# Summary description of project and main objectives

## Context of Project

European cities increasingly face problems caused by transport and traffic. The question of how to enhance mobility while at the same time reducing congestion, accidents and pollution is a common challenge to all major cities in Europe. Efficient and effective urban transport can significantly contribute to achieving objectives in a wide range of policy domains, for example on the efficiency of the EU transport system, socio-economic objectives, energy dependency, or climate change, partly depends on actions taken by national, regional and local authorities. Mobility is closely linked to quality of life, as represented in a number of policies and funding streams which seek to provider more accessible, cleaner pedestrian and cycle ways

A key factor for transport operators and authorities, regardless of transport mode, is the quality of the passenger experience, as this in part affects uptake of service offerings. It may be argued that the removal of barriers and improving access to public transport for all will lead to a modal shift in transport behaviour away from private fuelled vehicles. This in turn, will lead to reductions in congestion and carbon emissions.

The focus of METPEX has been on developing KPIs to measure the quality of the whole journey (door-to-door) passenger experience (including private or individual forms of transport such as walking, bicycling and car sharing), as a starting point to understanding where improvements need to be made from the travellers perspective. Reliable measurement instruments form the basis for robust data collection, but following this there has to be policy recommendations, commitment and investment by stakeholders to make improvements that will improve the quality of all modes of transport, for all people.

Although many studies have been conducted at both National and EU levels on mobility behaviour, there is no single measurement instrument which can be used to gather information about the whole journey passenger transport experience from journey planning to arrival at destination. The lack of such a validated instrument, taking as its unit of analysis the whole journey experience, makes it difficult to understand the barriers faced by active (walking and cycling), public (e.g. bus, metro, tram, light rail, train) or intermodal transport users (e.g. bus-train, cycle-train, bus-walk-train). It is then difficult to make comparisons, to ensure validity and reliability of data, to develop international, multi modal transport benchmarks and standards and to provide a coherent picture of the passenger experience across Europe.

The complexity of urban environments, reduced employment opportunities and the pressure on operators to increase profitability and service efficiency, and the availability of travel information all effect decisions on whether, when and how to travel and the quality of the travel experience. The potential complexity whole journey experiences requires the development of a measurement instrument which acknowledges and measures new mobility patterns, changing transport policy priorities and passenger perceptions and expectations.

The development of an inclusive, validated passenger experience measurement instrument is the first step in creating high quality, user centred, integrated, accessible public transport services which are capable of attracting and retaining public transport users whilst meeting sustainability targets. Such a tool needs to provide reliable data which can be used by transport providers, policy makers, vehicle designers and municipalities to measure in order to assess where changes need to be made to increase efficiency, effectiveness and attractiveness of service delivery. Enabling wider access to safe, secure, convenient, comfortable and economical public transport will in turn support the EU’s carbon reduction targets by leading to an increase in the number of people who use public or active forms of transport.

Therefore the aim of METPEX was to develop an intelligent measurement instrument which could be used to measure the quality of the whole journey, multimodal passenger experience across Europe. The outputs of such a tool could provide important information for transport providers, operators, municipalities and policy makers that are tasked with the development of sustainable, more efficient and passenger friendly services.

## Scientific and Technical Objectives

1. To develop an integrated approach to the measurement of the whole journey passenger experience that takes into account human (physiological, perceptual, cognitive, sensory and affective) socio-economic, cultural, geographic and environmental factors.
2. To assess the costs of ‘inaccessible transport’ for different sectors of society (such as those from low income groups, rural communities, the elderly, disabled and those with lower levels of literacy).
3. To assess the extent to which the measurement of the passenger experience can be used to drive innovation and attention to transport quality from the customer’s perspective in the transport industry.
4. To evaluate the passengers experience from different regions of Europe and to support the integration of regional transport networks into an European transport network
5. To facilitate the harmonization of travel behaviour research and analysis across European Union Member States.

These were mapped on to a number of SMART objectives and fulfilled as follows:

 S01: To ‘map’ the passenger journey experience, identifying critical stages of journeys where quality of service matters in relation to a seamless travel experience. This was completed in WP2 using desktop research in the first 6 months of the project

SO2: To develop and define by the end of year one a set of passenger experience variables informed by a review of current methodologies and best practice, as well as a clearly developed understanding of user requirements derived from primary research. WP2 completed this in the first year of the project using desktop research and a pilot study to develop initial variables

S03: To produce, an innovative on-line, multi-platform **Passenger Experience (METPEX) Measurement tool** based on previouslydefined set of passenger experience variables and designed to be used to capture users’ whole journey experience, especially barriers to accessibility and service quality. WP3 produced, online multiplatform methods to gather the quality of the passenger experience, for all stages of the journey in real time and retrospectively. This was supported by back end administrative services to adapt, verify, and monitor response rates.

SO4: To complement the on-line METPEX tool with a suite of low-tech tools, designed simultaneously to enable data to be captured from users without access to electronic media. During the course of WP3 activities it was confirmed that traditionally hard to reach groups were still hard to reach. Questionnaires, structured interviews, and focus group protocols were developed for each site to reach these groups.

S05: To implement and validate the METPEX on and off-line tools through testing in 8 sites chosen to reflect geographical, political and cultural differences as well as transport system types. WP4 designed and analysed the results of the month long survey of the tools conducted in October 2014 at 8 sites.

S06: To produce, during the first 10 months of year 3, a suite of reports that analyse the findings, outcomes and learning from the validation exercise. A comparative report will also be generated to synthesise findings, outcomes and learning across the different sites. WP5 undertook extensive analysis of the data from the trials, reported in a number of deliverables and also completed a comparative report was also undertaken of the results for each city.

S07: To frame the METPEX project findings in the context of the scientific and practical state of the art as it relates to the development and implementation of transport indicators and subsequently develop a set of indicators that can quantitatively evaluate quality and accessibility related issues. WP5 undertook a separate analysis of the results to develop KPIs and measurement tools for transport operators, authorities and other stakeholders

S08: To develop a Transport **Services Quality and Accessibility Evaluation Manual** in order to support practitioners in applying service quality and accessibility indicators to evaluate transport systems and to compare findings with those from the METPEX project WP5 produced a set of material and instructions for third parties to use METPEX outputs independently.

S09: To assess wider socio-economic and land-use issues and their relationship with accessibility and mobility in partner regions. WP6 produced a defined set of principles and strategies for optimising transport systems towards integrative accessibility, and an analysis of innovative technologies and their applicability in different socio-economic contexts

S10: To work alongside key project stakeholders to disseminate results against benchmark criteria, evaluate the extent to which passenger related information can effect change and discuss the implications of results for the creation of a more effective, seamless, accessible travel system in each of the trial sites. Stakeholder meetings were held in all WPs with local and national stakeholders throughout the project. A project conference and a policy report detailing how passenger information can inform local and national policies was produced by WP7 at the end of the project.

The objectives and actions proposed in METPEX met the topics addressed in the call through:

1. Provision of a METPEX tool that can be used to improve the **quality of mobility solutions** which recognise the user’s need for accessible seamless travel.
* The final measurement instrument consists of a series of KPIs, which can be used in isolation to measure the quality of the experience, for a specific user or transport mode, or in tandem to evaluate a whole transport system

2. Development of a tool that is ‘innovative’ in two complimentary ways.

* Social media was explored as a means of collecting real-time information using a game and bespoke questions linked to journey profile, the traveler and their progress on the journey.
* Especial consideration was given to the traditionally hard to reach groups, through the development of compatible, but non technologically dependent measure instruments (questionnaires, focus groups and structured interviews) in order to capture the experience of travellers who do not have high levels of computer or other forms of literacy, or access to high end technology. In this way METPEX fulfilled its commitment to gather the experiences of those from the most travel disadvantaged groups in the EU.

3. **Validation of** METPEX approach through its use in eight sites across Europe (Coventry, Stockholm, Dublin, Valencia, Rome, Grevena, Vilnius and Bucharest).

* Data was gathered and analysed from each site in order to validate the METPEX approach and to gather data which could be used for the derivation of quality indicators.

4. **Development of quality indicators** which recognise **passenger** (age, demographics, disability), **cultural diversity** and multimodal, informed travel patterns.

* The meta-analysis of METPEX trial data combined with analysis of previous research was used to develop Key Performance Indicators which could be used by organisations and authorities to measure the quality of the whole journey or different parts thereof for a wide range of traveller groups, including those from traditionally hard to reach groups

5. Analysis and measurement of the derived quality indicators checking the suitability for determining the benchmarks.

* The quality of the derived information and the KPIs was evaluated in terms of its scope, usefulness and actionability and presented to local stakeholders.
1. Examining and measuring innovative and integrated transport solutions in the trial sites to assess accessibility issues.
* Reports were compiled for each site based on the results of the survey and fedback to local stakeholders. This also provided an opportunity for stakeholders to provide additional requirements for the final system
1. Understanding the **mobility requirements** of a heterogeneous but growing group of travellers to establish inclusive, **cost-effective solutions.**
* The METPEX tools supported gathering the mobility requirements of a diverse range of users, including women, travellers with children and dependents, rural dwellers, those with disabilities (physical and cognitive), from low socio economic groups and with low levels of literacy.
1. Development of advanced methodologies for Cost-Benefit Analysis (CBA) from a system perspective
* Derived KPIs were measured in terms of their measurability, specificity, timeliness, originality, independence and usefulness.