Public report on the results and products of ASI

deliverable D13

public paper WP9

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July, 2005

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PREFACE

ASI - Assess implementations in the frame of the Cities-of-tomorrow – is an accompanying measure of the EC 5th Framework Program Energy, Environment and Sustainable Development in the Key Action 4: Cities of Tomorrow and Cultural Heritage. Partners from five different countries have been involved in the project:

1. *FACTUM OHG, Austria*

2. *Swedish National Road and Transport Research Institute, Sweden*

3. *University of Groningen, The Netherlands*

4. *Università degli Studi Roma Tre, Di.P.S.A., Italy*

5. *Centrum dopravního výzkumu, Czech Republic*

The main objective of the project was to provide knowledge about the practice of Quality of Life (QoL) assessment by different disciplines in connection with different types of public measures in the area of town planning and design, transportation and mobility.

Transport and mobility play an important role in connection with the concept of QoL as they are central elements of the integration in society. Due to the strong engineering focus taken in this area so far, too little action has been taken to understand, what difficulties different groups and sub-groups of people have with transport and mobility, as the needs and interests of the relevant segments of the population are not considered appropriately. Solutions in the transport and mobility area developed according to the methods suggested in ASI will be more effective and more efficient, because they meet the needs of the target groups, i.e. different groups of citizens in different parts of Europe.

ASI wanted to improve the understanding of the assessment of groups of citizen's QoL by responsible politicians and experts. This was done by analysing how mobility policies of five implementations in the frame of LUTR (Land Use and Transport Research Cluster) viz. of the Key Action Cities of Tomorrow (CoT) affect QoL. Evaluation was based on expert interviews, dealing with the following questions: How is QoL of different groups of citizens affected by town planning, transport and mobility conditions and how is it assessed by the responsible people. The main product of ASI will help to improve the assessment processes. The products consist of a toolbox for the assessment of QoL in connection with town planning, transport and mobility, a databank concept, and guidelines for implementation. The developed instruments were tested in a pilot study.

# CONTENTS

1. INTRODUCTION: BACKGROUND OF ASI

Implementations in the public space related to land use and traffic may significantly affect citizens' quality of life (QoL). Because implementations are generally aimed to increase QoL, it is thus important to assess how QoL of affected citizens is influenced and to be able to demonstrate that implementations in the public space do (indeed) have positive effects on QoL. QoL assessments are important for effective and efficient planning; implementations will be more acceptable, and thus feasible, if they do not significantly decrease individual QoL. Establish satisfying communication between decision makers and users is an important basis for achieving co-operation from different segments of the population, which is important if they should change behaviour in some way to achieve sustainability. Instruments to assess QoL may be an important tool for organising community participation, which is considered to be very important:

> "QoL is not created by local professional staff acting as experts in implementation of a community's vision and action plans. Instead, community QoL is decided each day through the individual actions of a community's residents. Therefore, these very residents are the only persons who can clearly articulate and implement the community ethos. It is the residents who must be empowered with the responsibility and luxury to frame the planning discussion"
> (Grunkemeyer and Moss, 2004: p. 33).

This implies that QoL issues should be considered when working on integrated land use and transport planning.

All implementations in the public space will, of logical reasons, involve at least one of the areas reflected in the "diamond" in Figure 1. This figure also underlines the necessity that several disciplines be involved in both planning and assessing implementations in the public space. The most relevant area of this diamond is related to infrastructure-aspects, i.e., most implementations are infrastructure-related. When hypothesising about how implementations affect QoL aspects, we can start with the assumption that these changes will take place somewhere in the diamond below. Thus, aspects related to each of these themes should be taken into account when assessing QoL of citizens.

Figure 1. Traffic System - Diamond (Risser 2004)
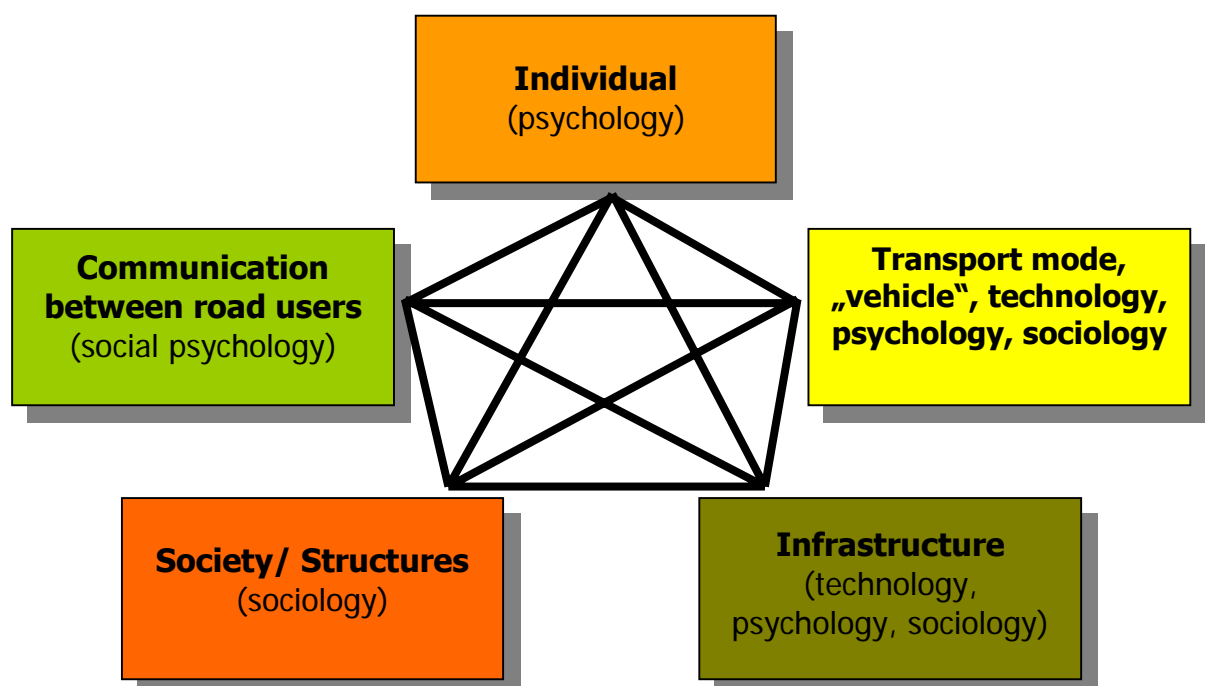
No routines in QoL assessments do exist in the traffic and land-use area. Of course, some aspects that according to literature are related to QoL – like accessibility, barrier-free environments, comfort, time-efficiency, and some others - are taken care of. Other aspects related to QoL, like independence, social relationships, personal values, environmental quality, are very rarely considered. As yet, no instruments are available to assess QoL issues comprehensively and systematically. The construct QoL is hardly ever applied as a holistic concept. Consequently, how QoL is affected by any implementation is often assessed appropriately. One may hope, though, that such assessments become more usual and are applied on a broad scale. But, this is not easy to accomplish, because of lack of thorough knowledge about what QoL aspects should be considered when examining how implementations affect QoL of citizens. Also, it is not known exactly what questions should be asked to assess the extent to which changes in the public space affect individual QoL.

One of the goals in connection with implementations in the frame of the Key action Cities of Tomorrow (CoT) and the Cultural heritage is to improve QoL in the cities in some respect. Whether QoL improves or not has to be defined with the help of the involved segments of the population, given that QoL is a subjective issue by definition. Segmentation of the population is needed because various groups may have fundamentally different needs and interests. Implementations may affect QoL of various groups differently, and conflicts of interest could result. Therefore, it should be examined how implementations affect QoL of different user groups, e.g., according to age, gender, mode choice, types of disabilities.

People who have the power to shape transport and mobility preconditions should know as much as possible about what different groups of citizens do perceive as a support for their own QoL, and/or how to inform people on (positive) effects of behavioural changes on their QoL. Experts in the area usually indicate that, "yes of course" they do consider QoL aspects. But we could neither in printed literature nor at the internet find any documents that this is done systematically, professionally, and scientifically based.

The ASI project (ASI: Assess implementations in the frame of the Cities-of-Tomorrow), sponsored in the frame of the Cities-of-Tomorrow programme, aims to find ways to define and assess QoL in relation to land use and traffic planning. More specifically, the goal is to find out how issues of QoL are considered and taken care of in connection with implementations of the programme by the responsible groups and disciplines (e.g., politicians, planners, practitioners, researchers), and to develop a toolbox comprising instruments and guidelines to assess QoL effects of such implementations.

2. SCIENTIFIC APPROACH AND DATA COLLECTION

2.1 QoL: a literature review

2.1.1 Defining QoL

QoL is a concept, which in recent years, has generated a great deal of interest but it is not only a notion of the twentieth century. Rather it dates back to philosophers like Aristotle (384-322 BC) who wrote about 'the good life' and 'living well' and how public policy can help to nurture it. Much later, in 1889, the term QoL was used in a statement by Seth: "we must not regard the mere quantity, but also the quality of "life" which forms the moral end" (in: Smith, 2000).

QoL has been the focus of many studies but a consensus as to how it should be defined has not been reached (Ormel, Lindenberg, Steverink, and Vonkorff, 1997; Lim, Yuen, and Low, 1999; Smith, 2000; Snoek, 2000). Many definitions of QoL refer to "well-being", "satisfaction" and "happiness". Well-being is either conceptualised as the objective living

conditions of a person or the way a person perceives these conditions, i.e. the subjective living conditions (e.g., Nutbeam, 1998).

However, despite the lack of consensus it is possible to discern some form of agreement. For instance, most researchers would argue that QoL is a multidimensional construct (Cummins, 1999; Snoek, 2000; Hagerty, Cummins, Ferriss, Land, Michalos, Peterson, Sharpe, Sirgy and Vogel, 2001) and that it reflects how well individual needs and values are fulfilled in various fields of life (Diener, 1995; Steg & Gifford, 2005). Three different dimensions of QoL have been proposed (Finlay, 1997; Snoek, 2000):

1. *Physical* – health status;

2. *Psychical* – self mastery, self-efficacy, love, satisfaction, happiness, morale, self-esteem, perceived control over life, social comparisons, expectations of life, beliefs, aspirations;

3. *Social (private)* – social network, social support, level of income, education, job. *Social (public)* - community, climate, social security, quality of housing, pollution, aesthetic surroundings, traffic, transport, incidence of crime, equality, equity.

The three dimensions interact with each other and if one domain changes then the others may follow. The social dimension is further divided into a public and private domain. Kent (1997, in Massam, 2002) described QoL and the public domain in terms of the "public good" which he defined in terms of minimum income, social security, health and education, equity and relationships with the community. In addition to this others have added safety from crime, low environmental pollution and reasonable house prices (Roseland, 1997); culturally desirable working and living conditions, low level of traffic (Transportation Research Board, 2001); aesthetic surroundings (Dalkey, 1972 in Andrews and Withey, 1976; Transportation Research Board, 1998); greater influence and public participation (Frankenhaeuser, 1976).

Studies have also found that communities who provide a high QoL have a competitive advantage when they try to attract both individuals and businesses (Winther, 1990; Transportation Research Board, 2001). However, evidence from many different studies show that the continuing urban growth and what that entails can destroy what we today value as contributing to our QoL. QoL is related to sustainable development (Burden, 2001; Steg and Gifford, 2005). Like QoL there is no definition of sustainable development that is universally accepted but one proposed by the World Commission on Environment and Development (The Brundtland Commission) has been cited frequently: "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*"...(in OECD, 2001). Others have elaborated on the above, emphasising that sustainable development should ensure that environmental, social and economic issues are considered and sustained for an unforeseeable future (see TDM, 2003).

Indicators that are used in order to measure QoL, according to the state of the art, should have the following characteristics: They should be

- *Measurable*	- *Quickly observable*
- *Based on existing data*	- *Widely accepted*
- *Affordable*	- *Easy to understand*
- *Based on a time series*	- *Balanced.*

Indicators encountered in the literature cover, or belong to, the following domains, that will have to be referred to when analysing QoL:

- Relationships with family/relatives
- Finances/standard of living/housing
- Own health
- Other people's health
- Ability to work/satisfaction with work
- Social life

There are many individual differences, but these differences can to some degree be explained by the group one belongs to. The following list displays the "favourites of different groups of people/road users":

QoL in the public:

The relevant issues that are related to sustainable development will be found in the economic, the social, and the environmental areas. As can be seen from the text above, QoL is referring to theses areas, as well.

The specifications of the **concept of sustainability** in connection with these areas are as follows:

- Economic area
- Affordability
- Resource efficiency
- Cost internalisation
- Trade and business activity
- Employment
- Productivity
- Tax burden

Economic aspects are, e.g., tightly connected to the question whether people can easily afford the use of the mobility preconditions. This for instance is a precondition for being independent and for having social contacts, both being relevant for QoL, as well

Social area

- Equity
- Human health
- Education
- Community
- QoL
- Public
- Participation

QoL is here mentioned at the same level as health, or participation. Modern QoL-research, however, would put QoL at a higher level, where for instance equity, health, participation, etc., make part of QoL. All these aspects are of high practical value. For instance, a pragmatic look at the principle of "participation", as it is discussed in literature, and its relation to QoL, shows that **participation**:

- reflects a basic democratic principle

- helps to avoid conflicts

- is a down-to earth source of practical assistance.

Environmental aspects:

- Pollution prevention
- Climate protection
- Biodiversity
- Precautionary action
- Avoidance of irreversibility
- Habitat preservation
- Aesthetics

Mainly the aspect of aesthetics can be directly related to the QoL-concept. More generally, a healthy environment is very often mentioned as contributing to QoL.

Summarising: The following postulated characteristics of Sustainable transport, that are mentioned in literature, are very interesting. According to them, the **goals in connection with sustainable transport** are:

- To help achieve equity goals
- To serve as a back-up option for those who can drive
- To increase transportation system efficiency
- To increase liveability
- To improve accessibility and mobility
- To provide mobility by improving the ease with which specific locations or activities can be reached, where mobility refers to a person's ability to move about

It can easily be seen thatthe characteristics Equity, Liveability, Accessibility also make part of the preconditions that have to be fulfilled in order to provide QoL.

Thus, the concept of QoL is highly relevant when considering sustainable development. Therefore policies that seriously decrease individuals´ QoL can hardly be called sustainable (e.g., Steg and Gifford, 2005).

2.2. Assessing QoL

How to measure QoL has been widely debated and there is still a lack of standardised measures. Despite this in the last twenty years progress has been made and. Most researchers agree that assessment of QoL should include subjective and objective indicators (e.g., Felce and Perry, 1995; Kim and Cho, 2003; Marans, 2003; Ormel et al., 1997). Objective indicators represent external life conditions such as economical, while technical factors and subjective indicators represent the individual's appraisal of these conditions. QoL

is usually assessed through the use of a set of indicators. (e.g.: Andrews and Withey, 1976)

Transport and land use planning may affect individual QoL at different levels and in different domains. First, transport and land use planning may affect overall QoL, e.g., when prices of car use would double, people may not be able to visit activities and locations that fulfil important needs such as social relations and leisure. In general, the intensity and way of travelling may have important consequences for QoL, since travelling enables one to fulfil various needs, such as maintaining social relations, visiting leisure activities and attending classes. Thus, travel is an important element in the integration of society. Scholars from the University of Groningen developed an instrument to asses effects of environmental policies and/or conditions on QoL in. This instrument is based on research and theories on values and needs in relation to sustainable development and comprises 22 QoL-indicators (see Table 1).

Table 1. Description of 22 QoL indicators (Poortinga et al. 2004).

Indicator	Description
Comfort	Having a comfortable and easy daily life.
Material beauty	Having nice possessions in and around the house.
Status, recognition	Being appreciated and respected by others.
Aesthetic beauty	Being able to enjoy the beauty of nature and culture.
Security	Feeling attended to and cared for by others.
Money, income	Having enough money to buy and to do the things that are necessary and pleasing.
Partner and family	Having an intimate relation. Having a stable family life and having good family relationships.
Health	Being in good health. Having access to adequate health care.
Social justice	Having equal opportunities and having the same possibilities and rights as others. Being treated in a righteous way.
Leisure time	Having enough time after work and household work and being able to spend this time satisfactorily.
Change, variation	Having a varied life. Experiencing as many things as possible.
Freedom	Freedom and control over the course of one's life, to be able to decide for yourself, what you do, when and how.
Privacy	Having the opportunity to be yourself, to do your own things and to have a place for your own.
Environmental quality	Having access to clean air, water and soil. Having and maintaining a good environmental quality.
Identity, self-respect	Having sufficient self-respect and being able to develop an own identity.
Social relations	Having good relationships with friends, colleagues and neighbours. Being able to maintain contacts and to make new ones.
Spirituality, religion	Being able to live a life with the emphasis on spirituality and/or with your own religious persuasion.
Education	Having the opportunity to get a good education and develop one's general knowledge.
Safety	Being safe at home and in the streets. Being able to avoid accidents and being protected against criminality.
Nature, biodiversity	Being able to enjoy natural landscapes, parks and forests. Assurance of the continued existence of plants and animals and maintaining biodiversity.
Challenge, excitement	Having challenges and experiencing pleasant and exciting things.
Work	Having or being able to find a job and being able to fulfil it as pleasantly as possible.

Effects of implementation on QoL are assessed by asking the public to what extent these implementations would improve or deteriorate these 22 QoL aspects. The instrument proved to be successful to assess QoL effects of environmental policies, among which transport policies (see Steg & Gifford, 2005 for a review). We examined whether this instrument should be included in our final toolbox to assess QoL effects of land use and transport planning, by investigating whether the instrument is useful to assess effects of transport policies on general QoL in different EU countries.

Transport and land use policies may affect QoL in specific domains, as well, such as the quality of the urban environment. For example, the quality of the neighbourhood may decrease when new road infrastructure is build, due to traffic noise, local air pollution or lack of safe crossings. Various studies revealed important indicators of urban QoL, such as (traffic) safety and security, (traffic) noise, availability of facilities, accessibility of various destinations and public transportation, lively neighbourhoods, number of people around, orderliness, pollution, aesthetics, availability of green areas, and illumination of public spaces (Bonaiuto, Aiello, Perugini, Bonnes & Ercolani, 1999; Bonaiuto, Fornara & Bonnes, 2003; Van Poll,1997; 2003). Transport and land use planning may also affect QoL related to traffic and transport. For example, constructing a cycle lane improves cycling facilities, and thus the quality of bicycling.

However, no comprehensive instruments are available to assess effects of land use and transport planning on urban quality and the quality of traffic and transport. The goal of ASI was to develop and test such an instrument within the ASI project (see Section 5) that would include both effects of implementations in of traffic and transport on QoL in general, and on urban QoL.

QoL indicators may be assessed subjectively as well as objectively. When assessing how people feel about the community (subjective assessments), a survey is usually used. Typically, responses are given on rating scale. The most common techniques use either a Likert type scale (e.g., 1=Very satisfied, 2=Satisfied, 3=Not satisfied, not dissatisfied, 4=Dissatisfied, 5=Very dissatisfied) or a bipolar scale in which the score is located on a single dimension (e.g., Delighted - Terrible). Several indexes measure both satisfaction with various aspects of QoL of life and how important these aspects are (Ferrans and Powers, 1985; Gill and Feinstein, 1994; Felce and Perry, 1995; Cummins, 1999; Poortinga et al., 2001). The results from surveys can then be paired with objective data.

Leitmann (1999) argued that objective QoL indicators should have the following characteristics: They should be

o *Measurable* – indicators should be quantifiable;
o *Based on existing data* – when possible, indicators should be derived from reliable existing information to speed up their use and minimise costs;
o *Affordable* – the financial cost and time required to assemble and analyse indicators should be prescribed by a predetermined budget;
o *Based on a time series* – the same indicator should be collected over a regular interval so that change can be evaluated;
o *Quickly observable* – indicators should change as conditions change so that they can accurately reflect reality;
o *Widely accepted* – indicators should be understood and accepted by their users;
o *Easy to understand* – indicators should be reported in a simple fashion so that a wide range of people can understand them; and
o *Balanced* – indicators should be politically neutral and allow for measurement of both positive and negative impacts.

Obviously, many of these characteristics are also important when considering subjective assessments of indicators.

2.3 Practical use of QoL assessments and barriers for implementation

We aimed to compare and supplement results of the (theoretical) literature review with ideas and conditions set by practitioners. This should facilitate the development of instruments to asses QoL that are not only theoretically sound, but also feasible in practice. We examined how QoL issues are currently taken into account in land use and transport planning. Further, we studied whether practitioners think it is important to consider QoL issues, and their wishes and demands regarding instruments to assess effects of implementations on QoL. For this purpose, first, we conducted a qualitative interview study among practitioners and experts who were involved in various LUTR projects (see Section 3.1). Second, an international workshop was organised, in which experts from various fields discussed the needs and conditions for QoL assessments (see Section 3.2).

2.3.1 Interviews with participants in LUTR projects

In 2003, a qualitative interview study was conducted among experts participating in implementations connected to the LUTR program (Land Use and Transport Research Cluster), which is part of the Key Action Cities of Tomorrow (CoT) program. In total 49 in-depth interviews were conducted. The interviews focused on ideas and definitions of QoL, relevant QoL indicators, and the extent to which QoL-effects of implementations are considered and assessed at different project stages.

The main aims of the interviews were to find out in which way QoL aspects are taken care of, how QoLaspects are assessed and what the problems with these kinds of assessment are. The in-depth interviews were summarised and translated so that an evaluation on an aggregate level was possible.

Five LUTR sites were selected in different European regions, i.e. in Northen (ARTIST in Malmö, Eskilstuna, and Tierp, Sweden), Eastern (ECOCITY in Trnava, Slovakia), Southern (PROMPT in Modena, Italy), Western (EDICT in Eindhoven, the Netherlands) and Central Europe (ECOCITY in Bad Ischl, Austria). Only sites belonging to a LUTR-project to the City-of-Tomorrow Program were selected, because these projects generally deal with the QoL of different target groups. Further, all project focused on transport issues, either on a theoretical, planning or implementation level. The most important objective of all projects is to develop guidelines or strategies to reach more sustainable cities by decreasing car use or driving speed, and by and promoting other forms of sustainable transportation (walking included) via structural changes in the physical environment. Thereby, the strategies followed differ. Most projects were in the planning phase; the implementation had not been realised. The Dutch project, EDICT, was just discontinued when the interviews took place.

Below follows an overview about the projects contacted by the ASI partners and some information about the interviewed experts.

ECOCITY:

The goal was to develop settlement patterns for sustainable cities (ECOCITIES), emphasising the implications for an environmentally compatible transport system.

By FACTUM OHG, the Austrian partner in the ASI project, interviews were carried out with the Austrian project co-ordinator of ECOCITY, with partners of the ECOCITY project who were responsible for traffic planning, the socio-ecological and the environmental consulting

and the participation process, and with representatives of the city of **Bad Ischl**, the Austrian ECOCITY site.

By partner 5 (CDV) interviews were carried out with partners of the ECOCITY **Trnava** project who were responsible for traffic planning, the socio-ecological and the environmental consulting and the participation process, and with representatives of the city of Trnava.

PROMPT:

The goal was to promote non-motorised transport in cities, with particular focus on pedestrian traffic in order to improve innovative tools and solutions for planners and designers, and for all the people that have a decision responsibility.

Partner 4 (UNIROMATRE) interviewed ten experts with different professional backgrounds in the two offices of the administration of Modena that were involved in the project PROMPT. Each of them was dealing, or going to deal, with an implementation in the frame of a sustainable mobility project related in some way to PROMPT. Many of the experts involved in the interviews have executive jobs in the mobility department.

EDICT:

The goal of EDICT was to demonstrate and evaluate the potential of Personal Rapid Transit in order to improve the accessibility and sustainability of medium-sized cities in Europe by providing an alternative for car use.

Partner 3 (RUG) interviewed Dutch participants involved in EDICT Eindhoven. Most of them are active in the area of research. Two experts are involved in the Transport Research Centre of the ministry of Transport, Public Works and Water Management. This is on a national level. One of the interviewed persons is involved on a provincial level (the Netherlands are divided in twelve provinces). Finally, one expert is involved on a local level, representing the community of Eindhoven. In the mean time, the experts of the University of Delft and ANT consultancy (Advanced Netherlands Transport) have started EDICT at a new site in the Netherlands, Almelo. Even if the interviews focus, in their site-specific questions, on the (terminated) evaluation of innovative transport systems in Eindhoven, they could contribute fully to the goal to assess what approaches experts take when they deal with projects of the type represented in the LUTR-cluster, and related ones.

ARTISTS:

The goal was to develop Best Practice Guidelines for city authorities throughout the European Union for re-designing and re-organising arterial streets in such a way as to improve the physical environment of the corridors, while contributing to the implementation of more sustainable urban transport systems.

By partner 2 (VTI) interviews were carried out with 11 experts at different places in Sweden, where people were involved in the project ARTISTS in different roles.

2.3.2 Sample & procedure

The total sample of experts interviewed in the frame of the ASI-project consisted, as said, of 49 experts with different roles and tasks in the projects.

As we aimed to get a broad overview of how QoL issues are being taken care of in LUTR projects, the selected group of experts was quite diverse, i.e., they had different roles and tasks and occupied different functions within the policy making, planning, and implementation phases (i.e., city counsellors, public administrators, policy advisors, traffic planners and scientists). We also tried to interview experts with different disciplinary backgrounds. However, most experts appeared to have a technical background, such as engineering and architecture. Social scientists hardly participated in the five projects. The

under-representation of social scientists is remarkable because most project dealt with QoL issues, which may by considered as the core business of social scientists. As sustainable development implies balancing economic, environmental and social costs and benefits (see Section 2.1), multidisciplinary teams including social scientists are certainly needed.

In each country, interview results were summarised and translated into English. Next, the full set of interviews was analysed.

2.3.3 Evaluation process

The following working steps were established for the evaluation of the interview results:

1. Transcription, categorisation, description of results according the common rules and possibilities
2. Summary of outcome and translation
3. Description of overall outcome
4. Harmonisation of materials / to be consistent in all parts
5. Analysis according to the hypotheses (Assumed national differences, differences between disciplines, differences in degree of implementation...)
6. Reporting

2.3.4 Main results

It appeared that QoL was defined quite differently by the interviewees. No clear definition of QoL emerged from the data. Also, a large variety of QoL indicators was mentioned; overall, 108 different indicators were identified. Regardless of the fact that no clear definition of QoL and QoL indicators was identified, the majority of respondents indicated that QoL was specified and/or operationalised in their project, and in some cases even 'measured' (e.g., via interviews, focus group interviews, observations, questionnaire studies or dialogues). QoL indicators were defined at different levels and focused on different domains. In most cases, the QoL indicators were related to transport (e.g., accessibility, transport services). Also, general social and environmental indicators were defined, such as comfort and a pleasant environment. In many cases, respondents indicated QoL issues were considered only at the beginning of the project (before implication), while fewer respondents indicated QoL issues were considered during the whole project. One interesting finding is that answers of participants within a project did not correspond. Participants in the same project seem to disagree about the definition, operationalisation and measurement of QoL. This suggests that no clear procedures for assessing QoL effects of land use and transport plans is available.

Below the statements of the interviewed experts are listed:

➢ The following QoL aspects are considered:

- user participation,
- measures reducing car traffic (support of pedestrians, bicycle lanes, car-sharing),
- sustainable town-planning with focus on traffic,
- good functional mix,
- access to green areas,
- appropriate consideration of environmental aspects (pure air, measures reducing noise),
- preconditions that enhance social interaction,

➢ QoL aspects are considered in the projects from the beginning

➢ QoL is much more considered *at the beginning* of the projects but becomes less and less important *during the progress* of the projects

➢ Both objective and subjective criteria are often used when trying to measure QoL:

  - objective ones represent external life conditions such as economical, environmental and technical factors and

  - subjective ones represent the individual's appraisal of these conditions

➢ The evaluation of QoL aspects is seen as difficult by almost all experts because it is hardly possible to find a general concept or operational aspects of QoL that should be considered

➢ Non-material aspects like communication, social interaction, reasons of unemployment etc. are important but hard to assess, as well

➢ It is relatively easy to measure quantitative aspects like emission, noise, energy consumption, etc.

➢ It is extremely difficult to indicate and describe causal relationships and even more difficult to calculate the level of dependence

➢ Another problem is that there are many experts from different disciplines (architecture, town planning, transportation planning, civil engineering, economy etc.) working in the projects. These experts have their own, and sometimes very divergent, points of view concerning QoL

➢ There is a common consensus about the importance of an evaluation of QoL aspects after the implementation

➢ The under-representation of social scientists in the evaluated projects is remarkable

➢ Each of the countries displays its own particular problems, corresponding to its level of:

  - technical development
  - economic development
  - social development
  - local legislative and
  - cultural environment

➢ The creation of tools for the possible assessment of the impact of the implementation of changes in the material world on the QoL of citizens is considered as being beneficial

➢ The creation of such a tool is, however, also perceived as being extremely difficult, even considering the current state of development of the humanitarian sciences

➢ Technical transport measures represent interventions into the complex system of the town, in the frame of other equally complex systems (economy, energy, environment, etc.), all of them having human beings and their societies in their centre. Therefore a **close co-operation** must be established between the humanitarian and technical sciences

➢ Sustainable development could be achieved by balancing costs and benefits reflected by:

  - Technical criteria
  - economic criteria,
  - environmental criteria, and

- social criteria

The main results can be summarised as follows:

The main aims of the analysed projects are sustainable transport and environmental improvements, which belong together. In no case was the improvement of QoL an <u>explicit</u> goal. Other aims stated by the experts like increasing the accessibility of public transport systems and improving liveability refer to the QoL-concept indirectly.

The target groups were mainly described very generally as "the public". More in detail, first of all groups that were directly affected by the projects were named; people living in the areas and different road user groups (drivers, vulnerable road users etc.).

When referring to QoL, the main measures to reach or improve QoL are said to be based both on quantitative and qualitative analyses and data collection. Designing of models and plans and of course also implementation should be accompanied by participation and dialogue with the people affected.

QoL is described on the one hand as the establishing of general preconditions like a clean environment, social security and places for recreation. On the other hand it reflects the satisfaction of individual needs - basic needs, to have a family, a good health and, more generally, to lead a good and happy life. This is also underlined by the answers given by the experts when asked for the three most and least important aspects of QoL: a clean environment on the one hand and satisfying social interaction prevail on the positive side. On the negative side luxury and money are seen as least important for achieving good QoL.

It is therefore clear that these aspects are especially taken into account when representatives of the projects discuss QoL matters with us. In connection with the main contents of the projects, namely traffic, mobility and land use aspects, issues like accessibility, good (inter)connections, comfort and smoothness of movement are given a high relevance. Another group of conditions that is considered having importance for QoL are the environment and sustainable development that should lead to energy saving processes accompanied by reductions of emissions. Last but not least the social dimension is seen to be important, represented by widely varying characteristics like places for interaction, freedom and social well-being.

Figure 2 below summarises this synthesis.

Figure2 : QoL in LUTR (and similar) – projects according to the involved experts (Schmeidler et al, 2004)
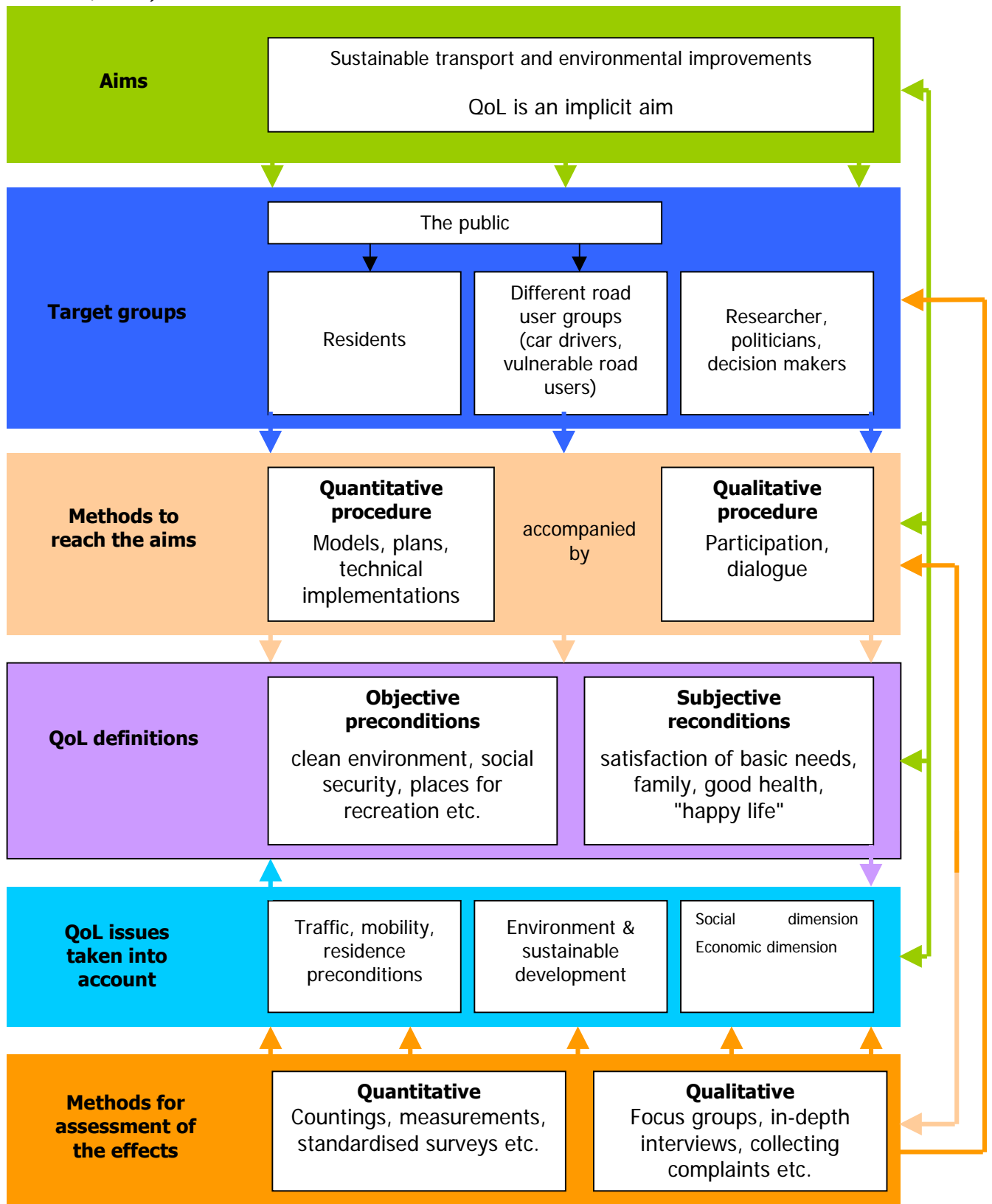
2.4 Expert workshop

In February 2004, an 2-day expert workshop was organised titled 'Transport, town planning and QoL' in Brno, Czech Republic. Participants were ASI partners, invited experts from LUTR sites (see Section 3.1) and experts on QoL. The main aim of the workshop was to discuss the definition and measurement of QoL and QoL indicators as derived from the literature review and the interview study, as well as from input from the workshop participants. Further, requirements for the practical use of QoL instruments to be included in the toolbox were discussed. Because some of the invited experts presented a paper on their own work, as well, we had another opportunity to examine whether and how QoL is being taken care of in different land use and transport planning projects.

Summarisingly, the main outcomes of the workshop, that reflect the opinions of the involved experts according to how we have perceived and interpreted them, for the ASI project are the following ones:

-   It is important to take subjective indicators into account in order to be able to really measure and assess QoL. Objective indicators are not sufficient.

-   Experts from different disciplines as well as politicians and decision-makers have different perceptions of QoL. They also use different terms to describe it. It is therefore important, especially when working with the toolbox, to take these different perceptions into account and to make terms clear. On the other hand, the perceptions of the experts about QoL and how to enhance it, may be rather different from the perceptions and opinions of the population. Nevertheless, many experts assume that they know quite well how to enhance the QoL of the population. It is necessary to point out that this could be a severe misunderstanding. This problem should be dealt with the help of evaluation work: for instance: before – after studies in connection with new implementations.

-   The results derived from this discussion are important raw material for the toolbox and the guidelines for adequate consideration of QoL aspects, as the consortium has unanimously experienced in the consortium meeting that was kept in connection with the workshop in Brno.

-   Such a toolbox is still missing according to the involved experts. It was recommend to make it compact, practical and easy to understand and to understand. Such a toolbox and also the databank and the guidelines for implementation are considered useful for politicians and decision makers by all, and there was nobody advocating against this judgement. The problem will be how to design the toolbox in detail:

-   Proposals for the design and possible indicators for the toolbox were given, the most important ones being that the numbers of indicators included should not be too high ("one cannot measure everything), and that both objective and subjective data have to be collected.

With these hints as a basis, a draft version of the toolbox was elaborated on by the consortium. According to the draft design below, the first part of the toolbox is represented by a qualitative part that helps to provide verbal an other qualitative data as preparatory work for the development of standardised questions. The second part consists of the standardised questions, thus derived, that are used for collecting data concerning different dimensions of QoL. The kernel section of standardised questions will be comparable between different countries, cities, sites etc. and can be used for a database. It will be applied in all countries participating in ASI. In addition to this kernel section of standardised questions there also will be additional questions – probably different in all participating countries - including site specific and culture specific questions.

However, we do not expect that one with the results of such a standardised questionnaire can go directly to measures. The consortium envisages that there should be a participation process where solutions, ideas and materials, and arguments reflecting pros and cons of such a measures are presented to relevant segments of the public and discussed with them. Such a process should offer the possibility to discuss measures with the persons responsible for sites where the toolbox is used. This would allow to carry out improvements rather fast and in the frame of a dialogue with the citizens.

The figure below shows the process described in the paragraph above: The qualitative approach that should in all cases show the validity of the kernel questions (that are standardised) initiates all activities. At any new site where the toolbox is applied, additional questions can be included that reflect the special features of the new site, or new perspectives taken in by the citizens due to a change in the public opinion about certain implementations, etc. And after these evaluation steps, citizens are confronted with the results and help to interpret them. When applied in a larger scale, or at more sites, this participation process has to be elaborated on.

*Figure 3: ASI – toolbox – first version (Schmeidler et al, 2004)*
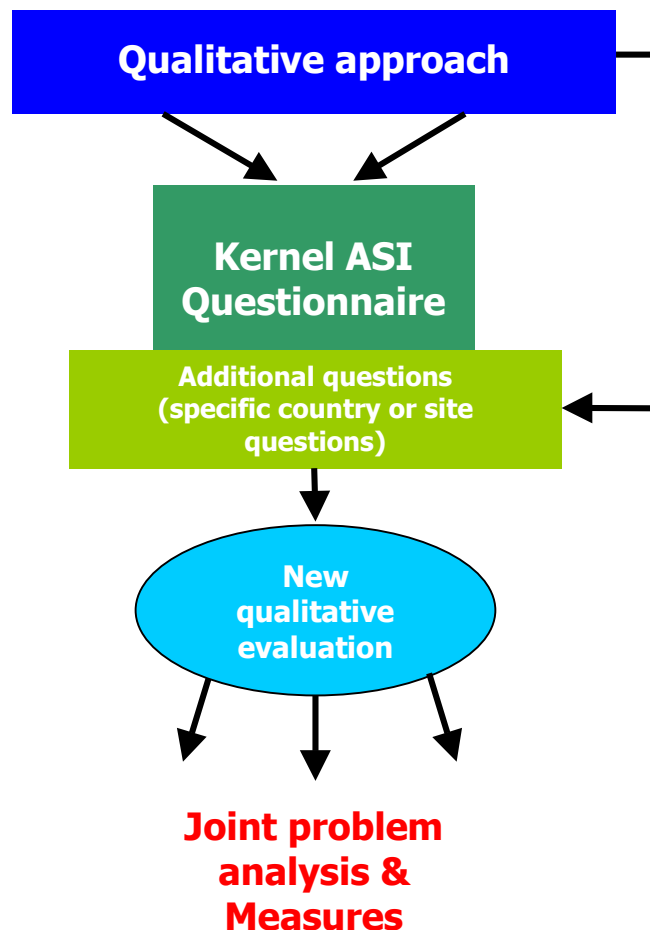
2.5 Assessing effects of land use and transport planning on QoL in general

For an additional working step in ASI, originally not planned in the project proposal, an instrument was available to examine to what extent land use and transport planning would affect individual QoL in general (Poortinga *et al.*, 2004, see Steg & Gifford, 2005). We tested the practical value of this instrument in different cultures and contexts by conducting an internet survey among 490 respondents in five different countries in Central, Eastern, Northern, Southern and Western Europe, respectively (i.e. Austria, Czech Republic, Italy, the Netherlands and Sweden). A detailed description of the study design and results is given in De Groot & Steg (2005). Here, we focus on the main results.

First, we examined how a transport policy aimed to reduce car use, in our doubling costs of car use, may affect individual's QoL. Second, we studied to what extent respondents from the five EU countries would differ in their evaluation of expected changes in QoL when the policy would be implemented. Respondents indicated that this rather stringent measure would hardly affect their overall QoL. The expected changes in the 22 QoL indicators confirm this result: people expect that most QoL indicators would not change much when this policy is introduced. Figure 4 shows the expected consequences for QoL aspects that change most when costs of car use are doubled. Some relatively large negative changes are expected for the aspects comfort, money/income, freedom, change/variation, leisure time and work. Three QoL aspects are expected to improve: environmental quality, nature and biodiversity, and safety. Because respondents indicated that their overall QoL would hardly be affected by this policy, these results suggests that negative changes in QoL are compensated by those aspects that are expected to improve.

Figure 4. Expected changes in some QoL aspects when prices of car use double
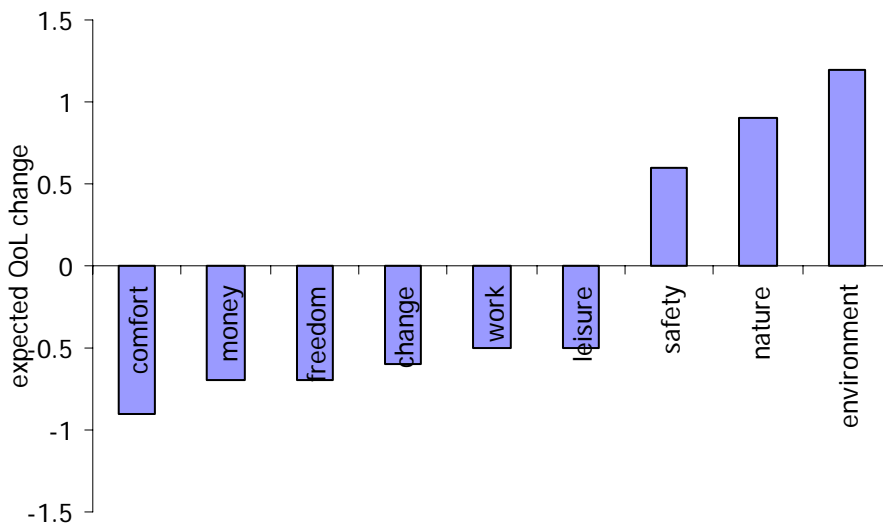
Results of this study further showed differences between the five countries concerning expectations of changes in QoL when prices of car use would double. In general, respondents from the Netherlands and Sweden are more pessimistic about possible effects on their QoL than are respondents from the Czech Republic, Italy and, to a lesser degree, Austria. More specifically, they expect the policy to have less positive effects and more negative effects. It is important to understand why people in different countries expect different QoL effects from this policy, because this may reveal how possible negative QoL effects may be prevented and/or compensated. The differences in expected QoL effects may

be due to differences between the countries in, e.g., spatial structure, the availability and quality of various travel modes or the level of congestion, which may affect car dependency in those countries.

Because transport policies will be less acceptable, less feasible and less effective if they have significant negative impacts on QoL (Steg and Gifford, 2005), studies like this could provide recommendations on how to adjust or supplement policies in order to achieve effective and efficient decision making.

3. PREPERATION OF THE ASI TOOLBOX

Based on the results of the results of the analysis work described in chapter two, a toolbox and procedure for its application were developed that should be tested in the frame of the ASI pilot study (chapter 4) and thereafter completed.

3.1 Preconditions for QoL assessment

- Mobility assessment in relation to QoL is characterised by objective and subjective aspects.

The objective aspects can be assessed without a critical participation of the users, they are strictly connected to the environment in which people move, to its structure and organisation, to the transport means and facilities at disposal. The subjective aspects are strictly connected to the perception that people have of the surrounding urban environment, and therefore of the objective reality, they are also connected to the behaviours, that people assume, more or less conditioned by such environment. The objective assessments are made by experts using scientific and technical procedures; they represent the typical approach that has been used for long time. People's perception can be understood with the help of questionnaires, interviews, interactive workshops and so on. There, one can detect the presence of perceived problems and wishes and their importance for the people. These are to a large degree social sciences' procedures, that in principle produce subjective assessments related to people's behaviour, perceptions, needs and problems.

The subjective approach is very important since it represents the QoL that is perceived by the people moving in the urban environment and that eventually has to be improved. On the other hand technicians can mainly act on aspects of the real world, it is therefore important to have the possibility of correcting the objective parameters elaborated by experts by considering appropriately the possible relationships with the subjective perception of the users.

- The categories to be involved are of two types:

The experts are a multifaceted class; the categories that have to be focused on seem to be four: politicians and administrators, scientists and practitioners. The groups of users are even more diverse (or end users if we speak of the evaluation of a plan, design or action); therefore, different age groups, genders, choices of modes and specific needs are aspects that characterise the target groups that the research is interested in, and that can be possible variables for selection.

Experts and users have to be involved at the various steps. These are:

1. the devising of a mobility design

Is it taking into account people's opinions and needs? Are the right indicators considered? Are they considered in the right importance ranking? Is the degree of change in agreement with the speed of adaptation of the dwellers?;

2. the implementation of such a design

Is the building site organised in such a way that QoL for the dwellers does not deteriorate? Is the time schedule fixed on the basis of people's capacity of bearing annoying conditions during the implementation phase?;

3. the monitoring of the implementation

(Are the measures restrictive for the users? Are the measures effective? Is QoL improved for all, or for some? With respect to what aspects?);

4. evaluation and/or revision of the measure.

Measures should be evaluated by applying evaluation instrument at several stages of the implementation process. If one does not want to apply the toolbox too often, however, because this would become too complicated for the practitioners, then at least steps 1 and 3 should be carried out as a standard.

- The aspects that influence mobility assessments are many.

It is of great importance then to choose what to measure or to enquire, how and where to measure or to enquire, and finally how to analyse and how to interrelate the different results that are collected.

- The analyses are above all local.

As mobility assessment is bound to the environment's characteristics, to people's perception of these characteristics and to their behaviour (that to some degree will be the results of preconditions), the analyses in the toolbox will have to be of local character, to start with. They can be different from place to place and from case to case. However, in the course of communication with local target groups, it will also be possible to identify items that can be more generally used for certain types of situations at different sites, and some aspects can be discussed therefore at a global level.

3.2   The enquiry fields

From the Qualitative interviews with experts some aspects seem to be of a higher importance, they are related to the possibility of choice of mode, tailored on users' needs, intermodality and accessibility.

The possibility of living in a quiet environment in term of absence of traffic congestions that are cause of stress are also important. Finally a strategic aspect is mentioned: the possibility to receive answers to questions of evaluation in a rather short time.

A synthesis work has been done by grouping similar indicators that sometime were expressed in different ways; by grouping/summarising sparse indicators in the form of higher-level categories and by ranking the indicators considering their frequency, above all in the interviews. The result of this work has been a "cleaned" list of performance classes or dimensions

- Accessibility (transport related aspects) (At)
- Accessibility (infrastructure related aspects) (Ai)
- Cleanliness (C)
- Wellbeing (W)
- Security (Se)
- Safety (Sa)
- Aesthetics (Ae)
- Services (Sr)
- Social Activities (So)

The list of main fields of preconditions, that are seen to be related to the QoL and that constitute. the enquiry fields to be faced in the toolbox was defined on the basis of this list. In each enquiry field, various dimensions are taken into consideration; the pertaining

indicators can be grouped to form various interrelated scenarios, that all together depict the mobility environment. The enquiry fields contain all the already listed. Each scenario contains all the aspects that are useful; for example, to make the environment comfortable. The aim is then to use a holistic approach to the solution of the problem, therefore indicators proper of different dimensions, or requirement/performance classes, are present in one enquiry field/scenario. Each one of them will have a different relevance inside the toolbox depending on the type of strategy, plan or design that will be analysed. The suggested enquiry fields are eight:

AN ACCESSIBLE ENVIRONMENT (At, Ai, Sa)

This field concerns accessibility related aspects that are connected with transport means and transport network use, such as vehicles accessibility, bus stop location, transport network efficiency and so on. It concerns also infrastructure related accessibility; this reflects the possibility of physically moving around without obstacles, and without too much effort, mainly as a pedestrian. Main reference indicator: Accessibility (transport related aspects), Accessibility (infrastructure related aspects).

A CLEAN ENVIRONMENT (C, Ae, W)

Ordinary public space maintenance activity, garbage management and collection are examples of aspects considered in this field. Main reference indicator: Cleanliness.

A COMFORTABLE ENVIRONMENT (W, Sa, Ai)

Conditions related to pollution as well as to noise and vibrations are considered here, together with other characteristics that enhance the feeling of comfort and easiness of use. Main reference indicator: Well-being.

A SECURE ENVIRONMENT (Se, W, Sr, So)

This field concerns personal security aspects (such as having to fear or not snatching, sexual harassments, etc.). It is related very much to lighting and presence of activities. Main reference indicator: Security.

A SAFE ENVIRONMENT (Sa, W)

This field concerns safety aspects related to the use of the infrastructure, such as accidents with cars (very often related to traffic speed and flow). Main reference indicator: Safety.

AN APPEALING ENVIRONMENT (Ae, W, Ai)

This field concerns the configuration of the outdoor public spaces and their capability of appeal. Parameters that can be considered are many, only some have been chosen: those that are related to the morphology of the itinerary and to its characteristics. Main reference indicator: Aesthetics.

A BUSY ENVIRONMENT (Sr, Se, So)

This field concerns the presence of various types of facilities (public services, private facilities, shops, equipment etc.) that make a place full of activity. Main reference indicator: Services.

A LIVELY ENVIRONMENT (So, W, Ae)

This field concerns all the activities that people perform in the outdoor public spaces by social exchange and relations with other people. Spaces and equipment needed for are therefore considered here. Main reference indicator: Social Activities.

3.3 The reference background

What to measure or to enquire, with the toolbox has been decided considering the achievements of the various research work packages already concluded, and in particular the ASI-State of the Art, as made in WP1, and to the results of the interviews with experts (WP3 and WP4). Also the results of the Brno Workshop debate and the Rome Consortium Meeting indications have been useful. A set of problems and a set of related indicators was deduced as a basis on which to work for the definition of the fields to analyse, under the objective and subjective point of view, in the toolbox to be tested in the pilot study.

3.4 Enquiry methods

3.4.1 Objective parameters

Most of the characteristics of the environment can be scientifically analysed directly by means of data collection, of surveys, of counting, of measurements, of weighed evaluations and so on. Indirect evaluations based on users' behaviour observations and short interviews on the spot are also possible and in some cases advisable; they are objective assessments that can be made by experts and that provide parameters to refer to for the design of the urban mobility environment. The way in which these operations are conducted, and most of all evaluated, show anyway the experts' point of view.

Each indicator will be enquired by data collection and analysis activities.

As far as possible parameters/indicators also need to be weighed, and not only to be detected. Giving such weights will enhance comparability between different sites.

- Objective parameters are evaluated according to different criteria depending on their characteristics. Criteria return a "performance" or "quality" indicator that could be "poor", "average", and "good".

- Analyses that return percentages, density, or absolute values may be evaluated simply by comparing the result with reference values or threshold values.

- Threshold values are stated, as first draft, by the Uniroma3 research group, on the basis of literature, experiences achieved during the work within other research projects, and common sense.

- Threshold values are not at hand yet for many of these issues. They need of course to be tuned at first by a wide research at international level and then ideally with the aid of the data stored in the data bank. (See chapter 5)

- We suggest to define the thresholds using the levels of "bench mark" (usual practice), "best practice" and "excellence", in order to give a range value instead of a precise numerical value.

Simple threshold criterion

It is suitable for indicators that return percentage, density and in some cases absolute values. It is based on the comparison of the obtained value with 1 or more thresholds (2 for having three quality levels as output).

Thresholds may, of course, vary among the different indicators, and maybe also according to different local condition

Assessment result

54.4

0   50   85   100

thresholds

medium

Evaluation
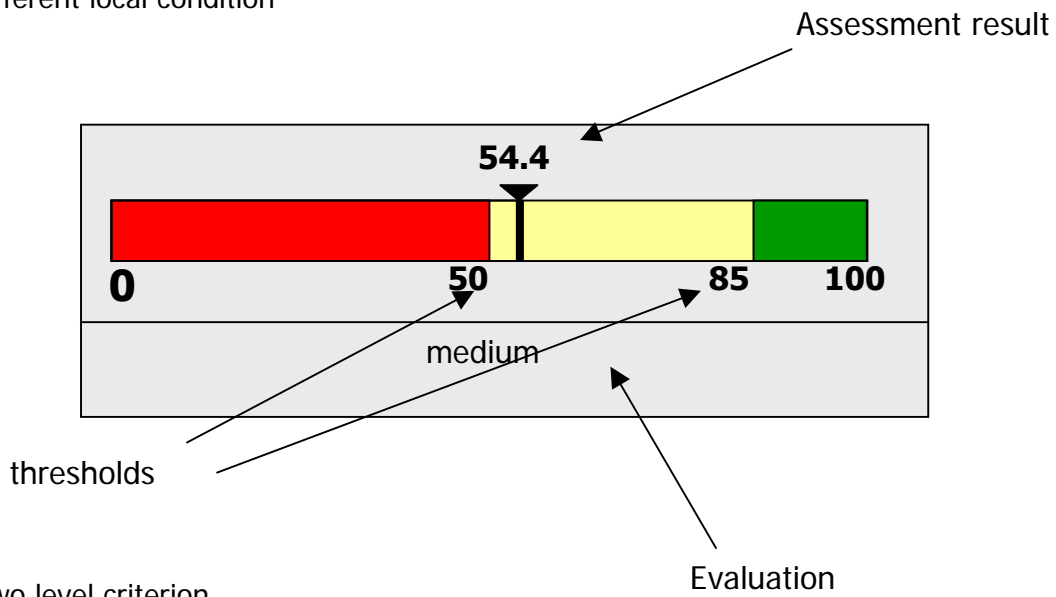
Two level criterion

It is suitable when it is important "spreading" something in the whole area. The area has to be divided in subzones to be studied separately (using simple threshold criteria). Then the percentage of satisfying subzones is evaluated again by giving the overall quality level.

Assessment result

threshold values

10   10   10

Subzone evaluation

good   good   bad

% good=66.7%

66.7

0   50   85   100

medium

Final evaluation
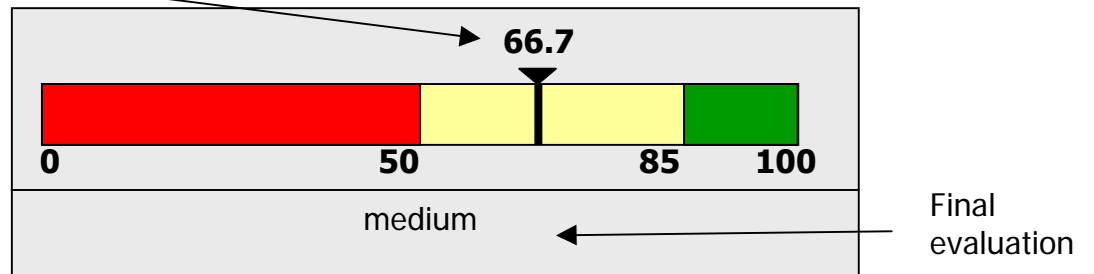
3.4.2 Subjective perception and evaluation of objective parameters

As already mentioned, in the toolbox, objective parameters, and the perception of them by the end users, are considered. For a long period psychosocial research worked assuming that social behaviour was due to individual attitudes and, above all, that it was coherent with them. According to this theory, positive attitudes toward an object produce positive behaviour and vice versa.

Positive attitudes   ⟹   Positive behaviour

i.e.

Positive Attitudes = Positive behaviour
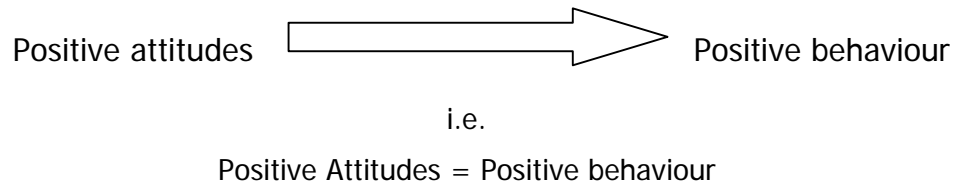
But in 1969, Wicker, in a literature review showed that the mean correlation between attitude and behaviour was usually very low (about 0,15).

Actually, when we talk about concrete implementations, we think that it is more correct to use satisfaction parameters, their value expressed on scales or in similar ways. We do not draw any direct conclusion concerning behaviour then but, to start with, we can state that people are more or less happy with certain conditions. How the degree of satisfaction correlates with further behaviour is then object of further research. But the main assumption in ASI, developed on basis of communication theory (Watzlawik et al. 1988), is that if society provides preconditions that satisfy the citizens, their preparedness to co-operate will improve. This means that, whenever society needs the citizens' co-operation in order to reach, e.g., sustainability goals, the chance to get such co-operation will be better under the precondition of the satisfaction with what society usually provides (see ASI project proposal).

Two methods are presented to collect the subjective data: one for finding out individual opinions: for instance by carrying out interviews; and one for finding out collective shared ideas: for instance in the frame of workshops, focus group interviews, round-table discussions, etc.. The first method has been considered as more appropriate to the case at hand, and therefore a questionnaire to be used for individual interviews has been developed. Both the experts and users must be involved in this process in order to express their opinions.

Subjective questions that could point out the satisfaction with the actual situation, expressed both by the users and by the experts were considered. Furthermore, we added a value that would define the strength of the answers (= the weight).

We started from the assumption that:

Each **enquiry field**	*is characterised by*	several objective parameters
Each **objective parameter**	*fosters*	a certain satisfaction level
Each **satisfaction level**	*has*	a value

- For measuring the Satisfaction with each parameter, we would ask the dwellers:

  Are you satisfied with this "objective parameter" in this area?

- For measuring the Importance attributed to each parameter, we would ask the dwellers:

  How important is this "objective parameter" for you?

The answers will be given by using a Likert Scale:

□ **very important**   □   □ **medium**   □   □ **not important at all**

Thinking about a graphic layout of the data, we could organise the results as in a Carthesian Plane (see figure 5 below), taking into consideration two different variables at the same time:

1. satisfaction level

2. importance level

Figure 5: satisfaction level / importance level

Satisfaction +

| No need of Intervention and low relevance for dwellers | No need of Intervention, high relevance for dwellers |

Importance -   Importance +

| Urgent Intervention, but low relevance for dwellers | Urgent Interventions and high relevance for dwellers |

Satisfaction -
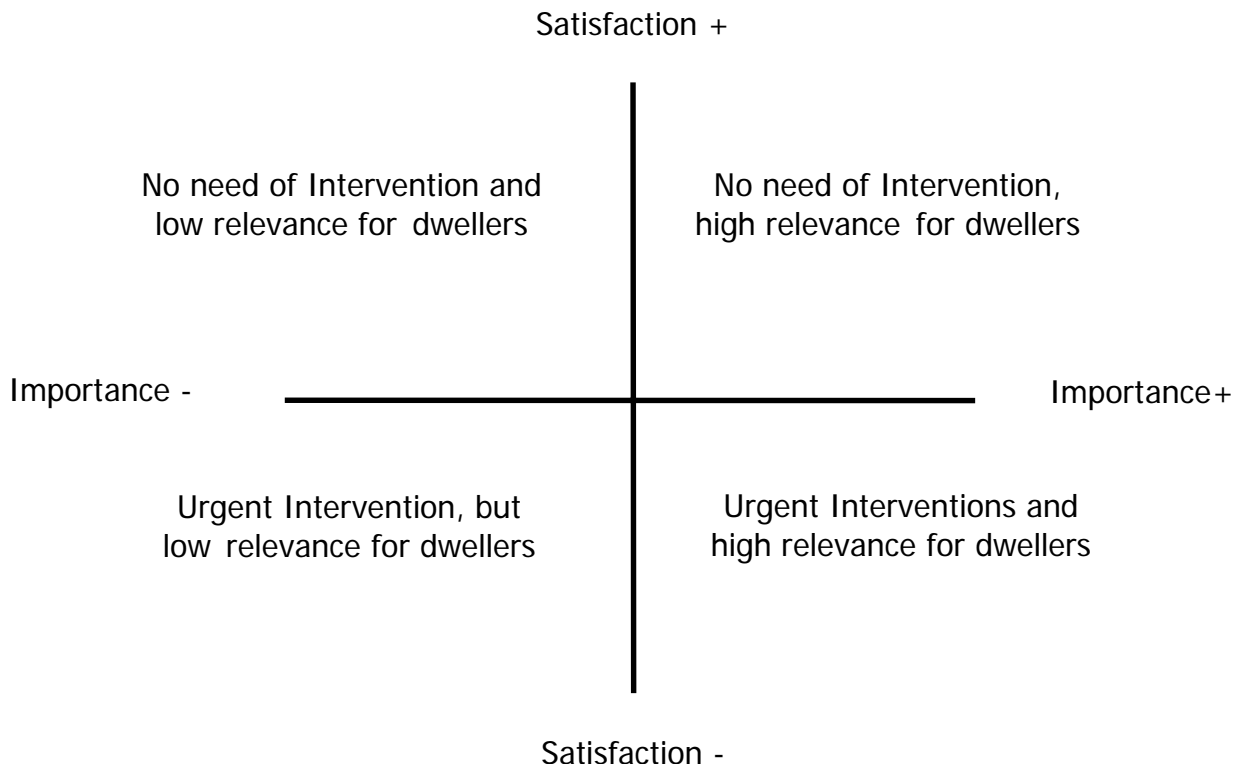
This can help to understand at a first glance in which quadrant it is most important to act, and what are the priorities of action.

The information collected during every application of the toolbox is precious because it can be the basis of a continuous progressive tuning process of the instrument. In particular it can help in removing redundant or useless parts from the data collection procedures, and in giving news on the effectiveness of possible measures and changes. In the first applications though, all the defined parameters will be kept, without any exclusion, a priori.

The first application in the pilot study will be used to test the toolbox, as far as both contents and articulation of the questions are concerned. The pilot study will help also to define the best guidelines for the application of the toolbox.

3.5 The enquiry instrument

3.5.1 The structure

For each enquiry field, some more important parameters have been proposed for the objective assessment, and some related questions for the subjective assessment. The relation between the two approaches is very important, because only in this way it is possible to compare the results of the experts' survey (= "objective") and of the users' opinions (= "subjective"). The analyses, subjective and objective, must be strongly rooted in the local conditions.

In defining the final toolbox, the attempt is to keep the number of operations to be made small, keeping in mind the goal to obtain an instrument that is easy to be used by local authorities. The idea is also to leave it up to the user of the toolbox to choose, or use, those items that seem most appropriate to the type of project that has to be assessed. This would allow reducing the number of items even more. But of course there needs to be background instructions for this, so that no items, that are important but, for instance, difficult to measure, or irrelevant only according to the toolbox users' background and sensibility, are left out.

According to the model displayed in the figure above, the section of the toolbox for assessing the subjective viewpoint has to be composed by two different questions on each parameter: **how satisfied one is with the considered aspect** and **how important that aspect is** for the interviewee. The questions have been organized in a questionnaire, taking into account the definition of each parameter. Since the aim is to consider always both the objective and subjective aspect, each question is strictly connected to an enquiry field, as already defined. The same questionnaire – with minor appropriate adjustments - will be used for experts and road users. It contains, besides the specific issues related to the survey, also some general questions for considering the socio-economic status, the demographic variables of our sample and mode-choice habits. In this group also questions on the relation QoL- mobility are included. The questionnaire contains also a section specifically dedicated to the type of implementation, to which one or two questions can be targeted. After the first tests in the ante operam (before-) phase of the pilot study, the questionnaire has been re-elaborated in some points, in order to improve the comprehension of the interviewees and the elaboration of data, thereby avoiding mistakes that could result from a different mean given to some items (e.g., when changing the number of points in the Likert scales).

The question about safety/security has been specified and divided into two different questions, one related to the traffic accidents and one related to personal security.

It was found useful to add also a question about the number of accidents known by the interviewees (where they themselves or friends/relatives have been involved, or that happened in the vicinity) and to compare these answers with the real number registered in the objective part of the survey.

Two other questions, about the traffic volume and presence of people, have to be investigated in depth asking the direction of the answers (too much vs. too little).

Accessibility (transport related aspects) (At)

This field concerns accessibility related aspects that are connected with transport means and transport network use, such as vehicles' accessibility, bus stop locations, transport network efficiency and so on.

Accessibility (infrastructure related aspects) (Ai)

Infrastructure related accessibility refers to the possibility of physically moving around (without obstacles), mainly as a pedestrian.

Cleanliness (C)

Ordinary public space maintenance activity, garbage management and collection are examples of aspects considered in this field.

Pollution (P)

Motorised transport implies important externalities: air pollution as well as noise and vibration are here considered.

Security (Se)

This field concerns personal security aspects (such as snatching, sexual harassments, etc.).

Safety (Sa)

This field concerns safety aspects connected to infrastructure use (such as incidents with cars).

Aesthetics (Ae)

This field concerns the configuration of the outdoor public spaces and their capability of appeal.

Services (Sr)

This fields concerns the presence of various types of facilities (public services, private facilities, shops, equipment, etc.).

Social Activities (So)

This fields concerns all the activities that people perform in the out-door public spaces in the frame of exchange and relation with other people

3.5.2 The articulation of the enquiry fields

Each enquiry field has been articulated to guide in a precise way the survey, indicating the suggested lists of objective parameters that should be taken into consideration. To each one of them corresponds a question for finding out the correspondent subjective assessment. In some case they are related only to the directs observation of the people's behaviour, and not to questions. (The questions have been formulated in their final version in Italian language, the English version below may in some cases not be formulated in the optimum way).

An accessible environment

% of residents with an access to the public transport network nearer than 500m [At]

This parameter gives a rough indication concerning availability of the public transport network. Evaluation has to be made with the aid of **maps**.

The number of residents, if not otherwise available can be estimated on the basis of the number of flats, or eventually, on the surface of the block and the number of floors. The measurement can be refined considering the efficiency of the bus stops, for instance by including number of buses/day.

1. Are you satisfied with the vicinity of the public transport network? (Do you think it is near enough?)

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

% of access points to the public transport network with total accessibility [Ai]

These parameters give an indication of the accessibility of the stops (in particular of the platform) for every user. Evaluation has to be done with **field surveys**. If necessary, different classes of aspects of use should be considered during the survey:

1. Crossing points (does a legal path to the platform exist from all the directions?)

2. Steps, barriers, narrow passages (does a continuous path exist from all the directions?)

3. Quality of the surface (does a path with a surface suitable to all users exist from all the directions?).

1. Are you satisfied with the accessibility of bus stops (thinking about elements like steps, barriers, narrow passages and quality of the surface)

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

% of public transport means with total accessibility [At]

This parameter refers to the possibility of getting on/off public transport means. Accessibility of the mean depends on the combination of its own characteristics with those of the platform. As a consequence, proper evaluation can be tricky. As a guideline the percentage of accessible means can be at first evaluated for every bus stop (percentage of accessible busses/day) and then the average for the entire zone can be computed. The evaluation has to be made with **field surveys in order to gain information on the public transport fleet characteristics.**

1. Are you satisfied with the accessibility of the public transport means?

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

% of sidewalks with total accessibility [Ai, Sa]

These parameters give indications on the "basic" characteristics of sidewalks ("walkability").

Evaluations can be made with the help of a **survey** taking in to account the aspects 2 and 3 of "% of access points to public transport with total accessibility" (see above). The last aspect is also related to safety of use (for example: falling down as a pedestrian):

1. Steps, barriers, narrow passages (does a continuous path exist?)

2. Quality of the surface (does a path with a surface suitable to all users exist from all directions?)

1. Are you satisfied with the accessibility of sidewalks in this area?

   (Thinking about elements like steps, barriers, narrow passages and quality of the surface)

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

% of pedestrians using sidewalks (in comparison with total longitudinal flow) [Sa,Ai]

This parameter indicates the consistency of provision and design of sidewalks. The evaluation can be made with the help of observations and countings of pedestrians in a street or on a street section.

Illegal behaviour may be caused by bad accessibility and result in unsafe conditions.

How to recognise an accessible sidewalk
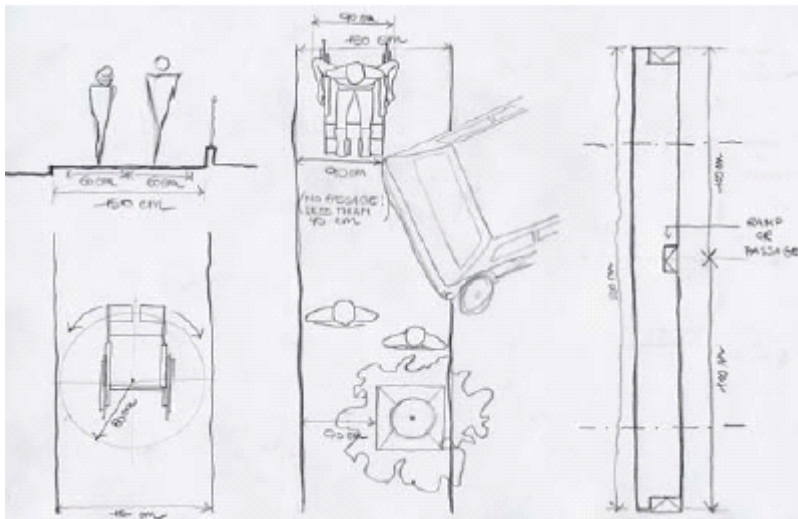
(Instructions for the survey)

A sidewalk is accessible if:

- it has a minimum width of 1.50 m along the 60% of its length
- it does not have any passage narrower than 0.90 m
- it has an access point (i.e. ramp) at the two ends and at least every 100 m
- it has an even surface

	Finland	France	D	Italy	Norway	CH	Slovenia	DK
Min. absolute	1,5 m	1,4 m	1,5 m	1,5 m	2,0 m	2,0 m	1,5-1,6 m	1,5 m
Normal	1,5 - 3,0 m	2,0 – 2,5 m	2,5 m	2,0 m	2,0 - 4,0 m	2,5 m		2,5 m
Main streets	2,5 – 4,0 m				4,0 – 5,0 m			

Sidewalk accessibility Reference Dimension (Cost C6 State of the Art Report)

% of pedestrian crossings with total accessibility [Ai]

These parameters give indication on the "basic" characteristics of crossing points. The most important aspect that must be considered is the **continuity of the paths**: steps, barriers. etc Evaluation can be made by direct **survey** taking in to account the aspects:	1. Are you satisfied with the crossing points? (thinking about the continuity of the paths and their accessibility) (yes/no) 2. How important is this aspect for you? (Likert Scale)

(instruction for the survey)

A crossing point is accessible if:

• it has no (or nearly no) step

• it has no passage narrower than 0,9 m

• it is reachable (no narrow passage nearby)

• it is ruled by "priority to pedestrian" signs or by general traffic norms

• it is recognizable by blind people (they should be at least able of detecting the end of the sidewalk);

• if median refuges exist, they should have enough space to allow people using a wheelchair, or pushing with a pram, to turn back (minimum 1.5 m)

Travel time/distance ratio [At]

Long distance accessibility needs the aid of transport means possibly provided by public transport service. Bad service results in "time" barriers that probably have as strong an influence as physical ones. To evaluate the efficiency of public transport, interviews with people arriving at the stop can be done; information is needed about travel starting point (distance can be calculated by using the map and simply considering the "bee-line") and travel time. This kind of information is especially useful in order to evaluate results of interventions (before/after analysis).	1. Are you satisfied with the time you need for reaching your destination (thinking about one of your daily trips)? (yes/no) 2. How important is this aspect for you? (Likert Scale)

A safe environment:

Number of accidents [Sa]

This parameter gives a rough indication of the safety, and can highlight critical points (black spots). Data may be available from police stations or other public authorities.

Note: pedestrian fatalities are fortunately relatively rare. As a consequence it is often difficult to have a realistic statistic base. Moreover, access to reliable data is often not easy. Overall data for parts of the city, or whole towns and villages, have to be used as rough approaches.

1. Are you satisfied with the feeling of safety you have at present in this area?

(yes/no)

2. How important is this aspect for you?

(Likert Scale)

% of streets in the network(considering their length) with 30 km/h (or lower) speed limit [Sa,P]

This parameter gives a rough idea of the physical quality of vehicle traffic flows, assuming that speed limits have a correspondence with actual vehicular speed.

1. Are you satisfied with the actual traffic speed in this area?

(yes/no)

2. How important is this aspect for you?

(Likert Scale)

% of streets in the network (considering their length) with 30 km/h (or lower) V85 [Sa,P]

Speed is always connected with risk, and risk increases more than proportionally for speeds higher than 30 km/h. **Direct speed measurements**, if affordable, can therefore be useful. Reliable evaluation can be done considering the speed that is not exceeded by the 85% of non conditioned or "free" vehicles.

1. Are you satisfied with the respect of speed limits by private motor vehicles in this area?

(yes/no)

2. How important is this aspect for you?

(Likert Scale)

A comfortable environment:

% of pedestrians using legal crossings (in comparison with the total crossing flow) [Sa,Ai]

This parameter indicates the consistency of crossing points' locations and design.

The evaluation can be made with the help of observations and countings of crossing pedestrians in a street or on a street section.

% of traffic lights with pedestrian red phase longer than x sec [Sa,Ai]

Too long red phases may be experienced by pedestrians as barriers, additionally and consequently, they may provoke illegal and dangerous behaviour.

A too short yellow phase does not allow slow pedestrians to complete a crossing manoeuvre begun during the green phase, this may lead to very unsafe conditions. At the same time it will cause considerable stress (= reduce comfort)

1. Are you satisfied with the length of the yellow phases of traffic lights?

   (yes/not)

2. How important is this aspect for you?

   (Likert Scale)

% of streets with sidewalks wider than 3m Ai

This parameter gives an indication about the amount of space dedicated to pedestrians. Possibly a ratio that refers to the total width of the street may also be considered.

1. Are you satisfied with the width of the sidewalks in this area?

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

Sidewalk width Reference Dimension
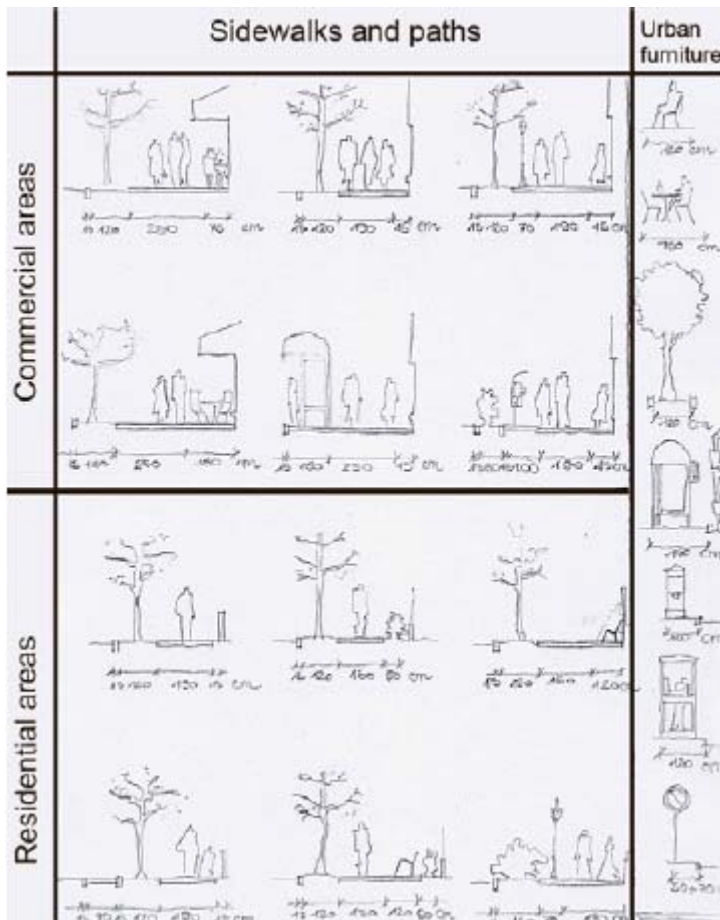
Portland pedestrian street design guidebook

% of streets with open-air noise > than 55 dBA [W]

This parameter gives an indication about the acoustic condition of a street (which is mainly conditioned by traffic flows). It requires special equipment to be measured and can be therefore expensive.

1. Are you satisfied with the acoustic conditions in this area (is there much noise, is it loud?)?

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

The World Health Organization (WHO), has published a series of recommended maximum sound levels applicable to various situations. Some of the WHO criteria are listed in the table below (Berglund, B. and Lindvall, T. 1995).

Descriptor	Limit	Situation or effect
LAeq,24	70 dBA	Negligible risk of hearing impairment
LAeq,8	75 dBA	Negligible risk of hearing impairment
LAeq	30 dBA	Excellent speech intelligibility
LAeq	55 dBA	Fairly good speech intelligibility
LAeq	30 dBA	No sleep disturbance (inside bedroom)
LAmax	45 dBA	No sleep disturbance (peaks inside bedroom)
LAeq	45 dBA	No sleep disturbance (outside bedroom)
LAeq,4	90 dBA	Discotheques and other ballrooms
LA	80 dBA	Toys (at the position of a child's ear)
LC,peak	130 dBC	Toys (at the position of a child's ear)
LAeq	35 dBA	Hospital room
LAmax	45 dBA	Hospital room (peaks)
LAeq	55 dBA	Residential areas, outdoors, daytime
LAeq	45 dBA	Residential areas, outdoors, night time

Noise levels recommended by the World Health Organization

The italian law limits are:

LAeq: 55 dBA II°class;   residential area

LAeq: 60 dBA III° class;   mixed use area

% of streets with in-house noise > than 45 dBA

This parameter gives an indication about the impact of traffic and transport on people at home. It requires special equipment to be measured and can be therefore expensive.	1. If you live in this area, are you satisfied with the in-house acoustic conditions (e.g., how is noise caused by traffic?)? (yes/no) 2. How important is this aspect for you? (Likert Scale)

Traffic flow volume and composition [W]

This parameter gives indirect information on vehicular impact on streets and houses. Data can be collected as total flow (all lanes all directions) or as flow per lane. Traffic volumes can be computed on daily basis (Annual Average Daily Traffic) or on hour basis (vehic./h). In this case information should be related to different times of the day. In order to better estimate traffic externalities, flow composition can be recorded as well. Possible vehicle categories are: cars &small vans, lorries, buses (non electrical), trams, electrical buses, motorcycles.	1. Are you satisfied with the traffic volume in this area? (yes/no) 2. How important is this aspect for you? (Likert Scale)

A secure environment:

Number of lights/square meter [W]

This parameter can give an indication on lighting conditions and can be evaluated with a **survey** and by obtaining the **technical specification** of the used lamps.	1. Are you satisfied with the quality of the street lights in this area? (yes/no) 2. How important is this aspect for you? (Likert Scale)

Amount of light lumen/square meter [Se W]

This parameter can give a rough indication on lighting conditions and can be simply evaluated with a **survey**.	1. Are you satisfied with the number of street lights in this area? (yes/no) 2. How important is this aspect for you? (Likert Scale)

Number of open activities/m along the street (day/night) [Se,Sr,So]

Activities at the ground floor level can enhance safety feeling and conditions. Separate countings for day and night, related to the length of the street, may be used as a parameter.	1. Are you satisfied with the number of activities open at night in this area? (yes/no) 2. How important is this aspect for you? (Likert Scale)

Number of "eyes and ears" along the street (day/night) [Se, Sr]

The presence of people enhances the security level, such as in streets that can be "overseen" and "overheard" by many people through the windows. Rough **countings** of "lively" windows (i.e. shops, offices during the day, private houses during the night) with a direct view on the street may be an effective indicator.

1. Are you satisfied with the presence of people living and working in this area?

   (yes/no)

2. Are you satisfied with your actual safety?

3. How important is this aspect for you?

   (Likert Scale)

A clean environment:

% of overfilled garbage bins (just before the garbage collection) [C,Ae,W]

This parameter can give a measure of the efficiency of the garbage collection system (it does not apply to garbage collection systems where bins do not exist and garbage is disposed at gathering points, according to a time table and collected just after, i.e. Zurich city centre)

1. Are you satisfied with the efficiency of the garbage collection system in this area?

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

Number of wastes left on ground/m [C,Ae]

This parameter can be used to have an idea of the cleanliness of the environment. Wastes can be classified (and separately counted) in three categories: small (i.e. cigarettes), medium (paper, bottles, etc.), large (doors, madrasses, etc.).

1. Are you satisfied with the cleanliness of the streets in this area?

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

An appealing environment:

Number of interesting views present of the path [Ae]

This parameter gives us information about the number of interesting views present on the path. Such attribute increase the level of appeal of the itinerary, making it seem shorter and easier to walk.	1. Are you satisfied with the views present in this area? (yes/no) 2. How important is this aspect for you? (Likert Scale)

Number of green elements per meter or % of green area per square meter [Ae W]

This parameter gives us information about the green elements in the area. The presence of green, besides increasing the level of appeal of a path, can improve also its comfort in summer and attract people to walk more, not only for duty but also for relaxing.	1. Are you satisfied with the presence of green elements in this area? (trees, flowers etc.) (yes/no) 2. How important is this aspect for you? (Likert Scale)

Number of landmarks and/or points of reference per meter [Ae Ai]

This parameter gives us information about what people consider as a point of reference in the case study area. The presence of monuments, landmarks, meeting points, etc. improve the attractiveness of a space or path, but increase also its accessibility thanks to their orientation value.	1. Are you satisfied with the presence of green elements in this area? (trees, flowers etc.) (yes/no) 2. How important is this aspect for you? (Likert Scale)

% of the rectilinear length of the path [Ae]

This parameter gives us information on how the path crosses the case study area; if it runs in a straight line or if it winds. Rectilinear paths are not appealing for those who move on foot, they are monotonous.	1. Are you satisfied with this kind of path? (yes/no) 2. How important is this aspect for you? (Likert Scale)

A busy environment:

Number of services per sub-areas (opening times : day/night) (Sr, Se)

This parameter has to be used together with the surveying of the opening and closing time (day and night) in order to have a measure of the business degree.	1. Are you satisfied with the number of services (i.e. post office, pharmacy, etc.) in this area? (yes/no) 2. Are you satisfied with the opening times of the services? (yes/no) 3. How important is this aspect for you? (Likert Scale)

Number of shops per type: daily, weekly, per sub-areas, and opening times (day/night) (Sr, Se)

This parameter has to be used together with the surveying of the opening and closing time (day and night) in order to have a measure of the activity degree.	1. Are you satisfied with the number of shops in this area? (yes/no) 2. Are you satisfied with their opening times? (yes/no) 3. How important is this aspect for you? (Likert Scale)

Number of facilities per sub-areas : bars, coffee shops, restaurants, kiosks, etc. (opening times: day/night) (S, Se, So)

This parameter gives us information about the number of bars, coffee shops, restaurants, kiosks, etc. in the case study area and has to be used together with the surveying of the opening and closing time (day and night).	1. Are you satisfied with the number of shops in this area? (yes/no) 2. Are you satisfied with their opening times? (yes/no) 3. How important is this aspect for you? (Likert Scale)

A lively environment:

Number of proper and improper seats (benches, stools, sitting walls, balausters, rails, columns) (So, W)

This parameter gives us information about the number of seats and their usability in the case study area. Presence of appropriate seats, well located and related, can help very much the possibility of social interaction.

1. Are you satisfied with the number of seating possibilities (benches, stools, sitting walls, balustrades, rails, columns) in this area?

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

Number of squares, widenings (So, Ae)

This parameter gives us information about the number of squares and widenings in the case study area. The presence of appropriate spaces, where people can meet and act freely gives a district liveliness.

1. Are you satisfied with the number of squares, widenings in this area?

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

Number of elements of urban furniture per square meter

This parameter gives us information about the type and quality of urban furniture in the case study area. The presence of various types of equipment improves the possibility of carrying various activities in a suitable way.

1. Are you satisfied with the urban furniture in this area? (tables, pooperscoopers, litterbins, toilets, etc.).

   (yes/no)

2. How important is this aspect for you?

   (Likert Scale)

Number of elements of traffic related urban furniture per square meter

This parameter gives us information about the type and quality of traffic related urban furniture in the case study area,, e.g. urban traffic signs and billboards.

1. Are you satisfied with the road signals in this area?

   (yes/no)

2. Are you satisfied about the bill boards in this area?

   (yes/no)

3. How important is this aspect for you?

   (Likert Scale)

4. PILOT STUDY

The instruments to assess urban QoL were first tested in a pilot study conducted in the town of Umbertide, in the province of Perugia, Central Italy, where the town municipality planned the implementation of a new cycle path. They aimed to construct a cycle ring running around the main residential area of Umbertide. The object of the ASI pilot study is a stretch of about 1.2 km that links two parks, two supermarkets and a school. The main part of the planned cycle route runs along a wide and straight road with rather fast driving cars (Via Morandi). The cycle path has been planned and realised mainly on the sidewalks with the idea of avoiding interferences between cars and bicycles. The intervention was in most cases simply constituted by painting part of the sidewalks red and by adding proper traffic signs to indicate where the space has to be shared by pedestrians and cyclists. Some work has been carried out in order to guarantee the continuity of the path and to organise traffic at junctions.

Figure 6. Construction of a new cycle path in Umbertide, Italy
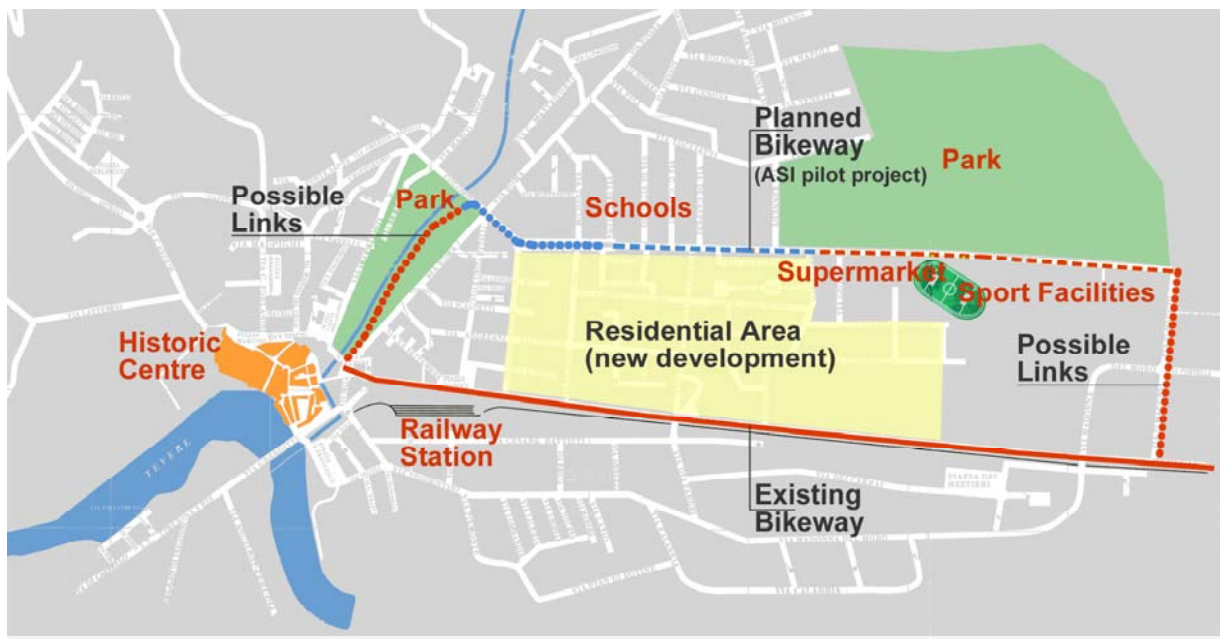
Interviews, surveys, measurements and observations have been carried to test the value and feasibility of the instruments, and to examine whether the first draft of the instruments could be further improved. Data were collected before (November 2004) and after (May 2005) the implementation took place by the ASI research group in Rome, with the support of Town Municipality technicians in Umbertide.

4.1 Analysis of the situation before the implementation

In total 60 persons moving around in the area where the implementation took place were interviewed during two days (November 13-14 2004). The standardised questionnaire (preliminary version) was used, complemented with a single question regarding the cycle path. Figure 7 shows the mean importance and satisfaction ratings of users of the relevant indicators of urban QoL. It appeared that users were quite satisfied with the situation in the

pilot study area. In general, users are less satisfied with aspects related to safety and security, traffic conditions (car speed, traffic flow, etc.) and with the lack of people and lively spots especially at night time. These indicators are up to improvement, especially because they are considered to be important by users. The large majority of the indicators were judged as important, indicating a proper selection of indicators of urban QoL.

Figure 7. Subjective evaluation before the implementation: importance and satisfaction
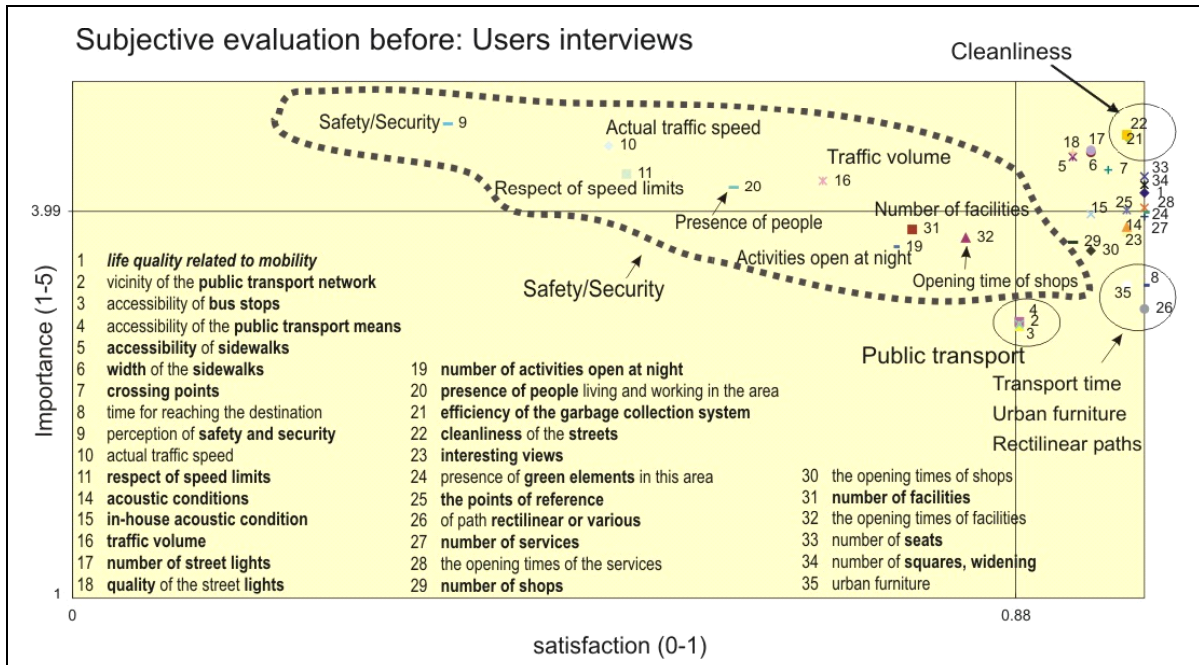
Next, in total 11 experts have been interviewed on December 30 2004: 2 employees of the Technical Office of the Town Municipality, 2 councillors of the Town Municipality, 1 member of the Town Council, 2 policemen from Provincial and Town Municipality stations, 3 representatives of User Associations (Disabled People's Relatives Association, Elderly People's Association, Caritas), and 1 practitioner. Each interview lasted about 40 minutes.

Overall, the experts expected an improvement of urban QoL and social relations after the implementation. Figure 8 shows some significant differences in importance ratings of indicators by users and experts. Overall, users tend to evaluate a smaller set of indicators as very important as compared to experts. In general, experts rate quality and transport related aspects, such as urban furniture and accessibility of public transport, as more important than users do. This may be due to the fact that accessibility of public transport is important only to a minority of citizens. The results presented in Figure 8 underline the importance of collecting user judgements on importance of indicators of urban QoL; experts may not assess user perceptions accurately.

Figure 8. Subjective evaluation before implementation: differences between experts and users in importance ratings of indicators
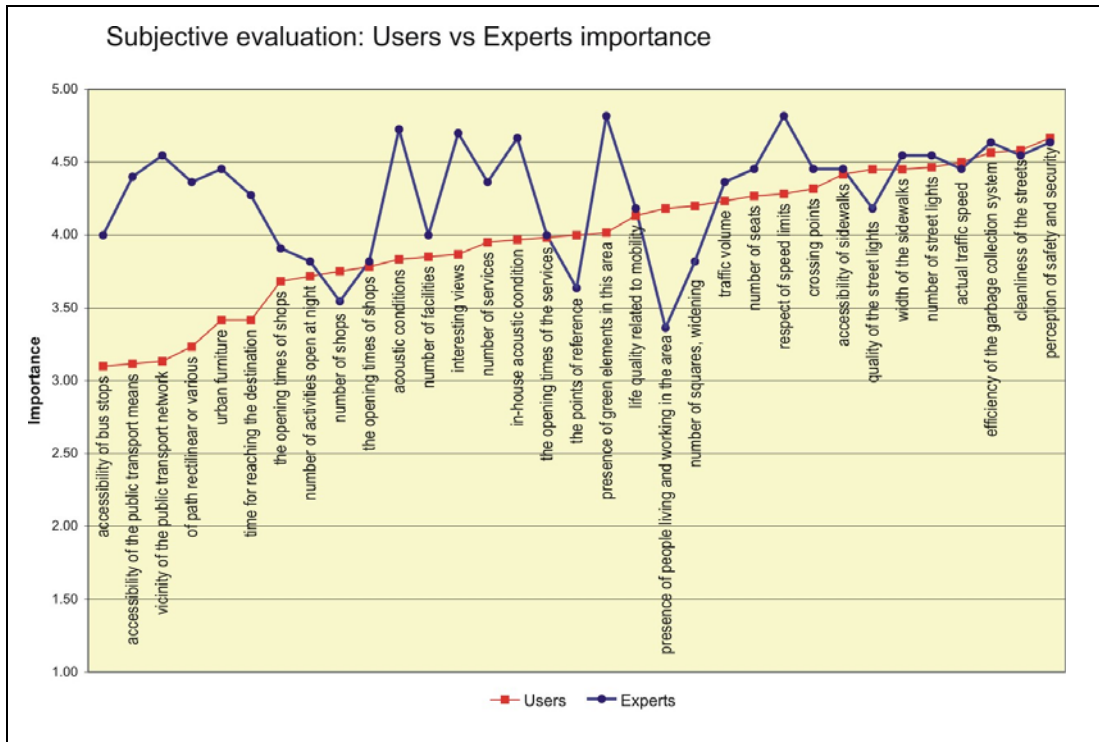
With regard to the objective evaluation, the majority of on-site survey data was first reported graphically and plotted on a map that constituted a basis for the subsequent analysis (see Figure 9). Next, different thematic maps were produced that provide more detailed information on a specific topic. Analysis of the different thematic maps facilitates the understanding of the local situation. The objective data confirmed some of the concerns expressed by users. For example, users reported concern with high vehicle speeds, which may be connected with concerns about traffic safety and lack of lively spots especially at night (when there a lot of pedestrians in the street, vehicle speeds are lower and traffic safety is higher). Indeed, the objective data revealed that vehicle speed is quite high at some locations in Umbertide (see Figure 10).

Figure 9. Symbolic mapping of objective indicators
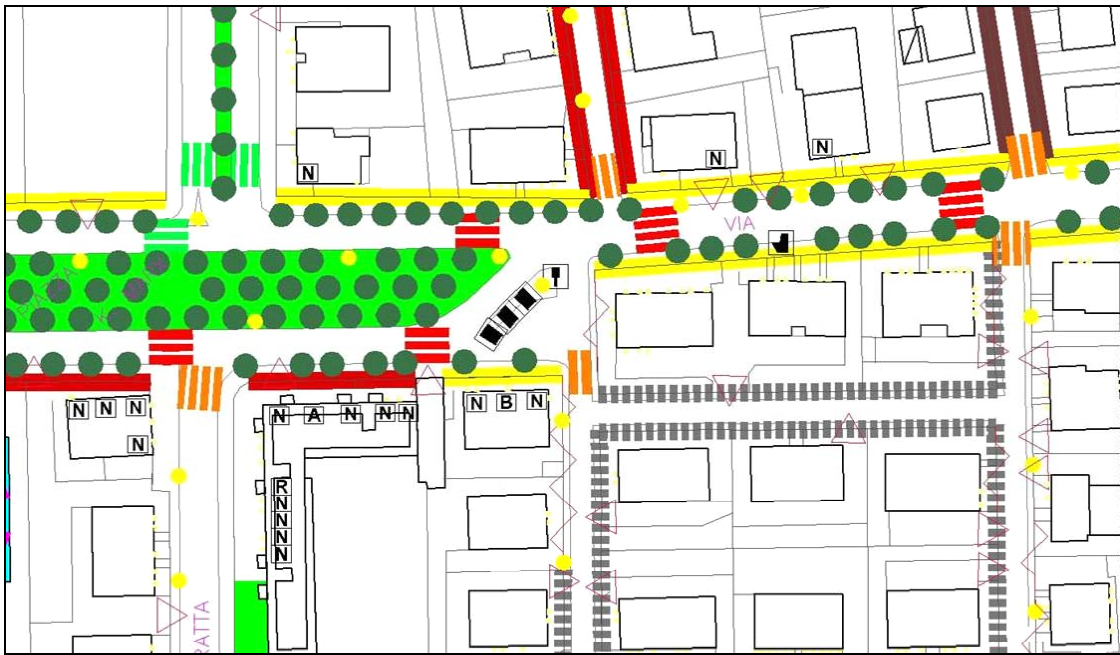
Figure 10. Thematic map: vehicle speeds in Umbertide

Umbertide: Surveyd Vehicular Speed.

- % of street-km in the network
with 30 km/h (or lower) speed limit:
19.2%

Caption

Historical centre

Important location

Car speed:

>30 km/h

30 - 40 km/h

40 - 50 km/h

50 - 70 km/h

70 - 80 km/h

80 - 90 km/h
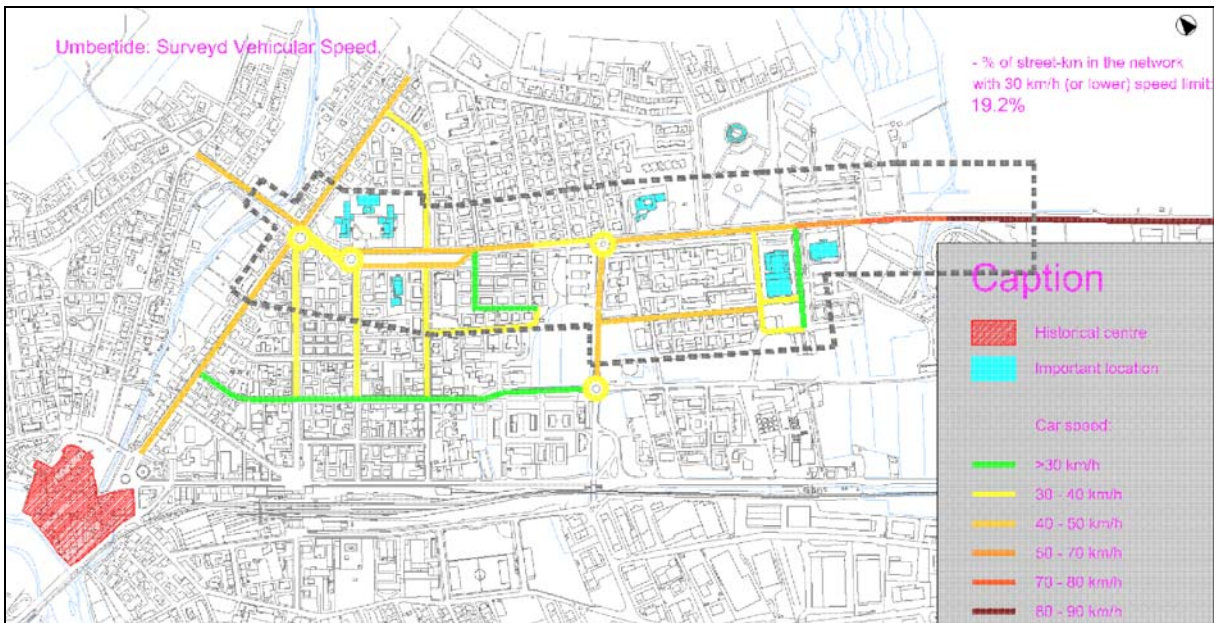
4.2 Analysis of situation after the implementation & comparison

Objective and subjective measurements have been repeated after the realisation of the implementation. Again, 60 users moving around in the pilot study area have been interviewed. This time, objective measures were made only for indicators that were expected to change due to the implementation. Only few changes in objective conditions were registered:

- the pedestrians' exclusive space decreased as sidewalks now have to be shared by pedestrians and cyclists (i.e., the cycle path was realised on stretches that used to be sidewalks);
- the share of pedestrians crossing streets at signed points increased, probably because of the repainting and partial reorganisation of some junctions.

Although a reduction of car speeds was expected because of the narrowing of the carriageway in some points, no changes in car speeds were observed.

In spite of these results, the interviews with users revealed some notable change in users' perception, as can be seen in Figure 11. In general, users are more satisfied with all safety and security indicators. This makes sense, since the implementation was aimed at increasing traffic safety. Nevertheless, the results are also surprising, since no improvements in objective indicators were demonstrated. A possible explanation could be that the initiative taken by the Town Municipality to increase traffic safety gave people the impression that things were improving because "something was done".

Figure 11. Satisfaction ratings before and after the implementation (blue: before, red: after)
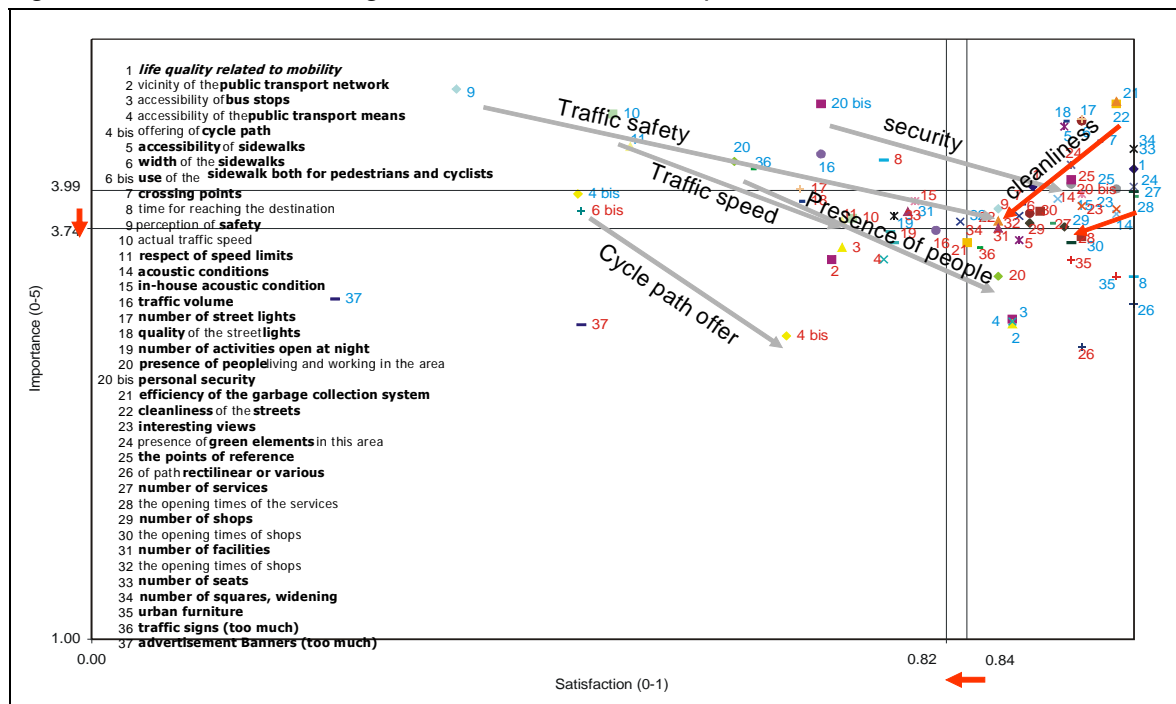
In conclusion, the pilot study yielded some interesting results, and reveals the potential value of QoL assessments. The instrument "toolbox" – used as a combination of measuring objective parameters and asking people how they perceive these parameters - proved to be quite feasible and easy to administer. However, the questionnaire was probably a bit too long. Ways to reduce the number of questions without loosing important information would be advisable. Therefore, we conducted another study, to fine-tune the instrument and to cut it down in length.

4.3 Further developing the instruments to assess urban QoL

The results derived from the pilot study were analysed with the purpose to refine the instrument. For instance, items which correlated with each other (i.e. a correlation coefficients exceeding 0.8) were excluded in order to ensure that each construct was discretely different from other items. This refined instrument was then tested in three different countries (Austria, The Netherlands and Sweden) in order to examine what clusters of QoL indicators (i.e., domains of urban QoL) could be distinguished, and to examine to what extent the indicators are related to overall judgements on urban QoL. In order to better reflect the procedure of other studies, only ordinal scales were used (as in the preliminary instrument used in the before phase of the pilot study). Satisfaction was also asked for on Likert scale in state of providing the options Yes and No only. A 7 point scale (ranging from very dissatisfied to very satisfied) was chosen, while importance was rated on a 7 point scale, as well, ranging from very important to not important at all.

In total, 134 questionnaires were collected. Further statistical analysis was carried out including correlation coefficient analyses, multiple regression analyses and factor analyses. The results showed that a general question about QoL in the community significantly correlated with most of the indicators in the questionnaire. The results also indicated that all indicators were important, although some more than others. For instance security was by 57 % of the participants seen as very important, whereas only 11 % would argue that resting places were very important. A multiple regression analysis was carried out using the general question about QoL in the neighbourhood as the dependent variables and the indicators as the independent variables. The results showed that six of the indicators explained 48 % of the variance which is more than satisfying. Finally a factor analysis was carried out to determine what domains the tool box included. The result from this exercise presented seven different factors, see Table 2.

Table 2. Results of Factor Analysis on Indicators of Urban QoL

Factor	Label	Indicators
1	Opportunities	Activities, different facilities
2	Accessibility	Barriers, crossing points, separation of pedestrians and cyclists
3	Liveability	People living and working in the area, cleanliness, aesthetics, green areas
4	Calmness	Speed, noise, volume of traffic
5	Recreation	Resting places, public places, cycle paths
6	Protection	Security, lights, social life, safety
7	Mobility	Public transport (near and frequent) time to destination

The conclusion which could be drawn from this exercise was that a number of different aims had been fulfilled; the toolbox had been carefully tested; it was clear and reflected important components, each indicator was independent from each other and various domains that are important for urban QoL were included.

The final instrument to assess urban QoL includes four different parts. The first part focuses on general information about the interviewees (gender, age, mobility habits and so on) as well as information regarding the context in which the interview takes place (season, hour,

location and so on). The second part assesses how satisfied the respondents are with the area in general. In the third part the respondents are asked how satisfied or dissatisfied they are with a number of conditions (i.e., QoL indicators). Finally, in the fourth part they are asked how important these conditions are for them. In addition to this, it is also suggested that further questions are added which concern specific conditions not included in the instrument. If the aim is to use the instrument as a way to assess an implementation then it is suggested that additional indicators are selected together with the end users, i.e. the inhabitants of a certain area or those people who travel there or stay in this area for a certain time.

5. THE DATABANK

5.1   General information

The databank is recommended to be structured as a relational database containing all the relevant information concerning the toolbox applications. It should be constituted by elements that describe the context of the project and by the data that come out from the toolbox application. The following structure was envisaged:

- project reference name
- city/location of application

  - name/state
  - population density
  - geographical zone (i.e. Central, Eastern, Northern, Southern and Western Europe, etc.. I.e. zones that have the same or similar socio-cultural characteristics)
  - economic growth index (or other economic wellbeing indexes)
- short description of the project
- main aspects involved (within the "enquiry fields list" defined in the toolbox).

5.2   Toolbox Application

For learning purposes it would be very advantages to insert the key data described above in the data bank in connection with all kinds of toolbox applications in the future. The following data types should be included:

- number and profile of the interviewed experts
- number and main personal data of the interviewed road users or residents (i.e. gender, age, etc.)
- interviews with expert and road users/residents: numerical results and synthesis charts (as defined in the toolbox, before and after the intervention if existing)
- objective parameters measuring numerical results of campaigns (before and after the intervention if available)
- relevant application problems that occurred (short description).

5.3 Possible ways to use the data bank

In the future, when the data bank will contain the results of a good amount of cases, the historical data can be, for instance, used to:

- highlight aspects that are always seen as important (or not important) and that can be therefore removed from the toolbox application, in order to make it "quicker to be used" (it is not necessary to ask if a parameter is relevant if it is already known that it is so, and it is not worth to investigate parameters that are for sure not relevant). It is also possible that correlation with the location characteristics can be found (a parameter can be important/not important, given some local characteristics) and it should be seen to it that the data reflect this;

- individuate relationship levels between subjective and objective measures. When a good relationship exists one of the two measurements can be removed from the toolbox; parameters that show very bad relationship should be further analysed in order to understand better the character of the relationship; this would improve predictability. It is also possible that correlation with the location characteristics can be found, the relationship between objective and subjective data may be mediated by the local characteristics; it should be seen to it that the data reflect this.

- The ratio "perceived improvement/objective changes" can be investigated; results can be used to choose the most cost effective way of solving a problem (i.e. objective parameters where small changes result in large perceived improvement, or where changes result in improvements in many fields).

It is obvious then that, to this first pilot study of ASI, should follow a campaign for the application of the toolbox in many other cases dealing with different implementations and in various European countries.

6. THE GUIDELINES

6.1   The phases of application

As explained before, the toolbox is articulated in two parts: one organised for analysing the objective parameters and one for analysing the subjective aspects of these parameters. Moreover such enquiry is run at different steps of the design process in the actual existing situation, before any implementation, and in the situation that it forms after the implementation. Between these two steps that are enquired using the toolbox, there is a very important step: the implementation of the strategy, plan or design. The time that has to pass between the first and the second phase changes depending on the type of implementation. It has to be long enough to let people use it and get used to it, so that they slowly perceive possible changes in their way of living, that improve it, as it is wished, or worsen it.

The first phase is the "Ante operam" (before phase), that is an enquiry of the situation before the new plan or design is realised. It studies the objective characteristics by the survey, and the subjective perception of such characteristics by the questionnaire. The third is the "Post operam" (after phase), that is an enquiry of the new situation, that exists after the implementation. It registers the objective characteristics by the survey, and the subjective perception of the changes due to such implementation, by the questionnaire.

The comparison among the Ante and Post operam phases points out the actual changes that occurred on the site and above all if and how these changes have affected, in some way, the general perception of the situation and thence the QoL of the users.

6.1.1 1st phase: Evaluation of Ante operam

This phase consists of a number of activities listed below:

1. Interviewing the dwellers on their subjective point of view. Expected result: definition of the dwellers' point of view.

2. Interviewing the experts involved in the process of decision making and implementation on their subjective point of view. Expected results: definition of the experts' points of view.

3. Data elaboration and comparison between the points of view of dwellers and experts. Expected result: charts for clustering the parameters in four different areas, depending on the positive or negative assessments of the parameters in the actual situation, and on their importance.

4. Data collection and survey of objective parameters.

Expected results: Collection of standardised data. A standardising process seems necessary for comparing different parameters.

5. Data elaboration and comparison between the subjective and objective assessments.

Expected results: Focus on actual problems, highlighting both similar and different viewpoints.

6.1.2 2nd phase: Implementation

This period concerns a possible review of the design, the building site and the time in which people start to get used to the new devices.

6.1.3 3rd phase: Evaluation of Post operam

This phase consists of analyses after implementation, among other things of interviewing the users/residents on their subjective point of view after the implementation of the project.

Expected results: Definition of the users/residents point of view after the implementation.

7. Data elaboration and comparison between the subjective data before and after the intervention.

Expected results: Verification of the shift of the parameters, target of the project, thereby considering the different areas of the graphic.

8. Data collection and survey.

Expected results: Check of the relation between actual and perceived improvements.

If it is not possible to apply the toolbox completely, it is necessary to apply the third phase of it to the items contained in the quadrant of the "Urgent intervention, and high relevance for users" and possibly also to the items contained in the quadrant "Urgent intervention, but low relevance for users" that resulted from analyses in the first phase.

The toolbox can be applied in several ways. If it is applied only before the revising of a design and its implementation it can help to target these activities better. If it is applied before and after the implementation it can confirm (or question) the appropriateness of the design and implementation: a declaration of success or failure (or anything in between). If it is applied only afterwards, it can be used as a validation of the prefixed goals.

6.1.4 Sample Selection Criteria

From the chosen theoretical and methodological approach and from the work already run in the other ASI WPs, it is evident that our target group has to be constituted not only by the road users and residents, or the dwellers, but also by the experts with their viewpoint. In fact, both these categories are – or at least should be - involved in the process of implementing interventions and projects for improving the QoL.

The conclusion is that the toolbox has to be used with two different samples, when we want to verify the consequences of an implementation for QoL. One sample is constituted by the users: the dwellers of the case area, who should, according to statistical rules of thumb, be represented by a minimum of 30 persons (if the group is not split up into sub groups), to be interviewed directly on the place where the implementation has to be realised. Better results, from the statistical point of view, can of course be achieved with higher numbers of persons.

All the experts involved in the process of decision making and implementation (politicians, councillors, technical offices members, municipality consultants, associations, pressure group, etc.) should be represented in the experts' sample, and be interviewed by appointment.

6.1.5 The toolbox team

The toolbox is aimed at being used by local administrations and practitioners, it should be applied in the field in order to assess implementations from various (pre-defined) perspectives.

The team has to be composed by two persons with different background (a technical and a psycho-sociological one), one for surveying and evaluating the objective parameters and one for interviewing and elaborating the subjective data.

A particular training for the interviewers is not necessary. They have to know very well the text of the interview in order to communicate smoothly with the interviewees and in order

not to annoy them. They have to be kind and friendly. The responsible of data entry and, then, of statistical analysis has to know, at least, the principal elements of statistics and their application on an excel file.

7. DISSEMINATION ACTIVITIES

The dissemination of results is one of the most important aspects of a project, as it is not enough to have only good results, but to make these results open to the public and to raise the probability for implementation, as well. Especially for the toolbox, the databank concept and the implementations guidelines, it is necessary that many people are aware of the existence of these products.

7.1 Dissemination activities during the project

Results of the ASI project are disclosed via five different routes:

1   reports to the EU: deliverables as indicated in the DoW

2   ASI webpage

3   professional publications: publications aimed to inform professionals on project results, such as policy makers, administrative officers, experts, EU officials

4   scientific publications: publications targeting scientific communities

5   presentations at conferences

Each of these is explained below. The consortium agreed to publish all relevant publications on the ASI website: www.factum.at/asi (see below).

7.2 Plan for dissemination after the project's life time

7.2.1 Reports to the EU

According to the DoW, writing the deliverables was the responsibility of the particular WP leader. Quality assurance, however, was the task of the co-ordinator, together with one other consortium member separately chosen for each deliverable.

Deliverables were put on the website, as to make them available to a wider public:

7.2.2 ASI webpage

A webpage about ASI was opened at the beginning of the project with information of the aims, working steps, progress, deliverables and publications: www.factum.at/asi.

7.2.3 Professional publications

The consortium has foreseen three major publications that should be of interest to those working in the field of traffic and urban planning dealing with issues related to QoL.

First, the final report would provide a detailed description of the ASI project, including the aim of the project, our main findings and conclusion, and a description of the toolbox.

Second, the consortium wrote a chapter for a book edited in the frame of the EU project PLUME. The title of the chapter is "Assessing QoL aspects in transport planning and urban design: definition, operationalisation, assessment and implementation." The aim of this chapter is to describe the approach and the main results of ASI. The chapter should clarify why it is important to consider and assess QoL in relation to transport and urban planning, and how to do this.

Third, the consortium produced a brochure in which the main results of ASI are described. The main aim is to arouse interest in the ASI project, and to inform people where they could

find more detailed information on ASI, such as the book chapter, the final report, or for those who would like even more detailed information, the deliverables and publications to be found on the ASI website.

Furthermore, the consortium agreed to send a short description of ASI to professional journals. The main aim is to inform a broad public on the project results. There, the consortium will indicate where more detailed information on ASI can be obtained, i.e., on the website, in the brochure, and in the book chapter.

7.2.4 Scientific publications

Each partner will write journal papers on ASI. Copies will be sent to the co-ordinator, in order to put them on the website, as well. This is mainly a task to be carried out after the life time of ASI.

7.2.5 Presentations at conferences

There were several presentations of ASI during the life time of the project, and these activities go on even after the finalisation of the project on May 31st 2005.

Copies of the conference papers are made available on the web page, as well.

7.2.6 Professional publications

Various information leaflets have been produced to be distributed among experts interested in transportation and QoL. Examples are:

- A general information-folder (see below) that was produced at the beginning of ASI and distributed at various conferences (ICTCT annual workshop Soesterberg, Walking and living in Cities – Brescia, ASI workshop Brno)

- An information brochure was produced by partner 4 UNIROMATRE (Lucia Martincigh and Luca Urbani) in Italian and English language. This brochure focuses mainly on the pilot project results. It is being and will even in the future be distributed at conferences, to town municipalities, etc.

- An other information brochure was produced that should provide a more general overview of the aims and the main results of the ASI project. The brochure is continuously distributed at conferences, as well, but the most important goal is to send it to practitioners in the field in various EU countries.

8. CONCLUSION

The concept of QoL (also called Life Quality) is increasingly important in socio-economic research. The main problem however is, that QoL is an abstract concept, and a homogeneous definition is hard to be found. QoL is influenced by many components like culture, religion, health status, income, age, mobility preconditions, job satisfaction, etc. Besides, the definition is influenced by the fact who, i.e. the representative of what discipline, measures QoL. The main objective of the project is to provide knowledge about the practice of QoL assessment by different disciplines in connection with different types of public measures in the area of town planning, transportation and mobility.

The main goal was to improve the understanding of the assessment of groups of citizens' QoL by responsible politicians and experts. This was done by the evaluation of how mobility policies of five implementations in the frame of LUTR (Land Use and Transport Research Cluster) of the Key Action Cities of Tomorrow (CoT) affect QoL. Evaluation was based on expert interviews, dealing with the following questions: How is QoL of different groups of citizens affected by town planning, transport and mobility conditions and how is it assessed by the responsible people. The main product of ASI was an advice for improved assessment processes. It consists of a toolbox for the assessment of QoL in connection with town planning, transport and mobility, a databank concept, and guidelines for implementation. The developed instruments were tested in a pilot study with respect to feasibility, applicability, and consistency.

ASI aimed to examine to what extent QoL issues are considered in traffic and urban planning, and the way they are dealt with in projects aiming to promote sustainable transportation.

The first thing that we found was that in the evaluated projects hardly any social scientists were included. However, social scientists have studied QoL issues for quite some time now, and could play an important role in developing relevant instruments. Most experts appeared to have a technical professional background, such as engineering and/or architecture. The under-representation of social scientists is remarkable because most projects dealt with QoL issues, which may by considered as the core business of social scientists. As sustainable development implies balancing economic, environmental and social costs and benefits, multidisciplinary teams including social scientists seem to be needed.

Although there is great consensus among experts and practitioners in the fields of land use and transport about the importance of evaluating the effects of policy implementations on QoL, such issues are considered mainly at the beginning of projects, but are considered less when the projects becomes more concrete and detailed; according to the result of the interviews QoL issues are taken care of in one or the other way throughout the whole life time of the projects, but not systematically. It is stated that the main reason for this can been seen in the high number of definitions for QoL. Therefore, many experts and practitioners experience significant difficulties with evaluating QoL effects of policies, because no general concept or operational definition of QoL is available at the moment. A complicating matter is that experts have different disciplinary backgrounds (e.g., architecture, town planning, transportation planning, civil engineering, economy), each associated with different, and sometimes divergent, ideas on and definitions of QoL. This not only hinders communication on this issue, but also the development of suitable instruments to assess QoL. But the consequence, according to our point of view, is not that the number of disciplines should be reduced. Rather, interdisciplinary work should become more common in the area so that joint discussion and problem solving procedures improve.

Interviewed experts say that practice mainly focuses on measuring objective conditions, reflecting expert's point of views. However, assessments of objective conditions may differ from subjective judgements, i.e., aspects that are believed to enhance QoL do not necessarily improve the citizens' perceptions of QoL. Thus, measuring objective conditions only does not provide valid information on what supports or deteriorates QoL. For this reason, it is important to also assess QoL subjectively, as this reveals to what extent people are actually satisfied with their life. Actually, the experts stated that subjective aspects of QoL have to be considered much stronger within the projects.

In accordance with the state of the art about QoL, physical and psychological aspects are named by the experts as important aspects for QoL. However, social-psychological and aspects concerning the society are mentioned as not so important, in contradiction to the state of the art, and also in contradiction to some of their own comments (e.g., when the importance of social interaction is underlined below). QoL is described by the experts on the one hand as the establishing of general preconditions like a clean environment, social security, places for recreation, etc. On the other hand it reflects the satisfaction of individual needs - to have a family, a good health and, more generally (but difficult to measure), to lead a good and happy life. This is also underlined by the answers given by the experts when asked for the most and least important aspects of QoL: a clean environment on the one hand and satisfying social interaction prevail on the positive side. On the negative side luxury and money are seen as least important for achieving good QoL. In relation to traffic and especially mobility, aspects like accessibility of means, and safety are seen as most important to ensure QoL.

It is therefore clear that these aspects are especially taken into account when representatives of the projects discuss QoL matters with us. In connection with the main contents of the projects, namely traffic, mobility and land use aspects, aspects like accessibility, good (inter)connections within and between transport modes, and comfort and smoothness of movement are given a high relevance. Another group of conditions that is considered important for QoL are the environment and a sustainable development that should lead to energy saving processes accompanied by reductions of emissions. Last but not least, the social dimension is seen to be important, represented by widely varying characteristics like places for interaction, freedom and social well-being.

As stated above the experts find it difficult to consider, and even more difficult to evaluate, QoL. The main measures to reach or improve QoL are said to be based both on quantitative and qualitative analyses and data collection. Designing of models and plans and of course also implementation should be accompanied by participation of, and dialogue with, the people affected. Experts in the fields of transport planning and urban design believe that tools for assessing QoL effects of those implementations that they usually deal with could be beneficial for them.

Within the ASI project, instruments were developed that will enable decision-makers to better address QoL issues in land use and transport planning, in order to secure public acceptance and promote user behaviour changes. As one of the main products, a toolbox to support this was developed, and such a toolbox is still felt missing by the involved experts. It was recommended to make it compact, practical and easy to understand and to use. In addition to the toolbox, a databank-concept and "proto-typical" guidelines for the implementation of land use and transport projects that focus on QoL are provided by ASI. These instruments are considered useful for politicians, decision makers and practitioners. The interviewed experts believe that they facilitate participation of affected (groups of) citizens in public planning and assessment, and, consequently, appropriate consideration of user needs.

The final instruments comprise a key set of indicators that according to our intention should be appropriate for use in every context. This set, then, can be enriched by project specific indicators, if needed. Toolbox users can either select additional indicators from a list of suggested indicators, or develop new ones. Clear guidelines are provided on how to use the instruments in order to end up with a reliable and valid assessments of (expected) effects of implementations on QoL. ("Expected" refers to measurements in the before-phase of evaluation processes).

Ideally, the QoL indicators are assessed objectively and subjectively, before and after implementations, via user and expert interviews. To collect valid (unbiased) data, to be able to compare results of different toolbox applications, to learn from previous experiences and to forecast possible effects of implementations, it is important to apply at least the key set of QoL indicators, and to follow the general guidelines as indicated in the toolbox. To achieve this, a databank is helpful in which comparable data on QoL assessments are put together. ASI underlines this by describing a databank concept. A databank that works according to this concept will improve the basis for practical work, since policy makers can build on experiences in previous projects. Data collected in the databank provide a detailed overview of how various implementations may affect QoL, and what should or could be done to (further) improve QoL.

In order to collect the data reflecting subjective aspects, sufficient numbers of users have to be interviewed in order to derive statistically meaningful results. If disaggregated analysis (for instance differentiating between age groups or genders) is desired, in order to compare needs of different groups, larger samples are needed. Interviews with users may be made "on the spot" with people moving around in the area of interest, but even residents living near, or "around" implementation sites may be asked. In most cases, this procedure is more feasible than random selection of a sample, because the latter may be too time consuming, and as striving for representatively, according to our experience, never gives fully satisfying results. It is suggested that the respondents are asked to fill in the questionnaire and either return it on the spot, or in a pre-stamped envelope. Selection of experts to be interviewed should be based on their involvement and/or interest in the development and implementation of the project to be assessed; in other words, all groups that in some way are professionally involved should be represented by one or some experts in the experts' sample.

The acceptability, effectiveness and efficiency of policies will be enhanced by systematically assessing (possible) QoL effects before and after the implementation of such policies. Administering the toolbox before a policy implementation is taking place can help policy makers to identify what aspects need to be improved. Further, it can reveal how and to what extent the policies may affect QoL of citizens, what should be done in order to reduce, prevent or compensate possible negative effects, and how to optimise positive ones. This becomes possible because the needs of various groups in society, including the needs of specific (vulnerable) groups, are then more thoroughly known. By paying due attention to the results of QoL assessments before a policy implementation, the implementation is more likely to become acceptable, effective and efficient.

Applying the QoL instruments after policies have been implemented helps to evaluate if the changes that have taken place have improved QoL or not. If not, policy makers may develop plans to adjust the policies, or to implement additional supportive policies. Comparisons can also be made between objective and subjective indicators, revealing to what extent objective improvements indeed have an effect on perceived QoL. User evaluations are important to supplement the experts' evaluations and perceptions, because the experts' opinions may not be accurate in specific situations. The tool can be used for benchmarking, by comparing QoL indicators in different cities, regions and countries. This once again illustrates the need for

the use of the complete set of instruments – toolbox, guidelines and databank - and for measuring all key indicators listed rather than changing the list of indicators for each implementation. We expect that our instruments, if applied, will help practitioners to develop plans that will improve QoL of citizens in the expected way.

Another benefit will be to raise the acceptance of implementations. According to our expectations this will be the case if QoL aspects are considerate appropriately. Application of the ASI instruments will help the decision makers and planners to get to know the opinions and perceptions of users more in detail. By this it will be easier to make the best decisions for citizens who are involved. Those readers who are familiar with the concept of "participation" may recognise that the procedures envisaged and recommended by ASI reflect, at least partly, such a participation process. What would be necessary to complete the process are meetings where the results of objective and subjective measurements and/or assessments are presented and conclusions to be drawn from this are discussed.

The figure on the next page describes the main procedure used in ASI (reflecting in general our view on the way how projects in the land use and transport area should be implemented), and the outcomes of the project. Among other things, the user groups who can benefit from these results are included, and for what kind of projects and implementations the ASI instruments could be used.

The figure on the next page summarises in a comprehensive way the work done in ASI, from the starting point to the results and conclusions.

Figure 12: ASI – project summary

The aspects of QoL are considered less the more concrete work within the project becomes

Experts have the opinion that QoL is taken care of within the projects from the beginning, but not systematically so, the main reason for this being the high number of definitions for QoL

It was underlined that subjective aspects of QoL have to be considered stronger

The experts wish to have and to use instruments in which QoL is explicitly considered and that help to evaluate the effects on QoL

At the evaluated projects hardly any social scientist were included

Planners

Municipalities

Politicians, decision makers

Persons who implement land use and transport measures

In accordance with the state of the art: Physical and psychological aspects are named by the experts as important for QoL. In contradiction to the state of the art (and to their own comments made lateron) social-psychological and societal aspects are not seen as so important

The most relevant aspects according to the experts are: a clean environment, security, access to (transport) infrastructure that allows to lead an autonomous life, and a functioning social network (work, family, friends, social activities)

The expert stated that collecting of luxury goods and satisfaction of short-term needs as less important aspect for QoL

In relation to traffic and mobility, accessibility and safety are seen as important to ensure QoL

Communication with the persons responsible for implementations

Communication with experts about how QoL-aspects are taken care of with respect to different users (road users, residents, citizens)

Analysis (sociological, psychological, technical) of results and overview on current practice of evaluation

Analyses of attractiveness/ satisfaction with solutions as far as collected data allow this

Definition of indicators for analyses

Participation

The acceptance of implementations can be raised if QoL aspects are considered appropriately. It is important that planners and decision makers know the opinions and perceptions of users → participation

Therefor interdisciplinary work is necessary in connection with implementations in the public space. Social- and human-scientific knowledge have to be included in order to ensure a better QoL for citizens.

Identification of possibilities for improvements from the perspective of the disciplines involved in ASI

Selection of implementations to be evaluated

Researcher

Theory about connections between (traffic) safety, attractiveness and QoL

Recommendations for improvements in the evaluation process and practical consequences

Citizens

Start

(Evaluation)

Pilot - Application

It is necessary to take objective as well as subjective indicators of QoL into consideration and to evaluate them

The numerous definitions of QoL vary depending on discipline and personal preference. It is difficult to find a general definition of QoL and to operationalise it. →

Thus: Unclear what indicators to use for the evaluation of QoL viz. For measuring effects of implementations

Traffic planning
Urban planning
Projects aiming to promote sustainable

Dissemination to all groups

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