

Postgraduate course MAICh, Crete, Greece

Strategic Environmental Assessment and Planning

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Land Use Planning



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COMPULSARY LITERATURE

Therivel, R., 2004. Strategic environmental assessment in action. Earthscan, London.

RECOMMENDED LITERATURE

Dalal-Cayton, B., and B. Sadler, 2005. Strategic environmental assessment: A source-book and reference guide to international experience. Earthscan, London.

Glasson, J., R. Therivel, and A. Chadwick, 2003. Introduction to environmental impact assessment. 2nd Edition. Spon Press, London.

Jones, C., M. Baker, J. Carter, S. Jay, M. Short and C. Wood (Eds.), 2005. Strategic environmental assessment and land use planning: An international evaluation. Earthscan, London.

Needham, B., 2007. Dutch land use planning: Planning and managing land use in the Netherlands, the principles and the practice. Sdu Uitgevers, Den Haag.

Roo, G. de, 2003. Environmental planning in the Netherlands: Too good to be true. From command-and-control planning to shared governance. Ashgate, Aldershot.

Schmidt, M, E. João, and E. Albrecht (Eds.), 2004. Implementing strategic environmental assessment. Environmental protection in the European Union, Volume 2. Springer, Berlin.

1 STRATEGIC ENVIRONMENTAL ASSESSMENT

The principles and the process of Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) in practice are quite similar. While the course will specifically focus at methods and techniques for strategic assessment, both SEA and EIA will be introduced in the first lecture. Furthermore, the course will elaborate on methods and techniques for environmental assessment that can be used in the context of spatial planning or land use planning. Typically, these methods and techniques are more qualitative of nature.

The compulsory literature for the course includes the book: Therivel, R., 2004. Strategic environmental assessment in action. Earthscan, London.

Note: Read Chapter 2 (pp. 7-19) of the book **before** the start of the course.

This first part of the course includes two assignments, concerning the SEA process (assignment 1.1) and SEA techniques, i.e. the use of impact matrices (assignment 1.2).

Assignment 1.1 – The context

This first assignment intends to give you a rough understanding of the process of assessment of alternatives in a SEA. You will be confronted with a strategic action concerning land use developments in an area and some alternative strategies for these developments. The assessment will be carried out in about three hours within a plenary group session. You should prepare yourself Monday afternoon by studying the literature and the case study material that will be handed out after the introduction lecture.

Assignment 1.1 Part 1

The first part of assignment 1.1 involves a one-day workshop about the SEA process. During the workshop you will be confronted with a real-life case. The workshop will give you a rough feeling of the different stages of SEA and what an entire SEA process feels like. See also Annex 1.

Assignment 1.1 Part 2

Discuss the SEA process of the one day workshop by describing its strengths and weaknesses, e.g. of the different steps taken, the methods and techniques used, the results of the process, your role in the process, and other things that you may find important to discuss. Make a concise report of a maximum of 1 page A4 in which you describe your findings.

NOTE: the report should be focusing at discussing the SEA process in the workshop, and not summarizing it.

Assignment 1.2 – The context

Traffic jams have become a common phenomenon at the Dutch highways. Increasing urbanization and commercialization are resulting in extra mobility. Road traffic will grow until 2020 by more than 40% in relation to 2000, on both the national road network (NN) and the regional road network (RN) (see Figure 1). The growth is concentrated in short distance journeys (up to thirty kilometers) and in urban areas. In all regions, the national road network accounts for the most kilometers.

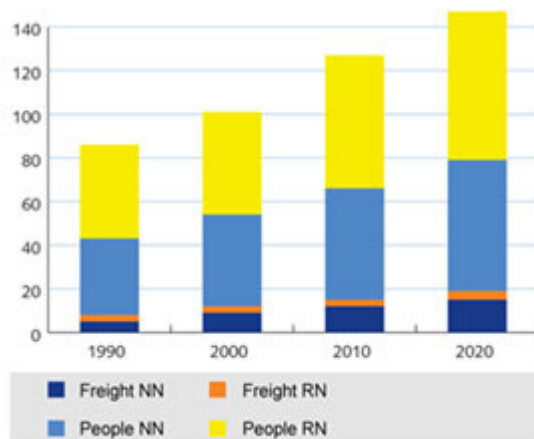


Figure 1 Development in vehicle kilometers on workdays (index 2000 = 100).

The existing national road network is unable to handle the growth in mobility. The intensity of road usage is increasing steadily, with particularly high traffic levels in the Randstad (west part of the Netherlands). Without extra measures, this will cause increases in journey time and decreases in predictability. Actual journey time often differs from the journey time estimates that citizens and companies make in advance. During rush-hour in the Randstad, journey time is unreliable for more than one in five journeys. This means that road users do not know what to expect. Calculations issued by the Spatial Planning Office reveal that reliability on the national road network will increase strongly until 2020 without extra policy. In 2020, journey time for 13% of the journeys of more than 50 kilometers will be a maximum of 20% longer or shorter than the expected journey time, with journey time for shorter distance a maximum of 10 minutes longer or shorter than expected. This was just 8% in 2000. Individual routes, particularly in the Randstad, can be even less reliable. Reliability on the national road network is higher than on the regional road network.

The Dutch Ministry of Transport, Public Works and Water Management is therefore taking measures, such as constructing rush-hour lanes, to help reduce the incidence of bottlenecks (see Figure 2). In order to ensure that the Netherlands remains accessible in the long term as well, the government is also investing in new roads and other infrastructure. The Mobility Policy Document of the Ministry aims to greatly improve the reliability of the journey time by 2020. This can be achieved by giving a strong impulse to construction and utilization measures, promoting cooperation at regional area level and eliminating maintenance backlogs. Incident management, traffic management and route and travel information is to be improved.



Figure 2 Map with the main bottlenecks in the highway infrastructure in the Netherlands.

An international study into the opinions of business people reveals that businesses feel that the Randstad is less accessible via the road than other competitive economic centers. Actually, the average speed by car from door to door is higher in the Randstad than it is in Paris or London. This is partially because of the relatively large percentage of highways and the spatial configuration of the Randstad: the Randstad consists of a number of cities at a distance from one another rather than of a single core. However, the chance of traffic jams in the Randstad is higher, which also makes the journey time in the Randstad less reliable.

One of the main bottlenecks is the route Haarlemmermeer-Schiphol-Amsterdam-Almere, located in northern Randstad where much new housing projects take place, with a subsequent increase in car traffic. A study revealed that more road capacity will be required in the long-term to handle traffic growth, including growth caused by the expansion of Almere. It also revealed that traffic jams would decrease if drivers were required to pay the costs associated with usage of the road. No major public transport capacity problems are expected for this route, with the exception of certain specific bottlenecks. Limited extra investments (in comparison with the reference situation in 2010) will be enough to solve bottlenecks in rail transport, in combination with road investments.

The results of the study justify a planning study for road capacity increase. Four main corridor alternatives for a new highway route between the highways A6 and the A9 were designed. These alternatives are much criticized since they are located in sensitive and important wetland areas and also run through present local communities. Therefore, an impact assessment was set up to make clear what environmental, social and economic impacts are included with the four alternatives. The baseline alternative includes a major investment in the present regional and national infrastructure, to upgrade its capacity.

In an effort to create a good living environment for future generations, nature, the environment, the landscape, the cultural legacy, living areas and the infrastructure must be properly managed. This is part of good stewardship; it also creates a positive climate for creating businesses. The Dutch government wants to let the economy grow and to provide space for traffic and transport while simultaneously limiting the negative effects of this traffic. Therefore, the government hires you, a well-known environmental consultant, to do an impact evaluation for a strategic environmental assessment and give an advice on the corridor alternatives, based on several characteristics. You will be given a table with these characteristics or criteria.

Assignment 1.2

Evaluate the alternative highway corridors in comparison to upgrading the present infrastructure (environmental baseline). First make clear what you consider to be the most significant impacts and criteria (i.e. scoping), assess the alternative corridors and the baseline for these criteria, and make a recommendation for the best alternative (or the baseline) with an explanation why you consider this the best alternative. Describe and discuss the results in a concise report. See detailed explanation below.

Procedure and detailed explanation of assignment 1.2

- a) The first step is to identify the most significant criteria. First you may consider eliminating irrelevant, redundant or unimportant criteria. Second, you may combine some criteria where it can be done without significant loss of information. Describe and discuss your choices and present the resulting table.
- b) Develop/choose a uniform qualitative, graphical scale (key, legend) of effect for the resulting criteria and present the assessment of the highway corridors and the baseline in an impact prediction matrix or magnitude matrix (without assessing a cumulative effect). Examples of these matrices are provided in the PowerPoint of the introduction lecture and Chapter 8 of Therivel (2004). Explain how you derived the matrix and discuss the results.
- c) Assess the cumulative effects of each highway corridor and the environmental baseline from the matrix in the previous step, using the same qualitative, graphical scale. Explain how you derived the resulting cumulative effects and discuss the results.
- d) Develop/choose a numeric ordinal scale (see e.g. Table 8.9 in Therivel, 2004) and produce a new magnitude matrix using this ordinal scale, which allows developing a weighted matrix (see PowerPoint of the introduction lecture).

- e) The next step is an evaluation of the resulting magnitude matrix. This requires the identification of the significance of each type of impact (criterion). You should assess this from the perspective of three stakeholder groups, i.e. from economical perspective, environmental perspective and the perspective of the local residents. Derive one set of weights for each perspective using the paired comparison method (see PowerPoint of the introduction lecture).
- f) Use a multi-criteria evaluation (MCE) technique such as weighted linear combination to calculate a ranking of the alternatives for each perspective (three sets of weights).
- g) Draw a conclusion and make a recommendation for the best alternative.
- h) Discuss the strengths and weaknesses of the methods and procedure of this assignment, e.g. with respect to the different matrices, the chosen criteria, scales and weights, and the likely issues for debate in planning practice.



2 ENVIRONMENTAL STANDARDS AND ZONING

2.1 Environmental standards

Over three successive decades, structured environmental policy in the Netherlands has developed into a full policy area with its own characteristics and interrelations. The structuring of environmental policy in the Netherlands resulted in a growing need for environmental standards at lower levels of government, in industry and in environmental organizations. The standards policy, particularly when based on figures, was expected to ensure legal certainty and equity. This role was elaborated in the 1976 Policy Document on Ambient Environmental Standards (PDAES, Ministry of Public Health and Environment, 1976). This is an interesting document, particularly in the light of the heated discussions on standards during the 1990s.

Standards are defined in the PDAES as “general rules that are binding to a certain extent, expressed in quantitative terms or otherwise”. National numerical standards can therefore be seen as general regulations expressed in quantitative terms. The PDAES defines five types of standard designed to combat various aspects of pollution occurring between the source (i.e. the emitting installation) and the recipient (i.e. the object of protection):

- a) Procedure and production standards: standards for fixed installations/products;
- b) Discharge or emission standards: standards relating to emissions at source;
- c) Immission standards: standards for the immission of pollutants in a recipient area, function or object;
- d) Quality standards: environmental standards relating to the condition of an area, function or object;
- e) Exposure standards: standards relating to the level of pollution to which individuals or populations are exposed.

Procedure and production standards and emission standards are source-oriented in terms of policy. Initially, this group of environmental standards had no consequences for spatial planning. However, this does not mean that the impact of emissions on the spatial environment is regarded as unimportant. Models are increasingly used to convert emission figures into immission figures, with a spatial and area-specific interpretation.

It was mainly the standards controlling immissions and quality that had consequences for spatial planning. Immission standards were designed to control the quantity of pollutants that encroach on an area, function or object in a given time period. Immission standards *à la lettre* are pollutant-specific, whereas quality standards reflect a desired situation for an area, function, object, individual or population. Immission and quality standards support and specify targets for environmental policy.

The role of exposure standards in environmental policy has many aspects. Because these standards do not relate to ambient environmental quality, it is inappropriate to

focus on emissions, immissions and quality. Exposure relates mainly to humans, e.g. exposure to pollutants in drinking water and food. Exposure to radiation is also important in this context.

Immission and quality standards – and, indirectly, emission standards – are used to monitor the levels of pollution to which areas, functions, objects, populations and individuals are exposed. This form of monitoring will, where necessary, result in source-directed and/or area-specific measures. Consequences for spatial planning can be identified on the basis of immission and quality standards – and possibly on the basis of emission standards – in order to define, aim for and attain the desired level of quality in the ambient environment.

zoning

Standards for controlling immissions can be used for zoning. Zoning is an important tool for spatial and environmental planning. In The Netherlands, this was first implemented in the Noise abatement act in 1979. Zoning aims to maintain a certain distance between environmentally intrusive activities and sensitive areas. In environmental planning two types of zoning are common: (1) inward zoning, and (2) outward zoning. Starting point of inward zoning are sensitive areas. A zone around a sensitive area is drawn, where environmental intrusive activities are not allowed. This type of zoning is used in situations where environmental intrusive activities are planned, whereas the environmental quality for specific sensitive areas should be protected. The starting point of outward zoning are the current intrusive activities.

VNG list

In 1986 the Association of Netherlands Municipalities (VNG) published the so-called ‘green book’ entitled “Bedrijven en milieuzonering” (Industry and Environmental Zoning) (VNG, 1986). This book describes a method for “systematically assessing the distances that should be maintained between industry and environmentally sensitive areas”. This indicative method of assessment categorizes industry according to a wide range of pollution categories and calculates the required distance in relation to environmentally sensitive residential areas. The relationship between an installation or industrial location and its environment is no longer considered in terms of individual environmental aspects, but in terms of almost all types of relevant pollution. This was the first practical application of integrated environmental zoning.

The VNG method for integrated environmental zoning is now a common and generally accepted method in the Netherlands for determining ‘safe’ distances between industry and homes in terms of environmental quality. The method is easy to implement, and therefore cheap. Because the specified distances are based on experience and are averages for the industrial category in question, the values are only indicative and not based on actual on-site pollution measurements. The categories and distances are updated regularly, and published as the so-called VNG-lists. For more complex industrial activities, the VNG method becomes less practicable.

The VNG method is important, because several other methods make use of the basic principles and data of the VNG method, e.g. the STEPP tool (see assignment 2.2).

<Examine the VNG-list in Annex 1 and use the list and the explanation of categories at the end of the list to answer the questions below.>

Assignment 2.1

The heart of the VNG-method lies in the VNG-list with environmental intrusive activities. Describe the answers of following questions in a brief report.

- Which types of environmental impact (pollution categories) are included in the VNG-method and which types are represented by distances and which are not?
- Can you describe if and how the categories that are not represented by impact distances might be used for an environmental assessment?
- Can the distances in the VNG-lists be used for inwards and/or outwards zoning? Please explain your answer.
- Are similar standards being used in your home country or would such standards (like VNG) be applicable or not? Discuss your answer briefly.

2.2 Environmental zoning: the STEPP tool

This section focuses at the GIS-ArcView based Strategic Tool for integrating Environmental aspects in Planning Procedures (STEPP). The tool is intended to support the work of local authorities throughout the spatial planning process by providing quick scan evaluations of the environmental impacts and possible consequences of several options. The tool is especially useful in the early phases of the planning process. This section describes the basic concepts of STEPP and the main tools of the STEPP application. A case study for the Ede-Veenendaal region in the Netherlands will be the focus for the practical assignments.

2.2.1 Basic concept of STEPP**Analysis and design component**

STEPP offers an analytical as well as a design component (Figure 3). The analytical component of STEPP (Figure 1A) includes a definition of the sensitivity of delineated receptive areas in a certain geographical domain, and a definition of areas with a specific degree of intrusion of pollutants or contamination. A spatially based confrontation of sensitivity and intrusion gives a certain environmental quality. The location and the nature of human activities in an area can be adapted (Figure 1B). The design component offers an opportunity to apply different scenarios, based on new spatial arrangements of human activities. See also Carsjens et al. (2002).

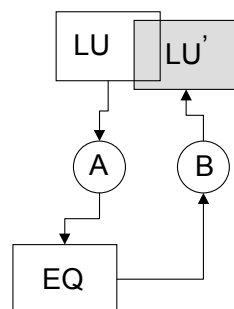


Figure 3 STEPP components (A: analytical component B: design component; LU: land use; LU': modified; EQ: environmental quality).

The analytical component consists of five different steps (see Figure 4):

1. Determining the human activities and types of receptive environment in a study area, based on land-use data.
2. Determining the areas where environmental impacts occur (zones of influences).
3. Combining the zones of influences and the sensitivities of receptive areas to produce an environmental quality map for each category of environmental impact.
4. Cumulating the zones of influences into an integrated environmental impact map.
5. Combining the individual quality maps into an integrated environmental quality map.

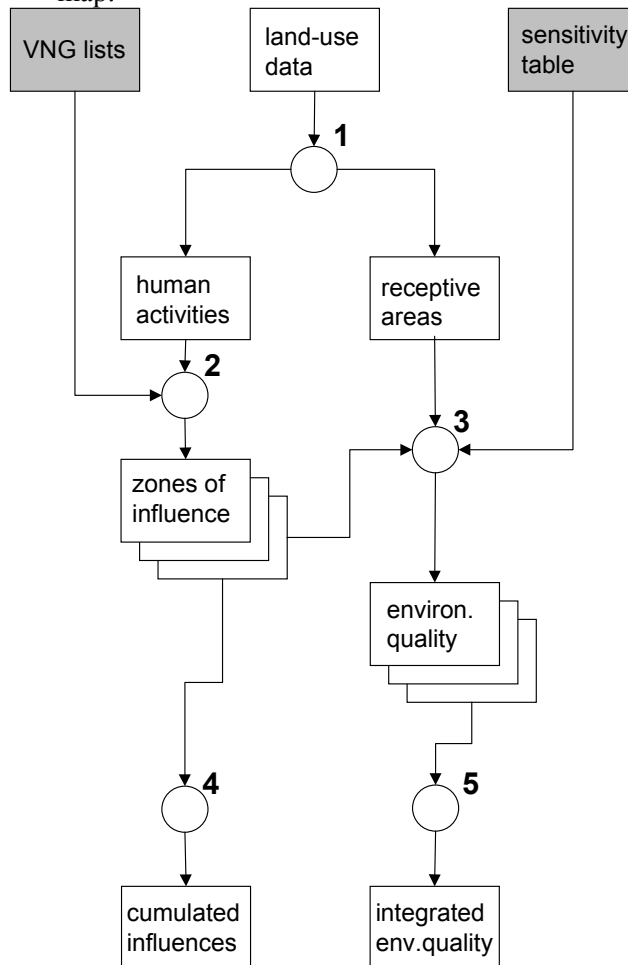


Figure 4 The basic steps of the analytical component of STEPP.

Activities Information on land use is a very valuable source to determine spatially located human activities (step 1). Most human activities are related to physical objects like industrial and company buildings, farmland parcels, roads and railways. Some typical environmental impacts of these activities are smell, dust, nuisance, fire and explosion hazards, and local air pollution. The data on activities can be derived from (mostly analogue) information available through the Dutch municipalities.

Functions Information on land use can also be used to define receptive areas (step 1). Two basic geographical information databases, the Digital Topographical Map 1:10.000 (published by the Dutch Topographical Service) and the Digital Land-Use Statistics (pub-

lished by the Dutch Central Bureau of Statistics) provide the necessary information. STEPP distinguishes three categories of receptive environment:

- Areas with human inhabitants, subdivided in areas with large numbers of humans (such as shopping malls), areas where humans have permanent residence (such as private residences) and areas that humans occasionally visit (such as recreation areas).
- Areas with (unique) ecological values (such as parks and nature areas).
- Areas without (unique) ecological values, subdivided in soil and water areas (such as gardens and canals) and paved areas.

Impact zones

The second step in the analytical component of STEPP begins with an analysis of the activities in the study area, in order to derive the zones where environmental impacts occur. The implications of the spatial scale of environmental impacts of most activities can be derived from lists of the Organization of Municipalities in The Netherlands (VNG 1999). These VNG lists are based on practical experience, and contain information on average distances necessary between various activities and sensitive functions. These distances can be used to calculate zones per impact category around the location of each activity. Table 1 gives an example of these VNG lists (see also Chapter **Error! Reference source not found.**).

Table 1 An example of activities in the VNG lists, with a selection of impact zones per category (VNG 1999).

(1)	(2) (3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SBI	nr definition	smell	dust	noise	risk	traffic	visual	B	D	L
1581	0 Bread factories and confectioneries:									
1581	1 - capacity < 2500 kg flour/week	30	10	30	10	1	1			
1581	2 - bread- and biscuit factories	100	30	100	30	2	2			
271	0 Pig iron and steel plants:									
271	1 - prod. capacity < 1,000 ton/yr	700	500	700	200	2	2	B		
271	2 - prod. capacity >= 1,000 tons/yr	1500	1000	1500	300	3	3	B		L
5122	Wholesale trade flowers and plants	10	10	30	0	2	1			
5231, 5232	Pharmacies and drugstores	0	0	0	10	1	1			
9272.2	Model aircraft airfields	10	0	300	100	1	1			
10037	Radar installations	0	0	0	1500	1	3			D

Explanation of the columns

- 1: Unique code for each type of activity (SBI-code)
- 2: Serial numbers for activities within the same SBI-code
- 3: Definition of the activity
- 4, 5, 6, and 7: Distance in meters per impact category
- 8, 9: Index number representing a small (1) to large (3) attraction of traffic or visual disturbance
- 10, 11: Codes indicating soil (B) and air (L) pollution
- 12: Code indicating a diversity of activities within the SBI-code

Industrial zones

The concept of influence distances of the VNG lists has been adopted in STEPP. In addition to the individual activities listed in the VNG lists, STEPP also includes a tool to introduce four different types of industrial zones. Each type of zone is characterized by average influence distances of representative activities in the VNG lists. The four types of industrial zones, with impact zones, are:

		Smell	Dust	Noise	Hazard
T -	INDUSTRIAL ZONES				
T 01	Service industries (offices)	0	0	10	0
T 02	Wholesale trade	30	10	50	30
T 03	Manufacturing industry	100	50	100	30
T 04	Heavy industry	300	100	300	50

Additional to the VNG lists, indicative impact distances for nuisance and local air pollution from road and rail traffic are also included, since these impacts are especially relevant in urban areas and urban fringes.

Sensitivities

The third step starts with an analysis of the sensitivity of functions for each impact category. Table 2 gives an example of how these sensitivities can be classified.

Table 2 Classification of function sensitivities for each type of impact.

Function	Code	Level of sensitivity per impact category					
		dust	smell	noise	hazard	infra noise	infra air pollution
<i>Human beings</i>							
concentrations	MEC	3	3	3	3	3	3
permanent	MEP	2	2	2	2	2	2
occasional	MEN	1	1	1	1	1	1
<i>Ecological values</i>							
ecological values	EC	1	1	2	1	2	1
<i>Other areas</i>							
soil and water	BW	1	1	1	1	1	1
paved area	MA	1	1	1	1	1	1

Environmental quality

STEPP compares the impact zones for each impact category with the sensitivity of the functions present in each zone. This gives a quality indicator map for each impact category. The general idea is that:

- Areas without influences have good quality (indicator value 0).
- Areas with functions that are not sensitive for a specific impact have a reasonable quality (indicator value 1).
- Areas with functions that are sensitive to a specific impact have a moderate quality (indicator value 2).
- Areas with functions that are very sensitive to a specific impact have a poor quality (indicator value 3).

Integrating maps

The fourth step incorporates the different impact maps into an integrated environmental impact map. It calculates the different impacts at any one location. The fifth step incorporates the different quality indicator maps into an overall integrated environmental quality map. This process entails summarizing the values of the different quality indicator maps. The importance of an individual quality indicator map depends on the situation and/or the sensitivities involved. Thus it is then possible to rank one map higher than another. Figure 5 gives a schematic example of the computations in the fourth and fifth step.

The design component (Figure 1B) offers an opportunity to work with scenario studies based on new spatial arrangements of human activities. Most input data and parameters that are used by STEPP can be modified, e.g.:

- The locations of (human) activities.
- The shape and size of specific areas.
- The different types of receptive areas (function of an area).
- The sensitivity of receptive areas.
- The activity-based environmental impact parameters (the influence distances of the VNG lists as well as impact distances of individual activities).

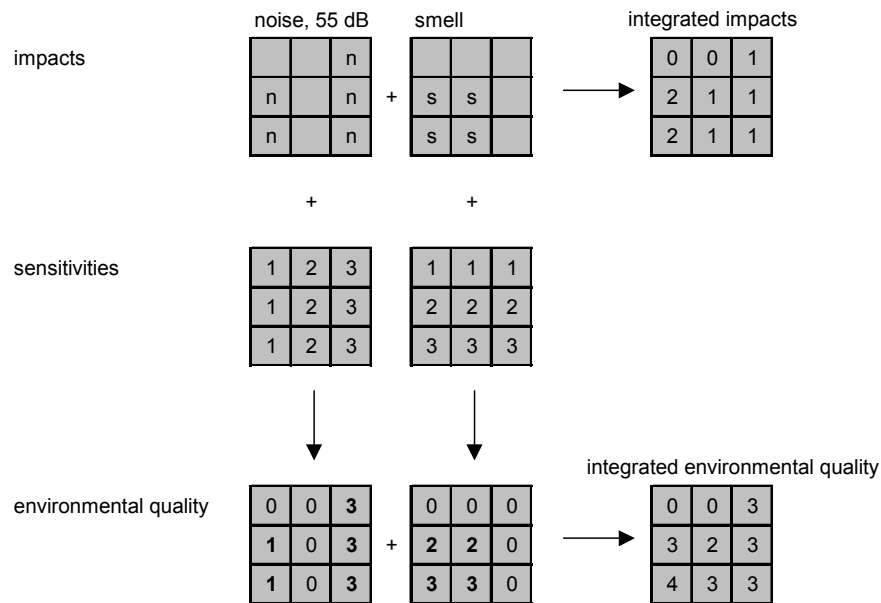


Figure 5 Example of the computations in the fourth and fifth step (without ranking the individual maps).

Intended measures to improve the environmental quality (e.g., the use of filters or noise barriers) have to be ‘converted’ to a reduction in impact distance before they can be introduced in STEPP.

The different menus and options of the STEPP application will be further explained in the next section.

2.2.2 The STEPP application

Starting up

The first time that you use STEPP, you need to open the ArcView project STEPP.APR in the main STEPP directory. Directly after opening the project STEPP will ask you to save the project under a new name, where PROJECT.APR is the pre-set name. The project should be saved in a working directory such as STEPP\PROJECT or another working directory, but NOT in the main STEPP directory. A working directory should be created with the Windows Explorer first. When working with STEPP several views are created that will be saved in this working directory. These should be separated from the initial files in the STEPP main directory.

Important note: After finishing your day's work, and saving the project, please be sure that you open your PROJECT.APR in the working directory the next day, so you can continue with your work of the previous day. Do NOT open STEPP.APR again, or if you do, save the new PROJECT.APR in another working directory, to prevent that your previous PROJECT.APR and corresponding files will be overwritten. Also, if you save your work at the local disk, use the same computer every day.

Main menus

The STEPP analyses take place with three pull-down menus: *STEPP-Initialize*, *STEPP-Edit* and *STEPP-Analyze* (see Figure 6). These menus are only visible when a View is open and active. Note: Specific menu options will be inactive, depending on the phase of the analysis. For instance, if you do create an impact map with the *STEPP-Analyze* menu, the corresponding data (Tables) cannot be altered anymore with the *Edit menu*. Therefore you need to create a new View with the *STEPP-Initialize* menu. During the analyses you should never try to change the names of Themes (e.g. names of impacts maps) manually, since this will probably cause the application to malfunction. If you like to use other names in a layout, please change the layout itself.

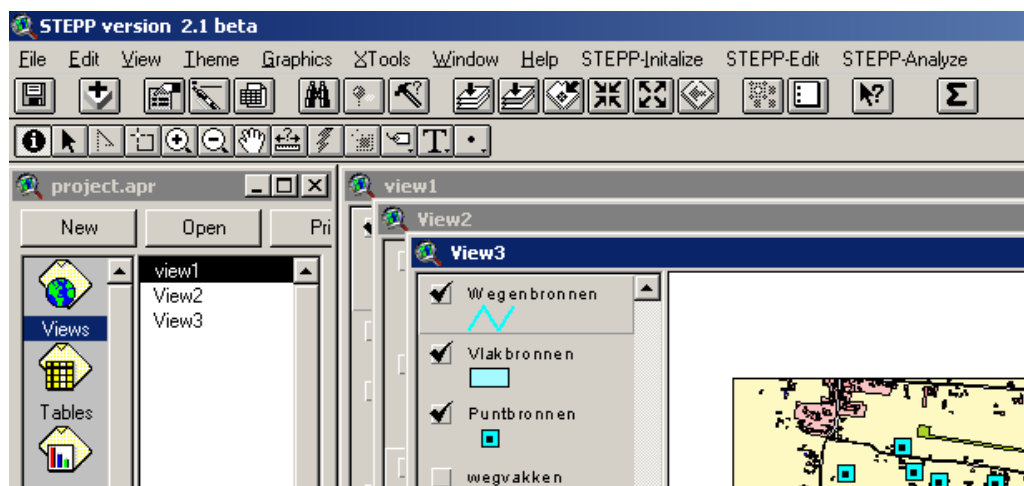
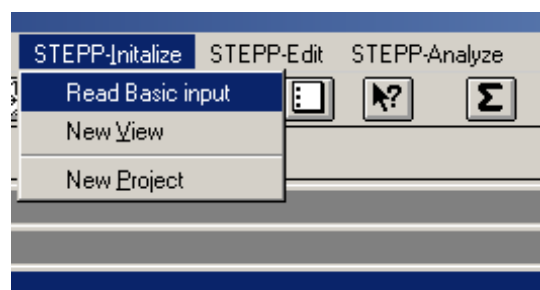


Figure 6 The main menus of STEPP are shown at the top right hand side.

The three STEPP menus will be described below.

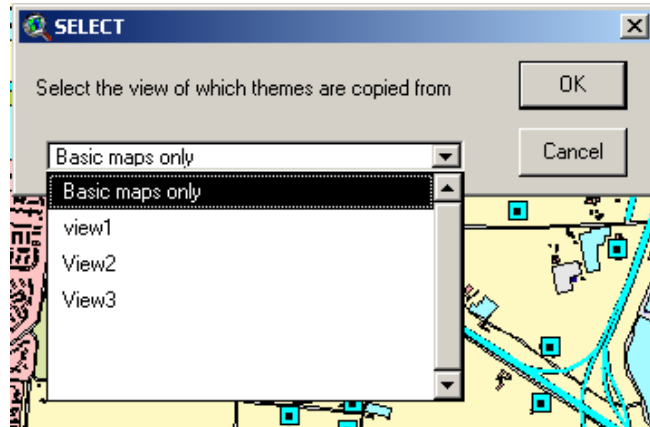


STEPP-Initialize The STEPP-Initialize menu includes three options (see above). These are:

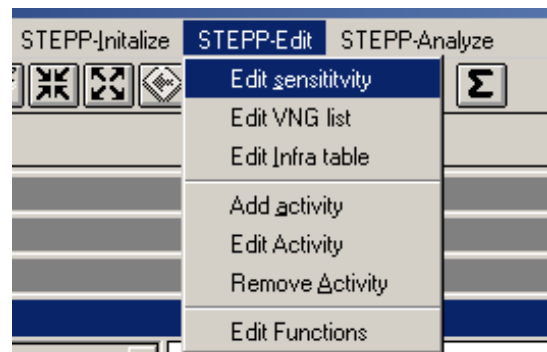
- **Read Basic input.** This option is used to import the basic input files from the main STEPP directory in an empty view. If used in a view that already in-

cludes input files, a warning message will appear. If you continue importing the basic input files all existing input files in the view will be overwritten.

- **New View.** This option creates a new view. After selecting this option a new empty view will be created, and the window below will appear that allows you to import the basic input data, or to choose the data of a previous view.



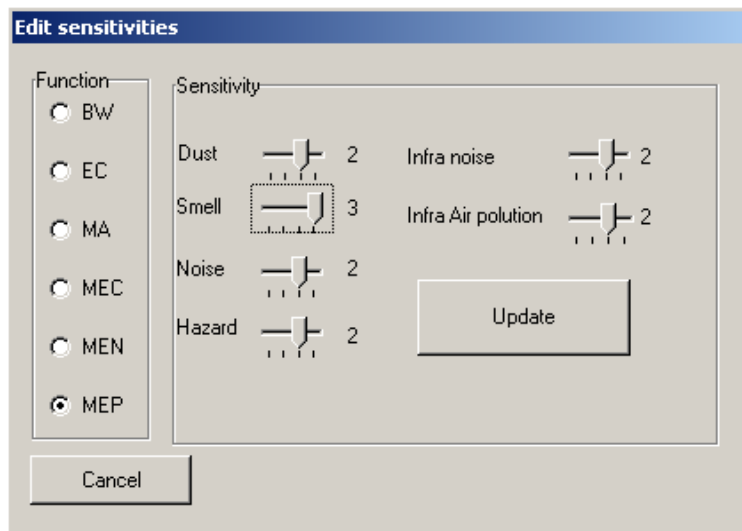
- **New Project.** If you like to start a completely new working project, you can use this option. Save the new project in another working directory (see the first phase of *Starting up*), in order to prevent that the project files in the current working directory will be overwritten.



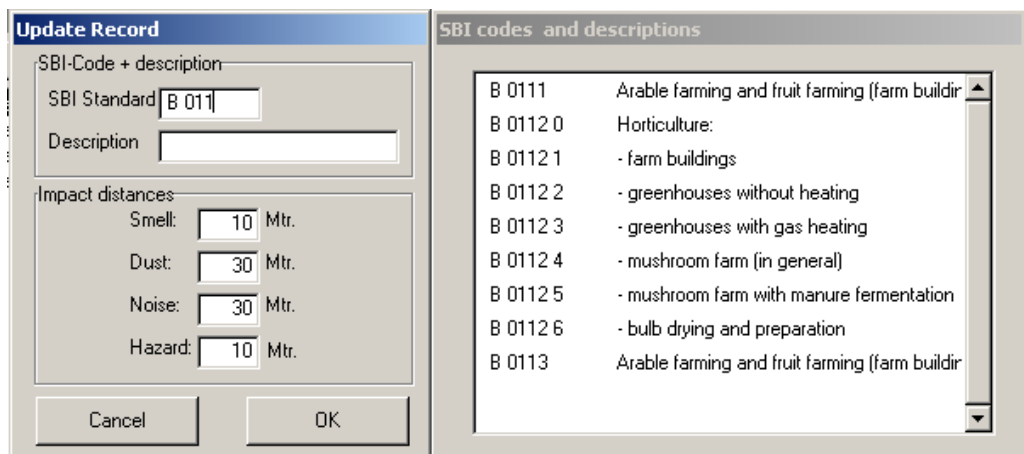
STEPP-Edit

The STEPP-Edit menu includes all options to modify the input data of the project, before running the analyses with the STEPP-Analyze menu. The STEPP-Edit menu includes the next options:

- **Edit sensitivity.** With this option you can change the sensitivity of the six functions in STEPP for the six types of impact (dust, smell, noise and hazard for activities in the VNG list, and noise and local air pollution for road and rail infrastructure). After changing one of the levers, as shown in the window below, the button Update appears. You need to press this button to confirm the changes for the present function.

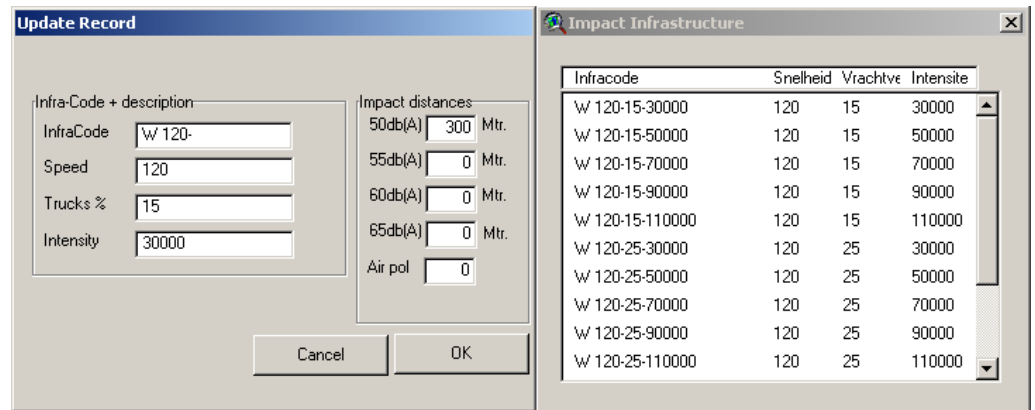


- Edit VNG list.** This option can be used to change the content of the VNG list, e.g. the different SBI-categories, the impact distances of a category. New categories can be added, and present categories can be deleted. Please note that changes in this table will affect the impact distances of all activities. If you prefer to change the impact distance of an individual activity, you should use the option *Edit Activity* (see further in this section). After selecting the option *Edit VNG list*, you can select the options *Add*, *Update* or *Delete*. After selecting *Update*, you will see the next window.

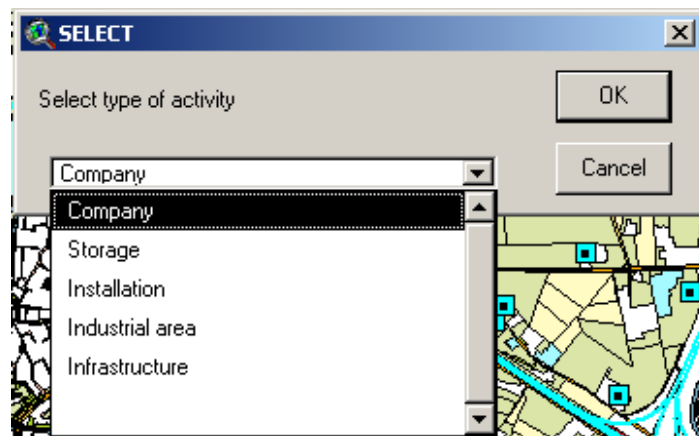


After clicking at the SBI Standard of Description box, the table at the right hand side with SBI codes and descriptions appears. You can either scroll through this list and select a category, or type a (part of the) SBI Standard code yourself. The codes start with B and <space> for companies, I and <space> for storage facilities and installations, and T and <space> for the four types of industrial areas. You can also type a word or phrase in the description box to get a specific selection of the table. The impact distances of any one category can be changed and confirmed after pressing the OK button.

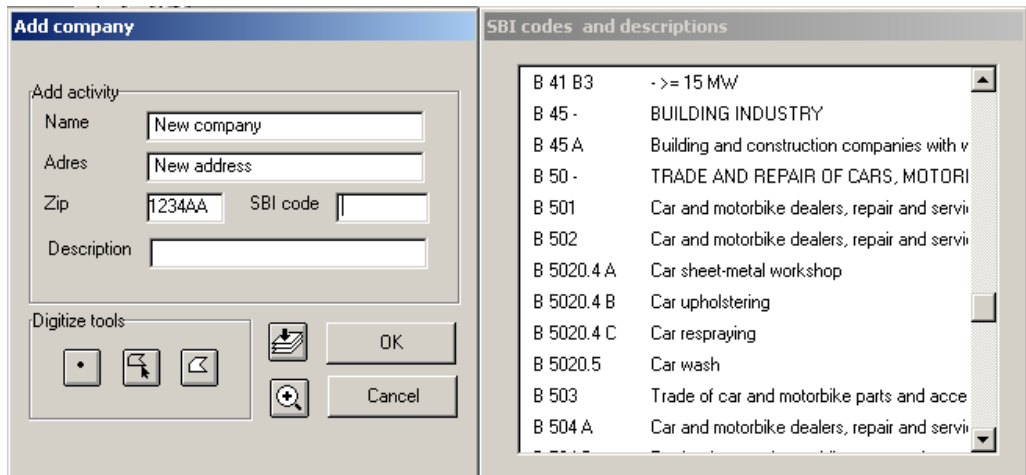
- **Edit Infra table.** This option can be used to change the pre-selected impact distances for noise and local air pollution of road infrastructure (similar to changes in the VNG list). At present, the impact distance for 50 dB(A) and air pollution are included. If you want to change the impact distances of a specific, individual road or railway only, you should use the option *Edit Activity*.








- **Add Activity.** With this option a new activity can be added to the study area. After selecting this option you get a selection window (see below) that allows you to add a new company, storage facility, installation or industrial area, as included in the VNG list (see also *Edit VNG list*), or to add new road or rail infrastructure by selecting the option *Infrastructure*.



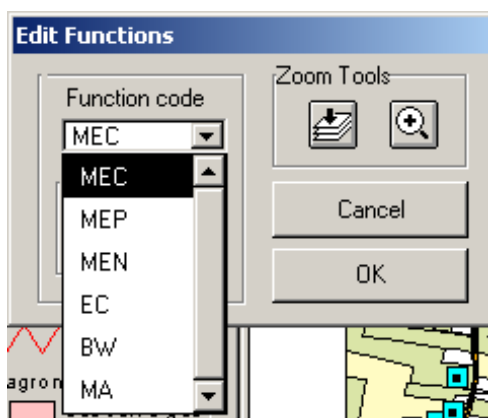
If you select one of the first four options you will get a new window, similar to the one below that belongs to the option *Add new company*.



Within the window you need to fill the name, address and zip code of the new activity, and select a SBI code from the table with SBI codes and descriptions, that appears after clicking the SBI code or the Description field. Of course, the new activity also needs to be digitized in the study area. The activity can be added either as a point or an area object. You can use the next buttons:

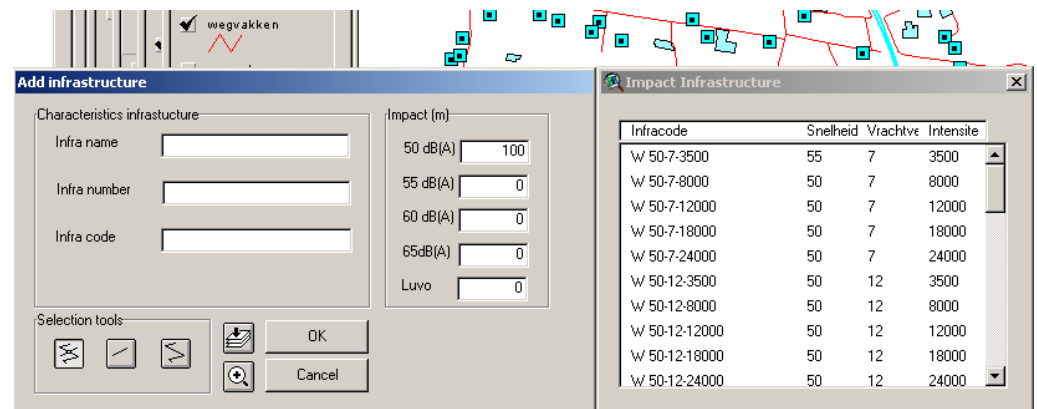
-  Create a new point activity.
-  Select an existing area (polygon) from the theme Functions (functions).
-  Draw your own area; you can use the theme Agrond as a background.
-  Zoom to the full extent of the themes.
-  Zoom to the selected area.

After adding an area activity, the corresponding area in the function map needs to be changed to. The next window will automatically appear.






You can make your choice from the field *Function code*. If you press the *Cancel* button in this window, the function map will not be changed, and the area will keep its current function.

The fifth option of *Add activity* adds new infrastructure, and the window below will show up.



Within this window you can include a name and number of the infrastructure that you like to add, and your own impact distances. By clicking at the Infra code field the table with standard impacts for road infrastructure at the right hand side will appear. After selecting a specific category, the corresponding impact distances will appear. The impacts of rail infrastructure are not included in this table. You can add the geometry of the new infrastructure with the buttons below. All infrastructural elements are represented by lines. In case of some larger infrastructure, such as a highway, two lines can be used to represent the heart of the lanes of both driving directions.

-  Select a complete road from the theme Wegvakken (Roads).
-  Select one section of a road from the theme Wegvakken.
-  Draw your own infrastructure.

Note: For selecting present infrastructure you can make use of the theme Wegvakken. Make this theme active first and/or de-select other themes, so the theme will appear clearly in the view.

- **Edit Activity.** This option allows you to change the properties of any individual activity or infrastructure. After choosing for activity, the next window shows up.

With the buttons below you can select a point or an area activity. Changes in the impact distance of the activity can be implemented in the column with distances in meter, or as a fraction of the distance in the VNG list. Changing one column will also change the corresponding value in the other column.



Select a point activity.



Select an area activity.

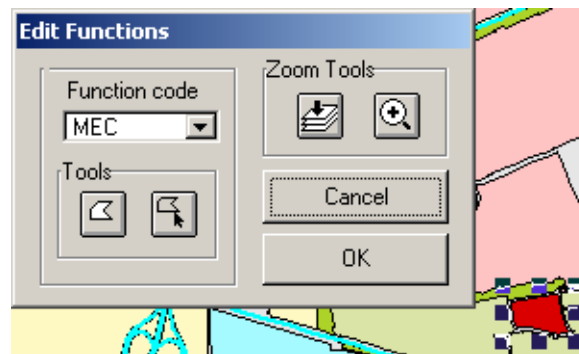
For editing the properties of infrastructure, the next window will appear, and allows you to change the impact distances and other characteristics.



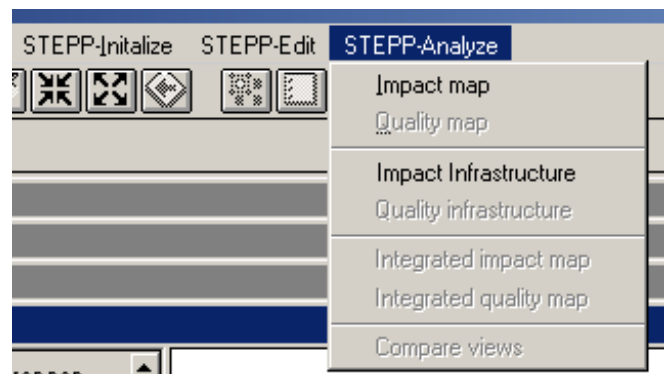
Select road or rail infrastructure. A specific segment or the whole infrastructural element will be selected, depending on how the specific infrastructure was added to the project (as segments or as one line object).

- **Remove Activity.** With this option activities or infrastructure can be deleted from the project.

- **Edit Functions.** The function map can be changed with this option.

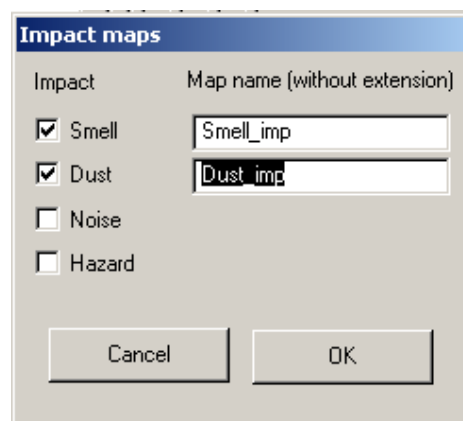


An area (polygon) from the function map can be selected, or a new area can be drawn. The corresponding function can be changed with the *Function code* field.

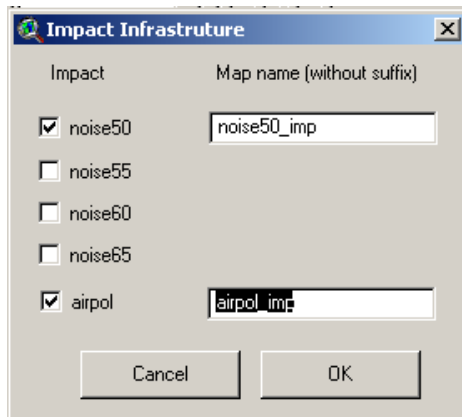


STEPP-Analyze With the STEPP-Analyze menu the impact and quality maps can be created. Some options in the menu become active only after previous steps have been finished, e.g. the option *Quality map* becomes active after creating an impact map, and the option *Integrated quality map* after creating two or more quality maps. The menu includes:

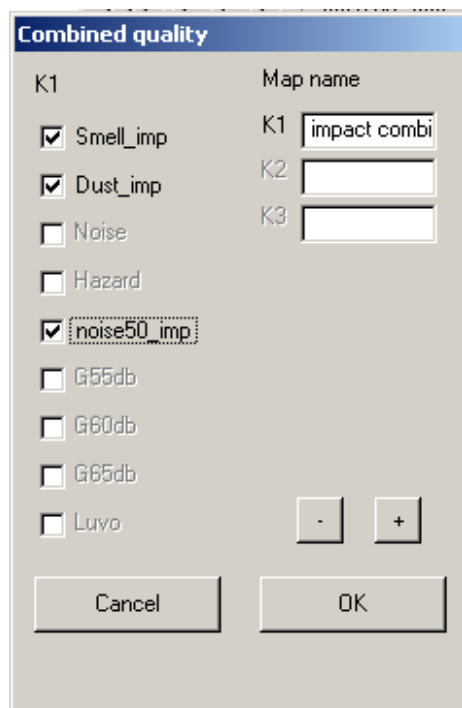
- **Impact map.** This option creates the impact maps of point and area activities. You can use the default map names, or type your own name. Do not use special symbols, such as spaces, in the file name.



- **Impact infrastructure.** Similar to the previous option, this option creates the impact maps of line activities (infrastructure). Again, you can use the default map names, or type your own name. Do not use special symbols, such as spaces, in the file name. Not all impact are included in the project. Empty or zero impact distances will result in an empty impact map.



- **Quality map.** After creating impact maps of point and area activities the corresponding quality maps can be created.
- **Quality infrastructure.** After creating impact maps of line activities (infrastructure) the corresponding quality maps can be created.
- **Integrated impact map.** The impact maps that have been created can be integrated into an integrated impact map. This map shows the number of simultaneous impacts in any part of the study area. A second or third combination of different impact maps can be calculated at once, by using the + button.



- **Integrated quality map.** Similar to the previous option, the quality maps that have been created can be integrated into an integrated quality map. This map shows the integrated environmental quality in any part of the study area.

2.2.3 The case study

The case study area is located between the cities of Ede in the east and Veenendaal in the west (see Figure 7), in the central part of the Netherlands, and includes an area of 6,5 km from east to west and 4.7 km from north to south, or 30 km². The municipality of Ede has over 100,000 inhabitants and Veenendaal over 60,000. Both include several rapidly developing residential and business areas, are rich in greenery, with continually expanding economic activity. In addition to urban renovation, to increase the residential function of the city centers, thousands of new homes will be built in the area in next years.

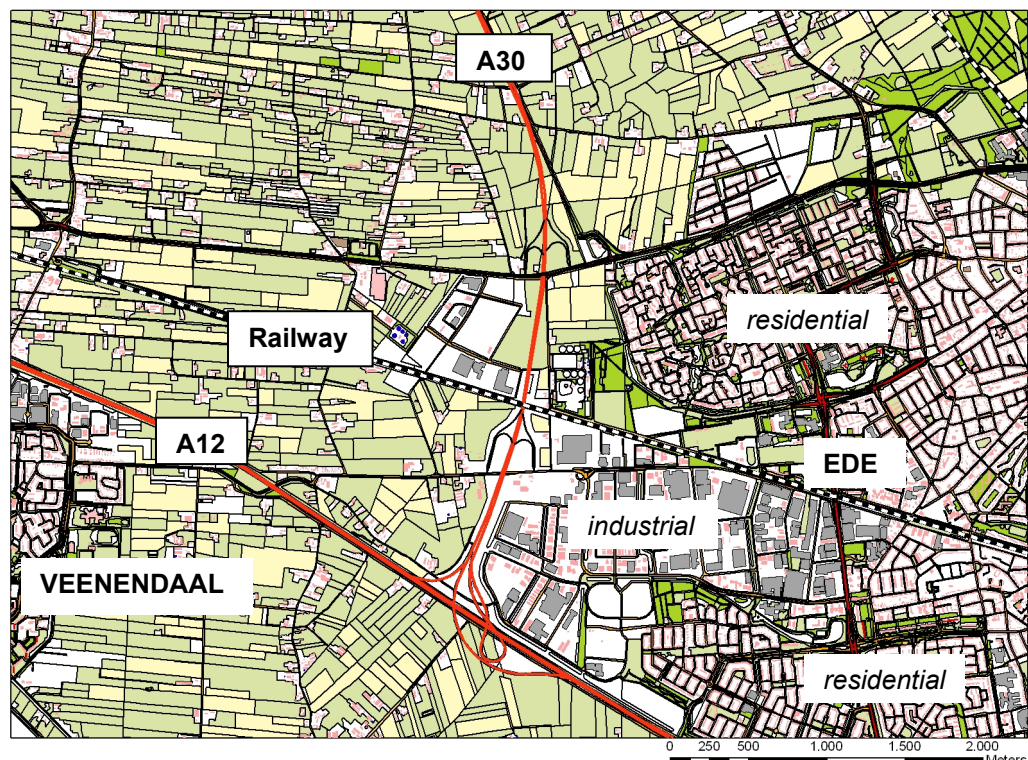


Figure 7 The study area Ede-Veenendaal.

The area is particularly attractive to companies, thanks to such factors as its strategic location in the heart of the Netherlands, between the Randstad in the west of the Netherlands with cities as Utrecht and Amsterdam, and the German Ruhrgebiet (see Figure 8). The level of facilities in Ede and Veenendaal is high, and includes a customs office and Intercity railway stations. By road, Ede and Veendaal are accessible via the A12 and A30 highways. The main railway line (dotted line north to highway A12) will also be the location of the future high speed train between Amsterdam and Germany. Ede and Veenendaal have various industrial areas. There are sites for offices (service companies) and research institutes, for industry, transport and logistics and for high-tech companies.



Figure 8 The location of the study area (box) in the Netherlands.

The rural area between both cities is highly influenced by these urbanization processes, and numerous urban activities are located in this rural area, such as transport companies, garden centers, and shops. A growing part of the (former) agricultural buildings is inhabited by urban residents. The remaining agricultural activities are dominated by intensive livestock farms, especially pigs and poultry. Some lists and more details of the activities and functions in the study area are presented in Annex 3 and 4.

Project

The local authorities of Ede and Veenendaal did appoint an urban project consultant (you) to make a study on the spatial-environmental issues in the area, and to develop a strategic plan for the future spatial development of a part of the area. The plan should include a description of some different spatial alternatives and their environmental implications, which support the local authorities in their decision-making. The local authorities wish to develop new residential areas as well as industrial zones, but also to protect the rural area for its importance to the natural and environmental quality of the study area. Therefore, large parts of study area should maintain its agricultural character or should be changed into natural reserves or water areas. The strategic plan should be illustrated with several environmental maps, showing the environmental implications of the different spatial alternatives. The project includes three successive assignments. The first assignment includes a scoping of the study area (similar to the scoping phase of an environmental impact assessment). By scoping you aim to identify the most important types of impacts, activities and functions in the study area, that allow you to choose what priorities should be given. Since the study area is very large, the analysis will be focused in more detail at a selection of about 1 km² of the rural-

urban fringe of Ede or Veenendaal. Each student will be provided with a map showing this selected area. The selected area will be studied further in second assignment, where several spatial alternatives should be considered. The results of your analyses should be presented in a report. The third assignment involves an evaluation of the assignments and the STEPP methodology and tool itself. The fourth assignment also includes the preparation of an oral presentation of the results with a PowerPoint presentation.

Assignment 2.2a

Examine the whole study area with the STEPP application, and the selected area in more detail. Identify and describe the present environmental quality in the study area and the selected area, according to the impacts and issues that you consider to be important. Produce some relevant maps that support your conclusions.

Assignment 2.2b

Develop a strategic plan for the selected area, by considering a few spatial alternatives with STEPP. Draw conclusions on e.g., whether or not industrial and business zones or other activities can be allocated in the selected area, how present and future residential areas and/or other sensitive areas can be allocated together with these zones, and which measures could be taken to prevent or reduce impacts (“mitigation”). Make clear what type / variety of options the local authorities have with regard to the selected area, and the implications of each option. Make a brief report with maps.

Assignment 2.2c

Discuss the methodological strengths and weaknesses of the STEPP method and tool. Also discuss the applicability of the approach in your home country. What elements of the approach and tool might be relevant or not?

Assignment 2.2d

Make a PowerPoint presentation with a maximum of 5 slides: four slides with maps from assignment 3.2 that clearly illustrate the results of your analyses and one slide that summarizes your advice for the selected area to the local authorities. On Saturday each student should give a 5 minute presentation with an additional 5 minutes for questions and discussion.

NOTE: Since you can easily spend many days on this assignment, you should choose priorities and limit your analyses within the time constraints (two and a half days). Basically you should spend the first day to read this chapter, learn to understand the application and make assignment 2.1 and 2.2a, including making a start with the report writing. Use the second day for analyzing several spatial alternatives of assignment 2.2b, discussing the method and tool (assignment 2.2c) and finishing the report. Prepare the slides for the presentation on Saturday morning (assignment 2.2d).



3 ANNEX

1. SEA in 1 person-day
2. VNG lists
3. Activities in the study area Ede-Veenendaal
4. Functions in the study area Ede-Veenendaal



Annex 1. SEA in 1 person-day

SEA in 1 person-day

What this process will do:

- give initial ideas for possible improvements (if appropriate) to 4–6 statements or alternatives of the strategic action; and
- give a rough feel for several stages of SEA and an indication of what an entire SEA process feels like, as an educational process for the decision-makers involved.

The process can be carried out at any stage of the strategic action decision making process where alternatives or strategies are developed in enough detail so that they can be assessed. One planner – the SEA coordinator ☞ – spends slightly over an hour getting ready for the assessment. She and the author of the strategic action statements/alternatives †† – then spend another three hours each carrying out the assessment. There is no formal documentation of the process.

- 9:00 ☞ Coffee (get the priorities right)
- 9:02 ☞ Adapt the SEA objectives of Table 6.1 to the circumstances of the strategic action: take out objectives that are not appropriate to the context, and integrate any relevant other objectives currently used (as long as they deal with outcomes not inputs). Aim for 6–12 objectives.
- 9:30 ☞ Brainstorm: what are worst environmental problems in the area? Put stars (*) next to the SEA objectives that symbolize the worst problems.
- 9:40 ☞ Identify 6 statements that are most likely to cause significant environmental/sustainability impacts; alternatively identify up to 6 alternative approaches to a given issue or constraint. You only have one day to do all of this, so don't agonize. The aim is to focus on more, rather than less, important parts of the strategic action.
- 10:10 ☞ Draw up a table like Table 4.2, with the 6 statements or alternatives in the first column, and the SEA objectives in the first row. Make sure to include a column on comments and proposed changes to the strategic action. Make enough copies of the table so that everyone involved in the SEA has a copy.
- 10:15 ☞ †† Gather together the strategic action author. Give them coffee.
- 10:20 ☞ †† Take the first statement/alternative. Fill in the table using the process outlined in Box 8.6. Focus particularly on any changes to the statement/alternative that would help to minimize negative impacts: the idea is to identify ways in which the strategic action could be improved. Focus

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particularly on those SEA objectives that you put a * next to.

11:10 📄 ⬆️ Now that you know how to do it, do the same thing for the other statements/alternatives, spending 20–25 minutes on each. If you are assessing alternatives, spend the last 10 minutes thinking about which alternative is best in terms of the environment or sustainability (using the SEA findings, focusing particularly on those objectives with * next to them).

13:00 Done!

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Table 6.1 Possible list of SEA objectives for land use plans

SEA theme	Possible SEA objectives (adapt to regional/local circumstances: delete, add to, refine)
Environmental	
Water and soil	<ul style="list-style-type: none"> • limit water pollution to levels that do not damage natural systems • maintain water abstraction, run-off and recharge within carrying capacity (including future capacity) • reduce contamination, and safeguard soil quality and quantity • minimize waste, then re-use or recover it through recycling, composting or energy recovery • maintain and restore key ecological processes (eg hydrology, water quality, coastal processes)
Air	<ul style="list-style-type: none"> • limit air pollution to levels that do not damage natural systems • reduce the need to travel
Climatic factors	<ul style="list-style-type: none"> • reduce greenhouse gas emissions • reduce vulnerability to the effects of climate change, eg flooding, disruption to travel by extreme weather, etc
Biodiversity, fauna and flora	<ul style="list-style-type: none"> • avoid damage to designated wildlife sites and protected species • maintain biodiversity, avoiding irreversible losses • restore the full range of characteristic habitats and species to viable levels • ensure the sustainable management of key wildlife sites and the ecological processes on which they depend • provide opportunities for people to come into contact with and appreciate wildlife and wild places
Social	
Population and human health	<ul style="list-style-type: none"> • protect and enhance human health • reduce and prevent crime, reduce fear of crime • decrease noise and vibration
Social inclusiveness*	<ul style="list-style-type: none"> • improve access to skills and knowledge • make opportunities for culture, leisure and recreation readily available to all • redress inequalities related to, for instance: age, gender, disability, race and faith, deprivation (including lack of access to car), regions and localities (including rural/urban)
Cultural heritage and landscape	<ul style="list-style-type: none"> • preserve historic buildings, archaeological sites, and other culturally important features • create places, spaces and buildings that work well, wear well and look well • enhance countryside and townscape character

Therivel, 2004, p. 78

-
- value and protect diversity and local distinctiveness
 - improve the quantity and quality of publicly accessible open space

Economic

*Economic development**

- give access to satisfying and rewarding work, reduce unemployment
- increase investment in people, equipment, infrastructure and other assets
- increase the efficiency of transport and economic activities

Other

- enhance other issues not discussed above, or reduce their negative effects

Note: * These objectives go beyond the remit of the SEA Directive and broaden it out into sustainability assessment.

Source: adapted from ODPM (2002)

Therivel, 2004, p. 79

Table 4.2 *Impact appraisal of some of the options for Tooton Rush's District Transport Plan*

Option	Impact of option on...						Comments/possible mitigation		
	water	air & biodiversity* climate	flora, fauna	human health*	social inclusiveness	cultural heritage, landscape		economic development	efficiency and access*
b. Congestion charging in Standstill		++		+	+/-		-	+/-	Impact depends on whether you are rich or poor and have a car or not. Will have a direct cost to businesses in Standstill that depend on motorized vehicles
e. Reduce the number of parking spaces in towns		+		+	-		-		Could negatively affect people with mobility problems. Could also affect businesses, particularly retail businesses depending on short-term parking
f. Require businesses to develop travel plans		+		+					Many impacts depend on implementation, eg how travel plans are used, and whether they apply to all businesses (or only large companies, or new businesses)
h. Pedestrianization of town centres		++		+			-/+	+	Previous experience with pedestrianization suggests that retailers' earnings go down for the first 6-18 months, then rise to levels above those pre-pedestrianization. Possible impact on people with disabilities and delivery vehicles. Through-traffic would need different route around town centre

Option	Impact of option on...							Comments/possible mitigation
	water	air & biodiversity* climate	flora, fauna	human health*	social inclusiveness	cultural heritage, landscape	economic development efficiency and access*	
h1/T3. Pedestrian priority in town centres		+		+			+	Could slow down traffic. Extend priority to cyclists and emergency vehicles?
i. Park and Ride system for Standstill	-	+/-	-	+		-	+	P+Rs improve air quality, etc in urban areas but have negative impacts on edge of towns – on land take and wildlife during construction, and on air quality and quality of life for local residents during operation. They could also increase commuting
k. Cycle lanes parallel to roads		+		++	+		+	Improves conditions for cyclists and could encourage drivers to cycle. Impact on biodiversity depends on whether lane goes on previously developed land or not

Key: + positive impact; - negative impact; | depends on implementation; * identified as particularly important criterion in previous SEA stage

Box 8.6 Questions to ask when predicting, assessing and mitigating impacts

Ask 'What will this statement look like on the ground? Does the statement say what its author wants it to say?' If not, it should be rewritten to be clearer. This rewrite is a mitigation measure. Where the decision-maker will definitely change the statement so as to make it clearer, then the new improved statement should be used for the subsequent stages of assessment; otherwise the original statement should be used.

Discuss what impact the statement will have on each environmental component. The precise symbol that goes in the table is not the important thing. Answering the following questions is!

- If the statement is likely to have a negative impact, can this be avoided, reduced, repaired or compensated for? If so, rewrite the statement accordingly, add other statements, etc. These changes are mitigation measures.
- If the statement is likely to have a negative impact that cannot be mitigated, are its benefits so important that they override this negative impact? If so, justify why. If not, consider deleting the statement or giving it a major overhaul. The deletion or overhaul is a mitigation measure.
- Can positive impacts of the statement be enhanced? Try rewriting it to do this: this is a mitigation measure.
- If it is unclear what type of impact the statement will have, how can this be determined? What additional information is needed? Get that information, or consider setting up a monitoring system to collect it for the next SEA.
- Where the impact depends on how the statement is implemented, use the symbol I (for 'depends on implementation') and try to set measures in place to ensure that the implementation is done 'right'. The measures are a mitigation measure.

Document all of these changes: they 'prove' that the appraisal process has influenced the plan-making process.

Therivel, 2004, p. 171



Annex 2. VNG LIST (For an explanation of the categories: see the last page of these tables).

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
01	-	AGRICULTURE AND AGRICULTURAL SERVICES													
0111, 0113		Arable farming and fruit farming (farm buildings)	10	30	30	C	10	1	1	30	2	B	L		
0112	0	Horticulture:													
0112	1	- farm buildings	10	30	30	C	10	1	1	30	2	B	L		
0112	2	- greenhouses without heating	10	10	30	C	10	1	1	30	2	B	L		
0112	3	- greenhouses with gas heating	10	10	30	C	10	1	1	30	2	B	L		
0112	4	- mushroom farm (in general)	30	10	30	C	30	1	1	30	2	B			
0112	5	- mushroom farm with manure fermentation	100	10	30	C	30	1	1	100	3	B			
0112	6	- bulb drying and preparation	30	30	30	C	10	1	1	30	2	B			
0121		Breeding and keeping cattle	100	30	30	C	0	1	1	100	3				
0122	0	Breeding and keeping other grazing animals:													
0122	1	- stud farm (horse-breeding)	50	30	30	C	0	1	1	50	3				
0122	2	- other grazing animals	50	30	30	C	0	1	1	50	3				
0123		Breeding and keeping pigs	300	30	50	C	0	1	1	300	4		D		
0124	0	Breeding and keeping poultry													
0124	1	- laying hens	300	30	50	C	0	1	1	300	4		D		
0124	2	- breeding hens and spring chickens	300	30	50	C	0	1	1	300	4				
0124	3	- ducks and goose	300	50	50	C	0	1	1	300	4				
0124	4	- other poultry	100	30	50	C	0	1	1	100	3		D		
0125	0	Breeding and keeping other animals:													
0125	1	- minks and foxes	200	30	30	C	0	1	1	200	4				
0125	2	- rabbits	100	30	30	C	0	1	1	100	3				
0125	3	- domestic pets	30	0	50	C	10	1	1	50	3				
0125	4	- maggots, worms and others	100	0	30	C	10	1	1	100	3				
0125	5	- bees	10	0	30	C	10	1	1	30	2				
0125	6	- other animals	30	10	30	C	0	1	1	30	2		D		
014		Agricultural services	30	10	50		10	2	1	50	3		D		
0141.1		Garden maintenance companies	10	10	10		10	1	1	10	1				
0142		Artificial insemination station	50	10	50	C	0	2	1	50	3				
02	-	FORESTRY AND FORESTRY SERVICES													
020		Forestry's	10	10	50		0	1	1	50	3				
05	-	FISHERIES AND FISH FARMING													
0501.1		Offshore fishery	100	0	100	C	50	2	2	100	3				
0501.2		Inland fishery	50	0	50	C	30	1	1	50	3				
0502	0	FISH- AND CRUSTACEAN FARMING													
0502	1	- oyster, mussel and crustacean farming	100	30	50	C	0	1	1	100	3				
0502	2	- fish farming	50	0	50	C	0	1	1	50	3				
10	-	PEAT CUTTING													
103		Peat-cutting industry	50	50	100	C	10	2	2	100	3				
11	-	EXTRACTION OF OIL AND NATURAL GAS													
111	0	Extraction of oil and natural gas:													
111	1	- oil well	100	0	200	C	200	1	2	200	4	B	L		
111	2	- natural gas extraction incl. treatment: < 100.000 N m3/d	30	0	500	C	200	1	1	500	5	B			
111	3	- natural gas extraction incl. treatment: >= 100.000 N m3/d	50	0	700	C Z	200	1	1	700	5	B			
14	-	EXTRACTION OF SAND, GRAVEL, CLAY, SALT, AND OTHERS													
1421	0	Stone-, gravel- and chalk crushing (open air):													
1421	1	- in general	10	100	200		10	2	1	200	4		D		
1421	2	- stone crushing	10	200	700		Z 10	2	2	700	5				
144		Salt-extraction industry	50	10	100	C	30	1	1	100	3	B			
145		Marl- and other mineral extraction industry	10	200	500	C	50	3	3	500	5				
15	-	PRODUCTION OF FOOD AND DRINK													
151	0	Slaughterhouses and other meat processing industry:													

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
151	1	- slaughterhouses	100	0	100	C	30	2	1	100	3				D
151	2	- render	700	0	100	C	30	2	2	700	5				
151	3	- processing unit for intestines and meat scraps	300	0	100	C	30	2	2	300	4				
151	4	- meat-packing and processing industry	100	0	100	C	50	2	2	100	3				
151	5	- wage slaughterhouses	50	0	50		10	1	1	50	3				
152	0	Fish processing industry:													
152	1	- drying	700	100	200	C	30	2	2	700	5				
152	2	- preserving	200	0	100	C	30	2	2	200	4				
152	3	- smoking	300	0	50	C	0	1	2	300	4				
152	4	- other processing	300	10	50	C	30	2	2	300	4				D
1531		Potato processing industry	300	30	200	C	50	2	2	300	4				
1532, 1533	0	Vegetable and fruit preserving industry													
1532, 1533	1	- jam	50	10	100	C	10	1	1	100	3				
1532, 1533	2	- vegetables (in general)	100	10	100	C	10	2	2	100	3				
1532, 1533	3	- with cabbage	200	10	100	C	10	2	2	200	4				
1532, 1533	4	- with drying	300	10	200	C	30	2	2	300	4				
1532, 1533	5	- with onion preserving	300	10	100	C	10	2	2	300	4				
1541	0	Production of raw vegetable and animal oils and fats:													
1541	1	- prod.cap. < 250.000 t/j	200	30	100	C	30	3	2	200	4				B
1541	2	- prod.cap. >= 250.000 t/j	300	50	300	C Z	50	3	3	300	4				B
1542	0	Refining of vegetable and animal oils and fats													
1542	1	- prod.cap. < 250.000 t/j	200	10	100	C	100	3	2	200	4				B
1542	2	- prod.cap. >= 250.000 t/j	300	10	300	C Z	200	3	3	300	4				B
1543	0	Margarine industry:													
1543	1	- prod.cap. < 250.000 t/j	100	10	200	C	30	3	2	200	4				
1543	2	- prod.cap. >= 250.000 t/j	300	10	300	C Z	50	3	3	300	4				B
1551	0	Dairy industry:													
1551	1	- dried products, prod.cap. >= 1,5 t/u	200	100	500	C Z	50	3	2	500	5				
1551	2	- concentrated products, evapor. cap. >=	200	30	500	C Z	50	3	2	500	5				
1551	3	- milk products industry proc.cap. < 55.000 t/j	50	0	100	C	30	2	1	100	3				
1551	4	- milk products industry proc.cap. >= 55.000 t/j	100	0	300	C Z	50	3	2	300	4				
1551	5	- other dairy industry	50	50	300	C	50	3	2	300	4				
1552		Ice-cream factories	50	0	100	C	50	2	2	100	3				
1561		Grocery factories	50	100	200	C	50	2	2	200	4				D
1561	0	Flour mills:													
1561	1	- prod.cap. < 500 t/u	100	50	200	C	50	2	2	200	4				
1561	2	- prod.cap. >= 500 t/u	200	100	300	C Z	100	2	2	300	4				
1562	0	Starch factories													
1562	1	- prod.cap. < 10 t/u	200	50	200	C	30	1	2	200	4				
1562	2	- prod.cap. >= 10 t/u	300	100	300	C Z	50	2	3	300	4				
1571	0	Fodder factories:													
1571	1	- destruction	700	30	200	C	50	3	3	700	5				D
1571	2	- bone, feather, fish, and meat meal factory	700	100	100	C	30	3	3	700	5				D
1571	3	- drying house (grass, pulp, fodder)	300	100	200	C	30	2	2	300	4				
1571	4	- drying house (grass, pulp, fodder)	700	200	300	C Z	50	3	3	700	5				
1571	5	- mixed feed, prod.cap. < 100 t/u	200	50	200	C	30	3	3	200	4				
1571	6	- mixed feed, prod.cap. >= 100 t/u	300	100	300	C Z	50	3	3	300	4				
1572		Production of pet food	200	100	200	C	30	2	2	200	4				
1581	0	Bread factories and confectioneries:													
1581	1	- proc.cap. < 2500 kg flour/week	30	10	30	C	10	1	1	30	2				
1581	2	- bread- and biscuit factories	100	30	100	C	30	2	2	100	3				
1582		Bread-, biscuit- and cake-factories	100	10	100	C	30	2	2	100	3				

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
1583	0	Sugar factories													
1583	1	- proc.cap. < 2.500 t/j	500	100	300	C		100	2	2	500	5	B		
1583	2	- proc.cap. >= 2.500 t/j	1000	200	700	C	Z	200	3	3	1000	5	B		
1584	0	Processing of cacao beans and production of chocolate and sweets:													
1584	1	- Cacao- and chocolate factories	500	50	100			50	2	3	500	5			
1584	2	- Sweets factories without caramelization	100	30	50			30	2	2	100	3			
1584	3	- Sweets factories with caramelization	300	30	50			30	2	2	300	4			
1585		Pasta factories	50	30	10			10	2	2	50	3			
1586	0	Coffee-roasting and tea packing:													
1586	1	- coffee-roasting factories	500	30	200	C		10	2	1	500	5		D	
1586	2	- tea packing factories	100	10	30			10	2	1	100	3			
1587		Production of vinegar, spices and herbs	200	30	50			10	2	1	200	4			
1589		Production of other food	200	30	50			30	2	2	200	4		D	
1589.1		Baking-ingredients factories	200	50	50			50	2	2	200	4			
1589.2		Rising-flour and blancmange factories	200	50	50			30	2	2	200	4			
1589.2	0	Soup and soup-aromatics factories::													
1589.2	1	- without powder drying	100	10	50			10	2	2	100	3			
1589.2	2	- with powder drying	300	50	50			50	2	2	300	4			
1591		Distilleries and liqueur distilleries	300	30	200	C		30	2	2	300	4			
1592	0	Production of ethyl alcohol by fermentation:													
1592	1	- prod.cap. < 5.000 t/y	200	30	200	C		30	1	2	200	4			
1592	2	- prod.cap. >= 5.000 t/y	300	50	300	C		50	2	3	300	4	B		
1593 t/m	1595	Production of wine, cider and others	10	0	30	C		0	1	1	30	2			
1596		Breweries	300	30	100	C		50	2	2	300	4			
1597		Malting plants	300	50	100	C		30	2	2	300	4			
1598		Mineral-water and soft-drinks factories	10	0	100			10	3	2	100	3			
16	-	TOBACCO INDUSTRY													
160		Tobacco factories	200	30	50	C		30	2	1	200	4			
17	-	TEXTILE INDUSTRY													
171		Processing and spinning of textile fibers	10	50	100			30	2	1	100	3			
172	0	Weaving mill:													
172	1	- number of looms < 50	10	10	100			0	2	1	100	3			
172	2	- number of looms >= 50	10	30	300		Z	50	3	2	300	4			
173		Textile refinement factory	50	0	50			10	2	2	50	3	B		
174, 175		Production of textile products	10	0	50			10	1	1	50	3			
1751		Carpet factories	100	30	200			10	2	2	200	4	B	L	
176, 177		Production of knitted and crocheted products	0	10	50			10	1	2	50	3			
18	-	PRODUCTION OF CLOTHES; PREPARE AND DYE FUR													
181		Production of leather clothes	30	0	50			0	1	1	50	3			
182		Production of clothes (except leather)	10	10	30			30	2	2	30	2			
183		Prepare and dye fur	50	10	10			10	1	1	50	3	B	L	
19	-	PRODUCTION OF LEATHER AND LEATHER PRODUCTS (EXCEPT CLOTHES)													
191		Leather factories	300	30	100			10	2	2	300	4	B	L	
192		Leather-products factories	50	10	30			10	2	2	50	3		D	
193		Shoe factories	50	10	50			10	2	1	50	3			
20	-	WOOD INDUSTRY AND PRODUCTION OF ARTICLES OF WOOD, CANE, CORK a.s.o.													
2010.1		Sawmills	0	50	100			10	2	2	100	3			
2010.2	0	Wood preserving factories													
2010.2	1	- with creosote oil	200	30	50			10	2	2	200	4	B	L	
2010.2	2	- with salt solutions	10	30	50			10	2	1	50	3	B		
202		Veneer and wooden plate factories	100	30	100			10	3	2	100	3	B		
203, 204		Woodwork factories	0	30	100			0	2	2	100	3			

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
205		Cork, cane and planting products factories	10	30	30			0	1	1	30	2			
21	-	PRODUCTION OF PAPER, CARDBOARD AND PAPER AND CARDBOARD PRODUCTS													
2111		Pulp production	200	100	200	C		50	3	2	200	4			
2112	0	Paper and cardboard factories:													
2112	1	- prod.cap. < 3 t/u	50	50	50	C		30	1	2	50	3			
2112	2	- prod.cap. 3 - 15 t/u	100	50	200	C	Z	50	2	2	200	4			
2112	3	- prod.cap. >= 15 t/u	200	100	300	C	Z	100	3	2	300	4			
212		Paper and cardboard products factories	30	30	100	C		30	2	2	100	3			
2121.2	0	Corrugated cardboard factories:													
2121.2	1	- prod.cap. < 3 t/u	30	30	100	C		30	2	2	100	3			
2121.2	2	- prod.cap. >= 3 t/u	50	30	200	C	Z	30	2	2	200	4			
22	-	PUBLISHERS, PRINTING AND REPRODUCTION BUSINESSES													
221		Publishers (offices)	0	0	10			0	1	1	10	1			
2221		Newspaper printers	30	0	100	C		10	3	2	100	3	B		L
2222		Printers (planography and rotary printing)	30	0	100			10	3	2	100	3	B		
2222.6		Small printer and copy centers	10	0	30			0	1	1	30	2	B		
2223	A	Graphic finishing businesses	10	0	10			0	1	1	10	1			
2223	B	Binderies	30	0	30			0	2	1	30	2			
2224		Graphic reproductions and compositions	30	0	10			10	2	1	30	2	B		
2225		Other graphic businesses	30	0	30			10	2	1	30	2	B	D	
223		Reproduction of recordings	10	0	10			0	1	1	10	1			
23	-	OIL AND COAL PROCESSING INDUSTRY; PROCESSING NUCLEAR FULL													
231		Coke factories	1000	700	1000	C	Z	100	2	3	1000	5	B		L
2320.1		Oil refineries	1500	100	1500	C	Z	1500	3	3	1500	6	B		L
2320.2	A	Lubricant and fat factories	50	0	100			30	2	2	100	3	B		L
2320.2	B	Recycling companies for used oil	300	0	100			50	2	2	300	4	B		L
2320.2	C	Oil product factories (others)	300	0	200			50	2	2	300	4	B	D	L
233		Nuclear full processing factories	10	10	100			1500	1	2	1500	6	B	D	
24	-	CHEMICAL INDUSTRY													
2411	0	Production of industrial gas:													
2411	1	- air separating unit, proc.cap. >= 10 t/d air	10	0	700	C	Z	50	3	3	700	5			
2411	2	- other gas factories, not explosive	100	0	500	C		50	3	3	500	5			L
2411	3	- other gas factories, explosive	100	0	500	C		300	3	3	500	5			L
2412		Pigments and paint components factories	200	0	200	C		200	3	3	200	4	B	D	L
2413	0	Inorganic chemicals factories													
2413	1	- not under the post-Seveso guideline	100	30	300	C		300	2	3	300	4	B	D	L
2413	2	- under the post-Seveso guideline	300	50	500	C		700	3	3	700	5	B	D	L
2414.1	A0	Organic chemicals factories													
2414.1	A1	- not under the post-Seveso guideline	300	10	200	C		300	2	3	300	4	B	D	L
2414.1	A2	- under the post-Seveso guideline	1000	30	500	C		700	2	2	1000	5	B	D	L
2414.1	B0	Methanol factories:													
2414.1	B1	- prod.cap. < 100.000 t/j	100	0	200	C		100	2	2	200	4	B		
2414.1	B2	- prod.cap. >= 100.000 t/j	200	0	300	C	Z	200	3	3	300	4	B		
2414.2	0	Fatty acids and alcohol factories (not synthetic)													
2414.2	1	- prod.cap. < 50.000 t/j	300	0	200	C		100	2	2	300	4	B		L
2414.2	2	- prod.cap. >= 50.000 t/j	500	0	300	C	Z	200	3	3	500	5	B		L
2415		Artificial fertilizer factories	500	300	500	C		500	3	3	500	5	B		L
2416		Synthetic plastic factories	700	30	300	C		500	3	3	700	5	B		L
242	0	Agricultural chemicals factories													
242	1	- manufacturing	300	50	100	C		1000	3	3	1000	5	B		L
242	2	- mixing and filling	100	10	30	C		500	2	2	500	5	B	D	
243		Paint and varnish factories	300	30	200	C		300	3	2	300	4	B	D	L

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
2441	0	Pharmaceutical components factories													
2441	1	- prod.cap. < 1.000 t/j	200	10	200	C		300	1	2	300	4	B		L
2441	2	- prod.cap. >= 1.000 t/j	300	10	300	C		500	2	2	500	5	B		L
2442	0	Pharmaceutical products factories													
2442	1	- mixing and filling medicines	50	10	50			50	2	1	50	3	B		L
2442	2	- bandages factories	10	10	30			10	2	1	30	2			
2451		Soap and cleaning products factories	300	100	200	C		100	3	2	300	4	B		
2452		Perfumes and cosmetics factories	300	30	50	C		50	2	2	300	4			
2461		Powder, fireworks and explosives factories	30	10	50			500	1	2	500	5	B		
2462	0	Glue and adhesive factories													
2462	1	- without animal components	100	10	100			50	3	2	100	3	B		L
2462	2	- with animal components	500	30	100			50	3	2	500	5	B		
2464		Photochemical components factories	50	10	100			50	3	2	100	3	B		L
2466	A	Chemical office supplies factories	50	10	50			50	3	2	50	3	B		
2466	B	Other chemical supplies factories	200	30	100	C		200	2	2	200	4	B	D	L
247		Artificial synthetic cotton factories	300	30	300	C		200	3	3	300	4	B		L
25	-	PRODUCTION OF RUBBER AND PLASTIC PRODUCTS													
2511		Rubber tire factories	300	50	300	C		100	2	2	300	4	B		
2512	0	Tread renewal factories													
2512	1	- floor area < 100 m2	50	10	30			30	1	1	50	3			
2512	2	- floor area >= 100 m2	200	50	100			50	2	2	200	4	B		
2513		Rubber products factories	100	10	50			50	1	2	100	3			D
252	0	Plastic processing companies:													
252	1	- without phenol resins	200	50	100			100	2	2	200	4			
252	2	- with phenol resins	300	50	100			200	2	2	300	4	B		L
26	-	PRODUCTION OF GLASS, POTTERY, CEMENT, MORTAR													
261	0	Glass factories:													
261	1	- glass and glass products, prod.cap. < 5.000 t/j	30	30	100			30	1	1	100	3			L
261	2	- glass and glass products, prod.cap. >= 5.000 t/j	30	100	300	C	Z	50	2	2	300	4			L
261	3	- glass wool and glass fibers, prod.cap.< 5.000 t/j	300	100	100			30	1	1	300	4			L
261	4	- glass wool and glass fibers, prod.cap. >= 5.000 t/j	500	200	300	C	Z	50	2	2	500	5			L
2615		Glass processing factories	10	50	50			30	1	1	50	3			
262, 263	0	Pottery factories:													
262, 263	1	- total power electrical ovens < 40 kW	10	50	30			10	1	1	50	3			L
262, 263	2	- total power electrical ovens >= 40 kW	30	100	100			30	2	2	100	3			L
264	A	Bricks and brick element factories	30	200	200			30	2	2	200	4			L
264	B	Tile factories	50	200	200			30	2	2	200	4			
2651	0	Cement factories:													
2651	1	- prod.cap. < 100.000 t/j	10	300	500	C		30	2	2	500	5			
2651	2	- prod.cap. >= 100.000 t/j	30	500	1000	C	Z	30	3	3	1000	5	B		
2652	0	Lime factories													
2652	1	- prod.cap. < 100.000 t/j	30	200	200			30	2	2	200	4			
2652	2	- prod.cap. >= 100.000 t/j	50	500	300		Z	30	3	3	500	5			
2653	0	Gypsum factories													
2653	1	- prod.cap. < 100.000 t/j	30	200	200			30	2	2	200	4			
2653	2	- prod.cap. >= 100.000 t/j	50	500	300		Z	30	3	3	500	5	B		
2661.1	0	Concrete construction factories:													
2661.1	1	- without presses and concrete vibration	10	100	200			30	2	2	200	4	B		
2661.1	2	- with presses and concrete vibration	10	100	300			30	2	2	300	4	B		
2661.1	3	- with presses and concrete vibration	30	200	700		Z	30	3	3	700	5	B		
2661.2	0	Limestone factories													
2661.2	1	- prod.cap. < 100.000 t/j	10	100	100			30	2	2	100	3			

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
2661.2	2	- prod.cap. >= 100.000 t/j	30	300	300	Z	30	3	3	300	4				
2662		Mineral construction sheet factories	50	100	100		30	2	2	100	3				
2663, 2664	0	Mortar factories:													
2663, 2664	1	- prod.cap. < 100 t/u	10	100	100		10	3	2	100	3				
2663, 2664	2	- prod.cap. >= 100 t/u	30	200	300	Z	10	3	3	300	4				
2665, 2666	0	Production of concrete, mortar and plaster products:													
2665, 2666	1	- prod.cap. < 100 t/d	10	100	100		100	2	2	100	3				
2665, 2666	2	- prod.cap. >= 100 t/d	30	200	300	Z	200	3	2	300	4	B			
267	0	Natural stone processing factories:													
267	1	- without braking, sifting and drying	0	30	100		0	1	2	100	3		D		
267	2	- with braking, sifting and drying, proc.cap. < 100.000 t/j	10	100	300		10	1	2	300	4				
267	3	- with braking, sifting and drying, proc.cap. >= 100.000 t/j	30	200	700	Z	10	2	3	700	5				
2681		Abrasive and polisher factories	10	50	50		10	1	2	50	3		D		
2682	A0	Bituminous materials factories:													
2682	A1	- prod.cap. < 100 t/u	300	100	100		30	3	2	300	4	B	L		
2682	A2	- prod.cap. >= 100 t/u	500	200	200	Z	50	3	3	500	5	B	L		
2682	B0	Insulating material factories (excl. glass wool):													
2682	B1	- stone wool, prod.cap. >= 5.000 t/j	100	200	300	C Z	30	2	2	300	4				
2682	B2	- other insulating materials	200	100	100	C	50	2	2	200	4				
2682	C	Mineral products factories, not previously mentioned	50	100	100		50	2	2	100	3		D		
2682	D	Asphalt plant	100	50	200		30	3	2	200	4	B	L		
27	-	PRODUCTION OF METALS													
271	0	Pig iron and steel plants:													
271	1	- prod. capacity < 1,000 ton/yr	700	500	700		200	2	2	700	5	B			
271	2	- prod. capacity >= 1,000 tons/yr	1500	1000	1500	C Z	300	3	3	1500	6	B	L		
272	0	Iron and steel pipes factories													
272	1	- prod.area < 2.000 m2	30	30	500		30	2	2	500	5	B			
272	2	- prod.area >= 2.000 m2	50	100	1000	Z	50	3	2	1000	5	B			
273	0	Wire drawing, rolling mills and profiling factories:													
273	1	- prod.area < 2.000 m2	30	30	300		30	2	2	300	4				
273	2	- prod.area >= 2.000 m2	50	50	700	Z	50	3	3	700	5	B			
274	A0	Nonferrous metal factories													
274	A1	- prod.cap. < 1.000 t/j	100	100	300		30	1	2	300	4	B			
274	A2	- prod.cap. >= 1.000 t/j	200	300	700	Z	50	2	3	700	5	B			
274	B0	Nonferrous metal rolling and drawing factories													
274	B1	- prod.area < 2.000 m2	50	50	500		50	2	2	500	5	B			
274	B2	- prod.area >= 2.000 m2	200	100	1000	Z	100	3	3	1000	5	B			
2751, 2752	0	Iron foundry works:													
2751, 2752	1	- prod.cap. < 4.000 t/j	100	50	300	C	30	1	2	300	4	B			
2751, 2752	2	- prod.cap. >= 4.000 t/j	200	100	500	C Z	50	2	3	500	5	B	L		
2753, 2754	0	Nonferrous metal foundry works													
2753, 2754	1	- prod.cap. < 4.000 t/j	100	50	300	C	30	1	2	300	4	B			
2753, 2754	2	- prod.cap. >= 4.000 t/j	200	100	500	C Z	50	2	3	500	5	B	L		
28	-	PRODUCTION OF METAL PRODUCT (EXCL. MACHINES)													
281	0	Assembly workshops:													
281	1	- closed building	30	30	100		30	2	2	100	3	B			
281	2	- open air, prod.area < 2.000 m2	30	50	200		30	2	2	200	4	B			
281	3	- open air, prod.area >= 2.000 m2	50	200	300	Z	30	3	3	300	4	B			
2821	0	Tank and reservoir construction companies:													
2821	1	- prod.area < 2.000 m2	30	50	300		30	2	2	300	4	B			
2821	2	- prod.area >= 2.000 m2	50	100	500	Z	30	3	3	500	5	B			
2822, 2830		Production of heating installations and radiators	30	30	200		30	2	2	200	4	B			

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
284	A	Thump, press and force companies	10	30	200			30	1	2	200	4	B		
284	B	Forges, welding, and bench works	50	30	100			30	2	2	100	3	B	D	
2851	0	Metal surfaces treatment companies:													
2851	1	- common	50	50	100			50	2	2	100	3	B	L	
2851	2	- scoping (spray on Zinc)	50	50	100			30	2	2	100	3	B	D	L
2851	3	- thermo galvanizing	100	50	100			50	2	2	100	3	B	L	
2851	4	- thermo blanching	100	50	100			50	2	2	100	3	B	L	
2851	5	- mechanical surface treatment (grinding, polishing)	30	50	100			30	2	2	100	3	B		
2851	6	- anodize, eloxize	50	10	100			30	2	2	100	3	B		
2851	7	- chemical surface treatment	50	10	100			30	2	2	100	3	B		
2851	8	- enameling	100	50	100			50	1	1	100	3	B	L	
2851	9	- galvanizing (blanch, zinc, copper ed)	30	30	100			50	2	2	100	3	B		
2851	10	- blasting	30	200	200			30	2	2	200	4	B	D	L
2851	11	- metal tempering	30	50	100			50	1	2	100	3	B	D	
2851	12	- enameling	100	30	100			50	2	2	100	3	B	D	L
2852		Other metal construction companies	10	30	100			30	1	2	100	3	B	D	
287	A0	Iron works, anchor and chain factories:													
287	A1	- prod.area < 2.000 m2	30	50	200			30	2	2	200	4	B		
287	A2	- prod.area >= 2.000 m2	50	100	500	Z		30	3	3	500	5	B		
287	B	Other metal works not previously mentioned	30	30	100			30	2	2	100	3	B		
29	-	PRODUCTION OF MACHINES													
29	0	Machine factories:													
29	1	- prod.area < 2.000 m2	30	30	100			30	2	1	100	3	B	D	
29	2	- prod.area >= 2.000 m2	50	30	200			30	3	2	200	4	B	D	
29	3	- with trial runs combustion engines >= 1 MW	50	30	300	Z		30	3	2	300	4	B	D	
30	-	PRODUCTION OF OFFICE MACHINES AND COMPUTERS													
30	A	Office machines and computers factories	30	10	50			30	1	1	50	3			
31	-	PRODUCTION OF OTHER ELECTRICAL MACHINES													
311		Electric motor and generator factories	200	30	30			50	1	2	200	4	B	L	
312		Switchgear and installation equipment factories	200	10	30			50	1	2	200	4	B	L	
313		Electric cable factories	100	10	200			50	2	2	200	4		D	L
314		Battery factories	100	30	100			50	2	2	100	3	B	L	
315		Bulb factories	200	30	30			300	2	2	300	4	B	L	
316		Electro technical industry not previously mentioned	30	10	50			30	1	1	50	3			
3162		Carbon electrode factories	1500	300	1000	C	Z	200	2	3	1500	6	B	L	
32	-	PRODUCTION OF AUDIO, VIDEO AND TELECOMMUNICATION EQUIPMENT													
321 t/m 323		Production of audio, video and telecommunication equipment	30	0	50			30	2	1	50	3	B	D	
3210		Printed wires factories	50	10	50			30	1	2	50	3	B		
33	-	PRODUCTION OF MEDICAL AND OPTICAL EQUIPMENT													
33	A	Production of medical and optical equipment	30	0	30			0	1	1	30	2			
34	-	PRODUCTIONS OF CARS AND TRAILER													
341	0	Car factories and assembly plants													
341	1	- prod.area < 10.000 m2	100	10	200	C		30	3	2	200	4	B	D	
341	2	- prod.area >= 10.000 m2	200	30	300	Z		50	3	2	300	4	B	L	
3420.1		Coachworks	100	10	200			30	2	2	200	4	B		
3420.2		Trailer factories	30	10	200			30	2	2	200	4	B		
343		Car component factories	30	10	100			30	2	2	100	3			
35	-	PRODUCTION OF MEANS OF TRANSPORTATION (EXCL. CARS AND TRAILERS)													
351	0	Shipyards and repair companies													
351	1	- wooden ships	30	50	50			10	1	1	50	3	B		
351	2	- fiber ships	100	50	100			50	1	1	100	3	B		
351	3	- metal ships < 25 m	50	100	200			30	1	2	200	4	B		

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
351	4	- metal ships >= 25m and/or trial runs engines >= 1 MW	100	100	500	C	Z	50	1	3	500	5	B		
3511		Ship-breakers	100	200	700			100	1	3	700	5	B		
352	0	Carriage and railway construction companies													
352	1	- common	50	30	100			30	2	2	100	3	B		
352	2	- with trial runs combustion engines >= 1 MW	50	30	300		Z	30	2	2	300	4	B		
353	0	Aircraft construction and repair companies													
353	1	- without trial runs engines	50	30	200			30	2	2	200	4	B		
353	2	- with trial runs engines	100	30	1000		Z	100	2	2	1000	5	B		
354		Bicycle and motorcycle factories	30	10	100			30	2	2	100	3	B		
355		Production of other means of transportation not prev. ment.	30	30	100			30	2	2	100	3	B	D	
36	-	PRODUCTION OF FURNITURE AND OTHER PRODUCTS NOT PREVIOUSLY MENTIONED													
361		Furniture factories	50	50	100			30	2	2	100	3	B	D	
362		Production of coins and jewels	30	10	10			10	1	1	30	2	B		
363		Music instruments factories	30	10	30			10	2	2	30	2			
364		Sports equipment factories	30	10	50			30	2	2	50	3			
365		Toy factories	30	10	50			30	2	2	50	3			
366		Production of other goods not previously mentioned	30	10	50			30	2	2	50	3		D	
37	-	PREPARATION OF RECYCLING													
371		Metal and cars shredder	30	100	500		Z	30	2	3	500	5	B		
372	A0	Rubble breaking companies													
372	A1	- proc.cap. < 100.000 t/j	30	100	300			10	2	2	300	4			
372	A2	- proc.cap. >= 100.000 t/j	30	200	700			10	3	3	700	5			
372	B	Rubber regeneration companies	300	50	100			50	2	2	300	4			
372	C	Waste separators	200	200	300		C	50	3	2	300	4	B		
40	-	PRODUCTION AND DISTRIBUTION OF ELECTRICITY, NATURAL GAS, STEAM AND WARM WATER													
40	A0	Power station (capacity >= 50 MW)													
40	A1	- coal-fired	100	700	700		C	Z	200	2	3	700	5	B	L
40	A2	- oil-fired	100	100	500		C	Z	100	2	3	500	5	B	L
40	A3	- gas-fired	30	30	500		C	Z	100	1	3	500	5		
40	A4	- nuclear plants with cooling towers	10	10	500		C		1500	1	3	1500	6		D
40	A5	- total energy power plant (gas)	30	30	500		C	Z	100	1	2	500	5		
40	B0	Electricity distribution installations, with transformer power:													
40	B1	- < 10 MVA	0	0	30		C		10	1	1	30	2	B	
40	B2	- 10 - 100 MVA	0	0	50		C		30	1	1	50	3	B	
40	B3	- 100 - 200 MVA	0	0	100		C		50	1	2	100	3	B	
40	B4	- 200 - 1000 MVA	0	0	300		C	Z	50	1	2	300	4	B	
40	B5	- >= 1000 MVA	0	0	500		C	Z	50	1	2	500	5	B	
40	C0	Gas distribution installations:													
40	C1	- gas compression stations, power < 100 MW	0	0	300		C		100	1	1	300	4		
40	C2	- gas compression stations, power >= 100 MW	0	0	500		C		200	1	2	500	5		
40	C3	- gas pressure regulator and measuring stations (cases and buildings)	0	0	30		C		10	1	1	30	2		
40	C4	- gas distribution stations, category D	0	0	100		C		50	1	1	100	3		
40	D0	Heating installations, gas-fired:													
40	D1	- district heating	30	10	100		C		50	1	2	100	3		
40	D2	- central heating of a whole block of flats	10	0	30		C		30	1	1	30	2		
41	-	COLLECTION AND DISTRIBUTION OF WATER													
41	A0	Water collecting and preparation installations:													
41	A1	- with chloric gas	50	0	50		C		1000	1	2	1000	5		D
41	A2	- preparation with chlorine and other chemicals	10	0	50		C		50	1	2	50	3		
41	B0	Water distribution installations with pump capacity:													
41	B1	- < 1 MW	0	0	30		C		10	1	1	30	2		
41	B2	- 1 - 15 MW	0	0	100		C		10	1	1	100	3		

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
41	B3	- >= 15 MW	0	0	300	C		10	1	2	300	4			
45	-	BUILDING INDUSTRY													
45	A	Building and construction companies with workshops	10	30	50			10	1	1	50	3	B	D	
50	-	TRADE AND REPAIR OF CARS, MOTORBIKES; PETROL STATIONS													
501, 502, 504		Car and motorbike dealers, repair and service companies	10	0	30			10	2	1	30	2	B		
5020.4	A	Car sheet-metal workshop	10	30	100			10	1	1	100	3			
5020.4	B	Car upholstery	10	10	10			10	1	1	10	1			
5020.4	C	Car respraying	50	30	30			30	1	1	50	3	B	L	
5020.5		Car wash	10	0	30			0	2	1	30	2			
503, 504		Trade of car and motorbike parts and accessories	0	0	30			10	1	1	30	2			
505	0	Petrol stations:													
505	1	- with LPG	30	0	30			100	3	1	100	3	B		
505	2	- without LPG	30	0	30			30	3	1	30	2	B		
51	-	WHOLESALE TRADE AND COMMERCIAL RELATIONS													
511		Commercial relations (offices)	0	0	10			0	1	1	10	1			
5121		Wholesale trade in arable farming products and fodder	30	30	30			30	2	2	30	2			
5122		Wholesale trade in flowers and plants	10	10	30			0	2	1	30	2			
5123		Wholesale trade in living animals	50	10	100	C		0	2	1	100	3			
5124		Wholesale trade in skins and leather	50	0	30			0	2	1	50	3			
5125, 5131		Wholesale trade in tobacco, vegetables, fruits and potatoes	30	30	30			30	2	1	30	2			
5132, 5133		Wholesale trade in meat, dairy products, eggs and edible oils	10	0	30			30	2	1	30	2			
5134		Wholesale liquor trade	0	0	30			0	2	1	30	2			
5135		Wholesale trade in tobacco products	10	0	30			0	2	1	30	2			
5136		Wholesale trade in sugar, chocolate, and sweets	10	10	30			0	2	1	30	2			
5137		Wholesale trade in coffee, tea, cacao and spices	30	10	30			0	2	1	30	2			
5138, 5139		Wholesale trade in other food and stimulants	10	10	30			30	2	1	30	2			
514		Wholesale trade in other consumers products	10	10	30			10	2	1	30	2			
5148.7	0	Wholesale trade in fireworks:													
5148.7	1	- consumer fireworks, packed, storage < 50 tons	10	0	30			30	2	1	30	2			
5148.7	2	- consumer fireworks, unpacked, storage < 2 tons	10	0	10			30	1	1	30	2			
5148.7	3	- consumer fireworks, unpacked, storage 2-5 tons	10	0	10			50	1	1	50	3			
5148.7	4	- professional fireworks, storage < 6 tons	10	0	10			1000	1	1	1000	5			
5151.1	0	Wholesale trade in solid fuel:													
5151.1	1	- small, locally	10	100	50			30	2	2	100	3			
5151.1	2	- coal-terminal, storage area >= 2.000 m2	50	500	500		Z	100	3	3	500	5	B		
5151.2	0	Wholesale trade in liquid and gaseous fuels:													
5151.2	1	- liquid, storage cap. < 100.000 m3	50	0	50			200	2	2	200	4	B	D	L
5151.2	2	- liquid, storage cap. >= 100.000 m3	100	0	50			500	2	2	500	5	B	D	L
5151.2	3	- liquid gas	50	0	50			300	2	2	300	4	D		
5151.3		Wholesale trade in mineral oil products (excl. fuels)	100	0	30			50	2	2	100	3	B		
5152.1	0	Wholesale trade in ore:													
5152.1	1	- storage area < 2.000 m2	30	300	300			10	3	3	300	4	B		
5152.1	2	- storage area >= 2.000 m2	50	500	700		Z	10	3	3	700	5	B		
5152.2 / .3		Wholesale trade in metals and semi manufactures	0	10	100			10	2	2	100	3			
5153		Wholesale trade in wood and building materials	0	10	50			10	2	2	50	3			
5154		Wholesale trade in iron and metal products and heating systems	0	0	50			10	2	2	50	3			
5155.1		Wholesale trade in chemical products	50	10	30			100	2	2	100	3	B	D	
5156		Wholesale trade in other goods	10	10	30			10	2	2	30	2			
5157		Car breaker's yards	10	30	100			30	2	2	100	3	B		
5157.2 / .3		Other wholesale trade in waste and scrap	10	30	100			10	2	2	100	3	B	D	
5162		Wholesale trade in machines and appliances	0	0	30			0	2	2	30	2	D		
517		Other wholesale trade (office furniture, packaging, etcetera)	0	0	30			0	2	2	30	2			

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
52	-	RETAIL TRADE AND REPAIR SERVICES FOR GENERAL PUBLIC													
52	A	Retail trade not previously mentioned	0	0	10			0	1	1	10		1		
5211/2,5246/9		Super markets, department stores, builders' merchants, garden centres	0	0	10			30	3	1	30		2		
5222, 5223		Retail trade in flesh and fowl, with smoking, cooking and baking	30	0	10			10	1	1	30		2		
5224		Retail trade in bread and pastry with baking for own shop	30	10	10	C		10	1	1	30		2		
5231, 5232		Pharmacies and drugstores	0	0	0			10	1	1	10		1		
5249		Retail trade in fire works	0	0	10			10	1	1	10		1		
527		Repair services for general public (excl cars and motor cycles)	10	0	10			10	1	1	10		1		
55	-	CATERING INDUSTRY													
5511, 5512		Hotels and guest houses with kitchen	30	0	10			10	2	1	30		2		
552		Camp sites, holiday centers (with kitchen)	30	0	50	C		10	2	1	50		3		
553		Restaurants, cafeteria's, snack bars, fish dealers, etcetera	30	0	10	C		10	2	1	30		2		
554		Pubs and discotheques	0	0	50	C		10	2	1	50		3		D
5551		Cantinas	10	0	30	C		10	1	1	30		2		D
5552		Catering companies	30	0	10	C		10	1	1	30		2		
60	-	TRANSPORT OVER LAND													
601	0	Railways:													
601	1	- stations	0	0	100	C		50	3	2	100		3		D
601	2	- shunting-yards, transshipment stations	30	30	300	C		300	3	2	300		4		D
6021.1		Bus, tram and metro stations en depots	0	10	100	C		0	2	2	100		3		D
6022		Taxi companies and cab stands	0	0	30	C		0	2	1	30		2		
6023		Coach companies	10	0	100	C		0	2	1	100		3		
6024		Freight transport	0	0	100	C		30	3	1	100		3		
603		Pump and compressor stations of pipelines	0	0	50	C		10	1	1	50		3		B D
61, 62	-	TRANSPORT OVER WATER OR BY AIR													
61, 62	A	Transport companies (only offices)	0	0	10			0	2	1	10		1		
63	-	TRANSPORT SERVICES													
6311.1	0	Loading and unloading and transshipment companies for sea shipping:													
6311.1	1	- containers	0	10	500	C		100	3	3	500		5		
6311.1	2	- mixed cargo	0	30	300	C		100	3	3	300		4		B D
6311.1	3	- ore and minerals, storage area >= 2.000 m2	50	700	1000	C Z		50	3	3	1000		5		B
6311.1	4	- corn and flour, proc.cap. >= 500 t/u	100	500	500	C Z		100	3	3	500		5		
6311.1	5	- coal, storage area >= 2.000 m2	50	700	700	C Z		100	3	3	700		5		B
6311.1	6	- petrol, liquid gas, and others	300	0	100	C		1000	2	3	1000		5		B L
6311.1	7	- tanker cleaning	300	10	100	C		200	1	2	300		4		B
6311.2	0	Loading and unloading and transshipment for inland shipping													
6311.2	1	- containers	0	10	300			50	2	2	300		4		
6311.2	2	- mixed cargo	0	10	100			50	2	2	100		3		B D
6311.2	3	- ore and minerals, storage area < 2.000 m2	30	200	300			30	2	2	300		4		B
6311.2	4	- ore and minerals, storage area >= 2.000 m2	50	500	700	Z		50	3	3	700		5		B
6311.2	5	- corn and flour, proc.cap. < 500 t/u	50	300	200			50	2	2	300		4		
6311.2	6	- corn and flour, proc.cap. >= 500 t/u	100	500	300	Z		100	3	3	500		5		
6311.2	7	- coal, storage area < 2.000 m2	50	300	300			50	2	2	300		4		B
6311.2	8	- coal, storage area >= 2.000 m2	50	500	500	Z		100	3	3	500		5		B
6311.2	9	- oil, liquid gas, and others	100	0	50			700	2	3	700		5		B L
6311.2	10	- tanker cleaning	300	10	100			200	1	2	300		4		B
6312		Warehouse and storage companies	30	10	50	C		30	2	2	50		3		D
6321		Car parks and parking garages	10	0	30	C		0	3	1	30		2		L
6322, 6323		Other transport services (offices)	0	0	10			0	2	1	10		1		
6323		Airports	200	50	1500	C		500	3	3	1500		6		B D L
633		Travel agencies	0	0	10			0	1	1	10		1		
634		Expeditors, ship brokers (offices)	0	0	10			0	1	1	10		1		D

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distanci	Cat	B	D	L
64	-	POST EN TELECOMMUNICATION													
641		Post and messenger services	0	0	30	C	0	2	1	30	2				
642	A	Telecommunication companies	0	0	10	C	0	1	1	10	1				
642	B	TV and radio stations (see also category installations)	0	0	0	C	30	1	3	30	2			D	
65, 66, 67	-	FINANCE AND INSURANCE COMPANIES													
65, 66, 67	A	Banks, insurance companies, stock exchanges	0	0	30	C	0	1	1	30	2				
70	-	LETTING AND SELLING OF REAL ESTATE													
70	A	Letting and selling of real estate	0	0	10		0	1	1	10	1				
71	-	LETTING OF TRANSPORT SERVICES, MACHINES AND OTHER MOVEABLE PROPERTY													
711		Private car rental companies	10	0	30			10	2	1	30	2			
712		Letting of transport services (excl cars)	10	0	50			10	2	1	50	3		D	
713		Letting of machines and equipment	10	0	50			10	2	1	50	3		B	D
714		Letting of other moveable property	10	10	30			10	2	2	30	2		D	
72	-	COMPUTER SERVICES AND INFORMATION TECHNOLOGY													
72	A	Computer services and information technology companies	0	0	10			0	1	1	10	1			
73	-	RESEARCH AND DEVELOPMENT													
731		Environmental research and development	30	10	30			30	1	1	30	2			
732		Social research and development	0	0	10			0	1	1	10	1			
74	-	OTHER PROFESSIONAL SERVICES													
74	A	Other professional services: offices	0	0	10			0	1	1	10	1		D	
747		Cleaning companies for buildings	50	10	30			50	1	1	50	3		B	D
7481.3		Photo and film processing companies	10	0	30	C	10	2	1	30	2		B		
7484.3		Auction-marts for agricultural and fishery products	50	30	200	C	10	3	2	200	4				
7484.4		Auction-marts for furniture, art and others	0	0	10			0	2	1	10	1			
75	-	PUBLIC SERVICES, GOVERNMENTAL SERVICES, SOCIAL SECURITIES													
75	A	Public services (offices)	0	0	30			0	2	1	30	2			
7522		Defense systems	30	30	200	C	100	3	1	200	4		B	D	
7525		Fire stations	0	0	50	C	0	1	1	50	3				
80	-	EDUCATIONAL SERVICES													
801, 802		Primary and secondary schools	0	0	30			0	1	1	30	2			
803, 804		Higher education, universities and other education	10	0	30			10	1	1	30	2		D	
85	-	HEALTH AND WELFARE SERVICES													
8511		Hospitals	10	0	30	C	10	3	2	30	2				
8512, 8513		Clinics and day-care centers	10	0	10			0	2	1	10	1			
8514, 8515		Health centers	0	0	10			0	1	1	0	1			
853		Nursing homes	10	0	30	C	0	1	1	30	2				
90	-	ENVIRONMENTAL SERVICES													
9000.1	0	Sewage works and liquid manure facilities:													
9000.1	1	- < 100.000 residents	200	10	100	C	10	2	1	200	4				
9000.1	2	- 100.000 - 300.000 residents	300	10	200	C Z	10	2	1	300	4				
9000.1	3	- >= 300.000 residents	500	10	300	C Z	10	3	2	500	5				
9000.2	A	Garbage collection services and street cleaning companies	50	30	50			10	2	1	50	3			
9000.2	B	Waste-disposal depots	30	50	50			10	2	1	50	3		B	
9000.3	A0	Waste processing companies:													
9000.3	A1	- manure processing plant	500	10	100	C	10	3	3	500	5				
9000.3	A2	- cable processing	100	50	30			10	1	1	100	3		B	L
9000.3	A3	- processing of nuclear waste	0	10	200	C	1500	1	1	1500	6				
9000.3	A4	- pathogenic waste incineration of hospitals	50	10	30			10	1	2	50	3			L
9000.3	A5	- solvent recovering	100	0	10			30	1	2	100	3		B	D
9000.3	A6	- waste incineration, thermic capacity > 75 MW	300	200	300	C Z	50	3	3	300	4		B	D	L
9000.3	A7	- processing photochemical waste	10	10	30			10	1	1	30	2		B	L
9000.3	B	Waste dumps	300	300	300			10	3	3	300	4		B	

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
9000.3	C	Waste transshipment stations	200	300	300			30	3	3	300	4	B		
9000.3	D0	Composting companies:													
9000.3	D1	- open	700	300	200			50	3	2	700	5	B		
9000.3	D2	- closed building	100	50	100			50	3	1	100	3	B		
91	-	DIVERSE ORGANIZATIONS													
9111		Industrial and trade unions (offices)	0	0	30			0	1	1	30	2			
9131		Church buildings	0	0	30			0	2	1	30	2			
9133.1	A	Community centers and clubhouses	0	0	50	C		0	2	1	50	3		D	
9133.1	B	Dog dressage ground	0	0	50			0	1	1	50	3			
92	-	CULTURE, SPORT AND RECREATION													
921, 922		Studios (film, TV, radio)	0	0	30	C	30		2	1	30	2			
9213		Cinemas	0	0	30	C	0		3	1	30	2			
9232		Theatres, concert buildings	0	0	3	C	0		3	1	30	2			
9233		Recreation centers, fairgrounds	30	10	300			10	3	3	300	4		D	
9234		Music and ballet schools	0	0	30			0	2	1	30	2			
9234.1		Dance schools	0	0	30	C	0		2	1	30	2			
9251, 9252		Libraries, museums, ateliers	0	0	10			0	2	1	10	1			
9253.1		Zoos	100	10	50	C	0		3	1	100	3			
9261.1	0	Swimming pools													
9261.1	1	- indoor	10	0	50	C	10		3	1	50	3			
9261.1	2	- outdoor	30	0	200		10		3	1	200	4			
9261.2	A	Sports centers	0	0	50	C	0		2	1	50	3			
9261.2	B	Bowling centers	0	0	30	C	0		2	1	30	2			
9261.2	C	Indoor skating rink	0	0	100	C	100		2	1	100	3			
9261.2	D	Stadiums and outdoor skating rinks	0	0	300	C	0		3	2	300	4			
9261.2	E	Riding schools	50	30	30			0	2	1	50	3			
9261.2	F	Tennis courts (with lighting)	0	0	50	C	0		2	2	50	3			
9261.2	G	Outdoor sports complex (with lighting)	0	0	50	C	0		2	2	50	3			
9261.2	H	Golf course	0	0	10			0	2	1	10	1			
9261.2	I	Artificial ski-run	0	0	30	C	0		2	2	30	2			
9262	0	Shooting centers:													
9262	1	- indoor: rifles and pistols	0	0	200	C	10		2	1	200	4			
9262	2	- indoor: longbows	0	0	10	C	10		1	1	10	1			
9262	3	- outdoor: clay pigeons	0	0	200		300		2	1	300	4		L	
9262	4	- outdoor shooting	0	0	500		1500		1	1	500	5			
9262	5	- outdoor: rifles	10	0	1500		1500		2	1	1500	6			
9262	6	- outdoor: pistols	10	0	1500		1500		2	1	1500	6			
9262	7	- outdoor: longbows	0	0	10		200		1	1	200	4			
9262	8	- outdoor with facilities	10	0	300		500		2	1	500	5			
9262	9	- outdoor with facilities: rifles	10	0	1000		1500		2	1	1500	6			
9262	B	Kart racetracks, < 8 hours/week	50	30	500	C	30		2	1	500	5	B		
9262	C	Kart racetracks, >=8 hours/week	50	50	1000	C	Z 30		2	1	1000	5	B		
9262	D	Racetracks, motocross tracks, < 8 hours/week	100	50	700		50		3	1	700	5	B		
9262	E	Racetracks, motocross tracks, >=8 hours/week	100	100	1500		Z 50		3	1	1500	6	B		
9262	F	Sports schools, gyms	0	0	30	C	0		2	1	30	2			
9262	G	Yacht-basins and marinas with facilities	10	10	50	C	30		3	1	50	3	B		
9262	10	- outdoor with facilities: pistols	10	0	1000		200		1	1	1000	5			
9262	11	- outdoor with facilities, longbows	0	0	30		30		1	1	30	2			
9271		Casinos	30	0	10	C	0		3	1	30	2			
9272.1		Amusement arcades	0	0	30	C	0		2	1	30	2			
9272.2		Model aircraft airfields	10	0	300		100		1	1	300	4			
93	-	OTHER SERVICES													

SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
9301.1	A	Laundries	30	0	50	C	30	2	1	50	3				
9301.1	B	Carpet cleaning companies	30	0	50		30	2	1	50	3				L
9301.2		Chemical laundries	30	0	30		30	2	1	30	2	B			L
9301.3	A	Linen transport services	0	0	30		0	1	1	30	2				
9301.3	B	Laundries (locally)	10	0	10		0	1	1	10	1				
9302		Hair dressers and beauty shops	0	0	10		0	1	1	10	1				
9303	0	Undertaker's													
9303	1	- mortuaries	0	0	10		0	2	1	10	1				
9303	2	- graveyards	0	0	10		0	2	1	10	1				
9303	3	- crematoria	100	10	30		10	2	2	100	3				L
9304		Bath houses and saunas	10	0	30	C	0	1	1	30	2				
9305	A	Animal homes	30	0	100	C	0	1	1	100	3				
9305	B	Other personal services	0	0	10	C	0	1	1	10	1				D
O -		STORAGE DEPOTS OF HARMFUL SUBSTANCES													
O 0001 0		butane, propane, liquid gas:													
O 0001 1		- aboveground, < 2 m3	-	-	-		30	-	-	30					
O 0001 2		- aboveground, 2 - 8 m3	-	-	-		50	-	-	50					
O 0001 3		- aboveground, 8 - 80 m3	-	-	-		100	-	2	100					
O 0001 4		- underground, 80 - 250 m3	-	-	-		300	-	3	300					
O 0001 5		- underground, < 80 m3	-	-	-		50	-	-	50					
O 0001 6		- underground, 80 - 250 m3	-	-	-		200	-	-	200					
O 0002		not aggressive gasses (incl. Oxygen), cooled	-	-	-		50	-	2	50					
O 0003 0		gas cylinders (acetylene, butane, propane and others):													
O 0003 1		- < 10.000 l	-	-	-		30	-	-	30					D
O 0003 2		- 10.000 - 50.000 l	-	-	-		100	-	-	100					
O 0003 3		- >= 50.000 l	-	-	-		200	-	-	200					
O 0004 0		inflammable fluids:													
O 0004 1		- underground, K1/K2/K3-class	10	-	-		10	-	-	10					B
O 0004 2		- aboveground, K1/K2-classes: < 10 m3	10	-	-		50	-	-	50					B
O 0004 3		- aboveground, K1/K2-classes: 10 - 1000 m3	30	-	-		100	-	3	100					B
O 0004 4		- aboveground, K3-class: < 10 m3	10	-	-		30	-	-	30					B
O 0004 5		- aboveground, K3-class: 10 - 1000 m3	30	-	-		50	-	3	50					B
O 0005 0		ammunition:													
O 0005 1		- < 275.000 cartridges and < 1 kg gunpowder	-	-	-		10	-	-	10					
O 0005 2		- >= 275.000 cartridges and < 3 kg gunpowder	-	-	-		30	-	-	30					
O 0006		fireworks < 1000 kg	-	-	-		10	-	-	10					
O 0007 0		pesticides:													
O 0007 1		- < 10.000 kg	-	-	-		10	-	-	10					B
O 0007 2		- >= 10.000 kg	-	-	-		30	-	-	30					B
O 0008		chemical fertilizer, not explosive	-	50	-		30	-	-	50					D
O 0009		ensilage	50	10	-		0	-	1	50					D
O 0010 0		liquid manure (closed storage):													
O 0010 1		- surface < 350 m2	50	-	-		-	-	-	50					B
O 0010 2		- surface 350 - 750 m2	100	-	-		-	-	-	100					B
O 0010 3		- surface >= 750 m2	200	-	-		-	-	1	200					B
I -		INSTALLATIONS													
I 0011		gas cylinder filling installation (butane, propane)	10	0	30		100	2	1	100					
I 0012		mechanical shovels, shovels, bulldozers	30	30	100		10	1	1	30					
I 0013 0		laboratories:													
I 0013 1		- chemical / biochemical	30	0	30		50	1	1	50					D

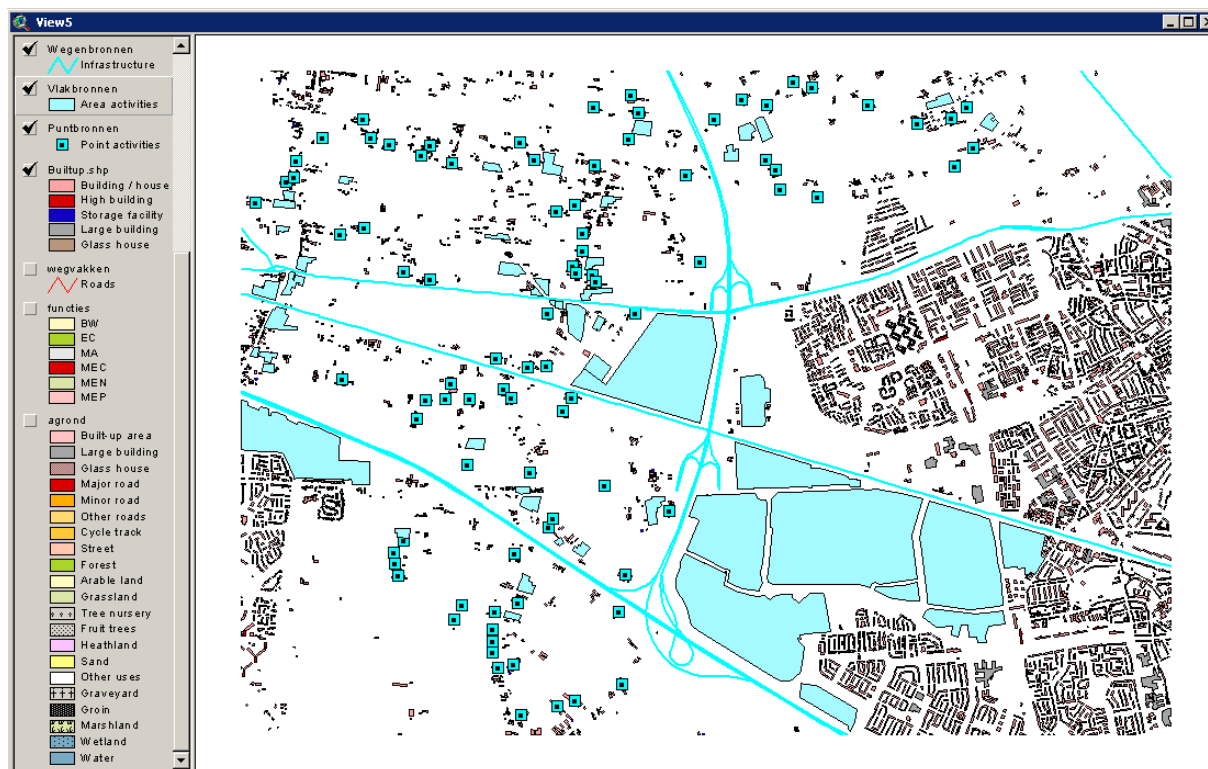
SBI	Nr	DEFINITION	Smell	Dust	Noise	C	Z	Hazard	Traffic	Visual	Distance	Cat	B	D	L
I 0013	2	- medical and higher education	10	0	30			30	1	1	30				
I 0013	3	- primary and secondary education	10	0	10			10	1	1	10				
I 0014		air treatment installation for retail trades	10	0	10	C	0	0	1	1	10				
I 0015		kitchens	30	0	10	C	0	0	1	1	30				
I 0016		cooling installations Freon approx. 300 kW	0	0	50	C	0	0	1	1	50				
I 0017		cooling installation ammonia approx. 300 kW	0	0	50	C	50	0	1	1	50				
I 0018		total energy installations (gas engines) approx. 100 kW	10	0	50	C	10	0	1	1	50				
I 0019		waste incineration, local scale	100	50	50	C	30	0	1	2	100			D	L
I 0020		sewer pumping-station	30	0	10	C	0	0	1	1	30				
I 0021		emergency power units	10	0	30			10	1	1	30			D	
I 0022		paint spray installations and enameling furnaces	50	30	50			50	1	1	50				L
I 0023		forklift trucks with incinerator engine	10	10	50			0	1	1	50				
I 0024		forklift trucks, electrical	0	10	30			0	1	1	30				
I 0025		gas: reducing, compressing, and measuring installation category A	0	0	10	C	10	0	1	1	10				
I 0026		transformers < 1 MVA	0	0	10	C	10	0	1	1	10				
I 0027		drums cleaning installation	50	10	50			30	1	1	50			B	
I 0028		fire hydrant booster	0	0	30	C	0	0	1	1	30				
I 0029	0	windmills													
I 0029	1	- wing diameter 20 m	0	0	100	C	30	0	1	2	100				
I 0029	2	- wing diameter 30 m	0	0	200	C	50	0	1	2	200				
I 0029	3	- wing diameter 50 m	0	0	300	C	50	0	1	3	300				
I 0030	0	furnaces:													
I 0030	1	- gas, < 2,5 MW	10	0	30	C	10	0	1	1	30				
I 0030	2	- gas, 2,5 - 50 MW	30	0	50	C	50	0	1	1	50				
I 0030	3	- gas, >= 50 MW	30	0	200	C	Z 50	0	1	2	200				
I 0030	4	- oil, < 2,5 MW	30	0	30	C	10	0	1	1	30				
I 0030	5	- oil, 2,5 - 50 MW	30	10	50	C	30	0	1	1	50				
I 0030	6	- oil, >= 50 MW	50	30	200	C	Z 50	0	1	2	200			B	L
I 0030	7	- coles, 2,5 - 50 MW	30	100	100	C	30	0	1	1	100				L
I 0030	8	- coles, >= 50 MW	50	300	300	C	Z 50	0	2	2	300				L
I 0031		steam engines	0	0	50			30	1	1	50			D	
I 0032		air compressors	10	10	30			10	1	1	30			D	
I 0033		elevators	0	0	10	C	10	0	1	1	10				
I 0034		fuel pumps without liquid gas	30	0	30			30	2	1	30			B	
I 0035		effluent purification plant < 100.000 inhabitants	200	10	100	C	10	0	1	1	200			D	
I 0036	0	transmitting stations:													
I 0036	1	- LW and MW, transmitting power 100 kW (with larger transmitting p	0	0	0	C	50	0	1	3	50				
I 0036	2	- FM radio and TV, height >100m	0	0	0	C	10	0	1	3	10				
I 0036	3	- mobile phones relay station	0	0	0	C	10	0	0	1	10				
I 0037		radar installation	0	0	0	C	1500	0	1	3	1500			D	
I 0038		power transmission line	0	0	0	C	50	0	1	2	50				
T -		INDUSTRIAL ZONES													
T 01		Service industries (offices)													
T 02		Wholesale trade													
T 03		Manufacturing industry													
T 04		Heavy industry													

Explanation of categories:

SBI	= Unique code for each type of activity (SBI-code)
Nr	= Serial number for activities within the same SBI-code
Definition	= Definition of the activity
Smell, Dust, Noise, Hazard	= Distances in meters per impact category
C	= Continuous production (twenty-four hours a day)
Z	= Heavy noisemaker
Traffic, Visual	= Index number representing a small (1) to large (3) attraction of traffic or visual disturbance
Distance, Cat	= Maximum impact distance and index number representing this maximum distance
B, L	= Codes representing soil (B) and air (L) pollution
D	= Code indicating a diversity of activities within the SBI-code

Annex 3. Activities (sources) in the study area Ede-Veenendaal

The themes with activities include point and area activities, as well as lines (road and rail infrastructure). The related tables are *PUNTBRONNEN.DBF* (point sources), *VLAKBRONNEN.DBF* (area sources), and *WEGENBRONNEN.DBF* (infrastructure). These tables show the characteristics of the activities in the study area. These characteristics include: name, address, SBI-code, the description of the SBI-code (VNG category), and impact distances.



Point sources

The point sources in the map represent the centre of the farm buildings of intensive livestock farms. The most important impact of these farms is smell. The study area includes 89 livestock farms that are dominated by pig and poultry farms, but also include some dairy farms. The point sources are all located in the rural area.

Area sources

The area sources in the map represent (mostly urban) activities, such as industrial zones, industrial buildings, company premises and sewage plants. The study area includes 53 area activities, including industrial zones (Service industries and offices, Wholesale trade, Manufacturing industry, and Heavy industry). The industrial zones are all located in the urban area, and the individual activities are located in the urban as well as the rural area.

The next table shows a complete list of all area activities in the study area. This information comes from the table *VLAKBRONNEN.DBF*, which is linked to the theme

vlakbronnen (area sources) in ArcView. The table also includes information on the impact distances of each activity.

Name	Address	SBI-code	Description	Smell	Dust	Noise	Risk
1 Veenendaal N	Veenendaal	T 02	Wholesale trade	30	10	50	30
2 Sewage Ede	Dwarsweg 5	B 9000.1 1	- < 100.000 residents	200	10	100	10
3 Frankeneng N	Ede	T 03	Manufacturing industry	100	50	100	30
4 Galvanistraat W	Ede	T 03	Manufacturing industry	100	50	100	30
5 Galvanistraat SW	Ede	T 02	Wholesale trade	30	10	50	30
6 Copernicuslaan East	Ede	T 02	Wholesale trade	30	10	50	30
7 Galvanistraat N	Ede	T 02	Wholesale trade	30	10	50	30
8 Galvanistraat S	Ede	T 02	Wholesale trade	30	10	50	30
9 Frankeneng SW	Ede	T 03	Manufacturing industry	100	50	100	30
10 Frankeneng SE	Ede	T 03	Manufacturing industry	100	50	100	30
11 Frankeneng E	Ede	T 02	Wholesale trade	30	10	50	30
12 De Klomp S	De Klomp	T 03	Manufacturing industry	100	50	100	30
13 De Klomp W	De Klomp	T 03	Manufacturing industry	100	50	100	30
14 De Klomp E	De Klomp	T 02	Wholesale trade	30	10	50	30
15 De Klomp N	De Klomp	T 02	Wholesale trade	30	10	50	30
16 Tree nursery	Ederveen	B 0111	Arable farming and fruit farming (farm buildings)	10	30	30	10
17 Garden Center	Ederveen	B 5211	Super markets, department stores, builders' merch	0	0	10	30
18 Woodwork	Manen	B 203	Woodwork factories	0	30	100	0
19 Kievitsmeent	Ede	T 03	Manufacturing industry	100	50	100	30
20 Manure processing	Ede	B 9000.3 A	- manure processing plant	500	10	100	10
21 Cars	Manen	B 501	Car and motorbike dealers, repair and service com	10	0	30	10
22 Contruction	Ederveen	B 45 A	Building and construction companies with workshop	10	30	50	10
23 Metal fences	Ederveen	B 287 B	Other metal works not previously mentioned	30	30	100	30
24 Horse riding	Veenendaal	B 9261.2 E	Riding schools	50	30	30	0
25 De Kade	Ede	T 03	Manufacturing industry	100	50	100	30
26 Agricultural transpo	De Kade	B 014	Agricultural services	30	10	50	10
27 Cars and recycling	Manen	B 501	Car and motorbike dealers, repair and service com	10	0	30	10
28 Cars	Manen	B 504 A	Car and motorbike dealers, repair and service com	10	0	30	10
29 Paving stones center	Manen	B 5211	Super markets, department stores, builders' merch	0	0	10	30
30 Snack bar	Manen	B 553	Restaurants, cafeteria's, snack bars, fish dealer	30	0	10	10
31 Manen S	Ede	T 02	Wholesale trade	30	10	50	30
32 Manen N	Ede	T 02	Wholesale trade	30	10	50	30
33 Agricultural machine	Manen	B 014	Agricultural services	30	10	50	10
34 Plastic recycling	De Klomp	B 5157.2	Other wholesale trade in waste and scrap	10	30	100	10
35 Soil tillage machine	De Klomp	B 014	Agricultural services	30	10	50	10
36 Petrol station	De Klomp	B 505 2	- without LPG	30	0	30	30
37 Agricultural machine	Ederveen	B 014	Agricultural services	30	10	50	10
38 Cars	Ederveen	B 501	Car and motorbike dealers, repair and service com	10	0	30	10
39 Electro technical se	Ederveen	B 316	Electro technical industry not previously mention	30	10	50	30
40 Trailers	Ederveen	B 501	Car and motorbike dealers, repair and service com	10	0	30	10
41 Paving stones	Ederveen	B 5211	Super markets, department stores, builders' merch	0	0	10	30
42 Agricultural transpo	Ederveen	B 014	Agricultural services	30	10	50	10
43 Garden center	Ederveen	B 5211	Super markets, department stores, builders' merch	0	0	10	30
44 Cars	Ederveen	B 501	Car and motorbike dealers, repair and service com	10	0	30	10
45 Restaurant	Ederveen	B 553	Restaurants, cafeteria's, snack bars, fish dealer	30	0	10	10
46 Garden machines	Ederveen	B 501	Car and motorbike dealers, repair and service com	10	0	30	10
47 Contruction company	Ederveen	B 287 B	Other metal works not previously mentioned	30	30	100	30
48 Horse riding	Ederveen	B 9261.2 E	Riding schools	50	30	30	0
49 Vlastuin transport	Ede Doesburg	B 6024	Freight transport	0	0	100	30
50 Mestpro BV	Ede Doesburg	B 9000.3 A	- manure processing plant	500	10	100	10
51 Cafe-restaurant	Ede Doesburg	B 553	Restaurants, cafeteria's, snack bars, fish dealer	30	0	10	10
52 Installatiebedrijf	Ede Doesburg	B 45 A	Building and construction companies with workshop	10	30	50	10
53 Hovenier	Doesburg	B 0141.1	Garden maintenance companies	10	10	10	10

Road and rail infrastructure

The line sources in the map represent the major road and rail infrastructure in the study area. This includes the highways A12 and A30, the railway line along the A12, and a small part of the railway line that goes from Ede to the north, and is located in the upper right hand corner of the study area. The major provincial road from Ede to Veenendaal is also included with the line sources. The most important impacts of the road and rail infrastructure are noise and local air pollution.

Annex 4. Functions in the study area Ede-Veenendaal

The map below shows the function codes in the study area. STEPP distinguishes six categories of receptive environment:

- MEC: Areas with large numbers of humans (such as shopping malls).
- MEP: Areas where humans have permanent residence (such as private residences).
- MEN: Areas that humans occasionally visit (such as sport facilities and recreation areas).
- EC: Areas with (unique) ecological values (such as city parks and natural reserves).
- BW: Soil and water areas (such as gardens and canals).
- MA: Paved areas (industrial zones, roads, parking areas).

