What do users tell you?: Considerations when collecting and analyzing opinions in traffic planning

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Keywords:
User, traffic-related phenomenon, occurrence, annoyance, street characteristics, walking frequency, user involvement

Abstract:
Users' perceptions of their traffic environment are of interest to both researchers and practitioners within the realm of traffic planning. The aim of this thesis is to contribute to methodological considerations when collecting and analyzing users' opinions on features in their traffic environment. Questionnaires were sent out to residents along four arterial streets in Malmö, Sweden, covering questions related to their respective traffic environments. The results show that respondents' answers were dependent on how frequently they walk in the neighbourhood and how the questions were phrased. Further, the results emphasize the importance of contextual aspects in terms of physical and traffic-related features in the streets, and show that the respondents are quite able to relate to their surrounding environment when answering. The thesis also contains discussions on relationships between estimated occurrence and associated level of annoyance. Finally, conclusions are drawn from telephone interviews with practitioners, covering why and how collection of user opinions is executed in Swedish municipal planning. The results from the interview study create a frame for analyzing how the results from the questionnaire can be implemented.

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To Agnes & Isak

Preface

"Is there too much traffic in your street?"

While this is an easy question to ask of someone in the street, the answer is likely to be as predictable as asking if environmental pollution is good or bad. Of course, there is always too much traffic!

Traffic-related issues often seem to trigger strong opinions, perhaps because everybody, in some way, is part of the traffic system. Whether one is involved in the daily activity in a street or road, or dependent on services or goods that in turn are dependent on travelling or transport-facilities, one may often have reason to relate to traffic and traffic-related issues. What does the answer to the question above tell us? How much is too much? How important is it to reduce the number of cars? Why is it important?

Since the traffic system is made up of a range of different types of individuals, who travel by different modes and have different interests, needs, and demands, the number of unique opinions grows with every single user. Hence, when planning traffic environments, there is a need to acknowledge the dynamism of the variety of users and to balance their *subjective* views with the *objective* demands on the traffic system, in terms of e.g. traffic safety measures and level of service.

From a research point of view, analyses of user opinions are vital in order to identify factors that may affect individuals' views or how different elements in the traffic environment are experienced or perceived generally. Another objective is to contribute to the state of the art in traffic planning in terms of how to meet the needs and demands of road users.

However, it is well known that objective reality and reality as individuals view it can differ widely. The overall aim of this thesis is to contribute to an enhanced understanding of how to collect and interpret users' experiences and perceptions of their traffic environment. This is done partly by discussing methodological considerations associated with the collection of user opinions, and partly by analyzing how user opinions are collected in Swedish municipalities today.

Contents

List of papers

Paper 1

Wahl, C., Svensson, Å., Hydén, C. *Factors influencing residents' estimate of traffic-related phenomena in their street*. (Submitted to Transport Policy, March 2011. Accepted with minor revisions, December 2011)

Paper 2

Wahl, C., Svensson, Å., Hydén, C. (2010) *Effects of minor phrasing variations in traffic-related questionnaires Comparison of objective equivalences and respondents' subjective statements*. Transportation Research Part F: Psychology and Behaviour, 13(5), pp. 315-328.

Paper 3

Wahl, C., Svensson, Å., Hydén, C. (2011) *The link between traffic-related occurrence and annoyance*. IATSS Research. (In press)

Paper 4

Wahl, C. *Swedish municipalities and public participation in the traffic planning process – where do we stand?* (Submitted to Transportation Research Part A: Policy and Practice, January 2012)

Sammanfattning

Planering av trafik omfattar betydligt mer än vad som kan ses för blotta ögat. Du måste tänka på helheten, inte bara situationen på den enskilda platsen. Du måste också tänka på hur det passar i hela systemet. Åtgärder måste sättas i sitt sammanhang. Vilka kompromisser måste göras? Är förbättringar av säkerhet alltid bra även om de t.ex. görs på bekostnad av miljön? Vad blir effekten på lång sikt? Vilka övergripande mål finns? Det viktigaste och svåraste målet är att skapa en miljö som passar så många som möjligt. En del i pusslet är därför att förstå hur olika situationer upplevs av de som vistas i miljön. Men hur tar man reda på vad människor tycker egentligen? Och vad betyder det folk säger?

Denna avhandling är ett bidrag till hur man går till väga när man tar tillvara människors erfarenheter av trafiken i staden. Utifrån ett forskningsperspektiv är kunskap om människors uppfattningar viktig för att därifrån kunna formulera riktlinjer och rekommendationer till planeringen. I den praktiska planeringen är människors uppfattningar och åsikter dessutom en viktig strategisk del i trafikplaneringsprocessen. Genom att låta människor delta i någon del av processen kan beslut och projekt förankras hos användarna. Därmed ökar möjligheten att skapa förståelse för varför vissa åtgärder görs och dessutom ges en chans att göra sin röst hörd.

Det låter enkelt. Men, det är inte bara att fråga folk om vad de tycker. En stor del av problemet är att alla människor är trafikanter. Vare sig det gäller ett enstaka ärende till butiken på andra sidan gatan eller daglig bilpendling till jobbet så utgör alla delar i en ständigt omväxlande trafikmiljö. Alla dessa trafikanters olika behov och egenskaper måste hanteras. Lägg dessutom till att dessa behov kan skifta när

en och samma person byter roll. Som forskare har man tillgång till gedigen kunskap i hur man samlar in och analyserar information från människor. Både trafikmiljöer och trafikanter är komplexa, och fokus i denna avhandling är att försöka identifiera samband för informationsinhämtning som är relevanta i trafiksammanhang.

För att kartlägga vilka metodsamband som kan vara intressanta vid insamling av information från människor i trafiksammanhang gjordes en enkätstudie. Denna utfördes bland boende längs fyra huvudgator i Malmö. Genom att koncentrera utskicket till begränsade områden gavs möjligheten att göra jämförelser mellan respondenternas svar och den verkliga trafiksituationen i dessa miljöer (i fråga om gatans fysiska utformning, hastigheter, flöden, olycksfrekvens mm). De forskningsfrågor som berördes i enkäten omfattade: Vilken betydelse har formuleringen av frågor? Vilka bakgrundsvariabler är relevanta att kontrollera för när man gör undersökningar i trafiksammanhang? Hur realistisk bild av en trafiksituation är människor kapabla att ge? Vilket samband finns mellan den skattade förekomsten av ett fenomen och graden av problem som associeras med problemet?

Resultaten från enkätstudien kan sammanfattas i ett antal rekommendationer:

- Människor som rör sig mer frekvent i en miljö anger oftare att efterfrågade fenomen förekommer i större utsträckning. Därför är det av intresse att kontrollera hur bekant den tillfrågade är med det frågan gäller.
- Information om bakgrundsfaktorer som kön och ålder är ofta relevanta och enkla att samla in. Resultaten i relation till trafikrelaterade faktorer visar dock att de är svåra att analysera eftersom effekterna av kön och ålder är svåra att isolera från varandra samt även från andra sociorelaterade faktorer. Därför är det viktigt att fundera på vilket bidrag kön och ålder kan tänkas ge till en analys och om de verkligen är intressanta i sammanhanget.
- Små förändringar av hur en fråga ställs kan få stora konsekvenser i svaret. Därför är det viktigt att vara konsekvent vid formulering av frågor, t.ex. när flera undersökare är involverade i en studie eller vid en före- efterstudie.
- Även om respondenterna i enkäten hade relativt svårt att göra korrekta skattningar av objektiva faktorer som olycksfrekvens och förekomst av fortkörning, visade det sig att de svarande på en gata gjorde rimliga bedömningar av situationen på sin gata i relation till situationen på andra gator. Vid analys av information från trafikanter är det därför viktigt att vara medveten om kontextuella aspekter, som t.ex. att trafiksituationen varierar i och mellan miljöer. Dessa kontexter kan skapa olika referensramar för olika individer.

- Ibland kan det verka som att folk klagar för klagandets skull. Men, vid jämförelser mellan den upplevda förekomsten av fenomen, som t.ex. fortkörning och cyklister på trottoaren, och det problem man förknippar med dessa, visade det sig att få svarande anger en hög grad av problem vid låg förekomst av ett fenomen, och omvänt. Detta indikerar att en persons uttryck av t.ex. hög förekomst av fortkörning, inte nödvändigtvis är ett uttryck för allmänt missnöje, utan tycks vara baserat på en personlig upplevelse av, och problem med, detta fenomen.

Inom ramen för denna avhandling utfördes även telefonintervjuer med trafikplanerare i syfte att undersöka hur vanligt det är med involvering av medborgare i trafikplaneringsprocessen, varför det utförs, samt på vilket sätt deltagande sker. Resultaten indikerade att det finns en positiv inställning gentemot deltagande, men att det av olika anledningar är ett sällsynt inslag i planeringen. I brist på direkt erfarenhet hade därför de flesta svarande svårt att diskutera för- och nackdelar med olika metoder. Däremot framkom att flera planerare, vid eventuell involvering av medborgare, hade svårt att veta vad de skulle göra med den insamlade informationen och att detta kunde verka direkt avskräckande mot ytterligare deltagandeprocesser. I perspektiv av att de instruktioner för deltagande som finns i gällande planeringshandledning är mycket summariska, indikerar detta att det finns ett behov av kortfattade och enkla riktlinjer. Utan att specificeras mot en viss typ av metod för datainsamling, skulle rekommendationerna i listan ovan kunna vara användbara för att förenkla informationsinhämtning i den praktiska planeringen.

1 Introduction

A traffic environment consists of physical elements such as street widths, number of lanes, presence of bicycle facilities, regulations, etc. and varying objectively measurable factors associated with these such as traffic volumes and speed levels. Since every street in the city is part of a larger network, there is a constant need to balance different interests, in a single street as well as the network as a whole. Which traffic mode/s should be prioritized? What level of service is desirable for different types of road users? What happens if motorized vehicles are restricted on some links, speed measures are implemented, new bicycle lanes are introduced, etc.? Issues of safety, level of service, accessibility, aesthetics, environmental factors, and so on must be weighed against each other.

Besides balancing physical and engineering prerequisites, consideration must be given to the fact that the basis for the traffic system is constituted by the people using it. These users[1] make *subjective* interpretations of their surrounding traffic environment and based on those interpretations they demonstrate needs and priorities from their perspective. In the realm of traffic planning, subjective opinions[2] are of importance creating traffic environments where the users feel comfortable and are encouraged to use the facilities in the intended way.

[1] The terms "public", "users" and "citizens" are used interchangeably and without further definition in this thesis. When used, they correspond to the individuals that the researcher or planner communicates with. In Study 1, the respondents are residents in the study area, and hence the term "residents" is to be interpreted as "users" (or equivalent) as well.

[2] "Opinions", as used in this thesis, is meant to embrace an individual's expression of his/her experiences and/or perceptions.

1.1 Reason for collecting user opinions

The overall objective of Swedish transport policy is that provision of transport services for people and businesses should be economically efficient and sustainable. One part of the overall objective covers basic accessibility of good quality and functionality for all. For instance, men and women should be able to use the transport system equally, the outdoor environments should be adapted for individuals with functional limitations, and children should be able to use the transport system in a safe manner. In order to fulfil these objectives, there is a need to consider the needs and demands of different groups of stakeholders when planning traffic environments. (Prop 2008/09:93)

Besides requiring knowledge of how users experience and perceive their traffic environment in order to fulfil the national objectives of accessibility, there is reason to explore and analyze the opinions of users in order to be able to understand how they react to and regard traffic elements. This knowledge can then be generalized into guidelines on best practice when planning[3] traffic environments (see Figure 1). For instance, regarding public transport, there is quantified information on the demands different user groups may have when it comes to subjective factors such as acceptable walking distances to bus stops, seating comfort, travel time (Holmberg, 2008). Similarly, highlighted relationships between gender and e.g. security and traffic safety, which has led to recommendations on design of pathways etc. (Polk, 2005).

From a planner's perspective, there can be reason to collect user opinions in specific projects, e.g. to understand users' needs and demands (Innes, 1998), to collect opinions and suggestions on designs or to follow up implemented projects (see Figure 1). Further, involvement of users also gives an opportunity to anchor objectives of the planning by enhancing users' knowledge and potentially creating a better understanding of measures and changes (Irvin and Stansbury, 2004; SKL, 2007; Taylor and Tight, 1997). Communicating with users in a planning context is voluntary, except when changes in zoning or development plans are to be made. General consultations with parties affected by the changes are then mandatory (SFS, 2010:900). However, involvement of users in the traffic-planning process is

[3] Even though traffic planning embraces both research and practice, the terms "planning" and "planner/s" are used here as equivalent to "practice" and "practitioner/s"

encouraged in the existing guidelines for traffic planning in Sweden, TRAST (Traffic for an Attractive Town)[4], and is also motivated by a statement that citizens have a right to influence their local environments (SKL, 2007).

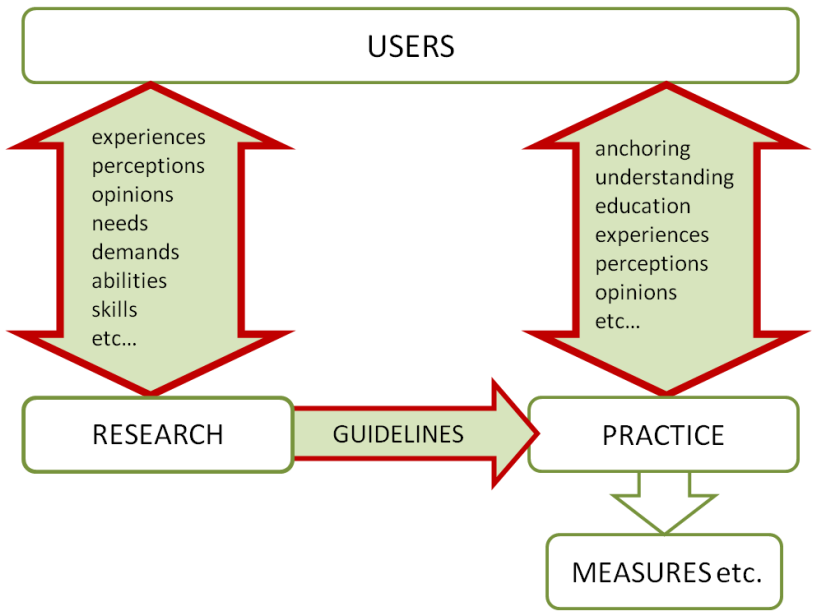

Figure 1 • Illustration of communication, researchers/practitioners – users

The extent to which users should be involved in planning-processes has been a matter of discussion. The "participation ladder" by Arnstein (1969) is a traditional model for participation and illustrates eight levels of involvement (Manipulation, Therapy, Informing, Consultation, Placation, Partnership, Delegated power, and Citizen control), where each level corresponds to different degrees of citizen power. Whether participation as a means of power should be the main objective with involvement has been open to question (Tritter and McCallum, 2006), and

[4] The first edition of TRAST was published in 2004, followed by the second edition in 2007, and is meant to embrace and replace all prior traffic-planning documents and norms in Sweden. The approach in TRAST is holistic with focus on traffic as a part of a town's physical and social environment. SKL (2007) *Trafik för en attraktiv stad: handbok*, Utg. 2 ed. Sveriges kommuner och landsting, Stockholm.

alternative models have emerged, e.g. a ladder by Wilcox (1994) which is more focused on the dynamics between the participants and the planner/s. What level of participation is the most appropriate has been debated. Grisez Kweit and Kweit (2007) conclude that the possibility of participating may be more important than participation itself, while Arnstein (1969) and Beebeejaun and Vanderhoven (2010) warn against involvement as an empty ritual without real influence to make changes.

1.2 Difficulties associated with opinions from users

Research has shown that subjective statements do not always match the objective situation on which the statements are supposed to be made, which makes handling user opinions on traffic-related matters a difficult task. For instance, the number of accidents can be used as an objective measure of the level of safety (Elvik et al., 1997), but users do not necessarily regard a place with few accidents as safe, or the other way around (Johansson and Naeslund, 1986). Similarly, speed levels can be used as a traffic-safety indicator, e.g. in the power model, where change in speed level is correlated to change in number of injuries and fatalities (Elvik et al., 2004; Nilsson, 2004). Still, lower speeds resulting in improved safety may be perceived as neither lower nor safer, (Ekman, 2000; Wahl, 2006). Further examples can be found e.g. regarding accessibility. Wennberg et al. (2010) examined older pedestrians' mobility before and after removal of physical barriers and found no significant change in mobility, which indicates that efforts to improve objective parts of the traffic environment may not be reflected in users' interpretation of the same.

Information about the discrepancy between objective and subjective is central when interpreting statements from users. When it comes to traffic, people often have strong opinions on what is right or wrong or what is best for them, and judging from letters to newspapers, for example, there seems to be little reliance on traffic-related research or on the professionalism of traffic planners. It is in some sense impossible to argue with an individual about what is right or wrong when it comes to his/her opinions. In the theoretical context of traffic planning, the way an individual experiences or perceives something can be regarded as right or wrong, but the experience itself is always right in the individual's context. Thus, it is of great importance to understand the individuals' experiences and perceptions of the traffic system, no matter if they are right or wrong in theory.

1.2.1 Factors influencing information from users

Another issue is that an individual's experience and subsequent perception of his/her traffic environment can be affected by several things not necessarily related to traffic-related factors alone.

The users may represent different age groups, men and women, different socio-economic prerequisites, and cultural groups, and thus have different values, attitudes, needs and demands. A factor such as gender can have an impact on how issues related to risk are perceived. Several studies have shown that women are more concerned about risks, and perceive them as higher (DeJoy, 1992; Finucane et al., 2000; Flynn et al., 1994). However, other studies have shown the opposite (Nordfjaern and Rundmo, 2009), and that it is hard to separate a factor like gender from others such as age and socio-economic factors (Polk, 2005), and socio-political factors such as power and alienation (Finucane et al., 2000; Flynn et al., 1994). Similarly, Breck et al. (2002) claim that it is difficult (maybe even impossible) to isolate risk from social or cultural contexts, in that an individual's risk-taking is often conducted with consideration of e.g. personal benefit despite the risk, awareness of the risk, and other's opinions. Another factor that has influenced how an individual perceives and subsequently assesses something is how familiar or new an activity is (Patel et al., 2008), as well as its likelihood of occurring and the individual's perception of the occurrence (Tversky and Kahneman, 1973). In the realm of traffic planning, the user is also, from time to time, the user of varying traffic modes, which may further affect the opinions and attitudes of the specific individual (see e.g. Rundmo et al., 2011).

Besides individual-related factors like those mentioned above, there are factors that may be influential when it comes to how the information from users is collected. For instance, regarding self-assessments, McKenna and Myers (1997) showed that respondents made less positive self-assessments of driving skills when they were made accountable for their statements, in this case that their assessments were compared to their actual skill. Examples like this highlight the potential impact of how studies are conducted and analyzed. Related issues will be further discussed in chapter 1.3.2.

The fact that there are so many conflicting factors which have an impact on how an individual experiences, perceives and expresses his/her opinions leads to the need to find structures of how these factors impact individuals' statements on traffic-related scenarios and phenomena. Is it possible to identify factors where the direct relationship with traffic-related phenomena can be traced?

1.3 The approach to collecting information from users in this thesis

At the start of this PhD-project a minor field study was conducted and the results led to some complex considerations associated with the analyses of user opinions (Wahl, 2006). As a step in the traffic-safety programme of Sweden's third largest city, Malmö, a two-week trial was undertaken where the speed limit was temporarily lowered from 50km/h to 30km/h along an arterial street that had heavy flows and speeding. This trial offered a unique opportunity to study how users reacted to traffic-related elements, such as speed, in relation to an actual speed change.

On-street questionnaires were conducted and speeds were measured before and during the trial. The speed measurements showed a reduction by almost 20km/h during the trial period (from ca 56 to ca 37km/h, 85-percentile). However, this did not seem to be reflected in the questionnaires, where the respondents reported perceiving the speeds as only slightly lower. The correspondence with the actual lowering of the speeds was not proportional and the respondents still felt that the cars went too fast. A further interesting aspect was that the respondents were satisfied with the speed-reducing project as a whole, even though they were not satisfied with the speeds (ibid.).

It may be argued that the question of speed was of a somewhat emotional character, since the respondents were to state their level of agreement on whether the cars drove *too fast* in the street. But the responses did, nevertheless, give rise to questions of what the respondents' answers actually convey; why were the obvious reductions in speed not reflected in the respondents' answers to the questionnaire? Why were the respondents positive towards the trial even though they did not acknowledge the speed-reducing effect? What was the impact of the way the questions were phrased? What must be taken into consideration is that the reduced speeds might not have been low enough to make the respondents change their opinion of the speed level in their street. Further, it might be suspected that the respondents considered aspects other than the specific speeds of the cars when they answered the question, for example the respondents' general feelings about high speeds, maybe principles regarding motorized vehicles, or perhaps feelings of insecurity associated with, not only high speeds, but towards being in a traffic environment.

The results of the trial were of such interest that they became the inspiration for this further investigation of how of communication with users should be performed and interpreted. If questions on specific aspects (here speed) in a given context (here the street in the trial) gave such ambiguous results, how should information from users to be collected and interpreted in order to be useful in research and planning?

This thesis is a contribution to enhanced understanding of how to collect and interpret user opinions on traffic-related issues. Contextual aspects, seem to be central and will be discussed further.

1.3.1 Considering the users' frames of references

The above descriptions of the difficulties in collecting and analyzing user opinions are not necessarily of a traffic-related context, but are general, and can therefore be considered to be applicable in such contexts as well. However, in order to perform useful communication with users on traffic-related issues, there is a need to understand how factors, as for instance age and gender, impact users' opinions on elements in the traffic environment specifically, and if they can be analyzed separately. There is also a need to investigate whether there are additional factors of interest in traffic contexts in particular.

Traffic environments are characterized by dynamic features such as a variety of traffic modes, different physical prerequisites, and varying levels of e.g. speed and traffic volumes, features that also vary over time. This dynamism complicates the analysis of user information since it makes it hard to know what the respondent relates to when stating his/her opinion. Previous research has shown that, when giving statements on annoyance, respondents relate to their exposure conditions which in turn makes it hard to compare the statements (Berglund et al., 1975). In order to make comparisons of respondents' statements, and to create stable and equal frames of reference, one needs to have knowledge of the potential effect of the exposure conditions (ibid.). Therefore, equivalent frames of reference, constituted by four limited street segments which were chosen according to certain prerequisites, were created as a basis for the analysis in this thesis, and to identify the factors that are important in a traffic-related context. The selection of streets was based on data on a range of variables, for instance speed level, traffic flow, and annual numbers of injury accidents. Descriptions of the street segments are found in chapter 3.1.1.

Using limited street environments as the basis for analysis also provides the opportunity of evaluating if an individual's familiarity with the surrounding environment affects his/her opinion of it. Spending more time as a pedestrian in an environment increases individuals' awareness and consequently affects their assessments of surrounding elements (Duncan et al., 2005; McCormack Gavin et al., 2008; Troped et al., 2003). Previous research has also shown that pedestrians' reflections on elements in the surrounding environment are dependent on the purpose of their walk (Humpel et al., 2004).

Considering the content in the users' statements

The frames of reference, in terms of limited street segments, provide an opportunity to evaluate different aspects of how users' statements can be collected and analyzed. As experienced in the trial, it is hard to identify exactly why an individual makes certain statements but, by comparing users' statements with street characteristics, it might be possible to see if contextual aspects provide information on how to interpret the statements. Estimates of the occurrence of traffic-related factors (e.g. traffic flow, speeding, accidents, and incidents) are used as bases for the analyses. From these, the impacts of personal factors such as age, gender, and familiarity, or contextual factors, such as street-related factors, which affect information from users, can be evaluated. Comparisons with objectively measured values provide information on how realistic the users' assessments are in the context of the limited street segments, and comparisons of assessments within and between different traffic-environments are also possible.

Information about whether an individual's estimate is realistic in comparison to actual numbers and in relation to other individuals, could be interesting in order to understand how users perceive their traffic environment and why they behave in certain ways. Individuals' statements, whether realistic reflections or exaggerations, can be seen as indicators for identifying problematic features within the traffic environment and the other way around; knowledge of features that are problematic from a theoretical point of view, but not considered problematic for the user, can therefore be interesting. It is also interesting to gain further understanding of what the estimates embrace, in terms of the level of annoyance associated with them. The estimates are to be interpreted as general assessments, while annoyance is introduced to address an individual's personal standpoint. Are individuals very annoyed even if they consider the occurrence as rare or vice versa? This is especially important for understanding whether there are situations or elements in the traffic environment that users are easily annoyed with, and vice versa, i.e. situations or elements for which they show much tolerance.

1.3.2 Analysis of the implications for practical planning

Besides the personal and contextual factors, mentioned above, that can affect an individual's statements, there is also reason to pay attention to how the collection of information is executed. Regarding methods for collecting user opinions, there are several things that may affect the information. For instance, there is a need to consider which method to use as well as how to carry it out, i.e. sampling of participants, which variables to control for etc.

Suggested methods in the Swedish guidelines for traffic planning, TRAST, are traditional forms of participation, such as workshops, surveys, focus group interviews, seminars, open-house sessions, and walk-through evaluations (SKL, 2007), but these are only a few of the 70 participatory forms identified by Magnusson (2011). Development work on finding good forms of participation is a continuing process. Interactive tools via information technology, such as web-based survey tools, 3D-models, virtual-reality models, GIS, and social platforms like Facebook and Second Life (Brabham, 2008; Evans-Cowley and Hollander, 2010; Hanzl, 2007; Wu et al., 2010), are being developed and evaluated. Regarding traffic-planning procedures, there have been several attempts to refine forms of participation where the participants are engaged in a very practical way, elaborating and gaining understanding of the variables used by traffic planners (Jones, 2011; Svensson, 2004).

Associated with every type of method (questionnaires, interviews, focus groups etc.) there is an extensive amount of information describing different aspects of the methods on how to collect, analyze and interpret the information. For instance, when interviewing, aspects such as leading questions, tone of voice, and stressing of words can affect the interviewed and hence the answer (Kvale and Torhell, 1997). In questionnaires, important factors to consider are the design of response scales (Schwarz et al., 1991; Schwarz and Oyserman, 2001), that the question only embraces one question and not several questions in one, that the questions and response alternatives are easily interpreted, that the language is easy to understand, that the question is not too long, that emotional words are avoided etc. (Trost and Hultåker, 2007).

Instructions on methods are rather general and applicable to several contexts. Therefore, it would be interesting to find out if there are aspects of methods that are directly related to a traffic context. For instance, it is well known that the phrasing of a question shapes the answer, and that small variations in choice of words can affect the response (Kvale and Torhell, 1997); much research has been

devoted to studying bias due to wording (Goetz, 2008; Holleman, 2006; Loftus and Palmer, 1974; Rugg, 1941; Schuman and Presser, 1977). In this thesis, the impact of phrasing is examined to see if there is reason to pay attention to such aspects in questions on traffic-related factors.

Need of guidelines?

As mentioned, user involvement is defined as an important anchoring feature in Swedish municipal traffic-planning processes, but the instructions and recommendations in the guidelines, TRAST, on how to collect and interpret user opinions are vague. There are examples and short descriptions of participatory methods, but no further guidance on choice of method, sampling of participants, implementation, or analysis of gathered information (SKL, 2007). It may be thought that TRAST ought to give more extensive instructions, but it might be understandable, considering the complexity of each specific method, that the instructions are limited. On the other hand, it can be argued that a responsibility to supply methodological tools and guidance for the planner follows from encouragement of participation.

Nevertheless, since there seems to be a desire to involve users in the planning process, it is relevant to analyze practical considerations associated with it and if there is a need to supply more detailed instructions on participatory methods. The possibility of involving users in the traffic-planning process is determined by several factors, for instance time (Mumpower, 2001; Svensson, 2004), costs, political support, and feasibility (Mumpower, 2001). This thesis evaluates how and to what extent involvement of users is a recurring feature in the traffic-planning process in Swedish municipalities. From there, the discussion can turn to the way in which the methodological considerations derived from this thesis can serve as recommendations for the planner when involving users in the planning process.

2 Aim and scope

The basic concept of this thesis is that subjective opinions constitute a vital part of traffic planning. To be able to propose and implement appropriate measures and recommendations/guidelines, it is important to acquire information on users' opinions, needs and demands in a traffic-related context. It is therefore important to gain an understanding of the factors influencing individuals' experiences and perceptions of the traffic environment and features in it.

The overall aim of this thesis is to contribute to methodological considerations when collecting and analyzing information from users concerning features in their traffic environment, considerations that may be implemented in guidelines on best practice.

2.1 Research questions

The thesis consists of two main research questions, divided into a range of sub questions:

- Methodological considerations when collecting and analyzing information from users.
  - What impact do minor phrasing variations have?
  - What background variables seem to be of importance when asking users questions on traffic-related phenomena?
  - How realistic are the assessments individuals are capable of making in comparison to other individuals and to objectively measured data?
  - What is the relationship between an individual's estimate of the occurrence of a traffic-related phenomenon and his/her associated level of annoyance?

- User involvement in municipal traffic-planning.
  - How and to what extent are users involved in traffic-planning processes in Swedish municipalities?
  - What are the strengths and difficulties associated with involvement, and what determines possibilities of involvement?

3 Methods

Two studies are conducted within the scope of this thesis. The first study concerns the first research question and covers theoretical contributions and methodological considerations that can be of relevance when collecting and analyzing experiences and perceptions from users. This study is denoted *Study 1* and consists of a postal questionnaire with residents in four arterial streets as respondents, and speed and flow measurements in these streets. The other study concerns the second research question and covers questions on how and to what extent users are involved in Swedish municipal traffic-planning, and how planners perceive the prerequisites for user involvement. This study is denoted *Study 2* and consists of nation-wide telephone interviews with municipal planners and consultants as participants. The results from *Study 2* create a frame for analyzing how the methodological contributions in *Study 1* may be applicable and useful when collecting and interpreting user information in traffic-planning processes. The results of the studies are presented in four papers *(Papers 1-4),* which are appended at the end of this thesis.

3.1 Study 1

The main objective in *Study 1* is analyses of respondents' estimates of how often a range of traffic-related phenomena occurs, how these estimates are dependent on factors such as objectively measured data, individual and physical variables, survey design in terms of phrasing, and how the estimated occurrences are correlated to the reported annoyances caused by the same phenomena.

Study 1 was performed in 2008 and consisted of two parts; a questionnaire sent by post to 1388 residents in four streets, and measurements of speed and traffic volumes in these streets. Questionnaires were chosen as the means for collecting information since they make it possible to reach a large number of individuals at the same time, and to collect sufficient amounts of data to run statistical analyses of group-wise differences (Trost and Hultåker, 2007). On the downside, questionnaires depend on the respondent understanding the written text and what the questions embrace. For instance, when performing face-to-face interviews, there are possibilities for the interviewer to provide explanations or for the interviewed to react when he/she does not understand the question (Gillham, 2008). Such explanations are not possible in questionnaires, and it is therefore important when designing the questionnaire, to be accurate and to enable the highest possible level of understanding, regarding both contents and language (Trost and Hultåker, 2007).

3.1.1 Selection of streets and measurements of speed and volumes

The study took place in four streets (here denoted A-D) in Malmö, Sweden. Since one aim was to analyze the impact of contextual aspects of the respondents' answers to traffic-related questions, the four streets were selected according to certain criteria and consisted of characteristics that could serve as a common frame of reference for the respondents in each street. The streets are arterial streets, which are often important links in the traffic network for all traffic modes. Arterial streets are also multifunctional, i.e. they have, besides the traffic-related activities, a range of social and commercial activities (Svensson, 2004). This range and variation of characteristics typical for arterial streets enabled selection of streets that have partly similar and partly varying features. From this, the impact

of contextual aspects could be analyzed by comparisons within and between the streets.

A limited segment in each street was selected as the area of interest and defined on an enclosed map in each questionnaire (see Appendix A). The characteristics of the street segments are presented in Table 1, together with acquired data on speeds, traffic flow, and injury accidents. The speeds and traffic volumes of motorized vehicles were measured with pneumatic tubes in the four street segments during the time-frame in which the questionnaire and two reminders were sent out. The measurements were limited to vehicles travelling above 8 km/h. Data on injury accidents in the street segments were collected from STRADA (Swedish Traffic Accident Data Acquisition).

Table 1 • Characteristics of the street segments A-D

Street	Number of lanes	Sidewalk width (m)[1]	Separated bicycle facilities	On-street parking	Presence of commercial amenities	AADT[2]	Speed (km/h)		Injury accidents (annual)[3]
							Av.	85%	
A	2+2	3-4	NO	YES	Sparse	19300	42	53	8.6
B	2+2	3-4	NO	YES	Sparse	16300	48	57	3.4
C	1+1	2-2.5	NO	YES	Dense	5200	33	42	1.4
D	1+1	2-3	NO	YES	Dense	11700	37	49	2.2

[1]Approximated along the street segment

[2]Annual average daily traffic

[3]Data covering 1 January 2003-1 January 2008

As seen in Table 1, Streets A and B show similarity in several respects, and differ from Streets C and D, which in turn are rather similar. Within these pairs, however, there are some variations as well. Streets A and B are alike in all respects, except speed and flow, i.e. the value of speed is higher in Street B and the value of flow higher in Street A. The latter also has a considerably higher number of injury accidents than Street B. As can be seen, Street C has lower figures on all levels than Street D.

3.1.2 The questionnaire

Sampling of participants

The respondents consisted of residents living along the streets A-D. The questionnaire was sent at random to one person, who was over 19 years of age, per household. The reason for choosing residents as respondents was to make sure that there was at least some acquaintance with the street segment upon which the responses were supposed to be based. However, this strategy of selecting respondents also resulted in no possibility of controlling for the composition of the participating group in advance. The composition of the residents in each street was therefore likely to be random. Still, this was not considered to be a problem since one of the aims was to analyze the residents' experiences and perceptions of the circumstances in the specific streets. There was a larger problem of lack of information on the characteristics of the household members who did not receive a questionnaire, or those who received a questionnaire but failed to respond. Information from these respondents would probably have made an interesting contribution to the analyses.

Questionnaire design

The respondents were clearly instructed to answer the questionnaire with their specific street segment in mind. The limited segment was marked on an enclosed map, together with existing crossing facilities. A translated version (Swedish to English) of the questionnaire can be found in Appendix A.

The questionnaire was divided into five sections; background factors, residential qualities, accident risks, views on crossing the street, and views on walking along the street. The questions in each section covered phenomena that, to different extents, are recognizable in many traffic environments and are activities familiar to individuals in their daily movements close to their home, for instance noise, speeding, and difficulty crossing the street. Since arterial streets often have a large number of conflicting functions in terms of activities along and across the street (Svensson, 2004) the items in the questionnaire were to reflect these environments specifically. The traffic environment in arterial streets, like those selected here, has been described as noisy and polluted, with considerable traffic and extensive speeding (Wahl, 2006). Feelings of risk when crossing on foot and presence of cyclists on the sidewalks are further factors that have led to discomfort when moving in these kinds of streets (ibid.).

The main questions were posed as statements of the occurrence of several phenomena *(Papers 1-3)*, and the level of annoyance associated with that occurrence *(Paper 3)*. Examining estimates of occurrence gave the possibility of analyzing whether the respondents made reasonable or exaggerated statements; this was done by comparing with objectively measured data *(Papers 1* and *2)*, and with statements on associated annoyance *(Paper 3)*.

The respondents were asked to state their level of agreement on a five-point rating scale (see Appendix A, for specific response scales). The choice of rating-scales and how the alternatives are defined are important considerations when constructing questionnaires, since they may affect the respondent's rating (Krosnick, 1997; Schuman and Presser, 1977). Further, modification of scales (e.g. by adding steps, refining the steps, shifting definitions of the steps, or changing the range of the scale) may have an impact on respondents' ratings (Schwarz et al., 1991; Schwarz and Oyserman, 2001). The scales in the questionnaires were alike with five steps, ranging from the alternative with the lowest level of occurrence/annoyance to the highest, completed with the alternative "never" (or corresponding). There were two versions of scales, one with all scale steps defined, and one with only the extremes defined. The different versions were used since there were different possibilities of making an exact assessment. For instance, since the occurrence of accidents is more random and uncommon than speeding, different scales were needed. Variables with both versions of rating scales were used in *Papers 1* and *2*. Since the answers to each question were not directly compared with each other, this was not considered to be a major problem. However, if the questions are to be compared, it is important to keep in mind that equivalent scale steps in different questions are not necessarily comparable.

Data analysis

The principal analyses performed in this thesis are presented below. Some descriptions are easier to understand in context, and are therefore further described in the Results and discussion section (chapter 4).

The questions that are subjected to analysis are displayed in Table 2, divided into each paper, together with the corresponding numbering of the questions. Further descriptions of the questionnaire and the associated analyses refer to these questions.

Table 2 • Analyzed variables in Papers 1-3, corresponding numbering in the questionnaire within brackets

Paper 1	Paper 2	Paper 3
Accidents (14b)	Accidents (14b,c)	Traffic flow (22a,c)
Incidents (15a)	Incidents (15a,b)	Speeding (23a,c)
Difficulty crossing the street (17a)	Speeding (23a)	Parked cars (24a,b)
Traffic flow (22a)		Standard of the sidewalk (28a,b)
Speeding (23a)		Cyclists on the sidewalk (29a,b)

Throughout the analyses, the same independent variables are used; *street*, *age*, *gender*, *walking frequency* and, where possible, interactions of these. Using the street variable is natural, since parts of the research questions focused on contextual, street-related aspects. Age and gender are often used as background variables since they are recognizable, easy to control for, easy to answer, and can be used to make the respondent feel motivated to answer the questionnaire (Trost and Hultåker, 2007). In this thesis, age and gender are analysed in relation to street-contextual aspects in order to shed some light on their importance regarding traffic-related issues. Walking frequency, posed as a question on how often the respondents walk in their local neighbourhood, is used as an indicator of how familiar the respondents are with their local environment. The answer to walking frequency was given on a five-point scale ranging from *a couple of times per year* to *every day* with the steps in between defined, plus the alternative *never*.

Since the response scales in the questionnaires are categorical and the data not normally distributed, non-parametric tests are used in the statistical analyses. The statistical methods used in the analyses are the following:

- ***Paper 1*** - binary logistic regressions are performed in order to analyze the potential effect of the *street*, individual-related factors *(age, gender, and walking frequency)*, and interaction effects of street and individual factors on the respondents' estimated occurrence of five traffic-related phenomena in their street *(accidents, incidents, difficulties crossing the street, traffic flow,* and *speeding)*. Binary logistic regressions are used because they are considered appropriate for analyzing the relationship between a dependent variable and several independent variables, as well as interactions of these (Kirkwood and Sterne, 2003).

- ***Paper 2*** - the impact of phrasing variations in questions on *accidents, incidents*, and *speeding* is analyzed via the Mann-Whitney's rank sum test, which is appropriate for examining the difference between the outcome variables of two groups (here defined by different phrasing) that are not normally distributed (Kirkwood and Sterne, 2003). Descriptive statistics such as bar charts and plots of mean values, even though not recommended with non-parametric data (Field, 2009), are here used as illustrations of data distributions. Further details on how the analyses are performed are presented in chapter 4.1.1.
- ***Paper 3*** - examines the relationship between a respondent's estimate of occurrence and associated level of annoyance of five traffic-related phenomena *(traffic flow, speeding, parked cars, standard of the sidewalk,* and *cyclists on the sidewalk)*. Spearman's rank correlation test is used to test the strength of the relationship between the two variables (Field, 2009). Binary logistic regressions are used to identify groups that, instead of giving corresponding ratings, associate high occurrence with low annoyance (and the other way around). Further details are presented in the chapter 4.1.4.

Since the questions on accidents and speeding (which were differently phrased in half of the dispatch) are used in the analyses in *Paper 1*[5], an independent variable indicating which questionnaire the respondents received is entered in the logistic regressions. The potential impact of phrasing variations is examined using this extra variable.

The variables are divided into categories in order to be able to perform the statistical analyses in *Papers 1* and *3*. There are known risks associated with such divisions; for instance, identified relationships might be enhanced or diminished depending on how the categories are defined (Trost and Hultåker, 2007). In *Paper 1*, the dependent variables are dichotomized into categories representing a "higher" and "lower" rating of the variable in question. The dichotomies are somewhat differently defined in different questions, indicating that the categories consist of a varying number of scale steps. The reason for this is mainly to get a sufficient number of respondents in each category in order to perform the statistical analyses. Since the aim is to examine the group-wise differences within

5 Speeding is also analyzed in *Paper 3*. Since the overall results for speeding show no difference due to phrasing, the phrasing effect is not regarded as affecting the results and is therefore not considered.

each question and not to compare the questions with each other, it is not considered problematic that the categories were not identical. In *Paper 3*, where two variables are compared (occurrence and annoyance), response categories are created in relation to the correspondence between the two variables (see chapter 4.1.4 for details on how the division is made). The question on *walking frequency*, which is used as an independent variable in *Papers 1-3*, is dichotomized into categories representing respondents who walk "several times per week" or more ("often") or those who walk less than that ("seldom"). Further, the independent variable *age (Papers 1-3)* is divided into four categories consisting of respondents aged 19-29, 30-44, 45-64, and over 64 years. Reflections on the division by age are made found in chapter 4.1.2.

Response

The dispatch consisted of 1388 surveys and the response rate was in total ca. 66 percent, i.e. altogether 919 surveys were returned. The number of surveys that were considered usable in the statistical analyses was adjusted by 42, due to wrong addresses (Streets A-D), delimitation of the survey area caused by large differences in vehicle flows (Street C), and respondents living outside the survey area (street D). In total, 877 surveys were used in the analyses and the response frequencies, divided into the independent variables; *street, age, gender* and *walking frequency*, as shown in Table 3.

Table 3 • Response frequencies divided into the independent variables used.

			Gender					Age									Walking frequency				
		Total	Total within gender	Man		Woman		Total within age	19-29		30-44		45-64		65-		Total within WF	Seldom		Often	
Street	Street A	144	143	57	(39.9%)	86	(60.1%)	144	40	(27.8%)	65	(45.1%)	14	(9.7%)	25	(17.4%)	142	32	(22.5%)	110	(77.5%)
	Street B	188	185	88	(47.6%)	97	(52.4%)	188	28	(14.9%)	93	(49.5%)	43	(22.9%)	24	(12.8%)	184	33	(17.9%)	151	(82.1%)
	Street C	264	258	122	(47.3%)	136	(52.7%)	264	34	(12.9%)	61	(23.1%)	81	(30.7%)	88	(33.3%)	257	40	(15.6%)	217	(84.4%)
	Street D	281	275	99	(36.0%)	176	(64.0%)	281	24	(8.5%)	69	(24.6%)	69	(24.6%)	119	(42.3%)	276	63	(22.8%)	213	(77.2%)
Gender	Man	366						366	47	(12.8%)	128	(35.0%)	104	(28.4%)	87	(23.8%)	362	68	(18.8%)	294	(81.2%)
	Woman	495						495	79	(16.0%)	159	(32.1%)	103	(20.8%)	154	(31.1%)	484	98	(20.2%)	386	(79.8%)
Age	19-29	126															125	27	(21.6%)	98	(78.4%)
	30-44	288															283	45	(15.9%)	238	(84.1%)
	45-64	207															207	44	(21.3%)	163	(78.7%)
	65-	256															244	52	(21.3%)	192	(78.7%)
Walking frequency	Seldom	168																			
	Often	691																			

3.2 Study 2

Study 2 consists of telephone interviews with practitioners within traffic planning. The objectives are to investigate to what extent and how Swedish municipalities and consultants interact with public participants in the traffic-planning process. Besides this, another aim is to analyze the potential of implementing the results from *Study 1*. Telephone interviews are considered to be appropriate since the ambition is to get an indication of how Swedish municipal planners perceive the prerequisites for performing participatory efforts.

Interviews as such provide a possibility of capturing a wide range of versatile experiences (Kvale and Torhell, 1997) and there is a direct communication with the interviewee, so that the interviewer, for instance, can pose follow-up questions and explain misunderstandings (Gillham, 2008). But, since the study was to be conducted in municipalities throughout the country, face-to-face interviews were considered impossible for practical and economic reasons. Using telephone interviews, some of the positive aspects of interviewing could be acknowledged, but with somewhat less dynamism since the interviewer and interviewee did not see each other (Gillham, 2008). An alternative method would have been postal questionnaires, but these were considered too structured with few possibilities of getting the participants to further develop their reasoning.

3.2.1 Telephone interviews

Sampling of participants

Twelve municipal planners and two consultants were selected as informants[6]. Of the twelve municipal planners ten were representatives of the 21 largest Swedish municipalities (85 000-834 000 inhabitants), and two represented very small municipalities (5 000 and 17 000 inhabitants). The main criterion for selection was that the municipality should be large enough to have officers working only on traffic-planning issues. Thereafter, the selection was based on willingness to

[6] The terms “interviewed planner”, “participant”, and “informant” are used interchangeably referring to the participants in the interview study. However, in chapter 4.2, “participant” refers to the user involved in participatory processes, not the practitioner.

participate and stated acquaintance with the questions that the study embraced. The planners in the two small municipalities did not work explicitly on traffic planning, but these municipalities were selected to see if comparisons between smaller and larger municipalities could contribute to the analysis. The number of participants was not determined in advance. Instead, a decision to stop was made when no more information was expected to be elicited by further interviews (Kvale and Torhell, 1997).

Data collection and analysis

The study was conducted between April and June 2010 by a single interviewer. The interviews were semi-structured in that the structure was pre-defined, but at the same time there was space for longer answers, discussions and follow-up questions (Gillham, 2008). The interview guide can be found in Appendix B. The length of the interviews depended on the length and relevance of the answers. Most of the interviews lasted around 45 minutes; some were as short as 15 minutes and some as long as 60 minutes.

The interviews were recorded and selectively transcribed, and summarizing content-analysis was performed (Flick, 2002). Themes were identified from the interview guide together with topics derived from the answers. Three interviews were not recorded, but notes were taken by the interviewer. In two cases the reason was faulty recording equipment, and in one case the informant refused to be recorded. The notes from these three interviews have been analyzed in the same manner and together with the recorded interviews.

It could be argued that the interviews were too few, and that the results in *Study 2* could be somewhat different if the selection of participants was different or if further interviews were conducted. However, the aim was to get an indication of the situation in Swedish municipalities, and throughout the interviews it was obvious that the amount of new information from the planners was diminishing. Therefore a decision was made to stop after 14 interviews. With that said, it is important to keep in mind that the results in *Study 2* are not general in the sense that they are valid for all Swedish municipalities. The informants' answers do not cover all aspects of user involvement, but they can serve as a general indication of how information from users is regarded and handled in the practical planning today.

4 Results and discussion

This chapter contains the results and discussions from *Studies 1* and *2*. The first part, “Methodological considerations when collecting and analyzing information from users”, concerns results and discussions from *Study 1 (Papers 1-3)*. The second part, “User involvement in traffic-planning”, is based on *Study 2 (Paper 4)*.

4.1 Methodological considerations when collecting and analyzing information from users

Study 1 covers different considerations that may be of importance when collecting user opinions. The results referred to below are found in *Papers 1-3*. Initially, the impact of phrasing variations is presented *(Paper 2)*. The second part, which covers analyses of the impact of tested variables, is a compilation of the results in *Papers 1-3*. The third part covers the respondents' ability to assess objective values *(Papers 1-2)*. Finally, the relationship between an individual's estimate of occurrence and associated annoyance is analyzed *(Paper 3)*. The same independent variables *(street, age, gender,* and *walking frequency)* are used throughout the analyses in *Study 1*. Note that the results associated with the street variable are not explicitly presented, but rather where relevant.

4.1.1 Phrasing

To examine the impact of minor phrasing modifications, half of the respondents along each street received questionnaires in which three questions were modified *(Paper 2*). The questions concerned estimates of accident frequency, incident frequency, and speeding. The two question types were phrased: "How often do accidents occur in your street?" (Survey 1) and "How often do *you think* accidents occur in your street?" (Survey 2) (here translated from Swedish to English; italics are used to highlight the difference). The phrasings were chosen because they are common variations of questions that could be used in surveys and interviews. They are similar in character and the small difference might be easily neglected.

The analyses show a systematic difference in that respondents, when answering the questions with "you think", are more likely to give higher ratings of the occurrences, meaning that they estimate a higher level of the frequency of accidents and incidents in their street, see Figure 2 (left side). This pattern is consistent regardless of the independent variables tested (total sample, age, gender, street, walking frequency). These results are highly interesting, and previous research supports the findings. For instance, similar bias has been found when various synonyms are used to describe a car collision (hit, smashed, bumped, collided, contacted) in questions asking respondents for speed estimates at the collision moment (Loftus and Palmer, 1974). Further, changing a negatively associated word in a question into a more neutral one (Goetz, 2008), and

elaborating with opposites (e.g. not forbid instead of allow) (Holleman, 2006; Rugg, 1941; Schuman and Presser, 1977), can also change the answer significantly. The results regarding speeding show no differences in the total sample. However, phrasing effects are found for some independent variables (street and gender) and some interactions, but these results are inconsistent and no conclusions can be drawn with regard to phrasing (see *Paper 2*).

The bias, concerning accidents and incidents, is even more interesting since there were control questions, which were identical in all questionnaires, immediately after the questions concerning accidents and incidents. The respondents were asked to state how often they had witnessed or been involved in an accident or incident themselves. No differences are found between the two phrasings of the control questions, and generally no differences when split into the tested independent variables and interactions of these, see Figure 2 (right side). This further emphasizes the phrasing effect in the preceding questions.

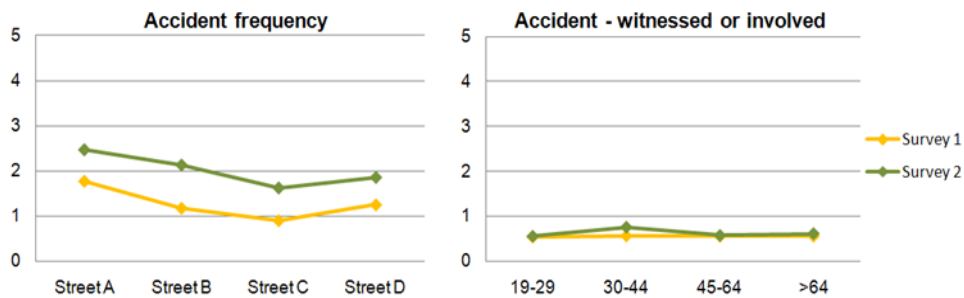

Figure 2 • Left side: Mean values of the questions "How often do accidents occur in your street?" (Survey 1) and "How often do you think accidents occur in your street?" (Survey 2). The example shows the estimates divided into "street". Right side: Mean values of Surveys 1 and 2, where the phrasing was identical "How often have you been involved in or witnessed an accident in your street?". The example shows the estimates divided into "age".

It is highly interesting that such minor changes of a question can affect respondents' answers to that extent, but it is hard to predict the impact of further variation of the questions. Besides phrasing, there are other ways of varying questions, but they are not tested here. Gendall and Hoek (1990) highlight aspects such as choice of format (open versus closed questions), or changing the order of the subjects in the question (here man and woman) in influencing respondents'

answers. Nevertheless, the results in *Paper 2* clearly indicate that there is reason to use consistent phrasings e.g. when several interviewers are engaged in a study, or when several individuals are the subjects of the study, or in follow-up studies.

4.1.2 Tested variables influencing an individual's statement

How something is experienced or perceived is one thing, but how an individual describes it is quite another, since there are several variables that may affect the statement. Here, the impact of the variables *gender, age*, and how often an individual walks in his/her local environment *(walking frequency)* are tested. The *street* in which the individual lives is also used as an independent variable in the statistical analyses in *Study 1*. However, the results associated with street are not explicitly presented in this chapter, but are mentioned where relevant.

Gender

Gender differences are mainly found regarding phenomena that can be frequently observed or experienced by the respondents (difficulty crossing the street, speeding, and traffic flow). In these, men are more likely to give lower estimates of occurrence than women. Regarding the tested factors that are more of a hypothetical character (accidents and incidents), of which the respondents are less likely to have any personal experience, no significant gender effect is found *(Paper 1)*. Due to the hypothetical character of the questions on accidents and incidents, there is no theoretical reason for the genders to differ, but because many studies indicate that women are more apprehensive of risks (DeJoy, 1992; Finucane et al., 2000; Flynn et al., 1994), it would not have been surprising if an effect had appeared here as well. A gender effect seems to be traceable when phrasing effects in the questions on speeding are analyzed, (*Paper 2*) indicating that women may have been affected by the changed phrasing. Since no other differences within the gender variable are traced (accidents and incidents), and the results with regard to speeding are inconsistent in the overall analyses in *Paper 2*, it is hard to draw general conclusions. Further, few differences are found between how men and women associate estimates of occurrence with level of annoyance of a traffic-related factor *(Paper 3)*. There are, however, indications that men are less concerned with the tested items than women, but these results should be regarded with care due to small sample sizes.

The results with regard to gender are inconsistent and imply that there is reason to discuss whether gender is an interesting variable to control for when collecting

user opinions on traffic-related questions. Gender is a variable that is commonly used in studies; it is easy to control for and the results are often easy to analyze, but, as seen, not always easily interpreted. Previous research has shown that gender is a complex variable, and is likely to be influenced by e.g. age and socio-economic factors (Polk, 2005), socio-political factors such as power and alienation (Finucane et al., 2000; Flynn et al., 1994), as well as social or cultural context (Breck et al., 2002). However, since information on gender is so easily found, there may be a risk that analyses with regard to gender are performed somewhat arbitrarily. It should therefore be considered whether it is always interesting to analyze differences (or similarities) between men and women.

Age

The analyses on *age* reveal some interesting results, in particular concerning the oldest age group (>64 years). The respondents in this group especially acknowledge problems with cyclists on, and the standard of, the sidewalk *(Paper 3)*. These are known to be typical problem areas for older people (Ståhl et al., 2008; Wennberg, 2009), and the results are not very surprising. It is, however, more surprising that the oldest age group estimate lower occurrences than the other age groups regarding the questions on incident frequency, speeding, and difficulty crossing the street *(Paper 1)*. As described in chapter 4.1.4 (and in *Paper 3*) the oldest age group is also more likely to associate high occurrence with low annoyance regarding the factors traffic flow, speeding and parked cars. These results may be generalized to illustrate the older respondent as someone who does not take much notice of the occurrence of surrounding traffic-related issues (except standard of, and cyclists on, the sidewalk), but when he/she acknowledges that something occurs to a higher extent, he/she is not very annoyed by it. This is especially interesting in comparison with results from *Study 2* in which a common concern expressed by the informants is frequent overrepresentation of older citizens, especially men, in participatory sessions such as general consultations. Some informants indicate that these individuals often have a strong and negative initial stance regarding whatever topic is discussed in these sessions. It must be remembered that participation in general consultations is voluntary, and attendance is probably related to a strong opinion. Hence, the picture of the older people as complaining and negative citizens may not be generalized.

However, the results regarding age are not consistent. The results for the oldest age group are, for instance, not consistent regarding all the tested factors, and in addition, a couple of other significant results for the other age groups, occur as well. For instance, respondents aged 45-64 are more likely than the other age

groups to give higher estimates on traffic flow, and men in the oldest age group are less likely than others to give a higher rating on difficulty crossing the street *(see Paper 1)*. Further, besides associating high occurrence with low annoyance on speeding, the oldest respondents are also less likely than the other age groups to associate high occurrence with high annoyance, a result that further describes the oldest respondents ratings on speeding to be moderate *(Paper 3)*.These inconsistencies make age, similar to gender, a variable that is easy to control for in a survey, but it is harder to analyze the impact of age and give general recommendations. As with gender, it is difficult to isolate age from other variables (Polk, 2005), and a discussion on whether age is important to control for in each specific case is recommended.

A further complicating factor is that, in order to perform statistical analyses with age as a variable, a division into age groups often has to be performed. Regardless of how this grouping is done, there is always a risk of variety within the groups, which in turn might affect the results (Trost and Hultåker, 2007). For instance, children perceive things differently from adults (Valentine, 1997). Further, aging affects individuals differently, which may lead to groups of older individuals tending to be more heterogeneous in relation to age than groups of younger individuals (Dehlin, 2000). In *Study 1,* the age variable is divided into four categories, 19-29, 30-44, 45-64, and >64 years old. The reason for this division is that these age groups are fairly good representations of different stages in life and that the number of respondents in each group is considered sufficient for performing statistical analyses with regard to age. However, the oldest age group is represented by respondents aged between 65 and 97, which may be a subject for discussion. For instance, a transition between what is called the "third age" and the "fourth age", where individuals, due to e.g. increasing degree of illnesses and functional limitations, move from high independency to lower, occurs in developed countries between 75 and 85 years of age (Baltes and Smith, 2003).

Walking frequency

The results for *walking frequency* show that it is important to control for how familiar the respondents are with the traffic environment upon which questions are asked. Respondents who state that they walk several times per week or more often in their neighbourhood are more likely to give a higher estimate of occurrence, for all tested phenomena, than respondents who state that they walk less often (see Table 4 and *Paper 1*). The distributions of giving a "lower" or "higher" rating of the tested phenomena, divided into the categories "seldom" and "often", are shown in Figure 3.

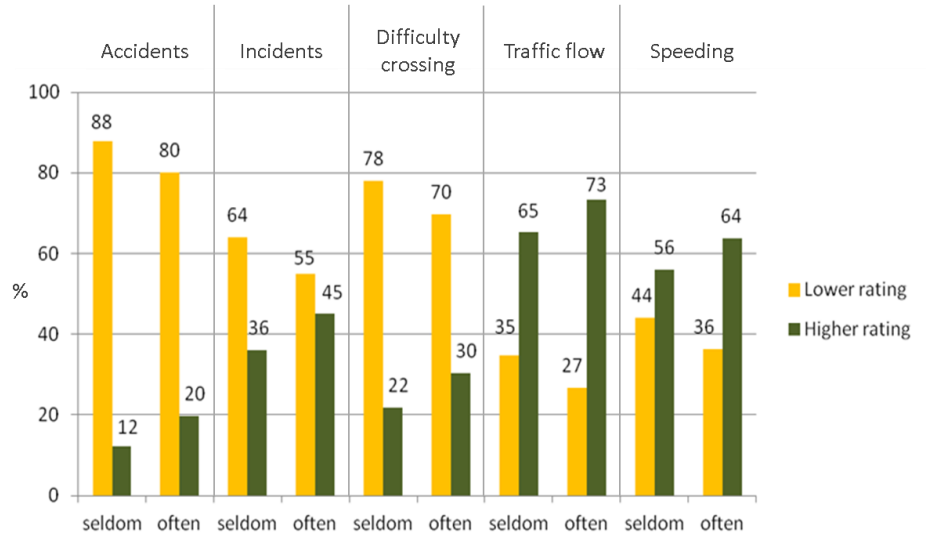

Figure 3 • Distributions (%) of giving a "higher" or "lower" rating of the tested phenomena, divided into the categories "seldom" and "often".

Interestingly, few interaction effects between walking frequency and the other independent variables (street, age, and gender) are found (see Table 4). This means that users who walk more frequently have a tendency to state that the tested items occur to a higher extent than respondents who spend less time there, regardless of gender, age, and which street they relate to. There are reasons for this to occur, and consequently also reasons for using a variable like walking frequency as a control variable. For instance, increased walking can increase the awareness and consequently affect an individual's assessments of surrounding elements (Duncan et al., 2005; McCormack Gavin et al., 2008; Troped et al., 2003). Environmental attributes can also bring different associations for pedestrians, depending on the purpose of their walk (Humpel et al., 2004). It should be noted that the respondents were asked to state the frequency of walking in their street, and therefore there might be a risk that respondents, who e.g. drove or cycled straight from their homes, did not consider their going to or from their vehicle as "walking in their street". Since the respondents are asked to give their rating of walking frequency, it must also be acknowledged that these ratings are individual assessments which in turn can be biased.

Table 4 • Significant main effects and interactions – walking frequency

	Main effects	Interactions walking frequency by		
		Street	Age	Gender
Accidents	*			
Incidents	*			
Difficulty crossing the street	*			
Traffic flow	*		*	
Speeding	*		*	

* $p<0.05$

The results for walking frequency imply that there is reason to pay attention to variables other than the conventional (e.g. gender and age) when analyzing how individuals perceive their traffic environment. To what extent this can be generalized and if there are other variables that could provide equivalent information are subjects for further discussion. Nevertheless, information on a variable like walking frequency could have an impact and may be useful when collecting information from users in general, and not only when using questionnaires.

4.1.3 Subjective assessments of objective data

Since the respondents were to relate their answers to their specific street segment, their ability to make realistic assessments of the occurrence of traffic-related factors (speeding, traffic flow, and accidents) can be evaluated by comparing the estimates with objectively measured values in the streets. This, in turn, makes it possible to evaluate whether the respondents' frames of references, in terms of contextual aspects in the streets, are of importance when interpreting their statements on these traffic-related factors. One part of the analyses covers in-between comparisons of the assessments in the streets. The other part covers analyses of how realistic the assessments are in comparison to objectively measured values. The measured, objective values of the variables speeding, traffic flow and accidents, in the Streets A-D, are displayed in Table 5. Figure 4 illustrates the cumulative frequencies of the measured speeds.

Table 5 • Objectively measured values of the street segments A-D

Street	AADT*	Speed (km/h)		% exceeding the speed limit (50km/h)	Annual value of injury accidents**
		Av.	85%		
A	19300	42	53	7.0%	8.6
B	16300	48	57	16.0%	3.4
C	5200	33	42	1.3%	1.4
D	11700	37	49	5.1%	2.2

*Annual average daily traffic

**Data covering 1 January 2003-1 January 2008

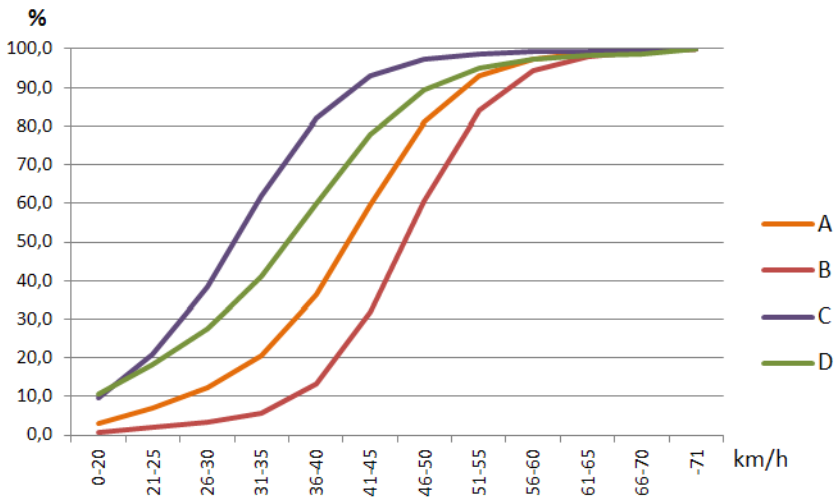

Figure 4 • Cumulative speed values for Streets A-D

Comparisons between the streets

The respondents' assessments of their streets are compared to each other in order to analyze the relations between the streets when compared to objective values. This is done by comparing the *orders* of the magnitude of the respondents' estimates with the order of objectively measured values of speeding, traffic flow and accidents in their streets.[7] The figure used as the magnitude is represented by the odds ratios of giving a "higher" estimate of the occurrence of the factors studied, in comparison to a "lower" estimate (see *Paper 1* for further descriptions). Table 6 displays the odds ratios for the questions on accidents, traffic flow and speeding for Streets A-D. Since the odds of giving a "higher" estimate are the lowest in Street C, this street is used as the reference and therefore attributed the value "1.00". The values for the other streets, in Table 6, are to be interpreted as the magnitude of the odds of giving "higher" estimates in comparison to Street C, e.g. a respondent in Street A is approximately six times more likely to give a "higher" accident rating, than a respondent in Street C.

Table 6 • Odds ratios of giving a "higher" rating in comparison to a "lower"

	Street			
	A	B	C	D
Accidents	5.94	2.49	1.00	1.70
Traffic flow	2.63/3.03*	2.14/2.32	1.00	2.42/2.38
Speeding	7.81/12.06	6.80/5.18	1.00	2.69/3.59

*Values from two sets of logistic regressions with varying independent variables (see *Paper 1*)

The most obvious results from the comparisons show that considering all three variables (accidents, speeding, and traffic flow), the estimates in the street with the considerably lowest objective values (Street C) are consistently lower than for the others. With minor exceptions, the order of the estimates corresponds to the order of the objective values in each street.

[7] It should be noted that one objective in *Study 1* is to test differences due to phrasing variations, of which the questions on speeding and accidents are parts (results from those analyses are presented in chapter 4.1.1). Since significant differences due to phrasing are detected, some analytical consequences are to be taken into consideration. Therefore, a variable is used in the statistical analyses to compensate for potential phrasing effects *(see Paper 1)*

It is highly interesting that the respondents' answers seem to be mostly correct in relation to each other, and especially that the estimates for the street that diverges the most objectively also diverges when the respondents' ratings are compared. These results imply that the respondents consider their surrounding environment when making their estimates, and are quite able to relate to the circumstances of their own street.

Comparisons within the streets

Further, the estimates of speeding and accidents are compared to the objective data in order to see how realistic the respondent's assessments are *(Paper 2)*. Mean values of the respondents' estimates are used in the comparisons. These values are calculated by converting the scale steps, on which the estimates were made, into numbers, 1-5 (0 for the alternative "never"), see Figure 5. Since the questions on accidents and speeding were subjected to phrasing variations, two mean values are displayed for each street. It may be argued that mean values are not appropriate for data that are not normally distributed (Field, 2009). However, when looking at the data distributions for the questions on accidents and speeding (Figure 6), it can be seen that the mean values can serve as good indications for a majority of the responses. The analysis can not be performed on traffic flow, due to a somewhat unfortunate phrasing of the question, asking about the occurrence of "too much" traffic.

Considering accident frequencies in their streets, the mean values of the respondents' estimates correspond roughly to the answer alternatives "a few times per year" and "a few times per month"[8] (see Appendix A for specific response scales). Since the objective data on injury accidents show 1.4 to 8.6 injury accidents per year (see Table 5), the respondents' assessments are considered to be rather accurate, but slightly exaggerated.

[8] Phrasing effects were detected in the question on accidents. The mean values of the responses in one half of the dispatch corresponded to the alternatives "a few times per year" (Streets B, C, D), and "a few times per month" (Street A). In the other half, the mean values in all streets corresponded to "a few times per month" (see *Paper 2).*

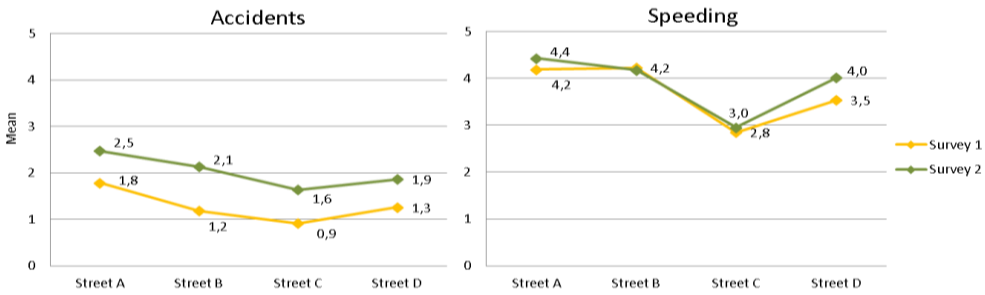

Figure 5 • Mean values accidents/speeding divided into Streets A-D. Surveys 1 and 2 represent the results due to phrasing variation

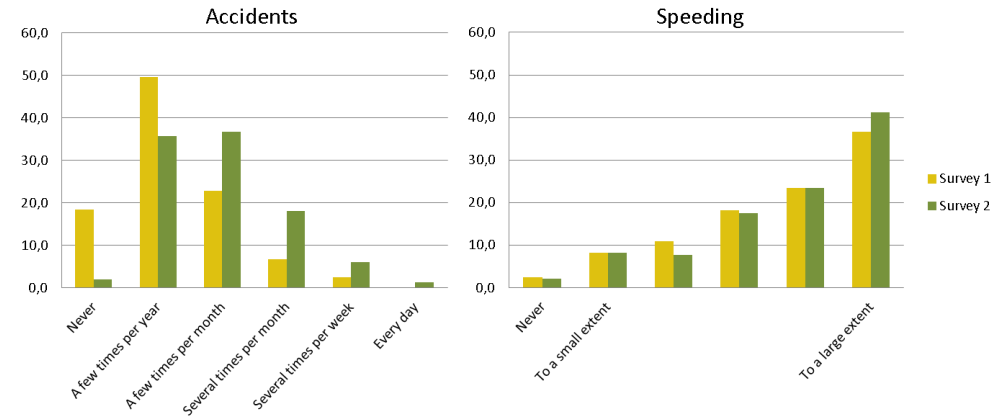

Figure 6 • Data distributions for the questions on accidents and speeding. Surveys 1 and 2 represent the results due to phrasing variation

However, regarding the accuracy of the estimates of speeding, the results are different[9]. As seen above, the respondents seem to be quite able to relate their answer to their own street. But when the actual shares of cars exceeding the speed limit are compared to the respondents' estimates, it can be seen that the respondents seem to be unable to make realistic assessments of speeding. The mean values of the respondents' estimates in Street C correspond to a rating in the middle of the scale; whereas the actual share of vehicles exceeding the speed limit is only 1.3% (see Table 5 and Figure 5). In Streets A, B, and D, the respondents' ratings correspond to approximately the fourth scale step, i.e. in the higher end of the scale meaning that the respondents estimate that speeding occurs to a "rather high extent". The shares exceeding the speed limits in Streets A, B, and D, are 7.0%, 16.0%, and 5.1% respectively, revealing a range of fairly low shares of vehicles exceeding the speed limit, but still considerably higher than the shares for Street C. This is in line with previous studies that have shown that individuals seem to have problems making realistic assessments of changing speed levels (Ekman, 2000).

The differing results concerning accuracy of estimating speeding and accidents can perhaps be explained by the character of the question. Studies have shown that an individual's recollection of events is a reflection of the individual's memory (Brown, 1987; Tversky and Kahneman, 1973), which is influenced by the frequency of the event as well as its estimated likelihood of occurring (Tversky and Kahneman, 1973). Since speeding is an event that can be witnessed on a daily basis, the tendency of overestimating it can be a logical consequence. Consequently, since accidents are rare events, the respondents' assessments are logical. On the other hand, there are theories that imply that the assessment of accidents may also be somewhat more exaggerated. de Blaeij and van Vuuren (2003) show that recollections of rare events tend to be biased since respondents make associations of the possible outcome instead of estimating the probability of the occurrence. Tversky and Kahneman (1973) reason that an individual's recollection may also be affected by his/her perception of the occurrence, which in turn may be affected by e.g. extensive media coverage. In these terms, it would not be surprising if the assessment of accidents were also exaggerated.

However, regardless of the fact that the occurrence of speeding is overestimated, it is interesting to note that, except for Street B, the assessments are wrong by

[9] Potential differences due to phrasing need to be considered for speeding as well. Since the overall results for speeding show no impact due to phrasing, alternative phrasings may therefore have little effects on the results regarding the comparison of estimates and objective data (see *Paper 2)*.

approximately the same magnitude. This calls for further studies of what the respondents' associate with the phenomenon of speeding. Why do respondents in Streets A and B give equivalent ratings on speeding when the objective values of speeding are so much higher in Street B? What is the impact of higher traffic flow and occurrence of injury accidents in Street A?

To sum up, it is highly interesting that the respondents in the different streets, show apprehension when it comes to lower (Street C) and higher values (Streets A, B, D). This implies that the respondents' given frames of references, in terms of street characteristics, are important when interpreting information from users. It would be interesting to further investigate how big the differences between the objective values have to be in order for this relationship to occur.

4.1.4 Analyzing the relationship between occurrence and annoyance

As seen, estimates of occurrences may provide information on whether the respondents' statements are exaggerated in comparison to objective data. These exaggerations may occur due to difficulties of making assessments, but may also be opportunities taken to show discontent with a situation. Hence, the variable *annoyance* was introduced to obtain a deeper understanding of the character of the potential discontent. Annoyance is meant to directly address individuals' personal standpoints by asking about the degree of the problem that relates to the estimates.

By testing the relationship between an individual's estimate of how often something occurs and the annoyance associated with that occurrence, it can be seen if the statements of annoyance are exaggerated or understated in relation to the estimates of occurrence, or if the ratings correspond. Information about these relationships gives insight into whether there is correspondence between perceived occurrence and associated annoyance, or if there are elements in the traffic environment which users are easily annoyed by and vice versa, i.e. a high estimate of occurrence is associated with a low level of annoyance.

In the questionnaire, the questions on occurrence were meant to reflect general assessments based on given prerequisites, and they were followed by questions on what level of perceived problem was associated with the stated occurrence (annoyance). The tested phenomena were traffic flow, speeding, parked cars, standard of the sidewalk, and cyclists on the sidewalk. Examples of the

formulations of the questions on occurrence and annoyance were "*Are there cyclists on the sidewalk in your street?"* and "*Are cyclists on the sidewalk a problem for you?"* respectively (see Appendix A for all questions). The questions on occurrence and annoyance were presented together in the questionnaire and the response scales were similar with five steps ranging from "to a small extent" to "to a large extent" (or equivalent), plus the alternative "never".

The analyses of the relationship between estimated occurrence and annoyance are performed in three stages. First, Spearman's rank sum tests are used to analyze the correlation between the variables. In the second and third stages, the definition of strictly corresponding ratings is expanded with one scale step, meaning, for instance, that a rating of 2 in occurrence is considered equivalent to 1, 2, or 3 in annoyance. These expanded ratings are here defined as being "on-diagonal"[10] (see Figure 7). This choice of expanding the corresponding ratings is made since the scale steps are not defined and hence may not be strictly associated with each other. The second stage deals with analyses of whether there are certain subgroups that deviate from giving a corresponding rating of annoyance compared to occurrence i.e. deviate from the "on-diagonal" (left side in Figure 7). The deviating groups are defined as consisting of respondents who associate low occurrence with high annoyance and high occurrence with low annoyance. Binary logistic regressions are performed, calculating the odds of belonging to each of the diverging groups in comparison to the group of on-diagonal responses. The third stage deals with analyses of whether patterns of certain subgroups can be identified among the respondents who give corresponding answers within the "on-diagonal", i.e. if certain subgroups cluster at different levels (right side in Figure 7). Binary logistic regressions are performed, calculating the odds of belonging to the upper part of the diagonal (high occurrence/high annoyance) in comparison to the lower (low occurrence/low annoyance). The subgroups *street, age, gender* and *walking frequency* are used as independent variables in all logistic regressions.

[10] Note that, for increased clarity, "on-diagonal" is used here instead of the term "normal" used in *Paper 3*

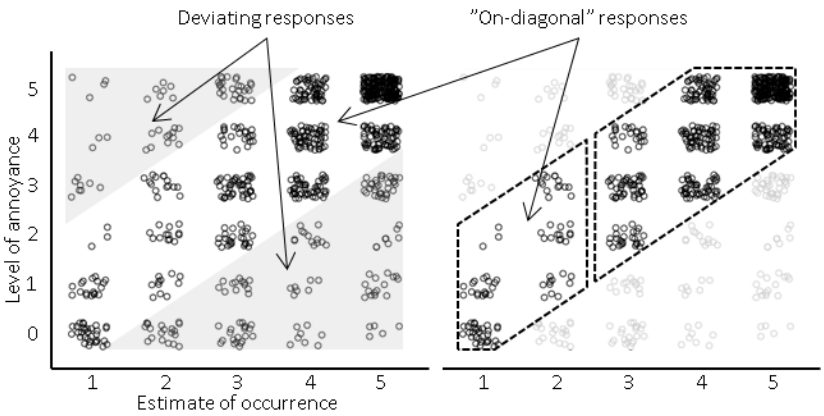

Figure 7 • Scatter plots illustrating the responses divided into "on-diagonal" and deviating groups

Good correlations

The correlations imply that the respondents' reported levels of annoyance do not seem to be exaggerated to any great extent in relation to their estimates of occurrence, and vice versa. The distributions of the respondents' answers are displayed in scatter plots in Figure 8. Just by looking at the diagrams, the clusters reveal clear patterns of the respondents' answers. The statistical analyses show good correlation between levels of occurrence and annoyance, regardless of which traffic-related phenomenon is tested (r^2=0.3-0.5, $p<0.01$). Correspondingly the estimates of occurrences in *Paper 1* (and chapter 4.1.3) might indicate that the respondents in the four streets state reasonable levels of annoyance, regarding traffic flow and speeding, in comparison to each other, i.e. that the level of annoyance is the lowest in the street with the lowest objectively measured values and so on.

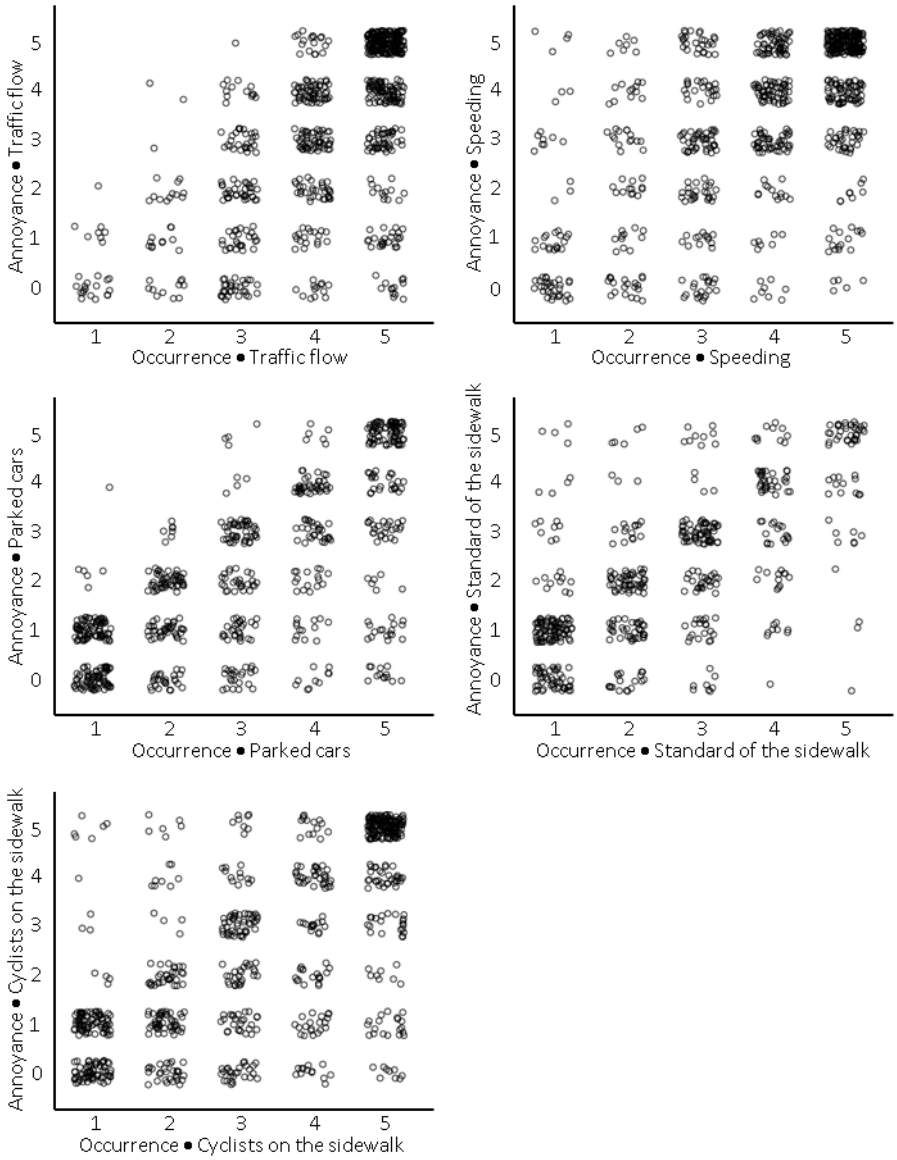

Figure 8 • Scatter plots illustrating the respondents ratings on occurrence and annoyance

It may be argued that good correlations might occur when questions are placed together in a questionnaire, and that the respondents may give corresponding ratings routinely. It has been shown that preceding questions may have an impact on follow-up questions (Gibson et al., 1978; Sterngold et al., 1994). The corresponding ratings may also be an effect of the respondents' general assessments in the estimates being too influenced by personal factors so the difference between how the questions on occurrence and annoyance are interpreted as negligible. However, if the number of respondents who gave strictly corresponding ratings, e.g. "1" in occurrence and "1" in annoyance, are compared with the number of respondents that shifted one scale step from the diagonal in either of the ratings, the number of respondents in these categories are rather equivalent (Table 7). This implies that the corresponding ratings are not necessarily effects of these responses. McKenna and Myers (1997) show that respondents' self-assessments are more realistic when they are made accountable for their judgements. The ratings of occurrences as preceding questions may, in this case, have had such an impact on the ratings for associated annoyance.

Table 7 • Response frequencies divided into "on-diagonal" and "strictly corresponding"

	"On-diagonal" responses	Strictly corresponding responses	
			Within on-diagonal
Traffic flow	561	317	56%
Speeding	612	332	54%
Parked cars	526	308	59%
Standard of the sidewalk	453	272	60%
Cyclists on the sidewalk	584	358	61%

It must be mentioned that not all respondents were included in the analysis. The missing responses consisted of respondents who estimated "no occurrence" (and therefore were instructed not to answer the question on annoyance), respondents who were not annoyed, as well as respondents who failed to fill in the question on annoyance, regardless of reason. The numbers of respondents who did not make a rating of annoyance are as follows; traffic flow 81, speeding 60, parked cars 168, standard of the sidewalk 314, cyclists on the sidewalk 71. As seen in the scatter plots in Figure 8, parked cars and standard of the sidewalk, seem to be phenomena

for which the respondents neither estimate high occurrences, nor seem to be very annoyed with; hence the large numbers of missing values are not that surprising.

Deviations from and relationships within the on-diagonal responses

Interesting results from the analyses of the subgroups are found especially for the variables *age* and *street*. Table 8 illustrates the independent variables for which significant differences are found. See *Paper 3* for descriptions on response frequencies and more detailed results from the logistic regressions.

Table 8 • Compilation of independent variables for which significant differences are found when analyzing the subgroups.

	Deviating group; Low occurrence/ High annoyance vs. on-diagonal	Deviating group; High occurrence/ low annoyance vs. on-diagonal	Within on-diagonal; High occurrence/ high annoyance vs. Low occurrence/ low annoyance
Traffic flow		Age	Street Age Gender Walking frequency
Speeding	Street	Age Gender	Street Age
Parked cars		Age	Street
Standard of the sidewalk	Gender		Street Age Walking frequency
Cyclists on the sidewalk	Street Gender	Street Age	Street Age Walking frequency

The oldest respondents turn out to be of specific interest when the deviating groups are analyzed. Regarding the questions on cyclists on the sidewalk, there is a continuous age trend towards the older the respondents, the less likely they are to associate high occurrence with low annoyance. Further, the analyses of the on-diagonal responses (right side in Figure 7), concerning cyclists on the sidewalk, show a continuous age trend towards older people being more likely to associate

high occurrence with high annoyance. Similar results are found for standard of the sidewalk. These results are not very surprising since cyclists on, and standard of, the sidewalk are well-known problem areas for older people (Ståhl et al., 2008; Wennberg, 2009), and they were therefore not expected to state much tolerance of them. The fact that the older respondents might be apprehensive regarding these problems may cause them to estimate high occurrences on these issues to begin with. The high estimates of occurrence may therefore serve as an indication of annoyance for this group.

It is more surprising, though, that the respondents in the oldest age group are the most likely to associate high occurrence with low annoyance regarding the factors traffic flow, speeding and parked cars. A possible explanation is that the individuals in this group may have exposed themselves to their local traffic environment to a lesser extent than respondents in the other age groups, and therefore report a lower degree of annoyance. But, the respondents' reported levels of walking in their neighbourhood show equal walking frequency in the age groups 19-29, 45-64 and >64, and a difference in the age group 30-44 where a slightly higher frequency of walking is reported (see *Paper 1*). However interesting, it is unclear why this age relationship occurs.

Further interesting results are found for the street variable, where the respondents in the street with the lowest speeds and traffic volumes (Street C) are also less likely to associate high occurrence with high annoyance regarding speeding, traffic flow, and cyclists on the sidewalk. Thus, regarding speeding in this street, the respondents who estimate low occurrence are likely to associate this with a high level of annoyance. This could perhaps be explained by the streets providing different frames of reference, with a varying composition of physical elements. In an environment where speeding is less likely to be expected, the associated annoyance might be higher, compared to streets where speeding is more common and hence more expected. Similar relationships are discussed by Berglund et al. (1975) and Pedersen and Persson Waye (2007), but regarding noise exposure.

In summary, it is hard to compare the annoyance of different individuals, since there are many factors that may influence their statements. Besides the influencing factors mentioned earlier in this thesis, statements of annoyance are likely to be influenced by current and prior experiences which in turn often vary between individuals (Berglund et al., 1975; Brown et al., 1985). Nonetheless, it is highly interesting that the respondents' ratings on occurrence and annoyance are correlated, which implies that the ratings are not exaggerated in relation to each other. This implies that an individual's expression of discontent may be considered

authentic in that the statement of annoyance, to a large extent, is based on the respondent's perception of occurrence.

4.2 User involvement in traffic-planning

As mentioned earlier, there may be good reason for a traffic planner to collect user experiences in planning processes. This chapter addresses the interviews in *Study 2,* also reported in *Paper 4,* on involvement of public participants in Swedish traffic-planning; how and to what extent users are involved in Swedish traffic-planning, benefits and problems associated with involvement, and what prerequisites seem to determine potential involvement. Using these as a reference, the possibilities of implementing the methodological considerations from *Study 1* can be discussed.

The results if the interviews indicate that involvement of public participants is not a common feature in Swedish municipalities. Few of the interviewed planners report recurring or systematic participatory efforts. Therefore, no conclusions can be drawn on what participatory methods they prefer in different circumstances, or what needs there are regarding e.g. guidelines for participation in general or instructions on specific methods. However, *Study 2* reveals other features of planners' reasoning on how to handle information from users in general. From this perspective, the results from *Study 1* are highly relevant, since they may contribute to overcoming some methodological obstacles.

4.2.1 Practice in Swedish municipalities

There can be many reasons for not involving users in the traffic-planning process. Resources, in particular in terms of time, money, and access to employees, are mentioned by all informants as the main constraints to involvement. This is in line with previous research that has acknowledged that participatory processes can be time consuming (Mumpower, 2001; Svensson, 2004), demanding of labour (Jones, 2011), and delays associated with them can be problematic (TRANSPLUS, 2003). Other factors, besides time, that are important for the effectiveness of participation are costs, political support, and feasibility (Mumpower, 2001).

However, the interviews reveal that the attitude of the planner and the tradition of working with participatory efforts in the municipality seem to be important

determinants for the involvement of users as well. The interviewed planners have an almost unanimous, positive attitude towards user involvement and are well acquainted with the benefits associated with it, such as increasing the knowledge and understanding of users' needs and demands (Innes, 1998), increasing the users' understanding of the planner's prerequisites (Burby, 2003), facilitating the anchoring and support of ideas and decisions among the users (Irvin and Stansbury, 2004; Taylor and Tight, 1997), and enabling the user to get his/her voice heard (Irvin and Stansbury, 2004). The planners with a negative stance explain this with credence in their own competence, whereas users' opinions are not necessary.

Since the level of involvement is reported to be low, it is impossible to draw conclusions on the interviewed planners' actual knowledge and abilities to perform participatory efforts. When performed, the involvement is said to be of an "ad hoc"-character, meaning that the choice of methods and participants is often made there and then and without deeper methodological considerations. Several informants mention having difficulties when handling information from the public. This is also experienced by Listerborn (2007) who shows that inability to deal with received information in the participatory processes is a common fear among planners. One informant says that this, together with time consumption associated with participation, is a probable reason for *not* involving users in the traffic-planning process. Another aspect of this is a feeling among several of the interviewed planners that participating users have difficulties understanding the complexity of traffic-planning issues. Several planners thought that suggestions from users are too detailed and based on self-interests, which further complicate the planner's interpretation of the information given.

Noticeably, despite lacking experience of participatory efforts as well as methodological considerations associated with these, almost all informants are willing to answer questions on how user involvement is to be performed. Most of them give good general descriptions of important things to keep in mind when involving users, but deeper knowledge of methodological considerations seems to be lacking. A few show more understanding of methods and difficulties associated with systematic involvement. These are the two consultants and primarily representatives from the municipalities where user involvement is a recurring feature. Cooperation with consultants as well as with internal public relations staff is reported to be common in the municipalities with the most extensive involvement of users. Hence, the results imply that with greater experience follow deeper knowledge and understanding of the complex task of involving users. Since the municipalities with the most extensive involvement probably have stronger

resources, the opportunity to achieve a deeper understanding through experience seems to be limited for municipalities with fewer resources.

The results from *Study 2* can be interpreted in various ways. On the one hand, the low level of participatory efforts is in general explained by limited resources in terms of time, money and personnel. This might very well be the main reason why participation is not a more common feature. On the other hand, the analysis indicates that there might be other, more underlying explanations determining whether participation occurs or not. As mentioned, the planner's general attitude towards involvement seems to be of importance, as do the planner's familiarity and knowledge of how to execute participatory efforts as well as how to analyze and implement the received information. Given the scope of this thesis, it is not necessarily of interest to ascertain which of the explanations above is "correct", since the interviews do not reveal the stance the informants would take if they were given sufficient resources. In order to get a more detailed description of why involvement is not a recurring feature in municipal traffic-planning, there is a need to gain more knowledge of the organizational prerequisites of participation in terms of who decides and who executes. In such a study, the indications from *Study 2,* regarding the impact of the planner's attitudes and the actual limits of resources, could be further investigated and validated.

5 Thesis contribution

There are valid reasons to discuss whether it is interesting to let users make estimates of occurrences of traffic-related factors that are easily made with objective data, or whether the main interest should instead be what they think about the occurrences. The results in this thesis reveal that it is of great interest for both researchers and planners to gain an understanding of what may have an impact on an individual's statements, and to acquire frames of references regarding how realistically an individual is capable of making assessments. For instance, the knowledge that citizens may have difficulties estimating speeds can be a useful tool when designing communication with users and evaluating how realistic or unrealistic individuals' statements may be.

This thesis identifies factors that seem to be of importance when collecting and analyzing user opinions on traffic-related subjects. The results reflect different aspects of methodological considerations when *collecting* information, as well as knowledge of how to *understand* and *interpret* the received information.

This chapter recapitulates, discusses, and condenses these aspects into a bulleted list of recommendations that can be of use when collecting user experiences in research and practice.

5.1 Aspects of information collection

The most interesting methodological considerations when collecting user experiences cover the choice of background variables to control for and aspects of phrasing of questions.

The analyses of background variables indicate that there is reason to pay attention to which variables are controlled for. The results concerning the variable *walking frequency* are especially interesting. Respondents who state that they walk "several times per week" or more in their street are more likely to give higher ratings than the respondents who walk more seldom. It would be interesting to control for variables that may impact the respondents' rating of walking frequency. For instance, the length of the walk was not defined in the questionnaire and hence there was a risk that some respondents neglected to recall or mention some of their trips. Further, different perspectives depending on preferred or frequently used traffic mode may give different associations on the traffic environment. Nevertheless, the results for walking frequency imply that controlling for a variable regarding a respondent's familiarity with the subject or environment of interest can make an interesting contribution to the analyses of user opinions.

Further results regarding background variables concern the more "traditional" variables age and gender. Information on these are easy to collect, and questions on age and gender are often used for collecting background information or for making the respondents feel comfortable and motivated to answer the questionnaire (or equivalent). However, when it comes to interpreting the information on traffic-related phenomena, difficulties arise with regard to age and gender. These are often interesting variables to control for since they can contain important information, and there is often reason to use them. The results in this thesis are interesting, however inconsistent, meaning that it is hard to draw general conclusions about the way in which they are interesting to control for when asking traffic-related questions. There seem to be a need to analyze the results in terms of the character of the question in order to understand some of these inconsistencies. Are the results known to be typical for respondents of specific age and gender, for instance cyclists on the sidewalk for older pedestrians?

Using variables like age and gender also demands an understanding that these variables are hard to analyze separately and are often affected by socio-related factors. A recommendation could be that these variables, though easy to control

for, should be used with the awareness that they are complex. Therefore, it might be a good idea to first find out whether they are an interesting to test for at all, and if so in what way, and then to be careful and aware of that the results may be affected by each other as well as other variables. Considerations of this may be important to ensure that age and gender are not tested for by default and instead of other, in the specific cases, more interesting variables.

Another interesting result shows that minor variations in phrasing can affect, and hence bias, the information received from public participants. Small changes in phrasing have a significant impact on the respondents' ratings of accidents and incidents. Knowing how the formulation of a question may have an impact on the answer can be useful, maybe not in terms of knowing exactly *how* certain phrasings are interpreted, but *that* differences due to phrasing variations may occur. This implies that there is reason to be consistent when formulating questions, e.g. throughout an interview or in before-after studies.

5.2 Aspects of analysis of information

Aspects that contribute to the understanding and interpretation of the subjective information obtained from users are also analyzed. The results discussed here cover individual's abilities to make realistic assessments of the occurrence of traffic-related features as well as how these are related to their annoyance. The results regarding the collection of information are also highly relevant in the interpretation of users' statements, though not discussed in this context here. Similarly, the results discussed below also apply when collecting information.

The results show that the order of the magnitude of the respondent's ratings coincides with the order of the objective values (accident frequency, traffic flow, and speeding), which implies that the respondents in each of the streets make realistic assessments of the situation in their street. It is especially evident that the estimates were lowest in the street with the lowest objectively measured values (Street C). This is interesting in that the respondents seem to follow the instructions on answering the questionnaire with their street, and its characteristics, in mind, and that those frames of reference are of importance when interpreting information from users. This rough accuracy between the estimates and objective data can be interesting when analyzing and comparing data from different environments. The relationship is especially evident for the streets with considerable differences in objective characteristics. Further studies

could embrace analyses of how big differences between the objective values that are needed in order for this relationship to occur.

However, further comparisons to objectively measured data on speeding and accident frequency show that the accuracy of the estimates are varying, with rather realistic estimates of accident frequency, but large exaggerations of speeding. This is mostly explained by the character of the question asked since accidents and speeding are phenomena that occur to quite different extents. Mean values are used as rough representations in the analyses and it might be interesting to follow up the studies with more exact assessments. But, since there are objective ways of measuring speed and acquiring data on injury accidents, it may not be of specific interest that there are some inconsistencies in the accuracy of the respondents' estimates of the different variables. Instead, increased knowledge of individuals' abilities to assess objective factors, implied by the results above, can be useful when analyzing whether the information given is a realistic reflection in relation to the objective prerequisites, or is perhaps exaggerated due to different circumstances. This in turn is an interesting input for creating traffic environments which the users will appreciate and use in the intended way.

Further, the correlation of the respondents' stated annoyance of traffic-related phenomena with their estimates of occurrence of the same phenomena implies that few respondents state exaggerated annoyance in comparison to the occurrence. This relationship can be interesting in that individuals' complaints may be based on their perception of occurrences and not on complaints for their own sake. The most interesting deviations from the correlating responses are found among respondents in the oldest age group, who turn out to be "non-complaining" regarding some of the tested phenomena, i.e. high occurrence is associated with low annoyance. Further, the respondents in Street C report of low occurrence but high annoyance regarding speeding. Since the actual share of speeding vehicles is very low in this street, this might be an effect of unexpected events being considered more annoying than more common events. However interesting, the results regarding the relationship between occurrence and annoyance should be a subject for further research, for instance an investigation of how the scale steps correspond to each other and whether the results may be an effect of the questions following each other.

5.3 Methodological implications in practical planning

Altogether, the interviewed planners seem to show a general interest in involving users in the planning process. However, there are several reasons given for considering limitations in feasibility. As mentioned, there can be limitations within the organization and decision making, which lies outside the scope of this thesis. Still, the interviews revealed methodological aspects that could well be the subjects of further discussion, to which the considerations in this thesis could contribute.

From the perspective of the methodological considerations described above, it is of specific interest that several informants admitted that they were insecure about dealing with the information from users, and that this in turn could discourage involvement. As mentioned, the instructions on how to involve users in the traffic-planning process are short and vague in the Swedish traffic-planning guidelines, TRAST. Different participatory methods are suggested, but without any instructions on how to perform them (SKL, 2007). The fact that planners feel insecure is not very surprising, since highlighting the complexity of users' statements was the starting point in this thesis.

However, instead of focusing on particular methods to use, and how they should be performed, the results in this thesis may provide the planner with a check list of factors to keep in mind when communicating with users, regardless of method. Thus, the involvement of users may be somewhat simplified and less dramatic. In order to facilitate the gathering and interpretation of data, a limited number of factors to keep in mind may encourage the involvement of users. A list of recommendations, presented below, could be the start of creating such a check list for planners, regardless of the form of communication that is executed.

5.4 List of recommendations

The results in this thesis, in the form of a list of recommendations, may well serve as guidelines on how to collect and analyze information on traffic-related phenomena from users (Figure 9):

- Individuals who are frequent walkers in an environment are more likely to state that traffic-related phenomena occur to a higher extent that those who walk less frequently. Therefore, when discussing traffic-related issues with users, controlling for how familiar a respondent is with the area/subject of interest should make an interesting contribution to the analyses.
- Variables such as gender and age are often relevant and easy to collect. However, in relation to traffic-related factors, they are difficult to analyze since their effects are hard to isolate from each other and from other influencing factors. Therefore, when controlling for factors such as gender and age it is important to identify what contribution they are supposed to make to the analysis and whether they are actually interesting to analyze, especially.
- Minor variations in phrasing of a question could bias the result considerably. Therefore, it is important to use consistent phrasings, for instance when asking different individuals as well as in before and-after studies.
- Even though they have difficulties making exact assessments of the occurrence of traffic-related factors in their street, such as speeding and numbers of injury accidents, individuals seem to be capable of making realistic assessments of the situation. Therefore, when analyzing information from users, awareness of the individuals' frames of reference in terms of contextual aspects, such as characteristics of the specific environment, is important
- Individuals' ratings of annoyance correlate well with their stated level of occurrence. Therefore, an individual's expression of e.g. discontent may be considered authentic in that statements of annoyance are based on the respondent's perception of occurrence.

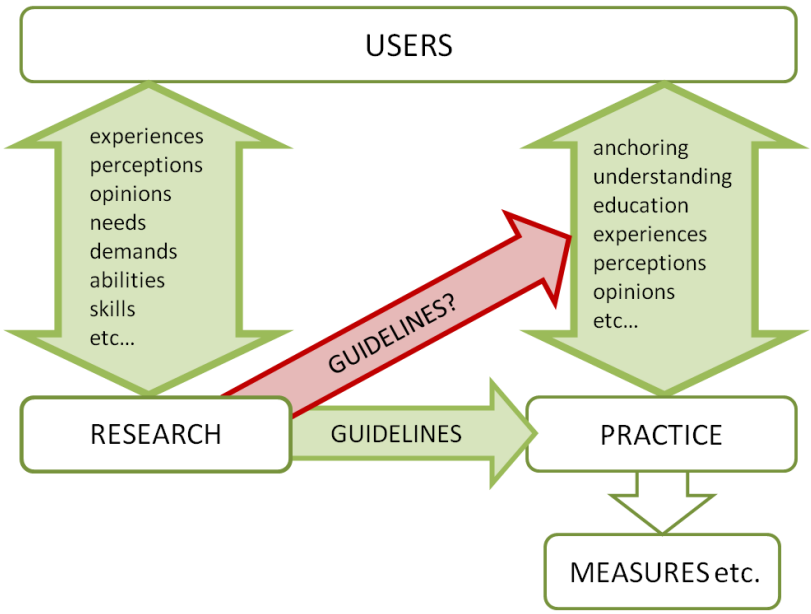

Figure 9 • Potential application of the listed recommendations

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Appendices

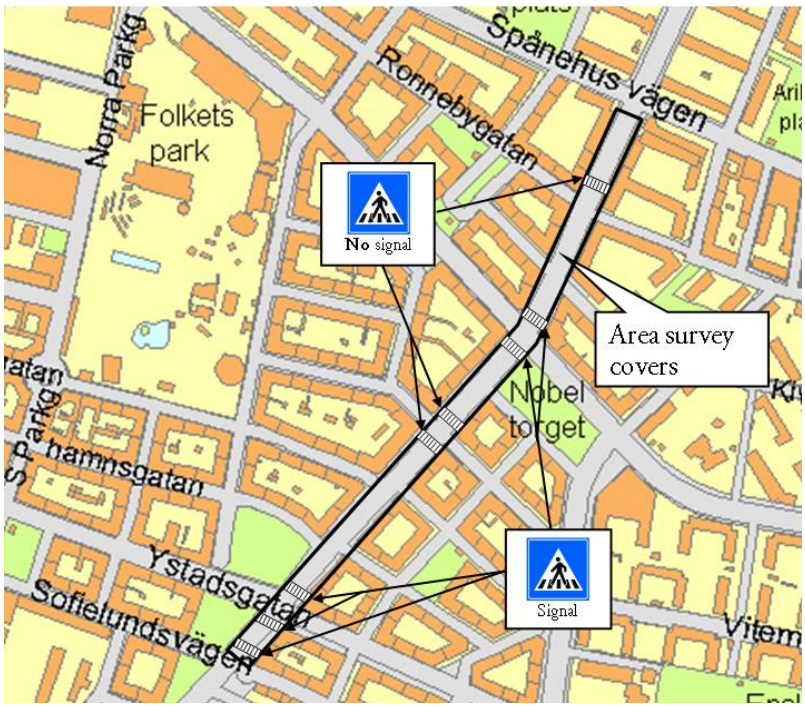
Appendix A

Survey of the traffic situation in your street

This survey contains questions on how you experience your street, in terms of living as well as moving in the traffic environment. The marked area on the enclosed map shows the street section that this survey covers. Note that it only covers this marked area, i.e. not the rest of the city.

We are interested in your experiences of the existing situation

Thus, we are **not** directly interested in how you believe it should be.



About you		
1	Year of birth	19 ____
2	Gender	❑ Woman ❑ Man
3	Form of residence	❑ Rented apartment ❑ Condominium ❑ Other _____
4	How many people live in your household? *(yourself included)*	_____ adults (adult children included) _____ children aged 0-5 _____ children aged 6-15 _____ children aged 16-19
5	What is your occupation?	❑ Gainfully employed / self-employed ❑ Job applicant ❑ Retired ❑ Student ❑ Other _____
6	Do you have access to a car within your household?	❑ Yes, I am a driver myself ❑ Yes, but I do not drive ❑ No
7	Mark how frequently you use each form of transport within the city. **"Walking (shorter distance)" includes shorter movements in your local neighborhood*	Never / Very seldom / Very often Walking (shorter distance)* ❑ ❑ ❑ ❑ ❑ ❑ Walking (longer distance) ❑ ❑ ❑ ❑ ❑ ❑ Bicycle ❑ ❑ ❑ ❑ ❑ ❑ Moped/Motorbike ❑ ❑ ❑ ❑ ❑ ❑ Car ❑ ❑ ❑ ❑ ❑ ❑ Bus ❑ ❑ ❑ ❑ ❑ ❑

Living along your street		
8	a • Do you have any windows facing the street?	❑ Yes, all of them ❑ Yes, some of them ❑ No
	b • Which window type does your apartment have?	❑ Double-glazed ❑ Tripple-glazed ❑ I don't know ❑ Other_____
9	a • Do you have a balcony facing the street?	❑ Yes ❑ No
	b • To what extent do you use your balcony?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all
10	a • To what extent do you hear the sound of traffic when you are inside your apartment?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 11
	b • Is the sound from the street a problem for you?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 11
	c • In what way is it a problem? *You are allowed to choose more than one alternative*	❑ Problems sleeping ❑ The sound disturbs conversations ❑ Problem hearing the radio or the TV ❑ Problems concentrating ❑ Problems ventilating the apartment ❑ Get headaches ❑ Other _____
	d • Do you adapt your daily life in any way, in order to handle the sound from your street? *You are allowed to choose more than one alternative*	❑ No ❑ I avoid opening the windows ❑ I avoid spending time outside ❑ I avoid using my balcony ❑ I switch rooms when I want to have conversations ❑ Other_____

11	a • To what extent do you notice the exhaust from traffic when you are inside your apartment?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 12
	b • Is the exhaust in your street a problem for you?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 12
	c • In what way is it a problem? *You are allowed to choose more one alternative*	❑ Feel nauseous ❑ Problems concentrating ❑ Problems breathing ❑ Problems ventilating the apartment ❑ Get headaches ❑ The apartment gets dirty ❑ Other _____
	d • Do you adapt your daily life in any way, in order to handle the exhaust in your street? *You are allowed to choose more than one alternative*	❑ No ❑ I avoid opening windows ❑ I avoid spending time outside ❑ I avoid using my balcony ❑ Other_____
12	Mark the alternative that you consider to be the largest problem concerning your street, when you are inside your apartment.	❑ I don't experience any problems ❑ Physical problems (e.g. headaches, nausea) ❑ Problems concentrating ❑ Problems conversing or hearing the radio and TV ❑ Problems sleeping
13	Do you experience any other problems associated with the traffic in your street.	_____ _____ _____ _____

About traffic-related accident risks in your street		
14	a • Are you afraid of being involved in an accident in your street?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all
	b • How often do you think accidents occur in your street?	❑ Never ⇒ continue to question 15 ❑ A few times per year ❑ A few times per month ❑ Several times per month ❑ Several times per week ❑ Every day
	c • How often have you experienced or witnessed an accident in your street?	❑ Never ⇒ continue to question 15 ❑ A few times per year ❑ A few times per month ❑ Several times per month ❑ Several times per week ❑ Every day
15	a • How often do you think incidents between road users occur in your street?	❑ Never ⇒ continue to question 16 ❑ A few times per year ❑ A few times per month ❑ Several times per month ❑ Several times per week ❑ Every day
	b • How often have you experienced or witnessed an incident between road users in your street?	❑ Never ⇒ continue to question 16 ❑ A few times per year ❑ A few times per month ❑ Several times per month ❑ Several times per week ❑ Every day

About crossing your street		
16	a • Where do you *usually* cross your street?	❑ At a signalized crossing ❑ At a non-signalized crossing ❑ Anywhere, regardless of the presence of crossing facilities ❑ Other _____
	b • Why do you choose to cross there?	_____
17	a • How often do you find it difficult to cross your street?	Very seldom ❑ ❑ ❑ ❑ ❑ Very often ❑ Never ⇒ continue to question 18
	b • During which periods in the day is it difficult to cross?	Never / Very seldom / Very often Morning ❑ ❑ ❑ ❑ ❑ ❑ Lunch hours ❑ ❑ ❑ ❑ ❑ ❑ Early afternoon ❑ ❑ ❑ ❑ ❑ ❑ Late afternoon ❑ ❑ ❑ ❑ ❑ ❑ Evening ❑ ❑ ❑ ❑ ❑ ❑ Night ❑ ❑ ❑ ❑ ❑ ❑
18	a • How often do you cross your street at a signalized crossing?	Very seldom ❑ ❑ ❑ ❑ ❑ Very often ❑ Never
	b • Is it a problem for you to cross there?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 19
	c • In what way is it a problem? *You are allowed to choose more than one alternative*	❑ Turning cars don't stop ❑ Too little time to cross ❑ I only make it to the refuge ❑ Too little space on the refuge ❑ Too long wait for green light ❑ I trip on edges and unevenness ❑ Other_____

19	a • How often do you cross your street at a **non**-signalized crossing?	Very seldom ❑ ❑ ❑ ❑ ❑ Very often ❑ Never
	b • Is it a problem for you to cross there?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 20
	c • In what way is it a problem? *You are allowed to choose more than one alternative*	❑ Only the car in one of the lanes stops ❑ None of the cars stop ❑ Too little time to cross before the crossing car ❑ Too much car traffic in the street ❑ The cars go too fast ❑ I have to stop and wait on the refuge ❑ Too little space on the refuge ❑ I trip on edges and unevenness ❑ Other_____
20	How often do you cross your street **between** two crossings?	Very seldom ❑ ❑ ❑ ❑ ❑ Very often ❑ Never
21	a • At what type of crossing facility do you *prefer* to cross a street like yours?	❑ At a signalized crossing ❑ At a non-signalized crossing ❑ Wherever, regardless of the presence of crossing facilities ❑ Other _____
	b • Why do you *prefer* this type of crossing facility?	_____ _____ _____

22	a • To what extent is there too much traffic in your street?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 23
	b • During which periods in the day is there too much traffic?	Never / Very seldom / Very often Morning ❑ ❑ ❑ ❑ ❑ ❑ Lunch hours ❑ ❑ ❑ ❑ ❑ ❑ Early afternoon ❑ ❑ ❑ ❑ ❑ ❑ Late afternoon ❑ ❑ ❑ ❑ ❑ ❑ Evening ❑ ❑ ❑ ❑ ❑ ❑ Night ❑ ❑ ❑ ❑ ❑ ❑
	c • Is too much traffic in your street a problem for you?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 23
	d • What is the main problem? *You are allowed to choose more than one alternative*	❑ Noise ❑ Exhaust ❑ Difficulty crossing ❑ Accidents ❑ Other _____
23	a • To what extent do you think the cars exceed the speed limit in your street?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Never ⇒ continue to question 24
	b • During which periods do you think the cars exceed the speed limit?	Never / Very seldom / Very often Morning ❑ ❑ ❑ ❑ ❑ ❑ Lunch hours ❑ ❑ ❑ ❑ ❑ ❑ Early afternoon ❑ ❑ ❑ ❑ ❑ ❑ Late afternoon ❑ ❑ ❑ ❑ ❑ ❑ Evening ❑ ❑ ❑ ❑ ❑ ❑ Night ❑ ❑ ❑ ❑ ❑ ❑

	c • Is speeding in your street a problem for you?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 24
	d • What is the main problem? *You are allowed to choose more than one alternative*	❑ Noise ❑ Exhaust ❑ Difficulty crossing ❑ Accidents ❑ Other _____
24	a • To what extent are there too many parked cars in your street?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Never ⇒ continue to question 25
	b • Are parked cars in your street a problem for you?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 25
	c • What is the main problem? *You are allowed to choose more than one alternative*	❑ They obstruct my view when crossing ❑ The car drivers can't see me behind the parked cars ❑ Difficulty crossing ❑ Other _____
25	Mark the alternative you consider to be the largest problem while crossing your street on foot.	❑ I don't experience any problems ❑ Too many *parked* cars ❑ The street is too wide ❑ I trip on edges and unevenness ❑ Too many cars ❑ The cars don't stop at non-signalized crossings ❑ The cars go too fast
26	Please state whether you experience any other problems associated with crossing your street on foot.	_____ _____ _____

About walking along your street		
27	a • How often do you walk along your street?	❑ Never ⇒ continue to question 28 ❑ A few times per year ❑ A few times per month ❑ Several times per month ❑ Several times per week ❑ Every day
	b • What is the main reason for walking?	❑ Exercise ❑ Social encounters ❑ Transport to and from a destination
28	a • Is the standard of the sidewalks in your street poor?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 29
	b • Is the poor standard of the sidewalks a problem for you?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 29
	c • What is the main problem? *You are allowed to choose more than one alternative*	❑ Narrow sidewalks ❑ Wide sidewalks ❑ Edges ❑ Unevenness ❑ Snow or pebbles on the sidewalk ❑ Other _____
29	a • Are there cyclists on the sidewalks in your street?	Very seldom ❑ ❑ ❑ ❑ ❑ Very often ❑ Never ⇒ continue to question 30
	b • Are cyclists on the sidewalk a problem for you?	To a small extent ❑ ❑ ❑ ❑ ❑ To a large extent ❑ Not at all ⇒ continue to question 30
	c • What is the main problem? *You are allowed to choose more than one alternative*	❑ They often come close ❑ They often go too fast ❑ It's difficult to hear them from behind ❑ It gets too crowded ❑ Accidents ❑ Other_____

30	Mark the alternative you consider to be the largest problem while walking along your street.	❑ I don't experience any problems ❑ Cyclists on the sidewalks ❑ The sidewalks are too narrow or too wide ❑ Edges on the sidewalks ❑ Unevenness along the sidewalks ❑ Poor cleaning or snow removal
31	Please state whether you experience any other problems associated with the sidewalks along your street.	_____ _____ _____

Further comments		
32	Would you like to add anything more concerning the traffic environment or living in your street?	_____ _____ _____
33	Do you have any further comments?	_____ _____ _____

Thank you for your participation!

Appendix B

Interview guide used in *Study 2*

Initial questions:

- Initial question on the informant's position and education
- Does your municipality have a pronounced strategy of involving citizens in the traffic-planning process?
- Is participatory effort a recurring feature in the traffic-planning processes in your municipality

If not:

- Are there any specific reasons for not involving users in your municipality?
  - Costs, time, lack of competence, lack of instructions
- Participation does not make a contribution

When participation occurs:

- What is the main objective of the involvement?
- How do you usually involve users in your municipality?
  - Standardized procedures or ad hoc
- Which participatory methods are more or less suitable?
  - E.g. questionnaires, interviews, focus groups
  - Why?
- Who is in charge of the design of the participatory process and choice of the methods used?
  - Is he/she skilled in collecting and analyzing user experiences?
- Who is in charge of the implementation?
  - Is he/she skilled in collecting and analyzing user experiences?
- If consultants are engaged, are there any checks of their skills in collecting and analyzing user experiences?

- What type of information do you usually wish to obtain from the citizens?
  - Experiences, descriptions, opinions, etc.?
- What is the information used for?
  - Is the information from users used in communicating with decision makers? In what way?
- What function do you think involvement of users can have?
- Benefits with information from users
- Difficulties or disadvantages
- What opportunities do you think there are with user involvement?
- What are the main obstacles?
  - Costs, time, lack of competence, lack of instructions
- When is it most suitable to involve users in the planning process?
  - Why?
  - Is it less suitable at any time of the process? Why?
- Can you give an example of present or previous projects where user opinions were taken into consideration?
  - What was the project's main objective?
  - What was the purpose of involving users?
  - Was there any advance plan of what the information was to be used for?
  - What participatory methods were used?
  - How were the participants recruited?
  - Who was in charge of designing the participatory process?
  - How was the information collected?
  - When in the process did the participation occur?
  - How was the information analyzed?
  - How was the information used?

Final questions on the existing traffic-planning guidelines in Sweden, TRAST (Traffic for an Attractive Town):

- Do you, as a traffic planner, use TRAST in your work?

If yes:

- In what way?
  - As guidelines for making a traffic strategy
  - As a book of reference
- Describe the strengths of TRAST
- Describe the weaknesses of TRAST
- Is there anything in TRAST that you would like to improve or lack?

If no:

- Why not?
- Are you familiar with TRAST?

Regardless of yes or no:

- What do you think of the part where involvement of users is described?
- Are the instructions sufficient?

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