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**Abstract**

The European project METPEX aims to develop an evaluation tool for the whole journey experience from the passenger viewpoint. A pilot survey has been implemented to help identify what kind of information should be collected to this effect. Five categories of variables were identified and tested: individual attributes, contextual variables, attitudes, travel experience and satisfaction aspects. Administering the pilot survey resulted in a total of 554 interviews in eight different European cities. The gained experience was supplemented by consultation with 45 different stakeholders that reviewed the tool. Potentialities and shortcomings that emerged from these assessment activities are discussed.

## 1. Introduction

Subjective determinants of mobility choices are increasingly being investigated to characterize the demand for transport and therefore to set up more effective analytical tools to support transport policies. Disaggregate behavioural demand models, representing the state of the art in transport modelling, are mostly based on the random utility theory. Their development has led to the analysis of related issues such as the effect of personal characteristics and individual taste variations (Ortúzar and Willumsen, 2011). However, recent research is focusing on the identification, operationalization, measurement and assessment of a wide range of self-related factors that are

grounded in different behavioural theories and that have a deep influence on travel behaviours. These include preferences, opinions, attitudes and perceptions (Kuppam et al., 1999; Diana, 2008), intentions and motivations (Steg et al., 2001), social values and behavioural norms (Van Vugt et al., 1995), affective-symbolic motives (Jakobsson-Bergstad et al., 2011), perceived responsibility and control, emotional states, habits (Schlich and Axhausen, 2003), lifestyles, personality traits (Vredin Johansson et al., 2006), identities (Murtagh et al., 2012), and situational factors such as health conditions, well-being (Friman et al., 2013).

Beyond these promising avenues for research in mobility behaviours, a related trend in contemporary transport research is to contextualize travel as a part of individual daily lives, and to acknowledge that traditional planning methods which focus exclusively on travel itself mostly fail to fully explain observed mobility behaviours. The increase of activity-based approaches can be seen as a paradigm shift that is substantially improving the state of the art in the modelling domain (Ortúzar and Willumsen, 2011). However, there are also other analytical activities in the transport sector beyond demand modelling, which would benefit from a similar enrichment of their theoretical perspectives and enlargement of their study object. In particular, different stakeholders (service operators, planning agencies, policy makers, user groups etc.) are for example likely to be interested in efficiency, effectiveness and quality evaluations and in benchmarking activities.

The European project METPEX (A MEasurement Tool to determine the quality of the Passenger EXperience, www.metpex.eu), co-financed within the 7th Framework Programme, has among its objectives to empower this type of broader perspective in travel-related evaluation activities. The key concept that is being used to carry out research activities within METPEX is the notion of traveller experience (METPEX, 2013a), defined in the next section. Mobility phenomena that are particularly addressed by the project involve the use of either public and demand responsive transport or active (walk, bicycle) modes, along with needs of special user groups, including minorities, disabled, the elderly and travellers with dependents.

Specially tailored data collection activities are being designed to fully support the above mentioned holistic analytical perspective of the project. However, it is impossible to incorporate all the hundreds of variables and factors of concern in measuring the existing levels of service and in stakeholder's planning guidance. Therefore as a first step, a travel survey pilot has been implemented to help identify what kind of information should be collected to sufficiently characterize the different phases of the traveller experience. The focus on the whole journey experience thus represents the first distinguishing characteristic of our data collection effort. In addition, the inclusion of questions targeted to special user groups within a survey that is designed for the general public is an additional feature of the METPEX approach. The third innovative aspect is related to the collection of self-related information (attitudes, perceptions etc.) at the stage rather than at the trip level. Finally, the variable selection process needs to consider that several different survey instruments are envisaged for this project, namely a self-administered online questionnaire, a face-to-face interview, a web application and a game for smartphones and tablets, along with focus groups specific traveller profiles. The issues here was also to understand if a stage-based collection of self-related information can be achieved through self-administered questionnaires of if assisted interviews are needed given the complexity of the task.

The goal of this paper is therefore to describe the METPEX pilot survey and the related experimental framework, to present its innovative features and to discuss those outcomes that drove the consortium in the design of the final survey instrument. Beyond the feedback from the pilot survey implementation, its questionnaire was also reviewed by many stakeholders that assessed the utility of the different questions from their perspective.

In the next following section, a brief discussion of the notion of travel experience and the formulation of the experiment framework and variables selection are described. The survey design is discussed and followed by brief descriptions of the result outcomes and the stakeholders' feedback on the survey implemented.

## 2. The notion of traveller experience

The *traveller experience* is a generalization of the more customary "study objects" in transport-related models and evaluation exercises, usually represented by trips, eventually broken down into stages. According to current definitions (Axhausen, 2007), "a *stage* [or a trip leg] is a continuous movement with one mode of transport, respectively one vehicle. It includes any pure waiting (idle) times immediately before or during that movement" and "a *trip* is a continuous sequence of stages between two activities".

The traveller experience is a much broader concept. It usually starts when the individual begins to consider making a trip, which could happen a long time before the trip actually takes place, and concludes with arrival at the final destination. Such experience can be influenced by instrumental (objective) variables (such as cost, vehicle quality, information provisions, etc.) up to non-instrumental (subjective) factors such as perceived safe environment. Friman and Gärling (2001) found that personal values and motivations often play an important role in mode choice in relation to traditional concerns of speed, cost, or efficiency. In line with this, Stradling et al. (2007), for example, found that satisfaction with bus services also depends on a variety of non-instrumental factors such as cleanliness, privacy, safety, convenience, stress, social interaction, and scenery, whereas pedestrians evaluated their walking trips in terms of non-instrumental criteria, such as crowdedness, air quality, presence of trees and flowers, presence of beggars, and type of pavement.

For analytical purposes, METPEX therefore starts monitoring the travel experience when the individual seeks information that will allow making the optimal choices. The traveller experience can thus be broken down into the following phases:

1) Trip-related information retrieval.
2) Trip-related decision making process.
3) Leaving from the trip origin.
4) Walking to the pickup point of the first mode of travel (if not a walking trip).
5) Waiting for the travel mode (for public transport trips).
6) Boarding the travel mode (if not a walking trip).
7) Departure.
8) Travel.
9) Arrival.
10) Alighting (if not a walking trip).
11) Transfer to the pickup point of the second mode of travel (for trips with more than one stage).
12) *[Repeat points 5-11 for all trip stages]*
13) Walking to the trip destination.

We report in figure 1 an example of a broken down journey experience, in this case of a trip by train, along with the possible elements that could influence the related perceptions and evaluations. For simplicity, only the above listed phases up to boarding the train are represented. The figure clearly shows the degree of complexity of the travel experience which the final measurement instrument should take into consideration, and a possible example of classification of the different tasks that constitute the traveler experience. The next section presents the methodology that has been adopted to define such tool, along with the experimental framework of the project.

## 3. Experimental framework and methodology for selecting the variables

The METPEX tool is developed and tested with different user groups in eight European cities: Bucharest (Romania), Coventry (UK), Dublin (Ireland), Grevena (Greece), Rome (Italy), Stockholm (Sweden), Valencia (Spain) and Vilnius (Lithuania). This sample represents a good blend of large versus small cities, areas with different socio- economic and demographic characteristics, areas with different geographic, climate and cultural contexts and diverging levels of transport systems development. This should ensure the robustness of the results and its applicability to a wider range of contexts. The final users of the METPEX tool (primarily transport operators and policy makers) will be able to benchmark their systems and services.

The tool has to measure a set of variables that can describe with a sufficient level of detail the different aspects of the traveller experience above discussed. Additionally, the focus on special user groups induces the need for high levels of flexibility in use and expands the data requirements. Inclusion of these two features could lead to the design of a long and complex survey instrument. To inform the development of the final measurement instruments, a pilot survey was implemented in April-May 2013 in eight EU cities (the previously mentioned ones, excluding Grevena and with the addition of Turin, Italy).

| Setting off to train station | | | | Waiting on the platform | | | Boarding the train | | |
|---|---|---|---|---|---|---|---|---|---|
| **Check time** | **Leave home** | **Journey to station** | **Arriving at station** | **Check time at station** | **Waiting for train** | **Train arriving at station** | **Train stops at station** | **Find seat** | **Prepare to depart** |
| Look up website for train times | Concern over weather | Determine travel duration | Check availability of car space | Look up station TV screens for train and time | See people exit at train arrival | Platform info of standing position | Platform info of standing position | Concern about hygiene on train | Carriage info provide info departure |
| Check mobile timetable | Pack belongings | Determine travel distance | Find car park space and park car | Look up to platform clock | Observe number people waiting | Display Entry and Exit in carriages | Display Entry and Exit in carriages | Air scent cleaning | Carriage info provide regular announcements |
| Look for any announcements | Station weather details on website | Thinking over days schedule | Notice car park peak time | Listen for train change announcements | Concern over whether enough seats | Look for seats through train windows | Brace self as wind blows from train | Inform about the latest cleaning time | Hear the train guard blow whistle |
| Memorize times | Station weather details on mobile | Concern over traffic obstacles to path | Concern over car in park | Look down the rail line to see if train coming | Platform info provide info on seat capacity | Move into "door opening" position | Noise unpleasant as train pulls in | Provide info on seat capacity for luggage | Hear automatic announcement for doors closing |
| Station timetable on website | Do list before leave home | Listen to radio | Parking for regular passengers | Concern over whether trains is on-time | Concern over whether train on time | Discuss to get on the train | See position of train entry doorway | Search for vacant seat | |
| Station timetable on mobile | Exit home | Plan day ahead in mind | Information on parking location and time | Platform timetable by destination | | Carriage info provide info on seat capacity | Move into "door opening" position | Concern over whether enough seats | |
| Station special /news | Map details and direction to station | Current location to station | Information safe way to enter platform | Platform clock | | On-board info to seats availability | Discuss to get on the train | Find suitable seat | |
| Send timetables to passenger | Start car, turn radio, drive | Traffic update news | Walk to platform | Regular train announcement | | | Enter onto the train through entry doors | Take seat | |
| Current location to station | Walk to station | | Purchase ticket | | | | | | |
| Concern over whether getting there on time | | | Ticket sales | | | | | | |
| | | | Pre-purchase ticket | | | | | | |

**Business:** Innovation idea — Business priority — Business gap
**Personal:** Personal doing — Personal thinking — Personal feeling

Fig. 1. Example of analysis of the journey experience for a rail trip (source: METPEX, 2013a).

Once the data were gathered and available from all sites, the variables selection procedure was carried out through statistical tests. These examined which variables really matter when compared, against the real individual choices, after all other variables (including respondents' socio-demographic variables) have been controlled. Whether a variable matters or not was ascertained based on statistical indicators that identify which variables are significantly correlated with the indicator(s) of travellers' reported satisfactions. In this sense, we note that Revealed Preference (RP) techniques have a greater statistical and predictive validity since they are linked to actual choices rather than hypothetical scenarios/abstract questions, such as "which one among these is important to you". This parametric test method was chosen as it is the standard practice to test a large sample, including ordinal data, e.g. tests comparing differences between independent groups for binary questions (yes/no answers), and tests comparing differences between independent groups for rating scale questions (e.g. 1 to 5). Where various travellers' groups are compared, appropriate tests were employed together with post hoc tests and adjustments. These data analyses are reported elsewhere (METPEX, 2013b; Susilo and Cats, 2014), whereas the present work focusses on the implementation of the pilot survey.

## 4. Design of the pilot survey

The design of a pilot survey had to make some basic choices concerning the general structure of the survey itself. At the outset, we note that a stated preference (SP) method could have been used. However, the pilot survey we implemented did not only elicit preferences but also for example, satisfaction ratings, so that a SP approach could not be feasible for all questions. Moreover, since this project involves different cities with different habits, patterns and infrastructure conditions, comparing a basic SP experiment of one city with another would be questionable since travellers' experience is very subjective and highly dependent on the individual's limited reference point and on each city's local conditions. This problem actually could have been mitigated with a complex SP structure which controls individual reference point and locality factors (Ortúzar and Willumsen, 2011). However, this was too demanding for our benchmarking exercises. Thus, a Revealed Preference (RP) approach was used throughout the project, analysing individual responses based on their revealed behaviours and statements. The RP method also enables us to provide an assessment of the current service provision to the local stakeholders, which is one of the METPEX project's expected outputs.

As already mentioned, the relationships between individual trip stages and the overall trip experience as well as between experience and the formation of expectations were directly addressed in our research. Therefore, it was initially decided to include variables related to attitudes, travel experiences and satisfaction aspects at the individual trip stage level rather than for the whole trip. This obviously lengthened the questionnaire and increased the respondent burden especially in case of multimodal trips. Hence the pilot survey balanced the related drawbacks with the benefit of a much greater precision in tracing back personal evaluations of the journey experience to the actual travel conditions.

Since the questionnaire required the completion of fairly detailed information and perceptions, it was important to collect data with a minimal time lag from the respective experience. Pedersen et al. (2011) show that recalled satisfaction was significantly lower than the satisfaction reported shortly after the experienced travel with public

Table 1. Classification of the variables considered in the questionnaire

| Category | Sub-categories |
|---|---|
| Individual attributes | Socio-demographics |
| | Mobility behaviours and mode usages |
| | Needs of special groups |
| Contextual variables | Time of day / week, season |
| | Weather |
| | Trip purpose |
| | Subjective well-being |
| | Hindrances |
| | Scheduling constraints |
| Attitudes | Preferences |
| | Opinions |
| Travel experience | Familiarity |
| | Past satisfaction |
| | Adaptation |
| | Extreme events |
| Satisfaction aspects | Availability |
| | Speed / Travel time |
| | Information provision |
| | Way finding |
| | Comfort |
| | Appeal |
| | Safety and security |
| | Reliability |
| | Customer care |
| | Price |
| | Network connectivity |
| | Ride quality |
| | Environment |
| | Travel time productivity |

Table 2. Structure of the questionnaire

| Main section | Subsections |
|---|---|
| Background information | Recruitment method |
| | Traveller socioeconomics |
| | Travel habits |
| | Modal access |
| Trip description and travel experience | Origin, destination and trip purpose |
| | Scheduling constraints |
| | Hindrances |
| | Familiarity |
| | Stage-based trip description |
| | Information provision and acquisition |
| | Adaptation |
| Satisfaction aspects | Previous satisfaction |
| | Overall satisfaction |
| | Availability |
| | Experienced speeds and travel time |
| | Information and orientation |
| | Comfort |
| | Appeal |
| | Safety and security |
| | Reliability |
| | Care and customer service |
| | Price |
| | Connectivity |
| | Ride quality |
| | Environment |
| | Travel time productivity |
| | Special groups |
| | Other aspects |
| Subjective well-being | (none) |
| Attitudes | Mode specific preferences |
| | Opinions |

transport. It was therefore agreed among the METPEX partners that the questionnaire should take place either on-site or retrospectively, but should refer to a trip carried out earlier on the same day. The questionnaire was, therefore, designed in two versions (*during the trip* or *retrospectively*) in order to accommodate the different recruitment methods that were used in the different sites.

Finally, it was decided to maintain one common questionnaire to be used by all user groups, rather than producing several versions customized by travel mode or user characteristics (e.g. special needs). The reasoning was that the questionnaire should address multimodal trips and hence the same respondent may have to provide information concerning different modes. Furthermore, there was a wide range of special needs in the population which should be accommodated in the questionnaire by common questions. Users that have a disability that limits significantly their ability to travel make up a fairly small portion of the population and are not likely to be recruited as respondents, given the recruitment method. Instead, their needs should be investigated through discussions with the relevant stakeholders or dedicated panel groups.

Five categories of variables that were expected to influence overall travellers' evaluations were identified and tested in the pilot survey: individual attributes, contextual variables, attitudes, travel experience and satisfaction aspects. Each category contains several sub-categories, as shown in Table 1. An extensive discussion on the state of the art of the research considering the effect of each category on travel-related evaluations, is reported in METPEX (2013b). Here we simply notice that we took a multidisciplinary approach in this exploratory phase of the research, not necessarily sticking to a given theoretical framework. For example, we considered both attitudes and satisfaction aspects, even if the two concepts are considered in different behavioural theories. This would hopefully enable us to address less explored research questions, that will be further discussed in the following section 5.

Variables in each category had to be transformed into questions, in order to assess the importance of different variables and ultimately determine their inclusion in the METPEX tool development, as explained above in the
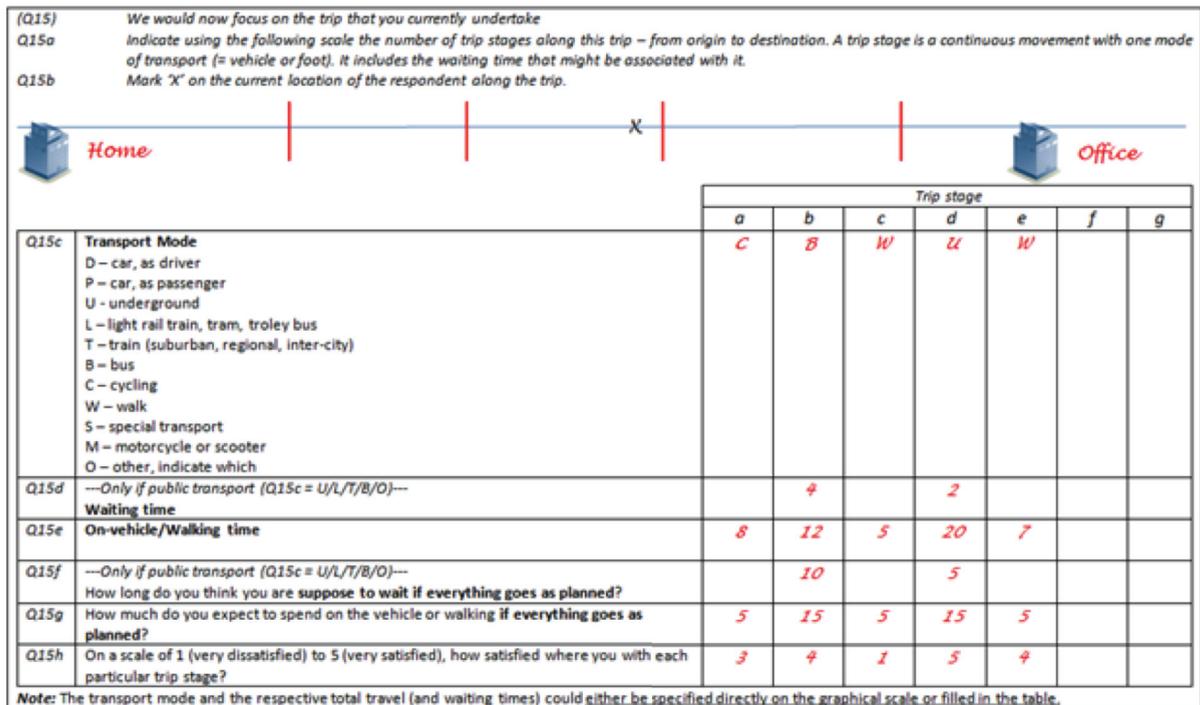
Fig. 2. Stage-based trip description.

methodological section. Questions were arranged and sorted in order to ease the survey completion, without necessarily following the above semantic groupings. The resulting questionnaire was therefore structured as shown in Table 2; it is not reported here for the sake of briefness but it can be found in METPEX (2013b). The stage-based trip description and satisfaction reporting needed some brainstorming to figure out suitable graphical layouts. Figures 2 and 3 show examples of such questionnaire sections. Both assisted interviews and self-administered ones have used such layouts. However, as we will mention in our conclusions, the implied respondent burden was acceptable only for specific user groups (e.g. university students) in case of self-administered surveys.

## 5. New research questions addressed through the pilot

We believe that the variables that have been introduced in the previous sections have the potential of addressing some issues and research gaps in current travel behaviour research. As highlighted by previous studies (e.g. Friman and Gärling, 2001, Pedersen et al., 2011), individual's travel satisfaction and appreciation of service attributes, among other things, are highly influenced by his/her expectation (which is in turn influenced of their habits, routines, reference point and past experience), mood and subjective well-being at the survey state (Friman et al., 2013). Thus we tried to broaden the survey context to better understand this complexity, not only to measure the impacts of the physical quality of the service provision, but also to explore the impacts of the complexity of relationships underlying individual's appreciation towards the given transport services. This includes measuring the impacts of individual dependency and dedication towards particular travel modes in skewing their appreciation towards the given service. The research questions stemming from these considerations are the following:

1) There is currently a lack of understanding in the link between travellers' experience, expectation and satisfaction. It was not clear how experience impacts on future expectations and what really matters in creating a good travel experience. If satisfaction levels depend on the extent to which experience satisfies expectations and

*For each of the __already completed__ trip stages (Continued): How much do you agree with the following statements?*
*Indicate your agreement using a 1 (strongly disagree) to 5 (strongly agree) scale. Use 'NA' for cases where not applicable.*

| | | | Trip stage (Note: Only for the relevant trip stages) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | a | b | c | d | e | f | g |
| Q21x | if public transport (Q15c = U/L/T/B/O) | The temperature on-board was fine | | | | | | | |
| Q21y | | I was disturbed by the behavior of fellow travellers | | | | | | | |
| Q21z | | It felt like it took longer than it actually did | | | | | | | |
| Q21aa | | I felt safe when riding the vehicle | | | | | | | |
| Q21ab | | It was comfortable to ride this vehicle | | | | | | | |
| Q21ac | | I felt travel sickness because of an unsmooth ride | | | | | | | |
| Q21ad | | It was easy to find out where to get off the vehicle | | | | | | | |
| Q21ae | | This is an environmental-friendly service | | | | | | | |
| Q21af | | The service was highly reliable | | | | | | | |
| Q21ah | | The travel time was good compared with the planned timetable | | | | | | | |
| Q21ai | | Travel information on the vehicle was relevant and timely | | | | | | | |
| Q21aj | | This service provides good connections to other travel options | | | | | | | |
| Q21ak | | I choose to change route even though it costs more | | | | | | | |

| | | | Trip stage (Note: Only for the relevant trip stages) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | a | b | c | d | e | f | g |
| Q22a | If car (Q15c = D/P) | It was easy for me to predict how much time it takes to travel | | | | | | | |
| Q22b | | The time it took me to travel is reasonable given the distance | | | | | | | |
| Q22c | | Travel information while driving was relevant and timely | | | | | | | |
| Q22d | | I felt perfectly safe on the road | | | | | | | |
| Q22e | | It felt like it took longer than it actually did | | | | | | | |
| Q22f | | It was easy to find a parking spot | | | | | | | |
| Q22g | | The price for parking was reasonable | | | | | | | |

Fig. 3. Stage-based satisfaction aspects according to different transport modes.

expectations depend on previous experience, then we may conclude that it is more important to be consistent than to become better: an ever improving service would lead to a shift in expectations which will result with the same satisfaction level (Kahneman, 2000).

2) Furthermore, whilst the provision of travel information has been a common feature in many stations and interchange locations, the impact and the value of different types of information provision to travel satisfaction are unknown. This includes the role of schedules and network maps, real-time arrival and departure times, in-vehicle information and information on potential connections with other services.

3) The impacts of potential disruption are also unknown, therefore they are explored in this experiment. Previous literature (Friman, 2004) underlined that incidents which deviate substantially from an individual's expectations have a non-proportional impact on travellers' satisfaction concerning public transport. Their likelihood is overestimated, especially by risk averse travellers.

4) Most, if not all, of the previous studies dealing with the application of travel experience measurements focused only on the attitudes towards trip legs. The consideration of intentions or further behavioural implication to the whole journey of the travellers has been much scarcer. Thus, it would be of special interest to study also how the overall travel satisfaction changes as a function of the satisfaction of journey elements and individual attributes. For example, what is the relative importance of access and egress stages? Does this depend on the primary mode? Preliminary studies in Stockholm and West Midlands highlighted the passengers and operators concern on the impacts of station and its environment to the whole journey experience (METPEX, 2013b), which so far has been neglected by the conventional main-trip-stages-focus approach.

5) To control the variability of travellers' mood due to variability of their external conditions, subjective well-being questions as suggested by Friman et al. (2013) were used.

6) To control and investigate the influence of local habits and cultures, attitudes, perceived control and social norm related questions were introduced. These are derived from a simplified concept of the theory of planned behaviour of Ajzen (1991).

## 6. Discussion on the outcomes and conclusions

A total of 554 interviews took place in the eight test sites. Of these, 307 (55%) were collected on-site whilst 247 (45%) were collected via the retrospective version of the questionnaire. A detailed analysis of the resulting dataset is outside the scope of the present paper: the interested reader is referred to Cats et al. (2014) for an outlook and to METPEX (2013b) for a more systematic coverage of this topic, including descriptive statistics of the sample. In the following we rather focus on the lessons learned from the survey implementation, but also from the consultation of a wide range of stakeholders that reviewed the pilot survey and provided useful suggestions.

### 6.1. Conclusions from the pilot survey implementation

At the outset, survey supervisors noted in all the test sites a consistent concern among respondents and surveyors that the questionnaire, although useful and interesting, was too long and too complicated. This was somewhat anticipated, since the goal of this pilot was exactly to select which questions should enter in the METPEX measurement tool. From the implementation of the pilot it is suggested that the final questionnaire should take about 5 to 10 minutes, maximum, and questions on trip stages need to be really clear. However, it was also noted that there are several ways in which the experience of the respondents could be improved and response rates increased. These are discussed below.

On the survey recruitment stage, surveys were carried on-board public transport vehicles in Dublin and Coventry. This seemed to work well since it not only allowed the surveyor to "capture" the respondent easily, but also found the respondents who were not in a position to rush somewhere else. This is in line with customer satisfaction surveys that are routinely carried out by the majority of public transport services operators. At the same time, some interviewers found it easier to recruit respondents on the streets and/or open spaces, as these people were less distracted and not in as much of a rush as those on public transport. Further, the teams from Dublin and Coventry believed that it was necessary for this survey to be conducted by interview rather than self-completion. For a larger sample this would have severe cost implications. One possible way of simplifying the questionnaire would be to have separate pages for each journey stage rather than having the respondent that scores each stage on one table.

In line with the suggestion from Dublin's team, other sites reported that the current layout of the questionnaire, as shown in the above reported questionnaire snapshots, made it difficult for people to follow. It is important to make this simpler to increase the effectiveness of the survey activity and also increase the response rates. To deal with this, in Stockholm the questionnaire was split into two parts, one part containing on-site travel experience which needs to be completed with assistance from the surveyor immediately, and a second part containing the background information, which could be filled later or through a follow-up phone survey.

Using computer assisted methods also proved useful. A tablet computer was used in Bucharest, which helps both respondents and surveyors to complete the surveys more easily. The use of an on-line survey can be also very useful and much cheaper alternative than face-to-face interview. However, once the on-line questionnaire's respondents become confused with the questions, it is very hard to get back to them and help them to complete the questionnaire. Thus, the respondents became discouraged quickly and they are likely to abandon the survey. More in general, different survey methods imply different levels of tolerable respondent burden and of maximum complexity of tasks. This seems particularly critical with the stage-based collection of data as depicted in Figures 2 and 3; the final survey therefore focusses on one trip leg. The analysis of the relationship between survey methods and obtained responses during the final survey is ongoing (Susilo et al., 2015).The recruitment process was very challenging given the amount of time and resources that were available for this task. This problem was alleviated by providing an incentive or token of appreciation to the respondents. Although this did not guarantee participation, it was still an attractive incentive for majority of the population. It was found in Coventry that despite offering 5 GBP incentives to particular travellers groups, the complexity of the questionnaire still put people off. But to make this initiative fully work, the complexity of the questionnaire needs to be reduced.

Recruitment of respondents at stations and on vehicles should only be conducted with the prior agreement to the relevant gatekeeper, i.e. transport operator, municipality and/or regulators. This might be difficult and may place restrictions on the data that is collected, where stakeholders request to see the questions in advance. Also, at least one operator in Coventry expressed their reluctance in assisting with recruitment, as this would interfere with the passengers and the smooth operation of the facilities. Additionally, as some operators are on a non-stop cycle of market research and consumer surveys, adding yet another questionnaire would lead to oversampling and fatigue in the passengers.

A "hall-test" situation would be a useful alternative of recruiting respondents; this is where a city centre venue is used (hotel, or a public transport interchange with suitable facilities) where people are invited from the street (filtered according to a quota system) and offered an incentive to take 20 to 30 minutes to complete the questionnaire. A large number of people could be recruited at one time with a number of supervisors. However such scheme was not pursuit in this pilot survey.

The importance of adjusting some questions not only with respect to local conditions but also to specific group's needs and conditions also clearly emerged (e.g. for students, who are living at the dormitory and have different composition of "household structure", whereas some questions were hard to understood by people with lower language skills and/or lower standard of education). The importance of a questionnaire designed to meet the needs and limited abilities of elderly and disabled people was also highlighted.

Some respondents also complained about the language of the questionnaire, which highlights the importance of a language check by the locals and local survey organisers. It is paramount for the travellers to understand and appreciate the purpose of each question, not only to give correct answers but also to enlist their cooperation. Therefore, it is important to have a good translation of the questionnaire. There was in fact some confusion among the respondents and the surveyors on the reason for some questions (some thought that the questions were not relevant and/or repetitive, e.g. questions on mood (subjective well-being) and friends' opinion (social norm impacts). This also highlights the needs of training and knowledge transfer between the survey designers and the surveyors/survey organisers of the reasons behind each question. This would enable the surveyors to explain to the respondents if they asked the reason why some questions are included.

There was also some constructive feedback to further improve the questions. For example, the definition of walking needed to be further clarified: there was confusion about whether a short walk from the car park to the nearby train platform was counted as a separate stage. Furthermore, many travellers took the travel information provision for granted and did not remember how they had used the information on their trips. Some of the surveyors also thought that asking age, gender and disability may embarrass some respondents.

Overall, country-specific issues and cultural differences played an important role, as it can be seen from the different feedback that came from different test sites across Europe. A recommendation that is stemming from this consideration is to test such kinds of surveys in each country to properly consider the different viewpoints during the survey design.

### 6.2. Conclusions from the stakeholders' feedback

In parallel with the data gathering activity, a consultation was launched among 45 different stakeholders through all test sites (17 services operators, 12 authorities and policy makers, 9 non-governmental special interest groups, 7 other institutions) to gather their viewpoint.

Although most of the stakeholders valued the thoroughness and comprehensiveness of the pilot survey, they confirmed that the pilot questionnaire was very long and too complicated for travellers to fill. Many of them thought that the delivery of the questionnaire needed to be more structured, synthetic and focused, especially to minimise its completion time. Many of the stakeholders suggested splitting the questionnaire, either by different group of travellers or by phases of interview. For example, one of the stakeholders in Stockholm suggested splitting future interviews into two phases: a shorter and more general interview to first capture all the variables that can affect satisfaction, and then followed by series of focus groups to allow longer interviews. Stakeholders from Turin suggested dividing the questionnaire based on their nature of trips: regular travellers (such as commuters and students) and occasional users (such as tourists).

Different questions were valued differently by different stakeholder groups. We refer the interested reader to METPEX (2013b) for a detailed analysis of the assessment of each variable in the dataset by different stakeholders. In more general terms, it seems that the operators were more interested and concerned with the impacts of detailed level-of-service related variables to the traveller experience (e.g. the use of travel information, more detailed impacts of disruptions, detailed trip pattern, etc.), and less interested with the overall satisfaction of the whole journey. They also questioned the usefulness of measuring poor experience in the past. Furthermore, they also appreciated less the variables that are too general and neither can be used in understanding their customers' behaviour nor in detailed planning processes (e.g. how the trip satisfaction can be improved at a detailed level).

On the other hand, planning authorities were more interested with wider general urban and public transport planning issues than the travellers' mobility patterns (e.g. different impacts of level-of-service for different travel modes and trip purposes), which is understandable since their responsibility is to improve the transport service at the whole network and city (or bigger) level. They are also interested on the impacts of congestions and pollution in general and at what particular conditions and locations public transport is needed (from planning perspective).

As for the special interest groups, understandably they were more interested in their constituents' interests. Some of them argued that the questionnaire was not detailed enough to explore the disabled travellers' needs. They believe that more targeted questions, with more detailed features are necessary. For example, instead of asking "whether the vehicle design fulfilled their needs", we should ask the detailed quality of the space, the ramps etc. Similar reactions were also found among car interest groups. Further, they were also sensitive to personal related information, such as asking age, education and disability level of the travellers and questions about feelings (e.g. the feeling of whether one could go anywhere without barriers etc.).

The "other" group of stakeholders that have been interviewed in this exercise were mainly government research institutes and universities. Many of them were interested with more detailed trip patterns and behavioural variables that underlie the travellers' decision making processes, in order to help the government to better design policy. They were also interested in multidisciplinary issues such as the role of subjective well-being conditions, stress and the impacts of travellers' time constraints.

Nevertheless, whilst different stakeholders had different interests, all stakeholders highlighted that it is important to make the questionnaire accessible for all. Some of the stakeholders argued that it is necessary to provide different questions in different forms in order to facilitate its accessibility by different social categories of people with different social categories, different ages and different levels of literacy. This includes the level of complexity of questionnaire to different group of travellers. For example, a stakeholder from Stockholm suggested redesigning the questionnaire (and re-distribute the questions) based on different type of travellers (e.g. frequent travellers vs. long distance business travellers). Direct access to the questionnaire through the internet, its promotion on social networks, contacting travellers by emails, phone interviews, direct interviews on the street, interviews during traveller journey etc. could be some ideas to implement METPEX tool to be accessible to all citizens.

It is also important to accommodate different needs of different trial sites. For example, Grevena is a small-medium city with very different service characteristics (e.g. frequency, connectivity and accessibility) and network coverage than other trial cities (more rural than other sites). Thus, METPEX tool development (and its subsequent analyses) may need to be adjusted accordingly. Related to that, some local stakeholders highlighted the benefits of having similar questions and ones comparable to those they use already. This may be a challenge, since different stakeholders in different countries are collecting similar but different variables in measuring seemingly similar quality indicators.

Some stakeholders also suggested some important variables that are currently missing from the questionnaire. For example, some stakeholders from Bucharest and Stockholm highlighted the need to directly measure the quality of the existing road and rail infrastructures. Although the trip service may be perfect, worn down vehicles and buildings may neither provide a good impression nor sense of belonging among the users. Moreover, a Stockholm stakeholder reminded us to look at seasonal habits, since driving and bicycling can have different seasonal patterns. Also, one of the stakeholders from Dublin pointed out that taxis had not been mentioned as a main transport mode, despite being an important means for travellers with small children and for travellers with disabilities in some cities. Stakeholders from Turin believed that we also need to expand questions related to motorcycles and mopeds, as they are an important mobility segment in Italy that is very affected by issues such as safety.

In interpreting the results, a stakeholder from Stockholm reminded us that there is always a risk in asking people about what they think and feel and interpret that as an indicator of true values. People "suffer" from hindsight wisdom, or rationalizing their choices afterwards, no matter what the alternatives were before the choice was made, to cope with the "cognitive dissonance" of potentially having made a bad choice. Thus, their answers will merely be a justification of their "wrong" decision. This gives rise to a more critical concern about how does one form a "level of satisfaction". Recalled experience is affected by potential biases but also the subject of METPEX tool measurements.

### 6.3. Next steps in the research

It can be seen from the above that we learned a lot of lessons from the survey implementation and from the stakeholder's views. This, along with the statistical analysis of the observations that allowed us to select those variables that should be measured (Susilo and Cats, 2014), was instrumental in developing the subsequent implementation of the METPEX tool and the related full-scale measurement campaign of the traveller experience in the eight text sites. In particular, the full-scale survey uses several different modules, according to the kind of instrument, the target group and the travel characteristics, to better focus on the most relevant aspects of the traveller experience while trying to limit the respondent burden (Susilo et al., 2015).

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