

Safety and contentment of pedestrians in connection with various mobility conditions

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Abstract

As input for COST Action Nr. 358 *Pedestrians' Quality Needs* (international co-operation started in autumn 2006) a study on life quality, safety and infrastructure for pedestrians was initiated in Vienna (Austria) in 2006. This national study is based on a pilot study implemented within the EU-project *Hotel (How to evaluate life quality)* and aims at an enclosing empirical analysis of life quality (referred to as Quality of Life QoL) in relation to mobility conditions. In detail, the (subjective) evaluation of certain improvements of road infrastructure for pedestrians will be screened. Based on the examination of the correlation between the design of public space, traffic safety and QoL, conclusions for the design of infrastructure and a reasonable organisation of the public space friendly to vulnerable road users can be drawn. Further emphasis will be put on safety aspects (which preconditions are beneficial for the safety of pedestrians; problems at crossings, line-of-sight obstructions etc.). Furthermore, gender aspects will be a special focal point of this study, as gender affects the use of public space, the (typical) modes of traffic etc. The survey (data collection) is conducted as representative questionnaire (telephone interviews). The results of this study will help to implement measures for the improvement of (subjective) traffic safety and, in connection with that, for the improvement of QoL (in Vienna). Therefore, the study is an instrument for the enhancement of walking and, at the same time, of the enhancement of safety for pedestrians. Here first results of the study are shown. In June 2007 there will be a final report with more details.

1. Background

1.1 COST 358 - Pedestrian quality needs

The COST action Nr. 358 *Pedestrians' Quality Needs* (PQN) is an international co-operation started in autumn 2006. The main objective of the Action is to provide an essential contribution to systems knowledge of pedestrians' quality needs, thus stimulating structural and functional interventions, policy making and regulations that support the improvement of walking conditions across the EU and other involved countries.

1.2 National project in Vienna (financed by Viennese authorities of MA 46)

As an input for this COST action a study on QoL, safety and infrastructure for pedestrians was initiated in Vienna (Austria) in 2006 by FACTUM OHG, the Austrian representative in this COST action.

The assumption of the national project was: QoL and safety of pedestrians are influenced by

- design of different places in the open space of a city (pavements, crossings etc.)
- organisation of car traffic taking pedestrians into consideration in a more thorough way
- space for walking and walkers (hindrances, width of pavement etc.)

All this, according to the state of the art (e.g., Risser et al. 2004) seems to have implications for safety as well as for QoL of pedestrians.

2. How to analyse QoL

In HOTEL a heuristic user oriented approach was chosen. In the frame of workshops and small working groups researchers of different disciplines discussed ways to define QoL.

Differences in definition were found between disciplines in respect to the following aspects:

- satisfaction of individual needs
- objective living conditions
- subjective well being
- sustainability
- connection with transport and mobility

One of the projects' objectives was to improve politicians', other decision makers', planners', technicians' and other experts' understanding of the assessment of different groups' of citizens' QoL.

Another goal was the development of a "toolbox" for the assessment of QoL in connection with city planning, transport and mobility and furtheron the harmonisation of data and starting up of a databank where results of QoL assessments at different occasions are stored.

The outcome of the approach was a checklist and thereafter a questionnaire were all the criteria for citizens' wellbeing in traffic, defined from different perspectives, and possible measures to improve it were mentioned. Objective as well as subjective assessment instruments of QoL are made use of.

The most important indicators for QoL in relation to traffic and mobility, according to Risser et al. 2004, are presented in the following figure 1.

Figure 1: Indicators of QoL and subgroups in relation to traffic and mobility



One of the findings was, that QoL in traffic had relevance on seven dimensions, which can be differentiated by special questions:

- * social climate/equity
- * objective safety
- * security
- * mobility
- * comfort
- * aesthetic/environmental quality
- * cost aspects

Other aspects relevant for dealing with QoL are sustainable mobility and possible conflicts which arise among different traffic participants and between communities and citizens. Being able to name and define the dimension of problems, e.g. aspects of comfort or safety, it would be easier to lead a dialogue between the different groups.

3. The Viennese project in the frame of COST 358

3.1. Goals of the national project

The Viennese project takes its starting point in the mentioned EU-Project **HOTEL (How To Evaluate QoL, HPSE-2002-60057)**. Primarily it is meant as a promotion of walking and more safety for pedestrians in the city of Vienna. Furthermore, it is also a replica of parts of the pilot study of Kristianstad, Sweden, which was part of the HOTEL research. The main focus, there, was to find out which elements of design and infrastructure of a city are in close relation to traffic safety and QoL.

Some central questions that should be answered with the help of the study in Vienna were:

- How can infrastructure and traffic organisation be assessed from the point of view of walkers?
- Which walking conditions support the feeling of safety?
- What could be good arguments for future traffic safety marketing in connection with the design of the open space

3.2. Basic information about the traffic situation in Austria - especially Vienna

In Austria, about 7 Mio people are living nowadays, in Vienna 1,7 Mio. According to latest data (31.12.2005 Austrian central bureau of statistics) the following amount of vehicles and among them cars are registered in Austria:

- 5,646.882 motor vehicles,
- Among them 4,156.743 cars

About 5,5 Mio people are driving licence holders in Austria. Of course, not all of them are driving. For example, many people who are older than 70 years still have their licence because there exists no age-limitation of the driving licence, but have reduced their driving considerably, or finished to drive motor vehicles.

Austria is divided into nine federal states, the city of Vienna is one among them. The safety situation of pedestrians in Vienna in relation to the other federal states is dramatic as shown in table 1. In 41% of all fatalities pedestrians are the victims which is the highest amount of all federal countries in Austria; in Austria as a whole "only" about 13 % of all killed persons are pedestrians.

Table 1: Pedestrian accidents per Austrian federal state 2005

	Pedestrian accidents			Accident rate (all accidents %)		
	Accidents	Injuries	Fatalities	Accidents	Injuries	Fatalities
BGLD	77	74	3	8,8	6,5	8,3
KTN	250	245	10	8,7	6,6	22,2
NÖ	462	450	20	6,7	4,9	9
OÖ	756	735	20	8,6	6,2	12
SBG	298	284	11	10,5	7,7	19
STMK	545	527	8	7,8	5,8	6,5
TIROL	405	396	3	9,8	7,4	5,3
VBG	188	173	8	11,1	8,2	32
VIENNA	1296	1267	14	22,7	17,8	41,2
Total	4277	4151	97	10,5	7,8	12,6

3.3. Approach

In the frame of HOTEL, preconditions for traffic safety and QoL have been worked out which are in close connection to walking. In a pilot study in the Swedish city Kristianstad citizens were asked about these preconditions. With respect to the Austrian study, we considered it interesting to compare the outcome of the Kristianstad pilot-study to the results of the inquiry in Vienna. This is of importance concerning the future planning of infrastructure, traffic organisation, and of the open space in the City of Vienna.

From February 12th to February 25th 2007 a standardised survey was carried out in the City of Vienna by FACTUM OHG (Gudrun Haindl and Ralf Risser). A representative sample of citizens (n=411) were asked to assess different kinds of infrastructure and traffic organisation.

To do this, the questionnaire of the HOTEL-project was adapted. The approach was subjective. Traffic participants could assess their safety-situation and express feelings regarding different traffic infrastructure elements and traffic organisation with help of Likert-scales. Especially four recently implemented infrastructure elements were of interest regarding traffic safety and QoL in traffic (see pictures 1-4 below).

In the end relations between those four ("new") design types and three other ("conventional") infra-structure elements – increased number of zebra crossings, regular raising of the whole intersection, increased number of traffic lights - and the feelings of safety as well as QoL should be analysed.



Pic. 1: Red framed zebra crossing



Pic. 2: Lane division



Pic.3: Extension of pavement



Pic.4: Raised pedestrian crossing

3.4. Results of the survey

3.4.1. Demographic aspects

To be able to find possible gender differences it was necessary to find male and female respondents equally represented. This was the case as can be shown in table 2. Moreover, respondents had to define themselves with respect to transport-mode choice (table 3).

Table 2: Gender

	N	%
male	201	48,9%
female	210	51,1%
total	411	100%

Table 3: Self definition of respondents regarding mode choice

	N	%
pedestrian	116	28,5%
cyclist	29	7,1%
car driver	74	18,2%
user of public transport	186	45,7%
other	2	0,5%
total	407	100%

Pedestrians and users of public transport (many of whom can be seen as pedestrians with respect to parts of their daily trips) were well represented. Similar to the actual situation in Vienna, car drivers were under-represented.

As some infrastructure elements are especially implemented in Vienna, much more than in other cities or on the countryside, it was important to find respondents who know the situation in Vienna, i.e. who regularly travel in Vienna. Accordingly, most of the people who were asked (91,7%) lived in Vienna, and the remaining persons stated that they would come to the city almost daily or at least once a week (table 4).

Table 4: Respondents living in or outside Vienna, accustomed to the traffic situation in Vienna

Residential area	N	%
Outside Vienna	34	8,3%
Vienna	377	91,7%
total	411	100%

3.4.2. Infrastructure and the importance for personal safety and/or QoL for pedestrians

The citizens who participated in the study (people who defined themselves as pedestrians, car drivers, cyclists, or users of public transport, see table 3) were shown pictures of the infrastructure elements and asked, to which of these elements they attributed most importance for their personal safety and for QoL.

Figure 2: Which infrastructure has most importance for your personal safety and QoL?



There was an equal ranking of the infrastructure measures but a significant difference (wilcoxon-test 0.0003) between the importance regarding safety and QoL.

Some of the measures seem to be more important with respect to QoL (zebra crossings, extension of pavements, raised pedestrian crossings) some with respect to safety (traffic lights, division of lane and raising of intersection).

Traffic lights were mostly attributed the highest safety- as well as QoL-contributions for the respondents. In this respect, no significant differences have been found between the groups of traffic participants. But traffic lights seem to have much more implications for safety than for QoL. This could be explained as a result of the situation in some intersections with traffic lights where pedestrians are not given the same time to cross the street as car drivers. Especially elderly people have to hurry very much which diminishes the feeling of comfort as well as the feeling of being equally respected as car-drivers are (see generally all criteria of QoL in fig 1, but especially that social and political ones).

It is also interesting that zebra crossings (redframed or not) without traffic lights are of more importance for QoL than for safety. They could be seen as a kind of symbol for an area especially dedicated for pedestrians. In relation to them traffic lights are meant for all traffic participants. Here some of the criteria of QoL of fig. 1 especially of the social and political part could influence the assessment particularly.

3.4.3. Implication of different measures regarding the situation of pedestrians Some questions were especially focussed on the situation of pedestrians. People were asked which of the infrastructure measures they assumed had the strongest potential to improve or deteriorate the situation of pedestrians.

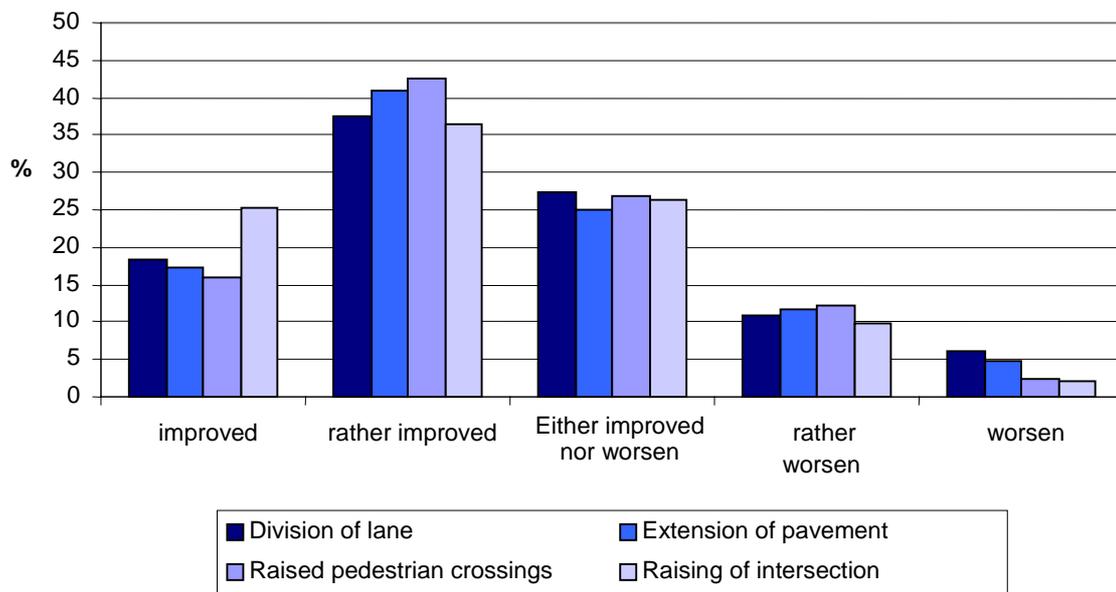
Concerning the three best ranked infrastructure measures (see fig. 2) the respondents meant that more zebra crossings as well as red framed zebra crossings had improved the situation of pedestrians most..

Figure 3: Which of the special measures have improved or deteriorated the situation of pedestrians most



But obviously also raised pedestrian crossings (fig. 4) have the potential to improve the situation of pedestrians. But in general, all of the analysed measures are attributed rather positive characteristics.

Figure 4: Which of the special measures have improved or deteriorated the situation of pedestrians



According to figures 3 and 4 the following measures have the best reputation:

- More zebra crossing
- Raised pedestrian crossings
- Red framed zebra crossing
- Traffic lights

Raised pedestrian crossings were the favourites.

Not surprisingly, differences could be found between pedestrians and cardrivers regarding the assessment of infrastructure:

- Pedestrians assess red framed zebra crossings and the raising of the crossing significantly better for the comfort and safety of pedestrians than car drivers and cyclists do.
- No significant differences between pedestrians and users of public transport were found.

With respect to the thorough analysis of these results, details are missing so far.

No differences have been found between the four recently implemented measures Red framed zebra crossing, Raised pedestrian crossing, Lane division and Extension of pavement (pic. 1-4) regarding

- safety of children,
- safety of elderly,
- comfort for pedestrians.

All of them were assessed equally well with respect to these criteria.

Conclusions

With the help of the adapted HOTEL-questionnaire the following hints for further improvements for the safety and QoL of pedestrians in the City of Vienna have been found:

- Traffic lights are estimated subjectively as being the best infrastructure measure – especially regarding safety of road users
- Basically all seven infrastructure measures have been assessed as being positive for pedestrians
- The extension of pavements is the most appreciated one among the four measures in question regarding pedestrians
- No gender differences have been found.

All four of the "new" measures in question were estimated as equally effective with regard to safety and QoL.

References:

Risser R. Bein N., Plichtová J., Sardi G.M. & Ståhl A. 2004, Pilot Study Report, Kristianstad, June – October 2004, FACTUM Chaloupka & Risser OHG, Vienna