Perception of Living Environment in the Netherlands
Disturbances Survey 2016

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Colophon

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Synopsis

Perceiving the physical living environment in the Netherlands
Disturbances Survey 2016

The National Institute for Public Health and the Environment (RIVM), in collaboration with Statistics Netherlands (CBS), carried out the seventh 'Inventory of Disturbances' (IV-7) in 2016. It was commissioned by the Ministry of Infrastructure and Water Management. The IV-7 is a questionnaire survey among a representative sample of residents of the Netherlands on how they experience their physical living environment. The survey examines environmental aspects such as sound, odour and vibrations, satisfaction with their living situation, anxiety and their opinion on the state of the living environment. The government closely monitors the development of disturbance in the living environment as well as satisfaction and concern about the living environment.
In the autumn of 2016, more than 8,000 Dutch residents aged 16 and older completed an 'on-line' survey. They answered questions on the annoyance and degree of sleep disturbance from more than 60 different sources of sound, odour and vibrations.

The main causes of noise annoyance are road traffic, noise produced by neighbours and air traffic. These are the same top 3 that were found in previous inventories of disturbances. Within road traffic, it is the roads with speed limits up to 50 km/h and mopeds and scooters that cause the most noise annoyance. The percentage of people who are disturbed by this is higher in the western part of the country and in the province of Limburg.

Noise annoyance caused by neighbours is difficult to address with policy measures. This is also evident from the figures on annoyance, which have remained stable over the years. Contact noises (walking stairs, slamming doors, hard floors) and outdoor activities are the main causes of noise annoyance. Noise and odour annoyance often go hand in hand with outdoor activities when the use of BBQs and fire baskets is involved. Odour annoyance caused by neighbours occurs more often nationwide than annoyance caused by factories, companies and the agricultural sector. Odour caused by commercial activities has clearly declined since the beginning of the century.

There is a clear reduction in noise annoyance caused by military air traffic, while annoyance due to civilian aviation has remained about the same at the national level.

Noise annoyance caused by train traffic is not among the top 3 at the national level, while rail transport may cause a lot of noise annoyance at the local level. This has to do with the reduction in the number of people who live near the railroad compared with the number of people who live near roads. The most severe noise annoyance is particularly noticeable in the vicinity of rail lines with a lot of freight traffic, often in combination with annoyance caused by vibrations. Research specifically

aimed at nuisance near railways also shows that freight trains are more annoying than passenger trains.

Odour annoyance is mainly caused by neighbour's activities, in which combustion processes (barbecue, fire pits, fireplaces and all-purpose burners) play an important part. At the national level, the odour nuisance has decreased in recent decades due to business activities. This applies to factories and companies as well as to the agricultural sector.

Road traffic is by far the most important source of annoyance due to vibrations, followed by construction and demolition activities, and aircraft and helicopters. Wind turbines are a source of complaints at local level, but are still a minor source of nuisance due to vibrations at national level.

Sleep disturbance caused by sounds is less common than noise annoyance. But the potential health effects are greater, which makes the impact on the Dutch population greater. For most sources of noise, the developments in sleep disturbance are equivalent to the noise annoyance. The top 3 sources of noise that cause sleep disturbance are road traffic, neighbours and recreational activities. Sleep disturbance caused by air traffic mainly occurs in the vicinity of Schiphol Airport and less near the other civilian airports. This is related to the small number of night flights at the regional airports. However, there is a striking increase in sleep disturbance caused by helicopters flying overhead, particularly in the western part of the country.

The survey includes several new sources that may cause nuisance now and in future. It is noteworthy that 8% of the population indicates experiencing at least some annoyance from low-frequency noise, described as a low, buzzing or humming sound from e.g. ventilation or air conditioners. The percentage of sleep disturbances is virtually the same as the percentage of people who are annoyed. It is difficult to speak of a single source for low-frequency sound since the cause of the nuisance cannot be clearly identified in many cases. But the extent of the problem indicates that the disturbance needs to be seriously considered in government policy.

Keywords: annoyance, sleep disturbance, residential satisfaction, concern, expectations

Publiekssamenvatting

Beleving Woonomgeving in Nederland
Inventarisatie Verstoringen 2016

Inwoners van Nederland hebben in hun woonomgeving vooral hinder
van geluid dat wordt veroorzaakt door wegverkeer, burenlawaai en
vliegverkeer. Bij wegverkeer zorgt verkeer op wegen met een
snelheidsbeperking tot 50 kilometer per uur, brommers en scooters voor
de meeste geluidhinder. Burenlawaai wordt vooral veroorzaakt door
'contactgeluiden' in woningen (traplopen, slaan met deuren, lopen op
harde vloeren) en geluid dat buren buiten maken. Geluidhinder door
militair vliegverkeer is afgenomen; de hinder door de burgerluchtvaart
op landelijk niveau blijft ongeveer gelijk. Treinverkeer valt landelijk
gezien buiten de top 3 van wegverkeer, burenlawaai en vliegverkeer,
maar kan lokaal voor veel hinder zorgen, vooral als er veel
goederenvervoer is.
Geurhinder wordt vooral veroorzaakt door activiteiten van de buren
waarbij verbrandingsprocessen (bij barbecues, vuurkorven,
openhaarden en allesbranders) een belangrijke rol spelen. Dit gaat vaak
samen met geluidhinder.
Wegverkeer is met afstand de belangrijkste bron van hinder door
trillingen, gevolgd door bouw- en sloopactiviteiten en vliegtuigen en
helikopters.

Geluid kan tot slaapverstoring leiden. Vooral geluid van wegverkeer, van
buren en van recreatieve activiteiten (zoals kermissen en sportvelden)
zorgen daarvoor. Slaapverstoring door vliegverkeer komt voornamelijk
voor in de omgeving van Schiphol. Dat is minder het geval rond de
regionale burgerluchthavens omdat daar minder nachtvluchten zijn. Een
opvallende toename van de slaapverstoring komt door overvliegende
helikopters, vooral in het westen van het land.

Bronnen die nu en in de toekomst voor hinder kunnen zorgen zijn
bijvoorbeeld drones en bronnen van laagfrequent geluid (laag zoemend
of brommend geluid zoals van een ventilator of airconditioning). Acht
procent van de Nederlandse bevolking heeft last van laagfrequent
geluid. Hierbij is vaak niet één bron als oorzaak aan te wijzen. De
omvang van het probleem vormt een signaal voor de overheid om deze
overlast in beleid mee te wegen.

Bovenstaande blijkt uit de zevende landelijke Inventarisatie
Verstoringen, die het ministerie van Infrastructuur en Waterstaat (I&W)
ongeveer eens in de zes jaar laat uitvoeren over de beleving van de
woonomgeving. Dit keer namen ruim 8000 inwoners van Nederland van
16 jaar en ouder eraan deel. Het onderzoek is uitgevoerd door het RIVM
en het CBS.

Kernwoorden: hinder, slaapverstoring, woontevredenheid, bezorgdheid,
verwachtingen

Contents

Samenvatting

Het Rijksinstituut voor Volksgezondheid en Milieu (RIVM) heeft samen met het Centraal Bureau voor de Statistiek (CBS) in 2016 de zevende 'Inventarisatie Verstoringen' (IV-7) uitgevoerd. Dit gebeurde in opdracht van het ministerie van Infrastructuur en Waterstaat (I&W). De IV-7 is een vragenlijstonderzoek onder een representatieve steekproef van inwoners van Nederland over de manier waarop ze hun fysieke woonomgeving beleven. In de vragenlijst wordt ingegaan op omgevingsaspecten als geluid, geur en trillingen, woontevredenheid, bezorgdheid en hun mening over de toestand van de woonomgeving. De overheid houdt hiermee een vinger aan de pols over de ontwikkeling van hinder in, woontevredenheid met en bezorgdheid over de woonomgeving.

In het najaar van 2016 hebben meer dan 8000 inwoners van Nederland van 16 jaar en ouder een online enquête ingevuld. Hierin hebben zij vragen beantwoord over de hinderlijkheid en de mate van slaapverstoring door meer dan 60 verschillende bronnen van geluid, geur en trillingen.

De belangrijkste oorzaken van geluidhinder zijn wegverkeer, burenlawaai en vliegverkeer. Dit is dezelfde top 3 als in de eerdere inventarisaties verstoringen werd gevonden. Binnen het wegverkeer zijn het de wegen met een snelheidsbeperking tot 50 km/u en de brommers en scooters die voor de meeste geluidhinder zorgen. Waarbij het percentage gehinderden hoger is in het westen van het land en in de provincie Limburg.

Hinder door geluiden van de buren is lastig met beleidsmaatregelen aan te pakken. Dit blijkt ook uit de hindercijfers, die door de jaren heen stabiel blijven. Contactgeluiden (traplopen, slaan met deuren, harde vloeren) en buitenactiviteiten zijn belangrijke oorzaken van geluidhinder. Geluid- en geurhinder gaan vaak samen bij de buitenactiviteiten wanneer het om het gebruik van BBQ's en vuurkorven gaat. Geurhinder veroorzaakt door de buren komt landelijk gezien vaker voor dan door fabrieken, bedrijven en de agrarische sector.

De geurhinder door bedrijfsmatige activiteiten is sinds het begin van de eeuw duidelijk afgenomen.

Er is een duidelijke afname van de geluidhinder door militair vliegverkeer, terwijl de hinder door de burgerluchtvaart op landelijk niveau ongeveer gelijk blijft.

Geluidhinder door treinverkeer staat op landelijk niveau niet in de top 3, terwijl het spoor lokaal voor veel geluidhinder kan zorgen. Dit heeft te maken met het kleiner aantal mensen dat in de buurt van het spoor woont ten opzichte van het aantal mensen dat rond wegen woont. De ernstige geluidhinder komt in het bijzonder voor in de omgeving van spoorlijnen met veel goederenvervoer, vaak in samenhang met hinder door trillingen. Ook onderzoek specifiek gericht op hinder rond spoorwegen laat zien dat goederentreinen hinderlijker zijn dan passagierstreinen.

Geurhinder wordt vooral veroorzaakt door activiteiten van de buren, waarbij verbrandingsprocessen (barbecues, vuurkorven, openhaarden

en allesbranders) een belangrijke rol spelen. Op landelijk niveau is de geurhinder door bedrijfsmatige activiteiten in de afgelopen decennia afgenomen. Dit geldt zowel voor fabrieken en bedrijven als voor de agrarische sector.

Wegverkeer is met afstand de belangrijkste bron van hinder door trillingen, gevolgd door bouw- en sloopactiviteiten en vliegtuigen en helikopters. Windturbines zijn op lokaal niveau een bron van klachten, maar in omvang op landelijk niveau nog een kleine bron van hinder door trillingen.

Slaapverstoring door geluiden komt minder vaak voor dan geluidhinder, maar de mogelijke gezondheidseffecten zijn groter. Daarom is de impact op de Nederlandse bevolking groter. Voor de meeste geluidbronnen zijn de ontwikkelingen in de slaapverstoring gelijk aan de geluidhinder. De top 3 van geluidbronnen die voor slaapverstoring zorgen, wordt gevormd door wegverkeer, buren en recreatieve activiteiten. Slaapverstoring door vliegverkeer komt voornamelijk voor in de omgeving van Schiphol en minder rond de overige burgerluchthavens. Dit hangt samen met het geringe aantal nachtvluchten op de regionale luchthavens. Wel is er een opvallende toename van de slaapverstoring door overvliegende helikopters, met name in het westen van het land.

In de vragenlijst is een aantal nieuwe bronnen opgenomen, die nu en in de toekomst voor hinder kunnen zorgen. Daarbij valt op dat 8% van de bevolking aangeeft minstens enige hinder van laagfrequent geluid, omschreven als een laag, zoemend of brommend geluid van bijvoorbeeld ventilatie of airconditioners, te ondervinden. Het percentage slaapverstoorden door laagfrequent geluid is vrijwel even groot als het percentage gehinderden. Het is lastig om bij laagfrequent geluid van één bron te spreken, omdat de oorzaak van de overlast in veel gevallen niet duidelijk is te identificeren. De omvang van het probleem vormt een signaal voor de overheid om deze overlast in beleid mee te wegen.

1 Introduction

In 2016, the Ministry of Infrastructure & Water Management commissioned the 'Disturbances Survey' study to be carried out for the seventh time. This annoyance survey has been carried out since 1977 at intervals of between 5 and 8 years. The study involves a national survey of annoyance from sound, odour, and vibrations. The study was carried out by the Dutch National Institute for Public Health and the Environment, RIVM in collaboration with Statistics Netherlands. RIVM asked Statistics Netherlands to carry out the fieldwork for the study. As the name 'Disturbances Survey' is a difficult one for persons being interviewed and could lead to misunderstandings, the name 'Study of Perception of the Living Environment' was chosen to approach persons being interviewed.

The study was first carried out by TNO in 1977. The study has now been carried out six times, most recently in 2008. The 2016 study is therefore the seventh such study.
Over the years, the 'Disturbances Survey' has served three goals:
- monitoring the national distribution and seriousness of disturbances (sound, odour, and vibrations) in terms of annoyance and sleep disturbance, concern, and satisfaction with the living environment, including trends over time;
- providing input for policy;
- identifying and exploring points of attention for future policy.

Since 2008, the manner of questioning interviewees about annoyance has been harmonised with the internationally accepted ISO/TS 15666:2003 standard. This ensures that interviewees are questioned about annoyance in the same way as is done in other national and international studies. In addition to this standardisation, the manner in which the questionnaire was filled out was also changed in the version at hand. Previously, the questionnaire was filled out in a one-on-one interview. This year, the questionnaire was sent to all participants via an internet questionnaire.
One or more themes have been added to the survey in each 'Disturbances Survey'. In 2016, attention was focused in particular on noise annoyance from road traffic and the factors that - in addition to the exposure to sound - contribute to whether a person does or does not experience annoyance from the sound.

Chapter 2 presents the most important results of the 'Disturbances Survey 2016' with a special focus on this year's theme, road traffic. Chapter 3 provides an explanation of the organisation and implementation of this survey for the interested reader. Chapter 5 contains tables with all the numbers from this survey arranged according to the various regions and provinces of the Netherlands.

2 Results of Perception of Living Environment

2.1 Introduction

The participants in this study answered questions on five themes in relation to the quality of their living environment. These topics are: annoyance and sleep disturbance from sounds, vibrations, and odours in the living environment; satisfaction with the home and living environment; concern about their own safety and health; and (expectations about) the state of their residential neighbourhood. The questionnaire is structured in such a manner that the participants first answer general questions about environmental factors, followed by questions that increasingly become more specific. For example, an interviewee is first asked to what degree sound from road traffic forms a source of annoyance, followed by questions about annoyance from different vehicles and road types.

The answers from the participants are used to calculate percentages of the Dutch population (16 years and older). These numbers are then further subdivided by calculating percentages for the 12 different provinces in the Netherlands and the 4 different regions differentiated by Statistics Netherlands. The organisation and implementation of the study are described in more detail in chapter 3. Insofar as possible, a comparison was made with the results of previous versions of this study, and trends were also described. The topics presented will first be briefly explained in order to be able to better interpret the results of the study. What is meant by annoyance and sleep disturbance and how were the percentages presented determined?

Annoyance
Annoyance is a collective term for all kinds of negative emotions such as irritation, dissatisfaction, anger, disappointment, feelings of withdrawal, helplessness, depression, anxiety, confusion, exhaustion, and agitation (WHO, 2011). It's about what people think of something or what emotions they feel in connection with something. The sound of a passing lorry can be annoying for one person but does not have to be so for another. Their experiences are different. However, both experiences are 'true'. After all, that's how they actually experience it. This example illustrates that the feelings and annoyance experienced by individual persons cannot be calculated based solely on the sound or odour levels to which people are exposed (RIVM and RIGO, 2005). This is because the individual experience is influenced not only by the exposure but also by all kinds of other factors. Situational, contextual, and personal factors all play a role here. Examples are the person's individual sensitivity to sound, expectations with regard to coming changes, anxiety reactions, and the attitude towards a source of annoyance. As people differ from each other with regard to these factors, it is not possible to predict who will experience annoyance to what degree. However, it is possible to say something about annoyance at the group level. In particular, the role played by situational, contextual, personal, and social factors in the perception of annoyance has been given extra attention in this study. This was done by including a number of extra questions related to these

factors in the questionnaire. A scientific publication on this topic is in preparation.

The degree to which groups of people experience annoyance was measured in this study with the help of a questionnaire. Within an international framework, researchers have agreed to use the same standard question for measuring noise annoyance. This question has been set down in an ISO standard (ISO/TS 15666, 2003) and the participants in this study were asked this same question. For each sound source surveyed, the question asks about the annoyance experienced in the home situation during the previous 12 months. The respondents can answer, on a scale of 0 to 10, to what degree they felt annoyed. This scale was converted to a range of 0 to 100, as there has been increasing international usage to classify the percentage of respondents whose level of annoyance exceeds 72 as being 'very annoyed' or 'severely annoyed'. If 50 is taken as the dividing line, then the result is called the percentage of persons who are '(at least) annoyed', and if 28 is the dividing line, the result is called the percentage who are '(at least) somewhat annoyed'. The results have to be converted to a scale of 0 to 100 because other answering scales (e.g. from 1 to 5) are also used in other studies. Converting the results to the same scale makes it possible to compare the results of different national and international studies. In the study at hand, the standardised question for noise annoyance is also used to measure annoyance from odour and vibrations.

Sleep disturbance
Sleep is an important recovery mechanism for human beings. Sufficient sleep ensures that we are alert in the daytime, that we can deal more effectively with stress, and that our concentration and memory functions work satisfactorily. (Chronically) disturbed sleep can have negative effects on health, including an increased pulse, increased movements during sleep, changes in sleep rhythm, waking up at night, and insomnia. In the long term, these effects can lead to increased blood pressure and cardiovascular conditions (WHO, 1999; Basner and McGuire, 2018). The quality of sleep can be measured fairly objectively in a laboratory, or by fitting a person with a movement sensor on the wrist or ankle.

Nightly sounds, vibrations, and odours in the living environment can disturb one's sleep. In this study, sleep disturbance is measured by asking the participants to what degree they were disturbed in their sleep during the previous 12 months by sounds, odours, and vibrations from various possible sources of disturbance in their environment. This question is comparable to the question about annoyance and therefore also measures the subjective perception of the individual's sleep. The participants can provide an answer on a scale from 0 to 10. The answers are used to calculate the percentages of 'severely sleep disturbed', '(at least) sleep disturbed', and '(at least) somewhat sleep disturbed'. The same cut-off levels are used in these calculations as are described above for the questions about annoyance.

2.2   Noise annoyance in the Netherlands

2.2.1   *Sources of noise annoyance in the living environment*
48% of adults in the Netherlands are at least somewhat annoyed by the sound of road traffic. Of these, approximately 26% say they are annoyed, and somewhat over 9% say they are severely annoyed. This makes the sound of road traffic the most important source of annoyance in the living environment. This is shown in Figure 2-1. The percentages on the right side of the figure show the fraction of the Dutch population that experience no annoyance or very little annoyance from a sound source. The percentage on the left side shows the fraction that is at least somewhat annoyed by the sound source, with the column indicating which part of this percentage is at least annoyed and which part is severely annoyed. Other major sources of annoyance are the various sounds made by the neighbours and the noise of aeroplanes taking off and landing.

In explaining the findings, it's important to note that the percentage of the population that reports noise annoyance is related not only to the annoyance factor of a sound source but also to actual occurrence of the sound source. Studies have shown, for example, that when the same level of sound from air traffic is compared to sound from road traffic, the sound from air traffic is perceived as being more annoying. However, as the number of people exposed to the sound of road traffic is larger at the national level, road traffic is shown to be the biggest source of annoyance in the study at hand.

These more general questions about sources of annoyance have been included in this study only since 2008. It is therefore not yet possible to describe any trends. However, the annoyance percentages for more specific questions (see chapter 5 Tables) show that the ranking for the sources of annoyance has not changed much over time.
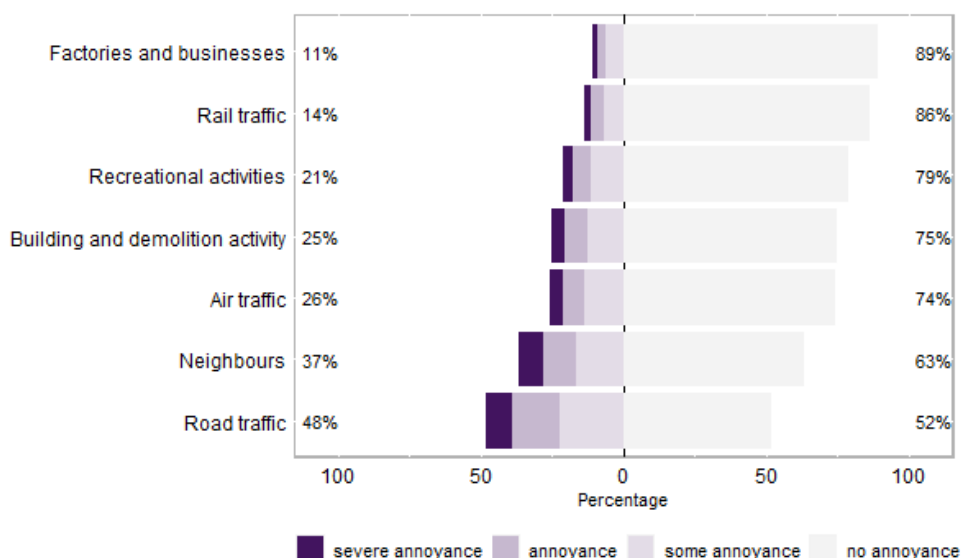
Figure 2-1 Most important sources of noise annoyance in the Netherlands (also see Table 5-2)

The distribution of annoyance over the provinces is shown in Table 5-44 in the appendix. The percentage of adults in the Netherlands that experiences severe noise annoyance from road traffic is approximately 5% in the relatively thinly populated provinces of Friesland and Groningen compared to 10-12% in the western part of the country and South Limburg. In none of the provinces does noise annoyance from neighbours differ from the national picture shown in Figure 2-1.

In the province of North Holland, the percentage of the population that experiences severe noise annoyance from air-traffic is 9.3%, which is practically identical with the 9.6% annoyed by the sound of road traffic. This is due to the presence of Schiphol Airport in this region. In the provinces where a regional airport of national significance is located or where some of the aeroplanes taking off and landing fly over at relatively low altitudes (Utrecht), the percentage experiencing severe noise annoyance is approximately 5%. Strikingly, somewhat over 4% of the participants of the study in Friesland say that they experience severe annoyance from air-traffic. This may possibly be related to the presence of the military airbase near Leeuwarden.

In most provinces, the percentage experiencing severe noise annoyance from building activities is between 3% and 5%, with the percentage in North Holland as an outlier, 7.6%. Particularly in the provinces of Utrecht and North Holland, recreational activities form a source of severe noise annoyance for 4.8% of the respondents. The nuisance from tourists in the cities may play a role in this regard.

2.2.2 Noise annoyance near roads

Most of the noise annoyance is experienced near roads in built-up areas where a maximum speed limit of 50 km/h or less is in force. Since the start of these studies, the extent of this annoyance has decreased (see Table 5-1). Whereas 22% of the population in the Netherlands experienced annoyance and 10% experienced severe annoyance from 50 km/h roads in 1987, these percentages decreased to 13.6% being annoyed and 5.6% being severely annoyed by 2016. Figure 2-2 shows that noise annoyance near provincial roads (with a maximum speed limit of 80 km/h) is 2.4%, which is comparable to noise annoyance near motorways. The extent of the annoyance from provincial roads and motorways is stable over time, showing similar annoyance percentages in the present study as in the previous studies. The distribution of annoyance over the road types in the provinces shows the same picture as described in the previous section: higher annoyance percentages in the western part of the country and Limburg compared to lower percentages in Friesland, Drenthe and Overijssel (see Table 5-43).
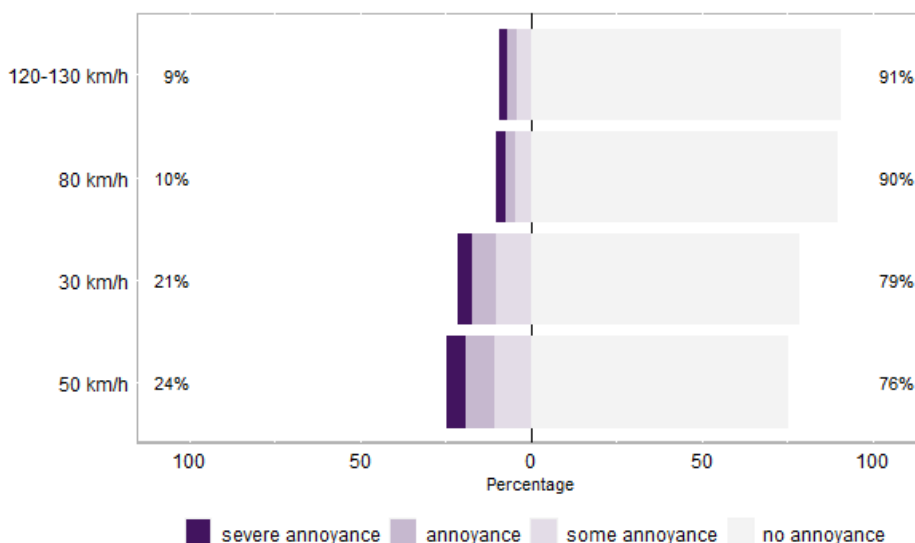
Figure 2-2 Noise annoyance from roads with different maximum speed limits (also see Table 5-1)

The participants were also asked which types of vehicles on the road were sources of noise annoyance for them, as shown in Figure 2-3. Mopeds are still the biggest source of noise annoyance, with 40% of the Dutch population experiencing at least some noise annoyance from this source. However, the extent of the annoyance from mopeds has decreased over the past decades, from 15% to 20% severe annoyance at the beginning of this century to 10% severe annoyance in 2016 (see Table 5-4). The fact that mopeds form the most important source of noise annoyance is related to the nature of the sound produced by mopeds, which is experienced as being loud and rough. An exploratory study by RIVM (Devilee and Van Kamp, 2013) indicates that the actual number of decibels (i.e. volume) of sound is less important. In addition, the reckless and noisy behaviour of moped users on the road irritates people, leading to a negative image of mopeds.
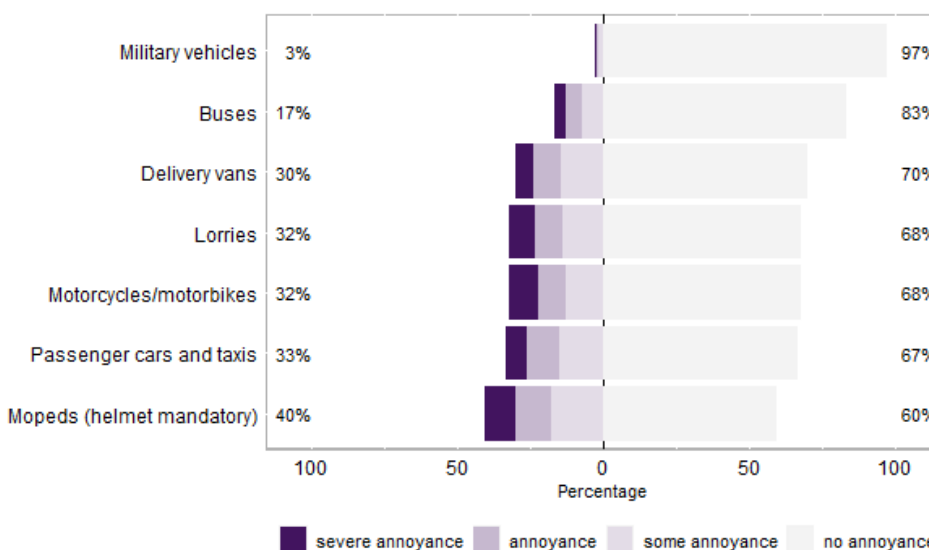
Figure 2-3 Noise annoyance from different types of road traffic (also see Table 5-4)

If we consider only severe annoyance, it becomes clear that the extent of severe noise annoyance caused by heavier motorcycles and motor bikes is the same as for mopeds. The distribution of the noise annoyance over the provinces does not show any clear differences from the national picture (see Table 5-46). The ranking of the most important sources of annoyance in all the provinces is practically the same as in Figure 2-3, with the extent of the noise annoyance being greater in the more densely populated western part of the country and in Limburg.

2.2.3 Noise annoyance in and around the home

After road traffic, sounds in and around the home are the second biggest source of annoyance in the Netherlands. Figure 2-4 shows that this is primarily caused by outdoor activities of the neighbours and contact sounds. Contact sounds are caused by sound vibrations transmitted via the floors and walls of the home. These can be caused, for example, by sounds of walking on hard floors, opening and closing doors, and walking up and down stairs.
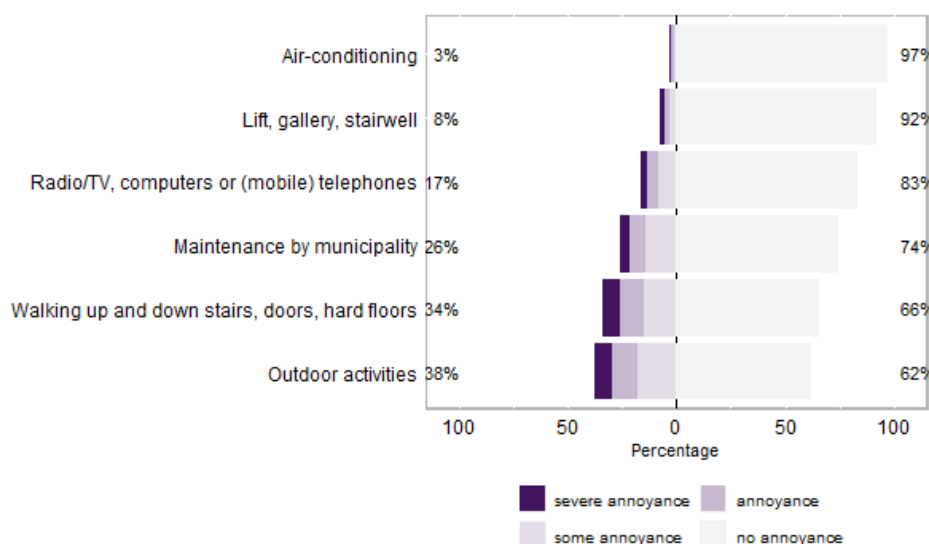
Figure 2-4 Noise annoyance caused by the neighbours or the municipality in and around the home (also see Table 5-8).

38% of the Dutch population experiences at least some annoyance from the outdoor activities of the neighbours. In addition, 8.2% say they experience severe annoyance. Contact sounds are the second biggest source of annoyance in the home, with 34% experiencing at least some annoyance, but the percentage experiencing severe noise annoyance, 8.5%, is practically the same as for outdoor activities. The annoyance from both sources has remained at the same level over the last 20 years (see Table 5-8). In contrast, the noise annoyance from neighbours' electronic devices (radio, TV, computers, etc.), lifts, galleries, and stairwells has decreased. For electronic devices, this may be related to changing patterns of use. The transition from a central TV and radio in the home to the individual use of mobile phones and tablets with associated headphones can influence this.

The 2016 study was the first one in which participants were asked about noise annoyance from air-conditioners. The increased probability of higher temperatures and longer periods of hot weather due to climate change is expected to cause an increase in the number of air-conditioners in private homes over the coming years. The outdoor units of such appliances are often fitted with vibration dampers that reduce contact sounds, but the continuous 'hum' of the airflow can be a nuisance factor. This type of nuisance can play a role particularly in the summer months when doors and windows are left open and people enjoy sitting in the garden. At 0.8%, the extent of severe noise annoyance from air-conditioners is still relatively limited in 2016.

As is the case for noise annoyance from road traffic, the percentages of persons experiencing annoyance from sound in and around the home are higher in the more densely populated provinces (see Table 5-50). In this regard, it is noteworthy that, in addition to the provinces of South Holland and North Holland, a relatively large percentage of people (9.9%) in the province of Groningen experience severe annoyance from contact sounds originating with the neighbours. This may be related to the distribution of the different types of houses present in the various provinces. Contact sounds are primarily noticed in homes that share walls and floors with the neighbours, such as apartments and terraced houses. If a province has a relatively large share of apartments, as is the case in Groningen (Statistics Netherlands, 2016), this may play a role in a higher percentage of persons experiencing severe annoyance from contact sounds.

2.2.4   *By rail and by air*
When it comes to air traffic and rail traffic, there are no large changes visible over time in the percentages of persons that experience noise annoyance (see Table 5-6). The most noise annoyance from rail traffic is experienced in the provinces of Gelderland and Overijssel, where 10.4% of the population experience at least some noise annoyance, followed by the province of Utrecht with 9.8%. However, the share of persons experiencing severe annoyance in the province of Utrecht is low (0.3%) compared to 2.2% and 2.1% in Gelderland and Overijssel respectively. In the province of North Brabant as well, 2.0% of the population experience severe annoyance from the sound of trains (see Table 5-48). When it comes to rail traffic, annoyance from sound and vibrations often goes together. Research on railways (Van Kamp et al., 2015) shows that the sound and vibrations caused by freight trains result in more annoyance than from passenger trains. The most important freight train routes (Betuwe route, IJssel route and Brabant route) run primarily through the provinces of Gelderland, North Brabant and Overijssel, and this is reflected in the percentages of persons experiencing severe annoyance. The dense rail network with a great deal of passenger traffic in the province of Utrecht also leads to noise annoyance, but this is experienced as less severe.

Since the start of these studies in the 1980s, the noise annoyance caused by military planes shows a decreasing trend throughout the Netherlands: from 15% severe noise annoyance in 1987 to 1.8% in 2016. The regional numbers (see Table 5-48) show that the annoyance is now concentrated in the provinces of North Brabant (9.1%), Friesland (8.8%) and Limburg (8.3%). This correlates with the airbases of Gilze-

Rijen, Volkel, Woensdrecht and Eindhoven in North Brabant and the base near Leeuwarden in Friesland. In South Limburg, the noise annoyance is primarily caused by the NATO airbase in Geilenkirchen in Germany, just over the border from the municipalities of Onderbanken and Brunssum.

On a national level, helicopters flying overhead form a relatively large source of severe noise annoyance, namely 4%, which is higher than for the remaining air-traffic. This severe level of noise annoyance is reported primarily in the provinces of Flevoland (6.2%), Utrecht (5.7%) and North Holland (5.5%).

Although the use of drones is still a niche market, their use has been rapidly increasing in recent years. This use is not confined to the hobby market. The number of drones that are being flown professionally and that are registered in the aircraft register is rapidly increasing (ILT, 2018). A question about the sound of drones is included in the study in order to be able to follow the trend over time. The answers indicate that 1.9% of the population experience at least some noise annoyance from drones flying overhead.

2.2.5   *Industry, building activities, and other economic activity*
After the financial crisis broke out in 2008, the construction sector in the Netherlands experienced a major economic downturn. According to data from Statistics Netherlands, turnover in the construction sector in 2016 was still 8% less than the pre-crisis level but was moving towards a similar level as in 2008 (Statistics Netherlands Statline). It was therefore expected that noise annoyance from construction and demolition sites in 2016 would be similar or less than in previous editions of this study. However, with 13.0% experiencing annoyance and 4.5% severe noise annoyance, that is not the case. In fact, noise nuisance from construction and demolition sites ranks fourth among the sources of noise annoyance. The questions asked about the various machines used in the construction sector did not provide any information that would explain the increase. It is possible that, with the upturn in the construction sector, the start of new projects has led to this increase.

Low-frequency sound (LFS) is sound with a frequency below 100 Hz. LFS can be heard as a humming noise over distances of several kilometres, as it has a long wavelength that is hardly absorbed at all by the surroundings. Sources of LFS include air-conditioners, ventilators, heavy industrial pumps, and (heavy) road and air traffic. Persons who are bothered by LFS often describe it as a humming, droning, or buzzing sound. Long-term exposure can lead to various health problems including poor sleep and loss of concentration. It is often difficult to pinpoint the source of low-frequency sound, in particular because the humming sound is not audible for everyone. Due to the increasing number of complaints about LFS (Slob et al., 2016), a question about humming/droning sounds was added to the study. 8.1% of the population report experiencing at least some annoyance from LFS, and 2.2% of these report experiencing severe annoyance (see Table 5-10). It is not easy to quantify the effect of LFS with a single question, but the annoyance percentages found are an indication that exposure to LFS is a problem that should not be underestimated. Also refer to the increase in

the number of complaints about LFS at municipal health services (Slob, 2016).

2.3 Sleep disturbance due to sound

The sounds that cause annoyance can also lead to sleep disturbance. This generally happens at night, but for persons working at night or in shifts, sleep disturbance can also occur in the daytime. The same type of questions used to determine annoyance from sound was also used to determine whether the population experiences sleep disturbance from sound in the living environment.
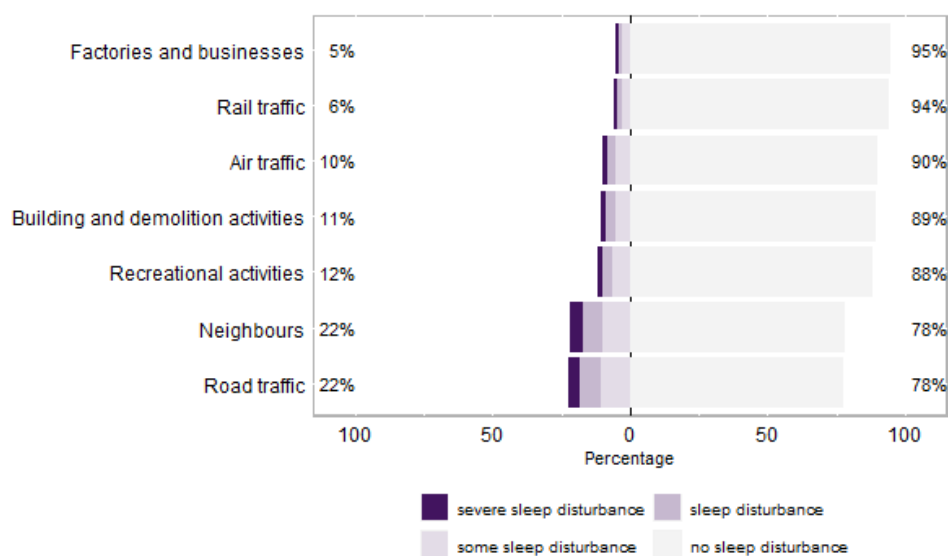
Figure 2-5 Most important sources of sleep disturbance from sound in the Netherlands (also see Table 5-3)

In general, the percentage of the population that is disturbed in their sleep by sound is smaller than the percentage that experiences annoyance, but sleep disturbance is possibly a more significant determinant of health than annoyance. Figure 2-5 shows that the sounds from road traffic and neighbours are the most important sources of at least some degree of sleep disturbance, as was also the case with regard to annoyance from sounds. In this regard, the percentage that experiences severe sleep disturbance due to sounds from neighbours is 5.1%, which is higher than the 4.3% experiencing it due to road traffic (see Table 5-3).
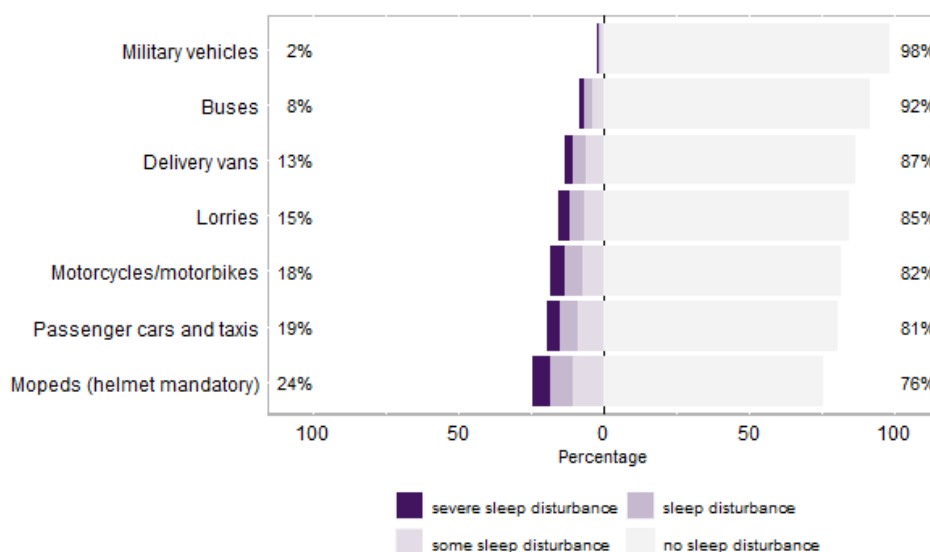
Figure 2-6 Sleep disturbance from different types of road traffic

If we consider the different types of road traffic, we see few changes over time (Figure 2-6 and Table 5-5). Sounds from mopeds are the most frequent source of severe sleep disturbance at 6.2%, followed by passenger cars and lorries. The regional distribution follows the degree of urbanisation of the provinces. However, a striking feature in this regard is that the percentage of persons experiencing severe sleep disturbance due to mopeds is the highest in North Holland, at 9.2%.

With regard to the various types of transport by rail and by air, the extent of the problem is stable over time (see Table 5-7). The only exception in that regard is formed by helicopters. Whereas the percentage of severely sleep disturbed persons due to helicopter noise had been less than 1% since 1998, that percentage has now increased to 2.7%. This is the same picture that was revealed by the numbers for noise annoyance. This increase is particularly visible in the provinces of Flevoland (3.3%), North Holland (4.6%), South Holland (3.7%) and Utrecht (4.7%). Nuisance from air traffic is concentrated in the vicinity of Schiphol Airport, with 5.6% reporting severe sleep disturbance. This is what one would expect, as the number of night flights is smaller at the other airports and their surroundings. In order to prevent a further spread of this problem, it would be advisable and in the national interest to seriously take into account the number of flights and routes carried out at night (and the hours just before and after) within the framework of the planned expansions of the regional airports.

Unlike the numbers over annoyance, recreational activities are the third largest source of at least some sleep disturbance, namely 11.9%. Significant sources mentioned in this regard include mass events (2.8% severe sleep disturbance) and discos & bars/restaurants (2.0%). As this was the first time that these questions were included in the study, it is not yet possible to identify any trends.

Sleep disturbance due to exposure to low-frequency sound was included in the study for the first time in 2016. A striking feature here is that the

percentage of persons reporting severe sleep disturbance, i1.9%, is practically the same as the percentage reporting severe annoyance.

2.4 Odours and vibrations

Various odours can cause nuisance in the living environment. Some odours, such as woodsmoke, are associated with increased concentrations of air pollutants. In order to prevent annoyance and limit the potential health risks, the government implements a proactive policy aimed at limiting odours from commercial activities and intensive livestock farming (also see: https://www.infomil.nl/onderwerpen/lucht-water/lucht/geur/

Figure 2-7 shows that factories and businesses, which account for 7%, and the agricultural sector, which accounts for 13%, are not (no longer) the most important sources of odour-related annoyance at the national level. Severe odour-related annoyance from factories and businesses decreased from 5% in 1993 to 1% in 2016; severe odour-related annoyance from the agricultural sector decreased from 5% to 2.5% over the same period.
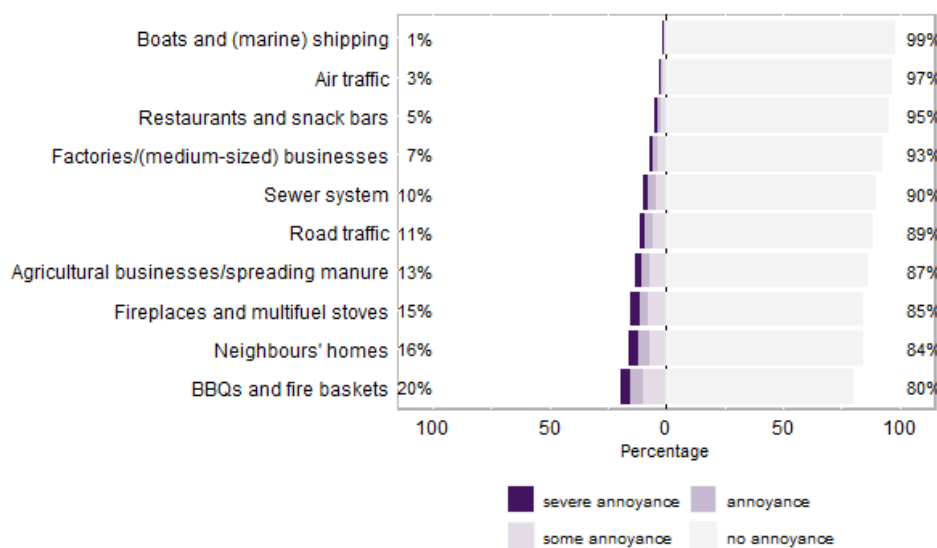
Figure 2-7 Odour-related annoyance in the living environment

Odours caused by the neighbours are the most important source of the annoyance. BBQs and fire baskets are ranked as the most important sources, followed by neighbours' homes and fireplaces and multifuel stoves. Open fireplaces, built-in fireplaces, stoves, fire baskets, and BBQs have become increasingly popular in recent years. This trend is not yet visible in the studies at hand, as the questions in the past surveys focused primarily on the commercial sources of odours. In 2016, approximately 10% of households in the Netherlands had a woodstove or a fireplace, and this number is expected to increase in the coming years with the projected transition from natural gas to other energy sources. Odours caused by neighbours are more difficult to regulate. The Woodsmoke and Health Platform was established to come up with solutions for the associated nuisance and possible damage to health. This platform brings together civil society organisations, research

and knowledge entities, the government, entrepreneurs, and consultancies with the aim of developing collective solutions (platformhoutrook.nl).
Besides annoyance, sleep disturbance is also reported on in this study. Here also, odours from nearby homes and the wood-burning or other fuel-burning behaviour of the neighbours are the most important sources, with approximately 6% reporting at least some sleep disturbance (see Table 5-16).

The numbers per province (see Table 5-57) show that severe annoyance due to odours from agricultural businesses and the spreading of manure is highest in Groningen (5.5%), Friesland (4.8%) and Drenthe (4.1%). A striking feature here is that 28.6% experience at least some annoyance due to odours from the agricultural sector in Zeeland (compared to 13% nationally), whereas the severe annoyance from odours in Zeeland, at 3.0%, does not differ much from the national average of 2.5%. For factories and businesses, the differences between the provinces are less pronounced, with Limburg reporting 2.7% severe annoyance from odours and North Holland reporting 2.0%. However, the percentages for at least some annoyance due to odours from commercial activity are the highest in South Holland (8.2%), Zeeland (9.0%), Groningen (10.1%) and Limburg (11.0%). Severe annoyance due to odours from fireplaces and stoves is reported in particular in Groningen (6.8%), Friesland (5.4%) and Drenthe (5.3%), whereas BBQs and fire baskets cause severe annoyance from odours in particular in Flevoland (7.9%) and Groningen (6.1%).

Vibrations that are felt in the home can also cause annoyance. This involves primarily vibrations that are transmitted via the soil. Vibrations can be physically experienced and felt, but the development of cracks in the home accompanied by possible feelings of anxiety regarding the quality of the home's construction can also contribute to the annoyance from vibrations. In the Netherlands, road traffic is the most important cause of annoyance from vibrations. 17% report being at least somewhat annoyed as a result, with 4.1% reporting severe annoyance. To a large degree, this is related to the presence of roads as potential sources of vibration compared to other causes of vibrations. However, the percentage reporting severe annoyance decreased by approximately 2% between 1993 and 2016. Figure 2-8 shows that construction & demolition activities and air & helicopter traffic are ranked second and third in this regard.
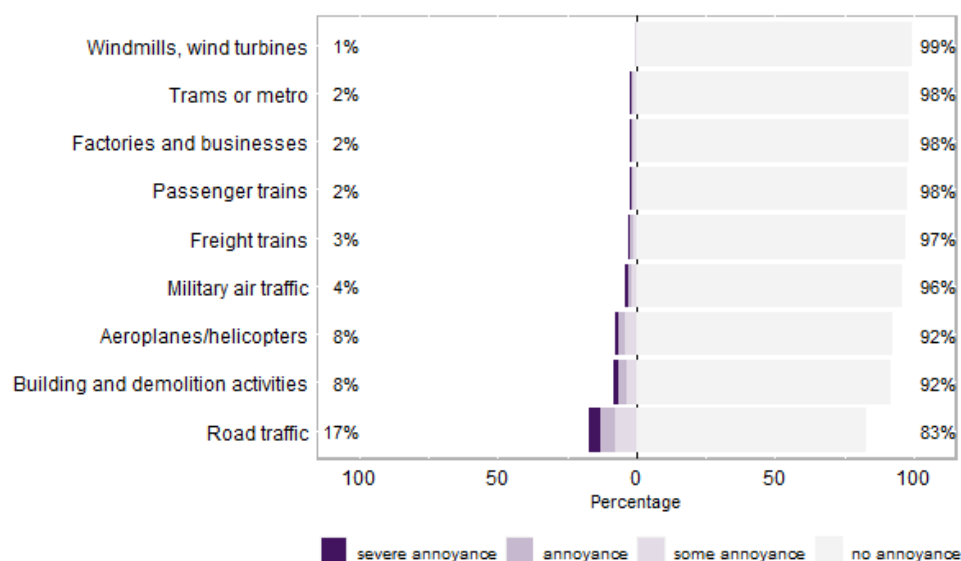
Figure 2-8 Annoyance from vibrations in the Netherlands

As the number of windmills and wind turbines is increasing in the Netherlands, a question on this topic was included in the study for the first time in 2016. Although these are a source of local complaints, annoyance due to vibrations from these windmills and turbines is hardly visible on a national level. In 2016, a differentiation was made for the first time between annoyance from vibrations resulting from passenger trains and freight trains. Research shows that freight trains are responsible for more annoyance from vibrations than passenger trains (Van Kamp, 2015), with percentages of up to 20% being reported for severe annoyance from vibrations in the direct vicinity of the railway. The difference between passenger trains and freight trains is also reflected in the study at hand, but the reported percentages of 2% to 3% indicate that this is not a major source of annoyance from vibrations on a national level.

2.5 How safe and healthy does the Dutch population consider its living environment to be.

The majority of the Dutch population is (very) satisfied with their living environment. In 2016, 69.1% reported being very satisfied, which is an increase of 8% compared to 2003 (see Table 5-20). On the other hand, the percentage of dissatisfied persons increased from 4% to 10.6% during the same period. Satisfaction with the living environment is measured in various studies, including the periodic Housing Survey of the Netherlands from Statistics Netherlands (WoON 2015, and Van Beuningen, 2018). As the various studies do not ask exactly the same question and the answering formats are also different, the percentages cannot be readily compared to each other.

If the interviewees are asked how the neighbourhood where they live has developed over the past year, then 16% say the neighbourhood has improved compared to 14% who say it has deteriorated (see Table 2-1). The expectations reported with regard to the development of the neighbourhood in the coming year show similar numbers.

Table 2-1 Opinion on the state of one's residential neighbourhood over the past year and the coming year

	Improved	Deteriorated	Remained the same
In the *past* year:			
the neighbourhood has	16	14	70
sound of road traffic in the neighbourhood	3	26	71
In the *coming* year:			
the neighbourhood will	15	11	74
sound of road traffic in the neighbourhood	3	25	72

The Dutch population is less positive regarding the trend for the sound of road traffic in their neighbourhood. Only 3% report that sound has improved in the past year, compared to 26% who noticed a deterioration. 25% also expect a deterioration with regard to the sound of road traffic for the coming year. There is no data available per province, but the numbers in Table 5-42 show that the opinion regarding the condition of the neighbourhood over the past year is practically the same in all four regions. The same is true of the expectations for the coming year. The same is not true for the sound of road traffic. In West Netherlands, 27.1% say that the situation regarding sound has deteriorated in the past year, whereas in North Netherlands that figure is 18.4%. The same pattern can be seen in the expectations people have with regard to sound in the coming year.

Since 1998, the level of anxiety of the Dutch population has been monitored with regard to their own safety in view of the risk factors present in their living environment. The percentages are calculated for those persons in the population who themselves indicate that a situation applies to them. The various factors that were investigated are presented in Figure 2-9. The percentage of 'concerned' persons is the percentage of persons who filled out a score of 5-7 on a scale of 0-10. The percentage of 'very concerned' persons is the percentage of persons who filled out a score of 8-10. 22% of the Dutch population is concerned or very concerned about their own safety as a result of their living in or near a busy street, followed by 20% who are concerned or very concerned regarding lightning striking their home. The degree of concern has shown a clearly decreasing trend since 1998, with it being noticeable that this same trend is visible for all the risk factors asked about (see Table 5-18). For example, in 2003 somewhat more than half of the Dutch population living near a busy street said that they were concerned or very concerned about their safety as a result, compared to 22% in 2016. This decrease corresponds to the overall perception of safety measured over the period 2005-2017 in the safety monitor (Safety Monitor, 2017).

In an agricultural or horticultural area	6%		94%
In the vicinity of intensive livestock farming	8%		92%
In a polder (reclaimed land) below sea level or river level.	10%		90%
Adjacent to a railway line	10%		90%
Near a high-voltage line	11%		89%
In the vicinity of a big airport	13%		87%
On or in the vicinity of contaminated soil	13%		87%
In the vicinity of a mobile phone base station	14%		86%
Adjacent to a route for hazardous substances	14%		86%
In the vicinity of a high-risk business enterprise	15%		85%
Below the route used by aeroplanes to approach a big airport	15%		85%
Lightning striking in your home	20%		80%
In a busy street	22%		78%

very concerned concerned not concerned

Figure 2-9 Concern about one's own safety due to risk factors in the living environment

The results indicate that 34% of the Dutch population sometimes feels unsafe in general, and that this percentage has decreased by almost 30% since 2005. The decrease is less pronounced with regard to feelings of being unsafe due to factors associated with the neighbourhood: from 18% in 2008 to 16% in 2017. The decreases found in the study at hand for the period 2003-2016, expressed in percentage terms, are greater.

Interviewees were asked how concerned they were about their own health in relation to the quality of the air (indoors and outdoors), the soil, (drinking) water, and sound around the house. The quality of the air led to the highest percentage of concerned persons (see Table 2-2). About one out of every three persons in the Netherlands (31%) is concerned or very concerned about their own health in relation to the air quality outdoors. The level of concern about the quality of the drinking water ranks lowest, but one out of every seven persons (14%) is still concerned or very concerned.

Table 2-2 Concern about one's own health in relation to the environment in and around the home

	Concerned		Very concerned	
	2008	2016	2008	2016
The air quality in your home	14	13	15	10
The air quality around your home	19	16	19	15
The soil quality around your home		11		7
The drinking water quality in your home		7		7
The water quality around your home		9		7
The sound around your home		13		10

Data from a previous survey are available only for (indoor and outdoor) air quality. These show a decrease in the level of concern about air quality. The data shows that the Dutch population perceives the outdoor air quality to be more of a concern for their health than the indoor air quality. However, people spend an average of 85% of their time indoors and 70% of that time is spend in their own home. Due to insufficient ventilation, the concentrations of substances in the indoor environment (including humidity, tobacco smoke, and radon) are often higher than outdoors, and these concentrations can therefore have a negative impact on health (Jongeneel et al., 2009).

2.6 Conclusions

The main conclusions per theme are presented in the following sections.

2.6.1 Noise annoyance

- Road traffic remains the most important source of noise annoyance in the Netherlands, followed by sound from the neighbours and air traffic.
- Roads with a maximum speed limit of 50 km/h generate the most annoyance from sound, but this annoyance has decreased over time.
- Within the category of road traffic, mopeds are still the most important cause of noise annoyance.
- The ranking of the biggest sources of noise annoyance did not change in 2016 compared to previous studies.
- There are clear differences between provinces in the level of noise annoyance from road traffic. The differences appear to be associated with the population density of the provinces and the more extensive network of roads serving higher population densities.
- Building and demolition activities are reported to be a source of noise annoyance particularly in North Holland.
- The level of noise annoyance caused by neighbours is fairly stable over time, with outdoor activities and contact sounds in the home (walking up and down stairs, doors, hard floors) being the main cause of the annoyance. Higher levels of noise annoyance from the neighbours are reported in the densely populated provinces of Western Netherlands.

- Although the use of air-conditioners in the Netherlands is increasing, this is not yet clearly reflected in the data on annoyance.
- Severe noise annoyance from rail traffic is reported primarily in the provinces of Gelderland, Overijssel and Noord-Brabant. Although there is a higher level of annoyance in the province of Utrecht, which has a relatively large amount of rail traffic, the annoyance here is experienced as being less severe. The severity of noise annoyance may be related to the percentage of freight trains passing through the province: the sound of freight trains is experienced as being more annoying than the sound of passenger trains.
- Noise annoyance from low-frequency sound was investigated for the first time; 8% of the population reported at least some annoyance from such sounds.

2.6.2 Sleep disturbance
- The percentages of people reporting sleep disturbance from sound are lower than the percentages reporting noise annoyance, but the potentially negative effects of sleep disturbance on health are greater.
- The most important causes of sleep disturbance are road traffic and neighbours, followed by recreational activities.
- Within the category of road traffic, mopeds are the most important source of sleep disturbance, with severe sleep disturbance being experienced primarily in North Holland.
- Air traffic ranks fifth among the causes of sleep disturbance on a national level, but this effect is concentrated mostly in the region around Schiphol Airport. As yet, relatively few night flights are being carried out in the vicinity of the other nationally significant airports.
- There is a striking increase in sleep disturbance caused by helicopters, particularly in the western part of the country.
- The percentage of the population experiencing sleep disturbance due to exposure to low-frequency sound is practically the same as the percentage experiencing noise annoyance. This is an indication that the low-frequency sound is frequently caused by sources that operate day and night.

2.6.3 Odours and vibrations
- Annoyance from odours is primarily caused by activities of the neighbours, with combustion processes (BBQ, fire baskets, fireplaces, and multifuel stoves) playing an important role.
- On a national level, the level of annoyance due to odours from commercial activities has decreased in recent decades. This applies to factories and businesses as well as the agricultural sector.
- Road traffic is by far the most important source of annoyance from vibrations, followed by building & demolition activities and aeroplanes & helicopters.
- Wind turbines are a source of complaints on a local level, but on a national level they are still only a minor source of annoyance from vibrations.

- Freight trains cause more annoyance from vibrations than passenger trains.

2.6.4 Safety and health in the living environment
- A quarter of the Dutch population finds that the sound of road traffic in their neighbourhood has decreased over the past year and expects that this will also be the case in the coming year.
- The biggest source of concern for the Dutch population in relation to their own safety is living in the vicinity of a busy street, followed by concern over lightning striking the home and the nearby presence of a route used by aeroplanes to approach an airport.
- The concern felt regarding one's own safety in relation to all the risk factors asked about in the study has decreased since 2003.
- 31% of the Dutch population is concerned or very concerned about the effect of air quality near their home on their health, and 23% is concerned about the air quality inside the home.

2.6.5 Comparison to previous surveys
The annoyance survey has been carried out since 1977 at intervals of between 5 and 8 years under a representative sample of the adult Dutch population. Over this period, a great deal has changed in the way these studies are carried out, the willingness of the population to participate in this type of study, the costs of the study, and the increasing availability of the Internet. In addition, these studies have been carried out by various research agencies and institutes over the years. These differences can lead to methodological disparities and can have an influence on trend changes over time.

During the previous study in 2008, it was determined that most of the indicators determined in the study were systematically lower than the values for these indicators determined in the previous studies. At the time, an analysis was carried out to determine whether this systematic deviation resulted from changes in the questions asked, from the design and structure of the sample, or from the influence of selective non-response. However, it was not possible to determine that any of these possible causes was responsible for the systematic differences with previous studies.
In connection with the costs, changes were also made in the organisation and implementation of the study in 2016. In addition, it was decided to call on the expertise of Statistics Netherlands in order to obtain a representative sample of the population and to take care of the fieldwork. As a result of these changes, the results of the 2016 study were more in line with the results of the annoyance surveys from 2003 and before. We can therefore conclude that the 2008 survey is an outlier within the series of studies carried out. The data from 2008 can therefore be used for making mutual comparisons between indicators but cannot be used as part of any solidly grounded trend analysis.

3 Organisation and implementation of the study

RIVM asked Statistics Netherlands to carry out the fieldwork for the study. Statistics Netherlands delivered the study database, together with a detailed report on the data collection, processing, non-response analysis, and weighting procedure A brief summary of the organisation and implementation of the study, as described in the background document of Statistics Netherlands, is presented below.

3.1 Study design and sample

Similar to the previous annoyance surveys, the target population consists of persons living in the Netherlands who are members of private households and are 16 years or older at the time of the study. A sample of persons for the study was drawn from the sampling frame used by Statistics Netherlands for all population samples in 2016. This sampling frame is derived from the General Municipal Register (BRP) and contains approximately 7% of all persons living in the Netherlands.

This annoyance survey analyses the relationship between annoyance and sleep disturbance resulting from exposure to the sound of road traffic. The population and the sample were therefore stratified according to the degree of exposure to the sound of road traffic. This is necessary in order to ensure a balanced distribution of the respondents over the entire range of exposure to road traffic sounds. The exposure to road traffic was determined using a standard calculation method (RMV scheme, 2012). This method uses digital data files containing the position of traffic roads. The traffic data of motorways is based on data for guideline 2002/49/EG for 2016 provided by Rijkswaterstaat (Directorate-General for Public Works and Water Management). The estimates of the noise exposure for provincial and municipal roads are based on traffic estimates from 2011 (www.emissieregistratie.nl). This data file was linked to the residential addresses in the 2014 General Register of Addresses and Buildings (BAG). As every person registered in the BRP resides in a BAG object, the sound exposure, expressed in decibels, can be linked to the person in question. This was carried out for every person in the target population, which consists of 13,838,717 persons. If it was not possible to link a sound exposure to a person in the target population because the address of the person in question was not registered in the 2014 BAG, then the sound exposure of a neighbouring address was used instead. The target population was then divided into four strata as defined in Table 3-1.

Table 3-1 Definition of target population strata

Stratum	Sound exposure of residential address	Persons in target population	
	Decibel	*Number*	*%*
1	<55	8,231,918	59.5
2	55 - < 60	3,271,030	23.6
3	60 - < 65	1,632,618	11.8
4	≥ 65	703,151	5.1
Total	-	13,838,717	100.0

The desired level of response was 6000 persons, including 3000 persons in stratum 1 and 1000 persons in each of the other strata. The sample consisted of a stratified two-step sample. In the first step, municipal districts were selected for each COROP area, with the probability of a municipal district being selected being proportional to its population. The Netherlands is divided into 40 COROP areas, and each province is the combination of several COROP areas. A municipal district is a combination of one or more neighbourhoods within a municipality. The second step is taking a random sample of persons who were at least 16 years old on 30 September 2016 in the municipal districts selected with populations as determined in the first step. This design ensures that the distribution per stratum in the sample taken is the same as in the target population.

Two samples were taken: one to be approached in October 2016 and one to be approached in November 2016. The persons in the sample were approached only via the Internet (CAWI). Internet non-responders were not approached a second time. This approach is different than the approach used in the 2008 study, in which the persons sampled were approached by interviewers at home (CAPI). The increased costs of CAPI type surveys made this change necessary.

3.2 Questionnaire

The questionnaire is included in its entirety in the Questionnaire Appendix (6). An explanation of the end points and scores measured is given in the introduction to the Tables (5.1).

3.3 Fieldwork results

The number of respondents is 7957. This is a response percentage of 35% of the sample approached and therefore more than meets the response target set beforehand of 6000 persons responding.

Table 3-2 Response overview in terms of fieldwork period and total sample

	October		November		Total	
	Number	*%*	*Number*	*%*	*Number*	*%*
Approached	11,367	100.0	11,367	100.0	22,734	100.0
Frame errors	11	0.1	18	0.2	29	0.1
Non-response dealt with	316	2.8	310	2.7	626	2.8
Non-response	7,056	62.1	7,066	62.2	14,122	62.1
Response	3,984	35.0	3,973	35.0	7,957	35.0

The response overview in Table 3-2 Response overview in terms of fieldwork period and total sample) shows that the percentage of frame errors and non-response dealt with is low, namely 2.9%, which is as expected for Internet studies. Frame errors include the following: no residential address, address not occupied, person deceased, and person moved to different address. These can be registered only if Statistics Netherlands is contacted and informed that the letter was not delivered to the right person. The same applies to the non-response dealt with, in which case Statistics Netherlands was contacted and informed that the sample person does not wish to or is not able to participate in the study.

The response numbers realised in the four sound strata are well above the targets set: 3774 persons responding (36.6% response) in stratum 1, 1419 (35.4%) in stratum 2, 1289 (33.6%) in stratum 3, and 1475 (32.3%) in stratum 4. Before implementation, the response rate in the higher sound strata was expected to be lower than in stratum 1, but the differences in response amounted to only a few percent.

3.4 Data processing and accessibility to third parties

After all the questionnaire data was combined in a single file, the file was enriched with register information at the level of individual persons. This information was derived from the Basic Municipal Register (BRP), the Area Layout Register (GIR) and the income data. The reference date of the data sourced from the BRP is as close as possible to the questionnaire period of the respondent. The file was enriched with the municipal code, the country region, the province, the degree of urbanisation, and the social-economic category of the respondents. In addition, a number of variables were derived for analytical and publication purposes: age, sex, marital status, household type, income quintile, province with large cities, and origin.

The data file of this Disturbances Survey, including metadata and background information, is accessible in the Remote Access environment of Statistics Netherlands. Requests for using the data can be submitted to Statistics Netherlands.

3.5 Non-response analysis and weighting

Non-response means that no information was obtained from a person in the sample. The willingness to participate in survey studies is decreasing, and this makes it even more important to take sufficient account of the possible influence of non-response on the results. The reasons for not participating in studies can vary. The participation of fewer participants in a study does not necessarily lead to incorrect conclusions, but it does increase the uncertainty margin around the results. Non-response can be a problem if the persons who participate in the study give different answers to the questions/target variables than the persons who do not participate in the study. This is referred to as selective non-response. Statistics Netherlands analysed whether the non-response, the underrepresentation or overrepresentation of certain groups in the study, leads to a distortion of the results.

To do so, Statistics Netherlands examined variables that would be expected to reveal selectivity with regard to participating in the study and that would possibly correlate with the target variables of the study. The characteristics included in these analyses were: stratum (exposure to the sound of road

traffic), country region, province, degree of urbanisation, age, sex, marital status, origin, household size, household type, position in the household, presence of children in the household (yes/no), social-economic category, UWV (Employee Insurance Agency) registered, capital assets, (standardised) disposable household income, residential status (rental or owner-occupied), WOZ property valuation, year built, and number of residential units per property (one or more).

The response rate decreases as the sound exposure increases. The areas with a high sound exposure are overrepresented in the sample and therefore also in the response. With regard to the variable 'sex', there is hardly any difference in response percentage between men and women. With regard to the variable 'age', there is a clear difference. The response rate of younger persons, with the exception of the 16 to 19 year age group, and persons 75 years or older was lower than for the middle group. Origin was also a strong differentiating factor for response. Persons with an immigrant background, particularly those with a non-Western immigrant background, responded less frequently than persons with a non-immigrant Dutch background.

The place where one lives also has an influence on participation in the study: the response rate is lower in West Netherlands and the provinces located there. This may be due to the larger number of very urbanised areas in these regions. However, the response rate in the province of Groningen is also lower than the average rate. In addition, the response rates for the subgroups married persons, couples without children, partners in a household, employed persons, and persons in owner-occupied homes were higher than in the other subgroups. The response rates for persons registered with the UWV and persons living in a property with a low WOZ valuation or a property containing more than one residential unit were lower than average. With regard to the variable 'standardised disposable income', the response percentage increases with the income decile.

The selectivity in the response to this study is comparable to that of other Statistics Netherlands studies. Younger persons, persons with a non-Western immigrant background, single persons, and persons with lower incomes generally show lower response rates than average. The response rate of older persons (75+) in this study was also lower than average. This could be due to the strategy chosen to approach the interviewees. Older persons are generally less receptive to being approached via the Internet and more receptive to telephone interviews. However, the study at hand was disseminated only via the Internet.

The response data were weighted in order to be able to arrive at population characteristics using the response data. This is done by calculating an "inclusion weight' and two correction weights for every person who responded. The inclusion weight corrects for possible differences in the probability that individual members of the population will be included in the sample as a result of the sample design. The two correction weights correct for the selective failure on the part of potential respondents in the sample during the survey. The product of the inclusion weight and the two correction weights is the end weight. The response data are weighted with this end weight in order to estimate the population characteristics.

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5 Tables

The tables provide an overview and a summary of the scores filled out in the questionnaires by the participants in the study. The tables provide information about the various endpoints: annoyance, sleep disturbance, satisfaction with the living environment, level of concern, and state of the neighbourhood. In addition, the tables differentiate between three levels at which the information is presented: The Netherlands, the (4) regions, and the provinces.

The endpoints are: annoyance and sleep disturbance from sources of sound, odour, and vibrations, satisfaction with the living environment, concern with regard to living in or near hazardous situations, and state of the neighbourhood.

Annoyance and sleep disturbance
Annoyance and sleep disturbance are presented per source groups. For sound, we differentiate 10 groups with more than 60 sources, for odour, one source group with 10 sources, and for vibrations, one source group with 9 different sources.

The share of persons experiencing annoyance and sleep disturbance is expressed in percentages. We differentiate three categories of annoyance in this regard: (at least) some annoyance, (at least) annoyance, and severe annoyance. Annoyance is measured on an 11 point scale (from 0 to 10).
A score of (approximately) 3 and more puts a respondent in the category of (at least) some annoyance; a score of 5 and more puts the person in the category of (at least) annoyance; finally, a score of 8 and more puts someone in the category of severe annoyance. Note: this means that the persons reporting more severe annoyance are also included in the numbers reporting (at least) lower levels of annoyance. A similar convention applies to sleep disturbance.

Trends: Whenever available, data from previous surveys (1977, 1987, 1993, 1998, 2003, 2008) is presented. This is available only for the Netherlands and not on the level of regions or provinces.

Satisfaction with the living environment
Satisfaction with the residential (home) environment is also measured on an 11 point scale (from 0 to 10). The scores are then divided into three categories and presented as a percentage.
A score of 0-5 means 'dissatisfied with the living environment'; 6-7 means 'fairly satisfied with the living environment'; 8-10 means 'very satisfied with the living environment'.

Concern
The percentage of 'concerned' persons is the percentage of persons who filled out a score of 5-7 on an 11 point scale of 0-10.
The percentage of 'very concerned' persons is the percentage of persons who filled out a score of 8-10. So with regard to 'concern', unlike the

convention for 'annoyance', the persons who were 'very concerned' are not included in the percentage of persons who were 'concerned'.

State of the neighbourhood: expectations
The 'state of the neighbourhood' indicates whether the participant finds that the state of the neighbourhood deteriorated or improved or remained the same in the past and whether it will deteriorate or improve or remain the same in the future. This question is also asked with regard to sound in the neighbourhood.

95% confidence interval
The calculated values are expressed in percentages, for example the point estimate, '21.4% severely annoyed'. This point estimate is surrounded by an interval, for example '21.4' followed by: '20.4-22.4'. This is the 95% confidence interval. This means that if we were to calculate this percentage of annoyed persons a great many times, then 95 of the 100 values (point estimates) calculated would fall within this interval.

The point estimates to one decimal place and the confidence intervals are presented for the 2016 data. In later additional analyses, point estimates and confidence intervals will also be determined for other years. This will make it possible to carry out possible trend analyses on a more quantitative basis and to indicate whether a change (higher or lower) is really higher or lower (statistically speaking).

Levels of scale
The living environment perception data from this Disturbances Survey is presented at three levels: at the national level (the Netherlands), at the regional level (4), and at the provincial level (12).
The regions are formed by combining a number of provinces with each other. The regions consist of the following provinces:
- North: Groningen, Friesland and Drenthe,
- East: Overijssel, Flevoland and Gelderland,
- West: North Holland, South Holland, Zeeland and Utrecht,
- South: North Brabant and Limburg.

At the provincial level, the numbers of participants per province and the distribution over a number of endpoints becomes so low that the data may not be presented for reasons of privacy. At this level, no data is presented on 'satisfaction with the living environment', 'concern', and 'state of the neighbourhood'.

5.1 The Netherlands

5.1.1 *Annoyance and sleep disturbance*

5.1.1.1 Sound

Table 5-1 Annoyance from traffic on road types with different speed limits

Traffic on a road with a speed limit of	Some annoyance 2016	Annoyance						Severe annoyance					
		87	93	98	03	08	2016	87	93	98	03	08	2016
30 km/h	21.4				9	8	11.1				3	3	4.1
	20.4-22.4						10.4-11.8						3.6-4.6
50 km/h	24.5	22	17	22	19	10	13.6	10	7	8	8	5	5.6
	23.5-25.5						12.9-14.3						5.1-6.1
80 km/h	10.0		3	2	4	3	5.5		1	1	2	1	2.5
	9.3-10.7						5.0-6.0						2.1-2.8
120-130 km/h	9.4	7	2	2	4	4	4.7	4	1	1	2	2	2.4
	8.7-10.1						5.7-9.4						2.0-2.7

Table 5-2 Annoyance General (from source groups)

	Some annoyance	Annoyance						Severe annoyance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Road traffic	48.0					18	25.8					6	9.3
	46.8-49.2						24.9-26.8						8.6-9.9
Rail traffic	13.8					3	6.8					1	2.2
	13.0-14.7						6.3-7.4						1.9-2.5
Air traffic	25.9					10	12.4					3	4.6
	24.9-27.0						11.7-13.2						4.1-5.1
Building and demolition activities	25.3	7	3	4	8	4	13.0	3	2	1	3	2	4.5
	24.3-26.7						12.2-13.7						4.0-5.0
Factories and businesses	10.8						4.8						1.9
	10.1-11.6						4.3-5.3						1.6-2.2
Recreational activities	21.2						9.6						3.3
	20.2-22.2						9.0-10.3						2.8-3.7
Neighbours	36.6						20.2						8.4
	35.4-37.8						19.2-21.1						7.7-9.0

Table 5-3 Sleep disturbance General (from source groups)

	Some sleep disturbance	Sleep disturbance						Severe sleep disturbance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Road traffic	22.4					8	11.8					3	4.3
	21.5-23.4						11.1-12.5						3.9-4.8
Rail traffic	5.9					1	3.0					0	1.2
	5.4-6.5						2.6-3.3						0.9-4.1
Air traffic	9.9					2	4.9					1	2.0
	9.2-10.6						4.4-5.5						1.7-2.3
Building and demolition activities	10.6						5.2						2.1
	9.9-11.4						4.7-5.8						1.7-2.4
Factories and businesses	5.1						2.5						1.0
	4.6-5.6						2.1-2.9						0.8-1.3
Recreational activities	11.9						5.6						2.1
	11.1-12.7						5.1-6.2						1.7-2.4
Neighbours	21.9						11.8						5.1
	20.9-23.0						11.1-12.6						4.6-5.7

Table 5-4 Noise annoyance from various sources of road traffic

	Some annoyance	Annoyance							Severe annoyance						
	2016	77	87	93	98	03	08	2016	77	87	93	98	03	08	2016
Passenger cars and taxis	33.1	14	19	18	16	18	12	18.2	7	8	9	9	6	4	7.2
	32.0-34.2							17.3-19.0							6.6-7.7
Delivery vans	29.8	11	17	13	9	13	9	15.7	5	7	6	3	4	3	6.3
	28.7-30.8							14.9-16.5							5.8-6.8
Lorries	32.0	22	28	20	20	22	13	18.2	15	14	11	9	10	6	8.6
	30.9-33.1							17.3-19.0							8.0-9.2
Buses	16.6	9	12	9	7	9	5	9.3	5	5	5	3	3	2	4.0
	15.8-17.4							8.6-9.9							3.6-4.5
Mopeds (helmet mandatory)	40.3	29	36	24	30	37	17	22.8	16	18	13	15	19	6	10.3
	39.1-41.5							21.8-23.7							9.6-11.0
(Cross) motorcycles/motorbikes	32.0	17	30	19	19	23	11	19.5	9	14	10	9	11	5	10.3
	30.9-33.1							18.6-20.4							9.6-11.0
Military vehicles	2.9	18	3	2	2	1	1	1.6	11	2	1	1	1	1	0.8
	2.5-3.3							1.3-1.9							0.6-1.0

Table 5-5 Sleep disturbance from various sources of road traffic

	Some sleep disturbance	Sleep disturbance						Severe sleep disturbance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Passenger cars and taxis	19.2 18.3-20.1			7	8	6	10.6 9.9-11.3			2	3	3	4.1 3.6-4.5
Delivery vans	13.1 12.3-13.9			3	3	3	7.1 6.6-7.7			1	2	2	2.8 2.5-3.2
Lorries	15.4 14.5-16.2			6	7	5	8.8 8.2-9.4			3	3	2	4.0 3.6-4.4
Buses	8.3 7.6-8.9			2	2	2	4.5 4.0-4.9			1	1	1	1.9 1.6-2.2
Mopeds (helmet mandatory)	24.3 23.3-25.3			10	14	9	13.9 13.1-14.7			4	7	3	6.2 5.7-6.8
(Cross) motorcycles/motorbikes	18.4 17.5-19.3			5	7	4	11.1 10.3-11.8			2	4	2	5.4 4.9-5.9
Military vehicles	1.8 1.5-2.2			0	0	0	1.0 0.8-1.2			2	0	0	0.5 0.3-0.7

Table 5-6 Noise annoyance from various sources of rail and air traffic

	Some annoyance	Annoyance							Severe annoyance						
	2016	77	87	93	98	03	08	2016	77	87	93	98	03	08	2016
Trains	7.8 7.1-8.4	1	3	3	4	4	1	3.6 3.2-4.0	0	1	1	1	1	1	1.3 1.0-1.6
Trams	2.2 1.8-2.5	1	2	1	1	1	1	1.3 1.0-1.5	1	1	0	0	1	0	0.5 0.3-0.6
Metro	1.5 1.2-1.8	0	1	0	0	0	0	1.3 1.0-1.5	0	0	0	0	0	0	0.2 0.1-0.4
Passenger and freight air-traffic	14.7 13.8-15.5	7	10	7	10	10	4	7.3 6.7-7.9	3	5	3	4	4	1	2.6 2.2-3.0
Sport and business aeroplanes	6.8 6.2-7.4	2	7	3	5	4	1	3.0 2.6-3.4	1	3	1	2	1	0	1.1 0.9-1.4
Advertising aeroplanes	4.0 3.5-4.5	2		4		4	1	2.0 1.7-2.3	1		2		2	0	0.8 0.6-1.0
Military aeroplanes (excluding helicopters)	8.0 7.4-8.7	19	25	16	14	12	3	4.2 3.7-4.6	12	15	9	7	6	1	1.8 1.5-2.1
Helicopters	20.6 19.6-21.6	5	15	8	9	11	5	10.0 9.3-10.7	2	6	3	3	3	1	4.0 3.5-4.4
Drones	1.9 1.6-2.2							1.0 0.7-1.2							0.4 0.3-0.6

Table 5-7 Sleep disturbance from various sources of rail and air traffic

	Some sleep disturbance	Sleep disturbance							Severe sleep disturbance						
	2016	77	87	93	98	03	08	2016	77	87	93	98	03	08	2016
Trains	4.9 4.3-5.4				2	2	1	2.6 2.2-3.0				1	1	0	1.0 0.7-1.2
Trams	1.4 1.1-1.7				0	0	0	0.8 0.6-1.0				0	0	0	0.3 0.2-0.4
Metro	0.9 0.7-1.2				0	0	0	0.5 0.3-0.6				0	0	0	0.2 0.1-0.3
Passenger and freight air-traffic	7.8 7.2-8.5				4	4	2	4.0 3.6-4.5				2	2	1	1.7 1.4-2.0
Sport and business aeroplanes	2.7 2.3-3.1				0	0	0	1.4 1.2-1.7				0	0	0	0.5 0.4-0.7
Advertising aeroplanes	1.7 1.4-2.0					0	0	0.9 0.6-1.1					0	0	0.3 0.2-0.4
Military aeroplanes (excluding helicopters)	3.7 3.2-4.1				2	1	1	1.9 1.6-2.2				1	1	0	0.9 0.7-1.2
Helicopters	11.4 10.6-12.2				1	1	1	6.0 5.5-6.6				0	0	0	2.7 2.3-3.1

Table 5-8 Noise annoyance from neighbours and outdoor sounds

	Some annoyance	Annoyance						Severe annoyance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Contact sounds from the neighbours (walking up and down stairs, opening and closing doors, walking on hard floor coverings)	34.2		11	17	17	14	19.1		6	7	7	5	8.5
	33.0-35.4						18.1-20.0						7.8-9.2
Radio, TV, computers, or (mobile) telephones	16.6		11	17	17	7	8.6		6	9	8	3	3.2
	15.6-17.5						7.9-9.3						2.8-3.6
Air-conditioning	2.9						1.6						0.8
	2.5-3.3						1.3-1.9						0.6-1.0
Outdoor activities	37.7			11	20	11	20.0			5	8	4	8.2
	36.5-38.9						19.0-20.9						7.5-8.9
Lift, gallery, stairwell	7.8			18	19	2	4.6			8	7	1	2.1
	7.1-8.5						4.1-5.1						1.8-2.5
Maintenance by municipality	25.7					5	11.8					1	4.5
	24.6-26.7						11.1-12.6						4.0-5.0

Table 5-9 Sleep disturbance from sound from neighbours and outdoor sounds

	Some sleep disturbance	Sleep disturbance						Severe sleep disturbance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Contact sounds from the neighbours (walking up and down stairs, opening and closing doors, walking on hard floor coverings)	18.9			8	9	7	11.0			3	4	3	5.0
	17.9-19.9						10.2-11.7						4.5-5.6
Radio, TV, computers, or (mobile) telephones	9.7			6	6	3	5.2			3	3	1	2.1
	8.9-10.4						4.6-5.7						1.8-2.5
Air-conditioning	2.0						1.3						0.6
	1.7-2.4						1.0-1.6						0.4-0.8
Outdoor activities	21.1					5	11.5					2	4.6
	20.0-22.1						10.7-12.2						4.1-5.1
Lift, gallery, stairwell	5.0					1	3.2					0	1.5
	4.5-5.6						2.7-3.6						1.2-1.8
Maintenance by municipality	10.7					1	5.7					0	2.4
	10.0-11.5						5.2-6.3						2.0-2.8

Table 5-10 Noise annoyance from industry and other activities

	Some annoyance	Annoyance							Severe annoyance						
	2016	77	87	93	98	03	08	2016	77	87	93	98	03	08	2016
Shopping street	5.7 5.1-6.2		2	1	1	1	1	2.7 2.3-3.1		1	1	0	1	0	0.9 0.7-1.1
Factories and businesses	10.8 10.1-11.6	4	4	4	2	4	2	4.8 4.3-5.3	2	2	2	1	2	1	1.9 1.6-2.2
Loading and unloading	10.6 9.9-11.4	2	5	4	3	6	3	5.2 4.7-5.7	1	3	2	1	2	1	2.1 1.8-2.5
Shunting yards	2.5 2.1-2.9		1	0	1	1	0	1.3 1.1-1.6		0	0	0	0	0	0.6 0.4-0.7
Building and demolition areas	25.3 24.3-26.4	2	7	3	4	8	4	13.0 12.2-13.7	1	3	2	1	3	2	4.5 4.0-5.0
Agricultural tractors	9.1 8.5-9.8	2	7	3	2	5	3	4.6 4.2-5.1	1	3	1	1	1	2	1.8 1.5-2.1
Military areas	1.3 1.0-1.6	1	2	0	1	1	0	0.8 0.6-1.0	0	1	0	0	0	0	0.3 0.2-0.5
Windmills, wind turbines	0.9 0.7-1.2					0	0	0.5 0.3-0.6					0	0	0.2 0.1-0.3
Low-frequency sound (a low, humming or buzzing sound from ventilators or air-conditioners for example)	8.1 7.4-8.8							4.5 4.0-5.0							2.2 1.9-2.6
Boats and (marine) shipping	2.1 1.8-2.5							1.2 0.9-1.4							0.4 0.3-0.6

Table 5-11 Sleep disturbance from industrial and other commercial activities

	Some sleep disturbance	Sleep disturbance							Severe sleep disturbance						
	2016	77	87	93	98	03	08	2016	77	87	93	98	03	08	2016
Shopping street	3.1				0	1	1	1.8				0	0	0	0.6
	2.7-3.6							1.4-2.1							0.4-0.8
Factories and businesses	5.1				1	2	1	2.5				0	1	1	1.0
	4.6-5.6							2.1-2.9							0.8-1.3
Loading and unloading	5.9				1	3	1	3.3				1	2	1	1.5
	5.3-6.5							2.9-3.8							1.2-1.7
Shunting yards	1.6				1	1	0	0.9				0	0	0	0.4
	1.3-1.9							0.7-1.1							0.2-0.5
Building and demolition areas	11				1	3	2	5.2				1	2	1	2.1
								4.7-5.8							1.7-2.4
Agricultural tractors	4.6				1	2	1	2.5				0	1	1	1.0
	4.1-5.1							2.2-2.9							0.8-1.2
Military areas	0.8				0	0	0	0.5				0	0	0	0.2
	0.5-1.0							0.3-0.7							0.1-0.4
Windmills, wind turbines	0.6					0	0	0.4					0	0	0.2
	0.4-0.8							0.2-0.6							0.1-0.4
Low-frequency sound*	5.5							3.4							1.9
	4.9-6.0							2.9-3.8							1.6-2.2
Boats and (marine) shipping	1.4						1	0.8						1	0.3
	1.1-1.7							0.5-1.0							0.2-0.5

*a low, humming or buzzing sound from ventilators or air-conditioners for example

Table 5-12 Noise annoyance from machines in building and demolition areas

	Some annoyance	Annoyance						Severe annoyance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Concrete transport trucks	4.6				2	1	2.4				0	0	1.1
	4.1-5.1						2.1-2.8						0.8-1.3
Mobile water pumps	2.3				1	1	1.3				0	0	0.6
	1.9-2.6						1.0-1.6						0.4-0.8
Motor-driven compressors	4.4				2	1	2.5				1	0	1.0
	3.9-4.9						2.1-2.9						0.8-1.3
Demolition hammers, pneumatic drills	10.9				6	3	5.9				4	2	2.4
	10.1-11.7						5.4-6.5						2.1-2.8
Excavators	8.1				3	2	4.2				1	1	1.6
	7.4-8.8						3.7-4.6						1.3-1.9
Shovel loader, loader	6.4				2	1	3.3				1	1	1.3
	5.8-7.0						2.9-3.7						1.0-1.5
Mobile cranes	5.5				2	1	3.0				0	0	1.3
	4.9-6.0						2.6-3.4						1.0-1.5
Hydraulic or electrical power units	3.3					1	1.8					0	0.9
	2.9-3.8						1.5-2.2						0.7-1.2
Pile drivers	8.0				5	4	4.5				3	2	2.2
	7.3-8.7						4.0-5.0						1.9-2.6
Backing-up warning signals from lorries	11.9					3	6.2					1	2.5
	11.2-12.7						5.6-6.7						2.2-2.9

Table 5-13 Noise annoyance from recreational activities

	Some annoyance	Annoyance							Severe annoyance						
	2016	77	87	93	98	03	08	2016	77	87	93	98	03	08	2016
Fairs, circuses, amusement parks	8.1	1	5	4	5	5	2	3.9	1	2	2	1	2	1	1.6
	7.5-8.8							3.5-4.4							1.3-1.9
Discos, bars, cafés and restaurants	7.5	2	4	4	4	5	3	4.1	1	2	2	2	2	1	1.8
	6.9-8.1							3.6-4.5							1.5-2.2
Sport facilities	6.3	1	2	1	2	3	2	2.7	1	1	1	1	1	0	0.9
	5.7-6.9							2.3-3.1							0.7-1.2
Mass outdoor events	12.5				3	6	4	6.3				2	3	2	3.0
	11.7-13.3							5.8-6.9							2.6-3.4

Table 5-14 Sleep disturbance from recreational activities

	Some sleep disturbance	Sleep disturbance							Severe sleep disturbance						
	2016	77	87	93	98	03	08	2016	77	87	93	98	03	08	2016
Fairs, circuses, amusement parks	5.3				3	4	1	2.8				1	2	0	1.3
	4.8-5.8							2.4-3.2							1.1-1.6
Discos, bars, cafés and restaurants	6.2				3	3	2	3.4				1	2	1	2.0
	5.6-6.8							3.0-3.8							1.7-2.3
Sport facilities	2.7				1	1	1	1.4				0	0	0	0.6
	2.3-3.1							1.1-1.7							0.4-0.8
Mass outdoor events	9.3				2	4	3	5.3				1	2	2	2.8
	8.6-10.0							4.8-5.8							2.4-3.1

5.1.1.2 Odour

Table 5-15 Annoyance from odours from various sources

	Some annoyance	Annoyance						Severe annoyance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Restaurants and snack bars	4.8		1	2	3	1	2.6		1	1	1	0	1.1
	4.2-5.3						2.2-2.9						0.8-1.3
Factories and (medium-sized) businesses	6.9		9	10	12	4	3.5		5	5	6	2	1.3
	6.3-7.5						3.1-3.9						1.1-1.6
Agricultural companies and the spreading of manure	13.2		11	10	10	4	6.0		5	4	4	1	2.5
	12.4-14.0						5.4-6.5						2.2-2.9
Road traffic	11.4		10	13	15	4	5.7		5	6	6	1	2.5
	10.7-12.1						5.2-6.2						2.2-2.9
Air traffic	3.2		1	2	1	0	1.9		0	1	1	0	0.8
	2.8-3.7						1.6-2.2						0.6-1.0
Neighbours' homes	15.8		8	8	11	5	8.8		4	4	5	3	4.2
	14.9-16.7						8.1-9.5						3.7-4.7
Sewer system	10.0		11	17	21	6	5.5		6	11	13	2	2.4
	9.2-10.7						5.0-6.1						2.1-2.8
Fireplaces and multifuel stoves	15.3					7	7.8					2	3.9
	14.5-16.2						7.1-8.4						3.4-4.3
BBQs and fire baskets	19.8						9.8						4.4
	18.8-20.7						9.1-10.5						3.9-4.9
Boats and (marine) shipping	1.4						0.8						0.4
	1.1-1.7						0.6-1.0						0.2-0.6

Table 5-16 Sleep disturbance from odours from various sources

	Some sleep disturbance	Sleep disturbance						Severe sleep disturbance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Restaurants and snack bars	1.4					0	0.8					0	0.4
	1.1-1.6						0.6-1.0						0.3-0.6
Factories and (medium-sized) businesses	2.1					1	1.1					1	0.5
	1.8-2.5						0.9-1.3						0.3-0.6
Agricultural companies and the spreading of manure	3.3					0	1.8					0	0.9
	2.9-3.7						1.5-2.1						0.6-1.1
Road traffic	3.9					1	2.2					0	1.0
	3.5-4.3						1.9-2.6						0.8-1.2
Aeroplanes	1.8					0	1.0					0	0.4
	1.4-2.1						0.8-1.3						0.3-0.6
Neighbours' homes	5.9					1	3.5					0	1.6
	5.3-6.5						3.0-3.9						1.3-1.9
Sewer system	2.9					1	1.7					1	0.8
	2.5-3.4						1.4-2.0						0.6-1.0
Fireplaces	5.9					1	3.5					1	1.8
	5.3-6.5						3.1-4.0						1.5-2.2
BBQs and fire baskets	6.9						4.0						1.9
	6.3-7.6						3.6-4.5						1.6-2.3
Boats and (marine) shipping	0.7						0.4						0.1
	0.5-0.9						0.3-0.6						0.0-0.2

5.1.1.3 Vibrations

Table 5-17 Annoyance from vibrations from various sources

	Some annoyance	Annoyance						Severe annoyance					
	2016	87	93	98	03	08	2016	87	93	98	03	08	2016
Road traffic	17.0		12	12	13	8	9.5		6	5	5	3	4.1
	16.2-17.9						8.9-10.1						3.6-4.5
Trains			1	2	1	1			1	1	1	0	
• Passenger trains	2.3						1.2						0.6
	2.0-2.7						0.9-1.4						0.4-0.8
• Freight trains	3.1						1.8						1.1
	2.7-3.5						1.5-2.2						0.8-1.3
Trams or metro	1.8			0	0	0	0.9			0	0	0	0.4
	1.5-2.1						0.7-1.1						0.3-0.6
Aeroplanes and/or helicopters	7.6		6	8	7	2	3.8		3	4	3	1	1.4
	7.0-8.2						3.3-4.2						1.1-1.7
Military air traffic	3.9					2	2.1					0	0.9
	3.5-4.4						1.7-2.4						0.7-1.2
Factories and businesses	1.9		1	1	1	0	1.1		1	0	1	0	0.5
	1.5-2.2						0.8-1.3						0.3-0.7
Building and demolition activities	8.2				7	3	4.6				3	1	2.0
	7.6-8.9						4.1-5.1						1.7-2.4
Windmills, wind turbines	0.6					0	0.3					0	0.2
	0.4-0.8						0.2-0.4						0.1-0.3

There are no sleep disturbance data available for vibrations. (these were not on the questionnaire due to the low prevalence expected)

5.1.2 *Concern*

Table 5-18 *Concern with regard to one's own safety as a result of living in or near one of the following situations*

Living:	Concerned				Very concerned			
	1998	2003	2008	2016	1998	2003	2008	2016
In a busy street	24	27	16	12.2 11.4-13.0	31	34	23	10.2 9.5-10.9
In a polder (reclaimed land) below sea level or river level.	15	13	12	6.0 5.4-6.5	7	6	14	4.1 3.6-4.6
In an agricultural or horticultural area	8	7	11	3.9 3.5-4.4	3	5	7	2.2 1.8-2.5
In the vicinity of intensive livestock farming				4.3 3.8-4.8				3.5 3.0-3.9
Below the route used by aeroplanes to approach a big airport	22	23	9	7.1 6.5-7.7	23	24	24	8.3 7.6-9.0
Adjacent to a railway line	18	8	8	4.8 4.3-5.4	8	15	20	5.6 5.0-6.2
In the vicinity of a big airport	21	24	8	5.2 4.7-5.8	18	19	24	7.4 6.8-8.0
Adjacent to a route for hazardous substances	36	26	7	4.6 4.1-5.1	32	33	30	9.6 8.8-10.3
Near a high-voltage line	22	18	10	3.8 3.4-4.3	11	15	21	7.0 6.4-7.7
On or in the vicinity of contaminated soil			5	3.4 2.9-3.8			36	9.4 8.7-10.1
In the vicinity of a high-risk business enterprise		38	6	4.6 4.1-5.1		23	31	10.2 9.4-10.9
In the vicinity of a mobile GSM/UMTS telephone mast		10	13	6.5 5.9-7.1		10	19	7.2 6.6-7.8
Lightning striking your home				11.0 10.3-11.8				9.0 8.2-9.7

Table 5-19 Concern over one's own health due to

	Concerned		Very concerned	
	2008	2016	2008	2016
The air-quality in your home	14	12.7	15	9.8
		11.9-13.5		9.1-10.5
The air quality around your home	19	16.0	19	14.8
		15.1-16.9		13.9-15.8
The soil quality around your home		10.5		6.5
		9.8-11.3		5.9-7.1
The drinking water quality in your home		7.0		7.1
		6.4-7.6		6.5-7.8
The water quality around your home		9.0		6.5
		8.3-9.7		5.9-7.1
The sound around your home		12.5		9.9
		11.7-13.3		9.2-10.6

5.1.3   *Satisfaction with the living environment*

Table 5-20 Satisfaction with the living environment

	2003	2008	2016
Very satisfied (8-10)	61	70	69.1
			68.0-70.2
Fairly satisfied (6-7)	35	27	20.3
			19.4-21.3
Dissatisfied (0-5)	4	3	10.6
			9.5-11.7

5.1.4 State of the neighbourhood

Table 5 21 Opinion on the state of one's residential neighbourhood over the past year and the coming year

	Improved	Deteriorated	Remained the same
In the *past* year			
• the neighbourhood has	15.8	13.9	70.3
	14.9-16.8	13.0-14.7	69.1-71.4
• Sound of road traffic in the neighbourhood	3.2	25.5	71.3
	2.7-3.6	24.5-26.6	70.2-72.4
In the *coming* year			
• the neighbourhood will	14.8	11.2	74.0
	13.9-15.7	10.4-12.0	72.9-75.1
• sound of road traffic in the neighbourhood	3.4	24.8	71.8
	3.0-3.9	23.8-25.8	70.7-72.8

5.2   Regions

Statistics Netherlands divides the country into regions: North, East, South, and West. The regions consist of the following provinces:

- North: Groningen, Friesland and Drenthe;
- East: Overijssel, Flevoland and Gelderland;
- West: North Holland, South Holland, Zeeland and Utrecht;
- South: North Brabant and Limburg.

5.2.1   Annoyance and sleep disturbance
5.2.1.1   Sound

Table 5-21 Roads with maximum speed limits

Roads on which you may not go faster than:	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
30 km/h	2.4	7.1	14.9	4.4	11.5	21.7	4.1	11.6	22.1	4.5	11.4	22.5
	1.2-3.6	5.2-9.0	12.2-17.7	3.2-5.5	9.9-13.2	19.5-23.9	3.5-4.8	10.5-12.7	20.7-23.6	3.5-5.6	9.8-13.0	20.4-24.7
50 km/h	3.4	9.3	18.5	4.3	11.5	21.5	6.5	15.3	27.3	5.9	14.1	24.0
	2.0-4.7	7.2-11.4	15.6-21.5	3.4-5.3	10.0-13.0	19.4-23.6	5.7-7.2	14.1-16.4	25.8-28.8	4.9-6.9	12.5-15.7	21.9-26.1
80 km/h	2.3	5.2	9.4	2.4	5.3	10.8	2.5	5.5	9.8	2.5	5.7	10.1
	1.3-3.3	3.7-6.6	7.2-11.5	1.6-3.2	4.2-6.4	9.2-12.4	2.0-3.0	4.7-6.2	8.8-10.8	1.8-3.2	4.6-6.8	8.6-11.6
120 km/h	1.5	3.8	8.7	1.8	4.0	8.1	2.8	5.8	9.9	2.6	5.7	10.0
	0.6-2.4	2.4-5.1	6.6-10.8	1.1-2.4	3.0-4.9	6.7-9.6	2.2-3.3	5.0-6.6	8.8-10.9	1.8-3.3	4.6-6.8	8.5-11.5

Table 5-22 General annoyance main groups

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Road traffic	6.1	17.7	37.6	8.1	24.6	48.2	9.8	27.5	49.8	10.9	27.1	48.6
	4.4-7.8	15.0-20.4	33.9-41.3	6.7-9.4	22.5-26.7	45.6-50.8	8.8-10.7	26.1-28.9	48.1-51.6	9.4-12.3	25.0-29.3	46.1-51.2
Rail traffic	1.1	2.9	6.7	2.3	6.3	14.7	2.3	8.4	16.2	2.3	5.9	11.2
	0.4-1.8	1.7-4.1	4.8-8.6	1.5-3.1	5.1-7.5	12.8-16.6	1.8-2.8	7.4-9.3	14.9-17.5	1.6-3.0	4.7-7.0	9.6-12.7
Air traffic	2.4	6.0	14.1	1.8	6.8	16.3	6.3	16.1	32.3	4.7	12.8	26.7
	1.3-3.5	4.3-7.7	11.5-16.8	1.1-2.5	5.6-8.1	14.3-18.2	5.5-7.2	14.9-17.4	30.7-34.0	3.6-5.7	11.2-14.4	24.4-28.9
Neighbours	8.1	18.2	32.8	7.6	20.3	37.5	9.3	22.1	39.3	7.2	16.7	31.7
	5.9-10.3	15.3-21.2	29.1-36.5	6.2-9.0	18.2-22.3	34.9-40.1	8.2-10.3	20.6-23.5	37.6-41.0	5.9-8.6	14.9-18.6	29.3-34.2
Factories	0.8	3.0	7.9	2.1	5.1	10.0	2.0	5.1	11.7	2.0	4.7	11.1
	0.2-1.4	1.8-4.3	5.9-9.9	1.3-2.8	4.0-6.1	8.4-11.6	1.5-2.4	4.4-5.8	10.5-12.8	1.3-2.7	3.7-5.7	9.5-12.6
Construction	2.9	7.2	15.8	3.2	10.6	20.9	5.9	16.3	30.8	3.5	10.7	22.1
	1.6-4.1	5.3-9.1	13.0-18.6	2.3-4.1	9.0-12.2	18.7-23.1	5.0-6.7	15.0-17.5	29.1-32.4	2.6-4.4	9.1-12.2	19.9-24.2
Recreation	1.3	5.1	13.7	2.8	8.1	18.3	4.0	11.6	24.3	3.0	8.9	20.7
	0.4-2.1	3.4-6.7	11.1-16.4	1.9-3.6	6.8-9.5	16.3-20.4	3.3-4.7	10.5-12.7	22.8-25.8	2.1-3.9	7.5-10.3	18.6-22.8

Table 5-23 General sleep disturbance main groups

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance
Road traffic	2.3	7.8	17.1	3.9	10.6	21.2	4.9	12.6	23.5	4.3	13.0	23.8
	1.3-3.3	5.9-9.7	14.3-19.9	3.0-4.9	9.1-12.1	19.1-23.3	4.2-5.6	11.5-13.6	22.1-24.9	3.4-5.2	11.4-14.5	21.7-26.0
Rail traffic	0.7	1.2	2.2	1.3	2.7	6.1	1.2	3.3	6.9	1.3	3.1	5.5
	0.1-1.4	0.5-1.9	1.2-3.3	0.7-1.9	1.9-3.6	4.8-7.4	0.8-1.5	2.7-3.9	6.0-7.7	0.7-1.9	2.3-4.0	4.4-6.6
Air traffic	0.5	1.8	4.3	0.5	2.1	5.1	3.0	7.1	13.6	2.0	4.5	9.2
	0.0-1.0	0.9-2.7	2.8-5.8	0.1-0.9	1.4-2.8	3.9-6.2	2.4-3.6	6.2-8.0	12.4-14.8	1.2-2.8	3.5-5.5	7.7-10.6
Neighbours	5.0	10.5	18.6	4.4	10.2	20.1	6.2	14.1	25.1	3.6	9.0	18.4
	3.2-6.8	8.1-12.8	15.5-21.8	3.3-5.5	8.6-11.8	18.0-22.3	5.4-7.1	12.9-15.4	23.5-26.6	2.6-4.6	7.6-10.4	16.3-20.4
Factories	0.6	1.7	3.6	0.9	2.5	4.6	1.2	2.8	5.7	0.8	2.0	5.0
	0.1-1.1	0.8-2.6	2.3-5.0	0.4-1.4	1.7-3.3	3.5-5.7	0.9-1.6	2.3-3.4	4.9-6.5	0.4-1.2	1.4-2.7	3.9-6.0
Construction	1.1	3.5	6.8	1.2	3.6	8.9	3.0	7.1	13.5	1.3	3.6	7.7
	0.3-2.0	2.1-4.9	4.9-8.8	0.6-1.8	2.6-4.5	7.3-10.4	2.4-3.6	6.2-7.9	12.3-14.7	0.7-1.9	2.7-4.6	6.3-9.1
Recreation	0.9	3.7	8.3	1.7	5.4	11.3	2.6	6.3	13.0	2.0	5.1	11.6
	0.2-1.6	2.4-5.1	6.2-10.5	1.1-2.4	4.3-6.5	9.6-13.0	2.0-3.1	5.5-7.2	11.8-14.2	1.2-2.7	4.0-6.2	9.9-13.2

Table 5-24 Annoyance sources road traffic

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Passenger cars and taxis	3.8	12.0	25.6	7.0	17.0	32.2	7.7	19.3	34.9	7.9	19.7	33.4
	2.5-5.1	9.8-14.3	22.3-29.0	5.7-8.2	15.2-18.9	29.8-34.6	6.8-8.5	18.1-20.6	33.3-36.6	6.7-9.2	17.8-21.6	31.0-35.7
Delivery vans	3.0	10.3	22.3	6.2	14.5	28.2	6.9	17.0	32.5	6.7	16.5	28.9
	1.9-4.1	8.2-12.5	19.2-25.4	5.0-7.4	12.7-16.2	25.8-30.5	6.1-7.6	15.8-18.2	30.9-34.1	5.6-7.9	14.8-18.3	26.6-31.2
Lorries	6.3	14.1	27.9	7.9	16.9	31.1	9.1	18.9	32.7	9.5	19.7	33.2
	4.6-8.0	11.7-16.5	24.6-31.3	6.6-9.2	15.1-18.7	28.7-33.5	8.2-10.0	17.6-20.1	31.1-34.3	8.2-10.8	17.8-21.5	30.8-35.5
Buses	2.2	6.6	12.9	3.5	8.6	16.2	4.4	9.6	17.0	4.6	10.3	17.9
	1.3-3.1	4.9-8.3	10.5-15.3	2.6-4.4	7.3-10.0	14.3-18.0	3.8-5.0	8.7-10.5	15.7-18.2	3.7-5.5	8.9-11.6	16.0-19.7
Mopeds	6.6	16.0	30.3	8.5	20.8	37.1	12.1	25.8	44.7	9.6	21.2	38.3
	4.8-8.5	13.3-18.7	26.8-33.9	7.1-10.0	18.8-22.9	34.6-39.7	11.0-13.2	24.4-27.3	43.0-46.5	8.1-11.0	19.2-23.1	35.8-40.7
Motorcycles/ motorbikes	5.4	13.3	25.2	8.6	17.5	29.2	11.7	22.3	36.0	9.2	18.2	29.1
	3.8-7.0	10.8-15.8	21.9-28.5	7.1-10.0	15.5-19.4	26.8-31.6	10.6-12.7	20.9-23.7	34.3-37.7	7.9-10.6	16.3-20.0	26.8-31.4
Military vehicles	0.2	0.8	1.8	1.1	1.7	2.9	0.6	1.3	2.2	1.2	2.4	4.8
	0.0-0.4	0.2-1.4	0.7-2.8	0.5-1.6	1.0-2.3	2.0-3.8	0.4-0.9	0.9-1.7	1.7-2.7	0.7-1.7	1.7-3.1	3.7-5.8

Table 5-25 Sleep disturbance sources road traffic

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe sleep distur-bance	sleep distur-bance	some sleep disturbance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep disturbance
Passenger cars and taxis	1.9	6.4	13.5	3.7	9.6	17.9	4.3	11.3	20.2	4.9	12.0	20.9
	1.0-2.8	4.7-8.1	11.0-16.1	2.7-4.6	8.2-11.1	15.9-19.9	3.7-5.0	10.3-12.3	18.9-21.6	3.9-5.9	10.4-13.6	18.9-22.9
Delivery vans	1.7	4.5	9.5	2.4	6.5	11.6	3.2	7.8	13.8	2.9	7.5	14.5
	0.8-2.5	3.2-5.9	7.4-11.7	1.6-3.2	5.2-7.7	10.0-13.3	2.7-3.8	7.0-8.7	12.7-15.0	2.2-3.7	6.3-8.7	12.7-16.2
Lorries	3.7	8.2	14.0	3.6	7.8	14.5	4.1	8.9	15.2	4.5	9.9	17.2
	2.4-4.9	6.3-10.1	11.4-16.6	2.7-4.5	6.4-9.1	12.7-16.3	3.5-4.7	8.0-9.8	14.0-16.4	3.6-5.4	8.6-11.3	15.4-19.1
Buses	1.0	3.0	5.9	1.8	4.1	6.9	2.0	4.6	8.8	2.5	5.1	9.4
	0.4-1.5	1.9-4.2	4.3-7.6	1.1-2.4	3.1-5.1	5.6-8.2	1.6-2.4	4.0-5.2	7.9-9.7	1.8-3.2	4.2-6.1	8.0-10.8
Mopeds	3.1	9.5	17.7	5.1	12.0	22.4	7.5	16.2	27.5	6.0	12.8	22.2
	1.9-4.4	7.3-11.6	14.8-20.6	4.0-6.3	10.3-13.6	20.2-24.6	6.6-8.3	15.0-17.4	26.0-29.1	4.8-7.3	11.1-14.4	20.1-24.4
Motorcycles/motorbikes	2.7	6.9	12.6	4.9	9.6	16.0	6.6	13.1	21.2	4.6	10.0	17.2
	1.5-3.8	5.0-8.8	10.0-15.1	3.7-6.0	8.0-11.1	14.0-17.9	5.8-7.4	12.0-14.2	19.8-22.7	3.6-5.6	8.6-11.4	15.3-19.2
Military vehicles	0.2	0.8	2.1	0.8	1.2	1.8	0.4	0.8	1.3	0.7	1.4	2.9
	0.0-0.6	0.1-1.4	1.0-3.3	0.3-1.3	0.6-1.8	1.1-2.5	0.2-0.6	0.5-1.1	0.9-1.7	0.3-1.1	0.8-2.0	2.0-3.7

Table 5-26 Annoyance sources rail and air traffic

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Trains	1.0	2.0	3.8	1.9	4.7	10.1	0.9	3.3	7.8	1.7	4.0	7.5
	0.3-1.7	1.0-3.0	2.4-5.2	1.2-2.7	3.6-5.8	8.5-11.7	0.6-1.3	2.7-3.9	6.8-8.7	1.1-2.4	3.1-5.0	6.2-8.8
Trams	0.0	0.0	0.0	0.1	0.2	0.4	0.9	2.5	4.2	0.1	0.2	0.4
	0.0-0.0	0.0-0.1	0.0-0.1	0.0-0.4	0.0-0.4	0.0-0.8	0.6-1.2	2.0-3.0	3.6-4.9	0.0-0.3	0.0-0.5	0.0-0.7
Metro	0.0	0.0	0.2	0.3	0.3	0.6	0.3	1.1	2.5	0.2	0.4	0.7
	0.0-0.0	0.0-0.0	0.0-0.5	0.0-0.6	0.0-0.6	0.1-1.0	0.1-0.5	0.7-1.4	1.9-3.1	0.0-0.5	0.1-0.7	0.3-1.1
Passenger planes	0.2	1.0	3.3	0.9	2.9	6.9	4.3	11.4	22.2	1.7	5.4	11.1
	0.0-0.5	0.4-1.7	2.0-4.7	0.4-1.3	2.0-3.7	5.5-8.2	3.6-5.0	10.3-12.4	20.7-23.6	1.1-2.4	4.3-6.5	9.5-12.6
Sport and business aeroplanes	0.2	1.0	3.2	1.0	2.6	5.9	1.3	3.7	7.8	1.2	3.0	6.9
	0.0-0.5	0.4-1.6	1.9-4.5	0.5-1.4	1.8-3.3	4.7-7.1	0.9-1.7	3.1-4.3	6.9-8.8	0.7-1.8	2.2-3.9	5.6-8.2
Advertising aeroplanes	0.1	0.7	2.0	0.7	2.0	3.9	0.9	2.2	4.5	0.9	2.0	4.1
	0.0-0.4	0.2-1.3	0.9-3.0	0.3-1.2	1.2-2.7	2.9-4.9	0.6-1.3	1.7-2.8	3.7-5.2	0.4-1.3	1.3-2.8	3.1-5.1
Military aeroplanes	1.3	4.6	9.8	2.1	4.1	8.1	0.8	1.9	4.2	3.7	8.8	15.6
	0.6-2.1	3.2-6.1	7.5-12.0	1.3-2.8	3.1-5.2	6.6-9.5	0.5-1.2	1.5-2.4	3.5-4.9	2.7-4.6	7.4-10.2	13.7-17.4
Helicopters	1.5	5.8	13.0	3.2	7.4	16.1	4.9	12.3	25.1	3.8	9.7	18.8
	0.7-2.3	4.1-7.4	10.4-15.5	2.3-4.1	6.1-8.7	14.1-18.0	4.1-5.7	11.2-13.4	23.5-26.6	2.8-4.8	8.2-11.1	16.8-20.8
Drones	0.0	0.9	1.8	0.4	0.7	2.0	0.5	1.0	2.0	0.5	1.0	1.6
	0.0-0.0	0.2-1.6	0.7-2.8	0.0-0.8	0.3-1.2	1.2-2.8	0.2-0.8	0.7-1.4	1.5-2.5	0.1-0.9	0.5-1.5	0.9-2.2

Table 5-27 Sleep disturbance sources rail and air traffic

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe sleep distur-bance	Sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	Sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	Sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	Sleep distur-bance	some sleep distur-bance
Trains	0.4	1.0	1.9	1.2	3.6	6.7	0.7	2.2	4.6	1.7	3.3	5.1
	0.0-0.8	0.3-1.6	0.9-2.9	0.6-1.9	2.7-4.6	5.4-8.1	0.4-0.9	1.7-2.7	3.8-5.3	1.1-2.4	2.4-4.1	4.0-6.2
Trams	0.0	0.0	0.0	0.1	0.2	0.5	0.6	1.5	2.6	0.0	0.3	0.4
	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.4	0.0-0.5	0.0-0.9	0.3-0.8	1.1-1.9	2.1-3.1	0.0-0.1	0.0-0.6	0.0-0.7
Metro	0.0	0.0	0.0	0.1	0.2	0.5	0.3	0.8	1.5	0.1	0.2	0.5
	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.4	0.0-0.5	0.0-0.9	0.1-0.5	0.5-1.2	1.1-2.0	0.0-0.1	0.0-0.3	0.2-0.9
Passenger planes	0.1	0.5	1.1	0.4	1.3	3.5	2.9	6.4	12.1	1.2	3.1	5.9
	0.0-0.3	0.0-1.0	0.4-1.8	0.1-0.7	0.7-1.9	2.5-4.4	2.3-3.5	5.6-7.2	10.9-13.2	0.7-1.8	2.2-3.9	4.7-7.0
Sport and business aeroplanes	0.0	0.1	0.8	0.2	0.7	1.9	0.8	2.0	3.4	0.6	1.6	2.9
	0.0-0.0	0.0-0.3	0.2-1.4	0.0-0.5	0.3-1.2	1.1-2.6	0.4-1.1	1.5-2.4	2.8-4.0	0.2-1.0	1.0-2.2	2.1-3.8
Advertising aeroplanes	0.0	0.1	0.4	0.2	0.6	1.6	0.4	1.1	1.9	0.2	0.9	2.0
	0.0-0.0	0.0-0.3	0.0-0.9	0.0-0.5	0.2-1.0	0.9-2.3	0.2-0.6	0.8-1.5	1.4-2.4	0.0-0.5	0.4-1.3	1.3-2.7
Military aeroplanes	0.5	1.4	3.3	1.1	1.8	3.7	0.4	1.1	2.3	2.0	4.0	6.9
	0.0-0.9	0.6-2.2	2.0-4.7	0.5-1.7	1.1-2.5	2.7-4.8	0.2-0.7	0.8-1.5	1.7-2.8	1.3-2.7	3.0-4.9	5.6-8.2
Helicopters	0.7	2.9	6.8	1.6	3.9	7.6	4.0	8.1	15.1	2.1	5.1	9.1
	0.1-1.3	1.7-4.1	4.8-8.8	0.9-2.2	2.9-4.9	6.2-9.1	3.3-4.7	7.1-9.0	13.8-16.3	1.4-2.8	4.0-6.2	7.6-10.6

Table 5-28 Annoyance neighbours' sounds and outdoor sounds

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Contact sounds from neighbours	6.2	13.0	24.6	7.1	16.5	31.4	10.1	22.8	39.6	7.4	16.2	29.6
	4.2-8.3	10.3-15.7	21.1-28.1	5.7-8.5	14.6-18.4	28.9-33.9	9.1-11.2	21.3-24.2	37.9-41.4	6.0-8.7	14.3-18.0	27.2-32.0
Radio, TV, PC, or (mobile) telephones	2.1	6.3	10.6	2.9	7.1	15.1	3.8	10.6	19.8	2.7	6.7	13.8
	0.9-3.3	4.3-8.3	8.0-13.1	2.0-3.8	5.8-8.5	13.2-17.1	3.1-4.4	9.5-11.7	18.3-21.2	1.9-3.5	5.4-8.0	11.9-15.6
Air-conditioning	0.0	0.6	0.8	1.2	1.7	3.0	0.9	1.9	3.6	0.6	1.3	2.3
	0.0-0.1	0.0-1.2	0.1-1.6	0.5-1.8	1.0-2.5	2.0-3.9	0.6-1.2	1.5-2.4	2.9-4.2	0.2-1.0	0.7-1.8	1.5-3.1
Outdoor activities	4.9	14.7	33.4	7.5	18.9	37.2	9.3	22.4	40.9	7.9	18.1	33.3
	3.3-6.5	12.1-17.3	29.7-37.0	6.1-8.9	17.0-20.9	34.6-39.8	8.3-10.4	21.0-23.8	39.2-42.7	6.5-9.3	16.2-20.1	30.8-35.7
Lift, gallery, stairwell	1.4	2.4	3.9	1.3	2.6	4.8	3.2	6.9	11.4	0.9	2.5	4.5
	0.4-2.3	1.1-3.6	2.4-5.5	0.6-2.0	1.7-3.5	3.5-6.0	2.6-3.9	6.0-7.8	10.2-12.6	0.5-1.4	1.7-3.2	3.4-5.6
Maintenance by municipality	2.9	7.6	18.4	4.0	10.6	24.8	5.2	13.8	28.8	4.2	10.6	23.0
	1.7-4.2	5.6-9.6	15.4-21.4	2.9-5.0	9.0-12.2	22.5-27.1	4.4-6.0	12.7-15.0	27.2-30.4	3.1-5.2	9.1-12.2	20.8-25.2

Table 5-29 Sleep disturbance neighbours' sound and outdoor sound

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep disturbance
Contact sounds from neighbours	4.3	8.5	15.1	4.2	8.6	15.9	5.9	13.4	22.6	4.3	9.1	15.4
	2.6-6.0	6.2-10.8	12.2-18.1	3.1-5.3	7.1-10.0	13.9-17.9	5.1-6.7	12.2-14.6	21.1-24.1	3.2-5.3	7.7-10.6	13.5-17.3
Radio, TV, PC, or (mobile) telephones	1.5	4.7	7.6	1.6	4.1	8.4	2.7	6.2	11.7	1.8	4.2	7.5
	0.5-2.5	2.9-6.4	5.4-9.8	0.9-2.2	3.0-5.2	6.9-10.0	2.1-3.3	5.4-7.1	10.5-12.8	1.1-2.5	3.2-5.2	6.1-8.8
Air-conditioning	0.2	0.6	0.9	0.8	1.2	2.2	0.7	1.6	2.4	0.3	1.2	1.6
	0.0-0.6	0.0-1.3	0.2-1.7	0.3-1.3	0.6-1.8	1.3-3.0	0.4-1.0	1.1-2.0	1.9-2.9	0.1-0.5	0.7-1.7	1.0-2.2
Outdoor activities	2.9	9.3	17.1	3.9	9.5	19.7	5.8	13.7	23.8	3.5	9.5	18.2
	1.6-4.2	7.1-11.5	14.1-20.1	2.9-4.9	8.0-11.1	17.5-21.8	5.0-6.6	12.5-14.9	22.3-25.3	2.5-4.5	8.0-11.0	16.2-20.2
Lift, gallery, stairwell	1.1	2.0	3.0	1.1	1.9	2.9	2.2	4.6	7.4	0.6	1.7	2.7
	0.2-2.0	0.8-3.1	1.6-4.4	0.5-1.7	1.2-2.7	2.0-3.9	1.7-2.7	3.9-5.4	6.4-8.4	0.3-1.0	1.0-2.3	1.9-3.6
Maintenance by municipality	1.6	3.9	6.9	1.9	4.9	9.5	3.0	6.8	12.7	1.8	5.0	9.4
	0.6-2.6	2.4-5.3	4.9-8.9	1.2-2.6	3.8-6.0	7.9-11.1	2.4-3.7	5.9-7.7	11.5-13.9	1.1-2.5	3.9-6.1	7.9-10.9

Table 5-30 Annoyance industrial and commercial activities

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Shopping street	0.4	1.3	2.7	0.7	1.8	4.3	1.1	3.4	6.8	1.0	2.8	5.9
	0.0-0.9	0.5-2.1	1.4-4.0	0.3-1.2	1.2-2.5	3.2-5.3	0.7-1.4	2.8-4.0	5.9-7.7	0.6-1.5	2.0-3.6	4.7-7.1
Loading and unloading	1.1	2.8	5.8	1.7	4.2	9.5	2.4	6.3	12.7	2.5	5.0	9.3
	0.3-1.8	1.6-3.9	4.0-7.6	1.0-2.3	3.2-5.2	8.0-11.0	1.9-2.9	5.5-7.1	11.6-13.9	1.7-3.4	3.9-6.1	7.8-10.8
Shunting yards	0.8	1.5	2.5	0.6	1.3	2.7	0.5	1.4	2.6	0.5	1.2	1.9
	0.1-1.6	0.6-2.4	1.3-3.7	0.1-1.0	0.7-1.9	1.8-3.5	0.3-0.8	1.0-1.8	2.1-3.2	0.1-0.9	0.7-1.7	1.2-2.6
Agricultural tractors	3.6	8.7	14.3	1.8	5.4	10.8	1.3	3.1	6.0	2.1	5.5	11.9
	2.3-4.9	6.6-10.7	11.7-17.0	1.1-2.4	4.3-6.5	9.2-12.4	0.9-1.6	2.5-3.6	5.2-6.8	1.4-2.8	4.5-6.6	10.3-13.5
Military areas	0.8	1.3	2.0	0.6	1.5	2.5	0.2	0.4	0.7	0.1	0.6	1.1
	0.1-1.5	0.4-2.2	0.8-3.1	0.2-1.1	0.9-2.2	1.7-3.4	0.0-0.3	0.2-0.7	0.4-0.9	0.0-0.3	0.2-1.0	0.6-1.7
Windmills, wind turbines	0.7	0.9	1.6	0.2	0.2	0.3	0.2	0.5	1.1	0.1	0.4	0.8
	0.0-1.3	0.2-1.6	0.6-2.7	0.0-0.4	0.0-0.5	0.0-0.7	0.0-0.3	0.3-0.8	0.7-1.5	0.0-0.2	0.1-0.6	0.3-1.2
Low-frequency sound*	1.3	2.8	5.5	2.5	4.1	7.3	2.6	5.6	9.6	1.4	3.3	6.7
	0.4-2.1	1.6-3.9	3.8-7.3	1.7-3.4	3.1-5.1	5.9-8.7	2.1-3.2	4.8-6.4	8.6-10.7	0.9-2.0	2.4-4.1	5.4-7.9
Boats and shipping	0.6	1.1	1.5	0.2	0.5	0.8	0.6	1.8	3.4	0.2	0.5	0.8
	0.0-1.3	0.3-1.9	0.5-2.4	0.0-0.5	0.1-0.9	0.4-1.3	0.3-0.8	1.3-2.2	2.7-4.0	0.0-0.4	0.1-0.8	0.4-1.3

* a low, humming or buzzing sound from ventilators or air-conditioners for example

Table 5-31 Sleep disturbance industrial and commercial activities

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe sleep disturbance	sleep disturbance	some sleep disturbance	severe sleep disturbance	sleep disturbance	some sleep disturbance	severe sleep disturbance	sleep disturbance	some sleep disturbance	severe sleep disturbance	sleep disturbance	some sleep disturbance
Shopping street	0.0	0.3	1.1	0.7	1.2	2.2	0.9	2.4	4.0	0.3	1.7	3.0
	0.0-0.0	0.0-0.7	0.3-1.9	0.2-1.1	0.6-1.7	1.4-3.0	0.6-1.2	1.8-2.9	3.3-4.7	0.1-0.5	1.0-2.3	2.1-3.9
Loading and unloading	0.3	1.4	3.4	0.9	2.4	5.0	2.0	4.3	7.2	1.2	2.9	5.2
	0.0-0.7	0.5-2.2	2.0-4.7	0.4-1.4	1.6-3.2	3.9-6.2	1.5-2.5	3.6-5.0	6.3-8.1	0.7-1.8	2.0-3.8	4.0-6.3
Shunting yards	0.4	0.7	1.1	0.4	0.7	1.3	0.3	0.9	1.8	0.5	1.0	1.6
	0.0-0.9	0.1-1.4	0.3-1.9	0.1-0.8	0.3-1.1	0.8-1.9	0.1-0.5	0.6-1.3	1.3-2.2	0.1-0.8	0.5-1.5	1.0-2.2
Agricultural tractors	2.1	4.2	7.9	1.1	3.0	5.4	0.7	1.8	2.9	1.2	3.1	5.9
	1.0-3.1	2.7-5.6	5.9-9.9	0.6-1.6	2.2-3.8	4.3-6.6	0.4-1.0	1.3-2.2	2.4-3.5	0.6-1.7	2.3-3.9	4.7-7.0
Military areas	0.4	0.4	0.7	0.4	0.8	1.3	0.2	0.5	0.7	0.0	0.4	0.5
	0.0-0.9	0.0-1.0	0.0-1.3	0.0-0.8	0.3-1.4	0.6-2.0	0.0-0.4	0.2-0.7	0.4-1.0	0.0-0.1	0.1-0.7	0.1-0.9
Windmills, wind turbines	0.4	0.6	0.8	0.2	0.2	0.4	0.3	0.6	0.9	0.1	0.1	0.2
	0.0-0.9	0.0-1.2	0.1-1.4	0.0-0.4	0.0-0.5	0.0-0.8	0.1-0.5	0.3-0.9	0.5-1.2	0.0-0.2	0.0-0.3	0.0-0.4
Low-frequency sound	0.9	1.3	3.3	1.9	2.9	4.9	2.3	4.1	6.5	1.4	3.1	4.7
	0.2-1.6	0.5-2.1	2.0-4.7	1.2-2.6	2.0-3.8	3.8-6.1	1.8-2.9	3.4-4.8	5.6-7.3	0.8-2.0	2.2-3.9	3.7-5.8
Boats and shipping	0.4	0.6	0.8	0.2	0.5	0.7	0.4	1.1	2.2	0.2	0.3	0.5
	0.0-0.9	0.0-1.3	0.1-1.5	0.0-0.5	0.2-0.9	0.3-1.2	0.2-0.6	0.7-1.4	1.7-2.7	0.0-0.5	0.0-0.6	0.1-0.9

* a low, humming or buzzing sound from ventilators or air-conditioners for example

Table 5-32 Annoyance machines

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Concrete transport trucks	0.4	1.9	3.2	1.0	1.8	3.8	1.2	2.9	5.4	1.1	2.3	4.2
	0.0-0.9	0.9-2.9	1.9-4.5	0.5-1.6	1.1-2.4	2.8-4.8	0.8-1.5	2.3-3.5	4.6-6.2	0.6-1.6	1.6-3.0	3.2-5.1
Mobile water pumps	0.0	0.4	1.4	0.7	1.0	1.9	0.7	1.8	2.8	0.4	0.9	1.8
	0.0-0.1	0.0-0.9	0.4-2.3	0.2-1.2	0.5-1.6	1.2-2.6	0.4-1.0	1.3-2.2	2.2-3.4	0.1-0.7	0.4-1.4	1.1-2.5
Motor-driven compressors	0.7	1.7	3.4	0.6	1.6	3.6	1.3	3.3	5.3	1.0	1.9	3.5
	0.0-1.4	0.7-2.8	1.9-4.9	0.2-1.1	0.9-2.2	2.5-4.6	0.9-1.7	2.7-4.0	4.5-6.1	0.5-1.5	1.2-2.6	2.5-4.4
Demolition hammers, pneumatic drills	1.7	3.6	6.9	2.0	4.6	8.1	3.2	7.7	13.9	1.5	4.5	9.0
	0.7-2.7	2.2-5.1	4.9-8.9	1.3-2.8	3.5-5.7	6.6-9.6	2.6-3.8	6.7-8.6	12.6-15.1	0.9-2.1	3.5-5.5	7.5-10.5
Excavators	1.5	2.7	6.1	1.5	3.5	6.7	1.9	5.0	9.3	1.2	3.6	7.7
	0.6-2.4	1.5-3.9	4.2-7.9	0.9-2.2	2.6-4.5	5.4-8.1	1.4-2.4	4.3-5.8	8.3-10.3	0.7-1.8	2.7-4.5	6.3-9.1
Shovel loader, loader	1.6	2.5	4.8	1.1	2.9	6.4	1.4	3.8	6.9	0.9	2.9	6.1
	0.7-2.4	1.4-3.6	3.2-6.4	0.6-1.7	2.0-3.7	5.1-7.8	1.0-1.8	3.2-4.4	6.0-7.8	0.4-1.4	2.1-3.8	4.9-7.3
Mobile cranes	1.0	2.3	4.7	1.2	2.7	5.1	1.5	3.5	6.1	1.0	2.5	4.8
	0.3-1.6	1.2-3.4	3.1-6.3	0.6-1.7	1.9-3.6	3.9-6.3	1.1-1.9	2.9-4.1	5.2-6.9	0.5-1.5	1.7-3.2	3.8-5.9
Hydraulic or electrical power units	0.8	1.6	2.5	0.7	1.3	2.7	1.2	2.3	4.1	0.7	1.5	2.7
	0.1-1.4	0.6-2.5	1.2-3.7	0.2-1.2	0.7-1.9	1.8-3.7	0.8-1.6	1.8-2.8	3.4-4.8	0.3-1.2	0.9-2.2	1.9-3.6
Pile drivers	1.3	2.6	5.6	1.9	3.5	6.6	3.3	6.4	11.2	0.8	2.1	3.6
	0.5-2.1	1.4-3.8	3.8-7.3	1.1-2.6	2.5-4.5	5.2-8.0	2.6-3.9	5.6-7.3	10.0-12.3	0.3-1.2	1.3-2.8	2.6-4.5
Backing-up warning signals from lorries	1.7	4.0	7.6	2.0	4.4	9.2	3.1	7.7	14.7	2.2	5.5	10.5
	0.7-2.7	2.6-5.4	5.5-9.6	1.2-2.7	3.4-5.5	7.7-10.7	2.5-3.7	6.8-8.6	13.5-15.9	1.4-2.9	4.4-6.7	9.0-12.1

Table 5-33 Annoyance recreation

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Fairs, circuses, amusement parks	1.1	2.4	5.5	1.9	4.1	8.6	1.6	3.6	7.4	1.7	5.1	10.7
	0.2-1.9	1.3-3.5	3.8-7.3	1.1-2.6	3.1-5.1	7.1-10.1	1.1-2.0	3.0-4.2	6.4-8.3	1.0-2.3	4.0-6.3	9.1-12.3
Discos, bars, cafés, and restaurants	1.4	3.3	6.3	1.6	3.5	6.8	2.1	4.5	7.9	1.7	4.1	7.9
	0.5-2.3	2.0-4.6	4.4-8.2	0.9-2.2	2.5-4.5	5.4-8.1	1.6-2.6	3.8-5.2	6.9-8.8	1.1-2.3	3.1-5.1	6.5-9.3
Sport facilities	0.5	1.5	4.8	0.9	2.7	5.7	1.1	3.2	7.2	0.8	2.5	5.6
	0.0-1.1	0.7-2.3	3.1-6.5	0.4-1.4	1.8-3.5	4.5-6.9	0.8-1.5	2.6-3.8	6.3-8.1	0.3-1.2	1.7-3.2	4.4-6.8
Mass outdoor events	2.8	5.6	11.6	3.0	6.7	12.1	3.2	6.5	12.6	2.5	6.0	13.0
	1.6-4.1	3.9-7.2	9.0-14.1	2.1-3.9	5.4-8.0	10.4-13.8	2.6-3.9	5.6-7.3	11.5-13.8	1.7-3.2	4.8-7.3	11.3-14.8

Table 5-34 Sleep disturbance recreation

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe sleep disturbance	sleep disturbance	some sleep disturbance	severe sleep disturbance	sleep disturbance	some sleep disturbance	severe sleep disturbance	sleep disturbance	some sleep disturbance	severe sleep disturbance	sleep disturbance	some sleep disturbance
Fairs, circuses, amusement parks	1.3	2.4	5.5	1.6	2.7	5.4	1.1	2.5	4.3	1.7	3.6	7.2
	0.4-2.2	1.3-3.6	3.7-7.2	0.9-2.2	1.9-3.6	4.2-6.7	0.7-1.4	2.0-3.0	3.6-5.0	1.1-2.4	2.7-4.5	5.9-8.6
Discos, bars, cafés, and restaurants	1.9	3.0	5.6	1.8	3.0	5.7	2.1	3.7	6.5	2.0	3.4	6.2
	0.8-2.9	1.7-4.2	3.8-7.4	1.1-2.5	2.1-3.9	4.5-6.9	1.6-2.6	3.1-4.4	5.6-7.4	1.4-2.7	2.5-4.3	5.0-7.4
Sport facilities	0.5	1.0	2.6	0.5	1.2	2.2	0.7	1.6	3.0	0.6	1.1	2.5
	0.0-1.0	0.3-1.7	1.4-3.8	0.1-0.9	0.7-1.8	1.5-3.0	0.4-1.0	1.2-2.1	2.3-3.6	0.2-1.0	0.6-1.7	1.7-3.2
Mass outdoor events	3.1	6.4	10.6	3.2	5.6	9.9	2.6	5.0	8.6	2.4	5.2	9.9
	1.8-4.4	4.5-8.2	8.2-13.0	2.3-4.2	4.4-6.8	8.3-11.5	2.1-3.2	4.2-5.7	7.6-9.5	1.6-3.2	4.1-6.3	8.4-11.4

5.2.1.2 Odour

Table 5-35 Annoyance odour

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Restaurants and snack bars	0.8	1.4	3.0	1.2	2.3	4.5	1.3	3.1	5.3	0.4	2.2	4.6
	0.1-1.6	0.5-2.3	1.7-4.3	0.6-1.8	1.5-3.1	3.4-5.6	0.9-1.7	2.5-3.7	4.5-6.1	0.2-0.7	1.5-2.9	3.6-5.7
Factories and businesses	1.0	3.3	7.3	1.1	2.4	5.0	1.4	3.9	7.3	1.7	3.8	7.7
	0.3-1.7	2.0-4.6	5.3-9.3	0.6-1.6	1.7-3.1	3.9-6.1	1.0-1.8	3.2-4.5	6.4-8.2	1.1-2.3	2.9-4.7	6.3-9.0
Agricultural companies and spreading manure	4.8	8.9	19.2	2.7	7.1	14.8	1.7	4.6	10.1	3.1	6.5	15.6
	3.2-6.5	6.8-11.0	16.2-22.2	1.9-3.6	5.8-8.3	12.9-16.7	1.2-2.1	3.9-5.3	9.0-11.2	2.3-3.9	5.4-7.7	13.8-17.5
Road traffic	1.5	4.3	7.6	2.2	4.7	9.9	2.9	6.5	13.1	2.6	5.4	11.0
	0.7-2.3	2.8-5.9	5.6-9.6	1.5-2.9	3.7-5.7	8.4-11.4	2.4-3.4	5.8-7.3	11.9-14.2	1.9-3.3	4.4-6.4	9.5-12.5
Aeroplanes	0.6	1.4	1.7	0.3	0.8	1.6	0.9	2.5	4.4	1.0	1.8	3.1
	0.0-1.2	0.3-2.4	0.5-2.8	0.0-0.7	0.3-1.3	0.9-2.3	0.6-1.2	2.0-3.0	3.7-5.1	0.5-1.5	1.1-2.4	2.2-3.9
Neighbours' homes	2.6	5.6	12.0	3.9	8.4	15.3	4.6	10.2	17.8	4.2	7.7	13.5
	1.4-3.9	3.8-7.4	9.4-14.6	2.8-4.9	6.9-9.9	13.4-17.3	3.9-5.4	9.2-11.3	16.4-19.2	3.1-5.2	6.3-9.0	11.7-15.3
Sewer system	1.5	4.1	7.4	2.0	4.8	8.7	3.0	6.5	11.9	2.0	4.7	8.3
	0.5-2.4	2.6-5.6	5.3-9.4	1.2-2.8	3.7-6.0	7.2-10.2	2.5-3.6	5.7-7.4	10.7-13.0	1.3-2.7	3.6-5.8	6.8-9.7
Fireplaces	5.7	11.5	20.1	4.5	7.8	16.6	3.1	7.0	14.0	4.2	7.6	14.7
	4.0-7.5	9.1-13.8	17.1-23.2	3.4-5.6	6.5-9.1	14.6-18.5	2.5-3.6	6.2-7.8	12.8-15.2	3.1-5.2	6.3-8.9	13.0-16.5
BBQs and fire baskets	4.1	9.2	17.2	5.0	9.9	20.1	4.6	10.5	21.3	3.5	8.3	17.4
	2.6-5.7	7.0-11.4	14.3-20.2	3.9-6.1	8.4-11.4	18.0-22.2	3.9-5.3	9.5-11.5	19.8-22.7	2.6-4.5	7.0-9.7	15.4-19.3
Boats and shipping	0.6	0.6	0.7	0.1	0.3	0.6	0.6	1.3	2.3	0.0	0.1	0.3
	0.0-1.2	0.0-1.3	0.0-1.4	0.0-0.4	0.0-0.7	0.2-1.0	0.3-0.9	0.9-1.7	1.8-2.9	0.0-0.1	0.0-0.2	0.0-0.6

Table 5-36 Sleep disturbance odour

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe sleep distu-rbance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance	severe sleep distur-bance	sleep distur-bance	some sleep distur-bance
Restaurants and snack bars	0.0	0.1	0.5	0.6	0.7	1.3	0.4	1.0	1.6	0.3	0.6	1.2
	0.0-0.1	0.0-0.2	0.0-1.1	0.1-1.0	0.3-1.2	0.7-1.9	0.2-0.7	0.7-1.4	1.2-2.1	0.1-0.6	0.3-1.0	0.7-1.7
Factories and businesses	0.2	0.3	1.2	0.3	0.9	1.7	0.5	1.3	2.3	0.7	1.2	2.5
	0.0-0.4	0.0-0.7	0.4-2.0	0.0-0.6	0.4-1.3	1.1-2.4	0.2-0.7	0.9-1.7	1.8-2.9	0.3-1.1	0.7-1.7	1.8-3.3
Agricultural companies and spreading manure	1.3	2.6	4.5	1.0	1.9	3.4	0.7	1.7	2.8	0.9	1.7	3.6
	0.4-2.2	1.4-3.7	2.9-6.1	0.5-1.5	1.2-2.6	2.5-4.3	0.4-1.0	1.2-2.1	2.2-3.5	0.5-1.4	1.1-2.3	2.7-4.5
Road traffic	0.6	1.5	2.9	0.6	2.0	3.6	1.1	2.6	4.4	1.2	2.1	3.6
	0.1-1.1	0.7-2.4	1.6-4.1	0.2-1.0	1.3-2.7	2.6-4.5	0.8-1.5	2.1-3.1	3.7-5.1	0.7-1.7	1.4-2.7	2.7-4.4
Aeroplanes	0.0	0.2	0.7	0.3	0.7	1.0	0.5	1.4	2.4	0.5	1.0	1.6
	0.0-0.0	0.0-0.5	0.0-1.4	0.0-0.6	0.2-1.1	0.4-1.5	0.3-0.8	1.0-1.8	1.9-2.9	0.2-0.9	0.5-1.4	1.0-2.2
Neighbours' homes	1.2	2.0	3.5	1.2	3.0	5.2	2.0	4.3	7.2	1.4	2.7	4.9
	0.2-2.1	0.9-3.2	2.1-5.0	0.6-1.8	2.1-3.9	4.0-6.5	1.5-2.5	3.6-5.0	6.2-8.1	0.8-2.0	1.9-3.5	3.7-6.0
Sewer system	0.4	1.1	1.9	0.8	1.4	2.3	0.9	2.1	3.7	0.6	1.3	2.4
	0.0-1.0	0.3-1.9	0.7-3.0	0.3-1.3	0.7-2.0	1.5-3.1	0.6-1.3	1.6-2.6	3.0-4.4	0.3-1.0	0.8-1.9	1.6-3.2
Fireplaces	2.0	4.4	7.0	1.9	3.8	6.6	1.7	3.3	5.4	2.1	3.5	5.7
	0.9-3.0	2.9-5.9	5.1-8.9	1.2-2.6	2.8-4.7	5.3-7.8	1.3-2.1	2.7-3.9	4.7-6.2	1.4-2.8	2.6-4.4	4.5-6.9
BBQs and fire baskets	2.0	4.2	6.6	2.0	3.8	6.6	2.1	4.5	7.8	1.5	3.1	5.7
	0.8-3.1	2.7-5.7	4.7-8.5	1.3-2.7	2.8-4.7	5.3-7.8	1.6-2.6	3.8-5.2	6.8-8.7	0.9-2.1	2.2-4.0	4.5-6.9
Boats and shipping	0.0	0.2	0.3	0.1	0.3	0.4	0.2	0.7	1.0	0.1	0.1	0.5
	0.0-0.0	0.0-0.6	0.0-0.6	0.0-0.4	0.0-0.6	0.0-0.8	0.0-0.4	0.4-0.9	0.7-1.4	0.0-0.2	0.0-0.3	0.1-0.8

5.2.1.3 Vibrations

Table 5-37 Annoyance vibrations

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance	severe annoyance	annoyance	some annoyance
Road traffic	3.8	9.8	16.5	3.6	7.6	15.3	4.1	10.3	18.0	4.4	9.4	16.8
	2.4-5.2	7.7-12.0	13.7-19.3	2.7-4.5	6.3-8.9	13.5-17.2	3.5-4.8	9.4-11.3	16.7-19.4	3.5-5.3	8.1-10.7	15.0-18.6
Passenger trains	0.8	1.2	1.9	0.7	1.2	2.7	0.5	1.1	2.1	0.6	1.2	2.6
	0.1-1.5	0.4-1.9	0.9-3.0	0.2-1.2	0.6-1.7	1.8-3.6	0.3-0.8	0.7-1.5	1.6-2.6	0.2-1.0	0.7-1.8	1.8-3.4
Freight trains	1.1	1.4	1.7	1.5	2.4	4.0	0.7	1.6	3.0	1.4	2.1	3.2
	0.3-1.9	0.5-2.3	0.7-2.6	0.8-2.1	1.6-3.1	2.9-5.0	0.4-1.0	1.1-2.0	2.4-3.6	0.8-2.0	1.4-2.9	2.3-4.1
Trams or metro	0.5	0.7	1.0	0.1	0.2	0.6	0.7	1.6	2.9	0.1	0.3	0.7
	0.0-1.1	0.0-1.3	0.2-1.8	0.0-0.4	0.0-0.5	0.1-1.1	0.4-1.0	1.2-2.0	2.4-3.5	0.0-0.3	0.0-0.5	0.3-1.1
Aeroplanes and helicopters	0.3	2.0	4.5	0.7	2.2	5.5	1.8	4.8	9.3	1.7	4.0	7.4
	0.0-0.6	0.9-3.1	2.9-6.0	0.3-1.2	1.4-3.0	4.3-6.7	1.4-2.3	4.0-5.5	8.3-10.3	1.0-2.4	3.0-4.9	6.1-8.8
Military air traffic	0.9	1.8	4.0	1.2	1.9	3.8	0.4	1.4	2.5	1.8	3.9	7.2
	0.2-1.6	0.8-2.7	2.5-5.5	0.6-1.8	1.2-2.7	2.8-4.9	0.2-0.7	0.9-1.8	1.9-3.1	1.1-2.5	3.0-4.9	5.8-8.5
Factories and businesses	0.6	0.9	1.1	0.5	0.9	1.7	0.5	1.2	2.1	0.4	1.1	1.9
	0.0-1.2	0.1-1.7	0.3-2.0	0.1-0.9	0.4-1.4	1.0-2.4	0.3-0.8	0.8-1.5	1.6-2.5	0.1-0.7	0.6-1.5	1.2-2.6
Building and demolition activities	1.3	3.2	6.1	1.5	2.9	5.8	2.6	6.2	10.6	1.5	3.4	6.4
	0.4-2.2	1.9-4.6	4.3-7.9	0.9-2.2	2.1-3.8	4.5-7.1	2.1-3.2	5.4-7.0	9.5-11.7	0.9-2.2	2.5-4.2	5.2-7.7
Windmills, wind turbines	0.4	0.5	0.7	0.1	0.2	0.5	0.2	0.4	0.7	0.1	0.2	0.4
	0.0-0.9	0.0-1.1	0.0-1.3	0.0-0.4	0.0-0.4	0.1-0.9	0.0-0.4	0.2-0.6	0.4-1.0	0.0-0.3	0.0-0.4	0.0-0.7

5.2.2   Concern
Table 5-38 Concern about one's own safety

	North Netherlands		East Netherlands		West Netherlands		South Netherlands	
	concerned	very concerned	concerned	very concerned	concerned	very concerned	concerned	very concerned
In a busy street	10.6	7.7	12.4	9.4	12.3	9.9	12.4	12.8
	8.3-13.0	5.6-9.7	10.6-14.2	7.9-10.9	11.2-13.5	8.8-10.9	10.7-14.1	11.2-14.4
In a polder (reclaimed land) below sea level	4.6	2.8	4.3	3.5	8.3	5.5	3.0	2.1
	3.0-6.2	1.5-4.1	3.2-5.4	2.5-4.6	7.4-9.3	4.7-6.4	2.1-3.9	1.4-2.9
In an agricultural or horticultural area	3.8	3.6	3.9	1.4	3.9	2.1	4.3	2.4
	2.3-5.2	2.1-5.1	2.8-4.9	0.8-2.0	3.2-4.6	1.6-2.7	3.3-5.3	1.6-3.2
In the vicinity of intensive livestock farming	4.7	4.2	3.3	2.8	4.4	3.4	4.7	3.9
	3.1-6.3	2.6-5.8	2.4-4.2	2.0-3.7	3.7-5.2	2.7-4.0	3.6-5.8	3.0-4.8
Below the route used by aeroplanes to approach a big airport	3.7	6.2	4.2	5.9	9.3	10.4	6.8	7.0
	2.2-5.3	4.3-8.1	3.1-5.3	4.6-7.2	8.2-10.3	9.3-11.5	5.5-8.2	5.7-8.4
Adjacent to a railway line	3.4	4.3	4.7	5.3	5.0	6.1	5.1	5.3
	1.9-4.8	2.7-5.8	3.6-5.8	4.2-6.5	4.2-5.8	5.2-7.0	3.9-6.3	4.2-6.5
In the vicinity of a big airport	2.7	5.2	3.2	5.1	6.6	9.1	5.3	7.0
	1.4-4.0	3.5-7.0	2.2-4.1	3.9-6.2	5.7-7.5	8.0-10.1	4.1-6.4	5.7-8.3
Adjacent to a route for hazardous substances	4.1	6.9	4.4	8.2	5.1	11.0	4.1	8.9
	2.5-5.7	4.9-8.9	3.4-5.5	6.8-9.7	4.3-5.8	9.9-12.2	3.1-5.2	7.5-10.4
Near a high-voltage line	3.1	5.5	3.9	6.1	4.4	8.1	3.0	6.2
	1.7-4.5	3.7-7.3	2.8-5.0	4.8-7.4	3.6-5.1	7.1-9.1	2.1-3.8	4.9-7.5
On or in the vicinity of contaminated soil	1.4	8.1	3.6	7.2	3.7	11.3	3.2	8.0
	0.5-2.4	5.8-10.3	2.6-4.6	5.8-8.5	3.0-4.4	10.1-12.5	2.3-4.1	6.5-9.4
In the vicinity of a high-risk business enterprise	2.8	8.1	2.9	7.7	5.6	11.9	4.8	9.7
	1.4-4.2	5.9-10.3	2.0-3.8	6.3-9.1	4.7-6.5	10.7-13.0	3.7-6.0	8.2-11.3
In the vicinity of a mobile GSM/UMTS telephone mast	5.9	6.4	6.2	5.4	7.4	8.5	5.3	6.5
	4.0-7.8	4.5-8.4	4.9-7.5	4.2-6.6	6.4-8.3	7.5-9.5	4.1-6.5	5.3-7.7
Lightning striking your home	11.3	8.7	11.8	9.0	10.1	8.6	12.2	9.9
	8.8-13.8	6.5-11.0	10.1-13.6	7.4-10.5	9.0-11.1	7.5-9.6	10.5-13.9	8.3-11.5

Table 5-39 Concern about health due to

	North Netherlands		East Netherlands		West Netherlands		South Netherlands	
	concerned	very concerned	concerned	very concerned	concerned	very concerned	concerned	very concerned
The air-quality in your home	9.5	6.1	11.6	7.8	14.6	11.7	11.2	9.1
	7.1-11.9	4.3-8.0	9.9-13.4	6.4-9.3	13.3-15.8	10.6-12.9	9.6-12.8	7.7-10.5
The air quality around your home	10.3	7.8	12.9	10.2	18.7	18.1	15.7	15.0
	7.9-12.7	5.8-9.9	11.0-14.7	8.7-11.8	17.3-20.1	16.8-19.5	13.8-17.6	13.2-16.7
The soil quality around your home	7.4	5.3	9.0	5.8	11.8	7.3	10.8	6.1
	5.3-9.4	3.5-7.1	7.4-10.5	4.5-7.0	10.6-13.0	6.3-8.2	9.1-12.4	4.9-7.3
The drinking water quality in your home	5.5	5.3	6.5	6.8	7.6	8.2	7.0	6.0
	3.6-7.3	3.5-7.1	5.2-7.8	5.4-8.2	6.6-8.5	7.2-9.2	5.7-8.3	4.8-7.2
The water quality in the vicinity of your home	6.5	5.1	8.6	5.8	10.2	7.4	7.8	5.8
	4.6-8.5	3.3-6.9	7.1-10.2	4.5-7.1	9.2-11.3	6.5-8.4	6.4-9.2	4.6-7.0
The sound around your home	10.4	7.1	11.0	8.5	13.9	11.1	11.8	10.0
	8.0-12.9	5.1-9.2	9.4-12.7	7.1-10.0	12.7-15.1	10.1-12.2	10.1-13.5	8.5-11.4

5.2.3 *Satisfaction with the residential environment*

Table 5-40 Satisfaction with the living environment

	North Netherlands	East Netherlands	West Netherlands	South Netherlands
(Very) satisfied	74.6	70.9	66.6	70.3
	71.1-78.1	68.4-73.3	64.9-68.3	67.9-72.7
Fairly satisfied	15.0	19.1	22.3	19.7
	12.2-17.9	17.0-21.2	20.8-23.8	17.6-21.8
(Very) dissatisfied	10.4	10.0	11.0	10.1
	6.8-14.0	7.7-12.4	9.4-12.8	7.8-12.3

5.2.4 *State of the neighbourhood*

Table 5-41 State of the neighbourhood this year and next year

	North Netherlands			East Netherlands			West Netherlands			South Netherlands		
	Improved	Remained the same	Deteriorated	Improved	Remained the same	Deteriorated	Improved	Remained the same	Deteriorated	Improved	Remained the same	Deteriorated
The last year: the neighbourhood has	15.0	72.3	12.7	13.8	72.8	13.4	18.0	67.5	14.5	13.4	73.1	13.5
	12.1-17.8	68.7-75.9	10.1-15.4	11.9-15.7	70.4-75.2	11.6-15.2	16.6-19.4	65.8-69.2	13.2-15.8	11.6-15.2	70.8-75.4	11.7-15.3
Sound of road traffic in the neighbourhood	3.3	77.1	19.6	3.0	73.3	23.7	3.3	69.6	27.1	2.8	70.5	26.7
	1.9-4.7	73.8-80.3	16.5-22.7	2.1-3.9	70.9-75.6	21.5-25.9	2.7-4.0	68.0-71.2	25.5-28.6	2.0-3.7	68.2-72.8	24.4-29.0
In the coming year: the neighbourhood will	14.4	76.9	8.7	12.3	77.6	10.1	17.5	70.4	12.1	11.7	76.9	11.4
	11.6-17.3	73.5-80.3	6.4-11.0	10.5-14.1	75.3-79.9	8.5-11.7	16.1-18.9	68.7-72.0	11.0-13.3	10.0-13.4	74.7-79.2	9.7-13.0
Sound of road traffic in the neighbourhood	3.2	78.4	18.4	3.4	74.3	22.4	3.4	69.3	27.3	3.6	71.6	24.8
	1.8-4.7	75.2-81.6	15.4-21.3	2.4-4.4	71.9-76.6	20.2-24.6	2.7-4.1	67.7-70.9	25.7-28.8	2.7-4.5	69.4-73.9	22.6-27.0

5.3   Provincial governments

The Netherlands is divided into 12 provinces: Groningen (Gron), Friesland (Frie), Drenthe (Dren), Overijssel (OvIJs), Flevoland (Flev), Gelderland (Geld), Utrecht (Utre), Noord-Holland (NHol), Zuid-Holland (ZHol), Zeeland (Zeel), Noord-Brabant (NBrab) and Limburg (Limb).

5.3.1 Annoyance and sleep disturbance sound
5.3.1.1 Sound

Table 5-42 Roads with maximum speed limits

		Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance	30 km/h	2.9	2.1	2.3	5.1	3.3	4.1	4.0	3.9	4.2	5.3	4.1	5.5
		0.5-5.3	0.6-3.6	0.0-4.6	2.9-7.3	0.1-6.5	2.8-5.5	2.4-5.6	2.8-5.0	3.2-5.3	2.0-8.6	2.9-5.3	3.3-7.6
	50 km/h	6.7	2.2	0.8	4.5	2.9	4.5	6.5	7.3	6.1	3.3	5.5	6.7
		3.2-10.3	0.7-3.7	0.0-1.6	2.7-6.3	0.2-5.6	3.3-5.8	4.5-8.6	5.9-8.7	5.0-7.2	0.7-5.9	4.4-6.7	4.7-8.7
	80 km/h	3.1	2.0	1.8	2.3	2.8	2.4	1.6	2.5	2.8	2.3	2.6	2.2
		0.8-5.3	0.7-3.4	0.4-3.2	0.8-3.7	0.1-5.5	1.5-3.4	0.6-2.6	1.6-3.4	2.0-3.6	0.1-4.5	1.8-3.5	1.1-3.3
	120 km/h	1.6	1.2	1.8	1.7	1.5	1.9	3.5	2.9	2.6	1.3	2.1	3.5
		0.0-3.3	0.0-2.4	0.1-3.6	0.4-2.9	0.0-3.6	1.0-2.7	2.0-5.0	1.9-4.0	1.8-3.3	0.0-3.0	1.3-2.9	1.9-5.0
annoyance	30 km/h	9.5	5.4	6.3	12.1	8.4	11.8	11.5	11.9	11.4	11.0	10.9	12.6
		5.6-13.5	3.1-7.8	3.0-9.6	9.0-15.1	3.8-13.1	9.7-13.9	8.9-14.2	10.1-13.7	9.8-13.1	6.2-15.8	9.0-12.7	9.6-15.6
	50 km/h	14.7	6.0	7.0	12.1	6.3	12.1	14.6	15.8	15.6	10.2	13.2	16.0
		10.0-19.4	3.5-8.5	4.0-10.0	9.2-15.0	2.6-10.0	10.1-14.1	11.8-17.4	13.8-17.8	13.9-17.3	5.6-14.8	11.4-15.1	13.0-19.1
	80 km/h	6.0	4.5	4.9	4.6	6.5	5.4	5.6	5.6	5.3	6.0	6.2	4.7
		3.0-9.1	2.5-6.6	2.4-7.4	2.8-6.5	2.6-10.4	3.9-6.8	3.8-7.5	4.3-6.8	4.2-6.4	2.7-9.3	4.8-7.5	3.0-6.3
	120 km/h	3.2	3.0	5.4	3.2	3.2	4.5	8.6	4.9	5.8	3.1	5.6	5.9
		0.9-5.5	1.2-4.8	2.5-8.3	1.7-4.8	0.3-6.1	3.2-5.8	6.3-10.9	3.6-6.1	4.6-7.0	0.6-5.7	4.2-6.9	4.0-7.8
some annoyance	30 km/h	14.6	15.3	14.9	22.8	16.9	21.9	22.1	22.5	21.8	22.8	21.8	24.2
		9.7-19.4	11.0-19.6	9.9-19.9	18.8-26.8	10.6-23.1	19.1-24.8	18.5-25.8	20.0-25.0	19.6-24.0	16.0-29.6	19.3-24.3	20.2-28.2
	50 km/h	24.8	14.8	15.7	20.5	15.6	23.1	24.9	28.7	28.3	16.3	22.8	26.7
		18.8-30.7	10.6-19.1	10.9-20.5	16.8-24.2	9.8-21.5	20.3-25.9	21.2-28.5	26.0-31.3	26.0-30.6	10.4-22.2	20.3-25.3	22.7-30.7
	80 km/h	9.3	10.4	8.1	9.5	13.8	10.9	10.8	10.0	9.1	10.8	9.9	10.6
		5.2-13.3	7.0-13.9	4.7-11.4	6.7-12.2	8.0-19.6	8.8-13.0	8.2-13.4	8.3-11.8	7.6-10.6	5.9-15.7	8.1-11.7	8.0-13.3
	120 km/h	7.3	8.4	10.9	5.6	6.3	9.8	14.8	8.5	9.6	5.8	9.8	10.7
		3.5-11.1	5.2-11.6	6.7-15.1	3.6-7.7	2.3-10.4	7.8-11.9	11.8-17.9	6.8-10.2	8.1-11.1	2.3-9.3	8.0-11.6	7.9-13.4

Table 5-43 Annoyance General: source groups

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Road traffic	8.0	4.9	5.3	7.0	7.7	8.7	10.2	9.6	9.9	8.5	10.6	11.5
	4.4-11.7	2.9-7.0	2.4-8.2	4.8-9.2	3.3-12.2	6.9-10.5	7.7-12.7	8.0-11.2	8.5-11.2	4.6-12.5	8.8-12.3	8.7-14.2
Rail traffic	2.3	0.5	0.3	2.8	1.7	2.2	2.0	2.5	2.5	0.6	2.3	2.2
	0.5-4.1	0.0-1.2	0.0-0.9	1.2-4.5	0.0-4.0	1.2-3.1	0.8-3.2	1.6-3.4	1.8-3.3	0.0-1.8	1.5-3.2	0.9-3.5
Air traffic	2.1	4.2	0.3	1.6	3.6	1.6	4.7	9.3	5.1	1.0	4.4	5.2
	0.3-3.9	1.8-6.6	0.0-0.7	0.3-2.8	0.5-6.7	0.8-2.4	2.9-6.6	7.6-11.1	3.9-6.2	0.0-2.4	3.2-5.7	3.1-7.2
Neighbours	9.9	7.4	6.8	7.6	7.9	7.6	8.5	10.5	9.0	4.8	6.9	7.9
	5.6-14.1	4.1-10.7	3.0-10.6	5.0-10.1	3.4-12.3	5.8-9.4	6.1-10.9	8.7-12.4	7.4-10.6	1.3-8.3	5.4-8.5	5.3-10.5
Factories	1.4	0.6	0.3	0.8	2.1	2.7	1.6	1.8	2.1	2.4	2.0	2.1
	0.0-2.8	0.0-1.4	0.0-0.7	0.0-1.8	0.0-4.4	1.6-3.8	0.6-2.7	1.1-2.6	1.4-2.9	0.0-4.8	1.1-2.9	0.9-3.3
Construction	4.0	3.5	0.7	2.5	4.4	3.3	4.6	7.6	5.2	3.3	3.2	4.1
	1.5-6.5	1.2-5.8	0.0-1.9	1.0-4.1	1.3-7.6	2.2-4.4	2.9-6.2	6.0-9.1	4.1-6.4	0.6-5.9	2.2-4.3	2.2-6.0
Recreation	2.6	0.9	0.1	2.2	3.1	3.0	4.8	4.8	3.2	3.1	2.9	3.3
	0.5-4.7	0.0-2.1	0.0-0.3	0.8-3.6	0.3-6.0	1.8-4.2	3.0-6.6	3.5-6.1	2.2-4.1	0.7-5.6	1.9-4.0	1.6-4.9
annoyance												
Road traffic	19.0	16.1	18.2	23.5	20.9	25.9	29.4	26.6	28.4	19.9	26.6	28.4
	13.9-24.1	12.1-20.1	13.3-23.1	19.7-27.2	14.4-27.4	23.1-28.6	25.6-33.1	24.2-29.0	26.2-30.5	14.0-25.8	24.1-29.1	24.5-32.3
Rail traffic	3.9	3.1	1.4	6.8	5.9	6.1	8.3	7.4	9.9	1.4	6.0	5.6
	1.4-6.3	1.0-5.3	0.0-2.8	4.6-9.1	2.1-9.7	4.5-7.6	6.0-10.6	5.9-8.9	8.3-11.4	0.0-3.1	4.6-7.3	3.6-7.6
Air traffic	3.9	10.3	2.8	5.3	16.8	5.8	10.6	24.8	12.9	1.7	12.4	13.7
	1.6-6.3	6.7-14.0	0.6-5.0	3.2-7.3	11.0-22.7	4.3-7.3	8.0-13.1	22.3-27.2	11.2-14.5	0.0-3.4	10.4-14.3	10.8-16.6
Neighbours	25.2	13.4	16.0	18.5	24.0	20.5	21.7	25.5	20.8	11.0	16.9	16.4
	19.2-31.3	9.4-17.4	10.8-21.3	15.0-22.1	17.3-30.7	17.8-23.3	18.1-25.2	22.9-28.1	18.7-22.9	5.9-16.0	14.6-19.1	13.0-19.8
Factories	3.2	2.9	2.9	3.6	5.4	5.8	4.1	4.7	5.7	6.1	4.3	5.6
	0.7-5.7	1.0-4.9	1.1-4.7	1.9-5.3	1.8-9.0	4.3-7.3	2.5-5.8	3.5-5.8	4.5-6.8	2.2-10.0	3.1-5.4	3.7-7.5
Construction	9.6	7.2	4.3	8.3	15.2	11.0	15.7	18.8	15.1	10.4	10.8	10.4
	5.9-13.3	4.2-10.2	1.6-7.0	5.8-10.8	9.7-20.8	8.9-13.1	12.6-18.7	16.6-21.1	13.3-16.9	5.7-15.1	8.9-12.7	7.7-13.2
Recreation	7.5	3.7	3.9	7.6	10.7	7.9	11.9	13.3	10.4	8.9	9.2	8.4
	4.1-10.9	1.5-6.0	1.2-6.5	5.3-10.0	6.0-15.4	6.2-9.7	9.1-14.6	11.4-15.3	8.9-12.0	5.0-12.9	7.5-10.9	5.9-10.9

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
some annoyance												
Road traffic	39.3	37.8	35.2	47.6	44.0	49.4	53.7	49.3	49.9	40.4	48.4	49.1
	32.6-46.0	32.0-43.6	28.6-41.8	42.9-52.3	35.7-52.3	45.9-52.8	49.3-58.0	46.3-52.3	47.3-52.6	32.4-48.3	45.3-51.4	44.5-53.7
Rail traffic	7.8	5.5	6.8	16.0	11.6	14.6	18.2	14.3	18.0	6.3	11.8	9.7
	4.1-11.6	2.8-8.3	3.3-10.2	12.4-19.5	6.2-17.0	12.2-17.1	14.7-21.6	12.2-16.4	16.0-20.1	2.4-10.3	9.9-13.8	7.0-12.3
Air traffic	8.1	22.6	10.4	10.6	38.8	15.1	24.3	45.8	27.5	4.6	26.5	27.1
	4.6-11.6	17.5-27.8	6.1-14.7	7.6-13.6	30.7-47.0	12.6-17.5	20.5-28.0	42.8-48.8	25.2-29.9	1.4-7.9	23.8-29.2	23.1-31.2
Neighbours	40.9	27.1	30.3	34.8	43.8	37.8	38.8	42.7	38.1	27.9	31.8	31.6
	33.9-47.9	21.7-32.6	23.8-36.8	30.2-39.3	35.5-52.1	34.4-41.1	34.6-43.1	39.7-45.7	35.5-40.6	20.5-35.3	28.9-34.7	27.2-36.0
Factories	8.4	7.3	8.2	8.0	11.8	10.9	10.2	11.4	12.7	9.4	10.3	12.8
	4.6-12.1	4.3-10.3	4.6-11.9	5.4-10.6	6.3-17.3	8.7-13.0	7.5-12.8	9.5-13.2	10.9-14.4	4.6-14.1	8.5-12.1	9.8-15.7
Construction	20.5	14.6	11.5	19.6	29.6	20.0	32.0	33.8	28.8	24.1	22.3	21.5
	15.0-26.0	10.3-18.9	7.0-16.0	15.8-23.4	21.8-37.3	17.2-22.8	27.9-36.0	30.9-36.6	26.3-31.2	16.9-31.2	19.7-24.9	17.7-25.4
Recreation	14.5	13.9	12.5	19.5	20.8	17.3	25.3	26.0	23.3	17.7	22.2	17.3
	9.7-19.4	9.5-18.3	8.0-17.0	15.7-23.2	14.0-27.5	14.7-19.9	21.5-29.1	23.3-28.6	21.1-25.6	11.6-23.8	19.6-24.8	13.8-20.8

Table 5-44 Sleep disturbance General: source groups

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe sleep disturbance												
Road traffic	3.8	1.6	1.4	4.3	2.9	3.9	4.9	5.4	4.8	2.6	4.0	4.9
	1.4-6.2	0.4-2.9	0.1-2.7	2.4-6.2	0.6-5.3	2.8-5.1	3.2-6.6	4.1-6.7	3.8-5.8	0.2-5.0	2.9-5.0	3.1-6.7
Rail traffic	2.1	0.0	0.0	1.8	0.1	1.3	1.5	1.3	1.0	0.6	1.2	1.5
	0.3-3.9	0.0-0.0	0.0-0.0	0.4-3.2	0.0-0.2	0.5-2.0	0.4-2.7	0.7-2.0	0.5-1.4	0.0-1.8	0.5-1.9	0.4-2.5
Air traffic	0.4	1.0	0.0	0.4	1.4	0.4	2.9	4.6	2.1	0.0	1.7	2.7
	0.0-1.0	0.0-2.1	0.0-0.0	0.0-1.2	0.0-3.5	0.0-0.7	1.4-4.5	3.3-5.8	1.3-2.8	0.0-0.0	0.8-2.5	1.2-4.2
Neighbours	5.3	4.3	5.4	4.4	3.8	4.5	5.7	6.6	6.2	5.2	3.8	3.0
	2.1-8.6	1.7-7.0	2.0-8.9	2.5-6.4	0.6-7.0	3.1-5.9	3.7-7.7	5.1-8.1	4.9-7.5	1.4-9.0	2.6-5.1	1.4-4.6
Factories	1.0	0.7	0.0	0.9	0.8	1.0	1.7	1.3	1.1	1.4	0.7	0.9
	0.0-2.3	0.0-1.5	0.0-0.0	0.0-1.9	0.0-2.1	0.3-1.6	0.5-2.9	0.6-1.9	0.5-1.6	0.0-3.3	0.2-1.2	0.1-1.8
Construction	1.2	1.5	0.6	1.4	1.7	1.0	2.1	3.9	2.7	1.7	1.1	1.7
	0.0-2.5	0.0-3.2	0.0-1.7	0.0-2.7	0.0-3.7	0.4-1.6	1.0-3.2	2.7-5.0	1.8-3.6	0.0-4.2	0.5-1.7	0.4-3.0
Recreation	2.0	0.6	0.1	2.4	1.1	1.5	2.3	3.5	2.0	1.6	1.9	2.0
	0.2-3.8	0.0-1.3	0.0-0.1	0.8-3.9	0.0-2.6	0.8-2.2	1.1-3.4	2.4-4.6	1.2-2.8	0.0-3.4	1.1-2.8	0.6-3.5
sleep disturbance												
Road traffic	10.0	6.7	6.7	10.7	10.7	10.6	13.5	12.3	12.8	8.9	13.2	12.5
	6.2-13.8	4.0-9.4	3.4-9.9	7.9-13.4	5.7-15.8	8.7-12.5	10.8-16.2	10.5-14.1	11.2-14.4	5.0-12.9	11.3-15.1	9.7-15.4
Rail traffic	2.8	0.4	0.1	4.0	0.9	2.4	3.1	3.4	3.7	1.0	3.1	3.2
	0.9-4.7	0.0-1.0	0.0-0.4	2.1-5.9	0.0-2.8	1.4-3.4	1.5-4.7	2.4-4.4	2.7-4.6	0.0-2.5	2.1-4.1	1.6-4.8
Air traffic	0.9	3.7	0.4	1.5	5.3	1.8	5.3	11.0	5.4	0.0	4.2	5.2
	0.0-1.7	1.4-5.9	0.0-1.0	0.3-2.7	1.8-8.9	1.0-2.5	3.4-7.3	9.2-12.8	4.3-6.5	0.0-0.0	3.0-5.4	3.2-7.2
Neighbours	13.5	8.6	9.2	9.3	13.1	10.1	13.3	16.9	12.9	7.6	8.9	9.1
	9.0-18.0	5.0-12.2	5.0-13.3	6.6-12.0	7.4-18.7	8.1-12.2	10.3-16.4	14.7-19.2	11.2-14.7	3.1-12.0	7.2-10.6	6.5-11.7
Factories	1.6	2.3	1.0	2.0	1.9	3.0	2.6	2.9	2.9	2.7	2.1	2.0
	0.0-3.1	0.6-4.0	0.0-2.1	0.7-3.4	0.0-4.2	1.9-4.0	1.1-4.0	2.0-3.9	2.0-3.7	0.0-5.5	1.2-2.9	0.9-3.1
Construction	5.1	3.8	1.2	2.7	4.1	3.9	5.6	9.3	6.0	5.0	3.7	3.6
	2.3-7.9	1.3-6.4	0.0-2.6	1.0-4.4	1.0-7.1	2.7-5.2	3.8-7.5	7.6-11.0	4.8-7.3	1.6-8.5	2.5-4.8	1.8-5.4
Recreation	5.0	3.8	2.2	5.9	3.5	5.5	5.8	8.5	5.1	3.8	5.4	4.5
	2.3-7.6	1.4-6.3	0.3-4.0	3.8-8.0	0.9-6.1	4.1-7.0	3.8-7.7	6.9-10.1	4.0-6.2	1.1-6.5	4.1-6.7	2.6-6.4

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
some sleep disturbance												
Road traffic	19.4	15.8	16.1	23.1	16.2	21.1	23.9	24.2	23.2	20.0	24.2	23.0
	14.0-24.7	11.4-20.1	11.1-21.1	19.1-27.0	10.3-22.2	18.4-23.9	20.3-27.5	21.6-26.7	21.1-25.4	13.7-26.4	21.6-26.8	19.2-26.7
Rail traffic	3.5	2.6	0.3	7.0	1.3	6.5	5.8	7.0	7.4	4.4	5.8	4.9
	1.2-5.8	0.8-4.3	0.0-0.9	4.6-9.5	0.0-3.3	4.8-8.1	3.8-7.8	5.5-8.5	6.0-8.7	0.9-7.9	4.4-7.1	2.9-6.9
Air traffic	3.5	7.2	1.6	3.3	14.0	4.4	9.9	20.0	11.0	2.6	8.5	10.7
	1.3-5.7	4.0-10.3	0.0-3.4	1.5-5.1	8.2-19.7	3.0-5.7	7.3-12.5	17.6-22.4	9.3-12.6	0.1-5.2	6.8-10.2	7.8-13.5
Neighbours	25.0	15.2	15.4	18.8	26.9	19.6	25.2	28.4	23.6	14.4	18.8	17.4
	18.7-31.2	10.7-19.7	10.1-20.7	15.0-22.6	19.3-34.4	16.8-22.4	21.3-29.1	25.7-31.2	21.3-25.9	8.5-20.3	16.3-21.3	13.8-21.0
Factories	3.9	4.0	2.8	4.5	4.1	4.8	5.2	5.8	5.8	5.6	4.8	5.4
	1.3-6.6	1.8-6.1	0.8-4.7	2.5-6.5	0.7-7.5	3.3-6.3	3.2-7.1	4.4-7.2	4.6-7.0	1.8-9.5	3.5-6.1	3.4-7.3
Construction	9.2	7.1	3.7	7.5	9.0	9.6	13.4	16.6	11.7	8.3	7.9	7.2
	5.3-13.0	3.9-10.3	1.1-6.3	4.8-10.1	4.3-13.8	7.5-11.7	10.4-16.4	14.4-18.9	9.9-13.4	3.7-12.9	6.2-9.6	4.7-9.7
Recreation	9.1	8.7	7.0	12.2	10.4	10.9	13.5	16.3	10.6	10.8	12.3	10.0
	5.1-13.0	5.1-12.3	3.6-10.3	9.1-15.4	5.4-15.5	8.8-13.0	10.5-16.5	14.0-18.5	8.9-12.3	5.7-15.8	10.3-14.3	7.2-12.9

Table 5-45 Annoyance sources road traffic

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Passenger	3.8	4.6	2.8	6.4	6.6	7.3	6.5	7.6	8.2	6.9	7.8	8.2
cars and taxis	1.4-6.1	2.4-6.7	0.7-4.8	4.2-8.7	2.6-10.6	5.7-9.0	4.5-8.5	6.1-9.1	6.9-9.5	3.3-10.5	6.4-9.3	5.8-10.5
Delivery vans	3.1	4.0	1.6	6.1	5.3	6.5	4.8	7.3	7.2	7.5	6.3	7.6
	1.0-5.1	2.1-6.0	0.1-3.2	3.9-8.2	1.9-8.6	4.9-8.1	3.2-6.3	5.9-8.7	5.9-8.4	3.9-11.2	5.1-7.6	5.3-9.8
Lorries	8.3	5.5	4.8	7.6	6.4	8.3	8.3	9.6	8.9	9.7	9.7	9.1
	4.6-12.1	3.3-7.8	2.2-7.3	5.3-9.8	2.4-10.3	6.6-10.1	6.2-10.3	8.0-11.2	7.5-10.3	5.2-14.2	8.1-11.3	6.8-11.5
Buses	2.4	2.8	1.3	4.6	1.9	3.3	4.7	4.3	4.5	3.2	4.8	4.3
	0.8-4.0	1.2-4.3	0.0-2.6	2.7-6.5	0.0-3.8	2.2-4.3	3.1-6.2	3.2-5.3	3.6-5.5	0.4-6.0	3.7-5.9	2.7-5.9
Mopeds	10.2	5.2	4.2	9.7	6.0	8.4	11.3	13.6	11.4	11.0	8.6	11.7
	6.0-14.3	2.9-7.6	1.5-7.0	6.8-12.6	1.8-10.2	6.6-10.2	8.6-13.9	11.7-15.6	9.8-13.0	6.2-15.9	7.0-10.2	8.8-14.6
Motorcycles/	7.8	4.8	3.2	9.0	6.9	8.6	10.3	12.0	12.2	9.1	9.0	9.9
motorbikes	4.2-11.5	2.5-7.2	1.2-5.2	6.3-11.7	2.7-11.2	6.8-10.4	7.8-12.8	10.1-13.8	10.6-13.8	4.7-13.6	7.3-10.6	7.2-12.5
Military	0.0	0.2	0.3	1.6	0.0	1.0	1.0	0.8	0.5	0.0	1.3	1.1
vehicles	0.0-0.0	0.0-0.6	0.0-0.9	0.3-2.8	0.0-0.0	0.3-1.7	0.2-1.8	0.2-1.4	0.1-0.8	0.0-0.0	0.6-1.9	0.1-2.0
annoyance												
Passenger	13.9	10.5	11.8	16.1	16.7	17.6	20.4	18.9	19.6	16.8	20.5	18.0
cars and taxis	9.5-18.2	7.3-13.8	7.7-15.9	12.8-19.4	10.7-22.7	15.2-20.0	17.1-23.7	16.8-21.0	17.6-21.5	11.2-22.4	18.2-22.7	14.8-21.3
Delivery vans	10.6	9.7	10.8	14.4	10.2	15.3	18.4	17.3	16.9	12.6	16.9	15.7
	6.6-14.6	6.7-12.8	6.9-14.8	11.3-17.5	5.5-15.0	13.0-17.5	15.3-21.4	15.2-19.3	15.0-18.7	8.0-17.2	14.8-19.0	12.7-18.7
Lorries	15.9	12.9	13.5	16.6	13.9	17.6	21.2	19.2	18.1	17.4	19.0	21.1
	11.2-20.7	9.3-16.4	9.1-17.9	13.4-19.9	8.3-19.5	15.2-20.0	17.9-24.4	17.0-21.3	16.2-19.9	11.8-23.0	16.8-21.2	17.6-24.6
Buses	8.9	5.8	4.8	9.2	5.1	9.0	10.3	11.0	8.6	7.6	10.4	9.9
	5.3-12.5	3.5-8.2	2.3-7.4	6.7-11.6	1.6-8.6	7.2-10.8	8.0-12.5	9.3-12.6	7.3-9.9	3.8-11.5	8.8-12.1	7.5-12.3
Mopeds	22.3	12.6	12.6	22.1	17.7	20.7	22.6	28.3	25.5	20.9	20.3	23.1
	16.8-27.8	8.8-16.3	8.1-17.2	18.3-25.8	11.3-24.0	18.1-23.3	19.2-26.1	25.7-30.9	23.3-27.7	14.7-27.2	17.9-22.6	19.4-26.8
Motorcycles/	20.3	9.1	10.2	19.6	12.7	17.2	19.8	23.0	23.0	18.6	17.5	19.6
motorbikes	14.9-25.7	5.9-12.3	6.5-14.0	15.9-23.3	7.2-18.1	14.8-19.6	16.5-23.1	20.6-25.4	20.9-25.1	12.8-24.5	15.2-19.7	16.2-23.1
Military	0.0	1.2	1.2	1.7	0.0	1.9	1.7	1.4	1.2	0.0	2.5	2.3
vehicles	0.0-0.0	0.0-2.3	0.0-2.8	0.5-3.0	0.0-0.0	1.1-2.8	0.6-2.7	0.7-2.1	0.6-1.9	0.0-0.0	1.6-3.3	1.0-3.5

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
some annoyance												
Passenger cars and taxis	26.9 20.7-33.1	26.6 21.4-31.9	22.8 17.0-28.6	31.0 26.7-35.3	30.9 23.2-38.6	33.1 29.9-36.3	36.3 32.1-40.5	35.9 33.0-38.7	34.4 31.9-36.8	28.6 21.3-36.0	34.3 31.4-37.2	31.3 27.0-35.5
Delivery vans	22.5 16.8-28.2	23.8 18.8-28.7	20.2 14.6-25.8	29.6 25.4-33.9	26.6 19.2-33.9	27.7 24.7-30.7	35.7 31.5-39.8	33.1 30.3-35.8	31.5 29.1-33.9	27.4 20.2-34.5	29.8 27.0-32.6	26.9 22.9-30.9
Lorries	29.9 23.6-36.2	27.8 22.6-33.1	25.6 19.6-31.6	30.5 26.2-34.8	27.3 19.8-34.8	32.2 29.0-35.3	33.5 29.5-37.5	32.8 30.0-35.6	33.0 30.5-35.4	26.5 19.4-33.5	32.2 29.4-35.1	35.2 30.9-39.6
Buses	16.6 11.6-21.7	12.6 9.0-16.2	8.7 5.1-12.4	18.4 14.8-22.1	10.7 5.7-15.7	15.9 13.5-18.4	20.2 16.8-23.6	18.2 16.0-20.4	15.3 13.5-17.0	13.6 8.3-18.9	17.6 15.4-19.8	18.6 15.1-22.0
Mopeds	38.8 31.9-45.6	27.5 22.1-33.0	23.7 17.7-29.6	37.3 32.6-41.9	38.0 29.8-46.2	36.9 33.6-40.2	41.9 37.6-46.1	47.2 44.2-50.2	44.9 42.3-47.6	34.5 26.7-42.2	37.0 34.0-40.0	41.0 36.5-45.6
Motorcycles/ motorbikes	33.2 26.6-39.8	22.4 17.4-27.4	19.1 14.0-24.3	31.2 26.7-35.6	22.9 15.8-29.9	29.4 26.3-32.5	33.3 29.2-37.4	36.8 33.9-39.7	36.8 34.3-39.4	31.4 23.7-39.0	28.1 25.4-30.8	31.4 27.1-35.6
Military vehicles	1.0 0.0-2.5	2.3 0.5-4.1	2.0 0.0-3.9	2.2 0.8-3.5	0.9 0.0-2.7	3.7 2.4-5.0	3.1 1.7-4.6	2.4 1.5-3.3	1.9 1.2-2.7	0.0 0.0-0.0	4.9 3.6-6.2	4.5 2.6-6.4

Table 5-46 Sleep disturbance sources road traffic

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe sleep disturbance												
Passenger cars	2.4	2.2	0.8	4.0	2.3	3.8	4.0	4.8	4.3	1.6	4.5	5.7
and taxis	0.6-4.3	0.8-3.6	0.0-2.0	2.1-5.9	0.1-4.5	2.6-5.0	2.3-5.7	3.6-6.0	3.4-5.3	0.0-3.2	3.4-5.6	3.7-7.8
Delivery vans	2.3	1.7	0.8	2.0	2.5	2.6	2.0	4.1	3.1	1.7	3.0	2.7
	0.5-4.1	0.5-2.9	0.0-2.0	0.7-3.3	0.1-4.8	1.6-3.7	1.0-3.1	3.0-5.2	2.3-3.9	0.0-3.4	2.2-3.9	1.4-4.0
Lorries	5.1	3.3	2.5	3.4	3.7	3.6	2.6	4.8	4.2	2.6	4.9	3.7
	2.3-7.9	1.6-5.0	0.7-4.2	1.8-5.1	0.7-6.8	2.5-4.8	1.5-3.7	3.6-6.0	3.3-5.1	0.2-5.0	3.7-6.0	2.2-5.3
Buses	1.2	1.0	0.6	2.2	2.4	1.4	1.4	2.5	2.0	0.3	2.1	3.1
	0.2-2.2	0.1-1.9	0.0-1.7	0.8-3.7	0.1-4.7	0.7-2.0	0.6-2.3	1.6-3.3	1.3-2.6	0.0-0.6	1.4-2.9	1.7-4.6
Mopeds	4.5	3.2	1.4	6.8	2.2	4.8	7.6	9.2	6.2	6.0	5.7	6.7
	1.7-7.3	1.4-5.0	0.0-3.1	4.4-9.2	0.0-4.5	3.4-6.2	5.4-9.9	7.5-10.9	5.0-7.4	2.1-9.8	4.3-7.2	4.4-9.0
Motorcycles/motor	4.0	1.9	2.1	6.5	2.9	4.4	5.0	8.1	6.1	4.6	4.1	5.7
bikes	1.6-6.4	0.5-3.4	0.1-4.0	4.0-8.9	0.2-5.5	3.0-5.8	3.3-6.8	6.6-9.7	4.9-7.3	1.1-8.0	3.0-5.2	3.6-7.9
Military vehicles	0.0	0.2	0.6	0.8	0.0	1.0	0.8	0.3	0.3	0.0	0.9	0.3
	0.0-0.0	0.0-0.6	0.0-1.7	0.0-1.8	0.0-0.0	0.3-1.7	0.0-1.5	0.0-0.6	0.1-0.6	0.0-0.0	0.3-1.5	0.0-0.7
sleep disturbance												
Passenger cars	9.2	5.8	3.8	9.6	9.5	9.7	9.8	12.3	11.6	6.8	12.1	11.7
and taxis	5.5-12.9	3.3-8.4	1.4-6.1	6.9-12.2	4.8-14.2	7.8-11.5	7.4-12.2	10.5-14.1	10.0-13.1	3.4-10.3	10.2-14.1	8.9-14.5
Delivery vans	6.1	4.3	3.0	6.9	5.7	6.3	5.7	9.2	7.9	4.2	7.7	6.9
	3.1-9.2	2.3-6.2	1.0-4.9	4.6-9.2	2.2-9.3	4.8-7.9	3.9-7.5	7.6-10.7	6.6-9.2	1.7-6.8	6.3-9.2	4.8-9.0
Lorries	10.8	7.3	6.2	7.6	5.6	8.2	8.4	10.1	8.3	7.7	9.9	10.1
	7.0-14.6	4.4-10.1	3.1-9.2	5.3-9.9	2.1-9.1	6.5-10.0	6.3-10.4	8.5-11.8	7.0-9.6	3.5-11.8	8.2-11.5	7.6-12.6
Buses	4.4	2.6	2.0	5.5	2.4	3.6	3.7	5.4	4.5	2.6	4.5	6.5
	1.9-6.9	0.9-4.3	0.3-3.6	3.3-7.7	0.1-4.7	2.5-4.7	2.3-5.1	4.2-6.6	3.6-5.4	0.3-5.0	3.4-5.6	4.5-8.5
Mopeds	14.2	8.0	5.5	13.7	9.0	11.5	13.5	19.0	15.5	11.0	12.1	14.1
	9.5-19.0	4.9-11.1	2.6-8.5	10.5-17.0	4.6-13.4	9.5-13.6	10.7-16.2	16.8-21.3	13.7-17.3	6.1-16.0	10.2-14.1	11.0-17.2
Motorcycles/motor	11.6	5.3	3.3	11.5	7.2	9.0	9.9	15.0	13.2	8.5	9.4	11.3
bikes	7.2-16.0	2.7-7.9	1.1-5.5	8.4-14.7	3.2-11.2	7.1-10.8	7.5-12.3	13.0-17.0	11.5-14.9	4.0-12.9	7.8-11.1	8.4-14.1
Military vehicles	0.8	0.7	0.9	1.1	0.0	1.5	1.2	0.7	0.8	0.0	1.5	1.2
	0.0-1.9	0.0-1.6	0.0-2.1	0.0-2.1	0.0-0.0	0.7-2.3	0.3-2.2	0.2-1.1	0.3-1.2	0.0-0.0	0.8-2.2	0.3-2.1

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
some sleep disturbance												
Passenger cars	16.3	12.7	11.3	17.4	18.8	18.0	20.0	21.6	19.4	19.0	21.1	20.5
and taxis	11.3-21.4	8.8-16.5	7.0-15.6	13.9-21.0	12.4-25.2	15.4-20.6	16.6-23.5	19.1-24.0	17.4-21.4	12.6-25.3	18.6-23.5	16.9-24.2
Delivery vans	11.6	8.7	8.1	11.7	13.5	11.2	11.9	15.1	13.5	13.6	14.7	13.9
	7.3-15.9	5.6-11.8	4.6-11.6	8.6-14.7	7.9-19.1	9.2-13.3	9.2-14.6	13.1-17.2	11.8-15.2	8.2-18.9	12.6-16.8	10.8-17.0
Lorries	17.9	13.0	10.7	13.9	14.9	14.8	15.3	16.5	14.0	15.7	17.1	17.5
	12.6-23.1	9.1-16.8	6.7-14.6	10.7-17.1	9.0-20.8	12.4-17.1	12.3-18.3	14.4-18.7	12.3-15.8	9.9-21.6	14.9-19.3	14.1-20.9
Buses	7.9	5.5	4.2	9.1	4.0	6.3	8.4	10.0	8.1	7.3	8.5	11.4
	4.4-11.4	2.9-8.1	1.8-6.5	6.4-11.9	0.8-7.1	4.7-7.9	6.1-10.7	8.3-11.7	6.8-9.4	3.2-11.4	6.9-10.1	8.6-14.2
Mopeds	21.0	18.1	13.2	26.1	23.2	20.2	25.4	31.7	26.0	18.4	21.0	24.9
	15.3-26.7	13.5-22.6	8.5-17.9	21.8-30.3	16.1-30.3	17.5-23.0	21.6-29.2	28.9-34.5	23.7-28.3	12.2-24.7	18.5-23.5	20.8-28.9
Motorcycles/motor	17.1	10.6	9.6	19.2	15.4	14.3	18.1	23.2	21.3	16.8	16.8	18.2
bikes	11.8-22.4	6.9-14.4	5.6-13.6	15.3-23.0	9.4-21.3	11.9-16.7	14.8-21.4	20.7-25.7	19.1-23.4	10.6-23.0	14.5-19.1	14.6-21.7
Military vehicles	2.7	1.9	1.8	1.5	0.0	2.2	2.4	1.1	1.3	0.0	2.8	3.0
	0.3-5.1	0.2-3.6	0.1-3.4	0.4-2.7	0.0-0.0	1.2-3.3	1.1-3.7	0.6-1.7	0.7-1.8	0.0-0.0	1.7-3.9	1.4-4.5

Table 5-47 Annoyance sources rail and air traffic

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Trains	1.4	0.7	0.9	2.1	0.2	2.2	0.3	0.7	1.3	0.7	2.0	1.3
	0.0-2.9	0.0-1.6	0.0-2.2	0.6-3.6	0.0-0.4	1.1-3.2	0.0-0.7	0.2-1.2	0.7-2.0	0.0-1.9	1.1-2.8	0.2-2.3
Trams	0.0	0.0	0.0	0.4	0.0	0.0	0.1	1.1	1.0	0.0	0.2	0.0
	0.0-0.0	0.0-0.0	0.0-0.0	0.0-1.2	0.0-0.0	0.0-0.0	0.0-0.4	0.6-1.7	0.6-1.5	0.0-0.0	0.0-0.5	0.0-0.0
Metro	0.0	0.0	0.0	0.4	0.6	0.1	0.2	0.4	0.3	0.0	0.3	0.0
	0.0-0.0	0.0-0.0	0.0-0.0	0.0-1.2	0.0-1.7	0.0-0.3	0.0-0.6	0.0-0.7	0.1-0.6	0.0-0.0	0.0-0.7	0.0-0.0
Passenger aeroplanes	0.4	0.2	0.0	0.7	2.8	0.6	2.1	8.0	2.7	0.0	1.6	2.1
	0.0-1.0	0.0-0.6	0.0-0.1	0.0-1.6	0.4-5.2	0.1-1.1	0.9-3.2	6.3-9.6	1.8-3.5	0.0-0.0	0.8-2.3	0.8-3.4
Sport and business aeroplanes	0.4	0.2	0.0	0.8	1.2	1.0	1.8	1.7	1.0	0.0	1.2	1.4
	0.0-1.0	0.0-0.6	0.0-0.0	0.0-1.8	0.0-2.8	0.4-1.6	0.7-2.9	0.9-2.5	0.5-1.4	0.0-0.0	0.5-1.8	0.3-2.6
Advertising aeroplanes	0.4	0.0	0.0	0.7	0.1	0.9	1.0	1.2	0.8	0.0	0.7	1.2
	0.0-1.0	0.0-0.0	0.0-0.0	0.0-1.6	0.0-0.3	0.3-1.5	0.1-1.9	0.5-1.9	0.3-1.3	0.0-0.0	0.2-1.2	0.2-2.3
Military aeroplanes	0.4	2.4	1.1	1.9	0.8	2.4	0.8	1.1	0.8	0.0	4.0	3.0
	0.0-1.2	0.7-4.2	0.0-2.3	0.5-3.2	0.0-2.3	1.4-3.5	0.1-1.6	0.4-1.7	0.3-1.2	0.0-0.0	2.8-5.2	1.5-4.5
Helicopters	2.4	1.2	0.7	1.3	6.2	3.7	5.7	5.5	4.7	0.1	4.6	1.9
	0.6-4.2	0.2-2.3	0.0-1.5	0.1-2.4	2.3-10.1	2.4-4.9	3.7-7.7	4.1-6.9	3.6-5.9	0.0-0.2	3.3-6.0	0.7-3.2
Drones	0.0	0.0	0.0	0.6	0.0	0.4	0.4	1.0	0.2	0.0	0.6	0.3
	0.0-0.0	0.0-0.0	0.0-0.1	0.0-1.5	0.0-0.0	0.0-0.9	0.0-0.8	0.4-1.6	0.0-0.5	0.0-0.0	0.1-1.1	0.0-0.5
annoyance												
Trains	2.6	2.2	1.2	4.5	4.4	4.9	2.9	3.1	3.7	2.3	4.4	3.1
	0.8-4.4	0.4-3.9	0.0-2.6	2.6-6.4	0.8-8.1	3.4-6.3	1.7-4.1	2.1-4.1	2.8-4.7	0.0-4.5	3.2-5.6	1.5-4.7
Trams	0.1	0.0	0.0	0.4	0.0	0.1	0.3	2.8	3.3	0.0	0.3	0.0
	0.0-0.4	0.0-0.0	0.0-0.0	0.0-1.2	0.0-0.0	0.0-0.2	0.0-0.7	1.9-3.6	2.4-4.2	0.0-0.0	0.0-0.7	0.0-0.0
Metro	0.0	0.0	0.0	0.4	0.6	0.2	0.4	1.3	1.3	0.0	0.4	0.2
	0.0-0.0	0.0-0.0	0.0-0.0	0.0-1.2	0.0-1.7	0.0-0.5	0.0-0.8	0.6-2.0	0.7-1.9	0.0-0.0	0.0-0.9	0.0-0.5
Passenger aeroplanes	1.5	0.7	0.9	1.4	11.6	2.0	6.1	18.3	9.0	0.0	5.1	6.0
	0.0-3.0	0.0-1.5	0.0-1.9	0.3-2.5	6.4-16.8	1.1-2.9	4.2-7.9	16.1-20.6	7.6-10.4	0.0-0.0	3.8-6.4	4.0-8.1
Sport and business aeroplanes	0.9	0.7	1.4	1.3	6.9	2.4	3.9	4.7	3.2	0.9	2.8	3.7
	0.0-1.9	0.0-1.5	0.1-2.8	0.2-2.4	2.7-11.0	1.5-3.4	2.3-5.5	3.4-5.9	2.3-4.0	0.0-1.9	1.8-3.7	2.0-5.3

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Advertising aeroplanes	0.7	0.6	1.0	1.1	1.7	2.5	1.9	3.1	1.9	0.3	1.8	2.6
	0.0-1.6	0.0-1.5	0.0-2.1	0.1-2.1	0.0-4.1	1.5-3.6	0.8-2.9	2.0-4.1	1.2-2.6	0.0-0.9	1.0-2.6	1.2-4.0
Military aeroplanes	0.9	8.8	3.7	2.9	1.9	5.2	2.3	2.3	1.7	0.7	9.1	8.3
	0.0-2.1	5.5-12.1	1.4-6.1	1.4-4.5	0.0-4.1	3.8-6.7	1.1-3.5	1.4-3.2	1.0-2.4	0.0-1.7	7.4-10.8	5.9-10.8
Helicopters	8.0	6.3	2.3	3.1	15.1	8.3	13.0	14.0	11.7	3.0	11.7	5.4
	4.6-11.4	3.6-9.0	0.8-3.8	1.5-4.7	9.3-21.0	6.5-10.1	10.2-15.7	12.0-16.0	10.0-13.4	0.4-5.6	9.8-13.6	3.4-7.3
Drones	0.5	1.7	0.4	0.9	0.0	0.8	0.9	1.6	0.7	0.2	1.1	0.9
	0.0-1.2	0.0-3.4	0.0-1.2	0.0-1.8	0.0-0.0	0.2-1.4	0.2-1.7	0.8-2.4	0.2-1.2	0.0-0.6	0.4-1.7	0.2-1.5
some annoyance												
Trains	4.5	4.1	2.5	10.4	7.6	10.4	9.8	6.9	8.1	4.5	8.3	5.6
	1.7-7.3	1.8-6.4	0.5-4.4	7.5-13.3	3.1-12.1	8.3-12.5	7.2-12.4	5.4-8.4	6.6-9.5	1.0-7.9	6.7-10.0	3.5-7.6
Trams	0.1	0.0	0.0	0.4	0.0	0.4	0.9	4.5	5.6	0.0	0.5	0.2
	0.0-0.4	0.0-0.0	0.0-0.0	0.0-1.2	0.0-0.0	0.0-0.9	0.0-1.8	3.4-5.6	4.5-6.8	0.0-0.0	0.0-0.9	0.0-0.4
Metro	0.0	0.0	0.5	0.4	0.6	0.7	0.8	3.2	2.8	0.0	0.7	0.7
	0.0-0.0	0.0-0.0	0.0-1.6	0.0-1.2	0.0-1.7	0.1-1.2	0.0-1.6	2.1-4.3	1.9-3.8	0.0-0.0	0.2-1.2	0.0-1.5
Passenger aeroplanes	3.3	3.8	2.7	3.4	25.6	5.2	13.0	33.2	18.7	3.7	10.8	11.7
	0.9-5.7	1.5-6.1	0.5-4.9	1.7-5.1	18.3-32.9	3.7-6.7	10.1-15.8	30.4-36.1	16.7-20.8	0.6-6.7	8.9-12.7	8.9-14.5
Sport and business aeroplanes	4.2	1.8	3.8	3.6	13.2	5.8	8.6	8.3	7.6	3.7	6.7	7.3
	1.5-6.8	0.4-3.3	1.1-6.5	1.9-5.3	7.8-18.7	4.2-7.3	6.1-11.0	6.7-10.0	6.3-9.0	0.9-6.5	5.2-8.2	5.1-9.5
Advertising aeroplanes	1.9	0.8	3.5	2.3	3.3	4.9	3.8	5.2	4.4	1.9	4.0	4.4
	0.2-3.6	0.0-1.9	0.9-6.1	0.8-3.7	0.3-6.3	3.4-6.4	2.1-5.4	3.9-6.5	3.3-5.5	0.0-3.9	2.8-5.2	2.7-6.2
Military aeroplanes	2.8	18.0	7.4	4.9	4.1	10.6	5.4	4.7	3.6	1.9	16.3	13.9
	0.3-5.3	13.4-22.7	3.8-11.1	2.9-6.9	0.8-7.3	8.5-12.7	3.5-7.3	3.4-6.0	2.6-4.6	0.0-3.8	14.0-18.6	10.7-17.1
Helicopters	13.5	15.6	8.8	6.7	33.3	18.0	25.1	27.8	24.9	6.7	22.3	11.1
	9.0-18.1	11.2-19.9	5.0-12.7	4.4-9.0	25.3-41.2	15.4-20.6	21.3-28.8	25.1-30.4	22.6-27.2	3.0-10.5	19.7-24.9	8.2-14.0
Drones	1.8	2.8	0.4	1.6	2.4	2.1	2.3	2.6	1.7	0.8	1.7	1.3
	0.0-3.8	0.8-4.8	0.0-1.2	0.3-2.9	0.0-5.2	1.1-3.1	1.0-3.5	1.6-3.6	1.0-2.4	0.0-1.9	0.9-2.5	0.4-2.3

Table 5-48 Sleep disturbance sources rail and air traffic

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe sleep disturbance												
Trains	1.0	0.0	0.0	1.5	0.0	1.4	0.6	0.5	0.8	0.6	1.8	1.6
	0.0-2.2	0.0-0.1	0-0.0	0.3-2.7	0.0-0.0	0.5-2.2	0.0-1.4	0.1-0.9	0.4-1.3	0.0-1.8	1.0-2.6	0.4-2.9
Trams	0.1	0.0	0.0	0.4	0.0	0.0	0.1	0.9	0.6	0.0	0.1	0.0
	0.0-0.4	0.0-0.0	0-0.0	0.0-1.2	0.0-0.0	0.0-0.0	0.0-0.2	0.3-1.4	0.3-1.0	0.0-0.0	0.0-0.2	0.0-0.0
Metro	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.5	0.1	0.0	0.1	0.0
	0.0-0.0	0.0-0.0	0-0.0	0.0-1.2	0.0-0.0	0.0-0.0	0.0-0.9	0.1-1.0	0.0-0.3	0.0-0.0	0.0-0.2	0.0-0.1
Passenger planes	0.3	0.0	0.0	0.4	0.8	0.3	0.9	5.6	1.8	0.1	0.9	1.9
	0.0-1.0	0.0-0.0	0-0.0	0.0-1.2	0.0-1.9	0.0-0.7	0.2-1.6	4.3-7.0	1.1-2.5	0.0-0.2	0.3-1.5	0.6-3.1
Sport and business aeroplanes	0.0	0.0	0.0	0.4	0.1	0.1	0.5	1.4	0.5	0.0	0.4	1.2
	0.0-0.0	0.0-0.0	0-0.0	0.0-1.2	0.0-0.3	0.0-0.3	0.0-1.0	0.6-2.1	0.1-0.8	0.0-0.0	0.0-0.8	0.2-2.1
Advertising aeroplanes	0.0	0.0	0.0	0.4	0.1	0.2	0.2	0.7	0.3	0.0	0.1	0.5
	0.0-0.0	0.0-0.0	0-0.0	0.0-1.2	0.0-0.3	0.0-0.5	0.0-0.6	0.2-1.2	0.0-0.6	0.0-0.0	0.0-0.3	0.0-1.1
Military aeroplanes	0.2	1.1	0.0	0.7	0.8	1.4	0.8	0.6	0.3	0.0	2.1	1.9
	0.0-0.4	0.0-2.4	0-0.0	0.0-1.5	0.0-2.3	0.5-2.3	0.2-1.4	0.1-1.1	0.0-0.5	0.0-0.0	1.2-2.9	0.7-3.1
Helicopters	1.2	0.7	0.0	0.9	3.3	1.6	4.7	4.6	3.7	0.0	2.6	1.1
	0.0-2.7	0.0-1.5	0-0.0	0.0-1.9	0.7-5.9	0.7-2.5	2.8-6.6	3.3-5.8	2.6-4.8	0.0-0.0	1.6-3.6	0.2-1.9
sleep disturbance												
Trains	2.2	0.6	0.0	4.3	0.5	3.9	1.2	2.3	2.6	1.0	3.4	3.1
	0.5-3.9	0.0-1.4	0-0.0	2.4-6.2	0.0-1.4	2.5-5.2	0.3-2.2	1.5-3.1	1.8-3.4	0.0-2.5	2.3-4.4	1.5-4.7
Trams	0.1	0.0	0.0	0.5	0.0	0.1	0.4	2.0	1.7	0.0	0.4	0.0
	0.0-0.4	0.0-0.0	0-0.0	0.0-1.3	0.0-0.0	0.0-0.3	0.0-0.9	1.2-2.7	1.1-2.4	0.0-0.0	0.0-0.8	0.0-0.0
Metro	0.0	0.0	0.0	0.5	0.0	0.1	0.5	1.0	0.9	0.0	0.2	0.0
	0.0-0.0	0.0-0.0	0-0.0	0.0-1.3	0.0-0.0	0.0-0.3	0.0-1.0	0.4-1.5	0.4-1.5	0.0-0.0	0.0-0.5	0.0-0.1
Passenger planes	0.8	0.4	0.3	0.6	5.6	0.9	3.1	11.4	4.3	0.7	2.3	4.7
	0.0-1.9	0.0-1.1	0-0.8	0.0-1.5	2.0-9.1	0.3-1.4	1.7-4.5	9.6-13.2	3.3-5.3	0.0-2.2	1.4-3.2	2.9-6.6
Sport and business aeroplanes	0.0	0.3	0.0	0.6	3.1	0.4	0.8	3.3	1.5	0.4	1.1	2.6
	0.0-0.0	0.0-0.8	0-0.0	0.0-1.4	0.6-5.5	0.0-0.7	0.2-1.5	2.3-4.4	0.8-2.1	0.0-1.1	0.5-1.7	1.2-3.9

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Advertising aeroplanes	0.0	0.4	0.0	0.5	1.8	0.4	0.3	2.2	0.8	0.0	0.6	1.3
	0.0-0.0	0.0-0.9	0-0.0	0.0-1.3	0.0-3.9	0.0-0.8	0.0-0.6	1.3-3.0	0.3-1.3	0.0-0.0	0.2-1.1	0.5-2.2
Military aeroplanes	0.6	3.2	0.0	1.1	0.8	2.4	1.7	1.6	0.7	0.0	3.9	4.0
	0.0-1.4	1.3-5.2	0-0.0	0.1-2.1	0.0-2.3	1.3-3.4	0.6-2.7	0.9-2.4	0.3-1.1	0.0-0.0	2.8-5.1	2.3-5.7
Helicopters	5.2	2.7	0.3	2.0	9.4	3.9	9.4	8.9	7.7	0.7	5.9	3.2
	2.5-7.9	0.7-4.8	0-0.7	0.7-3.3	5.0-13.9	2.5-5.2	6.9-11.9	7.2-10.6	6.3-9.1	0.0-2.2	4.5-7.4	1.6-4.8
some sleep disturbance												
Trains	3.7	1.4	0.4	6.5	2.4	7.7	3.9	4.6	5.0	2.8	5.3	4.6
	1.3-6.2	0.1-2.8	0-1.0	4.1-8.9	0.0-5.3	5.8-9.5	2.3-5.6	3.3-5.8	3.8-6.2	0.2-5.3	3.9-6.6	2.7-6.5
Trams	0.1	0.0	0.0	0.6	0.0	0.5	0.6	2.9	3.4	0.0	0.5	0.2
	0.0-0.4	0.0-0.0	0-0.0	0.0-1.5	0.0-0.0	0.0-1.0	0.0-1.3	2.0-3.8	2.5-4.3	0.0-0.0	0.0-1.0	0.0-0.4
Metro	0.0	0.0	0.0	0.6	0.0	0.5	0.5	2.3	1.5	0.0	0.6	0.4
	0.0-0.0	0.0-0.0	0-0.0	0.0-1.5	0.0-0.0	0.0-1.0	0.0-1.1	1.4-3.2	0.8-2.1	0.0-0.0	0.2-1.0	0.0-0.7
Passenger planes	1.5	1.3	0.3	2.1	11.8	2.6	6.3	20.1	8.9	1.9	4.9	7.9
	0.0-3.0	0.0-2.6	0-0.8	0.7-3.5	6.4-17.3	1.5-3.7	4.3-8.3	17.7-22.4	7.4-10.4	0.0-4.1	3.6-6.2	5.5-10.3
Sport and business aeroplanes	1.1	1.1	0.0	1.7	5.8	1.2	1.5	4.8	3.1	1.4	2.5	3.9
	0.0-2.3	0.0-2.3	0-0.0	0.4-3.1	1.8-9.8	0.5-1.9	0.6-2.5	3.6-6.1	2.2-4.0	0.0-3.3	1.5-3.5	2.2-5.6
Advertising aeroplanes	0.3	0.8	0.0	1.6	3.2	1.2	0.8	2.7	1.7	1.2	1.7	2.7
	0.0-1.0	0.0-1.9	0-0.0	0.3-2.8	0.1-6.4	0.5-2.0	0.1-1.4	1.8-3.7	1.1-2.4	0.0-2.9	0.9-2.5	1.3-4.0
Military aeroplanes	1.2	7.0	1.1	2.7	2.1	4.6	2.9	2.7	1.9	0.5	7.4	6.0
	0.0-2.8	3.9-10.1	0-2.8	1.1-4.3	0.0-4.6	3.1-6.2	1.5-4.3	1.7-3.7	1.2-2.6	0.0-1.4	5.8-9.0	3.9-8.1
Helicopters	10.5	7.3	1.7	3.9	17.0	8.0	16.9	17.1	14.2	2.8	10.8	5.4
	6.4-14.5	3.9-10.7	0-3.5	2.0-5.7	10.8-23.2	6.1-9.8	13.6-20.1	14.8-19.3	12.3-16.1	0.2-5.4	8.8-12.7	3.4-7.5

Table 5-49 Annoyance neighbours' sounds and outdoor sounds

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Contact sounds from neighbours	9.9 5.4-14.3	4.4 1.7-7.1	4.2 1.0-7.3	6.5 4.1-8.8	6.0 2.2-9.7	7.7 5.8-9.6	7.7 5.4-10.1	11.5 9.5-13.4	10.3 8.7-12.0	6.7 2.4-11.0	7.8 6.2-9.5	6.3 4.0-8.7
Radio, TV, PC, or (mobile) telephones	3.8 0.8-6.7	0.4 0.0-1.1	2.2 0.1-4.4	2.2 0.8-3.7	3.7 0.2-7.2	3.1 1.9-4.3	2.6 1.3-4.0	4.7 3.4-6.0	3.5 2.6-4.5	2.8 0.2-5.4	3.0 2.0-4.1	2.1 0.8-3.4
Air-conditioning	0.1 0.0-0.2	0.0 0.0-0.0	0.0 0.0-0.1	1.1 0.0-2.2	0.0 0.0-0.1	1.4 0.5-2.2	0.7 0.0-1.3	1.3 0.6-2.0	0.7 0.3-1.1	0.1 0.0-0.2	0.8 0.2-1.4	0.3 0.0-0.7
Outdoor activities	7.8 4.2-11.4	3.3 1.4-5.2	3.5 1.1-5.9	5.8 3.6-8.1	9.5 4.7-14.4	8.0 6.2-9.9	9.1 6.6-11.6	9.8 8.1-11.6	9.3 7.7-10.8	7.1 2.7-11.5	7.6 6.0-9.3	8.5 5.9-11.2
Lift, gallery, stairwell	1.7 0.0-3.7	1.6 0.1-3.2	0.7 0.0-2.0	0.9 0.0-2.0	1.0 0.0-2.2	1.6 0.6-2.6	3.0 1.4-4.7	3.7 2.5-4.8	3.0 2.1-4.0	2.6 0.1-5.2	1.0 0.3-1.6	0.9 0.2-1.6
Maintenance by municipality	4.2 1.5-6.9	1.4 0.3-2.5	3.4 0.7-6.2	4.0 2.1-5.9	5.7 1.9-9.5	3.6 2.3-4.9	3.7 2.2-5.3	6.9 5.4-8.4	4.8 3.7-5.8	1.6 0.0-3.7	4.0 2.8-5.2	4.6 2.6-6.6
annoyance												
Contact sounds from neighbours	18.4 12.9-24.0	9.4 5.8-13.1	11.0 6.3-15.7	15.9 12.5-19.4	16.5 10.5-22.5	16.8 14.3-19.4	21.5 17.9-25.0	25.1 22.5-27.7	22.4 20.2-24.5	14.2 8.5-19.9	16.8 14.6-19.1	14.7 11.4-18.0
Radio, TV, PC, or (mobile) telephones	10.0 5.6-14.4	2.6 0.8-4.5	6.5 2.9-10.1	6.3 4.0-8.7	7.9 3.2-12.6	7.5 5.6-9.3	8.9 6.4-11.4	13.1 11.1-15.1	9.7 8.1-11.2	7.4 3.1-11.7	6.6 5.1-8.1	6.9 4.7-9.2
Air-conditioning	1.2 0.0-2.9	0.2 0.0-0.5	0.3 0.0-0.8	2.0 0.5-3.4	0.5 0.0-1.3	1.9 0.9-2.9	1.7 0.7-2.7	2.5 1.6-3.4	1.5 0.9-2.1	1.9 0.0-4.5	1.4 0.7-2.1	1.0 0.2-1.8
Outdoor activities	16.3 11.4-21.2	13.3 9.3-17.3	14.5 9.8-19.2	15.9 12.5-19.2	20.8 14.1-27.4	20.3 17.6-22.9	21.1 17.6-24.5	24.3 21.8-26.8	22.1 20.0-24.3	15.4 9.8-21.0	19.0 16.6-21.4	16.2 12.8-19.5
Lift, gallery, stairwell	3.5 0.6-6.3	1.9 0.3-3.5	1.7 0.0-3.6	2.2 0.7-3.7	3.0 0.0-6.1	2.7 1.6-3.9	6.7 4.4-9.1	8.0 6.3-9.6	6.5 5.2-7.8	3.2 0.6-5.9	2.3 1.4-3.1	2.9 1.4-4.4
Maintenance by municipality	11.0 7.0-15.0	4.2 2.0-6.5	7.8 3.9-11.7	11.2 8.3-14.1	15.2 9.4-21.0	9.4 7.5-11.3	11.6 9.1-14.2	15.7 13.5-17.9	13.9 12.1-15.6	7.3 3.2-11.4	10.9 9.1-12.8	10.0 7.3-12.7

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
some annoyance												
Contact sounds from neighbours	30.7	19.8	23.3	30.7	36.1	30.9	37.1	42.2	39.6	29.0	31.2	26.0
	24.1-37.4	14.8-24.8	17.1-29.6	26.2-35.1	28.0-44.1	27.6-34.1	32.9-41.4	39.2-45.2	37.0-42.2	21.5-36.6	28.3-34.1	21.8-30.2
Radio, TV, PC, or (mobile) telephones	15.8	4.6	12.1	15.0	15.3	15.2	17.7	23.6	18.2	12.4	13.3	14.9
	10.4-21.2	2.0-7.1	7.2-16.9	11.5-18.5	9.3-21.4	12.7-17.7	14.3-21.1	21.0-26.3	16.2-20.3	6.9-17.9	11.1-15.4	11.4-18.3
Air-conditioning	1.2	1.0	0.3	3.7	1.1	2.9	3.1	4.2	3.2	4.5	2.3	2.4
	0.0-2.9	0.0-2.3	0.0-0.8	1.7-5.7	0.0-2.5	1.7-4.2	1.6-4.6	3.0-5.4	2.3-4.1	0.8-8.1	1.4-3.2	0.9-3.9
Outdoor activities	37.9	30.0	32.2	34.7	42.9	37.5	38.6	43.8	40.6	29.8	34.7	30.1
	31.1-44.7	24.4-35.7	25.6-38.7	30.1-39.2	34.7-51.2	34.1-40.8	34.4-42.9	40.8-46.8	38.0-43.3	22.3-37.3	31.8-37.7	25.8-34.4
Lift, gallery, stairwell	4.4	3.4	3.9	4.8	5.2	4.7	10.6	13.2	11.0	4.4	4.5	4.4
	1.4-7.5	1.2-5.6	1.0-6.8	2.5-7.1	1.3-9.1	3.1-6.2	7.7-13.6	11.1-15.3	9.3-12.7	1.3-7.4	3.2-5.8	2.5-6.4
Maintenance by municipality	22.9	15.3	17.0	22.8	27.4	25.5	27.2	30.7	29.0	18.0	22.6	23.9
	17.1-28.8	11.0-19.7	11.6-22.3	18.7-26.8	19.8-34.9	22.5-28.5	23.2-31.1	27.9-33.5	26.6-31.4	11.8-24.2	20.0-25.2	19.9-27.9

Table 5-50 Sleep disturbance neighbours' sound and outdoor sound

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe sleep disturbance												
Contact sounds	7.4	2.2	3.4	3.2	4.2	4.8	5.4	6.8	5.5	5.0	4.1	4.6
from neighbours	3.5-11.2	0.3-4.0	0.5-6.3	1.5-4.8	0.9-7.5	3.3-6.4	3.4-7.4	5.2-8.3	4.3-6.7	1.3-8.7	2.9-5.3	2.6-6.7
Radio, TV, PC, or	2.0	0.6	2.1	1.6	1.3	1.6	1.8	3.0	2.8	2.3	1.9	1.6
(mobile) telephones	0.0-4.1	0.0-1.7	0.0-4.3	0.4-2.9	0.0-3.1	0.7-2.4	0.7-2.8	2.0-4.1	1.9-3.7	0.0-4.6	1.1-2.7	0.4-2.8
Air-conditioning	0.1	0.5	0.0	1.0	0.5	0.8	0.2	1.4	0.4	0.7	0.3	0.3
	0.0-0.2	0.0-1.6	0.0-0.0	0.0-1.9	0.0-1.3	0.2-1.5	0.0-0.5	0.6-2.1	0.1-0.7	0.0-1.9	0.0-0.5	0.0-0.6
Outdoor activities	5.1	1.7	1.7	2.5	5.1	4.4	7.2	7.3	4.5	2.6	3.6	3.4
	2.1-8.1	0.3-3.2	0.0-3.5	1.0-4.0	1.4-8.8	3.0-5.8	4.9-9.6	5.7-8.8	3.4-5.6	0.2-5.0	2.4-4.7	1.7-5.1
Lift, gallery,	1.5	1.5	0.0	1.4	1.0	0.9	2.8	3.1	1.3	2.3	0.6	0.8
stairwell	0.0-3.4	0.0-3.1	0.0-0.0	0.0-2.7	0.0-2.2	0.2-1.7	1.2-4.4	2.0-4.1	0.7-1.9	0.0-4.7	0.1-1.0	0.1-1.5
Maintenance by	1.9	2.1	0.7	2.4	2.6	1.4	2.1	4.1	2.8	0.0	1.6	2.4
municipality	0.1-3.6	0.3-4.0	0.0-2.2	0.9-4.0	0.2-5.1	0.6-2.3	0.9-3.3	2.9-5.3	2.0-3.7	0.0-0.1	0.8-2.3	0.9-3.9
sleep disturbance												
Contact sounds	13.3	6.5	5.3	7.4	9.3	9.1	12.9	15.3	12.8	7.1	9.3	8.9
from neighbours	8.3-18.2	3.5-9.5	1.9-8.6	4.9-9.9	4.5-14.1	7.1-11.0	9.9-15.9	13.2-17.5	11.0-14.5	2.7-11.5	7.5-11.1	6.2-11.5
Radio, TV, PC, or	6.4	2.1	5.8	3.4	4.4	4.5	5.2	7.7	5.7	3.6	4.2	4.1
(mobile) telephones	2.8-10.0	0.3-3.9	2.4-9.3	1.6-5.2	0.8-8.1	3.0-5.9	3.3-7.2	6.1-9.3	4.4-6.9	0.6-6.6	3.0-5.5	2.3-5.8
Air-conditioning	0.7	1.0	0.0	1.4	0.5	1.3	1.4	2.3	1.1	1.2	1.1	1.3
	0.0-2.1	0.0-2.2	0.0-0.0	0.2-2.5	0.0-1.3	0.5-2.1	0.5-2.3	1.4-3.2	0.6-1.6	0.0-2.8	0.5-1.8	0.4-2.2
Outdoor activities	11.5	9.5	6.3	9.0	12.1	9.4	15.1	15.9	12.3	6.2	9.6	9.3
	7.3-15.8	5.9-13.2	3.0-9.6	6.3-11.6	6.8-17.4	7.4-11.3	11.9-18.3	13.7-18.1	10.6-14.0	2.5-9.9	7.8-11.4	6.6-12.0
Lift, gallery,	2.7	2.2	0.8	2.2	1.9	1.8	4.3	5.9	3.8	3.6	1.7	1.7
stairwell	0.2-5.3	0.4-4.0	0.0-1.8	0.7-3.7	0.0-4.3	0.8-2.8	2.4-6.2	4.5-7.4	2.8-4.8	0.5-6.8	0.9-2.5	0.7-2.6
Maintenance by	5.0	3.9	2.4	5.4	7.8	4.1	5.4	8.1	6.6	3.6	4.7	5.7
municipality	2.3-7.6	1.4-6.4	0.3-4.6	3.3-7.5	3.3-12.3	2.7-5.4	3.5-7.3	6.5-9.7	5.3-7.9	0.4-6.7	3.4-6.0	3.6-7.8
some sleep disturbance												
Contact sounds	22.0	12.7	9.9	15.0	16.0	16.4	19.7	26.2	22.0	11.4	16.0	14.1
from neighbours	15.8-28.1	8.5-17.0	5.5-14.4	11.4-18.5	9.7-22.2	13.7-19.0	16.1-23.2	23.5-28.9	19.8-24.3	6.0-16.8	13.7-18.3	10.8-17.5

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Radio, TV, PC, or (mobile) telephones	11.8	3.9	7.3	7.0	9.3	9.1	10.4	14.2	10.8	5.8	7.5	7.3
	7.0-16.6	1.5-6.3	3.5-11.2	4.5-9.6	4.2-14.4	7.0-11.2	7.6-13.2	12.0-16.3	9.1-12.5	2.0-9.7	5.8-9.2	4.8-9.7
Air-conditioning	1.2	1.2	0.4	2.3	1.1	2.3	2.1	3.2	2.1	1.2	1.5	1.7
	0.0-2.8	0.0-2.5	0.0-1.2	0.7-3.9	0.0-2.5	1.2-3.4	0.8-3.3	2.1-4.2	1.3-2.8	0.0-2.8	0.8-2.3	0.7-2.8
Outdoor activities	21.4	17.9	10.9	18.5	20.7	20.1	22.7	27.3	22.3	15.5	18.8	17.0
	15.6-27.2	13.0-22.8	6.5-15.4	14.7-22.4	13.9-27.5	17.3-23.0	18.9-26.5	24.6-30.1	20.1-24.6	9.6-21.5	16.3-21.2	13.5-20.5
Lift, gallery, stairwell	3.6	3.4	1.8	3.2	2.5	2.9	6.2	8.7	7.1	4.4	2.9	2.3
	0.8-6.5	1.2-5.6	0.0-3.8	1.3-5.1	0.0-5.2	1.6-4.1	3.8-8.5	7.0-10.5	5.7-8.5	1.0-7.7	1.9-4.0	1.0-3.6
Maintenance by municipality	9.4	6.3	4.5	10.2	12.0	8.7	10.9	13.5	13.1	8.5	9.2	9.8
	5.4-13.5	3.2-9.5	1.5-7.5	7.2-13.2	6.5-17.4	6.7-10.7	8.0-13.7	11.4-15.6	11.3-15.0	3.8-13.2	7.4-11.1	7.0-12.6

Table 5-51 Annoyance industrial and commercial activities

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Shopping street	0.0	0.1	1.2	0.6	0.5	0.8	0.4	1.5	1.1	0.0	1.0	1.1
	0.0-0.0	0.0-0.3	0.0-2.9	0.0-1.4	0.0-1.3	0.2-1.5	0.0-0.8	0.8-2.2	0.5-1.6	0.0-0.0	0.4-1.5	0.2-2.0
Loading and unloading	1.1	0.8	1.5	1.5	0.0	2.1	1.3	3.6	1.8	3.2	2.0	3.7
	0.0-2.3	0.0-1.7	0.0-3.2	0.3-2.8	0.0-0.0	1.1-3.0	0.4-2.1	2.5-4.7	1.1-2.4	0.3-6.2	1.1-2.9	1.9-5.5
Shunting yards	0.4	1.0	1.2	1.0	0.1	0.5	0.2	0.7	0.5	0.7	0.4	0.7
	0.0-1.1	0.0-2.3	0.0-2.9	0.0-2.0	0.0-0.3	0.0-0.9	0.0-0.6	0.2-1.1	0.1-0.9	0.0-2.2	0.0-0.8	0.0-1.5
Agricultural tractors	3.5	2.5	5.1	2.2	1.4	1.6	1.3	0.9	1.5	2.1	2.1	1.9
	1.1-5.8	0.9-4.1	2.1-8.0	0.9-3.4	0.0-3.4	0.9-2.4	0.4-2.2	0.3-1.4	0.9-2.0	0.2-3.9	1.3-3.0	0.7-3.0
Military areas	0.0	1.0	1.6	1.1	0.0	0.5	0.3	0.2	0.0	0.6	0.2	0.0
	0.0-0.0	0.0-2.4	0.0-3.3	0.0-2.1	0.0-0.0	0.0-1.0	0.0-0.7	0.0-0.6	0.0-0.0	0.0-1.8	0.0-0.4	0.0-0.1
Windmills, wind turbines	0.0	0.6	1.5	0.4	0.0	0.0	0.2	0.3	0.0	0.0	0.1	0.0
	0.0-0.0	0.0-1.9	0.0-3.3	0.0-1.2	0.0-0.0	0.0-0.1	0.0-0.6	0.0-0.7	0.0-0.1	0.0-0.0	0.0-0.3	0.0-0.1
Low-frequency sound*	1.6	0.6	1.7	2.0	2.7	2.8	3.3	2.9	2.4	0.5	1.5	1.3
	0.1-3.2	0.0-1.7	0.0-3.5	0.6-3.4	0.0-5.5	1.6-3.9	1.6-5.0	2.0-3.9	1.6-3.2	0.0-1.2	0.8-2.2	0.5-2.2
Boats and shipping	0.0	0.7	1.2	0.4	0.0	0.1	0.3	0.9	0.3	1.5	0.0	0.5
	0.0-0.1	0.0-2.0	0.0-2.9	0.0-1.2	0.0-0.0	0.0-0.3	0.0-0.7	0.4-1.5	0.0-0.5	0.0-3.7	0.0-0.1	0.0-1.1
annoyance												
Shopping street	0.6	1.0	2.5	2.1	0.5	2.0	1.9	4.4	3.3	1.0	2.7	3.1
	0.0-1.6	0.0-2.3	0.4-4.5	0.7-3.4	0.0-1.3	1.1-2.9	0.9-2.9	3.2-5.5	2.4-4.2	0.0-3.0	1.7-3.6	1.6-4.5
Loading and unloading	2.6	2.7	3.1	3.3	1.7	5.2	5.4	7.5	5.9	4.9	4.4	6.3
	0.7-4.5	0.9-4.5	0.8-5.3	1.8-4.8	0.0-3.6	3.7-6.7	3.5-7.2	6.0-9.1	4.7-7.0	1.5-8.4	3.2-5.6	4.1-8.5
Shunting yards	1.2	2.0	1.2	1.6	1.1	1.2	0.6	2.1	1.2	0.7	1.2	1.1
	0.0-2.3	0.1-3.9	0.0-2.9	0.4-2.7	0.0-3.2	0.5-1.9	0.1-1.1	1.2-2.9	0.6-1.8	0.0-2.2	0.6-1.9	0.2-2.0
Agricultural tractors	9.0	7.9	9.3	6.4	4.2	5.0	2.7	2.9	3.0	5.7	5.2	6.3
	5.1-13.0	4.9-10.8	5.5-13.1	4.2-8.6	0.8-7.6	3.8-6.3	1.4-3.9	1.9-3.8	2.3-3.8	2.7-8.7	4.0-6.5	4.2-8.3
Military areas	0.0	1.8	2.3	1.4	0.3	1.9	0.6	0.6	0.3	0.6	0.7	0.4
	0.0-0.0	0.0-3.6	0.2-4.5	0.2-2.6	0.0-1.0	0.9-2.8	0.0-1.1	0.1-1.1	0.0-0.5	0.0-1.8	0.2-1.2	0.0-0.9
Windmills, wind turbines	0.0	1.2	1.5	0.4	0.0	0.1	0.2	0.7	0.4	0.9	0.4	0.3
	0.0-0.0	0.0-2.6	0.0-3.3	0.0-1.2	0.0-0.0	0.0-0.3	0.0-0.6	0.2-1.3	0.1-0.8	0.0-2.7	0.1-0.7	0.0-0.6

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Low-frequency sound*	4.0	2.0	2.3	4.2	4.6	4.0	6.3	5.8	5.4	4.6	3.2	3.5
	1.5-6.4	0.3-3.6	0.4-4.2	2.3-6.1	1.1-8.1	2.7-5.3	4.1-8.4	4.5-7.2	4.2-6.5	1.0-8.1	2.2-4.2	2.0-4.9
Boats and shipping	0.7	1.5	1.2	0.6	0.0	0.5	1.5	2.0	1.5	3.1	0.4	0.7
	0.0-1.5	0.0-3.1	0.0-2.9	0.0-1.5	0.0-0.0	0.1-1.0	0.5-2.5	1.2-2.9	0.9-2.2	0.0-6.2	0.0-0.8	0.1-1.4
some annoyance												
Shopping street	2.8	2.2	3.2	5.2	2.1	4.1	5.0	7.7	7.3	2.2	6.4	4.8
	0.5-5.1	0.3-4.1	0.5-5.9	3.1-7.3	0.0-4.6	2.7-5.5	3.2-6.9	6.1-9.2	5.9-8.7	0.0-4.6	4.9-7.9	2.9-6.7
Loading and unloading	6.0	5.7	5.6	8.4	8.2	10.3	11.2	14.2	12.3	11.2	9.0	10.1
	2.7-9.2	2.9-8.5	2.4-8.8	5.8-11.0	3.5-13.0	8.2-12.4	8.4-13.9	12.1-16.2	10.6-14.0	6.2-16.3	7.2-10.7	7.3-12.8
Shunting yards	2.9	2.7	1.8	3.1	1.1	2.8	2.1	3.5	2.3	1.3	1.7	2.4
	0.7-5.0	0.6-4.8	0.0-3.7	1.4-4.7	0.0-3.2	1.7-3.8	0.9-3.3	2.4-4.6	1.5-3.0	0.0-3.1	0.9-2.5	1.0-3.8
Agricultural tractors	12.8	15.4	14.9	11.8	7.4	11.0	6.7	6.1	4.8	13.6	11.4	13.2
	8.1-17.5	11.1-19.6	10.2-19.5	8.8-14.7	2.8-11.9	8.9-13.0	4.6-8.7	4.7-7.6	3.8-5.9	8.6-18.6	9.5-13.2	10.2-16.2
Military areas	0.7	2.8	2.3	1.7	0.6	3.4	0.9	0.9	0.4	0.6	1.4	0.5
	0.0-2.2	0.6-5.0	0.2-4.5	0.4-3.0	0.0-1.9	2.2-4.6	0.1-1.7	0.3-1.4	0.0-0.8	0.0-1.8	0.7-2.2	0.0-1.1
Windmills, wind turbines	1.1	2.2	1.5	0.4	0.0	0.4	0.9	1.7	0.7	1.3	0.8	0.8
	0.0-2.7	0.4-4.1	0.0-3.3	0.0-1.2	0.0-0.0	0.0-0.8	0.1-1.8	0.9-2.5	0.2-1.1	0.0-3.2	0.2-1.3	0.1-1.5
Low-frequency sound*	8.5	3.3	4.9	5.9	8.3	7.9	10.8	9.8	9.3	8.5	6.8	6.3
	4.7-12.4	1.1-5.4	2.0-7.8	3.6-8.2	3.5-13.0	6.1-9.7	7.9-13.6	8.0-11.5	7.7-10.8	3.9-13.1	5.3-8.4	4.2-8.4
Boats and shipping	0.8	1.8	1.8	0.7	0.4	1.0	3.3	3.2	3.6	3.6	0.7	1.2
	0.0-1.8	0.0-3.5	0.0-3.7	0.0-1.7	0.0-1.3	0.3-1.6	1.6-5.0	2.1-4.2	2.6-4.6	0.4-6.8	0.1-1.2	0.2-2.1

* a low, humming or buzzing sound from ventilators or air-conditioners for example

Table 5-52 Sleep disturbance industrial and commercial activities

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe sleep disturbance												
Shopping street	0.0	0.0	0.0	0.8	0.5	0.6	1.0	1.4	0.6	0.0	0.3	0.4
	0.0-0.1	0.0-0.0	0.0-0.0	0.0-1.8	0.0-1.3	0.0-1.2	0.0-1.9	0.7-2.0	0.2-0.9	0.0-0.0	0.1-0.4	0.0-0.9
Loading and unloading	0.7	0.1	0.1	1.4	0.0	0.8	1.0	2.4	2.0	2.7	0.9	1.9
	0.0-1.8	0.0-0.3	0.0-0.1	0.2-2.7	0.0-0.0	0.3-1.4	0.2-1.7	1.6-3.3	1.2-2.8	0.0-5.5	0.4-1.4	0.7-3.2
Shunting yards	0.4	0.7	0.0	1.0	0.0	0.2	0.3	0.4	0.3	0.7	0.4	0.7
	0.0-1.1	0.0-2.0	0.0-0.1	0.0-2.1	0.0-0.0	0.0-0.4	0.0-0.6	0.0-0.7	0.0-0.5	0.0-2.2	0.0-0.7	0.0-1.5
Agricultural tractors	2.9	1.6	1.6	1.4	0.7	1.0	0.5	0.5	1.0	0.1	1.4	0.6
	0.6-5.1	0.3-3.0	0.0-3.3	0.4-2.5	0.0-2.0	0.4-1.6	0.0-1.0	0.1-0.9	0.5-1.5	0.0-0.2	0.7-2.1	0.0-1.2
Military areas	0.0	1.0	0.0	0.7	0.0	0.4	0.1	0.2	0.2	0.0	0.0	0.1
	0.0-0.0	0.0-2.3	0.0-0.0	0.0-1.6	0.0-0.0	0.0-0.9	0.0-0.1	0.0-0.6	0.0-0.5	0.0-0.0	0.0-0.0	0.0-0.2
Windmills, wind turbines	0.0	0.9	0.3	0.4	0.0	0.0	0.2	0.4	0.3	0.0	0.1	0.0
	0.0-0.0	0.0-2.2	0.0-0.9	0.0-1.2	0.0-0.0	0.0-0.1	0.0-0.5	0.0-0.8	0.0-0.7	0.0-0.0	0.0-0.3	0.0-0.1
Low-frequency sound*	1.6	0.8	0.3	1.0	2.7	2.2	2.8	2.6	2.2	0.1	1.3	1.7
	0.0-3.2	0.0-1.9	0.0-0.8	0.0-2.1	0.0-5.5	1.2-3.3	1.3-4.3	1.7-3.6	1.4-3.0	0.0-0.2	0.6-2.0	0.7-2.7
Boats and shipping	0.4	0.6	0.0	0.4	0.0	0.2	0.2	0.7	0.3	0.0	0.1	0.5
	0.0-1.1	0.0-1.8	0.0-0.0	0.0-1.2	0.0-0.0	0.0-0.4	0.0-0.6	0.2-1.2	0.0-0.5	0.0-0.1	0.0-0.4	0.0-1.1
sleep disturbance												
Shopping street	0.5	0.2	0.3	1.6	0.8	1.0	1.5	3.3	2.2	0.5	1.7	1.6
	0.0-1.4	0.0-0.5	0.0-0.8	0.4-2.7	0.0-1.8	0.3-1.7	0.4-2.6	2.2-4.3	1.4-3.0	0.0-1.5	0.9-2.5	0.5-2.6
Loading and unloading	3.2	0.3	0.6	2.5	0.6	2.7	2.4	5.6	4.1	3.6	2.1	4.6
	0.9-5.5	0.0-0.6	0.0-1.4	1.1-4.0	0.0-1.3	1.6-3.8	1.2-3.7	4.3-6.9	3.1-5.1	0.5-6.7	1.2-3.0	2.6-6.6
Shunting yards	0.6	0.9	0.6	1.4	0.0	0.5	0.3	1.4	0.8	0.7	1.0	1.0
	0.0-1.4	0.0-2.2	0.0-1.7	0.3-2.5	0.0-0.0	0.1-0.9	0.0-0.7	0.7-2.0	0.4-1.3	0.0-2.2	0.4-1.6	0.1-1.9
Agricultural tractors	5.7	3.9	2.6	3.8	3.2	2.5	1.3	1.7	1.9	2.4	3.1	3.1
	2.6-8.9	1.8-6.1	0.7-4.5	2.2-5.5	0.5-5.8	1.5-3.4	0.4-2.2	1.0-2.5	1.2-2.6	0.1-4.7	2.1-4.1	1.7-4.4
Military areas	0.0	1.2	0.0	1.0	0.0	0.9	0.6	0.5	0.5	0.0	0.4	0.4
	0.0-0.0	0.0-2.6	0.0-0.0	0.0-2.1	0.0-0.0	0.2-1.6	0.0-1.1	0.1-0.9	0.1-0.9	0.0-0.0	0.0-0.7	0.0-0.9

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Windmills, wind turbines	0.0	1.5	0.3	0.4	0.0	0.1	0.2	0.8	0.6	0.0	0.2	0.0
	0.0-0.0	0.0-3.0	0.0-0.9	0.0-1.2	0.0-0.0	0.0-0.2	0.0-0.6	0.3-1.4	0.1-1.0	0.0-0.0	0.0-0.4	0.0-0.1
Low-frequency sound*	2.1	1.2	0.6	2.2	3.3	3.3	3.6	4.6	4.3	1.1	3.2	2.8
	0.3-3.8	0.0-2.6	0.0-1.3	0.8-3.5	0.4-6.1	2.0-4.5	2.0-5.2	3.4-5.8	3.2-5.4	0.0-2.6	2.1-4.2	1.5-4.1
Boats and shipping	0.4	1.3	0.0	0.5	0.0	0.6	0.6	1.5	1.0	0.6	0.2	0.6
	0.0-1.1	0.0-2.9	0.0-0.0	0.0-1.4	0.0-0.0	0.2-1.1	0.0-1.1	0.8-2.3	0.5-1.5	0.0-1.7	0.0-0.5	0.0-1.2
some sleep disturbance												
Shopping street	0.7	1.4	1.2	3.2	1.1	1.9	2.6	5.2	3.9	1.5	3.2	2.6
	0.0-1.7	0.0-2.9	0.0-2.8	1.5-4.9	0.0-2.5	0.9-2.9	1.2-4.0	3.9-6.6	2.8-4.9	0.0-3.6	2.1-4.3	1.3-3.9
Loading and unloading	4.7	2.8	2.5	4.2	3.5	5.8	4.9	8.8	6.8	6.0	4.4	6.8
	1.8-7.5	0.9-4.7	0.6-4.4	2.4-6.1	0.4-6.6	4.1-7.4	3.0-6.8	7.1-10.5	5.5-8.2	2.2-9.7	3.2-5.6	4.4-9.2
Shunting yards	0.7	1.4	1.2	1.9	1.0	1.1	1.1	2.4	1.6	1.4	1.4	2.1
	0.0-1.5	0.0-2.9	0.0-2.8	0.6-3.2	0.0-2.9	0.4-1.8	0.3-1.9	1.5-3.4	0.9-2.2	0.0-3.3	0.7-2.1	0.7-3.4
Agricultural tractors	7.9	8.4	7.2	6.2	5.5	5.0	2.5	2.6	3.2	4.8	5.2	7.2
	4.1-11.7	5.3-11.6	3.9-10.5	3.9-8.4	1.5-9.6	3.6-6.5	1.3-3.7	1.6-3.5	2.3-4.0	1.7-7.8	3.9-6.6	4.9-9.6
Military areas	0.0	1.4	0.6	1.2	0.0	1.6	0.8	0.9	0.5	0.0	0.6	0.4
	0.0-0.0	0.0-2.9	0.0-1.7	0.0-2.4	0.0-0.0	0.7-2.6	0.0-1.6	0.3-1.4	0.1-1.0	0.0-0.0	0.1-1.0	0.0-1.0
Windmills, wind turbines	0.0	1.8	0.3	0.4	0.0	0.5	0.6	1.3	0.7	0.0	0.2	0.2
	0.0-0.0	0.1-3.6	0.0-0.9	0.0-1.2	0.0-0.0	0.0-1.0	0.0-1.2	0.6-2.0	0.2-1.2	0.0-0.0	0.0-0.5	0.0-0.5
Low-frequency sound*	4.2	2.7	3.0	2.7	5.0	6.1	6.3	7.1	6.4	2.8	4.6	5.0
	1.6-6.8	0.9-4.6	0.7-5.4	1.2-4.2	1.2-8.7	4.4-7.8	4.1-8.5	5.6-8.6	5.1-7.8	0.3-5.4	3.3-5.9	3.2-6.9
Boats and shipping	0.8	1.5	0.0	0.5	0.4	0.9	1.9	2.3	2.0	4.3	0.4	0.7
	0.0-1.8	0.0-3.1	0.0-0.0	0.0-1.4	0.0-1.3	0.3-1.5	0.7-3.1	1.4-3.2	1.3-2.8	0.8-7.7	0.0-0.9	0.0-1.3

* a low, humming or buzzing sound from ventilators or air-conditioners for example

Table 5-53 Annoyance machines

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Concrete transport trucks	0.8	0.4	0.0	1.1	1.8	0.9	0.6	1.6	1.1	0.2	0.9	1.5
	0.0-1.9	0.0-0.8	0.0-0.1	0.0-2.2	0.0-4.1	0.3-1.5	0.0-1.2	0.9-2.4	0.6-1.6	0.0-0.5	0.4-1.5	0.4-2.6
Mobile water pumps	0.1	0.0	0.0	1.2	0.9	0.4	0.1	1.2	0.7	0.0	0.4	0.3
	0.0-0.2	0.0-0.0	0.0-0.0	0.0-2.4	0.0-2.8	0.0-0.8	0.0-0.2	0.5-1.8	0.3-1.1	0.0-0.0	0.0-0.8	0.0-0.8
Motor-driven compressors	1.8	0.3	0.0	0.9	1.4	0.4	0.6	2.3	0.9	0.1	0.7	1.5
	0.0-3.7	0.0-0.9	0.0-0.1	0.0-1.9	0.0-3.4	0.1-0.7	0.0-1.1	1.4-3.2	0.5-1.4	0.0-0.2	0.3-1.2	0.4-2.6
Demolition hammers, pneumatic drills	2.3	1.7	0.9	1.9	3.7	1.8	1.8	4.9	2.5	1.1	1.4	1.7
	0.2-4.4	0.1-3.3	0.0-2.2	0.4-3.4	0.6-6.8	0.9-2.6	0.8-2.8	3.6-6.2	1.8-3.3	0.0-3.0	0.8-2.1	0.7-2.7
Excavators	1.1	2.5	0.7	2.0	1.5	1.3	0.9	2.6	1.8	1.0	1.2	1.5
	0.0-2.4	0.8-4.2	0.0-1.9	0.5-3.4	0.0-3.5	0.6-2.1	0.3-1.6	1.7-3.5	1.1-2.5	0.0-3.0	0.5-1.8	0.5-2.4
Shovel loader, loader	1.4	2.3	0.7	1.9	0.9	0.8	1.0	2.0	1.1	1.0	0.9	0.9
	0.0-2.9	0.6-4.0	0.0-1.9	0.4-3.3	0.0-2.8	0.3-1.2	0.2-1.8	1.2-2.8	0.6-1.7	0.0-3.0	0.4-1.5	0.1-1.7
Mobile cranes	0.0	2.5	0.1	1.7	1.4	0.8	1.2	2.0	1.3	1.1	0.9	1.2
	0.0-0.0	0.8-4.2	0.0-0.3	0.3-3.0	0.0-3.4	0.3-1.3	0.4-1.9	1.2-2.9	0.7-1.9	0.0-3.1	0.4-1.5	0.2-2.1
Hydraulic or electrical power units	0.5	1.6	0.0	1.0	0.9	0.5	0.3	2.4	0.7	0.0	0.5	1.3
	0.0-1.2	0.0-3.2	0.0-0.0	0.0-2.2	0.0-2.8	0.1-1.0	0.0-0.7	1.4-3.3	0.3-1.1	0.0-0.0	0.1-0.9	0.3-2.3
Pile drivers	1.5	1.4	0.9	1.7	2.8	1.8	1.0	4.7	3.3	0.4	0.7	1.0
	0.2-2.9	0.0-2.9	0.0-2.2	0.3-3.1	0.1-5.5	0.9-2.7	0.3-1.7	3.4-6.0	2.3-4.2	0.0-1.2	0.2-1.2	0.1-1.8
Backing-up warning signals from lorries	2.9	1.7	0.3	3.0	0.1	1.8	1.4	4.4	3.0	0.4	2.0	2.5
	0.6-5.2	0.2-3.2	0.0-0.7	1.3-4.7	0.0-0.2	0.9-2.7	0.6-2.3	3.2-5.6	2.1-3.9	0.0-1.1	1.2-2.9	1.1-4.0
annoyance												
Concrete transport trucks	2.7	1.6	1.5	2.1	1.8	1.6	1.7	3.7	2.8	2.0	2.2	2.7
	0.6-4.8	0.2-3.0	0.0-2.9	0.6-3.5	0.0-4.1	0.9-2.3	0.7-2.7	2.5-4.8	2.0-3.6	0.0-4.2	1.4-3.0	1.3-4.1
Mobile water pumps	1.2	0.0	0.0	1.6	2.2	0.5	0.6	2.6	1.7	0.0	0.9	0.9
	0.0-2.6	0.0-0.0	0.0-0.0	0.2-2.9	0.0-4.7	0.1-0.9	0.0-1.2	1.6-3.5	1.0-2.4	0.0-0.0	0.3-1.5	0.0-1.7

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Motor-driven compressors	3.5	1.0	0.6	1.6	2.2	1.4	2.0	5.2	2.6	1.2	1.6	2.5
	1.0-6.0	0.0-2.2	0.0-1.7	0.3-3.0	0.0-4.5	0.7-2.2	0.9-3.1	3.9-6.5	1.8-3.4	0.0-3.2	0.9-2.4	1.0-4.0
Demolition hammers, pneumatic drills	5.8	3.0	1.9	3.8	4.8	4.9	5.4	10.1	6.9	3.8	4.6	4.3
	2.7-8.9	0.9-5.0	0.0-3.8	1.8-5.8	1.5-8.2	3.5-6.4	3.6-7.3	8.3-12.0	5.6-8.2	1.0-6.6	3.4-5.9	2.6-6.0
Excavators	2.9	3.5	1.4	3.6	3.0	3.6	2.6	6.5	5.0	3.0	3.6	3.6
	0.8-5.0	1.4-5.6	0.0-3.2	1.7-5.5	0.2-5.8	2.4-4.8	1.5-3.7	5.1-7.9	3.9-6.1	0.5-5.4	2.4-4.7	2.0-5.2
Shovel loader, loader	2.9	3.0	1.3	3.6	1.3	2.8	2.5	4.4	4.0	2.1	3.0	2.8
	0.9-4.9	1.1-4.9	0.0-3.0	1.7-5.5	0.0-3.3	1.8-3.8	1.3-3.7	3.2-5.6	3.0-5.0	0.0-4.3	1.9-4.0	1.3-4.2
Mobile cranes	2.9	2.9	0.9	3.3	3.0	2.3	2.8	4.1	3.2	2.7	2.7	2.1
	0.7-5.0	1.1-4.7	0.0-2.2	1.5-5.1	0.2-5.8	1.4-3.3	1.6-4.0	3.0-5.3	2.4-4.1	0.1-5.3	1.7-3.6	0.8-3.3
Hydraulic or electrical power units	2.8	1.6	0.0	1.4	2.7	1.0	0.8	4.0	1.6	0.0	1.5	1.7
	0.7-5.0	0.0-3.2	0.0-0.0	0.1-2.6	0.0-5.4	0.4-1.7	0.3-1.4	2.8-5.2	1.0-2.2	0.0-0.0	0.7-2.2	0.5-2.9
Pile drivers	5.0	1.8	0.9	2.9	6.6	3.3	3.2	8.0	6.7	3.4	2.2	1.7
	2.1-7.8	0.3-3.3	0.0-2.2	1.1-4.6	2.4-10.8	2.1-4.5	1.9-4.5	6.4-9.6	5.4-7.9	0.9-6.0	1.3-3.1	0.5-2.9
Backing-up warning signals from lorries	6.8	2.7	2.3	4.8	2.7	4.5	5.5	9.7	7.3	4.8	5.5	5.6
	3.6-10.1	1.0-4.4	0.3-4.2	2.8-6.9	0.4-4.9	3.2-5.9	3.6-7.3	8.0-11.4	6.0-8.6	1.5-8.2	4.1-6.9	3.6-7.7
some annoyance												
Concrete transport trucks	4.1	2.7	2.6	4.3	4.0	3.5	4.6	6.1	5.4	2.9	4.1	4.3
	1.5-6.8	1.0-4.5	0.5-4.7	2.3-6.2	0.7-7.2	2.3-4.7	2.8-6.4	4.6-7.5	4.3-6.5	0.3-5.5	3.0-5.3	2.5-6.0
Mobile water pumps	2.5	0.0	1.7	2.4	3.9	1.2	1.3	3.8	2.7	1.6	1.8	1.7
	0.3-4.7	0.0-0.0	0.0-3.4	0.8-4.0	0.5-7.3	0.6-1.9	0.4-2.2	2.6-5.0	1.8-3.6	0.0-3.3	1.0-2.7	0.5-2.9
Motor-driven compressors	6.6	1.6	1.9	3.6	5.5	3.2	4.8	7.4	4.2	3.3	3.1	4.2
	3.1-10.2	0.0-3.2	0.0-3.8	1.7-5.5	1.5-9.6	1.9-4.4	2.9-6.6	5.8-9.1	3.1-5.2	0.4-6.1	2.1-4.2	2.3-6.1
Demolition hammers, pneumatic drills	10.8	6.4	2.7	7.4	8.4	8.4	12.0	17.4	12.3	8.4	9.2	8.5
	6.5-15.0	3.2-9.6	0.4-5.1	4.8-10.0	3.7-13.2	6.5-10.4	9.1-14.8	15.1-19.8	10.6-14.1	3.8-13.1	7.4-11.0	6.0-11.0
Excavators	8.0	6.8	2.6	6.1	7.2	7.0	6.0	11.3	9.1	6.8	7.6	7.8

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
	4.4-11.7	3.7-9.9	0.5-4.7	3.8-8.5	2.8-11.6	5.2-8.7	4.1-7.9	9.4-13.3	7.6-10.7	2.8-10.8	6.0-9.3	5.4-10.3
Shovel loader, loader	6.5	5.2	2.4	6.8	5.8	6.4	5.7	7.3	7.1	6.2	6.2	5.8
	3.1-9.8	2.7-7.7	0.3-4.4	4.2-9.3	1.7-9.8	4.7-8.1	3.8-7.6	5.7-8.8	5.7-8.4	2.5-10.0	4.7-7.7	3.7-7.9
Mobile cranes	7.7	4.6	1.4	4.9	5.6	5.2	5.7	6.5	6.1	3.4	5.3	3.8
	4.0-11.3	2.2-6.9	0.0-2.9	2.7-7.1	1.7-9.4	3.7-6.7	3.8-7.6	5.0-8.0	4.9-7.4	0.5-6.3	3.9-6.7	2.1-5.5
Hydraulic or electrical power units	4.1	1.6	1.6	2.2	4.9	2.6	2.4	6.4	3.2	1.0	2.7	2.8
	1.4-6.8	0.0-3.2	0.0-3.4	0.6-3.8	1.0-8.8	1.5-3.7	1.2-3.6	4.9-7.8	2.3-4.1	0.0-2.8	1.7-3.7	1.3-4.3
Pile drivers	8.6	5.1	2.4	4.9	11.7	6.5	7.2	13.0	11.5	7.3	4.0	2.6
	4.9-12.4	2.4-7.7	0.3-4.6	2.8-7.1	6.1-17.2	4.8-8.3	5.0-9.3	11.0-15.0	9.8-13.2	3.0-11.6	2.8-5.2	1.1-4.1
Backing-up warning signals lorries	12.1	5.3	5.1	8.4	11.7	9.2	14.1	17.0	13.8	8.1	10.6	10.5
	7.6-16.6	2.7-7.9	2.1-8.0	5.8-11.1	6.2-17.2	7.2-11.1	11.1-17.1	14.8-19.3	12.0-15.6	3.6-12.5	8.7-12.5	7.7-13.2

Table 5-54 Annoyance recreation

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Fairs, circuses, amusement parks	1.5	0.9	0.7	2.2	0.5	2.0	1.4	2.5	0.7	3.2	1.9	1.0
	0.0-3.1	0.0-2.1	0.0-2.2	0.7-3.7	0.0-1.3	1.0-3.0	0.5-2.3	1.5-3.4	0.3-1.1	0.4-6.1	1.2-2.7	0.1-1.9
Discos, bars, cafés, and restaurants	2.1	0.5	1.8	1.9	0.1	1.7	2.3	2.9	1.6	1.3	1.6	1.9
	0.2-3.9	0.0-1.2	0.0-3.9	0.5-3.2	0.0-0.2	0.8-2.6	1.0-3.5	1.9-3.8	1.0-2.2	0.0-3.0	0.9-2.3	0.7-3.0
Sport facilities	0.5	0.3	0.8	1.6	0.1	0.7	1.4	1.5	0.8	0.4	0.9	0.5
	0.0-1.3	0.0-1.0	0.0-2.2	0.4-2.8	0.0-0.2	0.2-1.2	0.4-2.4	0.8-2.2	0.3-1.3	0.0-1.2	0.3-1.4	0.0-1.1
Mass outdoor events	4.2	1.6	2.7	2.7	3.0	3.2	4.1	5.2	1.6	1.6	2.7	2.0
	1.5-6.9	0.3-3.0	0.4-4.9	1.2-4.3	0.2-5.7	2.0-4.4	2.3-5.8	3.9-6.6	0.9-2.2	0.0-3.5	1.7-3.6	0.8-3.3
annoyance												
Fairs, circuses, amusement parks	3.3	1.9	1.9	3.9	3.2	4.4	3.6	5.0	2.3	5.5	5.6	4.2
	1.0-5.6	0.4-3.3	0.1-3.7	2.1-5.8	0.6-5.8	3.0-5.7	2.0-5.3	3.8-6.3	1.5-3.0	1.9-9.2	4.2-6.9	2.4-6.1
Discos, bars, cafés, and restaurants	3.7	1.7	4.8	4.5	3.3	3.0	4.6	5.8	3.7	2.0	4.1	4.1
	1.3-6.1	0.3-3.1	1.7-7.9	2.5-6.4	0.3-6.3	1.8-4.2	2.8-6.3	4.5-7.1	2.7-4.6	0.0-4.1	2.9-5.2	2.4-5.9
Sport facilities	2.6	0.7	1.1	3.4	2.4	2.3	2.3	3.5	3.1	3.6	2.6	2.2
	0.8-4.5	0.0-1.6	0.0-2.5	1.7-5.2	0.0-4.9	1.3-3.3	1.2-3.5	2.5-4.6	2.2-4.0	0.8-6.4	1.7-3.5	0.8-3.5
Mass outdoor events	8.8	3.5	4.3	5.8	8.8	6.8	6.8	9.8	4.1	3.5	6.8	4.4
	5.2-12.4	1.6-5.5	1.5-7.1	3.6-7.9	4.3-13.4	5.1-8.5	4.7-8.9	8.0-11.5	3.1-5.1	0.8-6.3	5.3-8.3	2.6-6.2
some annoyance												
Fairs, circuses, amusement parks	6.5	5.1	4.9	9.7	6.0	8.4	6.7	9.3	5.6	12.1	11.8	8.3
	3.1-9.9	2.6-7.6	2.0-7.8	6.8-12.6	2.1-10.0	6.5-10.4	4.5-8.9	7.5-11.1	4.4-6.8	6.7-17.5	9.8-13.8	5.7-10.8
Discos, bars, cafés, and restaurants	8.6	4.2	6.4	8.2	5.7	6.2	8.2	9.8	6.7	4.2	8.1	7.4
	4.8-12.4	1.8-6.6	2.8-10.1	5.5-10.8	1.8-9.6	4.6-7.9	5.7-10.6	8.0-11.6	5.4-8.0	0.9-7.5	6.4-9.8	5.1-9.8
Sport facilities	6.4	3.6	4.4	6.7	4.9	5.3	5.8	7.4	7.4	9.2	6.0	4.8
	3.1-9.8	1.3-5.9	1.5-7.2	4.4-9.1	1.6-8.3	3.8-6.8	3.9-7.6	5.7-9.0	6.0-8.8	4.5-13.9	4.5-7.5	2.8-6.8
Mass outdoor events	17.8	8.3	8.3	12.0	13.8	11.8	11.9	17.4	9.6	8.3	14.3	10.1
	12.3-23.4	5.0-11.5	4.6-12.0	9.0-15.1	8.2-19.4	9.6-14.1	9.2-14.6	15.1-19.7	8.1-11.2	4.1-12.6	12.2-16.5	7.3-12.9

Table 5-55 Sleep disturbance recreation

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe sleep disturbance												
Fairs, circuses, amusement parks	1.2	0.9	2.0	1.6	0.5	1.8	0.8	1.7	0.5	2.9	2.0	1.1
	0.0-2.7	0.0-2.1	0.0-4.3	0.3-2.8	0.0-1.3	0.9-2.7	0.1-1.5	0.9-2.4	0.1-0.9	0.3-5.5	1.2-2.8	0.1-2.2
Discos, bars, cafés, and restaurants	2.6	0.9	2.1	2.3	0.8	1.7	2.2	2.7	1.6	2.0	1.7	2.7
	0.5-4.7	0.0-2.1	0.0-4.4	0.8-3.8	0.0-2.4	0.8-2.6	1.1-3.3	1.7-3.6	1.0-2.3	0.0-4.2	1.0-2.4	1.2-4.1
Sport facilities	0.5	0.3	0.8	0.7	0.1	0.5	1.1	1.0	0.4	0.0	0.6	0.6
	0.0-1.3	0.0-1.0	0.0-2.1	0.0-1.6	0.0-0.2	0.1-1.0	0.2-2.1	0.4-1.6	0.1-0.7	0.0-0.0	0.1-1.0	0.0-1.3
Mass outdoor events	5.0	1.9	2.4	3.2	3.5	3.2	3.0	4.7	1.0	1.6	2.5	2.1
	1.9-8.0	0.4-3.4	0.2-4.5	1.6-4.8	0.4-6.5	2.0-4.4	1.6-4.4	3.4-6.0	0.5-1.5	0.0-3.5	1.6-3.5	0.8-3.4
sleep disturbance												
Fairs, circuses, amusement parks	2.5	2.5	2.3	2.8	2.1	2.8	2.4	3.6	1.5	3.5	3.5	3.7
	0.4-4.5	0.7-4.4	0.0-4.6	1.1-4.4	0.0-4.1	1.7-3.9	1.1-3.7	2.5-4.7	0.9-2.2	0.6-6.3	2.5-4.6	1.9-5.4
Discos, bars, cafés, and restaurants	4.2	1.3	3.5	4.3	2.4	2.4	3.7	4.7	3.1	2.0	3.2	3.8
	1.7-6.8	0.0-2.6	0.8-6.3	2.5-6.2	0.0-4.8	1.4-3.4	2.2-5.3	3.5-6.0	2.2-4.0	0.0-4.2	2.2-4.2	2.2-5.5
Sport facilities	1.1	0.7	1.3	1.7	0.8	1.1	1.5	2.2	1.3	1.0	1.1	1.3
	0.0-2.4	0.0-1.5	0.0-3.0	0.4-3.0	0.0-2.3	0.4-1.7	0.5-2.5	1.3-3.1	0.7-1.9	0.0-2.2	0.5-1.7	0.2-2.4
Mass outdoor events	8.2	5.4	5.3	5.6	5.5	5.6	5.1	7.5	3.0	3.8	5.5	4.5
	4.6-11.9	2.8-8.1	2.2-8.3	3.4-7.8	2.0-9.1	4.1-7.2	3.3-7.0	5.9-9.1	2.2-3.9	1.0-6.6	4.1-6.8	2.7-6.4
some sleep disturbance												
Fairs, circuses, amusement parks	4.9	6.3	5.0	5.6	2.5	5.9	3.6	6.3	2.8	6.3	7.5	6.7
	1.9-8.0	3.5-9.1	1.8-8.1	3.3-7.9	0.0-4.9	4.3-7.5	2.0-5.3	4.8-7.7	1.9-3.7	2.4-10.2	5.9-9.1	4.4-9.0
Discos, bars, cafés, and restaurants	7.3	4.0	5.5	8.2	3.3	4.8	5.6	8.6	5.4	4.7	6.1	6.3
	3.8-10.9	1.6-6.4	2.2-8.8	5.5-10.8	0.4-6.1	3.4-6.3	3.6-7.6	6.9-10.3	4.2-6.6	1.2-8.1	4.7-7.5	4.2-8.5
Sport facilities	2.7	3.0	2.0	2.4	1.4	2.3	2.1	3.4	3.0	2.0	2.4	2.5
	0.5-4.8	0.9-5.1	0.0-4.1	1.0-3.9	0.0-3.4	1.3-3.3	1.0-3.3	2.3-4.6	2.0-3.9	0.0-4.0	1.5-3.4	1.0-3.9
Mass outdoor events	13.2	8.4	10.4	10.9	8.5	9.6	8.0	12.6	5.7	7.5	10.9	7.6
	8.4-18.0	5.0-11.8	6.3-14.6	8.0-13.9	3.9-13.1	7.6-11.6	5.8-10.3	10.6-14.6	4.5-6.9	3.2-11.7	9.0-12.9	5.2-10.0

5.3.1.2   Odour

Table 5-56 Annoyance odour

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Restaurants and snack bars	1.6	0.3	0.6	1.8	1.0	1.0	0.8	1.5	1.5	0.2	0.4	0.4
	0.0-3.4	0.0-1.0	0.0-1.8	0.4-3.2	0.0-2.4	0.3-1.6	0.1-1.6	0.7-2.2	0.9-2.1	0.0-0.3	0.1-0.7	0.0-0.8
Factories and businesses	1.2	1.0	0.7	1.3	0.0	1.1	0.6	2.0	1.3	0.7	1.2	2.7
	0.0-2.6	0.0-2.1	0.0-1.8	0.2-2.4	0.0-0.0	0.5-1.8	0.0-1.3	1.1-2.8	0.7-1.9	0.0-2.2	0.6-1.8	1.3-4.1
Agricultural companies and spreading manure	5.5	4.8	4.1	2.7	3.0	2.7	1.3	1.9	1.5	3.0	3.2	2.8
	2.2-8.8	2.4-7.3	1.4-6.8	1.1-4.3	0.0-6.1	1.7-3.8	0.3-2.2	1.1-2.7	0.9-2.1	0.3-5.8	2.2-4.3	1.4-4.2
Road traffic	2.2	1.3	0.9	2.4	2.2	2.0	2.0	3.4	3.0	1.6	2.6	2.6
	0.4-4.1	0.3-2.3	0.0-2.2	1.0-3.9	0.0-4.5	1.2-2.8	1.0-3.0	2.4-4.4	2.2-3.8	0.0-3.5	1.7-3.4	1.2-4.0
Aeroplanes	1.1	0.1	0.6	0.7	0.1	0.2	0.6	2.0	0.3	0.0	0.6	1.8
	0.0-2.6	0.0-0.3	0.0-1.7	0.0-1.6	0.0-0.2	0.0-0.6	0.0-1.2	1.2-2.8	0.1-0.5	0.0-0.0	0.2-1.1	0.6-3.0
Neighbours' homes	3.7	2.8	1.3	2.8	3.0	4.6	3.8	5.3	4.7	1.3	4.0	4.5
	1.0-6.4	0.6-4.9	0.0-2.8	1.3-4.4	0.5-5.5	3.1-6.1	1.9-5.6	4.0-6.6	3.6-5.8	0.0-3.1	2.8-5.3	2.5-6.5
Sewer system	2.3	0.9	1.1	2.2	1.5	2.0	1.9	3.2	3.3	3.1	1.6	2.9
	0.2-4.5	0.0-2.0	0.0-2.5	0.7-3.7	0.0-3.8	1.0-3.0	0.8-3.0	2.1-4.3	2.4-4.2	0.0-6.3	0.8-2.4	1.2-4.5
Fireplaces	6.8	5.4	4.8	4.4	5.5	4.3	3.1	3.2	2.8	4.8	3.6	5.3
	3.4-10.3	2.7-8.2	2.0-7.6	2.5-6.4	1.9-9.1	3.0-5.7	1.8-4.4	2.1-4.2	2.0-3.6	1.3-8.2	2.5-4.8	3.2-7.4
BBQs and fire baskets	6.1	2.6	3.8	4.1	7.9	5.0	4.3	5.2	4.4	2.5	3.6	3.4
	2.7-9.4	0.9-4.4	1.3-6.3	2.3-6.0	3.6-12.1	3.5-6.4	2.6-6.0	3.9-6.6	3.4-5.4	0.0-5.3	2.5-4.7	1.6-5.1
Boats and shipping	0.7	0.0	1.1	0.4	0.0	0.0	0.3	0.9	0.6	0.1	0.1	0.0
	0.0-1.8	0.0-0.0	0.0-2.7	0.0-1.2	0.0-0.0	0.0-0.0	0.0-0.8	0.3-1.4	0.1-1.1	0.0-0.2	0.0-0.2	0.0-0.0
annoyance												
Restaurants and snack bars	1.9	0.8	1.7	2.2	1.3	2.5	2.3	3.3	3.2	3.9	1.9	2.8
	0.0-3.7	0.0-1.7	0.0-3.6	0.7-3.7	0.0-2.9	1.5-3.5	1.1-3.4	2.3-4.4	2.3-4.0	0.8-7.0	1.2-2.7	1.3-4.3

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Factories and businesses	4.2	2.4	3.6	3.0	0.6	2.4	1.9	4.0	4.6	3.1	2.7	6.4
	1.7-6.7	0.7-4.1	1.0-6.2	1.4-4.5	0.0-1.5	1.5-3.4	0.8-2.9	2.9-5.2	3.5-5.6	0.7-5.4	1.8-3.5	4.2-8.5
Agricultural companies and spreading manure	9.4	9.3	7.9	6.7	7.6	7.2	5.1	4.2	3.8	12.8	7.0	5.5
	5.4-13.4	6.0-12.6	4.4-11.4	4.3-9.0	3.2-11.9	5.6-8.8	3.3-7.0	3.0-5.3	2.9-4.8	7.7-18.0	5.6-8.4	3.6-7.4
Road traffic	7.1	3.4	2.2	4.3	3.9	5.1	5.8	7.2	6.5	4.2	5.2	5.7
	3.5-10.8	1.6-5.1	0.5-3.9	2.5-6.0	0.9-6.9	3.7-6.4	4.0-7.5	5.8-8.7	5.4-7.7	1.5-6.8	4.1-6.4	3.8-7.6
Aeroplanes	2.4	0.5	1.1	1.0	1.2	0.7	1.5	4.8	1.4	0.0	1.4	2.6
	0.0-4.9	0.0-1.4	0.0-2.5	0.0-2.0	0.0-2.8	0.1-1.3	0.6-2.4	3.6-6.0	0.8-1.9	0.0-0.0	0.7-2.1	1.2-4.1
Neighbours' homes	8.3	4.5	3.9	6.6	11.2	8.8	8.1	11.4	10.8	3.2	7.4	8.2
	4.4-12.1	2.1-7.0	1.3-6.4	4.2-8.9	5.8-16.7	6.9-10.8	5.7-10.5	9.5-13.3	9.2-12.4	0.2-6.2	5.9-9.0	5.6-10.7
Sewer system	5.1	3.8	3.2	5.3	3.1	4.9	5.0	6.9	6.5	9.4	4.5	5.2
	1.9-8.3	1.5-6.1	1.0-5.5	3.1-7.4	0.2-6.1	3.4-6.4	3.3-6.7	5.4-8.4	5.3-7.8	4.3-14.4	3.2-5.7	3.1-7.2
Fireplaces	12.6	11.3	10.4	6.7	7.0	8.6	8.3	7.1	6.4	7.3	7.1	8.9
	8.2-17.1	7.6-14.9	6.4-14.4	4.4-8.9	3.1-10.8	6.8-10.3	6.1-10.4	5.6-8.6	5.2-7.6	3.3-11.4	5.6-8.5	6.3-11.5
BBQs and fire baskets	12.0	5.8	10.3	9.3	14.1	9.5	9.6	12.1	10.0	6.7	8.2	8.7
	7.6-16.3	3.0-8.5	6.2-14.5	6.6-11.9	8.6-19.6	7.6-11.4	7.2-12.1	10.2-14.0	8.5-11.5	2.6-10.7	6.6-9.8	6.1-11.3
Boats and shipping	0.7	0.2	1.1	0.5	0.0	0.3	0.9	1.5	1.3	1.5	0.1	0.1
	0.0-1.8	0.0-0.7	0.0-2.7	0.0-1.4	0.0-0.0	0.0-0.6	0.2-1.5	0.7-2.2	0.7-1.9	0.0-3.7	0.0-0.2	0.0-0.2
some annoyance												
Restaurants and snack bars	3.0	2.3	3.9	5.4	2.3	4.4	4.7	5.2	5.6	5.0	4.5	4.9
	0.7-5.3	0.6-4.0	1.1-6.6	3.2-7.6	0.0-4.5	3.0-5.8	2.9-6.4	3.9-6.6	4.4-6.8	1.3-8.7	3.3-5.7	2.9-6.9
Factories and businesses	10.1	5.5	6.1	4.9	4.4	5.2	4.0	7.3	8.2	9.0	6.1	11.0
	5.9-14.3	2.9-8.1	2.7-9.5	2.9-6.8	1.0-7.8	3.7-6.7	2.3-5.6	5.7-8.9	6.8-9.7	4.2-13.8	4.7-7.6	8.1-13.9
Agricultural companies and	19.4	20.0	17.9	12.9	14.4	16.0	10.8	10.3	7.7	28.6	14.9	17.2
	13.8-25.0	15.2-24.8	12.8-23.1	9.7-16.0	8.4-20.3	13.5-18.5	8.1-13.5	8.5-12.2	6.3-9.1	21.2-35.9	12.8-17.1	13.8-20.6

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
spreading manure												
Road traffic	11.1	6.5	4.7	10.1	8.5	10.0	13.4	13.2	13.2	9.4	10.5	12.2
	6.7-15.5	3.9-9.1	2.0-7.4	7.3-12.9	3.7-13.3	8.0-11.9	10.5-16.2	11.3-15.2	11.5-14.9	4.9-14.0	8.7-12.2	9.3-15.0
Aeroplanes	2.4	1.1	1.4	1.5	1.6	1.6	2.5	8.0	2.7	0.0	2.5	4.4
	0.0-4.9	0.0-2.6	0.0-3.1	0.2-2.8	0.0-3.7	0.7-2.5	1.1-3.8	6.4-9.6	1.9-3.5	0.0-0.0	1.6-3.4	2.5-6.3
Neighbours' homes	14.2	12.0	9.3	13.3	19.7	15.6	16.6	19.7	17.9	7.0	12.7	15.1
	9.0-19.3	8.1-16.0	5.1-13.6	10.0-16.7	12.9-26.5	13.0-18.2	13.2-20.0	17.3-22.1	15.9-19.9	2.8-11.3	10.6-14.8	11.7-18.5
Sewer system	8.6	7.0	6.4	9.3	7.6	8.5	9.5	12.5	11.9	14.8	7.6	9.8
	4.5-12.6	3.8-10.2	3.1-9.8	6.5-12.1	3.1-12.2	6.5-10.5	7.0-12.0	10.5-14.5	10.2-13.6	8.8-20.9	5.9-9.2	7.1-12.6
Fireplaces	21.7	19.0	19.7	14.2	17.4	17.7	15.0	15.0	12.9	14.3	13.7	17.1
	16.0-27.4	14.3-23.6	14.2-25.1	11.0-17.4	11.4-23.5	15.1-20.3	12.0-18.0	12.9-17.1	11.2-14.6	8.8-19.7	11.6-15.8	13.6-20.5
BBQs and fire baskets	22.3	13.6	15.8	18.0	23.8	20.6	21.4	23.1	20.3	15.7	17.2	17.7
	16.5-28.1	9.4-17.7	10.6-21.0	14.4-21.6	16.9-30.7	17.8-23.4	17.9-24.9	20.6-25.7	18.3-22.4	9.6-21.8	14.8-19.5	14.1-21.4
Boats and shipping	0.7	0.5	1.1	0.9	0.4	0.5	1.5	2.4	2.5	3.0	0.3	0.3
	0.0-1.8	0.0-1.4	0.0-2.7	0.0-1.9	0.0-1.2	0.0-1.0	0.4-2.7	1.4-3.3	1.7-3.4	0.3-5.7	0.0-0.7	0.0-0.6

Table 5-57 Sleep disturbance odour

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe sleep disturbance												
Restaurants and snack bars	0.1	0.0	0.0	0.9	0.5	0.4	0.2	0.8	0.2	0.0	0.3	0.5
	0.0-0.3	0.0-0.0	0.0-0.0	0.0-1.9	0.0-1.3	0.0-0.9	0.0-0.5	0.2-1.5	0.1-0.4	0.0-0.0	0.0-0.5	0.0-1.1
Factories and businesses	0.0	0.4	0.0	0.4	0.0	0.3	0.1	0.6	0.5	0.7	0.3	1.4
	0.0-0.0	0.0-1.1	0.0-0.0	0.0-1.2	0.0-0.0	0.0-0.5	0.0-0.2	0.2-1.1	0.1-0.9	0.0-2.2	0.0-0.6	0.3-2.5
Agricultural companies and spreading out manure	2.3	0.5	1.1	1.3	0.1	1.0	0.3	1.0	0.4	2.3	1.0	0.8
	0.1-4.6	0.0-1.2	0.0-2.3	0.1-2.5	0.0-0.2	0.4-1.6	0.0-0.7	0.4-1.7	0.1-0.7	0.0-4.9	0.4-1.5	0.0-1.6
Road traffic	1.0	0.6	0.0	0.7	1.1	0.5	0.9	1.5	1.0	0.0	1.2	1.2
	0.0-2.4	0.0-1.4	0.0-0.1	0.0-1.6	0.0-2.6	0.1-0.9	0.2-1.7	0.8-2.1	0.6-1.5	0.0-0.0	0.6-1.8	0.3-2.0
Aeroplanes	0.0	0.0	0.0	0.7	0.1	0.1	0.5	1.1	0.2	0.0	0.3	1.0
	0.0-0.0	0.0-0.0	0.0-0.0	0.0-1.8	0.0-0.2	0.0-0.2	0.0-1.0	0.5-1.8	0.0-0.4	0.0-0.0	0.0-0.7	0.0-1.9
Neighbours' homes	1.8	0.4	1.4	1.3	1.9	1.1	1.1	2.6	1.9	0.5	1.0	2.3
	0.0-3.9	0.0-1.1	0.0-3.2	0.1-2.5	0.0-4.0	0.4-1.8	0.2-2.0	1.7-3.6	1.2-2.7	0.0-1.5	0.5-1.5	0.8-3.7
Sewer system	1.1	0.1	0.0	0.9	0.5	0.8	0.6	1.0	0.9	1.9	0.4	1.2
	0.0-2.7	0.0-0.3	0.0-0.1	0.0-1.9	0.0-1.3	0.2-1.5	0.0-1.2	0.4-1.6	0.4-1.3	0.0-4.6	0.0-0.7	0.2-2.2
Fireplaces	2.0	2.9	0.7	1.4	2.0	2.1	1.6	1.9	1.6	1.6	1.6	3.1
	0.1-3.9	1.0-4.9	0.0-1.8	0.3-2.6	0.0-4.3	1.1-3.0	0.7-2.6	1.1-2.7	0.9-2.2	0.0-3.8	0.9-2.4	1.5-4.7
BBQs and fire baskets	2.5	2.0	1.1	1.5	5.3	1.7	2.2	2.7	1.8	1.0	1.4	1.5
	0.1-4.9	0.4-3.6	0.0-2.6	0.3-2.6	1.7-9.0	0.8-2.5	1.0-3.4	1.7-3.7	1.2-2.5	0.0-2.8	0.7-2.1	0.3-2.8
Boats and shipping	0.0	0.0	0.0	0.4	0.0	0.0	0.2	0.4	0.1	0.0	0.1	0.2
	0.0-0.0	0.0-0.0	0.0-0.0	0.0-1.2	0.0-0.0	0.0-0.0	0.0-0.6	0.0-0.8	0.0-0.3	0.0-0.0	0.0-0.2	0.0-0.5
sleep disturbance												
Restaurants and snack bars	0.1	0.2	0.0	1.1	0.5	0.6	0.7	1.5	0.9	0.0	0.5	0.8
	0.0-0.3	0.0-0.5	0.0-0.0	0.0-2.1	0.0-1.3	0.1-1.2	0.1-1.2	0.7-2.2	0.4-1.4	0.0-0.0	0.2-0.9	0.1-1.6

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Factories and businesses	0.4	0.4	0.2	1.1	0.0	0.9	0.2	1.7	1.3	1.8	0.8	2.1
	0.0-1.1	0.0-1.1	0.0-0.7	0.1-2.0	0.0-0.0	0.4-1.5	0.0-0.4	0.9-2.4	0.7-1.9	0.0-3.7	0.4-1.2	0.8-3.4
Agricultural companies and spreading out manure	3.4	2.6	1.6	1.9	1.9	2.0	1.3	2.0	1.4	3.0	1.7	1.7
	0.9-5.8	0.8-4.3	0.3-2.9	0.5-3.2	0.0-4.5	1.1-2.8	0.4-2.3	1.1-2.9	0.8-2.0	0.2-5.8	1.0-2.5	0.5-2.8
Road traffic	2.3	1.0	1.2	2.1	3.1	1.7	1.9	3.6	2.2	0.4	1.9	2.5
	0.5-4.2	0.1-2.0	0.0-2.6	0.7-3.5	0.3-5.8	0.9-2.5	0.8-2.9	2.6-4.7	1.5-2.9	0.0-1.0	1.1-2.6	1.2-3.9
Aeroplanes	0.4	0.0	0.3	0.8	1.2	0.5	0.9	2.7	0.6	0.7	0.8	1.4
	0.0-1.1	0.0-0.0	0.0-0.8	0.0-1.9	0.0-2.8	0.1-0.8	0.2-1.6	1.8-3.7	0.2-1.0	0.0-2.2	0.2-1.3	0.3-2.5
Neighbours' homes	2.9	1.1	2.2	3.0	2.5	3.1	3.7	5.4	4.0	0.5	2.2	3.8
	0.5-5.4	0.0-2.3	0.0-4.4	1.4-4.7	0.0-4.9	2.0-4.2	2.0-5.4	4.1-6.8	3.0-5.0	0.0-1.5	1.4-3.0	2.0-5.7
Sewer system	2.1	0.4	0.7	1.3	0.5	1.6	1.2	2.3	2.1	2.6	0.8	2.5
	0.1-4.2	0.0-1.1	0.0-1.7	0.0-2.5	0.0-1.3	0.7-2.5	0.4-2.1	1.4-3.3	1.4-2.9	0.0-5.4	0.3-1.2	1.1-4.0
Fireplaces	4.5	4.8	3.7	2.8	4.1	4.2	4.1	3.3	3.1	2.6	2.5	5.6
	1.8-7.2	2.3-7.4	1.2-6.1	1.4-4.2	0.8-7.3	2.9-5.5	2.6-5.6	2.2-4.3	2.2-4.0	0.0-5.2	1.6-3.4	3.4-7.8
BBQs and fire baskets	5.3	2.8	4.7	2.9	6.8	3.6	4.5	5.2	4.2	2.8	2.7	4.0
	2.2-8.4	0.9-4.7	1.8-7.6	1.5-4.4	2.8-10.9	2.4-4.8	2.8-6.1	3.9-6.6	3.2-5.2	0.0-5.6	1.7-3.6	2.1-5.9
Boats and shipping	0.1	0.0	0.7	0.5	0.0	0.2	0.3	0.8	0.6	1.5	0.1	0.2
	0.0-0.3	0.0-0.0	0.0-1.9	0.0-1.3	0.0-0.0	0.0-0.6	0.0-0.7	0.3-1.2	0.2-1.0	0.0-3.7	0.0-0.2	0.0-0.6
some sleep disturbance												
Restaurants and snack bars	0.1	0.9	0.6	2.0	0.5	1.1	0.9	2.0	1.7	0.9	1.0	1.7
	0.0-0.3	0.0-2.0	0.0-1.8	0.5-3.4	0.0-1.3	0.4-1.8	0.2-1.5	1.2-2.9	1.0-2.3	0.0-2.4	0.5-1.5	0.6-2.9
Factories and businesses	2.2	0.9	0.5	2.1	1.0	1.7	0.7	2.8	2.4	3.6	1.7	4.3
	0.3-4.1	0.0-1.9	0.0-1.4	0.7-3.4	0.0-3.0	0.8-2.5	0.0-1.3	1.8-3.8	1.6-3.3	0.5-6.7	1.0-2.4	2.5-6.2
Agricultural companies and spreading out manure	6.6	3.8	2.7	3.0	3.2	3.7	2.7	3.3	2.2	6.8	3.2	4.6

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
	3.2-10.1	1.4-6.2	0.5-4.9	1.4-4.6	0.0-6.3	2.4-4.9	1.2-4.1	2.2-4.4	1.4-2.9	2.6-10.9	2.1-4.2	2.8-6.5
Road traffic	3.9	2.6	1.9	4.3	4.4	3.0	3.3	5.7	4.1	1.2	3.5	3.7
	1.1-6.8	0.8-4.3	0.2-3.6	2.3-6.3	0.9-8.0	1.9-4.1	1.9-4.8	4.3-7.0	3.2-5.1	0.0-2.6	2.5-4.5	2.1-5.3
Aeroplanes	0.4	1.1	0.6	1.3	1.6	0.7	1.5	4.1	1.5	1.3	1.2	2.5
	0.0-1.1	0.0-2.5	0.0-1.7	0.1-2.5	0.0-3.7	0.2-1.2	0.5-2.5	2.9-5.3	0.8-2.1	0.0-3.0	0.6-1.9	1.0-3.9
Neighbours' homes	4.4	3.1	3.1	5.7	5.6	4.9	6.2	8.2	7.4	0.5	4.2	6.3
	1.3-7.4	1.2-5.0	0.4-5.7	3.3-8.1	1.8-9.3	3.4-6.4	4.0-8.4	6.6-9.9	5.9-8.8	0.0-1.5	3.0-5.5	3.9-8.6
Sewer system	3.9	0.7	1.0	1.8	2.1	2.6	2.3	4.4	3.7	3.3	1.8	3.7
	0.9-6.9	0.0-1.6	0.0-2.4	0.5-3.2	0.0-4.5	1.5-3.7	1.0-3.5	3.1-5.7	2.7-4.7	0.2-6.3	1.0-2.7	1.9-5.5
Fireplaces	7.5	6.6	6.8	5.0	8.4	7.1	6.5	6.2	4.7	3.4	4.7	7.9
	3.9-11.1	3.7-9.5	3.5-10.1	3.1-6.9	4.1-12.8	5.4-8.8	4.6-8.5	4.7-7.6	3.6-5.8	0.4-6.3	3.4-5.9	5.4-10.4
BBQs and fire baskets	8.9	3.8	7.5	5.2	9.8	6.6	6.5	9.4	7.2	5.0	5.2	6.6
	4.9-12.8	1.6-6.0	3.8-11.3	3.2-7.3	5.1-14.6	5.0-8.3	4.4-8.5	7.6-11.3	5.8-8.6	1.3-8.8	3.8-6.6	4.2-9.0
Boats and shipping	0.1	0.0	0.9	0.6	0.0	0.4	0.4	1.1	1.1	2.0	0.5	0.5
	0.0-0.3	0.0-0.0	0.0-2.1	0.0-1.5	0.0-0.0	0.0-0.8	0.0-0.8	0.5-1.7	0.5-1.7	0.0-4.3	0.0-0.9	0.0-0.9

5.3.1.3 Vibrations

Table 5-58 Annoyance vibrations

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
severe annoyance												
Road traffic	4.2	4.5	2.2	3.5	1.6	4.1	2.8	4.8	4.3	2.2	3.8	5.7
	1.7-6.8	2.0-7.1	0.3-4.1	1.8-5.1	0.0-3.3	2.8-5.3	1.4-4.1	3.6-6.0	3.4-5.3	0.0-4.4	2.9-4.8	3.6-7.7
Passenger trains	1.7	0.7	0.0	1.5	0.0	0.5	0.4	0.9	0.3	0.6	0.5	0.9
	0.1-3.2	0.0-1.9	0.0-0.0	0.2-2.8	0.0-0.0	0.0-0.9	0.0-0.9	0.3-1.5	0.0-0.6	0.0-1.8	0.1-0.8	0.0-1.8
Freight trains	1.7	1.2	0.4	1.8	0.0	1.6	1.2	1.1	0.3	0.6	1.3	1.4
	0.1-3.2	0.0-2.7	0.0-1.0	0.4-3.1	0.0-0.0	0.7-2.5	0.4-2.0	0.4-1.7	0.0-0.7	0.0-1.8	0.6-2.1	0.3-2.5
Trams or metro	0.2	1.2	0.0	0.4	0.0	0.0	0.2	1.4	0.5	0.0	0.2	0.0
	0.0-0.5	0.0-2.7	0.0-0.1	0.0-1.2	0.0-0.0	0.0-0.0	0.0-0.6	0.7-2.1	0.2-0.8	0.0-0.0	0.0-0.4	0.0-0.0
Aeroplanes and helicopters	0.0	0.7	0.0	1.2	0.1	0.6	1.9	3.4	0.8	0.0	1.7	1.8
	0.0-0.1	0.0-1.7	0.0-0.1	0.0-2.4	0.0-0.3	0.1-1.1	0.7-3.1	2.3-4.5	0.4-1.2	0.0-0.0	0.9-2.4	0.6-3.1
Military air traffic	0.3	1.2	1.2	0.9	0.8	1.4	0.6	0.8	0.2	0.0	1.8	1.8
	0.0-1.0	0.0-2.5	0.0-2.8	0.0-1.9	0.0-2.3	0.5-2.3	0.0-1.4	0.2-1.3	0.0-0.4	0.0-0.0	1.0-2.6	0.6-3.0
Factories and businesses	0.5	0.7	0.6	0.5	0.6	0.5	0.3	1.0	0.3	0.7	0.3	0.5
	0.0-1.5	0.0-2.0	0.0-1.7	0.0-1.3	0.0-1.7	0.0-0.9	0.0-0.6	0.4-1.6	0.0-0.5	0.0-2.2	0.0-0.6	0.0-1.1
Building and demolition activities	1.1	1.6	1.2	2.1	1.3	1.3	1.7	4.0	2.0	1.5	1.3	2.1
	0.0-2.3	0.0-3.4	0.0-2.8	0.6-3.6	0.0-3.1	0.6-1.9	0.7-2.7	2.8-5.2	1.4-2.7	0.0-3.6	0.6-1.9	0.7-3.5
Windmills, wind turbines	0.0	0.6	0.6	0.4	0.0	0.0	0.0	0.5	0.0	0.0	0.1	0.0
	0.0-0.0	0.0-1.8	0.0-1.7	0.0-1.2	0.0-0.0	0.0-0.0	0.0-0.0	0.1-1.0	0.0-0.1	0.0-0.0	0.0-0.4	0.0-0.0
annoyance												
Road traffic	13.4	10.0	5.3	8.4	3.7	7.9	9.0	11.0	10.5	8.8	8.5	11.3
	9.0-17.8	6.6-13.4	2.4-8.2	6.0-10.7	0.8-6.6	6.2-9.6	6.7-11.3	9.3-12.7	9.0-12.0	4.7-12.9	7.0-10.0	8.5-14.0
Passenger trains	2.1	1.2	0.0	2.0	0.0	1.0	0.8	1.9	0.6	0.6	1.2	1.3
	0.4-3.7	0.0-2.6	0.0-0.0	0.6-3.4	0.0-0.0	0.4-1.6	0.2-1.5	1.1-2.8	0.2-1.0	0.0-1.8	0.6-1.8	0.2-2.4
Freight trains	2.0	1.2	0.9	3.1	0.0	2.4	1.8	2.6	0.7	1.0	2.1	2.2
	0.4-3.6	0.0-2.7	0.0-2.2	1.4-4.7	0.0-0.0	1.4-3.4	0.9-2.8	1.6-3.5	0.3-1.2	0.0-2.5	1.2-2.9	0.9-3.6
Trams or metro	0.2	1.2	0.6	0.4	0.0	0.1	0.5	2.5	1.5	0.0	0.4	0.0
	0.0-0.5	0.0-2.7	0.0-1.7	0.0-1.2	0.0-0.0	0.0-0.3	0.0-1.0	1.6-3.4	0.9-2.1	0.0-0.0	0.1-0.7	0.0-0.1

	Gron	Frie	Dren	OvIJs	Flev	Geld	Utre	NHol	ZHol	Zeel	NBrab	Limb
Aeroplanes and helicopters	1.9	2.2	1.9	1.6	3.6	2.3	4.5	7.4	3.1	1.3	4.0	3.9
	0.0-3.9	0.6-3.8	0.0-3.8	0.3-2.9	0.6-6.7	1.3-3.2	2.7-6.3	5.9-9.0	2.2-4.0	0.0-3.1	2.9-5.2	2.1-5.6
Military air traffic	0.3	2.6	2.4	1.6	1.1	2.3	1.5	1.8	1.0	0.7	4.1	3.6
	0.0-1.0	0.8-4.5	0.2-4.6	0.3-2.8	0.0-2.7	1.2-3.3	0.4-2.6	1.0-2.6	0.5-1.5	0.0-2.2	2.9-5.2	1.9-5.2
Factories and businesses	1.1	0.7	1.0	0.7	1.1	1.0	0.4	1.8	1.0	1.0	0.8	1.6
	0.0-2.6	0.0-2.0	0.0-2.3	0.0-1.5	0.0-2.6	0.4-1.7	0.0-0.9	1.0-2.5	0.5-1.5	0.0-2.6	0.3-1.3	0.5-2.7
Building and demolition activities	3.7	3.5	2.1	3.2	1.3	3.1	3.9	8.5	5.4	4.4	3.4	3.2
	1.2-6.3	1.3-5.8	0.1-4.2	1.4-4.9	0.0-3.1	2.0-4.2	2.4-5.4	6.8-10.1	4.2-6.6	1.1-7.7	2.4-4.5	1.6-4.9
Windmills, wind turbines	0.0	0.9	0.6	0.4	0.0	0.1	0.1	0.8	0.2	0.0	0.2	0.0
	0.0-0.0	0.0-2.3	0.0-1.7	0.0-1.2	0.0-0.0	0.0-0.2	0.0-0.2	0.2-1.3	0.0-0.5	0.0-0.0	0.0-0.5	0.0-0.1
some annoyance												
Road traffic	21.1	16.5	10.7	15.6	9.5	16.3	15.2	20.1	17.5	16.9	15.8	18.8
	15.5-26.7	12.3-20.8	6.7-14.8	12.2-19.1	4.6-14.5	13.8-18.7	12.1-18.2	17.8-22.5	15.6-19.5	10.9-22.9	13.7-17.9	15.3-22.3
Passenger trains	2.5	1.9	1.3	3.6	0.9	2.6	3.2	2.6	1.4	2.0	2.5	2.8
	0.6-4.4	0.1-3.7	0.0-2.9	1.7-5.5	0.0-2.8	1.5-3.7	1.7-4.7	1.6-3.5	0.7-2.0	0.0-4.2	1.5-3.5	1.3-4.3
Freight trains	2.2	1.2	1.6	5.1	0.6	4.0	4.9	3.7	1.8	2.9	2.8	4.0
	0.4-3.9	0.0-2.7	0.0-3.3	2.9-7.3	0.0-1.7	2.7-5.3	3.1-6.8	2.5-4.8	1.1-2.6	0.1-5.8	1.8-3.9	2.2-5.8
Trams or metro	0.2	2.1	0.6	0.8	0.4	0.6	1.5	3.6	3.2	0.0	0.9	0.2
	0.0-0.5	0.2-4.1	0.0-1.7	0.0-1.8	0.0-1.1	0.0-1.2	0.4-2.6	2.5-4.6	2.3-4.1	0.0-0.0	0.3-1.5	0.0-0.5
Aeroplanes and helicopters	5.2	4.4	3.6	3.4	9.4	5.9	8.2	13.3	7.3	2.5	7.7	6.8
	2.2-8.2	2.0-6.8	0.9-6.2	1.5-5.2	4.5-14.4	4.3-7.6	5.8-10.6	11.3-15.3	5.9-8.6	0.1-5.0	6.1-9.3	4.5-9.2
Military air traffic	0.8	7.8	3.0	2.4	1.4	5.1	3.0	3.0	2.0	1.3	7.9	5.5
	0.0-1.8	4.5-11.0	0.5-5.4	0.9-4.0	0.0-3.2	3.5-6.6	1.4-4.6	1.9-4.1	1.3-2.8	0.0-3.1	6.2-9.6	3.4-7.5
Factories and businesses	1.2	0.7	1.6	1.4	1.6	1.9	1.8	2.7	1.7	1.4	1.6	2.5
	0.0-2.8	0.0-2.0	0.0-3.2	0.1-2.6	0.0-3.9	0.9-2.8	0.7-2.9	1.8-3.7	1.0-2.4	0.0-3.2	0.9-2.4	1.0-3.9
Building and demolition activities	7.2	6.1	4.7	4.9	4.2	6.6	8.9	13.5	9.1	9.1	7.1	5.0
	3.8-10.7	3.1-9.0	1.7-7.8	2.7-7.1	1.0-7.4	4.9-8.4	6.4-11.3	11.4-15.6	7.6-10.6	4.3-13.9	5.5-8.7	3.0-7.0
Windmills, wind turbines	0.0	1.4	0.6	0.8	0.9	0.3	0.9	1.1	0.3	0.0	0.4	0.3
	0.0-0.0	0.0-2.9	0.0-1.7	0.0-1.8	0.0-2.8	0.0-0.6	0.0-1.8	0.4-1.8	0.0-0.6	0.0-0.0	0.0-0.9	0.0-0.8

6 Appendix Questionnaire Disturbances Survey 2016

QUESTION 1   BLOCK A: SOUND

I would like to begin by asking you a number of questions about sounds that you
hear at home from traffic, industry, and other activities.
The questions relate to your experiences over the last 12 months (or the period of time that you have lived here if that is shorter). Would you please answer the questions in relation to your home situation, in other words the situation in your house, in front of your door, in your garden, or on your balcony.

QUESTION 101

Which number, on a scale from 0 to 10, best describes the degree to which you are annoyed, disturbed, or bothered by sound from the following sources when you are at home? In answering the questions, think about the last 12 months.
If the sound is not audible at your home, please indicate this separately.

Sound from	Not annoyed at all										Severely annoyed	Not heard
The total of all road traffic	0	1	2	3	4	5	6	7	8	9	10	
The total of all rail traffic	0	1	2	3	4	5	6	7	8	9	10	
The total of all air traffic	0	1	2	3	4	5	6	7	8	9	10	
Factories and businesses	0	1	2	3	4	5	6	7	8	9	10	
Building and demolition activities	0	1	2	3	4	5	6	7	8	9	10	
Recreational activities	0	1	2	3	4	5	6	7	8	9	10	
The neighbours	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 102

To what degree is your sleep disturbed by sound from the following sources? In answering the question, think about the last 12 months.
If the sound is not audible at your home, please indicate this separately.

Sound from	Not disturbed at all										Severely disturbed	Not heard
The total of all road traffic together	0	1	2	3	4	5	6	7	8	9	10	
The total of all rail traffic	0	1	2	3	4	5	6	7	8	9	10	
The total of all air traffic	0	1	2	3	4	5	6	7	8	9	10	
Factories and businesses	0	1	2	3	4	5	6	7	8	9	10	
Building and demolition activities	0	1	2	3	4	5	6	7	8	9	10	
Recreational activities	0	1	2	3	4	5	6	7	8	9	10	
The neighbours	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 103   SOUND OF ROAD TRAFFIC

I would now like to ask more detailed questions about the sound of traffic from different types of roads. To what degree are you annoyed, disturbed, or bothered by sound from the following roads when you are

at home? In answering the question, think about the last 12 months. If the sound is not audible at your home, please indicate this separately.

	Not annoyed at all							Severely annoyed				Not heard
Traffic on a road with a speed limit of 30 km/h	0	1	2	3	4	5	6	7	8	9	10	
Traffic on a road with a speed limit of 50 km/h (in other words within a built-up area)	0	1	2	3	4	5	6	7	8	9	10	
Traffic on a road with a speed limit of 80 km/h (e.g. a provincial road)	0	1	2	3	4	5	6	7	8	9	10	
Traffic on a motorway with a speed limit of 100 to 130 km/h (e.g. a divided highway)	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 104
I would now like to focus more on the sound from different types of vehicles. To what degree are you annoyed, disturbed, or bothered by sound from the following vehicles when you are at home? In answering the question, think about the last 12 months.

	Not annoyed at all							Severely annoyed				Not heard
Passenger cars and taxis	0	1	2	3	4	5	6	7	8	9	10	
Delivery vans	0	1	2	3	4	5	6	7	8	9	10	
Lorries	0	1	2	3	4	5	6	7	8	9	10	
Buses	0	1	2	3	4	5	6	7	8	9	10	
Mopeds/scooters (also when stationary)	0	1	2	3	4	5	6	7	8	9	10	
(Cross) motorcycles/motorbikes	0	1	2	3	4	5	6	7	8	9	10	
Military vehicles	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 105
To what degree is your sleep disturbed by the sound of the following vehicles? In answering the question, think about the last 12 months.

	Not disturbed at all							Severely disturbed				Not heard
Passenger cars and taxis	0	1	2	3	4	5	6	7	8	9	10	
Delivery vans	0	1	2	3	4	5	6	7	8	9	10	
Lorries	0	1	2	3	4	5	6	7	8	9	10	
Buses	0	1	2	3	4	5	6	7	8	9	10	
Mopeds/scooters (also when stationary)	0	1	2	3	4	5	6	7	8	9	10	
(Cross) motorcycles/motorbikes	0	1	2	3	4	5	6	7	8	9	10	
Military vehicles	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 106
I would now like to focus more on the sound from different sources of
rail and air traffic. To what degree are you annoyed, disturbed, or
bothered by sound from the following sources when you are at home? In
answering the question, think about the last 12 months. If the sound is
not audible at your home, please indicate this separately.

	Not annoyed at all							Severely annoyed				Not heard
Trains	0	1	2	3	4	5	6	7	8	9	10	
Trams	0	1	2	3	4	5	6	7	8	9	10	
Metro	0	1	2	3	4	5	6	7	8	9	10	
Passenger and freight air-traffic	0	1	2	3	4	5	6	7	8	9	10	
Sport and business aeroplanes	0	1	2	3	4	5	6	7	8	9	10	
Advertising aeroplanes	0	1	2	3	4	5	6	7	8	9	10	
Military aeroplanes (excluding helicopters)	0	1	2	3	4	5	6	7	8	9	10	
Helicopters	0	1	2	3	4	5	6	7	8	9	10	
Drones	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 107
To what degree is your sleep disturbed by sound from the following
sources?
In answering the question, think about the last 12 months. Here again,
if the sound is not audible at your home, please indicate this separately.

	Not disturbed at all							Severely disturbed				Not heard
Trains	0	1	2	3	4	5	6	7	8	9	10	
Trams	0	1	2	3	4	5	6	7	8	9	10	
Metro	0	1	2	3	4	5	6	7	8	9	10	
Passenger and freight air-traffic	0	1	2	3	4	5	6	7	8	9	10	
Sport and business aeroplanes	0	1	2	3	4	5	6	7	8	9	10	
Advertising aeroplanes	0	1	2	3	4	5	6	7	8	9	10	
Military aeroplanes (excluding helicopters)	0	1	2	3	4	5	6	7	8	9	10	
Helicopters	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 1080 BLOCK B: SOUND FROM INDUSTRIAL AND OTHER
ACTIVITIES
I would now like to ask a number of questions about sounds that you
hear in and around your home coming from industrial and other
activities.
Once again, the question relates to your experience over the last 12
months in your home, in front of your door, in your garden, or on your
balcony.

QUESTION 108
To what degree are you annoyed, disturbed, or bothered by sound from the following sources when you are at home? If the sound is not audible at your home, please indicate this separately.

	Not annoyed at all							Severely annoyed				Not heard
Shopping street sounds	0	1	2	3	4	5	6	7	8	9	10	
Activities in areas or places for loading or unloading	0	1	2	3	4	5	6	7	8	9	10	
Activities in shunting yards and railway yards	0	1	2	3	4	5	6	7	8	9	10	
Agricultural tractors	0	1	2	3	4	5	6	7	8	9	10	
Activities in military exercise areas, firing grounds, and shooting ranges	0	1	2	3	4	5	6	7	8	9	10	
Windmills/wind turbines	0	1	2	3	4	5	6	7	8	9	10	
Low-frequency sound (a low, humming or buzzing sound from ventilators or air-conditioners for example)	0	1	2	3	4	5	6	7	8	9	10	
Boats and (marine) ships	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 109
To what degree is your sleep disturbed by sound from the following sources?

	Not disturbed at all							Severely disturbed				Not heard
Shopping street sounds	0	1	2	3	4	5	6	7	8	9	10	
Activities in areas or places for loading or unloading	0	1	2	3	4	5	6	7	8	9	10	
Activities in shunting yards and railway yards	0	1	2	3	4	5	6	7	8	9	10	
Agricultural tractors	0	1	2	3	4	5	6	7	8	9	10	
Activities in military exercise areas, firing grounds, and shooting ranges	0	1	2	3	4	5	6	7	8	9	10	
Windmills/wind turbines	0	1	2	3	4	5	6	7	8	9	10	
Low-frequency sound (a low, humming or buzzing sound from ventilators or air-conditioners for example)	0	1	2	3	4	5	6	7	8	9	10	
Boats and (marine) ships	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 110
Many different types of machines can be used in building and demolition areas. To what degree are you annoyed, disturbed, or bothered by sound from the following machines when you are at home?

	Not annoyed at all							Severely annoyed				Not heard
Concrete transport trucks	0	1	2	3	4	5	6	7	8	9	10	
Mobile water pumps	0	1	2	3	4	5	6	7	8	9	10	
Motor-driven compressors	0	1	2	3	4	5	6	7	8	9	10	
Demolition hammers, pneumatic drills	0	1	2	3	4	5	6	7	8	9	10	
Excavators	0	1	2	3	4	5	6	7	8	9	10	
Shovel loader, loader	0	1	2	3	4	5	6	7	8	9	10	
Mobile cranes (also driving on the road)	0	1	2	3	4	5	6	7	8	9	10	
Hydraulic or electrical power units	0	1	2	3	4	5	6	7	8	9	10	
Pile drivers	0	1	2	3	4	5	6	7	8	9	10	
Backing-up warning signals from lorries	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 111   BLOCK C: SOUND IN AND AROUND THE HOME
The following questions concern the sound in and around your home. Once again, the questions relate to your experiences over the last 12 months (or the period of time that you have lived here if that is shorter). Would you please answer the questions in relation to the situation at your home?

How quiet is your home? By 'quiet' we mean that it is calm and there is no or almost no noise.

1	☐	A very quiet home
2	☐	A quiet home
3	☐	Not quiet but also not loud or noisy
4	☐	A home with little silence
5	☐	A home that is almost never silent

QUESTION 112
To what degree are you annoyed, disturbed, or bothered by the
following sounds when you are at home? If the sound is not audible at
your home, please indicate this separately.

	Not annoyed at all										Severely annoyed	Not heard
Contact sounds from the neighbours (for example walking up and down stairs, opening and closing doors, walking on hard floor coverings)	0	1	2	3	4	5	6	7	8	9	10	
Radio, TV, computers, or (mobile) phones of the neighbours	0	1	2	3	4	5	6	7	8	9	10	
Air-conditioning of the neighbours	0	1	2	3	4	5	6	7	8	9	10	
Outdoor activities of adults, children, and/or pets such as talking, playing, and gardening	0	1	2	3	4	5	6	7	8	9	10	
Sounds from the lift, gallery, and/or staircase (if you live in a multi-family property)	0	1	2	3	4	5	6	7	8	9	10	
Maintenance activities by the municipality (such as refuse lorries, sweeper lorries, and leaf blowers)	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 113
To what degree is your sleep disturbed by the following sounds?

	Not disturbed at all										Severely disturbed	Not heard
Contact sounds from the neighbours (walking up and down stairs, opening and closing doors, walking on hard floor coverings)	0	1	2	3	4	5	6	7	8	9	10	
Radio, TV, computers, or (mobile) phones of the neighbours	0	1	2	3	4	5	6	7	8	9	10	
Air-conditioning of the neighbours	0	1	2	3	4	5	6	7	8	9	10	
Outdoor activities of adults, children, and/or pets such as talking, playing, and gardening	0	1	2	3	4	5	6	7	8	9	10	
Sounds from the lift, gallery, and/or staircase (if you live in a multi-family property)	0	1	2	3	4	5	6	7	8	9	10	
Maintenance activities by the municipality (such as refuse lorries, sweeper lorries, and leaf blowers)	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 114   BLOCK D: SOUND RECREATION
I would now like to talk about sounds that you hear at home from
recreational activities in the vicinity such as amusement parks, bars,
cafés and restaurants, and sport parks.
The questions relate to your experiences over the last 12 months (or the
period of time that you have lived here if that is shorter). And once
again we are asking about the situation at your home.
To what degree are you annoyed, disturbed, or bothered by sound from
the following sources when you are at home? If the sound is not audible
at your home, please indicate this separately.

	Not annoyed at all										Severely annoyed	Not heard
Fairs, circuses, amusement parks, and local street events	0	1	2	3	4	5	6	7	8	9	10	
Discos, clubs, or other hospitality venues such as bars, cafés and restaurants	0	1	2	3	4	5	6	7	8	9	10	
Sport fields, stadiums, sport halls, swimming pools, tennis courts, halfpipes etc.	0	1	2	3	4	5	6	7	8	9	10	
Mass outdoor events such as pop concerts	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 115
To what degree is your sleep disturbed by sound from the following
sources?

	Not disturbed at all										Severely disturbed	Not heard
Fairs, circuses, amusement parks, and local street events	0	1	2	3	4	5	6	7	8	9	10	
Discos, clubs, or other hospitality venues such as bars, cafés and restaurants	0	1	2	3	4	5	6	7	8	9	10	
Sport fields, stadiums, sport halls, swimming pools, tennis courts, halfpipes etc.	0	1	2	3	4	5	6	7	8	9	10	
Mass outdoor events such as pop concerts	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 116   BLOCK E: VIBRATIONS

The following questions are about vibrations that you may feel at home from road, rail, and air traffic.

The questions relate to your experiences over the last 12 months (or the period of time that you have lived here if that is shorter). Would you please answer the questions in relation to the situation at your home?

Which number, on a scale from 0 to 10, best describes the degree to which you are annoyed, disturbed, or bothered by vibrations when you are at home? If a vibration is not felt at your home, please indicate this separately.

	Not annoyed at all										Severely annoyed	Not felt
Road traffic	0	1	2	3	4	5	6	7	8	9	10	
Passenger trains	0	1	2	3	4	5	6	7	8	9	10	
Freight trains	0	1	2	3	4	5	6	7	8	9	10	
Trams or metro	0	1	2	3	4	5	6	7	8	9	10	
Aeroplanes and/or helicopters	0	1	2	3	4	5	6	7	8	9	10	
Military aeroplanes	0	1	2	3	4	5	6	7	8	9	10	
Factories and businesses	0	1	2	3	4	5	6	7	8	9	10	
Building and demolition activities	0	1	2	3	4	5	6	7	8	9	10	
Windmills/wind turbines	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 117   BLOCK F: ODOUR

The following questions are about odours from your surroundings that you smell at home.

The questions relate to your experiences over the last 12 months (or the period of time that you have lived here if that is shorter). Would you please answer the questions in relation to the situation at your home? Which number, on a scale from 0 to 10, best describes the degree to which you are annoyed, disturbed, or bothered by the following odours when you are at home? If an odour is not smelled at your home, please indicate this separately.

	Not annoyed at all										Severely annoyed	Not smelled
Restaurants and snack bars	0	1	2	3	4	5	6	7	8	9	10	
Factories and (medium-sized) businesses	0	1	2	3	4	5	6	7	8	9	10	
Agricultural companies and the spreading of manure	0	1	2	3	4	5	6	7	8	9	10	
Road traffic	0	1	2	3	4	5	6	7	8	9	10	
Air traffic	0	1	2	3	4	5	6	7	8	9	10	
Neighbours	0	1	2	3	4	5	6	7	8	9	10	
Sewer system	0	1	2	3	4	5	6	7	8	9	10	
Fireplaces and multifuel stoves	0	1	2	3	4	5	6	7	8	9	10	
BBQs and fire baskets	0	1	2	3	4	5	6	7	8	9	10	
Boats and (marine) ships	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 118
To what degree is your sleep disturbed by odours from the following sources?
In answering the question, think about the last 12 months.

	Not disturbed at all										Severely disturbed	Not smelled
Restaurants and snack bars	0	1	2	3	4	5	6	7	8	9	10	
Factories and (medium-sized) businesses	0	1	2	3	4	5	6	7	8	9	10	
Agricultural companies and the spreading of manure	0	1	2	3	4	5	6	7	8	9	10	
Road traffic	0	1	2	3	4	5	6	7	8	9	10	
Air traffic	0	1	2	3	4	5	6	7	8	9	10	
Neighbours	0	1	2	3	4	5	6	7	8	9	10	
Sewer system	0	1	2	3	4	5	6	7	8	9	10	
Fireplaces and multifuel stoves	0	1	2	3	4	5	6	7	8	9	10	
BBQs and fire baskets	0	1	2	3	4	5	6	7	8	9	10	
Boats and (marine) ships	0	1	2	3	4	5	6	7	8	9	10	

QUESTION 119   BLOCK G: QUALITY OF LIFE
The following questions are about the neighbourhood you live in.
The questions relate to your experiences over the last 12 months (or the period of time that you have lived here if that is shorter).
How satisfied or dissatisfied are you with your living environment?

Very dissatisfied							Very satisfied			
0	1	2	3	4	5	6	7	8	9	10

QUESTION 1220
Would you please indicate how concerned you are about your safety with regard to the following situations? You can do so by choosing a number between 0 and 10, with 0 meaning that you are not concerned at all and 10 meaning that you are extremely concerned. If a situation does not apply to you or you do not know, please indicate it accordingly.

QUESTION 122
To what degree are you concerned or not concerned about your safety in the following situations?

	To what degree are you concerned or not concerned about your safety with regard to this situation?											n/a	I don't know
	Not concerned at all						Extremely concerned concerned						
Living in a busy street	0	1	2	3	4	5	6	7	8	9	10		
Living in a polder (reclaimed land) below sea level or river level	0	1	2	3	4	5	6	7	8	9	10		
Living in an agricultural or horticultural area	0	1	2	3	4	5	6	7	8	9	10		
Living in the vicinity of intensive livestock farming	0	1	2	3	4	5	6	7	8	9	10		

To what degree are you concerned or not concerned about your safety with regard to this situation?												n/a	I don't know
Not concerned at all							Extremely concerned concerned						
Living below the route used by aeroplanes to approach a big airport	0	1	2	3	4	5	6	7	8	9	10		
Living alongside a railway line	0	1	2	3	4	5	6	7	8	9	10		
Living in the vicinity of a big airport	0	1	2	3	4	5	6	7	8	9	10		
Living alongside a route for hazardous substances	0	1	2	3	4	5	6	7	8	9	10		
Living near a high-voltage line	0	1	2	3	4	5	6	7	8	9	10		
Living on contaminated soil	0	1	2	3	4	5	6	7	8	9	10		
Living in the vicinity of a high-risk business/industry	0	1	2	3	4	5	6	7	8	9	10		
Living in the vicinity of a mobile phone (GSM or UMTS) mast	0	1	2	3	4	5	6	7	8	9	10		
Lightning striking your home	0	1	2	3	4	5	6	7	8	9	10		

QUESTION 123
To what degree are you concerned that the following circumstances harm your health?

	Not concerned at all concerned						Extremely concerned concerned				
The air-quality in your home	0	1	2	3	4	5	6	7	8	9	10
The air quality around your home	0	1	2	3	4	5	6	7	8	9	10
The soil quality around your home	0	1	2	3	4	5	6	7	8	9	10
The drinking water quality in your home	0	1	2	3	4	5	6	7	8	9	10
The water quality in the vicinity of your home	0	1	2	3	4	5	6	7	8	9	10
The sound around your home	0	1	2	3	4	5	6	7	8	9	10

QUESTION 124   BLOCK H: EXPECTATIONS
The following questions are about your neighbourhood.
In your opinion, has the neighbourhood where you live improved or deteriorated over the last year?

1   ☐   Improved
2   ☐   Deteriorated
3   ☐   Remained the same

Do you think the neighbourhood you live in will improve or deteriorate in the coming year?

1   ☐   Improve
2   ☐   Deteriorate
3   ☐   Will not change

In your opinion, has the sound of road traffic in your neighbourhood increased or decreased over the last year?

1 ☐ Increased
2 ☐ Decreased
3 ☐ Remained the same

Do you think that the sound of road traffic in your neighbourhood will increase or decrease over the coming year?

1 ☐ Increase
2 ☐ Decrease
3 ☐ Will not change

QUESTION 1380

BLOCK J: FINAL QUESTIONS

To finish this questionnaire, I would like to ask you several more questions about
yourself and your home situation.

QUESTION 138
What kind of house do you live in?

1 ☐ Flat or apartment (downstairs)
2 ☐ Flat or apartment (upper story)
3 ☐ Terraced house
4 ☐ Corner terraced house
5 ☐ Semi-detached house
6 ☐ Detached house
7 ☐ Other, namely:

QUESTION 139
Is this house a:

1 ☐ Rented house
2 ☐ Owner-occupied house
3 ☐ Other, namely:

QUESTION 140
In what year was your house built?

1 ☐ <1900
2 ☐ 1901-1950
3 ☐ 1951-1960
4 ☐ 1961-1970
5 ☐ 1971-1980
6 ☐ 1981-1990
7 ☐ 1991-2000
8 ☐ 2001-2016
9 ☐ I don't know

QUESTION 141
How many years have you been living in this house?
If this period is less than one year, then fill in a 0.

QUESTION 142
How many years have you been living in this neighbourhood?
If this period is less than one year, then fill in a 0.

QUESTION 143
What is the highest level of education or training you have completed?

1 ☐ Did not complete primary school
2 ☐ Primary school (elementary school, special education elementary school)
3 ☐ Junior or pre-vocational education (such as junior secondary technical school (LTS), junior commercial education (LEAO), Junior agricultural education (LAO), junior domestic science and vocational education (LHNO), pre-vocational secondary education (VMBO))
4 ☐ Junior general secondary education (such as junior general secondary education (MAVO), higher elementary education (MULO), advanced elementary education (ULO), basic secondary vocational education (MBO-kort), the theoretical track of pre-vocational secondary education (VMBO-t))
5 ☐ Senior secondary vocational education and work-based education (such as senior secondary vocational education (MBO-lang), senior secondary technical school (MTS), upper secondary vocational education in business and administration (MEAO), school-based pathway (BOL)   work-based pathway (BBL), and medical assistant training (INAS))
6 ☐ Senior general secondary education and pre-university education (such as senior general secondary education (HAVO), pre-university education (VWO) without Latin or Greek (Atheneum)   or with Latin and Greek (Gymnasium), secondary modern school (HBS), girls' secondary school (MMS))
7 ☐ Higher professional education (such as school for higher professional education (HBO), institute of technology (HTS), school for higher education in economics and management (HEAO), Nursing degree (HBO-V), Bachelor degree))
8 ☐ University level education

QUESTION 144
Which description fits you the best?

1 ☐ I do paid work 32 hours or more per week
2 ☐ I do paid work between 19 and 32 hours per week
3 ☐ I do paid work less than 19 hours per week
4 ☐ I am a full-time housewife/houseman
5 ☐ I have retired (taken early retirement) (AOW, VUT, FPU)
6 ☐ I am taking education courses/studying
7 ☐ I do volunteer work
8 ☐ I am unemployed/looking for employment
9 ☐ I am incapacitated for work (WAO, AAW, WAZ, WAJONG)