# Using Milieu-Based Communication Strategies For Changing Mobility Behaviour Towards Low Energy Modes

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# USING MILIEU-BASED COMMUNICATION STRATEGIES FOR CHANGING MOBILITY BEHAVIOUR TOWARDS LOW ENERGY MODES

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**Abstract**

*Promoting the usage of low energy modes like walking and cycling requires devising both adequate information services and offers, but also appropriate incentives and motivations to arouse interest and actually change mobility behaviour. To develop persuasion strategies for different social groups, a milieu-based segmentation approach from market research (Sinus Milieus) is applied in this study in order to identify homogeneous groups of shared mobility-related information needs and to extract appropriate group-related arguments to promote active mobility (e.g. health, environment, costs, image, or adventure). This contribution describes the methodological approach combining qualitative-interpretative (12 focus groups; n=96) and quantitative-statistical methods (online and telephone survey; n=1,000 individuals representative for the Austrian population over 14 years) and the results in form of six comprehensively defined homogeneous target groups for Austria. Based on the outcomes, tailor-made concepts for specifically addressing each target group (arguments, information needs, and preferred information channels) are developed, thus providing a solid basis for implementing measures for promoting low energy modes.*

## 1.  INTRODUCTION

Despite diverse efforts of policy and optimisation of individual technologies, the achieved reduction of greenhouse gas emissions is very limited.

In Austria, the transport sector is responsible for about one third of the greenhouse gas emissions. A number of political interventions, various planning efforts and extensive technological developments could not reverse this trend. On the contrary, per capita emissions from transport have been rising since 1990 up to about 4.5 times the EU average, the mileage accelerated between the years 1995 and 2012 by 32.5% with almost unchanging consumption, resource requirements for the production of batteries for e-vehicles went up and motorized private transport is still the dominant transport mode [1].

By now, it is obvious that technological solutions alone cannot meet the objectives of environmental and climate protection [2] that are agreed upon in the Europe 2020 targets [3].

In addition to technological and regional frameworks, it is especially user behaviour that significantly affects climate change and energy efficiency. Promoting sustainable mobility, especially active mobility to people, is of paramount importance when it comes to tackling societal challenges such as quality of life issues and increasing sustainability in general. However, attitudes, behaviour patterns and information needs in target groups are very heterogeneous. The same holds for the perceived barriers of people against active mobility forms [4]. Identifying these differences is important for developing communication strategies for changing mobility behaviour towards low energy modes.

This contribution focusses on the investigation and categorisation of diverse patterns of mobility-related behaviour and attitudes of users of mobility-related information, in order to set the basis for developing user-oriented information services and measures for promoting active forms of mobility.

This paper is divided in six sections and starts with Section 2 giving an overview on related work on target group segmentation. This leads to the methodology described in Section 3 which combines qualitative-interpretative and quantitative-statistical methods. In Section 4, the identified homogeneous groups of shared mobility-related information as well as their applicability for behaviour change interventions are presented. Section 5 deals with the willingness to change towards low energy modes among the types and possible communication strategies. Section 6 discusses conclusions and potential to widen the research.

## 2.  TARGET GROUP SEGMENTATION

Today, in transport research segmentation approaches are an established means for analysing daily travel behaviour. Also transport providers and municipalities used segmentation approaches as a basis for targeted interventions to increase the use of sustainable transport modes. From a methodical point of view there are many different segmentation approaches existing in the field of travel behaviour, e.g. to identify specific target groups or for segmenting the population into definable homogeneous groups, respectively [5]. They focus on four basic classes of variables: travel behaviour, geographical-features, sociodemographic variables, attitude/value approaches.

In the travel behaviour approach, the population segments are defined by their actual behavioural patterns which are e.g. characterised by trip frequency, mode choice and trip purpose [6]. This method was for example used in the German national travel survey to combine the frequent use of transport modes as well as car availability and accessibility in order to divide the German population according to their mobility behaviour into seven user groups [7].

The geographical approach focusses on the aspect of the residential location, differentiating for example between urban, suburban and rural areas. The German national travel survey [6] used this approach to describe the mode choice within the spatial context, taking into accounts the related opportunities and restrictions. Other studies concentrate on the settlement structure of specific study areas to examine its influence on travel behaviour [8] or take the qualities of locations into account such as the 'accessibility' [9] or 'walkability' [10].

Segmentation according to sociodemographic or socio-economic and social stratification variables are based often on age groups [11] or the combination of household variables, like age, family and work status to identify different life cycles or life stages [12].

Research into social stratification in modern societies has shown that the complexity of social activities cannot be explained satisfactorily by sociodemographic variables alone. Attitudinal variables have thus finally been introduced in order to explain and understand individual mobility behaviour in more depth, and to segment the population into meaningful groups [13]. Nowadays, the segmentation based on attitudes and values is often used in the mobility research. The attitudes and values-oriented approach was first introduced into mobility research in the end of 1990s and derived from psychological and social theory, respectively [14]. Among the attitude-based segmentations, two basic approaches exist: the mobility specific approach or the life style approach and the holistic approach or milieu approach [15].

Life style approaches are based on attitudes and preferences in relation to mobility and focus on the analysis of orientations and behaviours relevant for this field. Target groups are elaborated from the observed field of mobility and show the problem of tautological results.

Milieu approaches relate to the idea that behaviour of people is influenced by general values, beliefs and viewpoints. They do not relate to a specific field of action and the distinction between (target) groups is founded on fundamental values and attitudes in everyday life. For the transport research means that, the milieu resp. fundamental values and everyday attitudes determine the typical behaviour pattern of mobility and the observable mobility behaviour.

Although none of the approaches can claim absolute superiority, milieu based approaches show advantages in explaining individual mobility behaviour [16]. Hence, this research is founded on a milieu-based approach as a starting-point to create communication strategies and interventions to alter individual mobility behaviour in order to increase sustainability.

## 3. METHOLOGICAL APPROACH

In order to identify and test groups of homogeneous attitudes and information requirements, a combination of qualitative-interpretative and quantitative-statistical methods was applied in form of a multi-level approach. The main goal was to identify people generally willing to change their mode choice patterns and to elaborate the basis for a type-related communication

strategy.

The initial step included desk research on classifications for mobility target groups as well as the systematic categorisation of mobility-related information categories. Based on the findings, an interview guideline was developed to identify the potential of mobility-related information. This guideline covered questions on demographic data, current mobility patterns, the image of transport modes and the attitudes towards them, criteria for mode choice, interest in developments within the field of mobility, usage of alternative transport modes, information needs and sources, the willingness to change towards more sustainable transport modes in the future as well as awareness of information services and campaigns.
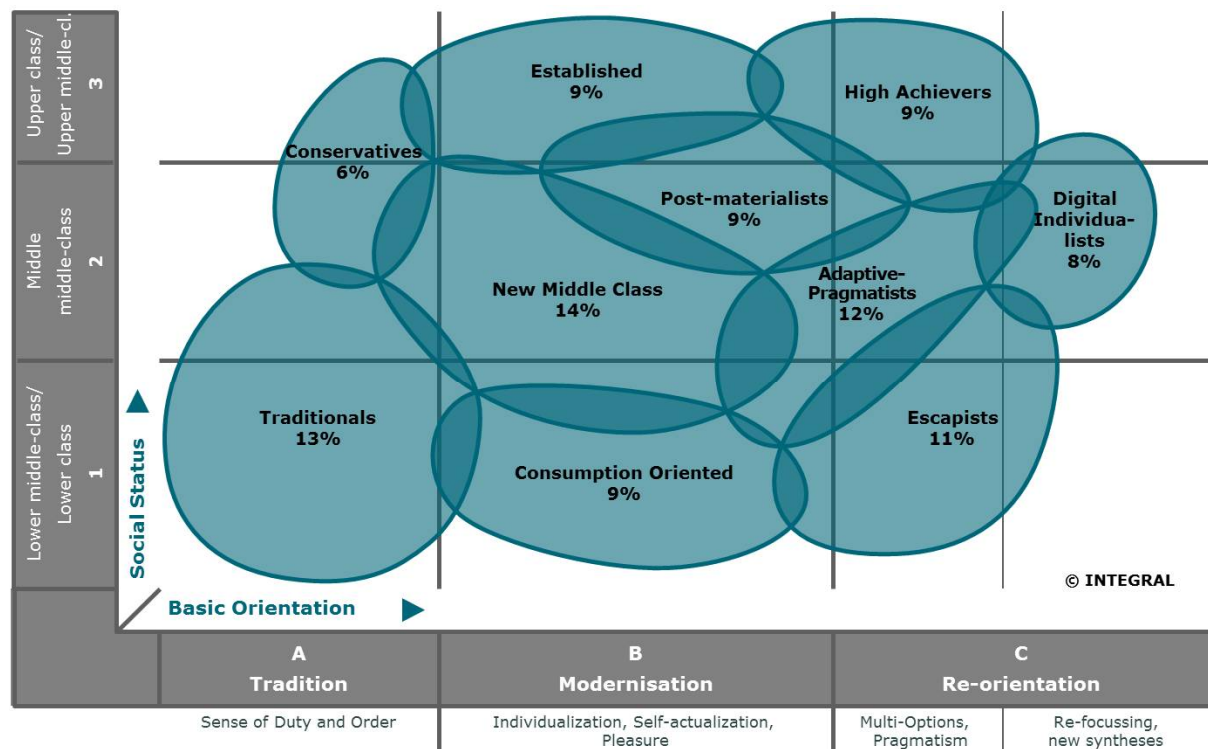


Fig. 1: Sinus Milieus for Austria (2014).

12 focus groups with eight participants each were performed in metropolitan (Vienna), urban (Graz) and small town/rural (Ried) areas to reach people with different transport options and trip chains. In order to facilitate the segmentation process, the recruitment of participants was performed with regard to their affiliation to the Sinus Milieus® [17] identified for Austria (see Fig. 1). This target group segmentation is based on an analysis of everyday life within our society and groups together people with similar attitudes and ways of life. Basic values as well as attitudes to work, family, leisure, money and consumption all play a part in the identification of the target groups. Sinus Milieus are developed and validated individually for each country, divided according to the social

classes and value orientation: the higher the location of the milieu in the figure, the higher the level of education, income and occupational group of its members; the further to the right its position, the more modern their basic values in a sociocultural sense.

The Austrian population can be divided into ten milieu groups: Conservatives (classical establishment), Established (fundamentally liberal, enlightened educational elite), High Achievers (multi-optional, global-oriented efficiency-oriented top performers), Digital Individualists (digital-creative avant-garde), New Middle Class (mainstream with the will to achieve and adapt), Adaptive-Pragmatists (ambitious young core of society with a markedly pragmatic outlook on life), Post-materialists (idealistic, discerning consumers with normative notions), Traditionals, (security/order-loving wartime/post-war generation), Consumption Oriented (lower class in search of orientation and social inclusion) and Escapists (fun and experience-oriented modern lower class/lower middle class) [18].

Within the focus groups all Sinus Milieus were equally represented except for the 'Traditionals'. Due to limited mobility as a result of age and attitude, very little evidence from the 'Traditional' was expected based on the findings from previous studies and this milieu was excluded from the qualitative study in order to concentrate resources on exploring the rest of the milieu groups. In the quantitative study however, all milieus have been addressed.

The outcomes of the focus groups resulted in the identification of hypothetical types of attitudes and information requirements which were used to create indicators and related statements for each type. All in all, 32 statements were elaborated to identify the information types and quantify the typology in the following survey.

The quantitative survey with an overall sample size of 1,000 individuals representative for the Austrian population over 14 years was conducted as a combination of online (750 persons) and telephone survey (250 persons) in order to ensure that people with varying web usage (ranging from no internet use to digital natives) could be reached adequately.

The survey items were based on the topics of the focus group guideline and included the 32 statements for rediscovering and quantifying the initial hypothetical types. Since the focus groups indicated a disproportional spatial distribution of the identified hypothetical types, a biased approach in favour of urban areas was chosen and revised by appropriately weighting the data in the analysis.

During the segmentation process, out of the mentioned 32 statements, eight statements showing the highest explanatory power for type-related information requirements were selected in order to obtain seeds for the assignment of respondents to the segments by k-means cluster analysis.

## 4. RESULTS

The analysis of the qualitative and the quantitative data resulted in six information types: 1) Spontaneous – On the Go, 2) Highly Informed Sustainability, 3) Efficiency-oriented Information Pickers, 4) Interested Conservatives, 5) Low Demand, 6) Digital Illiterates. For each information type the distribution in Austria's population and relations to the

Sinus Milieus were determined (see Fig. 2) in order to confirm the types' validity.
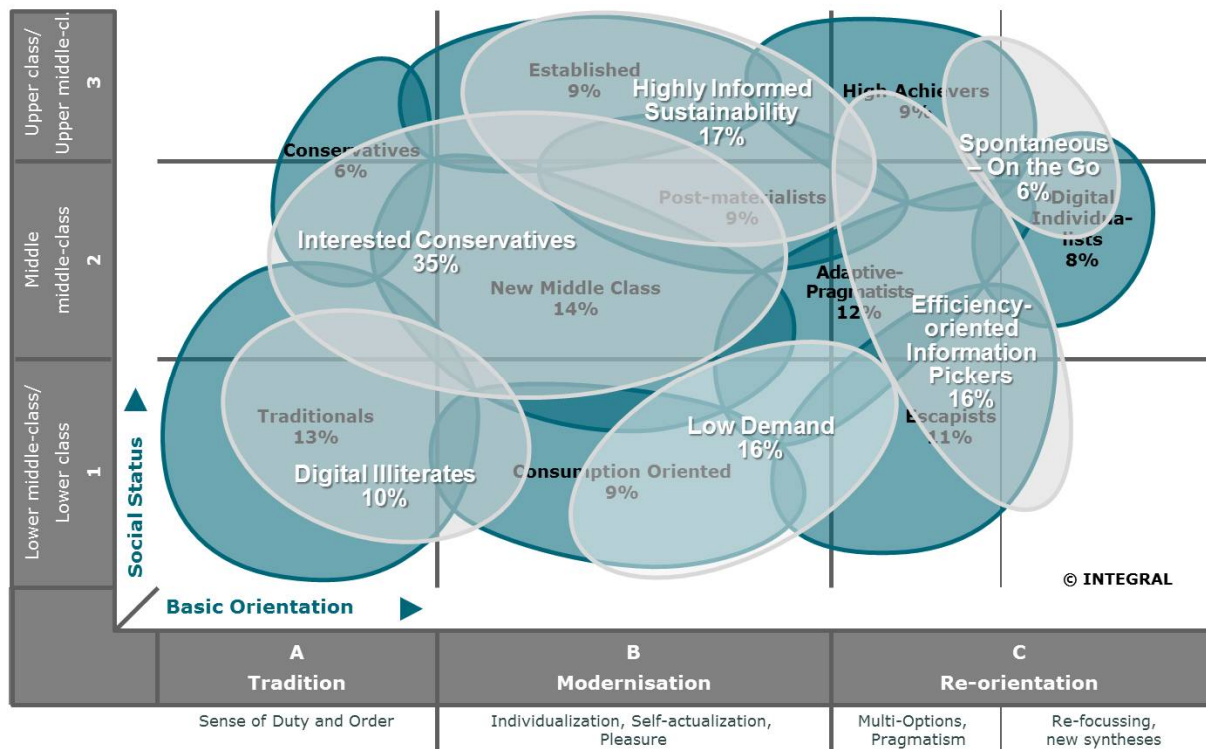


Fig. 2: Six resulting information types and their relation to Sinus Milieus.

## 4.1. Spontaneous – On the Go

This type has a 6% share of the Austrian population and is mainly found in the Sinus Milieus 'High Achievers', 'Digital Individualists' and partially the 'Adaptive-Pragmatists'. It is a young and urban group which is very mobile, flexible and little determined by routines. Due to its affinity for digital innovations, these people rely on internet and smartphones and are open towards new mobility concepts (e.g. sharing concepts) and innovations in the mobility domain.

Sustainability and environmental protection have no particular importance for these persons. A high percentage of car drivers can be found within this group since the car is associated with flexibility. The most promising way to alter their mobility behaviour step by step is to address the topics car-sharing, alternative transport modes, pooling and park and ride before encouraging the use of low energy modes. Arguments for an increased usage of more environmental friendly modes have to address the topics fun, creativity, flexibility and individuality to get noticed. This type accesses information through an average of 5.9 information sources which is clearly above average (3.6 in the overall sample). Therefore, creative and gamified apps as well as funny and playful campaigns can be used.

## 4.2. Highly Informed Sustainability

This type has a 17% share of the Austrian population and is mainly found in the Sinus Milieus 'Established', 'Post-Industrialists' and partially the 'High Achievers', 'New Middle Class'. People assigned to this type are very ecology-minded, rather young (40% up to 29 years versus 23% in the sample) and want to be comprehensively informed anytime and anywhere. Apart from their interest in environmental and healthcare aspects, more than 60% assigned to this type use the car more than once a week. In order to foster their willingness to use low energy modes, topics such as rationality, sustainability, costs, health and time efficiency should be addressed. This type collects information from more channels than any other and uses 6.1 information sources on average (3.6 in the overall sample). Information is therefore well received by digital as well as traditional media. Apps with comprehensive information and environmental focus or campaigns targeting environmental responsibility could be very successful to reach this type.

## 4.3. Efficiency-oriented Information Pickers

This type has a 16% share of the Austrian population and is mainly found in the Sinus Milieus 'High Achievers', 'Post-materialists', 'Adaptive-Pragmatists', 'Escapists' and 'Digital Individualists'. These persons are extremely organised in the uptake of information and have a preference for the use of digital media. It is a very mobile type which is rather stable on routine trips but often does non-routine trips were comprehensive information is needed.

These people who are driven by efficiency tend to be car-lovers with a lack of interest in environmental protection and sustainability. To persuade them of the value of low energy modes, arguments have to address efficiency, health and costs. As an initial step, information on public transport, cycling infrastructure and the combination of both in daily life could be provided to arouse interest in changing towards alternative modes. An average use of 4.5 information sources (3.6. in the overall sample) suggests they can be well reached by apps or campaigns.

## 4.4. Interested Conservatives

This type has a 35% share of the Austrian population and is mainly found in the Sinus Milieus 'New Middle Class' and to a limited level in 'Post-materialists', 'Established', 'Adaptive-Pragmatists', 'Conservatives', 'Consumption Oriented' and 'Traditionals'. People assigned to this type have more or less stable mobility routines and plan non-routine trips in advance. Furthermore, this type has a mediocre need for information, is interested in environmental aspects but hesitant to use new tools for which reason printed information is favoured.

Their current mobility behaviour strongly focusses on the car which is used by 70% more than once a week. Social aspects are important to them and therefore behaviour change can be encouraged by addressing the topics role models, social responsibility and health to some extent. Providing information on cycling infrastructure and (supra-regional) public transport focussing on the social benefits and role model effect is a promising approach to increase their willingness to switch towards more sustainable transport modes. Attention should be paid to the limited utilisation of information sources. This type uses an average of 3.0 information

sources (3.6 in the overall sample) and is no digital native. Therefore, apps are hardly used. Instead, traditional campaigns targeting responsibility and also fitness can arouse their interest.

## 4.5. Low Demand

This type has a 16% share of the Austrian population and is mainly found in the Sinus Milieus 'Consumption Oriented', 'Adaptive-Pragmatists', 'New Middle Class' and 'Escapists'. People related to this type are caught up in routines and show a rather old-fashioned approach to mobility. They have little interest in eco-friendly mobility solutions as well as new mobility services and appreciate face-to-face contact as an information source.

Since this type has relatively stable mobility behaviour patterns and is dependent on the own car, the willingness to change transport modes is weak. The cost argument and health issues have the highest potential to reach this type. Only an average number of 2.5 information sources are used (3.6 in the overall sample) and therefore traditional channels are most promising. Information on park and ride systems can be a starting point to motivate behaviour change towards low energy modes.

## 4.6. Digital Illiterates

This type has a 10% share of the Austrian population and is mainly found in the Sinus Milieus 'Traditionals', 'New Middle Class' and 'Consumption Oriented'. These people are overwhelmed by digital media and innovation and prefer face-to-face contact over written material to gain information. They are not very mobile and their mobility behaviour is characterised by routines. Non-routine trips are often done without gathering pre-trip information at all. The affordability of mobility options is a central topic and the access to modes therefore limited.

The image of the car is very good within this type but the mileage is below the Austrian-wide average. The willingness to change towards other modes is low. To foster the change towards low energy modes, the cost issue has to be addressed. Since they do not use apps and have only limited access to information and only use an average of 0.7 information sources (3.6 in the overall sample), campaigns are needed to target this type.

## 5. POTENTIAL FOR MOBILITY BEHAVIOUR CHANGE

Among all types, 49% are willing to change transport modes, meaning that 22% are willing to change more often towards other transport modes in the future in general (core potential) and 27% are willing to change when appropriate information is given (additional potential). Based on the results, the willingness to change transport modes for each individual type was identified in order to indicate the potential for a change of behaviour within the Austrian population (see Table 1).

Out of the Austrian population, 7% of all car drivers could imagine to change from driving to walking more often and 10% would be willing to cycle more frequently instead of driving in the future. Concerning the change from public transport (PT) to walking or cycling, 8% would be willing to switch towards low energy modes more common in the future. The highest

motivation for behaviour change can be found among the 'Highly Informed Sustainability', the 'Spontaneous – On the Go' and the 'Interested Conservatives' types which makes them especially promising for effective interventions. Taking into account the information requirements, motivations and specific information needs of each type, apps and campaigns can be derived that target each type appropriately.

Table 1: Willingness to change towards low energy modes within the identified types

|  | Spontaneous – On the Go | Highly Informed Sustainability | Efficiency-oriented Information Pickers | Interested Conservatives | Low Demand | Digital Illiterates |
|---|---|---|---|---|---|---|
| Overall willingness | 20% | 31% | 16% | 18% | 13% | 7% |
| From car to walking | 5% | 10% | 7% | 7% | 6% | 2% |
| From car to cycling | 7% | 15% | 6% | 12% | 8% | 4% |
| From PT to walking/ cycling | 14% | 16% | 8% | 6% | 4% | 2% |

Table 2: Individual prerequisites for information retrieval for each type

|  | Spontaneous – On the Go | Highly Informed Sustainability | Efficiency-oriented Information Pickers | Interested Conservatives | Low Demand | Digital Illiterates |
|---|---|---|---|---|---|---|
| Information requirements | on-trip, mobile information, apps | pre-trip, multiple information sources | frequent new trips, high demand, new media | pre-trip information, online or print, hardly apps | little demand for information, mainly routine trips | no demand for information, reduced mobility |
| Motivation | efficiency, flexibility, experience | responsibility, sustainability, awareness | efficiency, rationality, planning | pragmatic, reliability, novelty | costs, planning, stability | security, costs, stability |
| Specific information interest | car-sharing, alternative transport modes, pooling, park and ride systems | car- and bike-sharing, alternative transport modes, cycle infrastructure, pooling | cycling infrastructure, (taking a bicycle in) public transport | cycling infrastructure, (supra-regional) public transport | park and ride systems | non |

Table 2 illustrates options to capture the attention of different information types. As already pointed out, the 'Digital Illiterates', 'Low Demand' and 'Efficiency-oriented Information

Pickers' are especially rooted in customary routines. The most promising approach for these types would be to address low costs and (to some extend) health benefits as an advantage of low energy modes via traditional channels. Table 3 shows that these types do not response to rational arguments or the trendiness of transport options, furthermore these people predominantly do not use internet or smartphones which makes them more difficult to reach.

Table 3: Type-appropriate information channels and content

|  | Spontaneous – On the Go | Highly Informed Sustainability | Efficiency-oriented Information Pickers | Interested Conservatives | Low Demand | Digital Illiterates |
|---|---|---|---|---|---|---|
| Arguments | fun, creativity, flexibility, individuality | rationality, sustainability, costs, health | efficiency, health, costs | role models, social responsibility | costs, health | costs |
| Appropriate apps | creative, gamified | useful information, environment | no particular | hardly using apps | no use of apps | no use of apps |
| Appropriate campaigns | funny, playful | environmental responsibility | no particular | responsibility, fitness | no particular | classic campaigns |

For the other three types, on the other hand, it is comparatively easy to elaborate a communication strategy according to their needs.

The 'Spontaneous – On the Go' type expects communication to be original, unconventional, concise, multifaceted, multi-layered, professional in expression and aesthetics as well as networked and linked. Core values for the message should be referring to trendiness, novelty, efficiency, individuality and to some extent sustainability. Since public transportation is regarded as reasonable choice but not as individual, arguments for low energy modes can relate to the individuality aspect.

The 'Highly Informed Sustainability' type feels bad about using the car and is thankful for other options that do not include crowded public transport. Information has to be sound, comprehensive, non-manipulative and profound with professionalism in expression. It further has to target the core values sustainability, performance, health aspects, responsibility and quality. Cycling and walking have a positive connotation for this type and hence the perceived fun from cycling as well as the possibility to avoid crowded public transport by walking can be addressed in order to encourage their behavioural change.

People assigned to the 'Interested Conservatives' type appraise values such as sustainability, nature, performance, health aspects, balance/harmony and family. The task of communication is therefore to be useful, plausible, harmonious, balanced, realistic, unsophisticated and down-to-earth. This type likes the calming aspect of cycling but regards walking as too time consuming and uses public transport for pragmatic causes. To promote cycling is in this case easier than to encourage them to walk more often, especially when restrictions make driving by car tedious which makes them avoid this option.

## 6. CONCLUSIONS AND FURTHER WORK

Out of the qualitative and quantitative analysis of mobility patterns, information retrieval habits and social values, six reproducible types of information requirements have been identified. These types are the basis for the development of successful strategies to encourage behaviour change towards low energy modes for the different types. Furthermore, the outcomes disclose the potential success of related strategies for the different types which can be used in policy interventions to support the allocation of resources to the most effective measures.

The presented course of action focusses on the Austrian population and is therefore bound to this region. As Sinus Milieus are available for various countries, the chosen approach in gaining qualitative and quantitative data can be applied to other states as well in order to identify cultural differences in mobility behaviour and elaborate target group specific communication strategies for other regions. This knowledge can be used e.g. on an European scale in order to develop transnational mobility strategies fostering low energy modes that are more target group orientated than conventional methods.

## ACKNOWLEDGEMENT

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