage of participants**

Category	Variable name	[Unit]
Usage of bus or railway of participants	People, who know either bus or railway	14% (57 out of 408 people)
	People, who never use bus or railway	16% (9 out of 57 people)
	People, use bus or railway less than once a month	25% (14 out of 57 people)
	People, use bus or railway less than once a week	16% (9 out of 57 people)
	People, use bus or railway at least once a week	60% (34 out of 57 people)
	Average rating of performance of bus and railway	6.63 out of 10 [1] (n=57 people)
	Average number of days of those people using bus lines at least once a week	2.96 days a week (n=34 people)
	People possessing season ticket for the public transport	4% (15 out of 408 people)

[1] Where 1 equals poor and 10 equals best performance

Busses and railway are known to a minority of 57 out of 408 participants (14%). Of these 57 people who know bus and railway 16% never use the lines and 25% use the lines less than once a month. 16% of these participants use the lines less than once a week and merely 60% use the bus or railway at least once a week. On average, the participants who use the bus lines at all use them 2.96 days a week. 4% of 408 participants possess a season ticket for the public transport.

The performance rating of 6.63 points shows the satisfaction with the bus or railway in general. Indeed the number of participants is with 34 relatively low, and while dialogue marketing was carried out there were several huge problems with the local railway (i.e. trains has to be cancelled due to technical reasons, a lot of trains are 20 minutes and more delayed). Thus the performance rating in this case is probably of lower significance even in comparing it with the ex-post evaluation.

As a lot of PT in the implementation area is served by TaxiBus, the participants who said they know the PT were asked if they are familiar with the TaxiBus, too. 47 of 57 participants said they are familiar with the TaxiBus-service, 10 out of 57 said they aren't familiar with the TaxiBus.

Reasons for not using the public transport and possible improvements have been collected by open answers, and classified in order to be able to compare the results between the different implementation areas. The list of answer categories from the first draft (see Deliverable D6.1) has been extended based on the open answers given by the participants. The additional categories are marked green/italic style.

Table 4-3: Classification of open answers - reasons for not using bus or railway

Reasons	n=406 responds from 330 people	[%] - of people have named this reason
Want to use my car [1]	*125*	*37,9 %*
Time table – frequency of links	67	20,3 %
Time table – operation time	63	19,1 %
Healthy reasons [1]	*40*	*12,1 %*
Lack of information about the service [1]	*22*	*6,7 %*
Travel time	20	6,1 %
Travel comfort	17	5,2 %
I'm driven by family member/friend [1]	*15*	*4,5 %*
TaxiBus order deadline [1]	*13*	*3,9 %*
Location of pt stop	10	3,0 %
Cost, Ticket tariff	8	2,4 %
Need to change lines to often	4	1,2 %
Time table – not understandable	2 (visibility, readable)	0,6 %
Need to carry heavy goods	0	0 %
Time table – links to other lines	0	0 %

[1] The additional categories were created to represent the participants that stated answers/remarks which were not represented by the classification.

In Kreis Euskirchen 330 people took the chance of the open answer to explain, why they don't use the PT. Because of the possibility to give more than one reason 406 answers were collected.

Nearly 38% of them argued that they want to drive by their own car – irrespective of the quality of local PT service. These people have got a more emotional relationship for their choice of means of transportation. Around 20% of the participants said the frequency of links isn't sufficient, and 19% said the operation time doesn't work for them.

One focus group of the project SmartMove in the implementation area Kreis Euskirchen were elderly people. Thus around 12% of the called people said they can't use the PT because of healthy reasons i.e. they cannot reach the bus stop even if it's not far away or aren't able to order the TaxiBus by phone because of hardness of hearing. Additionally narrow 5% said that they can't drive by themselves both own car and PT and were driven by a family member, a neighbour or a friend.

Lack of information is to 6.7% the reason for not using the PT. Travel time and travel comfort are mentioned in 20 (6.1%) respectively 17 (5.2%) times. The order deadline

of the TaxiBus (at least 30 minutes until the TaxiBus starts), which may be also considered as a matter of travel comfort and travel time, is 13 times given as reason for not using the PT. For 3% the location of the PT stops – sometimes in combination with healthy problems – is reason not to use the TaxiBus, bus, or railway.

The further classifications like cost (ticket tariff), the restraint of changing lines, or not understandable timetables are at Kreis Euskirchen more or less negligible.

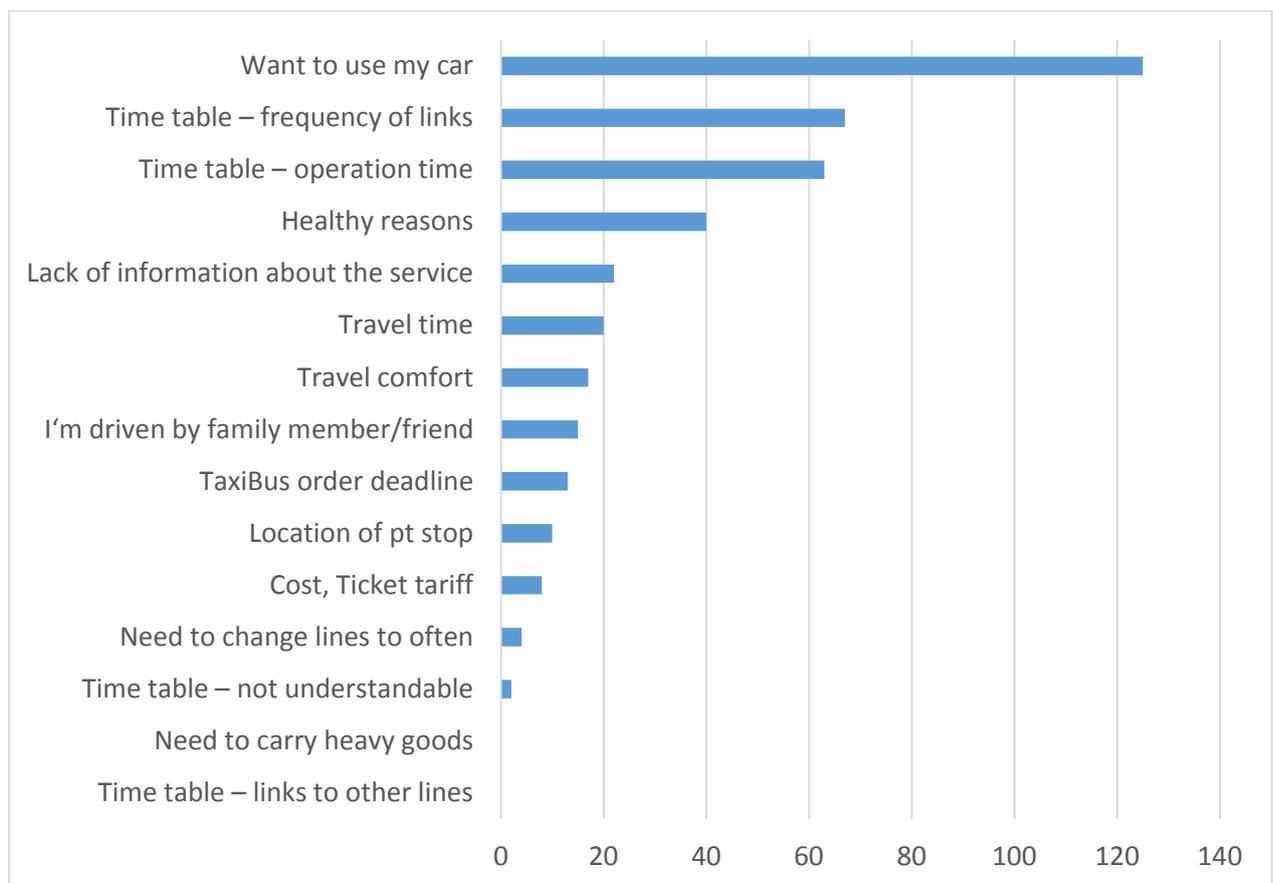**Figure 4-2: Reasons for not using PT**

Table 4-5:   Classification of open answers - improvement suggestions for the PT service

| Improvement suggestions	n=162 entries from 143 people	[%]- of people have named this reason
Time table – operation time	48	33,6 %
Time table – frequency of links	47	32,9 %
Travel comfort	20	14,0 %
Less delay	*20*	*14,0 %*
More information	*9*	*6,3 %*
Cost, Ticket tariff	8	5,6 %
Location of PT stop	5	3,5 %
Technical reason	*5*	*3,5 %*
Direct link	0	0 %
Time table readability[1)]	*0*	*0 %*

[1)] Out of the eleven participants that suggested improving the travel comfort, three suggested the construction of weather protection at the bus stop.

In all 143 people gave 162 improvement suggestions to the PT service. In relation to the reasons of not using the PT the most suggestions postulate a longer operation time or a higher frequency of links to the lines, even during the off-peak hours. According to this the travel comfort, which means inter alia crowded buses, is another wished improvement.

As written, two local railways have got significant delay during the campaign, thus the suggestion to reduce the delay is no really surprise. Unfortunately, some bus lines have to wait for the delayed trains.

The further improvement suggestions like more information about the lines, less expensive ticket tariffs or the location of the PT stops are of lower importance. Sporadical technical reasons like less breakdown of ticket vending machines were given, too.

Figure 4-3: Improvement suggestions
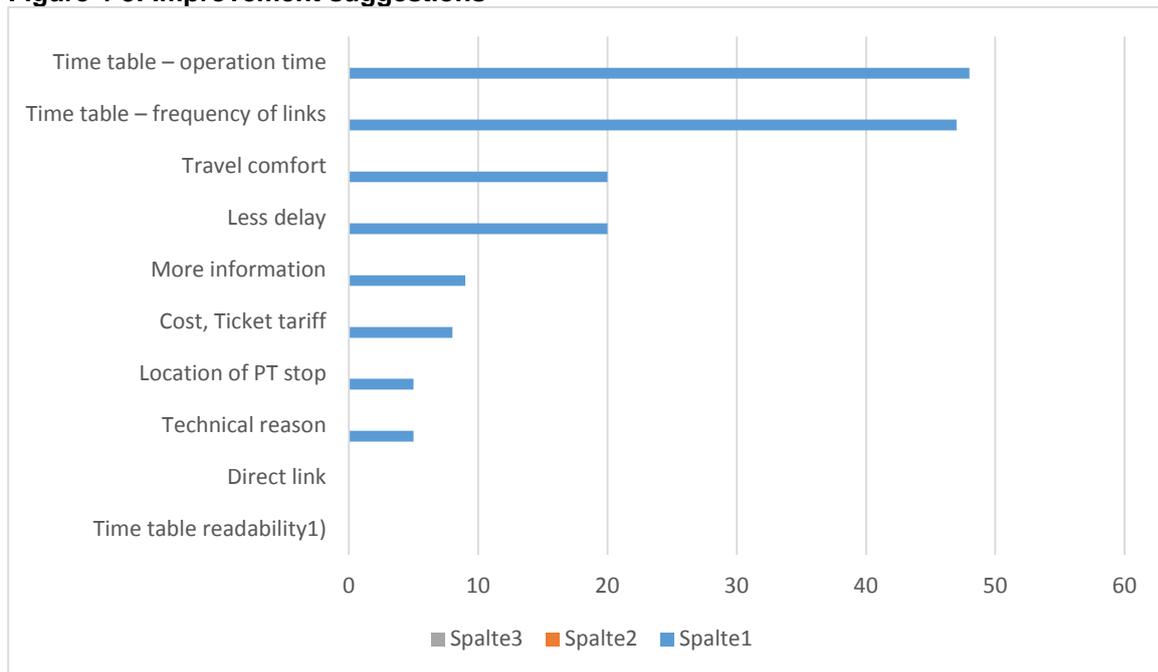
4.2 Persons who did not participating in the campaign

It is always difficult to get information from persons who are not willing to participate in a survey or campaign. Therefore, the information requested is reduced to two key variables to be able to identify the particularities of users and non-users of the public transport line among this group of people. Depending on the approach of contacting people and their personal patience, it is obvious, that information cannot be collected from everyone. However, it is important to ask a minimum number of people in order to identify the characteristics of these persons. The more detailed questions, inquiring after the person's reasons for not participating or their motivation to use or not to use public transport services, were not asked. Unfortunately, in Kreis Euskirchen the persons who won't participate aren't willing to answer any question.

5 Summary and conclusion

The Ex ante Evaluation presents the data collected before the implementation of the AMC-campaign. This includes figures describing the implementation area, the participants' mobility behaviour and their perception of the public transport services within their municipalities.

The variation in modal split is considerable when comparing the results of the participants and the general data of the implementation area. The mode distribution of the relevant municipalities shows a car usage (driver or passenger) of 67%, whereas the participants of the campaign exhibit a little lower percentage of only 65%. Equally notable is that the participants' usage of public transport (4%) is lower than the general percentage of the implementation area (6%).

The different bus lines are known to 14% of the people. Most of this 14% (47 of the 57 participants) are familiar with the TaxiBus, too. The average performance rating of the lines is 6.63 out of 10. The frequency of links of the bus service is most often given in answer to the question: what are the reasons of not using the public transport services and is also one of the top suggestions for improvement, alongside with the bus service operation time. But beyond this arguments a lot of people like driving car and don't use the PT because of this.

Based on these findings the impact of the AMC-campaign will be assessed at a later stage of the SmartMove project. Furthermore the profile of the implementation area can be used as a frame of reference to allow comparability across the different implementation areas of the SmartMove project and analyse possible relations between these framework conditions and the campaign itself.

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