
Article:
Hamersma, M, Heinen, E orcid.org/0000-0001-8428-5709, Tillema, T et al. (1 more author) (2016) Residents' responses to proposed highway projects: Exploring the role of governmental information provision. Transport Policy, 49. pp. 56-57. ISSN 1879-310X

https://doi.org/10.1016/j.tranpol.2016.03.011

Residents' responses to proposed highway projects: Exploring the role of governmental information provision

Marije Hamersma*
Faculty of Spatial Sciences
University of Groningen
9700 AV Groningen
The Netherlands
E-mail: m.hamersma@rug.nl

Eva Heinen
Institute for Transport Studies
Faculty of Environment
University of Leeds
LS2 9JT Leeds
United Kingdom
E-mail: e.heinen@leeds.ac.uk

Taede Tillema**
KiM Netherlands Institute for Transport Policy Analysis
E-mail: teade.tillema@minienm.nl

Jos Arts
Faculty of Spatial Sciences
University of Groningen
9700 AV Groningen
The Netherlands
E-mail: e.j.m.m.arts@rug.nl

*Corresponding author
** Disclaimer: The views expressed are purely those of the author and may not in any circumstances be regarded as stating an official position of the KiM Netherlands Institute for Transport Policy Analysis.

Abstract

Despite increased efforts to actively consult residents in highway infrastructure planning to i.a. increase acceptance of plans, the involvement of most residents is passive and limited to receiving information. By means of multivariate regression analysis, this paper explores the role of governmental information provision in residents' responses towards highway project proposals, measured by the expected change in residential satisfaction i.e. the match between housing needs and conditions, as a consequence of those projects. We also pay specific attention to permeability of and satisfaction with information provided. The analyses are based on questionnaire data collected among 484 residents living close to two announced plans for highway adjustment in the Netherlands.

We found indications that residents who received information from a governmental project team are more satisfied with information compared to residents who only received information from other sources. In its turn, a higher level of information satisfaction was associated with more positive expectations with regard to changes in their residential satisfaction, although other contextual variables were also explanatory. Receiving information from the project team was mainly associated with a closer residential proximity to the highway where project team distribution efforts were also more intensive. However, we observed clear personal and project-specific differences in the number of information sources received and the likelihood to attend information meetings. The latter was also associated with more negative expectations towards residential satisfaction change. This indicates a clear difference in characteristics between the more actively involved group and the silent majority.

An important implication of this study is that information provided by project teams seems to increase acceptance of plans, via its contribution to residents' information satisfaction. Nevertheless, only a minority of residents appeared satisfied with the information they received. Therefore, it seems worthwhile for planning agencies to pay more attention to people who currently appear less satisfied with the information provided. These include older residents, residents with fewer social contacts and families with children. In addition, the results indicate clear differences in expected satisfaction change between more actively and more passively involved residents. This may be a reason for governments to not only focus on opinions grasped from information meetings, but to specifically take into account the opinions of the more passive 'silent' majority.

Keywords: Highway projects, expected change in residential satisfaction, governmental information, information satisfaction, information permeability

1. Introduction

Announcing a highway project to residents living nearby has frequently proven to be a challenge. Projects are mainly initiated to increase (regional) accessibility, however, construction periods and changes in the local residential environment cannot be avoided. Residents are often worried about plans that may influence their residential surroundings, which may trigger so called 'NIMBY' i.e. Not In My Back Yard opposition (e.g. Healey, 1997). This is one of the reasons why nowadays it is generally believed that governmental authorities planning infrastructural projects such as highways should involve the public in the planning process (e.g. Wright, 1993; Healey, 1997; Booth and Richardson, 2001, Bickerstaff et al., 2002). Involvement of residents has the potential to reduce uncertainty and increase residents' acceptance of such projects.

This paper focuses on one of the authorities' activities to involve residents in highway infrastructure planning processes: information provision. Information provision is a relatively elementary method of residential involvement, often complemented with higher levels of involvement such as consultation meetings; the latter method is believed to be more effective in increasing acceptance of plans (e.g. Arnstein, 1969; Edelenbos, 2000). However, in general, the number of people actively participating, for example by attending meetings, seems to be limited and selective (e.g. Dideck and Sinclair, 2002; Hysing, 2015). Therefore, receiving information about the project is where the involvement of most people stops, making it an important mechanism in reaching the larger community. Although the importance of information provision receives attention in other NIMBY contexts (e.g. Schively, 2007; Frewer, 2004), as far as we know, empirical insights on its relevance in the context of highway infrastructure planning is limited.

Hence, the objective of our study is to explore to what extent information about proposed highway projects provided by governmental authorities (i.e. project teams) is related to residents' responses to those projects, the latter measured by expectations with regard to changes in residential satisfaction. In this, residential satisfaction i.e. the match between housing needs and conditions (Lu, 1999) could be seen as a proxy for quality of life and future coping strategies (e.g. Speare, 1974; Lu, 1999), which may be expected to change by the consequences of the project. More positive expectations could then be seen as a sign for a higher project acceptance. In studying this relation we also consider residents' information permeability (i.e. the extent to which residents report to have actually received information) (e.g. Perloff, 2003; Dunwoody and Griffin, 2015) and the satisfaction with the received information (e.g. Schively, 2007; Frewer, 2004) as research indicates both aspects to be important in understanding the effects of information provision. One should keep in mind that, in most developed countries, influencing acceptance of projects by information provision is not an explicit policy aim in itself. Nevertheless, government information provision may implicitly increase acceptance of plans when it contributes to transparency and consequently trust in governmental actions (e.g. Schively, 2007; Olander and Landin, 2008). Gaining insights into the consequences of governmental information provision could broaden our understanding of the effectiveness of involvement efforts. From a planning policy perspective, general insights into differences in residents' information permeability and satisfaction could help to better adjust information to specific information needs.

Two cases in the Netherlands - Groningen and Utrecht - are studied where major highway enlargement projects were announced. We chose enlargement projects because current and future road infrastructure projects in the Netherlands, similar to most developed countries, will mainly consist of extensions and improvements of the existing network (e.g. Tillema et al., 2012). We analysed data obtained by paper questionnaires from 484 respondents living within 1,000m from the proposed projects.

The outline of our paper is as follows: in Section 2, we provide a review on the effects of infrastructural projects on residents and the role of governmental information. In Section 3, we explain the research design and methodology of our study, followed by a presentation of our findings in Section 4. Finally, in Section 5 we discuss the implications of our research findings for theory and planning practice, and provide directions for further research.

2. Literature review

2.1 Residents' responses towards highway projects

When a highway project proposal is announced, residents will make a personal trade-off between perceived expected benefits and costs of the project on their residential satisfaction. On the one hand, a highway project could bring benefits to residents, for example when it comes with accessibility improvement (Tillema et al., 2012), which may positively influence residential satisfaction. On the other hand, transport infrastructure projects are also often associated with the NIMBY phenomenon, as the costs of such projects are mainly local (e.g. Arts, 2007) and may result in a decrease of residential satisfaction. Kahneman's prospect theory (1979) assumes that people are likely to overestimate the chance of losses in situations, which contain uncertainty. As an announced highway project proposal contains uncertainty, we may assume that residents living in its vicinity are likely to overestimate the potential negative effect the highway will have on their neighbourhood. Dear (1992) argues that uncertainty with regard to potential effects on house prices, neighbourhood changes and personal safety may cause concerns and resistance against 'unwanted' facilities. It may be assumed that residents weigh the expected perceived costs of a project in their environment against its perceived benefits and accept the project if they feel the benefits outweigh the costs (Aesenbacher, 2006; Lober, 1995; Portney, 1991).

The way in which residents make this trade-off between expected benefits and costs on their residential satisfaction could be dependent on a variety of factors. According to Siu et al (2001), stakeholders' expectations of projects may be determined by a combination of personal needs, past experiences, word of mouth and external communications. More specifically for the study of NIMBY responses, Dear (1992) mentions four factors which might be of relevance in understanding differences in residents' expectations to highway project proposals: client, facility/project, programmatic and community/personal characteristics. Client characteristics are the subjects related to the facility to be sited which could be seen as unwelcome, such as, in the example of Dear (1992), the patients of a mental hospital, or, in our case of highway siting, the cars driving on the highway. There is a growing aversion against the increase in car use (e.g. North, 1998), which may impact the way people judge highway projects. Facility/project characteristics relate to the type, size and appearance of the project, which could influence how people rate its impact. Programmatic considerations are aspects like the amount of community involvement and the amount of facilities already in the community, i.e. the saturation level. In this respect, Laws and Susskind (1991) refer to geographical fairness; facilities should be equally spread across neighbourhoods. Another reason for differences in responses are characteristics of the residents and the community. For example, several studies argue that the potential for NIMBY opposition is higher for males, individuals with a higher income, high-educated individuals, professionals, married people, homeowners and older people, as well as in more homogeneous neighbourhoods in which people have more contact with each other (e.g. Dear, 1992; Mansfield et al., 2001). Hamersma et al (2014) report that older people, non-highway users and people who are already annoyed by noise and air pollution had more negative expectations about a highway enlargement project. In a study on locating solid waste facilities, Wolsink (2012) argues that trust in the government and environmental interests are of relevance in

understanding reactions of residents. Other studies argue that people in close vicinity to a project are more likely to value costs stronger than benefits (e.g. Aesenbacher, 2006; Lober, 1995). In addition, timing can also play a role; a shorter timespan until the project's execution is found to be associated with increased negative response (e.g. Devine-Wright, 2007; Dear, 1992). As such, in analysing responses of residents to highway projects, several contextual aspects could be taken into account.

2.2 Governmental information provision about highway projects

Residents' acceptance of proposed highway projects could be influenced by the information received from project teams assigned by governments to plan and execute the project. Information provision is one of the elements of the project team´s broader stakeholder management i.e. all the activities aimed to incorporate the interests and demands of stakeholder groups in decision making, in order to build trustful relationships and ensure the success of the project (e.g. Olander and Landin, 2005; Aaltonen, 2011). In Arnstein's participation ladder (1969) – going from non-participation in which the public hardly has power, to full participation with high degrees of power – informing people is defined as one of the most elementary levels of stakeholder participation. Information provision is often used next to higher levels of participation. Project teams are generally one of the sources from which residents could receive information in addition to other information sources including media and other citizens.

Although to our knowledge the effects of information provision by project teams have never been empirically studied in the context of highway infrastructure project proposals, the implications of governmentally provided information have been widely addressed in the broader discussion on NIMBY-siting to which the study of proposed highway projects could relate to. Within the research on NIMBY siting, the relevance of information provision is often approached from the perspective of risk communication (Schively, 2007), which is any public or private communication that informs individuals about the existence, nature, form, severity, or acceptability of risks (Plough and Krimsky, 1987). In general, studies argue that the effects of governmental information to people in situations of risk are not straightforward (e.g. Slovic, 2000; Schively, 2007; Basolo et al., 2009; Frewer, 2004). Slovic (2000), for example, argues that the extent to which the risk is perceived as involuntary is more important in understanding acceptance than the provided information alone.

Studies in the field of risk communication (and beyond) emphasize that the extent to which information (disseminated) by experts – such as governmental authorities – is effective is likely to be dependent on the way it is perceived, possibly compared to other information sources received. In order to be effective, experts should engage with the receivers and adjust information to their needs and concerns (e.g. Fischhof, 2009; Frewer, 2004). Several studies notice a shift away from more one-way information sending and towards a two-way interactive communication process in which governments try to engage with the public in a social learning process (e.g. Bouder, 2014; Bandura, 1977). Also stakeholder management literature emphasizes the importance of good and open communication in improving the stakeholder management process (e.g. Olander and Landin, 2008; Yang et al., 2011). Related to this, it is argued that governmental information should follow appropriate quality standards such as complete, timely and factual information provisions (e.g. Gelders, 2005; Bouder, 2014). In this light, the usage of Internet as a channel for government information provision is seen as one of the ways to improve accessibility and completeness of information (e.g. Welsch et al., 2005). Schively (2007) mentions that when communication is effective, it has the potential to increase trust and acceptance.

In analysing the relevance of project team information, we should also be aware of potential differences in residents' information permeability: receiving information could be perceived as more

important for some than for others. Cohrssen and Covello (1989) indicate that next to message, channel and source problems, receiver problems play a role in the transmission of risk information. For example, research shows that people with access to the same information may seek and process information differently (e.g. Pol et al, 2009; e.g. Perloff, 2003; Petty and Brinol, 2010). Models such as the Risk Information Seeking and Processing (RISP) model imply that seeking and processing information is primarily driven by the gap between what the person knows and what he considers necessary to know, i.e. the perceived information insufficiency (Griffin et al., 1999). The search for information is argued to be dependent on the person's judgment of the seriousness of the problem, his ability to search for information and the perceived utility of the seeking behaviour (e.g. Dunwoody and Griffin, 2015; Yang et al., 2014). Another reason for differences in information permeability may be information asymmetry; some people may search for more information than others because they may be more aware of the potential importance of having information, for example due to past experiences with highway projects (Stiglitz, 1992). Several studies point on the potential selectivity of citizens into active information seeking and participation. Studies in the field of NIMBY siting in general seem to indicate that individuals who are most actively seeking for information are likely to be more concerned about projects. For example, Wright et al. (1993) argue that people who are generally more informed about a waste siting project are more likely to have negative attitudes. Others indicate that opponents of environmental plans are more likely to attend public meetings or be civically engaged than supporters of these plans (e.g. McComas, 2001; Mansfield et al., 2001). For example, a study by Grillo et al. (2010) shows that people who have more social contacts in the neighbourhood are more likely to be involved with civil activities in their neighbourhood. Other studies indicate that people's civic engagement may have to do with more economic aspects such as time and money (e.g. Costa and Kahn, 2004). This indicates a potential difference in the characteristics of residential groups being more actively and more passively involved in their information reception.

3. Research Design

3.1 Setting the research context: Government information provision in Dutch highway infrastructure planning

Within this study, the relevance of government information provision is studied in residents facing a highway project in the Netherlands. Similar to the situation in other western countries, the provision of information is one way, alongside more active participation, by which stakeholders – such as residents – are involved in highway infrastructure planning processes in the Netherlands. Dutch infrastructure planning processes have increasingly followed a planning approach on the highest steps of Arnstein's ladder (Woltjer, 2002). Since the publication of the outcomes of a report on the causes of slow decision making in infrastructure planning (Committee Elverding, 2008), there has been increasing attention for starting to involve stakeholders early on in the process, in order to decrease potential protest and consequent delays in later planning phases. For example, within the "Business Plan" (2011) of Rijkswaterstaat (Dutch executive agency for national infrastructure projects such as highways), particular attention is given to the topic of "Connecting with stakeholders". Principles such as mutual gains, transparency and creating trust are important aspects in current involvement strategies. Information efforts especially aim to contribute to the latter two principles. By being transparent, governments hope to increase trust in governmental actions in the longer term (Hamersma et al., 2014; Rijkswaterstaat, 2013).

A Dutch infrastructure planning process generally contains both formal and more informal moments of information provision. Formally (by law), the public should at least be informed on different key points within the planning process, such as the first announcement of developing plans and the announcement of

the chosen alternative (Environmental act, Dutch: Wet Milieubeheer; Record of decision, Dutch: Tracéwet). In addition, and more informally, it is advised to communicate with the public at other moments in the planning process as well, in order to involve them in the steps being taken (Rijkswaterstaat, 2010). An active communication strategy gives the public the possibility to be involved and to be kept informed about projects in their neighbourhood.

Rijkswaterstaat provides guidelines for the communication about infrastructural projects that are (partly) under their executive responsibility. Communication strategies towards the public should preferably be adjusted to the needs of target groups (Rijkswaterstaat, 2013), to be specified within the context of the project concerned. The content of the information preferably refers to the main policy themes of the ministry: "traffic safety, livability and accessibility" and focuses on the aspects "what", "why" and "how" (Rijkswaterstaat, 2013). "What" is a more traditional way of informing people about what will happen. "Why" and "how" were added more recently, as Rijkswaterstaat considers it important to communicate the reasons behind the things they do ("why") and the way they work and collaborate with other stakeholders ("how"). Furthermore, the use of storytelling has recently been getting increased attention in the communication around infrastructural projects, for example by allowing stakeholders to tell their story and by using images. In addition, all information concerning specific governmental projects is preferably communicated through the logo of the ministry and digital communication is (increasingly) the preferred method. This way, the government tries to achieve uniformity in practice (Rijkswaterstaat, 2013).

For the larger infrastructural projects, a governmental project team is assigned to guide the planning process and execute public engaging strategies, including information provision. The teams that focus on national highway planning are formed solely by Rijkswaterstaat or by Rijkswaterstaat in combination with regional/local governments. Within this team, Stakeholder Management (Dutch: Omgevingsmanagement) is responsible for the development and execution of the communication and participation strategies. The project teams can decide on a "communication and participation plan" that fits the specific context of the project. Often, a mixture of different communication channels is used. In addition to press releases and printed leaflets, an important source nowadays is the project website, complemented with digital newsletters to which people can subscribe. More recently, Twitter was introduced as a way to communicate about projects. These more passive ways of providing information are complemented by more interactive efforts, such as information meetings or markets, consultation meetings or face-to-face conversations. Generally, individuals living in close vicinity to the project are given the most attention in these involvement efforts. By these efforts, project teams aim to sufficiently reach the public and satisfy information needs.

3.2 Research model

Figure 1 presents our research model, in which three steps are distinguished.

First, we analyse differences in residents' information reception (Figure 1,1). People may have received project team information 'passively' or 'actively', the latter through attending information meetings. Residents may also have received information from other sources i.e. the media, neighbours or citizens' organizations. As residents may seek and process information differently (see e.g. Perloff, 2003; Yang et al., 2014), we assume a relationship between contextual factors and the extent to which residents received information about the proposed highway project. As project teams are likely to more intensively inform those in closer vicinity to the highway, we assume the level of project team information reception to be higher among this group.

The second step is to study to what extent receiving project team information contributes to residents' information satisfaction while controlling for contextual factors (Figure 1,2). Experts, such as governmental project teams, should engage with the receivers and adjust information to their needs and concerns (e.g. Fischhof, 2009; Frewer, 2004). We investigate whether respondents who reported to have received information from the project team show a higher information satisfaction compared to residents who received information from other sources only.

Third, we explore the potential relationship between project information provision and residents' response to projects i.e. expected changes in residential satisfaction (Figure 1,3). The effectiveness of information may depend on the extent to which it results in information satisfaction (e.g. Schively, 2007; Frewer, 2004; Fischhoff, 2009). Therefore, we assume that project team information mainly influences residents' responses when it contributes to information satisfaction. We also assume other contextual factors to be at least as important in explaining residents' responses; studies indicate that the effects of information are not straightforward in situations of involuntariness, as is the case when highway projects are announced (e.g. Slovic, 2000; Schively, 2007; Frewer, 2004), Finally, we assume those who more actively seek information – i.e. by attending project team information meetings or who reported a higher amount of received information sources – to be more negative about the proposed project, because opponents may be more likely to be involved in projects (e.g. Mansfield et al., 2001; McComas, 200; Wright, 1993).

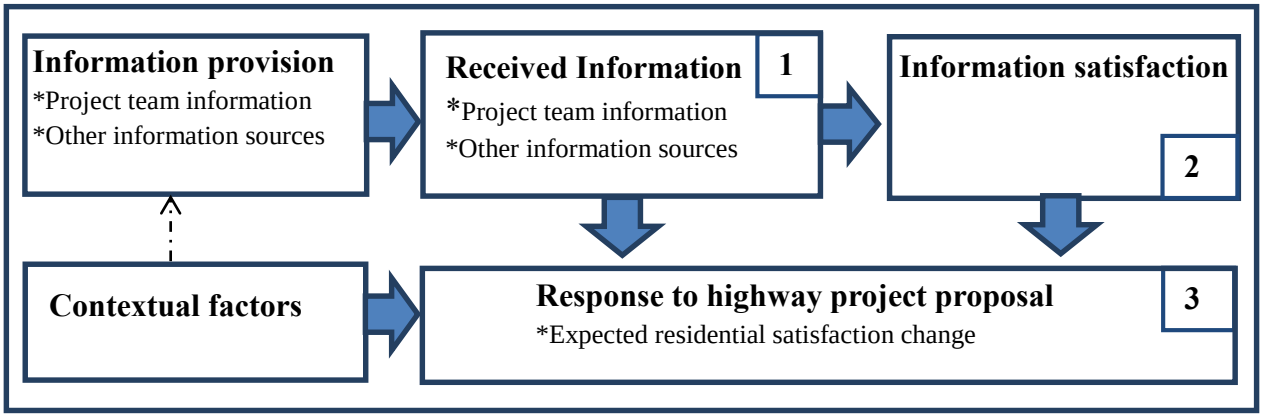

Figure 1: Research model on the role of information provision in residents facing highway project proposals

3.3 Study location

Data were collected in two cities in the Netherlands: Utrecht and Groningen (Figure 2). Analysing multiple cases instead of one single case was preferred to avoid project specific outcomes. The projects in Utrecht and Groningen entail considerable enlargements of the existing highway infrastructure in the near future. At the time of sampling, both projects were still in the proposal stage, although the project in Groningen was somewhat further advanced in the planning process towards realization. In both projects, the responsible teams indicate to have actively informed citizens in a broad range around the highway in an early stage of the project by means of printed media, the website and information meetings. Moreover, both projects are situated close to relatively densely populated areas.

Obviously the cases also have unique characteristics, which makes it interesting to study project specific differences. The proposed projects had different design plans and were managed by different

governmental project teams, which has likely resulted in different communication strategies. Furthermore, the geographical location is different; one project is located in the northern, more peripheral part of the Netherlands (Groningen; Figure 2b), the other one in the centre of the country (Utrecht; Figure 2a). In both cities, the projects are controversial and citizens' groups have protested against them. For example, protest groups in Groningen claim that the project will result in decreased accessibility and liveability for at least a part of the city. In Utrecht, protest groups specifically focus on liveability aspects in the surrounding neighbourhoods as a consequence of an extension of the number of highway lanes. Compared to Groningen, organized civil protest in Utrecht had been intense from the initial stage of the project. Communities of interest like the "Vrienden van Amelisweerd", have been protesting against highway development through the Amelisweerd woodland bordering the city since the 1970s. In both cities, citizens' groups have spread information and have organized activities to garner interest amongst the broader local community.

In Utrecht, the two residential areas Lunetten (southeast of Utrecht) and Voordorp (east of Utrecht) were separately investigated as potential differences could be expected. Firstly, at the moment of sampling a railway project was also being executed in the Lunetten neighbourhood; the fact that people were already being 'bothered' by another project may have influenced reactions (Dear, 1992). Secondly, the historical protest against highway development through the woodlands is especially related to the Lunetten area located on close proximity of the 'Amelisweerd' woodlands, which could still influence the present likelihood for protest in that area. In the analyses, we control for potential differences between Groningen, Utrecht-Lunetten and Utrecht-Voordorp.

3.4 Data collection

The data for this study were collected as part of a broader questionnaire by paper mail among residents within a one kilometre-radius from the highway in the case locations, set out in the spring of 2011 (see also Hamersma et al., 2014). The questionnaire included a broad range of questions concerning people's perceptions of the neighbourhood and socio-demographics. In addition, individuals were asked to give their opinions regarding the announced highway project and to report and evaluate the information they had received so far with respect to the announced highway project. The questions were designed in consultation with several experts, and were pre-tested with a few lay people. A total of 2,500 questionnaires were set out (1,500 in Groningen and 1,000 in Utrecht respectively) in the neighbourhoods directly surrounding the highways. Several zip code areas within the one kilometre radius were selected for questionnaire distribution. To assure a certain system in the distribution process, the questionnaire was distributed to the first house(s) of each selected zip code area each time. In Groningen, 327 were returned, and in Utrecht 290 - a response of 22% and 29%, respectively. After excluding questionnaires that were incomplete on the variables needed for the analysis, a total of 484 questionnaires were used for the present analyses. Within the survey, residents living in single households and older people (65+) were slightly underrepresented compared to the actual characteristics of the neighbourhoods.

3.5 Variables and Methods

Table 1 presents an overview of the variables used for the analysis, divided by location (i.e. Groningen, Utrecht-Lunetten and Utrecht-Voordorp). We discuss the variables following the three steps in our research model. In addition, we indicate the methods used in the different analyses steps.

To measure differences in information permeability (step 1), residents were asked to report whether they had received information. They could indicate having received project team information ´passively´

as well as more ´actively´ by attending a project team information meeting, both indicated by a dummy variable. In addition, residents could have received information from (local) media, 'citizens' such as neighbours and citizen groups and/or 'other sources'. The total number of received information sources was calculated by counting all reported information sources (Table 1,1). Three analysis were performed. The likelihood to receive project team information and to -more actively- attend information meetings were both tested by use of binary logistic regression. In addition the total number of information sources was explained from contextual variables by use of an ordinal least squares regression.

To measure information satisfaction (step 2), people who received information from at least one source were asked to rate five statements regarding the perceived quality of information on a seven-point scale ("1 - completely unsatisfied" to "7 - completely satisfied"). These statements included satisfaction with accuracy of information, the amount of information, the reliability of information, the quality of information and the timing of the information, and were found to be highly correlated (Cronbach's alpha of 0.904). Therefore, a single variable of 'information satisfaction' was calculated by taking the average of the five items and rounding them off to a seven-point scale (Table 1,2). Differences in information satisfaction were explained by use of ordinal logistic regression, as the dependent variable was measured on an ordinal scale.

Response to highway project proposals (step 3) was measured by residents' expected residential satisfaction change as a consequence of the highway project. The expected change in satisfaction was measured on a scale ranging from expecting a strong decrease in satisfaction (1) to expecting a strong increase in satisfaction (7) (Table 1,3). Due to the ordinal measurement scale, expectations regarding residential satisfaction were explained by use of an ordinal logistic regression.

Contextual variables were included as covariates in all analyses. To measure project/programmatic location specific differences, dummies for respectively Groningen, Utrecht-Voordorp and Utrecht-Lunetten were included. In addition, the proximity to the highway was calculated by the distance as the crow flies between the 6-digit zip code of the home address and the highway, because the response to the proposal was expected to be more negative closer to the highway (e.g. Aesenbacher, 2006). We controlled for gender, age, level of education, income, having children, home ownership, house type, house tenure and highway usage. Also, individuals' perceptions[1] about highway noise, air and barrier- effect nuisances as well as residents' opinions about cars were added. Research on the likelihood of NIMBY behaviour indicated these aspects to be potentially important in understanding community response (e.g. Dear, 1992; Hamersma et al., 2014). As the reactions may be caused by perceptions of risk (e.g. Yang et al., 2014), we included the extent to which people are risk averse, measured by the statement 'I don't like to take risks' on a scale of "1 - completely disagree" to "7 - completely agree". In addition, the amount of contacts people have in the neighbourhood was included, as responses may be dependent on neighbourhood attachment (e.g. Grillo, 2010).

Table 1: Descriptives

	Utrecht-Lunetten		**Utrecht-Voordorp**		**Groningen**		**Total**	
	Mean/%	**St.dev**	**Mean/%**	**St.dev**	**Mean/%**	**St.dev**	**Mean/%**	**St.dev**
1.Information reception								
Did not receive information	8.5%		9.3%		23.6%[ab]		16.5%	
Received information from the project team	41.5%[b]		22.9%		29.2%[b]		29.8%	

[1] We are aware that perceptions could have been influenced as well by the information received. Therefore, caution should be taken in interpreting the causality of the results.

Received information from local media	68.1%		73.6%[c]		55.6%		63.2%	
Received information from citizens (organization)	52.1%[c]		48.6%[c]		27.6%		38.4%	
Received information from other source than mentioned above (yes/no)	2.1%		2.9%		5.2%		3.9%	
Total number of information sources received (0-4)	1.6[c]	0.9	1.5[c]	0.9	1.2	0.9	1.4	0.9
Attended project team information meeting	17.0%		13.6%		8.4%		11.6%	
2. Satisfaction with information								
1 Completely unsatisfied	2.4%		1.7%		2.8%		2.4%	
2	8.2%		7.8%		5.6%		6.8%	
3	23.5%		24.1%		17.9%		21.1%	
4	25.9%		30.2%		38.5%		33.2%	
5	22.4%		20.7%		19.6%		20.5%	
6	16.5%		11.2%		13.4%		13.4%	
7 Completely satisfied	1.2%		4.3%		2.2%		2.6%	
3.Expected change in residential satisfaction								
1 Expects strong decrease in residential satisfaction	11.7%[c]		8.6%[c]		1.6%		5.6%	
2	20.2%[c]		17.1%[c]		4.4%		11.2%	
3	16.0%		13.6%		8.0%		11.2%	
4	30.9%		30.7%		41.6%		36.4%	
5	13.8%		17.1%		25.6%		20.9%	
6	6.4%		11.4%		14.8%		12.2%	
7 Expects strong increase in residential satisfaction	1.1%		1.4%		4.0%		2.7%	
Contextual variables								
Location characteristics								
Groningen	0		0		100%		51.7%	
Utrecht-Lunetten	100%		0		0		19.4%	
Utrecht-Voordorp	0		100%		0		28.9%	
Distance from highway (Km)	0.5	0.2	0.4	0.3	0.4	0.3	0.4	0.2
Socio-demographics								
Women	54.3%		54.3%		59.6%		57.0%	
Age 18-30	17.1%		7.9%		16.0%		13.8%	
Age 30-60	73.3%		67.1%		63.2%		66.4%	
Age over 60	9.6%		25.0%[a]		20.8%[a]		19.8%	
Children in household	44.7%[c]		37.9%[c]		17.6%		28.7%	
Highly educated	74.5%		77.9%[c]		63.6%		69.8%	
Income below EUR 3,000 per month	58.5%		30.0%		68.4%		55.4%	
Income above EUR 3,000 per month	39.4%		60.7%[ac]		26.8%		39.0%	
Income unknown	2.1%		9.3%		4.8%		5.6%	
House tenure <10years	53.2%		40.7%		62.4%[b]		54.3%	
House tenure 10-30 years	41.5%		52.2%		31.6%[b]		39.5%	
House tenure >30years	5.3%		7.1%		6.0%		6.2%	
Living in a rental house	53.2%[b]		21.%		39.6%[b]		37.0%	
Living in a detached house	3.2%		13.6%[ac]		5.2%		7.0%	
Frequently in highway traffic jams	5.3%		7.1%[c]		1.2%		3.7%	
Not frequently in highway traffic jams	72.4%		79.3%		80.0%		78.3%	
(Almost) no highway use	22.3%		13.6%		18.8%		18.0%	
Level of risk aversity (1 'Low'-7 'High')	4.7	1.3	4.5	1.3	4.7	1.2	4.6	1.3
Number of contacts in neighbourhood (1 'Low'-7 'High')	5.2	1.1	5.7[ac]	1.1	5.3	1.3	5.4	1.2
Perceptions								

Opinion about driving (1 'Negative'-7 'Positive')	4.5	1.2	4.5	1.3	4.8	1.3	4.7	4.7
Perceived highway noise nuisance (1 'Low'-7 'High')	2.9[c]	1.7	2.7[c]	1.6	1.9	1.1	2.3	1.4
Perceived highway air pollution (1'Low'-7'High')	3.6[c]	1.7	3.2[c]	1.6	2.4	1.3	2.8	1.5
Perceived highway barrier effects (1'Low'-7 'High')	3.8	1.1	3.7	1.1	3.5	1.1	3.6	1.1
N	94		140		250		484	

[a] Significantly different from "Utrecht-Lunetten"
[b] Significantly different from "Utrecht-Voordorp"
[c] Significantly different from "Groningen"

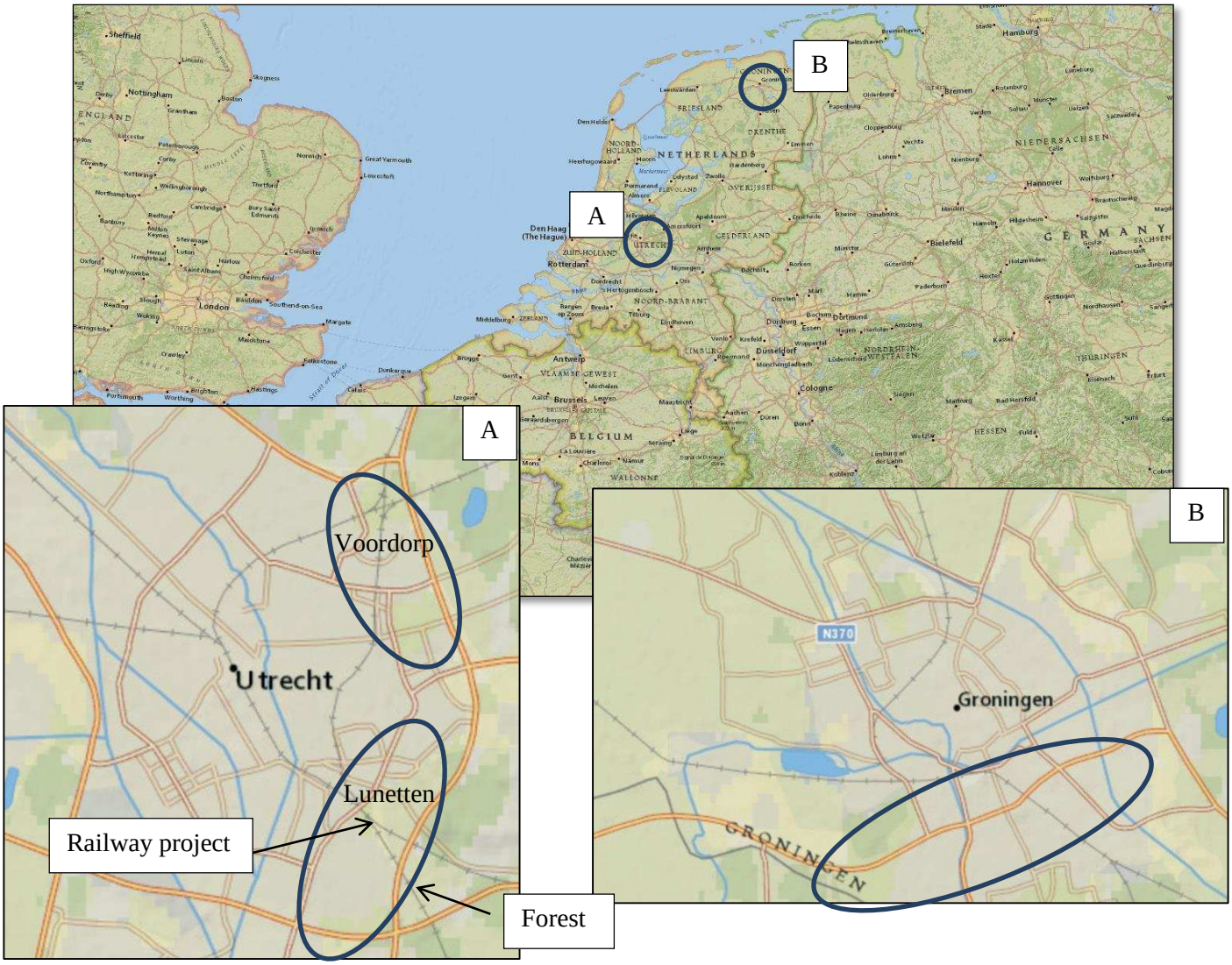

Figure 2: Locations of the cases in Groningen and Utrecht (ESRI, 2014)

4. Results

We studied the role of project team information following the three steps as discussed in the research model. Below we present the results of our analyses. We will first describe the descriptive analyses before presenting the results from the multivariate regression analyses.

4.1 Who received information?

Table 1 (1) shows that at the moment of the questionnaire, on average almost 30% of the respondents reported to have received information from the project team. Although both project teams indicated to have actively informed residents in the vicinity of the highway, a large group of residents was not aware or believed this information had come from another source. The most commonly used source of information was local media (63%), followed by information from other residents (38%). Another 4% of the respondents indicated having received information from other sources, whereas 17% indicated not having received information at all. About 12% (also) attended a project team information meeting. On average, residents received information from 1.4 sources. In general, residents in Groningen indicated having received less information than residents in Utrecht. As expected, based on historical and programmatic grounds discussed in section 4.1, information permeability was highest among residents in Utrecht-Lunetten.

Regression results

Table 2 (1) presents the results of three analyses we performed to investigate differences in respondents' information reception.

Results indicate that having received information from the project team is significantly associated with the distance to the highway (Table 2); respondents living closer to the highway received information from the project team more often. This may be explained by the logic that project teams put more effort into providing information to residents in the vicinity of the project. Another explanation may be that residents closer to the highway have a higher search for information because of a higher risk perception (e.g. Dunwoody and Griffin, 2015; Yang et al., 2014) as these residents will potentially bear more of the 'costs' of the project (e.g Aesenbacher, 2006). No further associations were found with other included contextual variables, except for some minor differences between the project locations.

In addition to more passive ways of receiving project team information, residents could have actively attended an information meeting. Interestingly, attending information meetings was not found to be associated with proximity to the highway, at least within the one-kilometre range in which respondents were selected. Especially men, residents with above-average income, residents without children, non-highway users, residents who were more concerned about air pollution[1] and residents with many contacts in the neighbourhood were more likely to attend meetings. These findings correspond with studies on the likelihood for NIMBY response (e.g. Dear, 1992; Hamersma et al., 2014) as well as with studies mentioning that selectivity in civic engagement is associated with economic aspects such as income, time and neighbourhood attachment (e.g. Grillo et al., 2010; Costa & Kahn, 2004).

Finally, we analysed which residents were more likely to report a higher number of information sources. We found that residents living closer to the highway reported having received information from a significantly higher number of sources. We also found that people in Groningen indicated having received fewer information sources than people in Utrecht-Lunetten and Utrecht-Voordorp, this despite the fact that the project in Groningen was somewhat more advanced in the process. Furthermore, residents with many contacts in the neighbourhood reported having received information from a higher number of sources.

Additionally, although the direction could be discussed[1], residents who perceive more highway air pollution nuisances and who are more negative about cars were (slightly) more likely to report a higher number of information sources. Finally, whereas residents receiving project team information indicated also having received information from more information sources, no relationship was found between attending information meetings and receiving a higher amount of information sources.

4.2 Satisfaction with information

This section discusses the information satisfaction of residents and specifically the contribution of information provided by the project team to this (Figure 1, 2). Table 1 (2) shows that only a minority of the residents (37%) was satisfied (a 5 or higher on a seven-point scale) with the received information. 33% of the respondents was indifferent, whereas the remaining 30% appeared unsatisfied (a grade of 3 lower on a scale of "1 - completely unsatisfied" to "7 - completely satisfied"), with no considerable differences between the different project locations.

Regression results

Table 2 (2) shows to which extent differences in information satisfaction could be explained by whether or not project team information was received.

Results indicate that residents who received information via the project team reported significantly higher information satisfaction compared to residents who received other information sources. We also checked for the consequences of potential selection bias in interpreting the effect of project team information on information satisfaction by use of a treatment regression, but no proof for selectivity was found. An interaction effect between receiving project team information and highway proximity was included, because of the strong association we observed in studying project team information permeability. The interaction effect was negatively significant, indicating that the relationship between receiving project information and information satisfaction was stronger for the respondents closer to the highway. Furthermore, no differences in information satisfaction were observed for residents who received more information sources or who attended project team information meetings.

Several contextual variables were also associated with information satisfaction. Older residents, residents with children, residents with fewer contacts in the neighbourhood and (to a lesser extent) residents who were less satisfied with visual aspects of the highway were less satisfied with the information they currently received. These results were stable when only individuals who received information from the project team were investigated. This implies that especially for these groups, the information currently received was less effective in fulfilling their information needs.

4.3 Expectations regarding changes in residential satisfaction

As a final step, we investigated the relationship between receiving information from the project team and respondents' expected change in residential satisfaction as a consequence of the highway project (Figure 1, 3). Table 1 (3) shows that respondents have different expectations regarding satisfaction change. In Groningen, expectations were more positive compared to Utrecht-Voordorp and Utrecht-Lunetten. Based on open-ended questions, we found that people in Groningen more often describe benefits of the project in terms of increasing regional accessibility and economic growth, whereas people in Utrecht more often indicated that money should be invested in alternatives for car usage. The finding that people in Groningen expected larger benefits for the region may be explained by its more peripheral location, where accessibility benefits may have a relatively higher (perceived) added value compared to the more centrally

located city of Utrecht. The more negative expectations in Utrecht and especially Lunetten compared to Groningen may also be related to earlier protests against the initial construction of the highway that go back all the way to the 1970s.

Regression results

The analysis results on the relationship between information and the expected change in residential satisfaction are presented in Table 2 (3).

We found that residents who are more satisfied with the received information more often expected an increase in residential satisfaction due to the highway project. No stand-alone effect for having received information from the project team information was found. This indicates that project team information is associated with expectations towards changes in residential satisfaction via its contribution to information satisfaction. In line with other studies (e.g. Wright, 1993; Mansfield et al., 2001), we found that the residents attending information meetings were slightly more negative about the project. However, no difference in expectations was found depending on the reported number of received information sources.

Other contextual factors also explained residents' expected change in satisfaction. With regard to project/programmatic aspects we found that residents in Groningen were more positive towards the project. Furthermore, residents living closer to the highway were more negative about the project, which could be explained by the fact that they might be confronted most with the negative consequences of the announced project (e.g. Aesenbacher, 2006). Regarding personal and community characteristics, men, higher educated individuals, car users and residents with house tenure shorter than 10 years or longer than 30 years more often expected an increase in residential satisfaction. Finally, with regard to subjective aspects, people who were more positive about driving and less annoyed by air pollution and noise nuisance had more positive expectations. To a large extent, these findings were in line with findings by Hamersma et al. (2014).

Table 2: Results analyses

	1. Information reception						**2.Satisfaction with information**		**3. Expected change in residential satisfaction**	
	Received information from the project team (Ref = Did not receive information from the project team)		Attended project team information meeting (Ref = not attended a meeting)		Total number of information sources received		Satisfaction with information (1=Completely unsatisfied-7=Completely satisfied)		Expected change of residential satisfaction (1=Strong decrease-7=Strong increase)	
	Binary Logistic Regression		Binary Logistic Regression		Linear Regression		Ordinal Logistic Regression		Ordinal Logistic Regression	
	OR	95% CL	OR	95% CL	B	Std. Error	B	Std. Error	B	Std. Error
Contextual factors										
Location characteristics										
Utrecht-Lunetten (Ref: Groningen)	0.58	[0.17;2.00]	1.6	[0.52;4.98]	0.25**	0.10	0.41	0.34	-1.17***	0.36
Utrecht-Voordorp	0.32	[0.12;0.88]	0.65	[0.22;1.91]	0.25***	0.08	0.47	0.30	-0.91***	0.31
Distance from highway (Km)	0.06***	[0.01;0.23]	0.55	[0.08;3.96]	-0.29**	0.14	-0.44	0.50	1.57***	0.52
Interaction										
Utrecht-Lunetten x Distance	14.77**	[1.12;195.76]								
Utrecht-Voordorp x Distance	4.79	[0.48;47.80]								

Socio-demographics										
Women (Ref: Men)	0.76	[0.49;1.18]	0.45*	[0.20;1.02]	-0.05	0.07	0.26	0.20	-0.50**	0.21
Age 18-30 (Ref: 30-60)	0.76	[0.37;1.56]	0.43	[0.05;3.80]	-0.12	0.11	0.65*	0.35	0.13	0.36
Age over 60	0.60	[0.29;1.24]	0.41	[0.11;1.52]	-0.11	0.10	0.16	0.30	0.28	0.31
Children in household (Ref: No children in household)	0.95	[0.56;1.61]	0.35**	[0.13;0.91]	0.02	0.08	-0.49**	0.25	-0.10	0.26
Highly educated (Ref: Low educated)	1.30	[0.76;2.22]	0.89	[0.33;2.36]	-0.04	0.08	-0.33	0.23	-0.50**	0.24
Income above EUR 3,000 per month (Ref: Income below EUR 3,000 per month)	1.35	[0.80;2.27]	3.01**	[1.12;8.10]	0.05	0.08	0.19	0.24	-0.12	0.25
Income unknown	1.77	[0.68;4.58]	3.54	[0.73;17.26]	0.12	0.15	0.54	0.42	-0.31	0.43
House tenure <10 years (Ref: 10-30 years)	1.32	[0.80;2.18]	1.67	[0.68;4.06]	-0.05	0.08	0.03	0.22	0.49**	0.23
House tenure >30 years	0.65	[0.18;2.29]	0.35	[0.03;4.35]	-0.06	0.15	-0.17	0.44	1.35***	0.46
Living in a rental house (Ref: Living in an owned house)	0.78	[0.47;1.31]	0.82	[0.29;2.34]	-0.07	0.08	-0.29	0.23	-0.43*	0.23
Living in a detached house (Ref: Non-Detached house)	1.13	[0.49;2.57]	2.05	[0.62;6.76]	0.03	0.13	0.41	0.37	0.02	0.39
Frequently in highway traffic jams (Ref: Not frequently in traffic jams)	1.86	[0.65;5.27]	1.56	[0.28;8.68]	0.20	0.17	-0.33	0.5	-0.41	0.51
(Almost) no highway use (Ref: Not frequently in traffic jams)	1.26	[0.68;2.33]	2.64*	[0.82;8.48]	-0.08	0.09	0.11	0.28	-0.99***	0.30
Level of risk aversity (1 'Low'-7'High')	0.95	[0.80;1.13]	0.89	[0.65;1.22]	0.01	0.03	0.10	0.08	-0.01	0.08
Number of contacts in neighbourhood (1 'Low'-7'High')	1.07	[0.93;1.23]	1.74***	[1.28;2.37]	0.05**	0.02	0.14**	0.06	0.12*	0.07
Perceptions										
Opinion about driving (1 'Negative'-7 'Positive')	1.03	[0.86;1.24]	1.20	[0.84;1.73]	-0.06**	0.03	0.04	0.09	0.32***	0.09
Perceived highway noise nuisance (1 'Low'-7'High')	0.89	[0.72;1.11]	1.00	[0.68;1.47]	-0.04	0.03	-0.05	0.09	-0.22**	0.10
Perceived highway air pollution (1 'Low'-7'High')	1.11	[0.90;1.36]	1.65***	[1.15;2.36]	0.06*	0.03	-0.11	0.09	-0.42***	0.10
Perceived highway barrier effects (1 'Low'-7'High')	1.15	[0.92;1.43]	0.95	[0.65;1.38]	0.05	0.03	-0.17*	0.1	-0.17	0.10
Information										
Received information from the project team					1.12***	0.08	1.49**	0.72	-0.25	1.05
Attended project team information meeting					0.17	0.14	-0.61	0.38	-0.91**	0.40
Total number of information sources							-0.13	0.26	-0.12	0.26
Information satisfaction									0.28***	0.10
Interaction										
Received information from the project team x Distance to the highway							-1.81**	0.89	0.35	0.92
Received information from the project team x Total number of information sources							0.20	0.33	-0.05	0.34
Received information from the project team x Utrecht-Lunetten							0.16	0.51	0.54	0.52
Received information from the project team x Utrecht-Voordorp							-0.56	0.49	0.47	0.51
Received information from the project team x Information satisfaction									0.10	0.16

* p < 0.1; **p <0.05; *** p<0.01

OR= Odds ratio; 95%CI= 95% Confidence Interval; Std. Error= Standard Error; B=Beta

N.B.: Results were generally stable when models were estimated with clustered standardized errors on the neighbourhood level (N=14)

5. Discussion and conclusion

Although information provision is often seen as one of the tactics used in stakeholder management for increasing acceptance of infrastructural projects facing residential areas (e.g. Olander and Landin, 2005; Aaltonen, 2011), empirical insights into this relationship with regard to proposed highway projects are limited. In this article we aimed to increase insight into the role of information in residential areas with plans for highway extensions. More specifically, we explored the relationship between information (provided by a governmental highway project team) and expected changes in residential satisfaction as a consequence of the highway project, by analysing data collected in two residential locations in the Netherlands. In studying this, we also considered residents' information satisfaction (e.g. Schively, 2007; Frewer, 2004; Slovic, 2000; Fischhoff, 2009) and information permeability (e.g. Perloff, 2003; Dunwoody and Griffin, 2015; Yang et al., 2014).

Our findings suggest that information provided by the project team increases the likelihood of having positive expectations towards future residential satisfaction, via its contribution to information satisfaction. By empirically testing the role of project team information, our research suggests that governmental information efforts as part of a broader stakeholder strategy are indeed of added value in striving for more acceptance of highway project proposals (e.g. Schively, 2007; Rijkswaterstaat, 2014). Our study also confirms the importance of information satisfaction in understanding this relationship (e.g. Fischhoff, 2009; Schively, 2007; Frewer, 2004; Slovic, 2000).

However, our analyses also showed some reason for nuance in interpreting project team efforts. For example, contrary to our expectations based on the aims of Dutch (highway) infrastructure stakeholder policy (e.g. Rijkswaterstaat, 2013), only about 30% of the respondents remembered having received project team information, despite the fact that teams indicated that information had been provided. Several concepts might help explain this low percentage, including insufficient information provision, a lack of interest in information (e.g. Griffin et al., 2011), misinterpretation of the source, or unawareness about the potential importance of such information (e.g. Stiglitz, 1992). Additionally, contrary to our expectations, a considerable group of residents was not satisfied with the information they had received so far. Our results indicated that this was especially the case for older residents, residents with fewer social contacts and families with children. This may indicate that the communication between the project team and residents is currently not as efficient as it could be (e.g. Bouter, 2014; Fischhoff, 2009; Bandura, 1977). Furthermore, our findings also suggest that when residents are satisfied with information, other contextual aspects still predict the expected change in residential satisfaction. As such, despite the relevance of providing information, the role of information in residents' acceptance of highway project proposals should not be overemphasized (e.g. Slovic, 2000),.

In addition, our results confirmed the importance of accounting for differences in residents' information permeability (e.g. Perloff, 2003; Yang et al., 2014). The likelihood of receiving information from the project team was found to be higher in residents living in close proximity to the highway and this group also reported higher levels of satisfaction with information when project team information was received. In contrast, more 'active' information seeking behaviour, i.e. receiving information from multiple sources and attending information meetings was also related to project/programmatic and personal characteristics. Residents attending meetings had more negative expectations towards their future residential satisfaction. Although additional research is necessary, there may be two explanations for this finding. First, it may be the case that meetings are attended mainly by people who are more concerned about the project (e.g. Wright, 1993; Mansfield et al., 2001), which hints at potential self-selection. Our finding that, among other things, non-highway users and residents who are currently more concerned

about air pollution attend project team information meetings more frequently, further supports this line of reasoning. Second, the attendees' experiences, such as receiving more detailed information, listening to opinions of other residents, or feeling they cannot influence the project, may cause increased concerns and potentially negative expectations compared to more 'ignorant' people who did not attend these meetings (MacKenzie, 1990). Nevertheless, contrary to our expectations, receiving information from multiple sources - which could also be an indication of a respondent's interest in the project - was not reflected in more negative residential satisfaction expectations. This indicates an explicit difference in views between the more active and 'visible' group and the more silent majority of residents.

Our study provides starting points for further research. For example, whereas our study was limited to exploring the importance of information satisfaction, qualitative research could create a deeper insight into how information satisfaction is formed, whether or not in relation to people's acceptance of plans. Furthermore, where our study was based on cross-sectional data, additional research could elaborate on the causality of the proposed relationship between project team information and project acceptance as explored in our study. For example, the effects of different information types could be studied by quasi-experimental research in which groups receive different types of information at random. In addition, the same research questions could be investigated in other project contexts. In this study, we looked into two large highway adjustment projects in an early phase of planning. Studying the effects of information in different project types or in different planning phases could increase our insight into the need for project context specific communication strategies. A final research suggestion is to investigate to what extent residents' expectations with regard to changes in residential satisfaction prior to project realisation are indeed reflected in an actual change in residential satisfaction after finalizing the project. This may provide indications to which extent people's expectations under 'uncertainty' (e.g. Kahneman and Tversky, 1979) are indeed overestimating the potential negative effects of a project in its prior stages.

The findings of our study provide several implications for infrastructure planning policy. First, the notion that government information provision contributes to information satisfaction underlines the relevance of current governmental efforts. The finding that receiving information from the project team seemed to be more important in terms of information satisfaction for individuals living relatively close to the highway indicates that current policy efforts to give specific attention to individuals most affected seems worthwhile. Nevertheless, our analysis also revealed that older residents, residents with fewer social contacts and families with children appeared less positive about the information currently received. It may be effective to provide information via various channels, both via brochures and media in paper and digital form to serve different information needs. This includes also investing in and experimenting with creative ways to provide information, such as the use of social media, interactive websites, virtual simulations and Building Information Modelling (BIM). Furthermore, it may be worthwhile to further explore information preferences of different groups by actively approaching people regarding their information needs. Second, our results showed clear differences in information reception and residential satisfaction change expectations between the project locations. More specifically, we found that residents in Groningen showed a lower information permeability as well as a more positive response to the highway adjustment project compared to respondents in Utrecht, especially Utrecht-Lunetten. This indicates the relevance of taking note of location specific differences in information policy. Third, the finding that only around 30% of the respondents indicated they had received information from the project team at the moment of the questionnaire is a point of attention. Although both projects were still in the proposal phase, the relatively low level of information permeability is noticeable. In the light of the policy aim to involve stakeholders early in the planning process in order to reduce future potential protest against plans,

attention should be directed to the question why a considerable group of people is not involved through information and how residents can be better involved in the early phases of a planning process. Fourth, our results support the notion that groups that are more actively involved (i.e. attending information meetings) are likely to be selective, and different from the silent majority. Especially families with children, women, people with lower incomes, younger residents, residents less socially attached to the neighbourhood and residents less concerned with highway nuisance were found to be less likely to attend meetings. One should be aware of the potential bias in the opinions gained from such meetings. In addition, efforts could be taken to make information meetings more accessible to groups currently less present.

Acknowledgements
This research is funded by Rijkswaterstaat, Dutch Ministry of Infrastructure and the Environment. The work of Eva Heinen is supported by the Dutch Research Council fellowship (VENI-grant 016.145.073).

References

- Aaltonen, K., 2011. Project stakeholder analysis as an environmental interpretation process. International Journal of Project Management 29, 165–183
- Aeschbacher, M., 2006. The acronym NIMBY, Its use in the scientific literature about facility siting. ETH-NSSI Semesterarbeit 50(6).
- Arnstein, S.R., 1969. A Ladder of Citizen Participation. JAIP 35 (4), 216-224.
- Arts, J., 2007. Nieuwe Wegen? Planningsbenaderingen Voor Duurzame Infrastructuur. Groningen: Faculty of Spatial Sciences.
- Bandura, A., 1977. Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review 84(2), 191-215.
- Basolo, V., Steinberg, L.J., Burby, R.J., Levine, J., Cruz, A.M., Huang, C., 2009. The Effects of Confidence in Government and Information on Perceived and Actual Preparedness for Disasters. Environment and Behavior 41 (3), 338-364.
- Bickerstaff, K., Tolley, R., Walker, G., 2002. Transport planning and participation: the rhetoric and realities of public involvement. Journal of Transport Geography 10, 61–73.
- Booth, C., Richardson, T., 2001. Placing the public in integrated transport planning. Transport policy 8, 141-149.
- Bouder, F., 2014. Risk Perception and Communication. In: Teodorescu, H.N., Kirschenbaum, A., Cojocaru, S., Bruderlein, C. (Eds), Improving Disaster Resilience and Mitigation - IT Means and Tools (45-62). NATO Science for Peace and Security Series C: Environmental Security. Springer, Dordrecht.
- Committee Elverding, 2008. Sneller en Beter. The Hague: Ministry of Transport and the Environment.
- Cohrssen, J.J., Covello, V.T., 1989. Risk Analysis: A Guide to Principles and Methods for Analyzing Health and Environmental Risks. National Technical Information Service, Springfield VA.
- Costa, D.L., Kahn, M.E., 2004. Civic engagement and community heterogeneity: An economist's perspective. Perspectives on Politics 1(01), 103–111.
- Dear, M., 1992. Understanding and Overcoming the NIMBY Syndrome. Journal of the American Planning Association 58(3), 288-300.
- Dideck, A., Sinclair, A.J., 2002. Public Involvement in Environmental Assessment: The Case of the Nonparticipant. Environmental Management 29 (4), 578–588.

- Dunwoody, S., Griffin, R., 2014. Risk information seeking and processing model. In: Cho, H., Reimer, T., McReimer, K.A. (Eds), The SAGE handbook of risk communication (102-117). Sage Publications, Los Angeles.
- Edelenbos, J., 2000. Proces in vorm: Procesbegeleiding van interactieve beleidsvorming over lokale ruimtelijke projecten. Lemma, Utrecht.
- Fischhoff, B., 2009. Risk Perception and Communication. In: Detels, R., Beaglehole, R., Lansang, M.A., Gulliford, G. (Eds), Oxford Textbook of Public Health (5th Ed.) (940-952). Oxford University Press, Oxford.
- Frewer, L., 2004. The public and effective risk communication. Toxicology Letters 149, 391–397.
- Gelders, D., 2005. Public information provision about policy intentions: The Dutch and Belgian experience. Government Information Quaterly 22, 75–95.
- Griffin, R.J., Dunwoody, S., Neuwirth, K., 1999. Proposed Model of the relationship of risk seeking and processing to the development of preventive behaviors, Environmental Research 80 (2), 230-245.
- Grillo, M.C., Miguel, E., Teixeira, A., David, E., Wilson, C., 2010. Residential Satisfaction and Civic Engagement:Understanding the Causes of Community Participation. Soc Indic Res 97, 451–466.
- Hamersma, M., Tillema, T., Sussman, J., Arts, J., 2014. Living close to highway: the impact of perceived highway externalities on (changes in) residential satisfaction. Transportation Research A 59, 106-121.
- Hamersma, M., 2014. Omgevingsmanagement in de praktijk: Dilemma's op het snijvlak van omgeving en project. CVS Congres, November 2014.
- Healey, P., 1997. Collaborative planning. Shaping places in fragmented societies. MacMillan, London.
- Hysing, E., 2015. Citizen participation or representative government – Building legitimacy for the Gothenburg congestion tax. Transport Policy 39, 1–8.
- Kahneman, D., Tversky, A., 1979. Prospect Theory: An Analysis of Decision under Risk. Econometrica 47(2), 263-292.
- Laws, D., Susskind, L., 1991. Changing perspectives on the facility siting process. Maine Policy Review 1 (1), 29-44.
- Lober, D.J., 1995. Why protest? Public behavioural and attitudinal response to siting a waste disposal facility. Policy Sciences Journal 23 (3), 499-518.
- MacKenzie, D., 1990. Inventing Accuracy: A Historical Sociology of Nuclear Missle Guidance MIT Press, Cambridge MA.
- Mansfield, C., Van Houten, G., Huber, J., 2001. The Efficiency of Political Mechanisms for Siting Nuisance Facilities: Are Opponents More Likely to Participate than Supporters? The Journal of Real Estate Finance and Economics 22(3), 141-161.
- McComas, K.A., 2001. Public meetings about local waste management problems: Comparing participants to non-participants. Environmental Management 27(1), 135-147.
- North, P., 1998. 'Save our Solsbury!': the anatomy of an anti-roads Protest. Environmental Politics 7 (3), 1–25.
- Olander, S., Landin, A., 2005. Evaluation of stakeholder influence in the implementation of construction projects. International Journal of Project Management 23, 321–328.
- Olander, S., Landin, A., 2008. A comparative study of factors affecting the external stakeholder management process. Construction Management and Economics 26 (6), 553-561.

- Perloff, R. M., 2003. The Dynamics of Persuasion: Communication and Attitudes in the 21st Century (2nd ed.). Lawrence Erlbaum Associates, Mahwah NJ.
- Petty, R.E., Brinol, P., 2010. Attitude change. In: R.F. Baumeister and E.J. Finkel, Advanced Social Psychology: The State of the Science. Oxford University Press, New York.
- Plough, A., Krimsky, S.,1987. The emergence of risk communication studies: social and political context. Science, Technology & Human Values 12, 4-10.
- Pol, B., Swankhuisen, C., 2009. Nieuwe aanpak in overheidscommunicatie. Coutinho, Bussum.
- Portney, K.E., 1991. Siting Hazardous Waste Treatment Facilities, the NIMBY syndrome. Auburn House, Westport CT.
- Rijkswaterstaat, 2010. Handreiking MIRT-Verkenning. Ministry of Infrastructure and the Environment, The Hague.
- Rijkswaterstaat, 2011. Ondernemingsplan ("Business Plan") 2015. Ministry of Infrastructure and the Environment, The Hague.
- Rijkswaterstaat, 2013. Communiceren bij Rijkswaterstaat doe je zo! Uitgangspunten corporate communicatie. Ministry of Infrastructure and the Environment, The Hague.
- Schively, C., 2007. Understanding the NIMBY and LULU Phenomena: Reassessing Our Knowledge Base and Informing Future Research. Journal of Planning Literature 21 (3), 255-266.
- Siu, G.K.W., Bridge, A., Skitmore, M., 2001. Assessing the service quality of building maintenance providers: mechanical and engineering services. Construction Management and Economics 19 (7), 719-726.
- Slovic, P., 2000. The Perception of Risk. Earthscan, London.
- Stiglitz, J.E., Weiss, A., 1992. Asymmetric Information in Credit Markets and its Implications for Macroeconomics. Oxford Economic Papers 44 (4), 694-724
- Tillema, T., Hamersma, M., Sussman, J., Arts, J., 2012. Extending the scope of highway planning: accessibility, negative externalities and the residential context. Transport Reviews 32(2), 745-759.
- Woltjer, J., 2002. The 'Public Support Machine': Notions of the Function of Participatory Planning by Dutch Infrastructure Planners. Planning Practice & Research 17 (4), 437-453.
- Wright, S.A., 1993. Citizen information levels and grassroots opposition to new hazardous waste sites: are NIMBYists informed? Waste management 13, 253-259.
- Yang, J., Aloe, A.M., Feeley, T.H., 2014. Risk Information Seeking and Processing Model: A Meta-Analysis. Journal of Communication 64, 20–41.
- Yang, J., Shen, G.Q., Ho, M., Drew, D.S., Xue, X., 2011. Stakeholder management in construction: An empirical study to address research gaps in previous studies. International Journal of Project Management 29, 900–910.