

How to define and measure access and need satisfaction in transport

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Transport Planning and Quality of Life

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Abstract

Transport planning aims to improve access to important destinations, that is, the ease of reaching opportunities. Typically, transport planners consider the time and money needed to reach opportunities. We propose that transport planners should take a broader perspective. Rather than focussing on improving accessibility as such, they should aim to increase individual quality of life which depends on the extent to which basic human needs and values are fulfilled. This chapter discusses ways to assess anticipated and actual effects of transport planning policies on individual quality of life. We explain the concept quality of life, and indicate how individual quality of life can be assessed. Also, we describe how quality-of-life assessments can assist transport planners in designing, implementing, and evaluating policies to increase accessibility. Finally, we discuss factors that should be considered when assessing expected changes in quality of life.

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1. Introduction

Transport planning aims to enable individuals to satisfy their needs by facilitating access to important destinations (see #Becker and Gerike, this volume). This implies that transport planners are aware of basic human needs and understand how these needs can be best fulfilled. Transport planners generally focus on optimising access: they aim to improve the ease of reaching opportunities, that is, goods, services, activities, and destinations (Litman, this volume). Typically, transport planners consider the time and money it takes to reach these opportunities, while other costs (e.g., social and physical costs) are hardly taken into account.

In this chapter, we propose that transport planners should take a broader perspective. Rather than focussing on improving accessibility as such, they should aim to increase individual quality of life which depends on the extent to which basic human needs and values are fulfilled (e.g., Diener, 1995; Diener, Suh, Lucas and Smith, 1999). Although there is great consensus among experts and practitioners in the fields of transport planning about the importance of evaluating the effects of policies on quality of life, quality-of-life issues tend to be overlooked in current practices (Steg, De Groot, Forward, Kaufmann, Risser, Schmeidler, Martincigh and Urbani, 2007). This may be due to the fact that many experts and practitioners experience difficulties with evaluating quality-of-life effects of policies, because no general concept or operational definition of quality of life is available at the moment.

Improvements in collective quality of life may conflict with individual short-term interests, especially when individuals have to adapt their lifestyles to safeguard collective qualities. This is especially true for many problems related to traffic and transport. For example, car use harms collective quality of life because it causes environmental and accessibility problems, and threatens urban quality of life (OECD, 2002). On the other hand, car use has many individual advantages and thus enhances various aspects of individual quality of life. For example, driving a car provides convenience, independence, flexibility, comfort, speed, safety, and the car provides more status and pleasure than other modes of transport (e.g., Reser, 1980; Steg, 2003). Thus, collective and individual interests may be at odds. As such, the problems caused by cars are a typical example of a social dilemma. Improved quality of life for most citizens may imply that drivers forfeit some of the individual advantages of car use, which may (at least initially) be perceived as a threat to their individual quality of life. This suggests that we should not only examine how transport planning would affect quality of life on a collective level, but also how such plans would influence individual quality of life, because in the end, transport planning aims to increase the quality of life of citizens. Therefore, in this paper, we focus on individual quality of life.

In this chapter, we discuss ways to assess (possible) effects of transport planning policies on individual quality of life. We first explain the concept quality of life, and indicate how individual quality of life can be assessed. Next, we describe how quality-of-life assessments can assist transport planners in designing, implementing, and evaluating policies to increase accessibility. We also discuss factors that should be considered when assessing expected changes in quality of life. We end with a discussion of the main issues addressed.

2. Quality of Life

Individual quality of life is a multidimensional construct, and may be defined as the extent to which important values and needs of people are fulfilled (e.g., Diener, 1995; Diener et al., 1999). Quality of life refers to well-being, conceptualised either as the objective conditions of living of an individual, or as the person's experience of life (e.g., Ormel, Lindenberg, Steverink, and Vonkorff, 1997; Marans, 2003). For example, vehicle emissions are objective indicators of quality of life, while the extent to which individuals are concerned with these emissions are subjective indicators of quality of life. Assessments of objective conditions may differ from subjective evaluations of quality of life, that is, aspects that are believed to enhance quality of life do not necessarily improve citizens' perceptions of quality of life (and the other way around). Thus, measuring objective conditions only does not provide valid information on what supports or deteriorates quality of life. In this paper, we focus on subjective quality of life, which refers to individuals' cognitive and affective evaluations of their lives (Diener, 2000). When evaluating their quality of life, people may consider individual aspects (such as freedom and pleasure) as well as collective aspects (such as environmental quality). Thus, individual quality of life not only depends on the extent to which individual needs and values are fulfilled, but also on collective qualities.

3. Assessment of Quality of Life

Researchers from the University of Groningen developed a list of quality-of-life aspects on the basis of an extensive literature review of needs, values and human well-being. This instrument has been tested in various research projects on sustainable household consumption (see Gatersleben, 2000; Poortinga, Steg and Vlek, 2004; Poortinga et al., 2001; Skolnik, 1997; Steg et al., 2002; Vlek, Rooijers and Steg, 1999; Vlek, Skolnik and Gatersleben, 1998). This list appears to represent a wide range of non-overlapping dimensions that are important to consumers (and thus travellers). Table 1 provides an overview of the most recent version of these quality-of-life aspects. Clearly, quality of life is a much encompassing construct, that comprises many aspects that are relevant for accessibility, including money and time.

The list of aspects of quality of life (see Table 1) can assist transport planners in deciding:

- whether accessibility should be improved,
- for whom such improvements are needed,
- how such improvements may be best realised,
- to what extent these improvements are expected to increase the quality of life of various individuals and groups, and
- to what extent policies actually increased individuals' quality of life.

Three types of data are relevant in this respect. First, individuals can rate the importance of each quality-of-life aspect in their life. Second, individuals can indicate to what extent each quality-of-life aspect is currently being fulfilled. Third, individuals can report to what extent future developments or policies would affect relevant quality-of-life aspects in positive or

negative ways, or, after the chances have been realised, to what extent their quality of life has actually improved or reduced.

Judgements on satisfaction with quality-of-life aspects can be weighted on the basis of evaluations on the importance of the relevant aspects. Similarly, the expected or actual changes in quality-of-life aspects may be weighted on the basis of the same importance judgements, as changes in important quality-of-life aspects are more significant for individuals than changes in aspects that are considered to be less important. Subsequently, the overall quality of life, the overall expected changes in quality of life, or the actual changes in quality of life can be calculated. That is, a multi-attribute quality-of-life scale can be created by summing the judgements on the quality-of-life aspects, and, when desirable, each multiplied by the importance judgment assigned to it (e.g., Poortinga et al., 2001).

4. Practical Value of Quality-of-Life Assessments

Assessments of quality of life provide transport planners with various types of useful information to design and evaluate policies to improve accessibility and quality of life. Below, we discuss four ways in which quality-of-life assessments can facilitate policy making aimed to promote accessibility and sustainability.

Which quality of life aspects should be considered in transport planning?

First, information on the importance of various aspects of quality of life in general indicate which aspects should particularly be considered to safeguard or improve individual quality of life. Table 1 provides an overview of importance ratings of quality-of-life aspects by a representative sample of the Dutch population in 1999 (adapted from Poortinga et al., 2004). Scores could vary from 1 'not at all important' to 5 'very important'. Not surprisingly, most quality-of-life aspects are considered to be very important in people's life. This indicates that the lists indeed comprises relevant quality-of-life aspects. Table 1 shows that people would be more concerned about health, partner and family, social justice, safety, and education compared to material beauty, spirituality and religion, status and recognitions, and challenge and excitement. Transport planners should particularly consider possible impacts on the most significant quality-of-life aspects when designing and implementing policies, because the public will especially oppose policies that negatively affect these quality-of-life aspects, while they are more likely to support policies that would improve these aspects.

Aspect	Description	M	SD
Health	Being in good health. Having access to adequate health care.	4.9	.43
Partner and family	Having an intimate relationship. Having a stable family life and good family relationships.	4.7	.65
Social justice	Having equal opportunities and the same possibilities and rights as others. Being treated in a just manner.	4.7	.58
Freedom	Freedom and control over the course of one's life, to be able to decide for yourself, what you will do, when and how.	4.5	.67
Safety	Being safe at home and in the streets. Being able to avoid accidents and protected against criminality.	4.5	.71
Education	Having the opportunity to get a good education and to develop one's general knowledge.	4.3	.78
Identity/self-respect	Having sufficient self-respect and being able to develop one's own identity.	4.2	.82
Privacy	Having the opportunity to be yourself, to do your own things and to have a place of your own.	4.2	.82
Environmental quality	Having access to clean air, water and soil. Having and maintaining good environmental quality.	4.2	.77
Social relations	Having good relationships with friends, colleagues and neighbours. Being able to maintain contacts and to make new ones.	4.2	.76
Work	Having or being able to find a job and being able to fulfil it as pleasantly as possible.	4.2	.87
Security	Feeling attended to and cared for by others.	4.1	.84
Nature/biodiversity	Being able to enjoy natural landscapes, parks and forests. Assurance of the continued existence of plants and animals and maintaining biodiversity.	4.1	.86
Leisure time	Having enough time after work and household work and being able to spend this time satisfactorily.	4.0	.84
Money/income	Having enough money to buy and to do the things that are necessary and pleasing.	3.6	.78
Comfort	Having a comfortable and easy daily life.	3.5	.86
Aesthetic beauty	Being able to enjoy the beauty of nature and culture.	3.5	1.10
Change/variation	Having a varied life. Experiencing as many things as possible.	3.3	.90
Challenge/excitement	Having challenges and experiencing pleasant and exciting things.	3.2	.95
Status/recognition	Being appreciated and respected by others.	3.0	.98
Spirituality/religion	Being able to live a life with the emphasis on spirituality and/ or with your own religious persuasion.	2.9	1.32
Material beauty	Having nice possessions in and around the house.	2.6	1.03

Table 1: Description and importance ratings of 22 Quality-of-Life aspects.

Source: Adapted from Poortinga, Steg and Vlek (2004).

Table 1 also shows the standard deviations of the importance ratings of quality-of-life aspects. These standard deviations reflect the extent to which respondents agreed upon the importance of the aspects: the lower the standard deviation, the more respondents are in agree-

ment. The standard deviations of the aspects health, social justice, partner and family, and freedom are relatively small, indicating that people agree that these aspects are very important. In contrast, the standard deviations of aesthetic beauty, spirituality and religion, and material beauty are relatively high, indicating there is more disagreement on the significance of these aspects. So, respondents disagreed largely on the importance of the latter aspects. Interestingly, people seem to agree more on the significance of the most important aspects, whereas they disagree more on the least important aspects (see Poortinga et al., 2001).

Some studies examined group differences in the importance of aspects of quality of life. A study by Gatersleben (2000) revealed that low income groups rate freedom and privacy as more important than high income groups, while work is less important to low income groups as compared to high income groups. Also, young people rate nature as less important than other age groups, while older single people rate privacy, safety, comfort and material beauty as more important and work and education as less important than younger people do. The higher-educated value nature, freedom, and work more than the lower-educated do, while the latter group value safety and education more. In another study, Poortinga and colleagues (2001) found that Dutch respondents with greater environmental concern evaluate environmental quality and personal freedom as more important, and material wealth as less important than do respondents with less environmental concern. Dutch women value personal freedom and maturity more than do men, and unmarried persons evaluate family, health and safety as less important than do couples and families (Poortinga et al., 2001). This indicates that the same transport planning policy can affect various groups differently, because a policy may affect a quality of life aspect that is important to some groups, but far less important to other groups. It also implies that interests of different groups should be deliberated, and that it is very unlikely to design policies that will improve the quality of life of all involved.

Which improvements in quality of life are needed?

Second, assessments of current quality of life of individuals (that is, the extent to which each quality of life aspect is met, if needed, weighted on the basis of judgements on the importance of quality-of-life aspects) reveal which improvements in aspects of quality of life are desired or needed for different groups. That is, individual evaluations of the extent to which various aspects of quality of life are satisfied indicate in which areas improvements may be worthwhile, and how such improvements may be realised. For example, poor people may indicate that they are not satisfied with the amount of freedom and social relations they have, in contrast to wealthy people. This may be due to poor public transport that negatively affects the quality of life of those without a car, but not the quality of life of car owners. Another way to examine which aspects of quality of life should be improved is to combine users' evaluation of the importance of quality-of-life aspects and their satisfaction with the particular aspects in a Cartesian Plane (see Figure 1). By plotting importance ratings and satisfaction scores in a two-dimensional space (as in Figure 1), transport planners can easily assess which aspects of quality of life need further attention, and which aspects do not need urgent attention. That is, quality-of-life aspects that are highly important and not satisfied sufficiently need most attention, while those aspects that are less important and aspects with which individuals are satisfied do not need urgent attention. A diagnosis of the extent to which people

are satisfied with different aspects of their life is an important precondition for effective interventions.

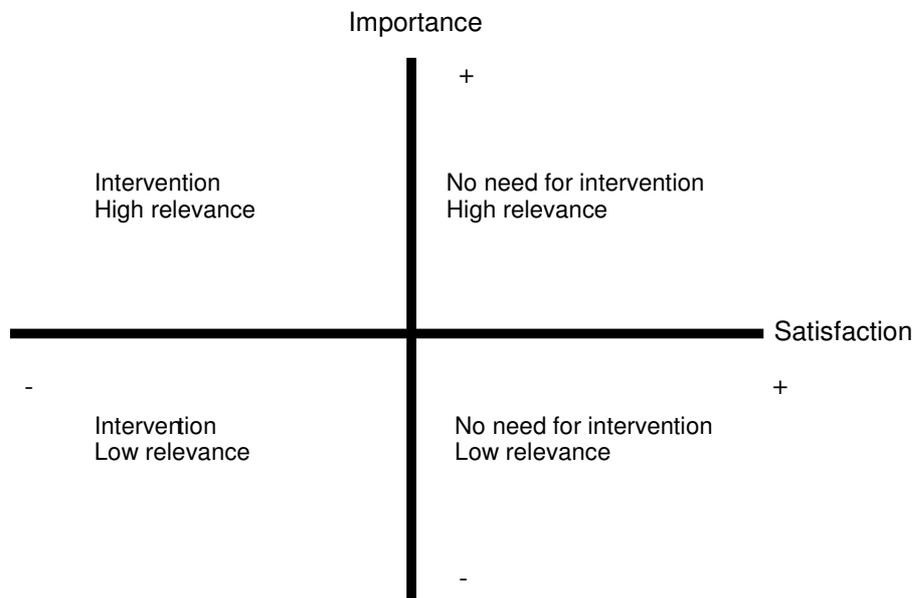


Figure 1: Cartesian Plane.
Source: Adapted from Steg *et al.* (2007).

How would future developments or policies affect individual quality of life?

Third, transport planners can assess to what extent future developments or future policies aimed to improve accessibility will affect individual quality of life before these developments have actually taken place or before the relevant policies have actually been implemented. Such information is highly relevant, as it reveals to what extent intended effects are likely to occur, which positive and negative effects are expected to occur, to what extent overall quality of life would improve or deteriorate, whether individuals have accurate perceptions of possible effects, and whether additional policies (including information strategies) are needed to compensate for expected negative effects.

This method has been successfully applied in various studies on sustainable household consumption. Vlek and colleagues (1998) studied to what extent future economic and environmental improvements or deteriorations would affect individual quality of life. Dutch respondents expected various negative changes in their quality of life when environmental conditions would deteriorate under either an improved or deteriorated economy, respectively. In particular, environmental quality, nature, health, aesthetic beauty, and safety were expected to be threatened. In contrast, respondents expected mixed positive and negative changes in their quality of life when economic conditions would deteriorate under improved environmental quality. More specifically, positive changes were expected in environmental quality, nature, safety, and health, whereas negative changes were expected in comfort, money, material beauty, and work. This suggests that environmental deterioration may reduce individual quality of life more strongly than economic deteriorations.

Gatersleben (2000) studied how reductions in household energy use would affect the quality of life of Dutch households. Participants first indicated which energy saving options they would choose when they had to reach a sustainable consumption level. Next, they indicated to what extent the adoption of these energy saving options would result in changes in 16 quality-of-life aspects. Reductions in freedom, comfort, pleasure, social relations, work, and leisure time were expected, as were some minor reductions in privacy and social justice. Improvements in environmental resources, quality of nature, income, safety, and recognition were expected, while few changes were expected in material beauty, education and health. The more respondents expected energy savings to have negative effects for health, social justice, leisure time, and freedom, and the less they expected negative effects for privacy, the more they believed that their quality of their life in general would be reduced. This suggests that negative effects on quality of life may be compensated with positive effects, resulting in minor changes in overall quality of life. Moreover, these results suggests that policy makers should especially try to prevent reductions in freedom, health, leisure time, and social justice.

Poortinga and colleagues (2001) examined the extent to which sustainable household energy consumption scenarios would affect individual quality of life. Respondents evaluated scenarios that systematically varied on 3 dimensions:

- the focus of energy saving (home versus transport),
- the means of energy saving (technical innovations, behaviour changes, or a combination of both) and
- the amount of energy saving (20 per cent versus 30 per cent energy reduction).

Dutch respondents indicated which changes in quality-of-life aspects they expected from the scenarios. For this volume, the expected quality-of-life changes from the transport scenarios are particularly relevant. In general, the transport scenarios were expected to reduce comfort, work, money, privacy, and freedom, whereas improvements were expected in nature and biodiversity, and environmental qualities. Interestingly, overall quality of life (that is, the sum of expected changes in quality-of-life aspects) appeared not to be affected much, which implies that the expected improvements nearly compensated the expected reductions in quality of life. The respondents expected most negative consequences from the transport scenario that involved technological as well as behavioural changes that would result in small energy savings. Interestingly, the multi-attribute quality of life measure appeared to be significantly correlated with an intuitive measure of expected quality of life changes (the latter was based on one question: respondents indicated to what extent their quality of life would change if the scenario was implemented; Poortinga et al., 2001). This indicates that the quality of life instrument provides a valid indicator for evaluating changes in quality of life, showing how people think they will be affected by certain policies and which quality-of-life aspects are responsible for this evaluation.

De Groot and Steg (2006a) investigated the extent to which doubling of the costs of car use would affect individual's quality of life. The study was conducted in five European countries: Austria, Czech Republic, Italy, Sweden, and The Netherlands. Respondents expected negative changes in comfort, money and income, freedom, change and variation, leisure time, and work, while they expected positive changes in environmental quality, nature and biodiversity,

and safety. Strikingly, overall, people expected only a minor decrease in their perceived quality of life when costs of car use are doubled, as became apparent from an evaluation of the extent to which this policy would affect overall quality of life (again, respondents indicated to what extent their overall quality of life would change) as well as from the mean score on perceived changes in 22 specific quality-of-life aspects. Thus even a stringent measure, such as doubling costs of car use, seemed hardly to affect people's general well-being. Apparently, reductions in some quality-of-life aspects were compensated by improvements in other aspects. Some interesting differences between the five countries were found. Respondents from The Netherlands and Sweden appeared to be more pessimistic about the quality-of-life consequences of the policy than respondents from the Czech Republic, Italy and, to a lesser degree, Austria. That is, the Dutch and Swedes expected the negative effects to be stronger, and the positive effects to be less significant than respondents from the Czech Republic and Italy. Further research is needed to examine why these differences occurred. This study also revealed that the mean score in perceived changes in the 22 aspects of quality of life was strongly related to people's overall judgment of perceived changes in quality of life, again indicating that the quality-of-life instrument is useful to evaluate changes in quality of life.

In another paper, based on the same study as described above, De Groot and Steg (2006b) examined group differences in expected quality-of-life effects. They demonstrated that people with different value orientations expected different effects of transport policies (i.e., a doubling of costs of car use) on their individual quality of life. People with a strong egoistic value orientation, who especially consider costs and benefits for them personally, evaluated quality-of-life consequences of this policy more pessimistically than people who have a weak egoistic value orientation. On the other hand, people with a strong altruistic or biospheric value orientation were more optimistic compared to those with weak altruistic or biospheric value orientations. People with an altruistic value orientation will particularly evaluate the consequences of transport planning policies on the basis of perceived costs and benefits of these policies for other people, while a biospheric value orientation implies that evaluations are based on perceived costs and benefits for the ecosystem and biosphere. This implies that it is important to consider group differences in (expected) quality of life effects, and to examine whether and how particular groups can be compensated when they will be affected disproportionately. Also, these results imply that people are more likely to evaluate effects on individual quality of life positively when altruistic and biospheric values are strengthened or dominant.

How did policies actually affect individual quality of life?

Fourth, actual quality of life effects of transport planning policies can be assessed after a particular policy has been implemented. Actual changes in quality of life may differ from changes that individuals expected before the proposed policy has been implemented. For example, various studies have shown that public support of transport pricing strategies may be higher after transport policies have been implemented (Tretvik, 2003; Schuitema and Steg, 2008), and that actual effects of pricing policies were less negative than expected beforehand (Schuitema and Steg, 2008). Similarly, a study by Heath and Gifford (2002) revealed that attitudes toward bus riding improved and bus riding increased after a policy change, that is, the implementation of a U-Pass that allows free bus riding after a mandatory addition to stu-

dent fees at the University. Probably, opinions are better informed after policy implementation, because individuals actually experience the pros and cons of the measures. Individuals may also be more convinced of the advantages of the new policies because they perceive that the problems are being solved (cf. Schuitema and Steg, 2008). Moreover, changes typically are resisted at first, because these may have negative consequences. As long as the consequences are unsure, individuals prefer the status quo (Kahneman and Tversky, 1984). Similar processes may play a role when people are asked to assess which changes in quality of life they would expect from future (transport) scenarios and policies.

To examine the extent to which changes in society or in transport actually affect judged quality of life, the quality-of-life concept should also be used to monitor quality of life over time. Steg and colleagues (2002) asked respondents to indicate how and to what extent their quality of life would be affected by reducing their household energy use, and how and to what extent their quality of life actually changed after they reduced their energy use. Dutch households were asked to (voluntarily) reduce their household energy use by at least 5 per cent. Each household received tailored information about possible ways to reduce their household energy use. They also received feedback about the amount of energy saved. Before the experiment, respondents expected improvements in environmental qualities and in nature and biodiversity when they would reduce their energy use by about 5 per cent, while few changes were expected on the other 20 quality-of-life aspects listed in Table 1. One month after the experiment started, households indicated how and to what extent their quality of life actually changed because of their energy savings. They reported improvements environmental quality and in nature and biodiversity. No changes in the other quality-of-life aspects were reported. These results suggest that respondents were rather accurate in their assessment of how and the extent to which their behaviour changes would affect their quality of life. This study focused on voluntarily behaviour changes. Probably, participants adopted energy saving options that were convenient for them, and would not affect their quality of life much. It is likely that quality of life would be affected more when people are forced to change their behaviour, and that expectations on changes in quality of life are less accurate in this case.

5. Factors Influencing Judgements of Quality-of-Life Effects

When assessing how transport planning may affect future quality of life, it is important to consider the following issues. First, it may be difficult for individuals to think through how various transport planning policies would affect their quality of life. To ensure that respondents provide well-considered judgments of the expected effects of transport plans on their quality of life, the plans should be described in a plausible and imaginable way. Clear description of proposed changes in the transport system is important for helping respondents think through possible consequences of the plans for them personally. Future research should reveal how valid judgments can best be collected, and how psychological processes that affect quality-of-life evaluations can best be understood.

Second, transport planning policies are likely to be met with initial resistance, as long as individuals are not convinced of the positive consequences. However, individuals seem to adapt

to positive as well as to negative changes in their lives; they change their expectations and goals (e.g., Diener, 2000; Meyers, 1992; Suh, Diener and Fujita, 1996). For example, Diener et al. (1999) found that general subjective well-being has not changed much over the last several decades, even though incomes and consumption levels have increased significantly (see also Veenhoven, 2004). Apparently, quality of life is judged in comparison to some standard (Diener, 2000; Ormel et al., 1997). We feel more satisfied with our lives when we believe we are better off than others are, when we are better off than yesterday, or when we are closer to our aspirations. These standards used to judge quality of life do change over time, that is, we adapt our comparative standards to changes in our circumstances, which might improve or deteriorate. This implies that further increases in transport or accessibility will not necessarily enhance quality of life, and reductions in transport levels or accessibility may not necessarily reduce quality of life. Although in the latter case individuals may initially experience a reduction in quality of life, they probably will adapt soon after the changes (Diener, 2000). Thus, the conviction of many politicians that accessibility should be increased as much as possible because restrictions in accessibility will seriously threaten quality of life may not be true, and should at least be tested. Moreover, support for transport planning policies may be stronger after they have been implemented, especially when individuals experience the positive aspects of the policies (e.g., Schuitema and Steg, 2008).

Third, we defined 22 quality-of-life aspects that are supposed to be relevant for any individual. This is in line with theories that assume that needs and values do not differ over time or between cultures (e.g., Maslow, 1954; Max-Neef, 1991; Rokeach, 1973; Schwartz, 1992; Schwartz and Bilsky, 1987; 1990; see Vlek et al., 1999 for a review). However, the way individuals (prefer to) fulfil their needs and values does change over time and differs between cultures and groups. For example, in some (sub-)cultures the need for freedom may be fulfilled by driving a car, while other cultures prefer cycling. Also, some decades ago, people generally lived more close to their friends and family than nowadays. Such preferences for ways to fulfil one's needs and values have great consequences for accessibility.

Obviously, transport planning can affect various groups in society differently, and group differences may exist in preferences for different transport planning policies (cf. Adams, 1999; Button, 1982). For example, reductions in car use may enhance the quality of life of city dwellers because of fewer traffic jams, less noise, and better urban quality of life, while it may reduce the quality of life of rural dwellers because some locations and activities may be much more difficult to access. Consequently, the interests of various groups should be balanced, and it may be necessary to compensate groups that are disproportionately affected by current as well as future transport planning policies. Also, the relative importance of aspects of quality of life may vary over time (see Gatersleben, 2000; Inglehart, 1990). This implies that the multi-attributive evaluation of sustainable transport scenarios on quality of life effects can be time dependent. We know reasonably well which quality-of-life aspects should be considered, but the relative importance of various quality-of-life aspects, and consequently, overall (multi-attributive) effects on quality of life should be monitored on a regular basis. Based on this, transport planning policies may need to be adapted.

Fourth, the method to assess (changes in) quality of life is based on a compensatory decision-making model. The assumption is that people consider changes in all 22 quality-of-life

aspects. That is, it is assumed that all 22 quality-of-life aspects are important for individuals' overall evaluations of quality of life. In practice, people can use other decision rules when evaluating future scenarios and policies. Whether drivers or other concerned individuals are "involved" (that is, actively considering) or not in the particular transport planning initiative may imply different models of how proposed alternatives are evaluated (e.g., Greenwald and Leavitt, 1984). When individuals are involved, compensatory models like the multi-attribute model described above may better describe their evaluations of transport alternatives presented to them. That is, involved persons are able and willing to compensate less-desirable consequences with more-desirable consequences of scenarios presented to them. However, many persons may have little cognitive or emotional involvement in transport planning issues. For these individuals, a variety of non-compensatory models may better describe their evaluation of alternatives, because they have limited beliefs and limited knowledge, and care little for the issues. Their evaluations may be better predicted by conjunctive or disjunctive rules. When a conjunctive rule is used, the person rejects any alternative that does not meet all his or her minimum criteria for acceptability. When a disjunctive rule is used, the person accepts any alternative that meets or surpasses any of his or her criteria. Individuals may also use "*fast and frugal*" criteria when they are less involved (Gigerenzer and Todd, 1999); transport users have many things on their minds in their daily lives besides transport planning issues, and must be "*cognitive misers*" (Fiske and Neuberg, 1990) to survive and prosper. However, the studies by De Groot and Steg (2006a) and Poortinga and colleagues (2001) suggest that a compensatory model is accurate to assess quality of life. Both studies revealed that the multi-attribute quality-of-life measure was strongly correlated to an overall (intuitive) measure of expected quality-of-life changes (see Section 4). Strong correlations between both measures are less likely when non-compensatory models are used. Future research should study whether the level of involvement affects the evaluation of transport planning scenarios, and whether a compensatory model is indeed appropriate to assess quality of life.

6. Discussion

We aimed to demonstrate that the quality-of-life concept is useful for assessing expected effects of transport planning policies or future developments in accessibility and transport, because in the end, transport planning strategies are aimed at increasing quality of life of citizens. Also, we illustrated how quality-of-life issues can be addressed in transport planning. We defined quality of life as the extent to which important needs and values are fulfilled, and focused on subjective evaluations of quality of life. Of course, user perceptions may be biased and based on insufficient information on the aims and consequences of transport planning policies. However, since quality-of-life evaluations are subjective by nature, and such evaluations will affect the acceptability and effects of the particular policies, it is important to collect information on user perceptions. Of course, perceptions may change (and become more accurate) when users are informed about the aim and intended and actual outcomes of policies. Quality-of-life assessments can assist transport planners in deciding whether user perceptions are correct and how perceptions can be improved. In case of misperceptions or public un-

awareness, the public can be informed and educated to the need for, and possible consequences of, transport planning policies.

The studies reviewed in this chapter indicate that reductions in car use typically threaten quality-of-life aspects on an individual level, such as comfort, freedom, and privacy, while quality-of-life aspects that refer to perceptions of collective qualities, such as environmental quality and nature and biodiversity would improve. This once again illustrates the conflict between individual and collective interest in the domain of traffic and transport. Interestingly, the studies revealed that deteriorations in specific quality of life aspects on an individual level can be compensated for by improvements in other aspects, notably collective-level aspects, such that even stringent transport planning policies may not affect overall individual quality of life much.

The quality of life instrument can be used as a tool to diagnose the present situation, as well as to evaluate possible solutions for transport problems. Several studies revealed that the quality-of-life instrument is useful for assessing actual as well as expected quality-of-life effects of transport planning policies. The instrument not only reveals whether overall quality of life of different groups of citizens would be affected, but also how quality of life would be affected, that is, which quality-of-life aspects are expected to improve or deteriorate when transport planning policies would be implemented.

We believe that the acceptability, effectiveness and efficiency of transport planning policies will be enhanced by systematically assessing (possible) quality-of-life effects *before and after* implementation of such policies. Administering the instrument before a policy implementation is taking place assists transport planners to identify which aspects of life are in need of improvement. Further, this reveals how and to what extent transport planning policies may affect quality-of-life of different groups of citizens, and what can be done to reduce, prevent or compensate possible negative effects and optimize positive ones. By doing so, the needs and values of various groups can be better understood, including the needs and values of specific (notably vulnerable) groups. Also, the public can be informed about expected positive and negative effects of proposed transport planning policies. This would greatly improve the current situation, in which decisions often are based on the preferences of special-interest groups. At present, significant minorities that have sufficient political power can obstruct particular solutions or compromises, which leaves transport planners with options that are unacceptable for others and/or watered down so much that their effectiveness becomes questionable.

Employing the quality-of-life instrument after policies have been implemented reveals to what extent policies have actually improved quality of life. If not, transport planners may adjust policies, or implement additional supportive policies. We hope the quality-of-life instrument will help transport planners to better address quality-of-life issues in their work and to develop plans that will improve the quality of life of citizens in the intended way.

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