

# 34 THE ENVIRONMENTAL MAXIMISATION METHOD

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The environmental maximisation method is a design method used by town planners in which an attempt is made to clarify the long-term, ecological approach in such a way, that it is possible to recognise how decisions were made in the final design.

## 34.1 BLUEPRINT FOR A CITY

The original idea for the environmental maximisation method came into being in the mid-seventies. A research programme, *'Blueprint for a City'*, was started in what was then the multidisciplinary Centre for Environmental Science and Technology. The title was inspired by the manifesto *'Blueprint for survival'*, written by Friends of the Earth. The research programme had two main aims. Firstly, to encourage inter-disciplinary co-operation. Secondly, to clarify pre-conditions and requirements set by the professions involved in advising the building industry as a whole. What was required was an indication of the ideal extent, density and system of land division for a city or urban area as seen by a particular profession. The question was put to specialists in fields like district heating, use of solar energy, and avoidance of wind problems, public transport and sewage treatment. This kind of approach turned out to be impractical. The advisors were not accustomed even to give an outline answer to such questions.

## 34.2 URBAN DESIGN AND THE ENVIRONMENT ('SOM')

When the attempt to use staff-members failed, a further attempt was made in 1978 using final-year students in the various professional fields brought together in the Inter-faculty Study Group for Planning, Urban Design and the Environment. Between 1978 and 1980, eight different groups worked, half a year each, on environmental awareness plans for cities like Delft, Rotterdam, Almere and Wageningen. One result was formation of the SOM Group currently acting as the source for co-ordination of regular environmental education. The concept of maximisation is currently used in the design tasks in the second-year block IMAGO (Integration of Environmental Aspects in the Built Environment) and in the fourth-year environmental module *'Integrated Design'* and in the Delft Interfaculty Research Centre: *'The Ecological City'*.

## 34.3 CONTACT WITH ACTUAL PRACTICE

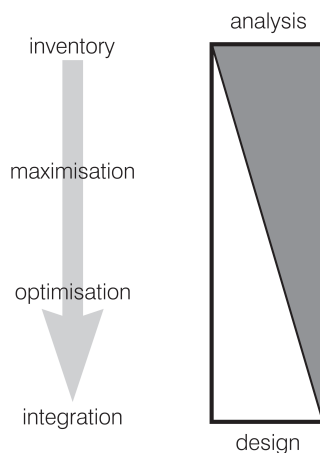
The SOM Group has many contacts with actual practice; ex-SOM students are involved in the majority of Sustainable Building projects in the Netherlands. One important contact is with *BOOM, Buro voor Onderzoek & Ontwerp voor het Milieu* (Office for Research & Design for the Environment) in Delft. In 1995 BOOM completed the manual *'Materials for Sustainable Urban Design'* commissioned by SEV (Steering Committee for Experiments in Housing) and Novem (The Netherlands Agency for the Environment and Energy). This manual and the maximisation concept are being used in the planning of DE Wijk, a 2.800 houses development area in the western part of Tilburg.<sup>a</sup>

## 34.4 THE THREE-WAY APPROACH

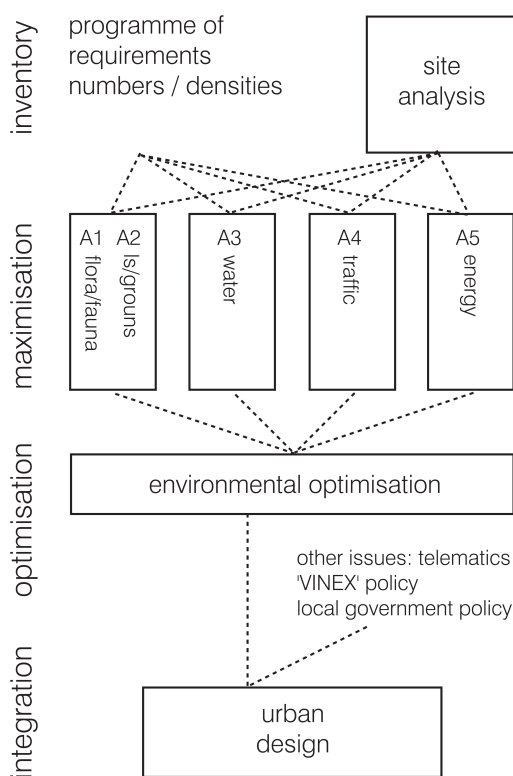
After brainstorming sessions, the local government departments developing DE Wijk in Tilburg decided to take a three-way approach. Besides design quality and environmental quality research study would be carried out into what influence the application of computer techniques might have on the master plan for the new area. Prof. Wytze Patijn was asked to supervise design quality, Prof. Theo Beckers of Tilburg University was asked to handle informatics and the author of this Chapter was given the task of ensuring that environmental thinking had proper influence on the master plan. In the first instance the local project co-ordinator only

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a Boom-Duijvestein (1998) *De milieu maximalisatie methode*.



321 How environmental issues affect the master plan during the gradual progression from analysis to design



322 Maximisations give insight into environmental issues affecting the master plan. Sketch maps are given for the subjects and issues in the boxes. A1, A2 etc. refer to the manual 'Materials for Sustainable Urban Planning'

involved local government departments in the planning process indirectly. This meant that the team that had been put together had the task of developing not only a product (DE Wijk), but also a process.

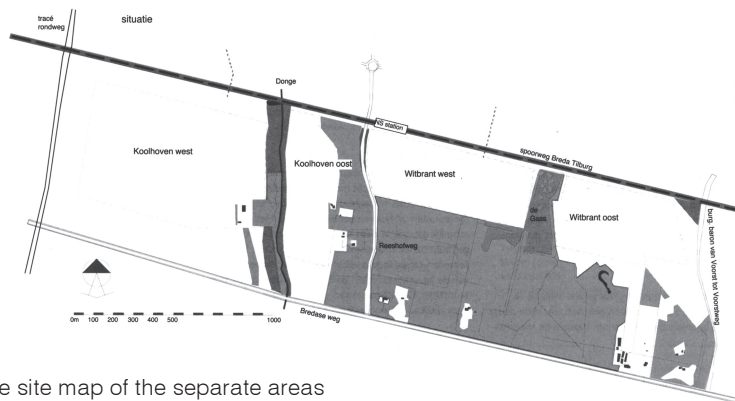
### 34.5 DESIGN PROCESS

Design processes are often carried out in a highly individual way, which makes it difficult afterwards to find out exactly what happened. The process, from analysis of the location and the programme of requirements through to design, takes place largely inside the heads of those involved. If all goes well, this ensures a constant interplay between analysis and design.

The first draft (design) is often put forward quite early on, and refers back to continuation of the analysis that will be necessary for quite a while. Figure 321 represents the gradual progression from analysis to design as a two-way process. The maximisation concept is used to give some insight into the influence of the environment on the master plan. For each environmental issue a plan is drawn that would be most beneficial to the environment if all requirements relating to that issue, and of course to location and requirements, are taken into account (see figure 322).

### 34.6 THE SITE

The method used certainly allowed the choice of location and programme of requirements to be analysed, but did not allow it to be discussed in the first instance.

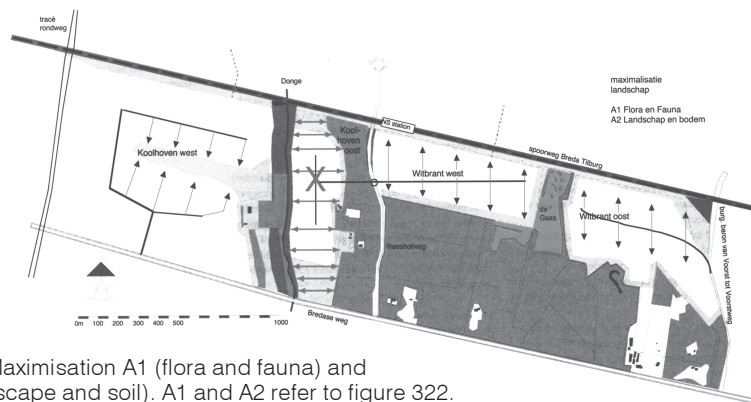


323 Map 1 The site map of the separate areas

The location is due west of Tilburg, south of the 10,000 house district of Reeshof, between the railway line running from Tilburg to Breda and the old Breda road, about eight kilometres from the centre. The programme includes at least 2,650 houses for which the necessary services are to be in Reeshof on the other side of the railway track. The Witbrant district was reserved for the Floriade, but when the choice for Floriade 2000 went to Haarlemmermeer the area came free for residential development. It consists of fields and grazing land where buildings can be put up without trespassing on an area of pine trees within which, in principle, no building is permitted. A number of estates are located in this area along the Breda road. On the east the boundary is formed by the Burgemeester Baron van Voorst tot Voorst road, and on the west by the future western ring road. The area is divided in four sections by a stream (the Donge), the Reeshof road and a piece of heath land (De Gaas). There is a plan for a railway station along the Reeshof road. The area comprising Koolhoven west and Witbrant west is to be connected to the Reeshof by a tunnel for cyclists and pedestrians. All this is shown in map 1.

### Landscape

The maximisations A1 (flora and fauna) and A2 (landscape and soil) used the countryside inventory prepared by the local department responsible for the provision of green space. This inventory divides Tilburg into separate regions and gives for each region present an ecological quality and a description of the target to be aimed at.

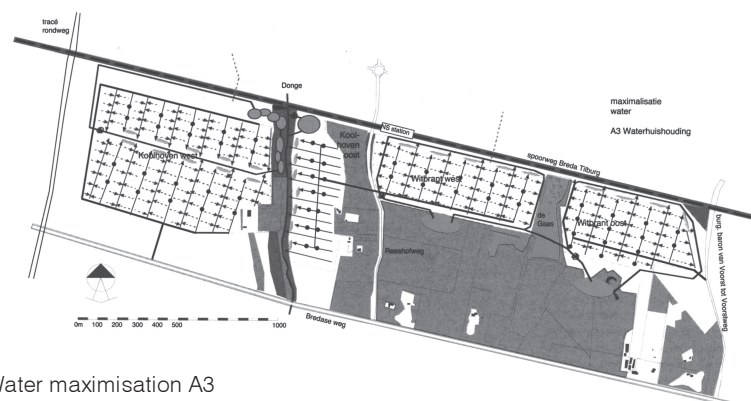


324 Map 2. Maximisation A1 (flora and fauna) and A2 (landscape and soil). A1 and A2 refer to figure 322.

The regions with the highest present and future ecological quality are in DE Wijk the strip along the railway, the heath land (De Gaas) and the area between the Donge and the Woodland along the Reeshof road. This Area, Koolhoven east, is scheduled for building, but should really remain unbuilt, forming an important connection between the Donge and the Wood. The strip along the railway largely co-incides with the noise-pollution zone, so the pressure to build is to be expected mainly in the neighbourhood of the station. Access is to be provided to the edges of Koolhoven west, with an extra strip of green planned for the middle; access to Witbrant east and west is thought to go via the middle. Map 2 shows how these data are translated into a sketch of the master plan.

### Water

An important guideline in the water maximisation is that rainwater infiltration should be allowed to the greatest extent possible, topping up the ground water level. This combats drying out and minimises reduction in water quality. So the surrounding natural areas and the quality of the immediate environment will benefit from this maximisation.



325 Map 3. Water maximisation A3

Rainwater from roofs and the surfaces of road not intensively used by motor traffic is either allowed to flow directly into the ground, or led to ditches via surface drainage. Water in the ditches is then pumped back; up to higher sandy areas in the pinewoods. Water still left is discharged in the Donge. Map 3 indicates how this is done.

### *Traffic*

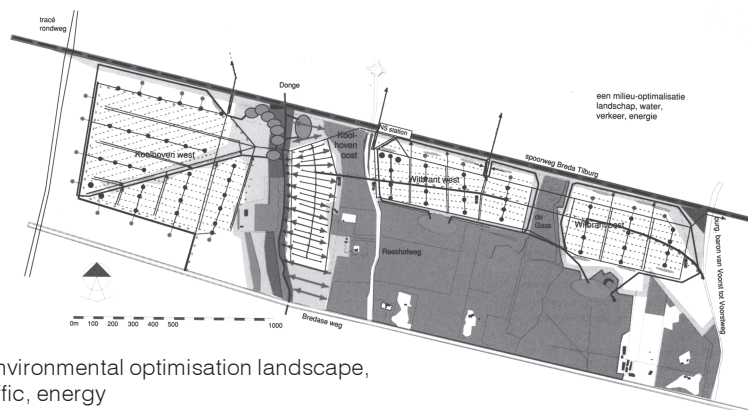
This maximisation looks at cyclists and pedestrians ('slow traffic'), public transport and motor vehicles. Issues relating to cyclists and pedestrians include road safety, connections, immediacy (including access to the railway station, schools, the Reeshof Centre and the centre of Tilburg), speed, attractiveness and the alternatives available at times when the prevailing circumstances create a feeling of social insecurity.

Direct connection with the station means a diagonal running across Koolhaven west. There are connections under and over the track in Koolhoven west and Witbrant west. For public transport the location of the planned station is taken as fixed; further consideration being directed at provision of a fast direct bus route and maximal distance between houses and bus stops. Koolhoven west is to be opened up for motor traffic from the Breda road, Koolhoven east and Witbrant west from the Reeshof road and Witbrant east from Burgemeester Baron van Voorst tot Voorst road. This means that the Donge and the heath land area are not crossed by motor vehicles in any way, though crossing will be possible for the other two types of traffic. Slow traffic and public transport are the key factors in this maximisation.

### *Energy*

Energy maximisation looks primarily at the influence of orientation towards the sun. According to specialists, district heating imposes no pre-conditions that need affect the master plan. Uses of solar energy considered were passive: windows or conservatories, and active: solar collectors or solar cells. In all cases a deviation of no more than 20° from due South appeared to be acceptable. The long straight lines running through the location – the railway line and the old Breda road – which gave the town-planners' outline master plan its name, deviate approximately 15 from East-West. This makes the area outstandingly suitable for East-West land division for the residential blocks.

## **34.7 AN ENVIRONMENTAL OPTIMISATION**



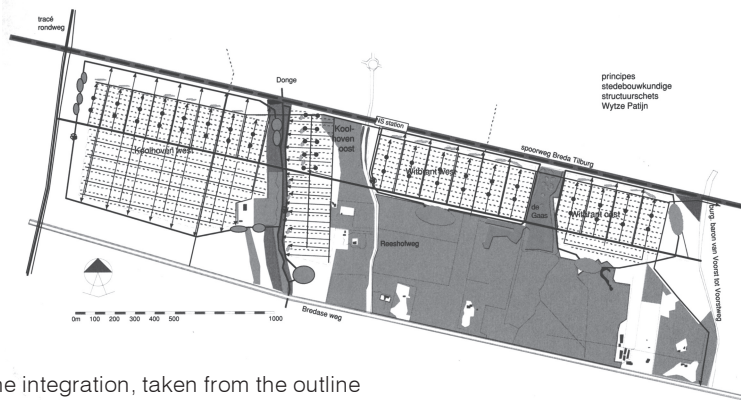
326 Map 4. Environmental optimisation landscape, water traffic, energy

The individual maximisations appear for the most part to fit together well, like pieces of a jigsaw. There are a few points at which choices must be made. The landscape maximisation indicated that Koolhoven east should be left unbuilt, to preserve the connection between the Donge and the higher wooded area. But this area is situated close to the station, and for that very reason should have a high building density. The choice was made to build in the area, but to have green connective zones. The landscape maximisation opened up Witbrant to traffic from the middle of the districts, while the water system and the traffic system provided access along the edge of the wood. The existing landscape has been taken as basis; the other maximisation models have been adjusted to fit. Fortunately, they are sufficiently flexible to allow this.



### 34.8 THE INTEGRATION

Map 5, taken from the outline master plan 'The long lines', shows how everything has been integrated.



327 Map 5. The integration, taken from the outline master plan 'The Long Lines' prepared by Wytze Patijn Architecten

A large number of points can be recognised as derived from the individual maximisations and the final optimisation. It seems that the different players were in agreement (or reached it) on a large number of matters affecting the master plan. Disagreement remained on two issues. In the outline master plan, the choice was made to introduce a long third line, the '*Nieuwe Laan*', to accompany the two existing lines (the railway and the Breda road). This *Nieuwe Laan*, a significant visual element, important for the design, connects the various neighbourhoods and also provides access for buses and cycles. How to avoid traffic, using it as a short cut or driving too fast along it, is to be looked at in the detail planning stage. Consideration is to be given to experimental electronic speed regulation systems and perhaps blocking the traffic flow by the Donge and by the De Gaas heath-land. Another immediately recognisable difference between the environmental optimisation and the way everything is integrated into the plan is the absence of a diagonal green strip and a route for slow traffic in Koolhoven west. This is a case where the image of a peaceful piece of urban design took precedence over a short connection for slow traffic. The outline plan does provide a close-knit network for slow traffic that will be almost entirely free of motor vehicles. What will happen next? After the outline master plan was prepared, four designers were asked to give their ideas on how the development of DE Wijk might be taken further. After discussing different opinions, they were asked to concentrate particularly on the individual component areas, while at the same time keeping an eye on developments in adjacent areas.



328 Map 6. One of the variations from the design study carried out by Lafour en Wijk for the consultation with designers in November 1996

Map 6 shows a variation that came out of one of these studies, from which it is possible, to some extent, to see how each individual component area is to be developed in its individual way. It also shows how an attempt is to be made to keep the area between the Donge and the wood as open as possible, both visually and as an ecological connection, despite building. The environmental maximisation method appears to be an outstanding tool for systematic integration of environmental issues into the process of urban design.