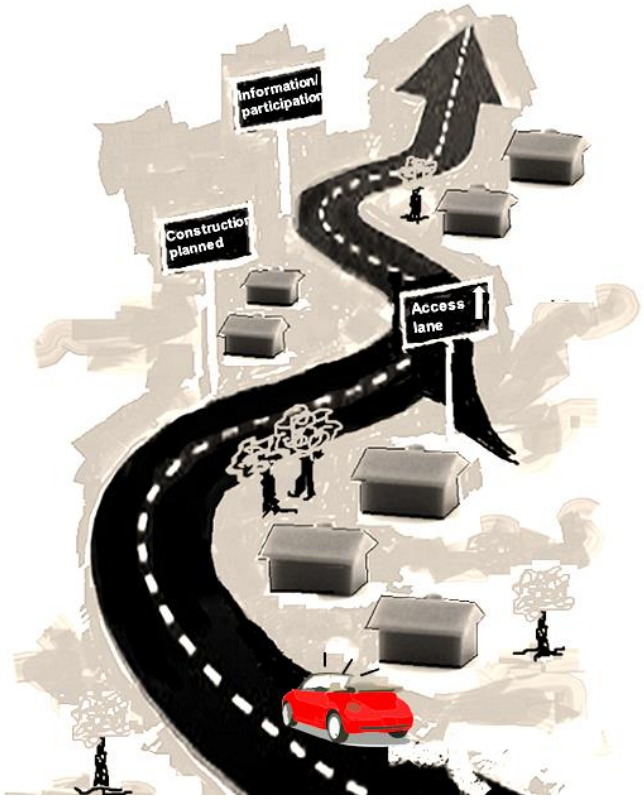
Summary

Living near Highways



Introduction

Living near highways is a controversial topic. On the one hand, proximity to highways is associated with negative environmental effects caused by the presence of highway infrastructure and car use, such as noises, air pollution and barrier-effects through fragmenting areas. On the other hand, people living in proximity to highways may gain from higher accessibility generated by highway infrastructure (when an access lane is provided), as the highway makes it easier to reach places in a regional context. Living near highways may thus come with both negative and positive effects. But how do residents tradeoff those negative and positive effects in the residential context? To what extent does this change as a consequence of highway projects? And to what extent and how do they want to be involved in the planning of highway infrastructure?

In current decision-making about management and planning of highway infrastructure, positive and negative effects of highways are mainly traded off by governmental experts, guided by the views of active citizens attending consultation meetings, or taking part in formal voice giving activities (i.e. “zienswijzes”). The question could be raised to what extent those views are representative to the broader residential population close to highway infrastructure. This study aims to provide more general insight into the influence of existing and planned highway infrastructure based on the perspective of the wider residential community living in proximity of highway infrastructure.

Limitations in existing research and focus of the study

Three specific knowledge gaps in existing literature and challenges to planning are addressed, to which the study contributes.

First, the study tries to gain better insight to what extent and how residents trade-off positive and negative effects of highways. Although there is quite some research being done on either explaining nuisance or accessibility interest, and on the impact of road externalities on housing prices, there is hardly any information about how accessibility factors and negative environmental aspects related to highways are traded off in people’s overall residential context. Further understanding of this tradeoff from a residents’ perspective could assist planners in better estimating the effects of highway infrastructure on the residential context.

Second, the study investigates the impact of highway infrastructure change i.e. highway projects on the residential context. Although existing research provides insight into the impact of highway projects on house prices, this may not always

give a complete picture of the perceived implications for (different) residents. Having better knowledge of the impacts of highway infrastructure change could help to understanding under which conditions (re)development projects are more and less accepted by residents.

Third, the study pays attention to the role of involvement activities in addressing the impact of (planned) highway infrastructure, by distinguishing between information and participation activities. Despite several studies have investigated aspects, which are important when it comes to information and participation of stakeholders in projects, empirical insight in the effects of such efforts from the perspective of (different) residents is limited. Such insights could help to better understand to what extent and under which conditions involvement activities could indeed contribute to addressing the perception of highway infrastructure projects.

Research aim and approach

This study aims to evaluate the impact of highway infrastructure from a residents' perspective by analysing the knowledge gaps as just specified. In doing so, it centralizes *residential satisfaction* as an important concept. Residential satisfaction or the match between actual and preferred housing conditions is often seen as a proxy for a resident's quality of life and subjective wellbeing. More specifically, the study aims to: *"To gain greater insight in how positive and negative effects of highway infrastructure, planned highway projects and involvement activities influence residential satisfaction and consequent (re)location behaviour as to facilitate highway planning."* Such insights may help transportation planners to relieve locational stress and may also prevent or reduce protests and relocations.

The knowledge gaps are studied in the context of the Netherlands, a small highly densely populated country with contested claims on scarce space. In order to create a comprehensive insight, a mixed method approach is used while applying both quantitative and qualitative research methods. First, a conceptual model is constructed based on an extensive literature study, which formed the basis for the empirical analysis. Subsequently, relationships between highway infrastructure (projects), residential satisfaction and (re)location are studied based on data from an extensive questionnaire set out in 2011 in seven highway locations in the Netherlands among residents living within 1km from the highway: Assen (A28), Ypenburg (A4), Son (A50), Uden (A50), Veghel (A50), Groningen (N7/A7) and Utrecht (A12/A27). In total, 1396 residents participated in the questionnaire, which is a response rate of 25.4%. The questionnaire consisted of questions about residential satisfaction, moving intentions, the perception of highway nuisance and

accessibility, and various location- and personal characteristics. Within the locations where highway projects were announced at that time (Groningen and Utrecht) or where recently a project took place (Son and Uden), the questionnaire also paid attention to the residents' perception of those projects. By selecting both, 'stable' situations and situations in which projects are or were recently planned, it was aimed to account for different phases of highway planning. Subsequently, the insights of the questionnaire are deepened through in-depth interviews with residents living along the Southern Ring Road highway in Groningen, in order to further understand motivations and experiences with living close to highways. The Southern Ring Road highway crosses the city of Groningen and is part of the highway A7. The case was chosen as it can provide insight in residents' experiences with living close to the Southern Ring Road highway as well as with a planned highway (re)development project, as an extension and adjustment of the highway and its surroundings was discussed at that time. In total, 38 residents living along the Southern Ring Road were interviewed, complemented by interviews with representatives of neighbourhood interest groups and the governmental project team planning the Southern Ring Road project. Additionally, the insights from a residents' perspective were complemented with observations, interviews and discussions with representatives from highway planning policy and practice. Specific attention is paid to the challenges, which exist in planning practice when it comes to involving residents in projects. The insights of the study are furthermore discussed in a 'focus group' with experts from science, policy and practice to further interpret the findings.

Research findings

The research aim is split up into several research questions which are investigated and discussed along the chapters. Below the main findings are discussed.

First, in *Chapter 2*, the impact of highway infrastructure on the residential context is more extensively explored based on an extensive literature study. It is concluded that current insights on the impact of highway infrastructure on the residential context are incomplete, yet needed in order to assist planners in understanding the opinions of the wider residential community and include them more effectively. Despite effects are of course partly situation-/project specific, an analysis of the perceptions of the wider residential community close to highways could provide more general insight into how the residential context is affected by the proximity of highway infrastructure. The Chapter presents a conceptualization to study the impact of existing and planned highway infrastructure on the residential context, in

which residential satisfaction plays a central role. In defining the positive effects of highways, the study argues that proximity to a highway is related to regional accessibility: reaching activities within a regional context. With regard to negative effects, three types of highway nuisances are defined: noise, air pollution, and barrier- and visual effects. Residential satisfaction could be influenced by both positive and negative effects of highways, by (perceived) changes in those effects as a consequence of highway projects, and by information and participation. A low residential satisfaction could result in coping strategies and in the most extreme case trigger residential moving.

In *Chapter 3* the relationship between highway infrastructure and residential satisfaction is empirically investigated, using questionnaire data collected among residents in seven residential areas close to highway infrastructure in the Netherlands. The Chapter reveals that the relationship between highway infrastructure and residential satisfaction is not straightforward. Among the almost 1,400 respondents living within one kilometre of highway infrastructure, residential satisfaction is relatively high, the perception of highway related noise, air pollution and barrier-effect nuisance relatively low and accessibility satisfaction high. The statistical analyses show that residential satisfaction is not per definition influenced by actual exposure or distance to the highway or access lane, but is affected in case positive –accessibility gains- or negative effects –mainly noise and air pollution– of highways are perceived by residents. In addition, other (appreciated) location characteristics such as perceived attractiveness of building infrastructure, perceived traffic safety and perceived social cohesion were found to be of comparable importance in explaining residential satisfaction. This indicates that both accessibility gains and appreciated location characteristics could fulfil a compensating function on perceived negative environmental effects of highways.

Chapter 4 takes it a step further, and investigates how positive and negative effects of highway infrastructure alongside other location characteristics relate to each other *as well as* to one of residents' most extreme coping strategies: the intention to move. The relationships are studied based on the collected questionnaire data using a 'Structural Equation Model' (SEM). The analyses confirm the important role of residential satisfaction in understanding moving intentions, and also emphasize the complex relationship between highway nuisances, perceived accessibility gains and other location characteristics. More specifically, positive and negative effects of highways alongside other location- and personal characteristics influence the intention to move mainly via their effect on residential satisfaction. In addition, the analysis shows that accessibility gains, but also other appreciated location characteristics could not only compensate for, but are also directly associated with perceived highway nuisances. More specifically, the perception of

highway noise, air pollution and barrier-effects was not only found to be positively associated with the level of (calculated) highway noise and air pollution and actual highway proximity, but also with a low preference for a highway location, negative attitudes about cars in general, and negatively perceived location characteristics (such as lower perceived traffic safety, lower perceived social cohesion and unattractiveness of buildings). In addition, with regard to socio-demographics, perceived highway noise and air pollution was e.g., found higher in older residents, the perception of noise and barrier-effect nuisance higher in house owners and the perception of air pollution higher in people with children. Finally, results indicate that certain groups of residents, such as people with a lower highway interest, house buyers, older people, and residents in high noise exposure areas, are less likely to move in case of low residential satisfaction, which might be an indication for a lower coping ability.

Subsequently, *Chapter 5* studies the motivations of residents behind the just discussed relationships while focusing on the development of highway nuisance perception, based on in-depth interviews with residents along the Southern Ring Road highway in Groningen. The Chapter shows how the perception of highway nuisances - as described by residents - develops in the interaction between people and their experiences in their broader residential environment, and discusses five main themes underlying motivations of residents. First of all, the analysis indicates the importance of awareness of opting for a highway location; residents indicated that having evaluated the positive effects of accessibility and / or the negative effects of highways when making their location choice was a reason for a lower perception of highway nuisance. However, there were also residents who described that they were more or less surprised by the negative consequences of the highway after their location choice had been made, which they mentioned as a reason for perceiving highway nuisances in the current situation. It is also noticeable that several people indicated that they did evaluate noise, but not air pollution when making their location choice; they became more aware of the potential effects of air pollution upon being confronted with dust in and around their house. As a second theme, following on the insights from Chapter 3 and 4, residents described that perceived changes in the residential environment had changed their perceiving of highway nuisances; developments such as an increase in traffic intensity, the placing of a noise barrier, or changes in other environmental features such as changes in the direction of wind, the construction or removal of buildings causing reflection, or greenery associated with health, had influenced the development of highway nuisance perception through the residential experience in positive or negative ways and changed the situation compared to what they once chose to live in. A third important theme in the development of highway nuisance

perception described by interviewees was increased information about the potential adverse health effects of air pollution during their residential experience. Residents described that extra information in the media about the consequences of air pollution had led them to realize that they might be more at risk of harm because of their residential location close to a highway. This point was especially addressed by residents in relation to their children, their own health and to a low level of trust in the government. Furthermore, as a fourth theme, residents referred to announced future highway adjustment plans in describing their nuisance perception, which could be described as anticipation effects. Information about the project had made them more aware of the presence of the Southern Ring Road. Residents described that recent information explaining that the highway was soon to be covered by a green park, relieved their current perception of highway nuisance. Conversely, people who felt frustrated about what they heard about future plans for highway development and were dissatisfied with the way they were involved in the planning process, described that they became increasingly stressed by the presence of the highway, resulting in their becoming more aware of its nuisances. Finally, as a fifth defined theme, the ability to develop coping strategies during the residential experience appeared important; residents described cognitive coping strategies for mentally dealing with the situation such as habituation, but also cognitive dissonance reduction, or trying not to focus on the nuisances. Problem-focused coping strategies were also described, such as living far enough away, closing windows, placing grids and avoiding the balcony. However, another group of residents described an inability to cope with the nuisance perceived. Some residents explicitly referred to their socio-demographic characteristics which reduced their flexibility with regard to moving elsewhere as most extreme coping strategy, such as an older age or owning a house versus renting a house. This is largely consistent with the findings in Chapter 4 on moving intentions.

After this, in *Chapter 6*, the focus is turned to highway infrastructure in a phase of change. The chapter discusses to what extent the development of the A50 highway in Son and Uden in the Netherlands has influenced residential satisfaction. The question is studied while analysing questionnaire data collected in the two residential locations six years after highway development. An important finding of the study is that residents experience the effects of highway development differently, with differences between residential areas and between individual residents. In both studied locations most residents experienced a positive effect on residential satisfaction, this despite protest against highway development in Son prior to highway development. Residents in the town of Uden – where people were already used to living close to a busy road – were more positive about highway

development than residents in Son – where the highway was constructed on a new trajectory. Based on a Structural Equation Model (SEM), the insights of Chapter 6 also indicate that the change in residential satisfaction is positively associated with living further from the new highway, having a preference for car accessibility and a low preference for environmental quality, mostly via a positive association with the perceived change in liveability or accessibility. Residential satisfaction change appeared to be comparably influenced by perceived accessibility and liveability change. Finally, the Chapter also provides (first) indications for a process of residential self-selection as a consequence of highway development. The analyses suggest that residents who had relocated into the area after the highway development have a slightly more 'highway-oriented' profile than the original population, i.e. a marginally higher preference for car accessibility and lower preference for environmental quality, although difference between both groups appeared small.

Also *Chapter 7* discusses the question how highway projects influence residential satisfaction, but focuses mainly on expectations regarding this change prior to project execution on two locations were projects were announced at that time: the Southern Ring Road Groningen (N7/A7) and the Utrecht Ring Road (A12/A27). The analyses show that perceptions of residents in Groningen and Utrecht regarding the project were mixed: over the two projects, the groups of residents expecting a negative effect, no effect, or a positive effect on residential satisfaction, were about the same size. However, residents in Groningen (in the periphery of Groningen) had more positive expectations than residents in Utrecht (a medium-sized city in the centre of the Netherlands). Further analysis of motivations of residents showed that in Groningen, more people seem to acknowledge the importance of the project for the regional economy. Also differences between residents were observed. The analysis showed more positive expectations among residents living further away from the proposed highway project, males, lower educated, highway users, people with positive opinions about car driving, and people currently perceiving a lower amount of noise and air pollution nuisance.

In addition, the Chapter pays particular attention to the role of information about projects in understanding residents' expectations. A main conclusion from the study is that receiving governmental project team information is associated with more positive expected changes in residential satisfaction, as it contributes to higher information satisfaction. Nevertheless, only a minority of residents indicated to be satisfied with information, which suggests that information does not yet succeed in satisfying all information preferences. In addition, the study shows that although project teams indicated they had been informing residents since the exploratory phase of the project, over the two highway projects, only 40% of the

residents reported actually having received information from the project team. This points to a mismatch between information provision and perceived information reception. Finally, the Chapter provides insights into differences in information collecting behaviour between residents. Whereas receiving project team information was mainly associated with proximity to the highway project, attending information meetings organised by the project team was additionally positively associated with having a higher income, being male, making little use of the highway, having many contacts in the neighbourhood and having a higher perception of highway nuisance. As such, the group of people actively searching out information seems to be selective, differing from the more silent majority. The analysis also indicated that those attending meetings showed a more negative expectation with regard to the change in residential satisfaction.

Chapter 8 further elaborates on the role of information and participation, and discusses motivations behind residents' preference for- and satisfaction with involvement during the plan process of the Southern Ring Road highway adjustment project. An important contribution of the study is that it visualises how motivations of residents for satisfaction with involvement activities are related to the perceived quality of involvement activities provided by the government, but are also influenced by residents' contextual characteristics such as different involvement preferences.

All interviewees found it important to receive information about the project and thus to be at least passively involved, although many of them were only minimally aware of the project details. Satisfaction with passively received information about the project among interviewees was first of all described by the extent to which their concerns were addressed by the provided information. Residents indicated that concerns were addressed as they felt the project team provided sufficient information about the planning i.e. when to expect things and what it means for their daily activities, and the impacts of the project on the direct residential environment. However, residents also described contextual factors, which made them feel more easily satisfied, such as a low interest in neighbourhood development, having intentions to relocate anyway, feelings that the project would not directly change their immediate environment or the execution is still far away, or having a personal interest in good highway accessibility. In addition, trust in the information provided by the project team also appeared important to residents in describing their satisfaction with passively received information. Residents indicated that project team efforts to provide information on a frequent basis and about both the positive and negative consequences of the project positively stimulated trust, but that contradicting information during the planning process stimulated distrust. Trust in the information was also expressed by referring to

experiences with governmental actions in the past, such as financial cutbacks in previous projects which influenced the extent to which people believed the information provided by the project team about the current project. Furthermore, residents provided examples of other (trusted) information sources, which influenced the extent to which they felt the information provided by the project team was satisfactory, such as information they received from the action group against the highway project or from family and friends.

Some residents indicated a preference for seeking additional information, which was mainly motivated by interest in neighbourhood developments or having concerns regarding the plans based on the passively received information. Residents expressed their satisfaction by referring to the extent to which they perceived sufficient access to additionally preferred information, in which a good accessible website or information meeting was described as positive, but a time consuming process to get additional information not available on the website or in the meeting as negative. Furthermore, residents described that satisfaction was related to the extent to which the information-seeking process resulted in a reduction of concerns. With regard to the latter, several residents expressed that the possibility for face-to-face contacts with project team members had a positive influence on reducing their concerns, but not getting answers to their questions had a negative influence.

A final group of residents expressed a preference for active participation in the planning process of the Southern Ring Road project in addition to receiving or seeking information. These residents motivated their preference by having strong concerns, having ideas about city improvement, being triggered by social cohesion, or being triggered by earlier experiences with actions of the government they disliked and wanted to avoid this time (and a feeling to have influence on those actions). Residents motivated their satisfaction with provided participation activities first of all by their perceived access to those activities. Residents who do not like to give their opinion in public were less satisfied in this respect and expressed a perceived lack of possibilities for giving their opinion in a written manner. Provided possibilities for getting assistance in formulating a formal reaction (In Dutch: “Zienswijze”) regarding the project during information meetings were described as positive, as they make participation more accessible. In addition, residents referred to their feeling of being heard in expressing satisfaction; most residents who were involved in participation activities mentioned that although the project team was eager to change small things in the plan based on their views, they felt their influence on the plans was only marginal.

Conclusions

Based on the findings as presented in the different Chapters and reflecting on the aim of the study, the following conclusions, directions for further research and implications for planning practice are discussed (see also *Chapter 9*).

Reflection on research aim

This study aimed to investigate the impact of existing and planned highway infrastructure on the wider residential community through providing insight in the tradeoff between accessibility gains and environmental nuisances, highway projects and information and participation in residential satisfaction.

With regard to the tradeoff between accessibility gains and environmental nuisances of highways, it could be concluded that highway nuisances and accessibility gains of highways are traded off in case they are *perceived* by residents. This stresses the importance to have a broad perspective accounting for positive and negative effects of highways when considering the impact of highways on residential satisfaction. The fact that residential satisfaction and highway nuisance perception close to highways is relatively high seems to indicate that living near highways is not per definition perceived as negative. At the same time, the fact that perceptions of highway accessibility and nuisances were more important to residential satisfaction than 'objective' factors also indicates that such a perspective may need to go further than accounting for actual proximity or the level of exposure to highway infrastructure only. The study indicates that perceptions are only partly related to 'actual exposure; personal aspects such as the extent to which people have been able to make an evaluated choice for living in proximity of a highway (self-selection through information prior to the residential location choice), or have found possibilities to 'cope' with the consequences of highway proximity, but also personal circumstances are important in this respect. In addition, the study indicates the importance of the broader environment in both compensating and directly influencing the perception of highway nuisances. Increasing residential satisfaction thus asks for an integrated perspective in which the highway is seen as part of- and in interaction with the broader environment.

With regard to a changing highway environment i.e. highway projects, the findings show that the impact of highway projects on residential satisfaction is mixed and dependent on how residents personally tradeoff accessibility gains with impacts on their broader living environment. The study shows that residents who actively participate in projects are generally somewhat more negative about projects than the 'silent' majority. It might therefore be worthwhile to consider collecting the

values and preferences of residents much more widely, to better fit projects within the perceived local environment. The findings also indicate the importance to account for the type and phase of projects. Reactions on highway adjustment projects tend to be somewhat milder compared to new developments, and uncertainty about plans seems to trigger more negative reactions in the pre-phase of projects compared to reactions after project development. In addition, the study stresses differences between types of areas and residents; for example, residents with an interest in good car accessibility, living on further distance of projects and who see more benefits of the project for the larger region seem to be more positive. It is worthwhile to consider the characteristics of residential areas in assessing the potential impact of projects.

When it comes to involving residents, the study findings indicate that information and participation could help to relax the impact of projects on residential satisfaction, when those activities succeed to be perceived as satisfactory. From the perspective of residents, satisfaction with passive information provision is higher when project teams provide information on a frequent base and pay attention to the planning and positive and negative impact of projects on the broader environment. Residents who prefer to be more actively involved appreciate a good access to information, openness of information and answers to their questions. For those preferring to actively participate, perceived access to participation activities and a feeling of influence is crucial in understanding satisfaction with participation activities. Satisfaction with involvement is, as the study shows, also strongly dependent on personal factors such as interest and trust in government due to previous activities. Whether or not satisfaction with involvement is achieved is thus dependent on both project team efforts and personal characteristics. Providing various ways of information and possibilities for participation and variation in the intensity of those efforts is important to connect to different preferences.

Overall, one could thus conclude that the impact of existing and planned highway infrastructure on residential satisfaction is not straightforward, given the plurality of views among the wider residential community studied in the context of this research. This underlines the importance of including opinions of the wider community in order to draw more general conclusions about the impact of highway infrastructure. However, at the same time, the finding that residents have different views about highway infrastructure, projects, and involvement, also indicates the importance of context-specific ‘tailor made’ solutions when it comes to the planning of highway infrastructure in specific residential areas. Having a proper overview of the preferences of residents living in the area where the planning of highway infrastructure takes place could help in this respect.

Recommendations for further research

The present study provided various insights, which could be further deepened in follow up research. For example, although the study explored differences between projects in different phases of planning, and between new development and highway adjustment projects, it might be worthwhile to study further differences between types of projects, such as between smaller and larger projects, projects with more and less investment in liveability, or between types of infrastructure (railways, waterways, electricity). In addition, whereas the present study mainly focused on projects in phases before and after project realization, it is recommended to also look at reactions of projects during the construction phase. Furthermore, whereas the present study focused on people living in proximity of highways, follow-up research could study motivations of people for *not* living close to highways or for moving away from highway locations. In addition, the interviews show that perceptions of residents are also influenced by people´s trust in government. This study pays some attention to how trust in government during highway projects could be increased, but those insights could be deepened, for example by comparing actions of project teams in different projects, and/or focus group discussions with residents. A last important methodological recommendation is to further study causality. In the present study, relationships were investigated based on cross-section at one moment in time, and by asking residents to reflect on changes and developments in the past. Causality could be more systematically studied by a longitudinal study design. Comparing opinions of residents at several phases of highway projects, or before and after mitigation measures, in a more quantitative way might provide such additional insight.

Implications for planning policy and practice

Based on the findings of the study several recommendations for planning policy and practice could be distracted. For example, the insights stress the importance of further integration between the planning of highway infrastructure on the one hand and local environmental planning on the other hand, as the study emphasizes that effects of highways are evaluated in relation to the broader environment. Current policy is highly sectoral, which could limit a proper coordination between both fields of planning. It is therefore also important to better combine and integrate efforts and finances of the national government (responsible for highways) and local government (responsible for the local environment), such that possibilities for more integrated planning are increased. Cooperation and communication between both fields of planning is crucial in that respect. In addition, although the study indicates high levels of residential satisfaction and low levels of highway nuisance perception in proximity of highway infrastructure, it is advisable to keep on investing in ways to

reduce health effects of highway infrastructure for the benefit of those living near highway infrastructure. People are not always aware of environmental effects, or cannot always easily ´cope´. In the mean time, there is an increasing recognition of the potential harmful effects of fine dust on health on the longer term. There is a governmental possibility to further study those effects and protect residents´ health. Nevertheless, the study also indicates that it is important to look beyond the use of calculated exposure levels, and relate more to the perception of highway nuisance. Although not all variation in perceptions of residents could be accounted for, investing in attractive environments and in ways people could more easily cope with negative effects of highways could support in compensating and mitigating the perception of highway nuisance. Related to that, it is also important to take residents and their opinions serious in case nuisances are perceived. Independent measurements of nuisance could also provide support in communicating with residents, as the government –who sets the norms – is not always trusted by residents. In this way more trust in governmental policy could on the longer term be increased. Furthermore, the study indicates the importance to invest in possibilities to more systematically include the preferences and values of the wider residential community, especially when it comes to highway projects with a considerable impact on the living environment. In this way projects could be better fitted into the residential environment. Those opinions could be collected using extensive written and/or digital questionnaires, potentially combined with interviews and work groups with selected residents. In addition, a proper insight in the characteristics of the area and the background characteristics of residents living in the area could help in designing information and participation efforts. Concerning the efforts to involve residents, it is important to offer a broad variety of information and participation activities, in order to reach the wider community of residents. The study indicates the importance of openness and frequent communication about the effects of the project in order to address concerns and increase trust in information. In addition, it is important to not only consult residents, but to search for ways in which they could actively contribute to and have control over the design of projects in their residential environment. In this way projects could be better fitted into residential environments in order to contribute to higher residential satisfaction.

All in all, the insights of the study from the perspective of residents indicate the importance of a broad, integrated approach, complemented with context specific tailor made solutions. In other words, in order to increase residential satisfaction close to highways it might be apt for highway planning to broaden the scope from "*living near highways*", to "*highways as part of the living environment*".