

MUNICIPALITY OF ROTTERDAM  
HOLLANDSE DELTA WATER BOARD  
HIGHER WATER BOARD OF SCHIELAND AND KRIMPENERWAARD  
HIGHER WATER BOARD OF DELFLAND



# WATERPLAN

WORKING ON WATER FOR AN ATTRACTIVE CITY

# Rotterdam



**2007**

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**Rotterdam** 

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## **WATERPLAN 2 ROTTERDAM**

**‘Waterplan 2 Rotterdam’ outlines how the municipality of Rotterdam and the water boards want to deal with the city’s water in the period ahead. This needs to be set down on paper, particularly now that the signs of climate change are becoming increasingly clear. This change could have major consequences for Rotterdam. In order to make the city ‘waterproof’, a new approach to water storage, water quality and protection from water is needed.**

The water action program of the last Water plan is still in progress, but a new water plan was necessary because of new developments and insights. The vision in the current plans goes up to 2030. That year was chosen because the City Vision also looks ahead to 2030. In the City Vision, the municipal council states what it has in mind for Rotterdam: a city with a strong economy and an attractive place to live. This development and all the measures in this water plan are closely connected.

Plenty has been done in recent years. More open water has been created in the revamped Zuiderpark, thereby increasing the storage capacity. The banks have been redesigned, the ecology has been improved and there is now more space for recreation. Canals and brooks in Noord and Zuid have been cleaned up and the quality of the water here has improved tremendously. The Bergse Plassen have been spruced up, so that the water is now clean and clear again. Other big projects are still under way. Furthermore, the municipal authority is busy implementing the measures as mentioned in the Municipal Sewerage Plan.

### **WHAT WE ARE FACING**

Rotterdam is working on a strong economy and an attractive residential environment. Water is an important aspect of an attractive city, certainly one that profiles itself as ‘water city’. The vision of Rotterdam for the future plays an important role in all the plans. In addition, there are three crucial developments with which we will, or might be, faced in the period ahead.



- Higher water level due to the rise in sea level. There is a risk of flooding in areas outside the dykes. Flood defences will simply have to be reinforced.
- Flooding caused by increasing rainfall. Due to the changing climate, a lot of rain can fall in a short space of time. In order to process that water, provisions are needed for collection and storage. At the moment, there is already a shortage of around 600,000 m<sup>3</sup> of storage. At least 80 hectares of extra lakes and canals would be needed to cope with this shortage by means of open water.
- Stringent demands on the quality of water. Rotterdam wants to be an attractive water city, with clean, clear and plant-rich water. The city must also meet European requirements (the European Framework Directive on Water). So-called quality profiles, based on these requirements, are in the process of being drawn up for all stretches of water in the city.

## **DECISIONS OF CRUCIAL IMPORTANCE**

In order to solve the problems referred to above, choices have to be made. These are the so-called ‘decisions of crucial importance’.

**PROTECTION** Rotterdam needs to be protected against flooding, both inside and outside the dykes. All quays and dykes which are not yet high enough, according to the current standards, will be reinforced in the coming years. But in the more long term too, the city will have to be protected. For this reason, space needs to be reserved now for enforcing the flood defences in due course.

This does not mean that these dykes will form massive barriers between areas. Water managers and urban developers will work together, using them, where possible, as a connecting element, as park landscape, balcony on the Maas or footpath and cycle route. If Rotterdam starts to build outside the dykes, the design will also have to take account of possible higher water levels in the future, the so called adaptive approach. In short: measures have to be taken now, even if they will only have an effect in the longer term.

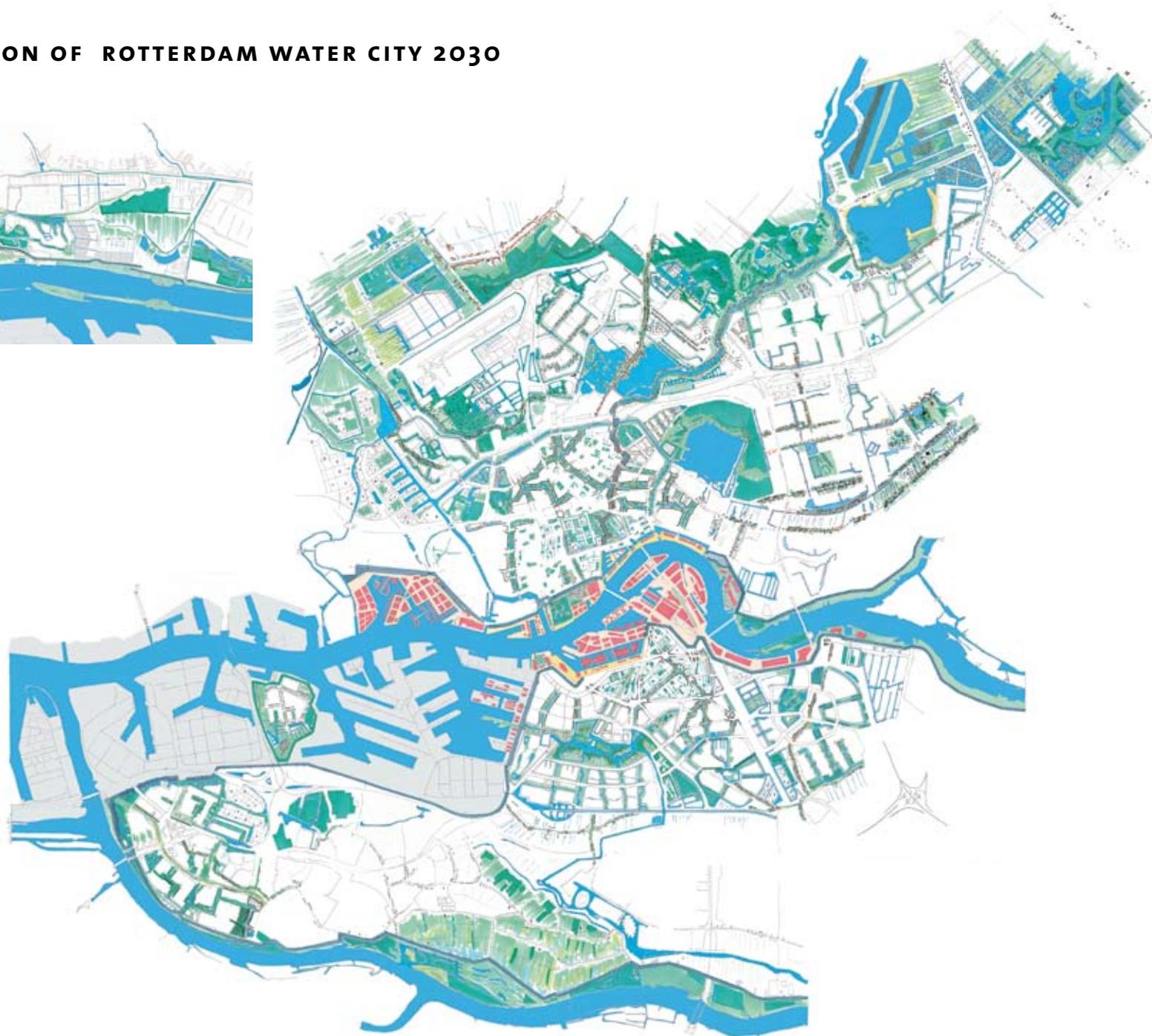
**CLEAN WATER** ‘Clear and plant-rich water’ is the general objective for water in Rotterdam. With the right mix of measures, that goal is feasible for almost all stretches of water in the city.

**ATTRACTIVE CITY** This is perhaps the most important decision: how can the city be made even more attractive as a place to live, work, study and spend leisure time, and can the water problems be solved at the same time? Traditional solutions are inadequate here. In the city centre and the old neighbourhoods, for example, it isn’t possible to tackle the problems of water storage by digging extra facilities. The costs are exorbitant and existing buildings can’t simply be demolished. Innovations such as green roofs, ‘water squares’, alternative forms of water storage and the like are therefore essential for the further development of the city.

**SEWERS** In practice, rainwater usually drains away via the sewers. The increasing rainfall is leading to problems with the existing sewerage system. One possible way of avoiding these problems is to collect the rainwater and allow it to drain away in a system other than the sewers, therefore separating the dirty waste water from the relatively clean rainwater. However, this system must not be allowed to adversely affect public health, the quality of the groundwater or the groundwater levels. It’s no picnic to reconstruct Rotterdam’s sewerage system. Sewage pipes last around fifty years; the reconstruction would take up several decades. According to a recent social cost-benefit analysis, complete division throughout Rotterdam would not be the best solution. For this reason, an approach for each type of area is being sought.



# VISION OF ROTTERDAM WATER CITY 2030



## GENERAL

- residential areas
- new residential areas
- ribbon developments
- industry and business parks
- parks and woods

## RIVIER CITY

- existing housing outside the dykes
- new development outside the dykes
- dyke as dyke
- dyke as urban balcony
- dyke as urban balcony
- industry and business parks outside the dykes

## NOORD

- drainage pools and canals
- water squares
- green roofs
- water gardens
- (new) areas for nature and recreation

## ZUID

- canals in Oud Zuid
- water squares in Oud Zuid
- green roofs in Oud Zuid
- water squares in the garden cities
- water jewel Zuiderpark
- open water connection Zuiderpark Carnisselanden
- temporary water collection

## HOOK OF HOLLAND

- water collection via infiltration Watercentrum West
- collection of seepage
- new areas for nature and recreation



## **PERSPECTIVE ON ROTTERDAM WATER CITY 2030**

The plans for Rotterdam Water City 2030 consist of enhancing existing qualities and responding cleverly to new developments. Chapter 3 was about the choices which have to be made; this chapter looks at the consequences of these choices, divided into three main areas.

**RIVER CITY** River City consists roughly of the area outside the dykes. The key feature of River City is the Maas, the trademark of Rotterdam, the city's lifeline. The river connects the port – the economic motor – with the hinterland. Rotterdam has a characteristic waterfront, with the Kop van Zuid, the Lloydkwartier and new construction sites. There is space here for a wide range of dynamic areas in which to live and work. At the same time, the river provides opportunities for more transport by water: that reduces travelling time and improves the accessibility of these areas. Furthermore, Rotterdam could distinguish itself from other cities with this form of transport. A recreational route can be created along the whole length of the river; a succession of unique spots, which together form the city's largest recreational area.

**ROTTERDAM-NOORD** On the northern banks, there are many popular residential and commercial areas: most of the centre, Kralingen, Blijdorp, Hillegersberg, the Brainparks and Alexander. Water makes a massive contribution; living alongside water is very popular. The aim for this part of the city is to build further on these existing qualities.

Rotterdam-Noord has 'boezems' (drainage pools) and canals which serve as water storage, but a large part of the storage is via the sewerage system. The strategy is to reinforce the canals and boezems and extend them where possible, and to use innovative solutions when space is in short supply, such as in the city centre and the old districts.

**ROTTERDAM-ZUID** Zuid requires an unconventional approach. That's because the problems are not run of the mill either. There are exceptional opportunities here, however. Zuid is an area rich in water, with its (inner) ports and possible water connections. The water could be put to even better use, but that would mean encroaching fundamentally on the urban area. Possibilities are: to reinforce and extend the water structure from within the Zuiderpark; to create new water networks from existing and new canals, watercourses, Zuiderpark and the districts earmarked for restructuring and to link Zuid with the surrounding area via a new north-south connection.

## REALIZATION STRATEGY

A strategy is needed if the water plans are to be achieved. This consists of prioritising (what definitely has to be done in the coming years?) and phasing (which measures do we take when?).

Basically, there are three types of measures.

- Improving the water system: what do we do, for safety's sake, to combat flooding and to improve the quality of the environment?
- Enhancing the urban quality: how do we link Rotterdam's development plans with what needs to be done in terms of water?
- Introducing innovative and alternative solutions: what do we do if the traditional approach is inadequate?

To prioritise, a list of criteria was drawn up. What is important, for example, is the question, if a project is already under way, of how this helps solve the water problems, how it contributes towards an attractive city, if there is a 'now-or-never' situation and if there is evidence of an exemplary effect.

**IMPLEMENTATION PROGRAMME** The Implementation Programme 2007 – 2012 sets out what needs to be done in the next five years. This involves ongoing projects from the first water plan, new projects and studies, which are already being conducted so that we can carry on quickly after 2012. They can be subdivided into projects to improve safety, projects to cope with the quantity (thus storage) of water and to improve the quality of the water.

**SAFETY** The safety aspect involves two main themes: the dykes and building outside the dykes. The starting point is that the city is and remains protected from the water. In the more long term, choices will have to be made about the storm surge barrier and the required height of the dykes.

During the implementation period of the water plan, those sections of the dyke which do not yet meet current standards will be reinforced. The flood defences at the Vierhaven and Merwehaven also require attention. As soon as the examination method is made known, detailed examination can be carried out here and a study can be launched into adaptive building in this port, as well as in the Rijnhaven and Maashaven. For the areas outside the dykes, proper account must be taken of the risks of flooding. Newbuild and the design of the area must be geared towards this, evacuation must be possible and communication with the residents is a precondition. For the coming five years, studies on these aspects are on the agenda.



**QUANTITY OF WATER** In the coming years, Rotterdam will have to store more rainwater than is currently the case. The Municipal Sewerage Plan already contains many relevant measures. Another approach is to create more space for open water. This is possible particularly in the neighbourhoods earmarked for restructuring. Examples include Groenehagen/Tuinhoven, Hordijkerveld, the northern side of Lombardijen and Oedevlietsepark. Where there is no or little space, we will have to focus on innovation and alternative ways of retaining water. Examples are wadis, water gardens, water squares and green roofs. There are pilots in the pipeline for the last two examples. There will also be a study into solutions for the problems anticipated in the city centre, Oude Noorden, Crooswijk, Overschie and Oud-Zuid and the industrial estates Spaansepolder and Noordwest.

**QUALITY OF WATER** Rotterdam and the water boards are striving to improve the quality of the water by 2015. They are doing this, on the one hand, because Europe has drawn up relevant guidelines, but also because such water has more potential uses, is perceived to be better and has greater economic value. A completely clean water system within ten years is not feasible, however. It



> 2030

costs a lot of money and the effects of measures are often only visible in the more long term. We have therefore chosen to prioritise. Thanks to a special system of water quality profiles, we can choose measures which are practicable, technically feasible and affordable. We apply this approach particularly in the municipal district water plans. Apart from this, the watercourses which are not yet being tackled in this way must meet certain minimum criteria: as little floating waste, complaints about the stench and dead fish as possible. There will also be a study into possibilities for fish migration and a comprehensive plan for the fish stock, with a focus on the ecological value of the waterways.

In order to ensure that the starting points of the water plan are actually put into practice, also organizationally, it is essential that collaboration between municipality and water boards and between water specialists and urban designers will continue.

The foregoing results in the ambitious implementation programme for the years 2007 – 2012 in which the projects are described in detail.

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Water and Rotterdam cannot be separated. Water forms an essential part of the city and plays a crucial role in its development: the rivers Maas, Schie and Rotte, the many canals and lakes, and the docks are so characteristic of the city of Rotterdam. The water networks are under pressure and the limits have already been reached. The climate is changing. More water is heading our way from four directions – the sea, rivers, air and ground. And there are other developments: new legislation and regulations are affecting Rotterdam (such as the European Water Framework Directive and the National Administrative Agreement on Water).

What impact is all this having on Rotterdam? What does the city have to do? How can the different ways of coping with all the extra water be used to make the city more attractive? Clearly, we will have to make some crucial decisions in the coming years, for both the short and long term. Waterplan 2 Rotterdam describes how the municipality of Rotterdam and the water boards want to approach water in the city in the years ahead. Taking account of the spatial developments, which are inextricably linked with the need to accommodate the extra water. With Waterplan 2 Rotterdam, the idea is that these components can actually reinforce each other. The three main themes here are: water safety, water storage and water quality.

Waterplan 2 Rotterdam provides frameworks, a vision and an elaborated programme of measures for coping with the extra water. The strategy for achieving this indicates what we have to do now if we are to achieve the long-term vision. Waterplan 2 Rotterdam means much more than this publication. Through the years it has become a forum for the 'water partners', providing an opportunity for consultation, discussion and joint studies. In the future, new insights and developments are sure to emerge, for which this water plan forms a basis.

If you have any questions about Waterplan 2 Rotterdam, please contact one of the parties listed below, which have worked on the water plan. You can also visit [www.waterplan.rotterdam.nl](http://www.waterplan.rotterdam.nl)

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