

# ROTTERDAM – PEOPLE MAKE THE INNER CITY

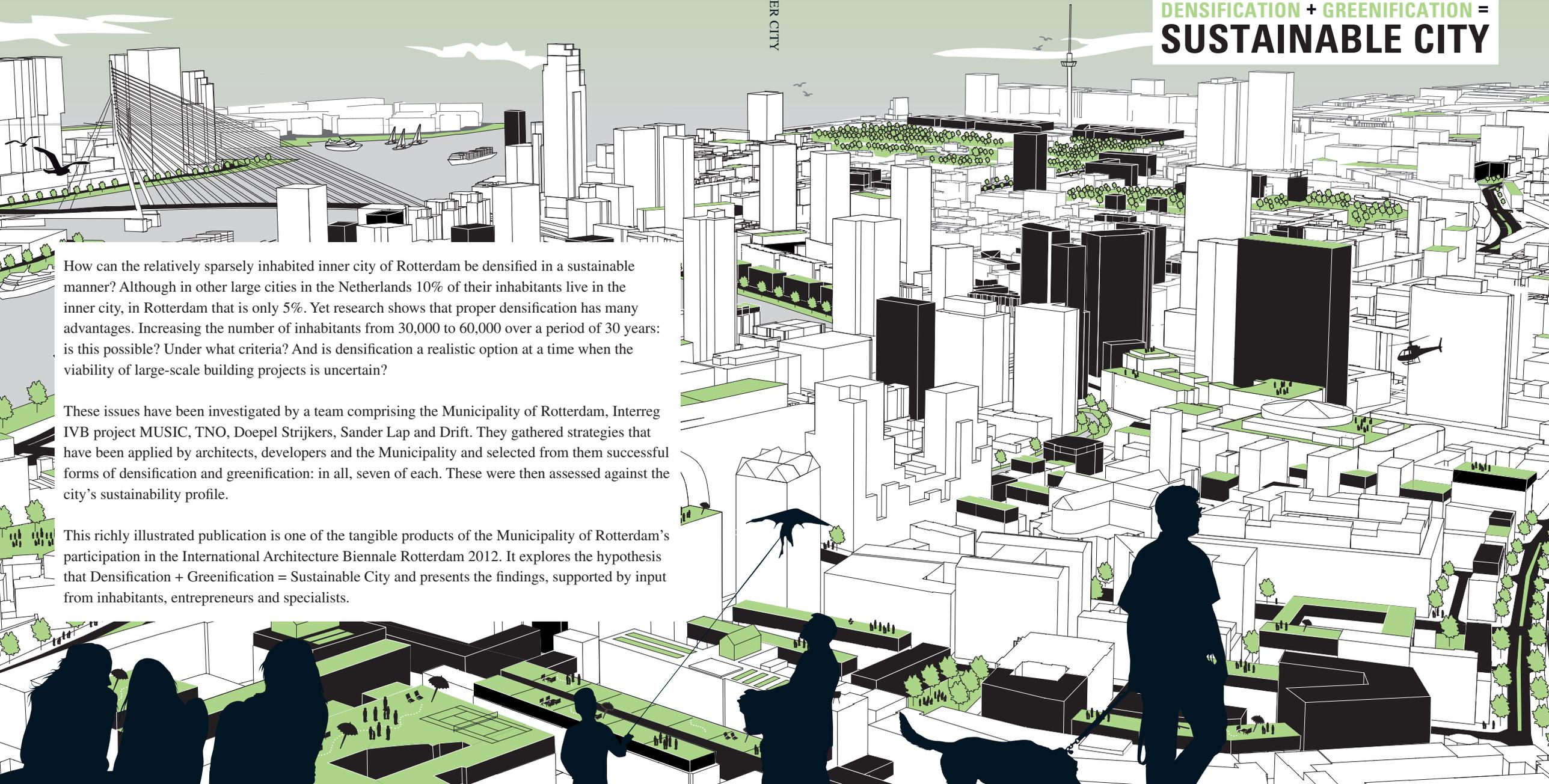
ROTTERDAM – PEOPLE MAKE THE INNER CITY

DENSIFICATION + GREENIFICATION =  
SUSTAINABLE CITY

How can the relatively sparsely inhabited inner city of Rotterdam be densified in a sustainable manner? Although in other large cities in the Netherlands 10% of their inhabitants live in the inner city, in Rotterdam that is only 5%. Yet research shows that proper densification has many advantages. Increasing the number of inhabitants from 30,000 to 60,000 over a period of 30 years: is this possible? Under what criteria? And is densification a realistic option at a time when the viability of large-scale building projects is uncertain?

These issues have been investigated by a team comprising the Municipality of Rotterdam, Interreg IVB project MUSIC, TNO, Doepel Strijkers, Sander Lap and Drift. They gathered strategies that have been applied by architects, developers and the Municipality and selected from them successful forms of densification and greenification: in all, seven of each. These were then assessed against the city's sustainability profile.

This richly illustrated publication is one of the tangible products of the Municipality of Rotterdam's participation in the International Architecture Biennale Rotterdam 2012. It explores the hypothesis that Densification + Greenification = Sustainable City and presents the findings, supported by input from inhabitants, entrepreneurs and specialists.



# ROTTERDAM – PEOPLE MAKE THE INNER CITY

DENSIFICATION + GREENIFICATION =  
**SUSTAINABLE CITY**

# FOREWORD

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As a harbour city of world renown, Rotterdam is used to meeting challenges. Throughout the centuries the city has often had to adapt to changing circumstances, a process that has brought forth extraordinary urban innovations. *Waterplan Rose*, which combined improvements in water quality with the creation of an attractive green living environment along the city's canals is an example that springs to mind. And what about the unique architecture of the *Groothandelsgebouw*, Rotterdam's first multifunctional building for offices and retail space. Then there are the water squares and underground water storage facilities built for climate adaptation and – not to be forgotten – the successful DIY renovation projects, in which inhabitants can create their own special dream house. The strength of Rotterdam most certainly lies in its ability to convert problems into opportunities.

Over the past few years “making the city” has come to be seen in a new light. The global financial crisis has not only led to the demise of “blueprint”, top-down thinking. In particular, the growing scarcity of fossil-derived and other raw materials increasingly demands the creation of sustainable cities that offer high levels of liveability. Cities that are resilient with respect to climate change and energy supply. Cities that offer new means of generating economic activity and income, and of providing food. Rotterdam

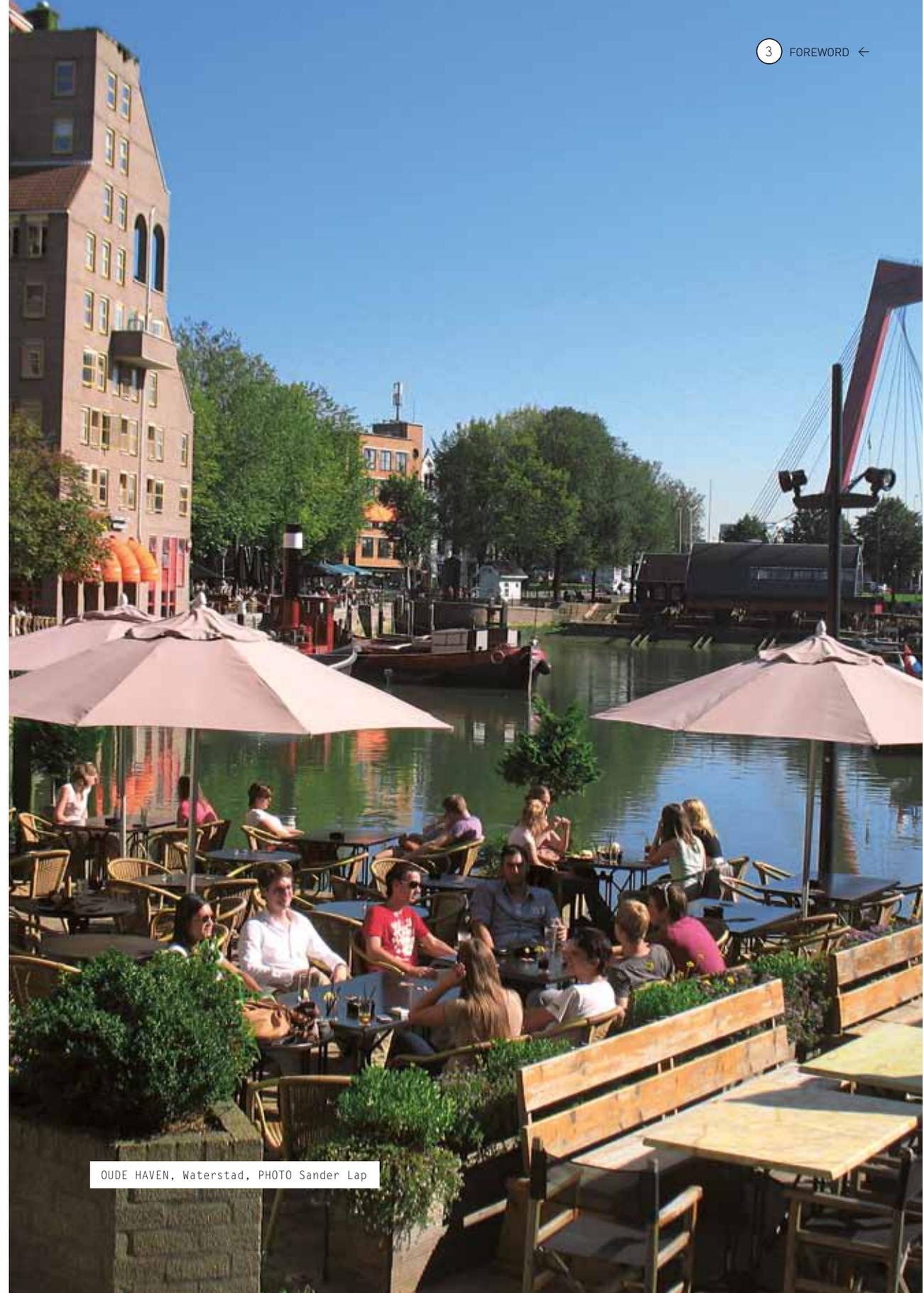
has already begun a new journey of discovery to meet these immense challenges.

Many of these issues are to be found in plans for the densification and greenification of Rotterdam's inner city. Which strategy should be followed if the aim is to increase the number of inner-city dwellers by 30,000 people? And will that strategy improve the quality and sustainability of inner-city living?

The Fifth International Architecture Biennale Rotterdam is creating a platform for exploration, for demonstrating new roles and for inhabitants and businesses to illustrate what an attractive, sustainable inner city in Rotterdam would be like.

The exploration of inner-city design presented in this publication shows that densification and greenification can deliver an attractive, sustainable inner city in Rotterdam. This is an exploration that sets out to concentrate the city's energy and display a breeding ground for initiatives.

The potentials for the future presented in this publication are based on strategies and projects that have already been implemented by Rotterdam's inhabitants as they make their city – as they make it “the place to be”. In reality, the future is well and truly underway, and you are very welcome to join in.



OUDE HAVEN, Waterstad, PHOTO Sander Lap



SKYLINE ROTTERDAM, PHOTO Rotterdam Municipality

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# ROTTERDAM – PEOPLE MAKE THE INNER CITY

“IN SUCCESSFUL CITIES, EVERYTHING IS ABOUT PEOPLE WHO CHALLENGE, COMPETE AND STIMULATE EACH OTHER SO THAT INNOVATION CAN COME ABOUT.”

Jane Jacobs, *Economy of Cities*, 1973

*We know that urban regions form the motor of our economy and that inner cities play a leading role in this. In this context, the Municipality of Rotterdam is expected to set priorities (especially in these times), and currently the inner city is at the top of the list. As yet, the potential of Rotterdam’s inner city has not been fully exploited. This is in large part a consequence of the relatively small number of inhabitants the inner city currently accommodates. Those who are familiar with Rotterdam’s history will understand this. Nevertheless, we are not standing by and doing nothing. In the larger cities of the Netherlands, about 10% of city dwellers actually inhabit the inner city (Engelsdorp-Gastelaars 1988), but in Rotterdam that number is just over 5%, in spite of a rising trend. This is why the Municipality of Rotterdam attaches such great importance to inner city densification. Research (Marlet 2009) shows that synergy is important: synergy between the enterprising inhabitants of inner cities and employment, and culture and, for example, culinary meeting points. Thus, the more inhabitants, the greater the synergy. A confident inner city is vital for the resilience of the city as a whole.*

## INTRODUCTION

### Making the inner city

17 May 2011 saw the launch of a research project to chart the possibilities for densification of Rotterdam’s inner city. The most immediate reasons for this initiative were the International Architecture Biennale 2012 held in Rotterdam every two years and the European Interreg IVB project MUSIC, which focuses on the transition towards sustainable cities, of which the Municipality of Rotterdam is a lead partner. The Biennale has posed the question: “How do we make the city?” This question arose at a moment when the global financial crisis could no longer be considered a transient phenomenon, but rather as the beginning of a new era in which cities will shape the future, both in economic terms and those of the sustainability of society. Thus, the time spent on this research also presented an opportunity for reflection about the extent to which the Municipality of Rotterdam had already been anticipating and reacting upon the new situation. The future prospects for the inner city played an important role here. In this respect, measures had already been taken to stimulate large and ambitious housing projects, while, for example, at the same time small-scale experiments with do-it-yourself (DIY) housing were being undertaken.

It was made clear during the launch that (future) inhabitants will hold a central position in the future and that people who want to live

in the inner city are often not only enterprising characters but also entrepreneurs. Furthermore, it was emphasised that creating attractive conditions for families is important, even if they only form 20% (after densification) of the total number of inhabitants. Several architects presented their work. In addition to the existing high-rise strategy, what also emerged was that there are at least six alternative densification strategies to be distinguished for this group of enterprising inner-city inhabitants. The main question, according to former director of planning of the city of Vancouver, Larry Beasley, was then to find out whether such bottom-up initiatives would also contribute significantly – besides generating enthusiasm – to the desired attractiveness of the inner city. With that, Rotterdam’s first “research by design” project had been defined. Next, the question arose as to whether or not the city would become very “stony”, which quickly generated the second research question: i.e. which green strategies (already) exist for turning Rotterdam into a green/greener city?

**The research hypothesis is that with sufficient densification in pleasant, green surroundings, the quality of life in the inner city will improve making Rotterdam a more sustainable city.**

## ROTTERDAM – PEOPLE MAKE THE INNER CITY

“Sustainable” stands for People, Planet, Profit and thus also implies socio-economic resilience! Together with densification studies performed by Doepel Strijkers Architects and the Municipality of Rotterdam, and greening studies carried out by the Municipality of Rotterdam and Sander Lap, the hypothesis was tested by TNO with convincing results, as this publication demonstrates. Indeed, the research shows that smart spatial structuring and transport strategies can have a highly significant influence on the establishment of a sustainable society. Furthermore, the research indicates that the relationship between the municipality and its enterprising inner-city inhabitants will change.

That change is, under the direction of Dutch Research Institute for Transitions (DRIFT), being addressed through the MUSIC project, which focuses in particular on “front runners” in the city, as they have already set out to work with this radically different method. Change has already begun!

“PEOPLE GO WHERE PEOPLE ARE.”

Jan Gehl, *Public Spaces - Public Life*, 2007

### Densification + Greenification = Sustainable City

Densification is clearly a step-by-step process. In fact, Rotterdam has already shown that steps in the right direction can be very inspiring and

can greatly contribute to creating a successful city; *Laurenskwartier* district is an example of this. But the inner city of Rotterdam has the potential to house 60,000 inhabitants. If we suppose that this potential will actually be reached by 2040, will we really have a much more sustainable city, as Florida (2010) and Glaeser (2011), for example, have promised us? We need not only socio-economically successful cities, but physically sustainable ones too. A frequently heard adage in this respect is: where sustainability is involved, large cities are the problem but also the solution.

In terms of numbers, Rotterdam needs to add around 20,000 extra houses in 30 years to its inner city. Such inner-city densification implies that building in the landscape at some moment comes to an end, that public transport is more cost-effective, and, from what we notice in other cities, that there will be more cyclists and pedestrians and less cars. And there will be less demolition and more transformation of existing real estate, which implies more efficient use of basic materials. But what exactly is the advantage of doubling the number of inhabitants of the inner city? Does densification + greenification = sustainable city? The conclusions of the research carried out by TNO confirm many issues of this hypothesis, although no one had expected that the results would be so unequivocally positive, in socio-economic terms, as well as those of physical and cultural living space. The research results also

made clear that densification and increase of urban green need to go hand in hand with good parking solutions and an ambitious mobility strategy. The inner city has evolved into a pilot project for finding out which measures will succeed in turning the entire city of Rotterdam into a sustainable, vital one. It is also heralds the potential of Rotterdam to become a model city: an attractive, economically successful “Green Capital”.

### Never waste a good crisis

Rotterdam has said goodbye to its long-cherished, post-war reconstruction mentality. Today, the municipality no longer plays a dictating role, but rather a facilitating one. Through this radical change the municipality now provides opportunities for a multitude of initiatives by inhabitants and business. Merely facilitating, and still making a city together: how do you achieve that? Defining frameworks is relatively simple compared to the competence required for their application. In this respect, the former Belgian Prime Minister Guy Verhofstadt had the following to say: “Regulation is an extremely complicated exercise of equilibrium. Too much will put a check on things. Too little may lead to derailment. Moreover, regulation can be interpreted wrongly or inadequately supervised, and thus miss its goal.” His conclusion is that cooperation requires socially-intelligent civil servants.

Change has not been restricted to the role of the municipality, however. The roles of the citizen and market parties have changed as well. Society and the institution of the municipality are both in a transitional state. Fortunately, a start has already been made and there are some successful practices. During conversations with front runners in the city it seemed that some of these practices are becoming mainstream. People prefer to orchestrate their own lives. 500 DIY houses have already been renovated. In *Hoboken* buyer panels have been introduced, empty offices are waiting to be transformed and many initiatives for a greener city have been welcomed. There are also initiatives to repair the urban fabric with small-scale projects, which in their turn can inspire a street or a neighbourhood. And what about the renovation of the cultural institute WORM with recycled materials, only because it is more interesting and more sustainable. It seems to be a movement that cannot be stopped. With this research, the municipality is keen to stress that it supports this development and is even trying to accelerate it. It is, therefore, an invitation to (future) inhabitants and entrepreneurs to come again and again with initiatives – with the conviction that these inhabitants and entrepreneurs will always find innovative ways of making the city sustainable. And more inhabitants in the inner city also make it more attractive, because it is people that make the inner city!

# SEVEN DENSIFICATION STRATEGIES

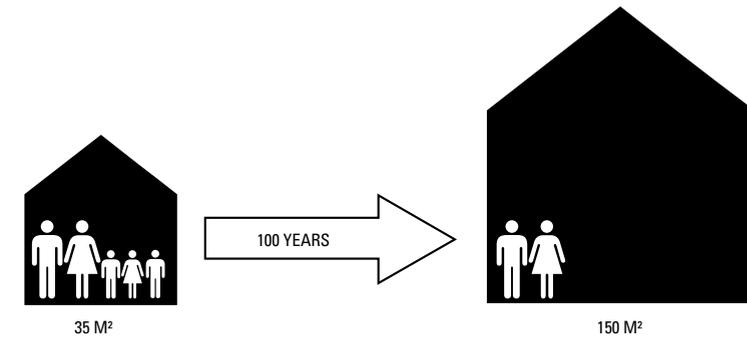
CHAPTER 1

*It's not about adding as many dwellings to the inner city as possible. The challenge is to increase the number of attractive houses in such a manner that the overall quality, liveability and microclimate of the inner city improves. Smart densification goes hand in hand with the upgrading and expansion of urban green. The social advantages of proximity to others and urban facilities are coupled with economic and environmental benefits, increasing the overall quality of life for new and existing inner-city dwellers.* (Doepe1 Strijkers, 2012)

## Smart density

Proximity to others and urban amenities are the most cited reasons for choosing to live in a dense urban environment. Diversity in terms of neighbourhoods, types of buildings and public space also makes the city attractive to the multitude of subcultures that inhabit it. Adding dwellings in the right place can improve the existing mix of functions and strengthen or repair the existing identity of a city block or neighbourhood. But adding building mass to a city normally occurs at the expense of open (green) space. If improving the overall

CHANGE IN HOME SIZE IN THE LAST CENTURY IN THE NETHERLANDS  
(SOURCE: Rudy Uytengaak, Steden vol Ruimte, 2008)



quality of the inner city is the goal, then smart densification must go hand in hand with the qualitative upgrading and quantitative expansion of urban green.

If we consider the notion of doubling the number of inner-city dwellers in Rotterdam, the question that arises is a two-fold one: is there enough physical space for 20,000 new dwellings without destroying the existing qualities of the urban fabric; and how can the municipality help create the “mental space” needed to help potential home owners identify these chances and capitalise on them?

## Physical space

“THE AVERAGE FAMILY MAY BE SMALLER THAN IT WAS 10 YEARS AGO, BUT THE AVERAGE SINGLE-FAMILY HOUSE IS LARGER AND MORE LUXURIOUS. IT HAS MORE BATHROOMS, HIGHER CEILINGS, MORE ELABORATE MASTER BEDROOMS, BIGGER KITCHENS AND MORE OUTDOOR SPACE”.

The Washington Post, 11 August 2007

This trend is not limited to our American counterparts. In the Netherlands the floor space of the average home has doubled in size in the last 20 years and currently averages 70 m<sup>2</sup> per inhabitant.

One can argue that this is not sustainable from a spatial and environmental perspective, but the reality is that consumers want larger homes and are willing to pay for them. A 150 m<sup>2</sup> dwelling for two is, simply put, what the market demands. Private and collective outdoor space, direct access to and visual and acoustic contact with the street, and individual control over levels of privacy ranging from public to private are the spatial challenges architects need to address with tailor-made solutions. The advantage of building larger homes is, of course, that young professionals are not forced to exit the city if they have children, as their home accommodates their changing lifestyle. But living in the city with children does not only depend on a home that meets one’s spatial requirements. Proximity to childcare facilities, schools and safe playgrounds are a prerequisite for young families to choose to live in the inner city.

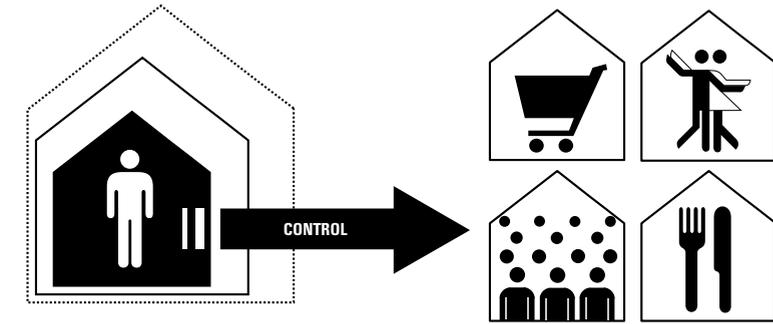
Densification in an existing urban fabric is a matter of precision. Besides creating the right mix of dwellings and amenities to strengthen the identity and quality of an existing living environment, the overall comfort in both buildings and the public realm can be improved by smart and bioclimatic design. To begin with, daylight, solar rights and views from existing dwellings must be preserved. Small, precise interventions can capitalise on existing residual space without degrading the quality for existing inhabitants.



“ECONOMIC PRODUCTIVITY INCREASES SYSTEMATICALLY ON A PER CAPITA BASIS BY 15% WITH EVERY DOUBLING OF A CITY’S POPULATION, REGARDLESS OF A CITY’S INITIAL SIZE.” Bettencourt, 2010

BEURSTRAVERSE, Lijnbaankwarter / Laurenskwartier, PHOTO Sander Lap

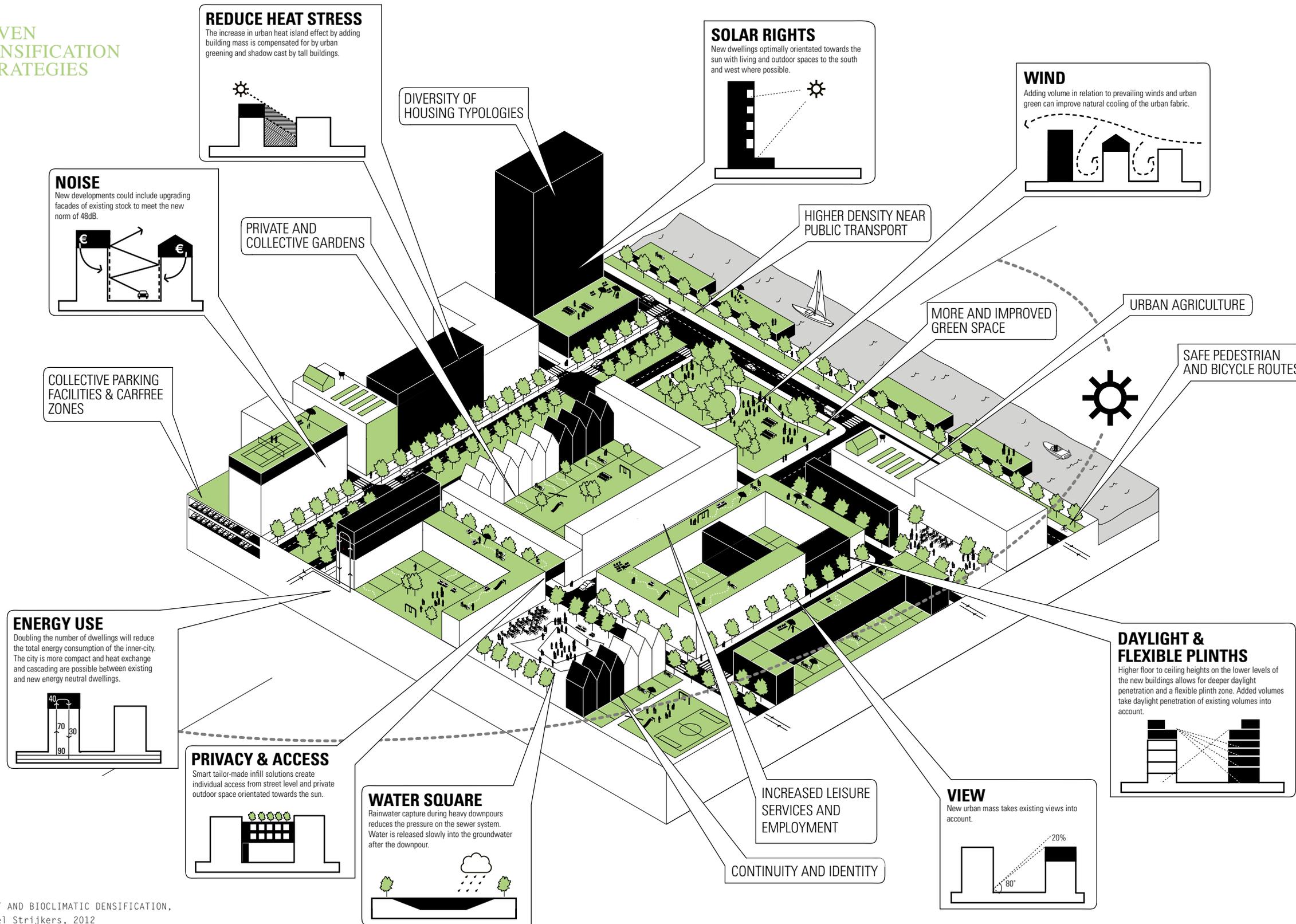
THE ‘PARADOX OF PROXIMITY’. INDIVIDUAL CONTROL OVER LEVELS OF PRIVACY  
(Based on text by Rudy Uytengaak, Steden Vol Ruimte, 2008)



Adding building mass in the right place can even have a positive effect on the microclimate of a city block or street. Normally, more mass means more thermal gains, which can increase urban heat stress. Light and reflective facades can, however, counter this effect, and the smart placement of building mass can create welcome shade, lowering cooling demands.

An additional advantage of adding houses and the related functions to the city is that, from an energy perspective, each function has its own pattern of energy consumption. By adding functions in the right place, heat and cold can be exchanged between buildings (Tillie 2009), resulting in immense reductions in energy use for the existing building stock. This smart form of energy exchange requires new coalitions and organisational innovations, but it has the potential to help the city radically reduce its eco-footprint (Dobbelsteen 2011). In addition to this, the smart positioning of building volume in relation to prevailing winds, urban green and water bodies can be a valuable instrument in cooling the inner city, making it more comfortable in what appears to be increasingly hot summers and heat waves.

# SEVEN DENSIFICATION STRATEGIES



## SEVEN DENSIFICATION STRATEGIES

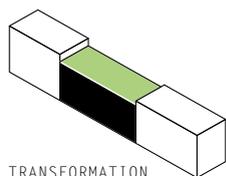
### Mental space

In Rotterdam, the process of inner-city densification has been going on for decades. Take the large-scale development of the *Kop van Zuid* district, for example. Initiated in the eighties, this top-down process has ultimately resulted in an attractive living environment with a high number of cultural amenities. But in the current economic climate, this kind of master planning alone, however successful in its day, no longer suffices. Inner-city densification in

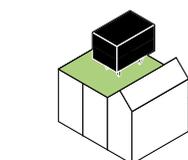
the coming decades will be more dependent on small-scale, bottom-up initiatives. Visionary private individuals and cooperatives are already creating exemplary dwellings that meet their specific desires. This “mental space” can be fed by exploring the physical potential of the city for further densification, combined with inspiring examples of what has already been realised.

For presentation at the Rotterdam Biennale, seven densification strategies have been identified

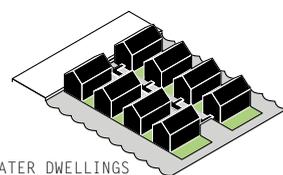
## DENSIFICATION + GREENIFICATION = SUSTAINABLE CITY



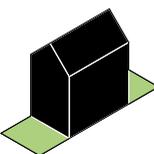
TRANSFORMATION



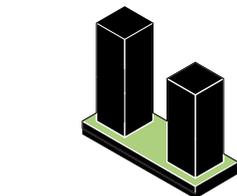
SKYBORN



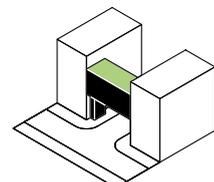
WATER DWELLINGS



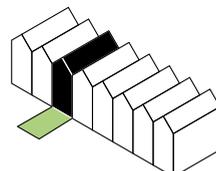
GROUND-BASED DWELLINGS



HIGH-RISE DWELLINGS



INFILL



DO-IT-YOURSELF

and explored in terms of their spatial potentials. There is no ambition with this exploration to generate a master plan for densification of the inner city. Rather, we intend that the exploration will demonstrate that there is more available space in the inner city than one may think, and that, in potential, doubling the number of inner

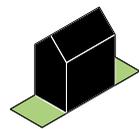
city inhabitants is spatially realistic without diminishing the existing quality of living. On the contrary, when combined with an increase in the quantity and quality of urban green and an intelligent mobility strategy, the overall quality of life in the inner city could dramatically improve for all.

OVERVIEW OF INNER-CITY NEIGHBOURHOODS

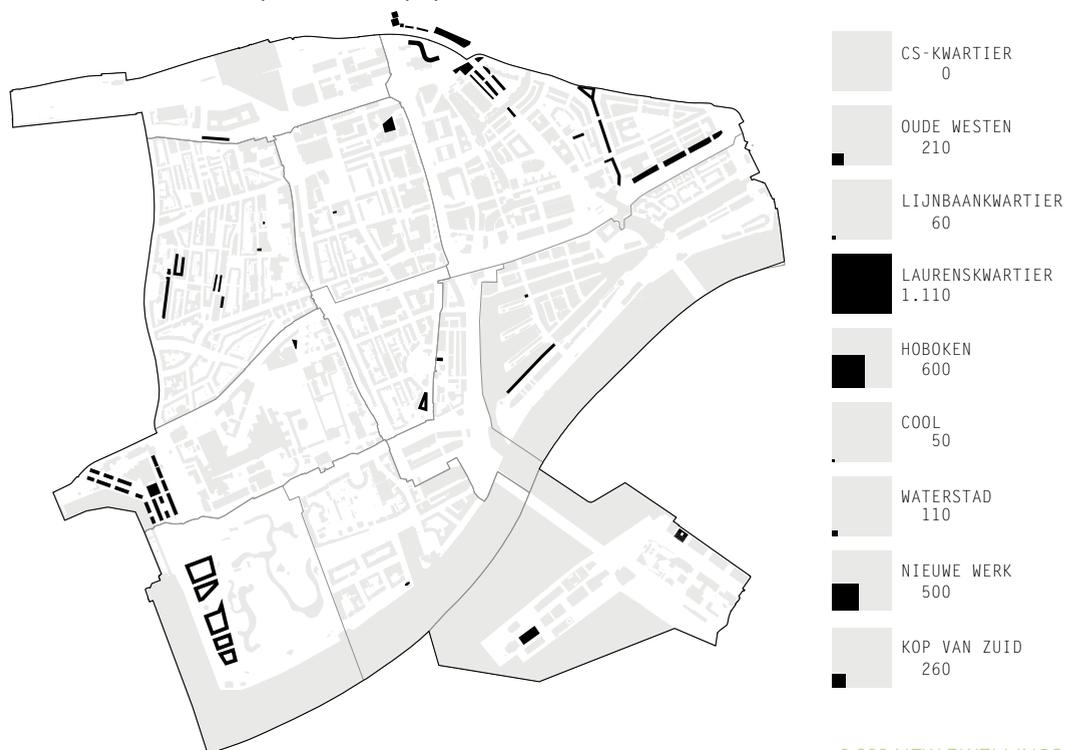


# 01 DENSIFICATION STRATEGY

## GROUND-BASED DWELLINGS



POTENTIAL MAP, 2040 (Partly based on study by West 8, 2005)



2,900 NEW DWELLINGS

Access at ground level makes a street featuring ground-based housing particularly attractive, not only because it contributes to distinguishing the individual dwelling, but also as it increases the liveability of a neighbourhood. Undeveloped plots of land and large public outdoor spaces lend themselves to this form of densification.

Traditional typologies such as terraced houses, patio-houses, and urban villas form the “repertoire” of this strategy. In the inner city there is potential for this approach in the districts of *Laurenskwartier*, *Hoboken*, *Nieuwe Werk* and *Kop van Zuid*. A garden and access at street level is

what makes this densification strategy particularly attractive for families.

The ground-based dwellings on the quay next to the building blocks *De Landtong*, located on the *Kop van Zuid*, are a fine example.



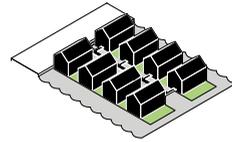
DE LANDTONG, Kop van Zuid, Frits van Dongen, PHOTO Rotterdam Municipality

HAVENKWARTIER Katendrecht, diverse architects, PHOTO Doepel Strijkers



# 02 DENSIFICATION STRATEGY

## WATER DWELLINGS



POTENTIAL MAP, 2040



440 NEW DWELLINGS

There are two sites that form natural, potential locations for water-based housing: the *Rijnhaven* port and the expanse of water between *Oude Haven* and *Boompjes*. Living on a grand landscape structure allows for a new perception of the river and its old harbours.

tides and waterways. Situated away from the hustle and bustle of traffic, these housing areas benefit from the proximity of top-quality urban amenities. Water dwellings are accessed at surface level, just above the waterline, and a floating infrastructure connects the dwellings to the city.

Unhindered by cadastral plots of land and existing building lines, a multitude of different dwelling types are possible: quay blocks at the interface of city and water, jetty-, pole- and floating dwellings make optimal use of this dynamic environment.

The locations of such housing areas comply with the criteria for external safety zones, water depth,



FLOATING PAVILION, Kop van Zuid, Public Domain Architects, PHOTO Rotterdam Municipality

PAALWONINGEN, Nesselande, Attica Architects PHOTO Attica Architects





“THAT ROTTERDAM’S INHABITANTS THEMSELVES MAKE THE CITY DOES NOT MEAN, HOWEVER, THAT ANYTHING GOES AND THAT EVERYTHING HAS TO BE BETTER THAN BEST.”

Hajo Doorn (Worm), photo Rotterdam Municipality



“PROVIDE MORE GREEN SPACES IN ROTTERDAM. THEY CREATE SUSTAINABLE COMMUNITIES, FOR EXAMPLE, BY PROVIDING GREEN PUBLIC SPACE, WHERE ROTTERDAM’S INHABITANTS CAN MEET.”

Piet de Jonge (Initiator, Gardens on the Meuse), photo Rotterdam Municipality

# 03 DENSIFICATION STRATEGY

## HIGH-RISE DWELLINGS



POTENTIAL MAP, 2040



11,050 NEW DWELLINGS

City densification by means of high-rise building is consistent with the famous Rotterdam skyline. The potential for high-rise dwellings can be realized where regulations and ground conditions allow for it. As they are naturally situated in the most urban areas (high-rise zones), the inhabitants of such dwellings benefit from the proximity of amenities.

An open view across the city constitutes the living horizon; high-rise dwellings benefit from the visual quality of the inner city. Situated on the backbone of the inner city, the centre's north – south axis, the high-rise zone presents unhindered views across the city in an east – west direction.

In Rotterdam, "Highrise" is used to refer to buildings with a height of 70 m or more, although under the national Building Code any dwelling that requires a lift can be defined as a high-rise building. This concerns not only tower buildings, but also buildings with five or more floors. In Rotterdam this is called medium high rise.

Attractive collective space, amenities and significant outdoor space per dwelling compensate for the fact that there is no ground-based garden or front door. Rather than being just vertically stacked dwellings, qualitative high-rise housing can be characterised as vertically stacked living environments.



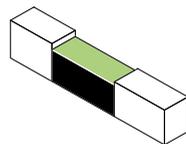
HOFDAME, Laurenskwartier, Klunder Architecten, PHOTO Bas Czerwinski

RED APPLE, Waterstad, KCAP Architects&Planners, PHOTO Rob 't Hart



# 04 DENSIFICATION STRATEGY

## TRANSFORMATION



POTENTIAL MAP, 2012 (Partly based on study by Zandbelt & van der Berg, 2011)



3,690 NEW DWELLINGS

Current vacancies in the inner-city's offices were mapped by Bureau Zandbelt & van der Berg. There is an ocean of short- and long-term vacancies spread out across the city, with a concentration in the post-war reconstruction era office areas. As housing is less sensitive to economic conditions, a mix of dwellings with offices could provide a more stable backbone for an attractive inner city.

Situated, from an economic point of view, in the most attractive locations in town, and equipped with spacious parking facilities, these buildings provide optimal opportunities for high-quality living. The scale and construction typologies of office buildings are suitable for creating attractive

houses with voids and large, flexible houses with built-in collective space. These can be accessed by the existing spacious staircases and connect immediately with their lively urban surroundings. Abundant parking facilities and roof space allow for green terraces and courtyard gardens.

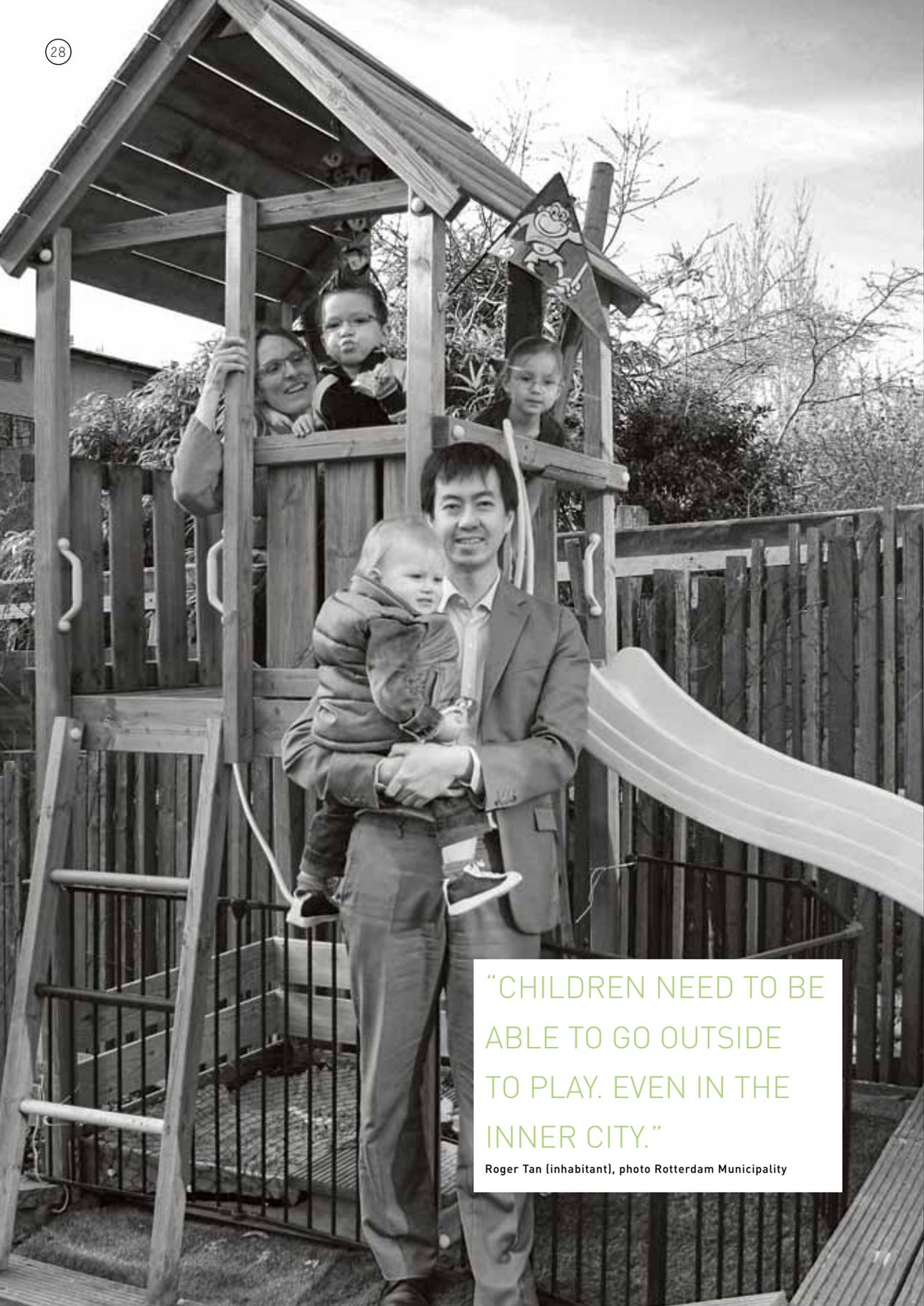
A striking Rotterdam example of such transformation is "Parksite", the converted ambulance garage designed by Doepel Strijkers in collaboration with Lex Architects. Located just two minutes from Rotterdam Central Station, this luxurious urban dwelling with a private park offers the family who inhabit it suburban spaciousness in the heart of the city.



VOPAK, Nieuwe Werk, Ector Hoogstad Architects, PHOTO Rotterdam Municipality

PARKSITE, Provenierswijk, Doepel Strijkers i.c.w. Lex Architects, PHOTO Maarten Laupman



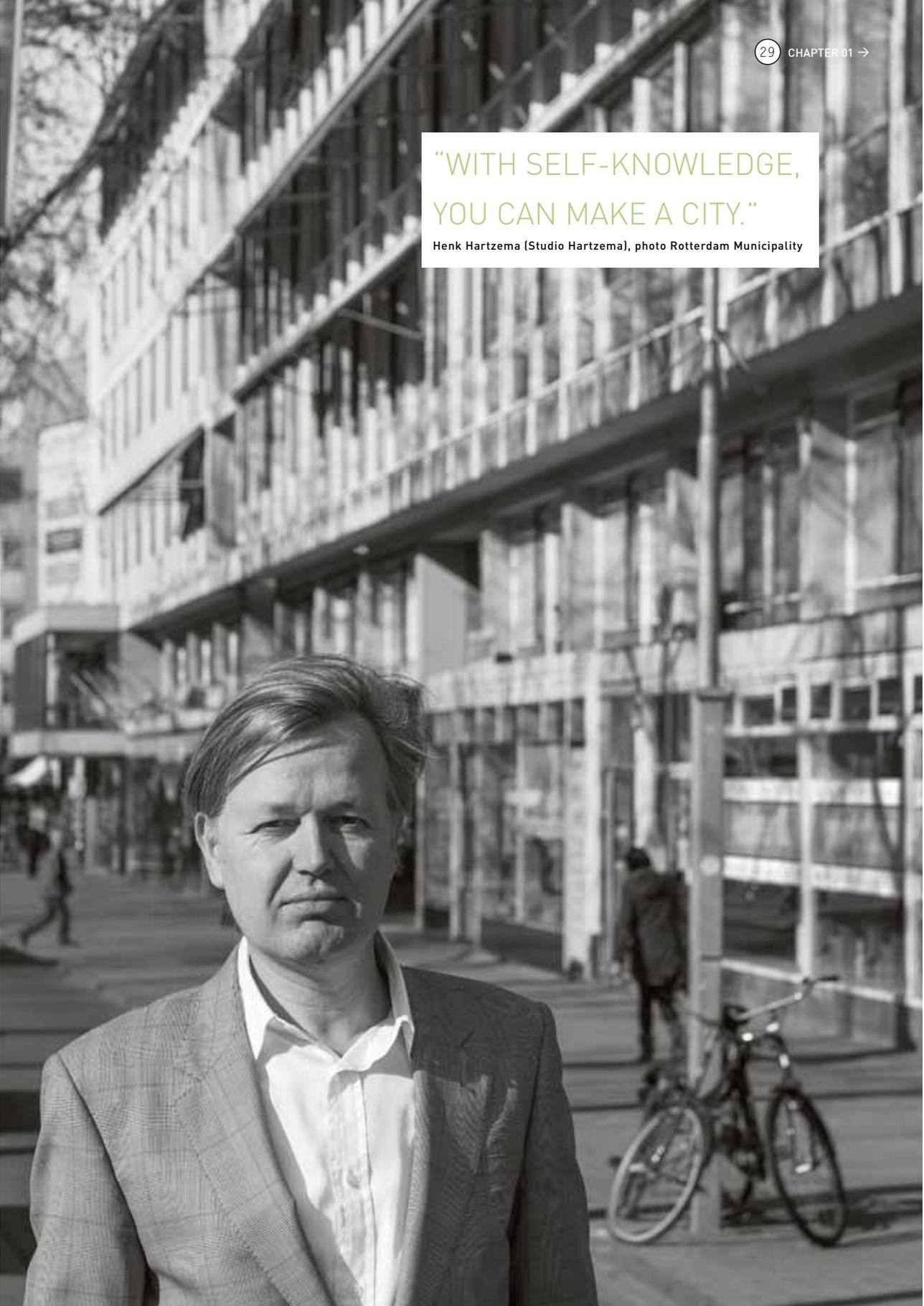


“CHILDREN NEED TO BE ABLE TO GO OUTSIDE TO PLAY. EVEN IN THE INNER CITY.”

Roger Tan (inhabitant), photo Rotterdam Municipality

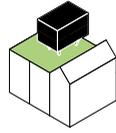
“WITH SELF-KNOWLEDGE, YOU CAN MAKE A CITY.”

Henk Hartzema (Studio Hartzema), photo Rotterdam Municipality



# 05 DENSIFICATION STRATEGY

## SKYBORN



POTENTIAL MAP, 2040



1,520 NEW DWELLINGS

Existing buildings with a solid construction are suitable for densification by “topping-up”. This is mostly done with houses built after 1950, with their concrete or steel structure and flat roofs. For the greater part, buildings suitable for this form of densification are owned by corporations and developers, which often makes their development by the market easier than with privately-owned property.

A skyborn densification strategy optimally exploits the proximity of urban amenities and green infrastructure. Because new dwellings need to adapt to existing substructures, this strategy encompasses a large diversity of building

typologies: from roof villages with a communal character, to individual penthouses, to building-block-on-block constructions. Collective green outdoor space can be created at roof level, with additional private outdoor areas in the form of large balconies or patios.

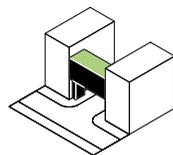
Archipel Architects are renowned for their skyborn dwellings in the Hague and their proposed construction in the *Wijnhaven* area. A realised example in Rotterdam, Didden Village, designed by MVRDV, constitutes a striking example of a small-scale residential addition to the city. This skyborn addition combines spacious outside space with the close-by proximity of urbanity.



DIDDEN VILLAGE, Middelland, MVRDV, PHOTOS Rob 't Hart



# 06 DENSIFICATION STRATEGY



## INFILL

POTENTIAL MAP, 2040 (Partially based on study by Studio Hartzema, 2011)



540 NEW DWELLINGS

The urban fabric of terraced houses, corner houses and flats can be completed by dwellings that fit in with surgical precision – infill housing. Gaps above narrow delivery streets, undeveloped plots of land and large courtyards can be filled in with dwellings that cross the street like a bridge, hover above a parking lot or complete a block of buildings. Especially around the Fire Boundary, where the fault line between old and new city is most apparent, infill is a valuable strategy. In so doing, the identity of the urban fabric can be strengthened, increasing the diversity and attractiveness of a neighbourhood. With their proximity to urban amenities such as shops, parks

and public facilities, infill dwellings fully exploit the advantages of urban living.

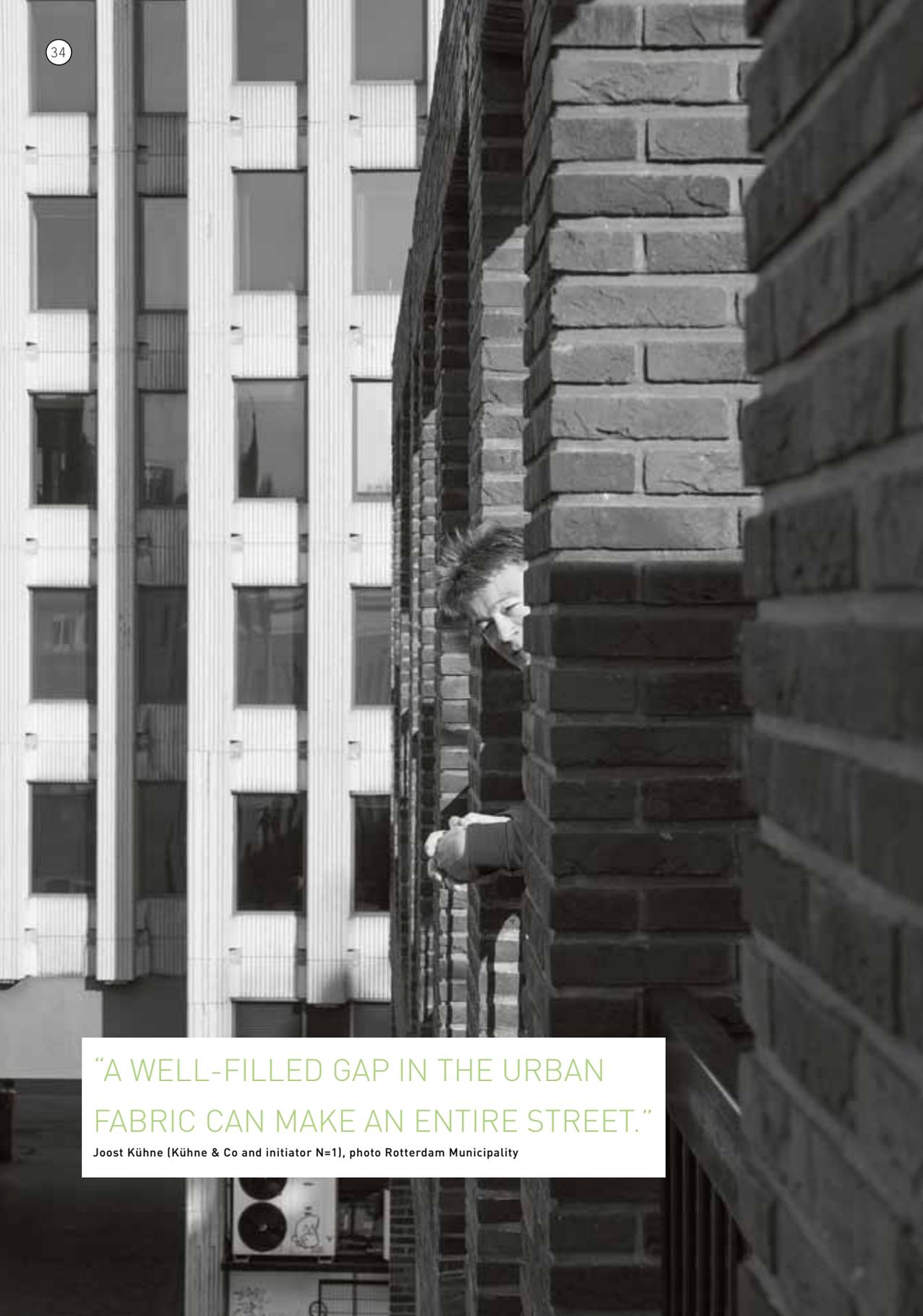
An infill densification strategy is implemented on a small scale, block by block. Solving access, daylight and privacy issues demands tailor-made solutions, often resulting in extraordinary one-off architectural gems. The house over the *Mauritsstraat* in Rotterdam by architects Kühne & Co is an example of how the unidentified potentials of the inner city can be optimally exploited.

BOOMGAARDSSTRAAT, Cool, Kühne & Co., PHOTO Edwin Prins



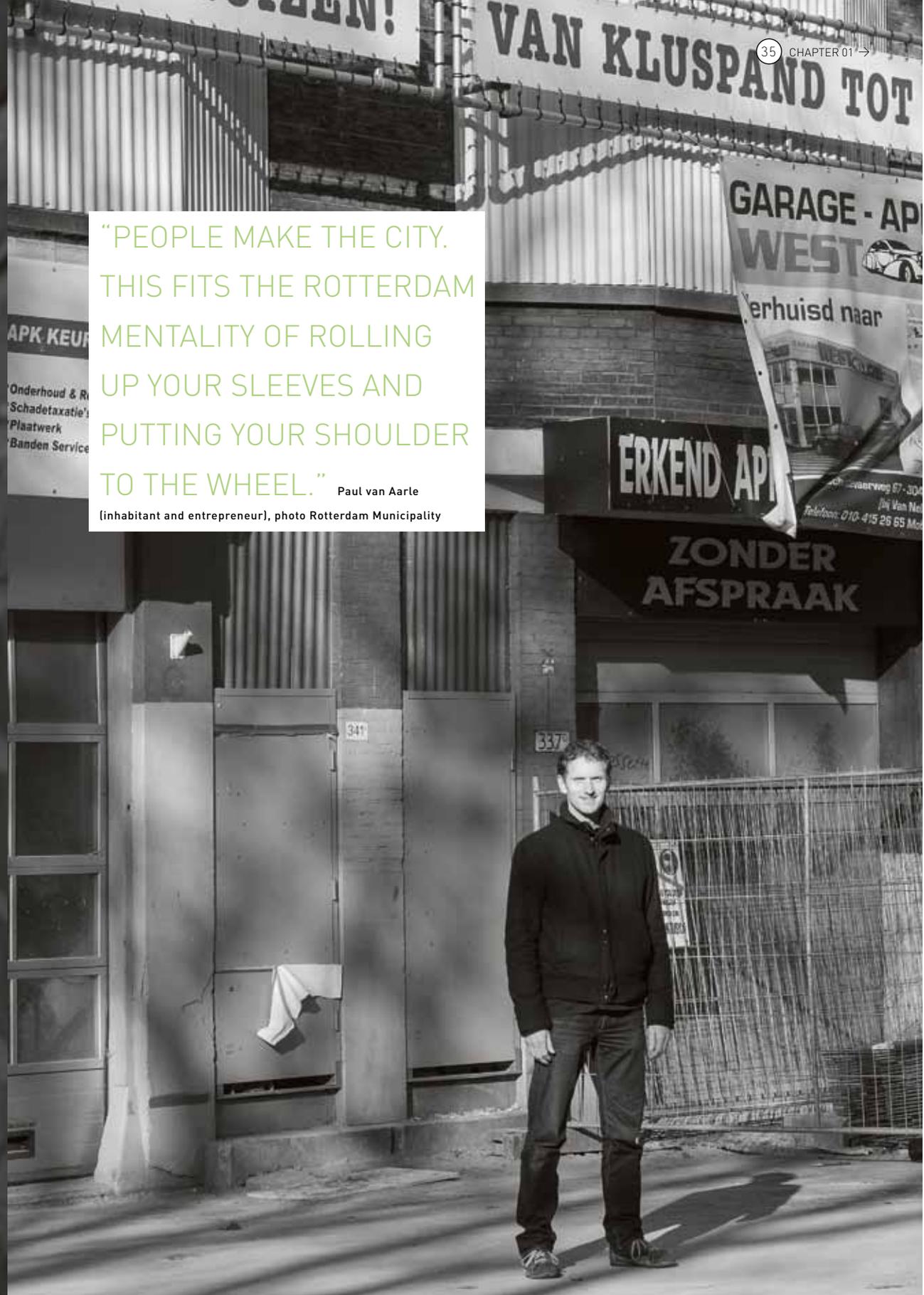
MAURITSSTRAAT, Cool, Kühne & Co., PHOTO Edwin Prins





“A WELL-FILLED GAP IN THE URBAN FABRIC CAN MAKE AN ENTIRE STREET.”

Joost Kühne (Kühne & Co and initiator N=1), photo Rotterdam Municipality

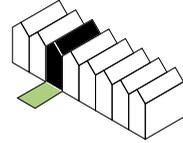


“PEOPLE MAKE THE CITY. THIS FITS THE ROTTERDAM MENTALITY OF ROLLING UP YOUR SLEEVES AND PUTTING YOUR SHOULDER TO THE WHEEL.” Paul van Aarle

(inhabitant and entrepreneur), photo Rotterdam Municipality

# 07 DENSIFICATION STRATEGY

## DO-IT-YOURSELF



POTENTIAL MAP, 2012



- CS-KWARTIER 0
- OUDE WESTEN 110
- LIJNBAANKWARTIER 0
- LAURENSKWARTIER 0
- HOBOKEN 0
- COOL 0
- WATERSTAD 0
- NIEUWE WERK 0
- KOP VAN ZUID 0

110 NEW DWELLINGS

With their characteristic facades, nineteenth century housing stock appeals to a large group of home buyers. Often in a poor state of repair, and way too small to meet current spatial demands, houses of this type can be adapted to suit the lifestyles of young professionals and families.

In this case, it is not about densification in terms of square metres, but rather about the adaptation of building blocks to house more inhabitants. Housing associations or developers ensure that the shell of the construction is stable and watertight, while the new home owners are responsible for an interior structure that suits their individual lifestyle. Because these dwellings were originally ground-

based homes, they are always in the vicinity of facilities such as schools and playgrounds, which makes them extremely suitable for young families.

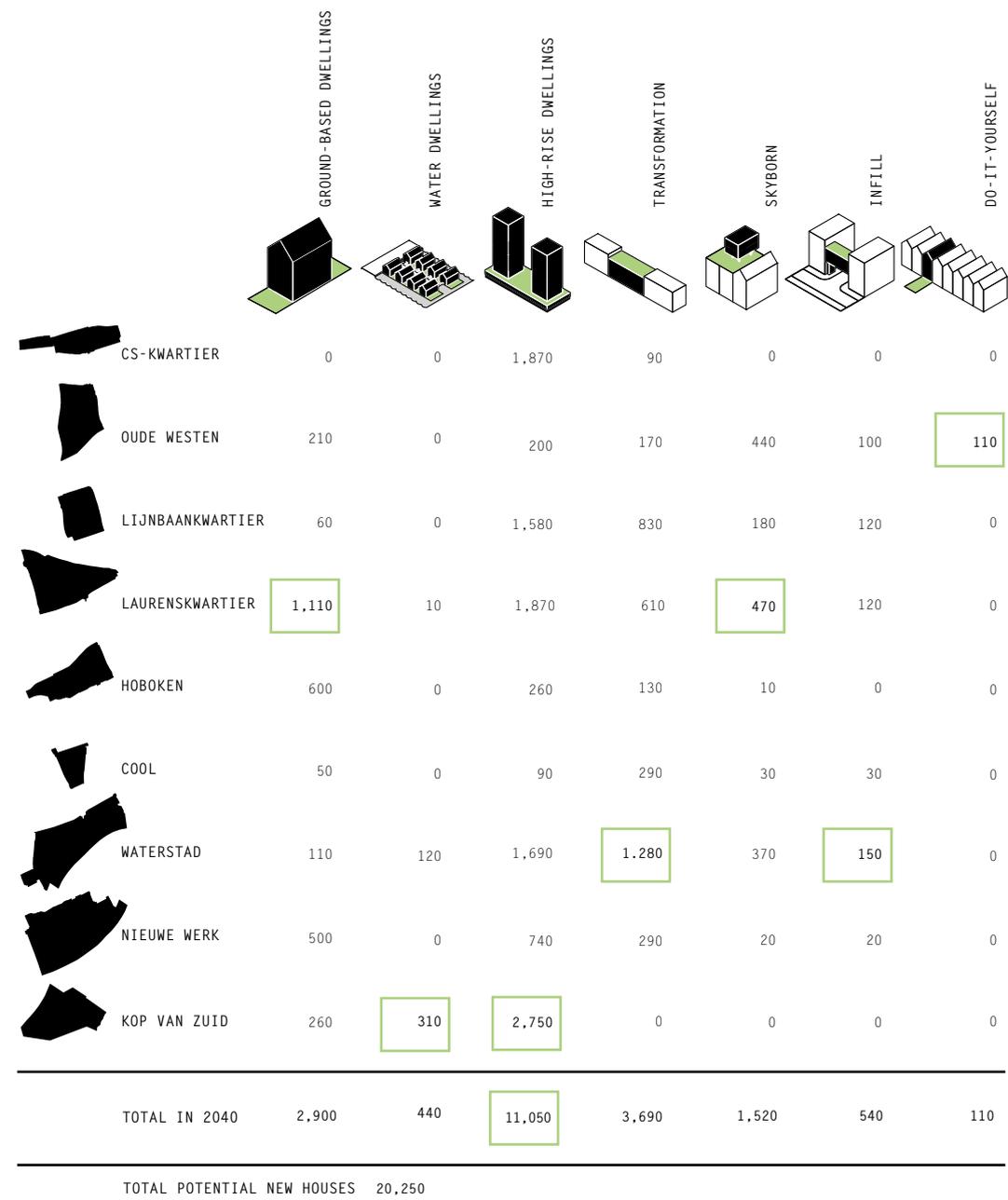
In the *Wallis block*, situated in the district of *Spangen*, the courtyard was developed into a collective garden, complete with a more private zone around the edges for the individual houses. Designed by Hulshof architects the inner facade reflects the collective quality that characterises this development.



WALLISBLOCK, Spangen, Hulshof architects, PHOTOS Jeroen Musch



TOTAL POTENTIAL, 2040



OVERVIEW OF POTENTIAL NEW DWELLINGS PER NEIGHBOURHOOD, 2040



# SEVEN GREEN STRATEGIES

## CHAPTER 2

*Vivid and attractive: these are keywords for pleasant living, working and recreating in the inner city. Rotterdam wants to draw more inhabitants and visitors to its city centre. This will only work if the city offers a pleasant living environment that grows as the city does, and the public realm has an important role to play in this. Research has shown that an attractive public realm, one in which green amenities are the essence, is an important prerequisite for city life, in terms of day-to-day living and for the work and leisure environment. The more attractive this public realm is, the more people will want to spend time there. Rotterdam is ready to meet the challenge. In the next few years, 5,000 new trees are to be planted in the inner city, along with greenery covering an area totalling 150 football pitches.*

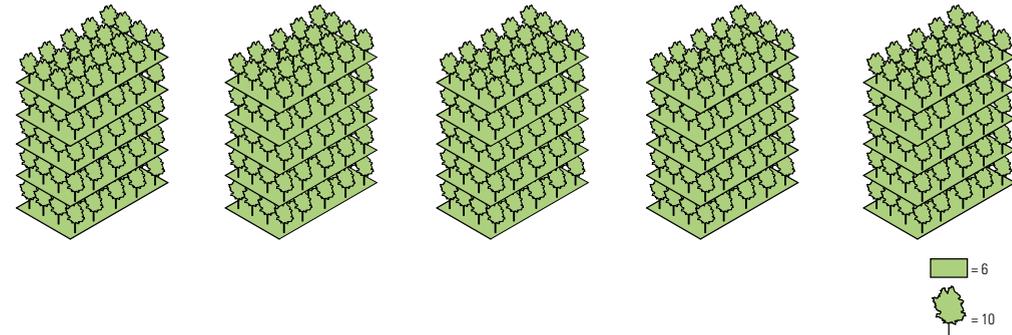
### The green challenge

Analyses presented in the report *Groenonderzoek 2008* (Green Research 2008) confirmed that more green space in the inner city is desired, as well as greater diversity in that green space and a better quality of green design and management. This implies that the construction of new dwellings should be accompanied by the provision of extra urban green, to compensate for previously unmet demand. In any case, to welcome the inhabitants that come with these new dwellings, more and better quality urban green is needed. An attractive green infrastructure in the inner city is conditional to the popularity of living in the inner city. The current green infrastructure needs to be expanded and complemented with new qualities. The approach to be taken is described through seven

green strategies, which are expected to create and exploit opportunities. And, as a consequence, the inner city of Rotterdam is ready to grow in both green quantity and green quality.

The municipality aims to establish 20,000 extra dwellings in the inner city by 2040. Thus, the number of inhabitants will double from 30,000 to 60,000 people. In order to maintain the same quantity of green per inhabitant, the area of public green will need to expand considerably. This is, however, not only about the number of square metres of green per inhabitant, but also about the pleasant perception of the green space available, for which an attractive distribution of the greenery, with more differentiation in outlook and use, and improved spatial design are necessary.

ADDITIONAL GREEN SPACES 2040, 150 football pitches greenery + 5,000 trees



Rotterdam has already started to catch up. Over the past 20 years, several important steps have been taken to improve the quality of the public space in the inner city. At the end of the last century a number of ambitious redevelopment projects were realised, such as the *Schouwburgplein*, *Museumpark*, *Skatepark*, *Westblaak*, *de Culturele As* and *Koninginnehoofd*. That location-driven approach was complemented this century by a centre-wide approach. In 2008 the *Vision for Public Space in the Inner City of Rotterdam* was published. It proposes the creation of a connected city in which urban locations are connected by attractive routes. The reinforcement of connections between locations is meant to ensure that in an increasingly urban environment the intensification of public space is restricted to a few specific locations.

In addition to that Vision, what is known as the Rotterdam Style has been developed for the urban design of outdoor space. Important principles in this style are the use of superior design elements (paving, street furniture, public green), establishment of more green elements and a good balance between the variety of possibilities for the use of outdoor space (dwellings, recreation, traffic) with the ultimate goal of producing outdoor space that is more attractive for all.

Such developments did not come to a halt in the planning and policy-making stages. Over the past

three years, their execution has been pursued energetically. Large investments have been made, and the Rotterdam Style was applied to locations on *Binnenwegplein*, *Lijnbaan*, *Westerkade* and *Leuvehoofd*; the results were positively received by both inhabitants and visitors to the inner city. The principles described above can be easily recognised from the selected materials and the application of more green space. The desired expansion of green elements was also achieved through the increase of the number of trees spread throughout the inner city. At various locations, tree populations were increased or improved, as can be seen on the edges of *Schouwburgplein* and the renovated *Kruiskade*. Significant improvements in quality were made too: the new trees are bigger than usual.

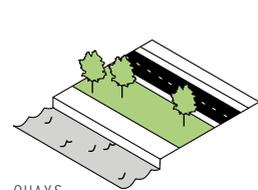
The green strategies presented below were developed to green the inner city in a sustainable way, and thus to improve the quality of urban space and living. Rotterdam continues to expand on its existing qualities and looks forward to further densification. By continuing to invest in high quality, green outdoor space the value of real estate, current and future, will grow, encouraging private investment in the inner city. The seven green strategies show that the area of green space can be considerably increased. It is important that private parties and developers can also contribute in this respect and not only the municipality. The inhabitants of Rotterdam make their city!

## SEVEN GREEN STRATEGIES

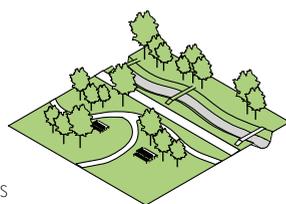
The municipality has stimulated this by, among other things, drawing up a Wish Guide, which catalogues ways in which private parties can contribute to the development of outdoor space, for example with the gift of a tree or a bench and maintenance for a period of 10 years.

The Municipality of Rotterdam is actively exploring other innovative forms of urban greening. One such initiative is urban agriculture, in which city inhabitants produce food for personal consumption or sale at local markets. In view of the limited space in the inner city, green

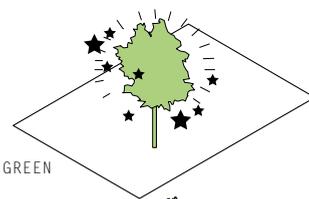
### DENSIFICATION + GREENIFICATION = SUSTAINABLE CITY



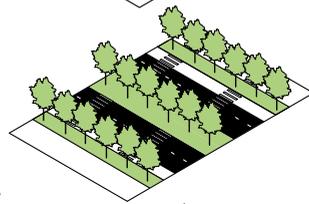
QUAYS



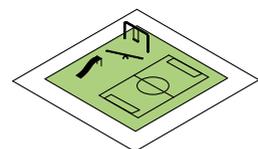
PARKS



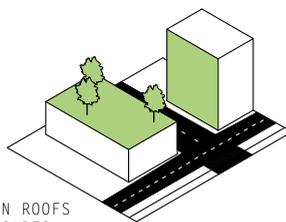
GLAMOROUS GREEN



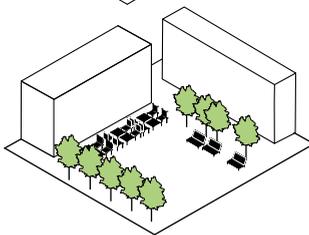
BOULEVARDS



PLAYGROUNDS



GREEN ROOFS & FACADES



SQUARES

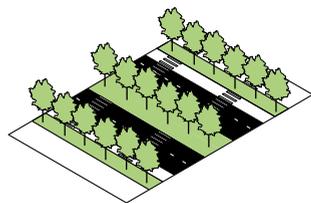
roofs and facades offer the best opportunities for urban agriculture.

With the implementation of the seven green strategies presented below, an attractive living environment for 60,000 inner-city inhabitants

starts to become a reality. More urban green and the upgrading of the inner city's outdoor space to the highest international standards cannot fail to boost the image of the entire city.

# 01 GREEN STRATEGY

## BOULEVARDS



POTENTIAL MAP, 2040



■	CS-KWARTIER	10.400
■	OUDE WESTEN	13.600
■	LIJNBAANKWARTIER	7.700
■	LAURENSKWARTIER	35.900
■	HOBOKEN	6.500
■	COOL	8.300
■	WATERSTAD	30.000
■	NIEUWE WERK	11.300
■	KOP VAN ZUID	6.700

590,300 M<sup>2</sup> GREEN OF WHICH 130,400 M<sup>2</sup> IS NEW

### The more beautiful the boulevards, the more beautiful the city

The streets *Mariniersweg*, *Parklaan* and *Coolsingel* display stylish green design. Monumental trees decorate important locations such as *Koningin Emmaplein* and *Droogleever Fortuynplein*. Richly planted boulevards, but especially city streets like *Kruiskade* and *Meent*, form a green network that connects squares, parks and green areas inside and outside the city centre.

The boulevard strategy aims at planting more greenery on these thoroughfares. Wherever necessary, gaps in the tree structure are filled and, where this is possible, extra lines of trees

added. The variety in tree species creates more diversity and reduces vulnerability for species specific diseases. Trees and grass on roadsides and alongside tram tracks make roads and streets much more attractive and improve the microclimate of the city. The greenery captures fine particles from the atmosphere, absorbs CO<sub>2</sub>, tempers heat in the summer and restricts hindrance caused by wind. Green streets and roads invite people to walk and cycle and make routes leading to green areas more attractive places. Cyclists and pedestrians benefit from more room on the streets. As a result of more public spaces being situated on boulevards, their recreational value will continue to increase.



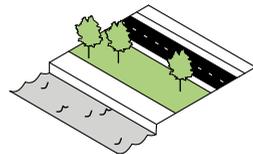
KAREL DOORMANSTRAAT, Lijnbaankwartier, PHOTO Rotterdam Municipality



“ROTTERDAM COULD BE A GREEN CITY. ITS BROAD STREETS OFFER AMPLE ROOM FOR LARGE TREES. EACH YEAR, PLANT LOTS MORE. BEAUTIFUL ROWS OF TREES PRODUCE MIRACLES.” Jan Gehl, Public Spaces – Public Life, 2007

# 02 GREEN STRATEGY

## QUAYS



POTENTIAL MAP, 2040



242,800 M<sup>2</sup> GREEN OF WHICH 210,600 M<sup>2</sup> IS NEW

### Rivers as an urban recreational landscape

The rivers Nieuwe Maas, Rotte and Schie are inextricably bound to the history of Rotterdam. These are home to the quays of the old harbour, which used to bustle and teem with industriousness. The location of the inner city along these rivers and the old inner harbours offer enormous potential for much sought-after living and working environments on the water, as well as recreational possibilities and transport across the water.

The quay strategy aims at transforming the river banks and stony quays into an attractively connected, green recreational landscape. This is

all about a new perception of the water: the river Meuse, the old river mouths, old harbours and the course of the river *Rotte*. Getting rid of car parking on the quays wherever possible and designing new green spaces will create a continuous walking and cycling route with connections in the direction of the inner harbours and the areas beyond them. Important steps for improving dwelling quality on the river quays have already been taken with the greening of the *Leuvehoofd* and *Westerkade* areas. The new bridge across the Rijn harbour contributes greatly to better connections between the quays, and in this manner Rotterdam will acquire a markedly green waterfront. The city is once again connected with the water.



VAN OMMERENHAVEN, Nieuwe Werk, PHOTO Rotterdam Municipality

WESTERKADE, Nieuwe Werk, Tour de France, PHOTO Ben Ter Mu1



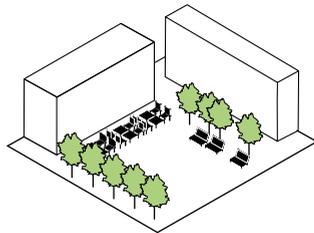


“EVERY CITY HAS A MOUNTAIN, A SEA,  
A WOOD OR A RIVER. SO GO FROM THERE.”

Anthony Williams (former mayor of Washington D.C.)

# 03 GREEN STRATEGY

## SQUARES



POTENTIAL MAP, 2040



■	CS-KWARTIER	34,900
■	OUDE WESTEN	0
■	LIJNBAANKWARTIER	21,300
■	LAURENSKWARTIER	42,700
■	HOBOKEN	6,000
■	COOL	4,600
■	WATERSTAD	0
■	NIEUWE WERK	0
■	KOP VAN ZUID	3,000

213,200 M<sup>2</sup> GREEN OF WHICH 112,500 M<sup>2</sup> IS NEW

### Squares are the living rooms of the city

With the renovation of the *Stationsplein/ Kruisplein* square, opposite the Central Station, to be completed in 2014, Rotterdam will bid a warm welcome to the large stream of inhabitants and visitors who enter the city here. This square and four others (*Schouwburgplein, Stadhuisplein, Binnenrotte* and *Plein 1940*) are the focal points of the city. Besides these squares, there are a number of smaller squares in the inner city. These squares have the potential to become strong identifying features of the city because they are linked to a specific function, such as a café, a restaurant, a hotel, a church or a museum. This strategy aims

to provide each square with its own character and various uses: a palette of squares. Squares function best when they are surrounded by buildings with mixed programmes on the plinths and amenities in the form of terraces or attractively decorated public places. Trees and attractive greenery in the form of flowering and scent-laden bushes and plants can play an important role in providing a square with a pleasant ambiance, as well as contributing to its identity and character. Sculptures and playing facilities also play an important role in this. Flexible use of space can also provide opportunities for inhabitants to hold a barbecue, a children's party or some other event.



BINNENROTTE, Laurenskwartier, PHOTO Enith Stenhuys

SCHOUWBURGPLEIN, Lijnbaankwartier, PHOTO Sander Lap



“INTRODUCE DIFFERENT KINDS OF PUBLIC SPACE TO ACCOMMODATE A VARIETY OF ACTIVITIES, SOME FIXED IN THEIR USE AND OTHERS MORE FLEXIBLE.”

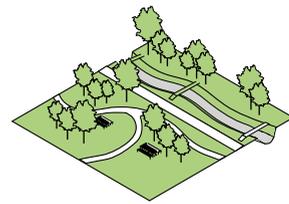
Jan Gehl, *Public Spaces – Public Life*, 2007

BINNENWEGPLEIN, Lijnbaankwartier, PHOTO Rotterdam Municipality

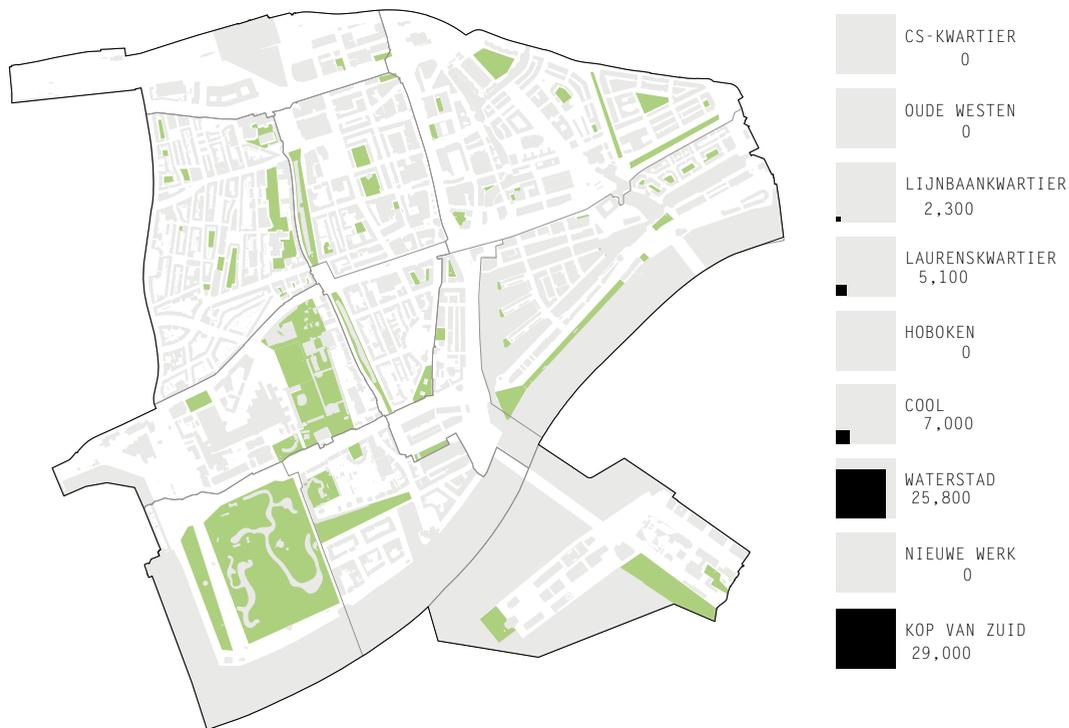


# 04 GREEN STRATEGY

## PARKS



POTENTIAL MAP, 2040

624,100 M<sup>2</sup> GREEN OF WHICH 69,200 M<sup>2</sup> IS NEW

### A park for everyone within walking distance

On a sunny summer's day, the city's parks come to life with pleasure seekers: thousands of people come to the parks to sun-bathe or in search of cool shade under the trees, to read a book, to walk the dog and to play. In the next few years, new parks will be created in the inner city, for example a new mid-sized park along the *Rijnhaven* on the *Kop van Zuid*. Some parts of the centre that are not green enough now, such as the *Laurenskwartier* district, will get an extra number of small parks. The inner city, crammed with buildings, has no more room for a large metropolitan park, but many small parks can also greenify an inner

city. The park strategy aims at creating parks in such a way that a park, however small, is within walking distance of every home. The parks will be well appointed and differ from each other in form and use. Existing qualities in parks should be maintained and reinforced as much as possible. The romantic style that, for instance, is so typical for Het Park should be preserved. The west side of the city has a contiguous network of good parks, which can contribute crucially to the perception of green in the entire inner city, provided they are well connected.



HET PARK, Nieuwe Werk, PHOTO Sander Lap

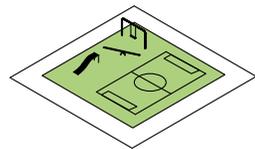
JOOST BANKERTHOF, Lijnbaankwartier, PHOTO Bas Czerwinski





WESTERSINGEL, Hoboken / Cool, PHOTO Rotterdam Municipality

# 05 GREEN STRATEGY PLAYGROUNDS



POTENTIAL MAP, 2040



56,600 M<sup>2</sup> OF WHICH 24,570 M<sup>2</sup> IS NEW

## Children are the future of the city

How did you grow up? And what are your best memories? Horsing around with friends outside on the square, climbing trees, and picking flowers and berries can also be done in an inner city. A child-friendly outdoor space is essential for attractive and complete living surroundings in an inner city. Child-friendliness entails more than just creating a few playgrounds: it encompasses the entire design of the public realm. Broad sidewalks, slow-traffic routes and speed-bump zones play an important role. Broad sidewalks provide informal space for games. Threshold zones create transitional areas between private domain and public space, where children can play in a safe, protected environment.

Specific facilities for all sorts of target groups are also needed. Thus, for adolescents to unwind, there is the internationally appreciated skate park on *Blaak*. The youngest children can play on the playing square *'t Landje* and there are the public sport grounds on *Henegouwerplein* square, on the edge of the city centre.

Using the playground strategy, the Municipality of Rotterdam intends to create living oases for children: squares that encourage children to play and sufficient places to sit. The combination of variety in living environments, meeting places and amenities belonging to the inner city will turn the centre into a regular el dorado for children growing up.



KONINGINNEHOOFD, Kop van Zuid  
PHOTO Rotterdam Municipality

HET LANDJE, Cool, PHOTO Sander Lap



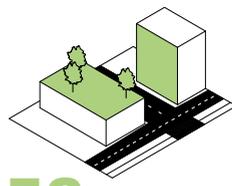


“CHILDREN PROVIDE A STREET WITH LIVELINESS AND SOCIAL CONTACTS BETWEEN EVERYBODY AND EVERYTHING. FAMILIES ARE THE CARRIERS OF NEW URBANISM.”

Larry Beasley, *Smart growth in Rotterdam*, 2009

# 06 GREEN STRATEGY

## GREEN ROOFS & FACADES



POTENTIAL MAP, 2040



CS-KWARTIER	39,500
OUDE WESTEN	172,600
LIJNBAANKWARTIER	119,300
LAURENSKWARTIER	155,200
HOBOKEN	113,200
COOL	41,200
WATERSTAD	122,900
NIEUWE WERK	59,900
KOP VAN ZUID	46,500

897,200 M<sup>2</sup> GREEN OF WHICH 870,300 M<sup>2</sup> IS NEW

### Green in the third dimension

Seen from a high-rise building, in 2040 the inner city will look like a park. By then, green roofs and facades will have become a common sight. The post-war reconstruction era buildings, with their flat rooftops, offer many opportunities for inner-city greening. A potential roofed area of 85 ha – to be shared with photovoltaic cells – is available for creating attractive green surfaces.

Green roofs provide extra ecological quality, capture fine particles and CO<sub>2</sub>, and provide green scenery (from high-rise buildings) and green recreational (sitting and playing) environments. Moreover, they have a positive effect on the

densified inner-city climate and function as water buffers, thus contributing to urban water management. Green roofs and facades also provide excellent locations for realising urban agriculture. Combinations of functions in buildings (e.g. restaurants and schools) and agricultural activities on roofs and facades also have socio-economic value. The challenge is to combine densification with urban greening that directly improves the living environment.

Green roofs can already be seen on the new Erasmus Medical Centre building. In this manner the “stony” inner city can be transformed relatively simply, quickly and effectively into a green experience.

ENGELS, Groothandelsgebouw, CS-kwartier  
PHOTO Maayke de Ridder



PUBLIC LIBRARY ROTTERDAM, Laurenskwartier, PHOTO Rotterdam Municipality

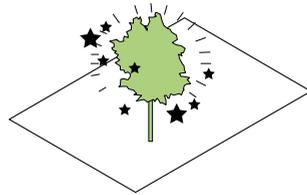




“EVERYBODY, REGARDLESS OF THEIR ECONOMIC MEANS, SHOULD HAVE ACCESS TO THE SAME HEALTHY, SAFE, AFFORDABLE FOOD THAT IS GROWN NATURALLY. JUST AS IMPORTANT, FARM PROJECTS GROW COMMUNITIES AND NOURISH HOPE.” Will Allen, Growing Power uit Milwaukee, The 2010 Time 100, 2010

# 07 GREEN STRATEGY

## GLAMOROUS GREEN



POTENTIAL MAP, 2040



### Green pearls shine in the city

Nothing can replace physically meeting out in the public domain. The Internet is a wonderful medium but it is not Rome's *Piazza Navona*, with its space in which to move about freely or for surprise meetings in the urban open space. In spite of the challenges brought about by the digital age, commercialisation, vandalism and perceptions of personal safety, people will continue to come and visit the inner city, as this is where life in all its forms is apparent and where it develops in every aspect. The design of this public domain is decisive for the atmosphere, tempting people to dwell longer and, finally, to feel more connected with the city. Outdoor space of excellent quality

– Glamorous Green – is needed for the busiest and most characteristic places in town. The *Stationsplein* with more than 70,000 passers-by every day, the landing points of Rotterdam's city icon, the Erasmus bridge, *Schouwburgplein* and *Coolsingel* are places where Rotterdam must glitter and shine. This is where the city displays all the grandeur of the metropolis it is. An international style for an international and ambitious town must be visualized here. This had already started, with the restoration of the *Leuvehoofd*, and in 2014 the restored *Stationsplein / Kruisplein* square will rise in full glory, showing itself once more to the world.



BEURSTRAVERSE, Lijnbaankwartier /  
Laurenskwartier, PHOTO Rotterdam  
Municipality

ERASMUS BRIDGE, Waterstad, PHOTO Sander Lap





LEUVEHOOFD, Waterstad, PHOTO Sander Lap

TOTAL GREEN POTENTIAL, 2040



	BOULEVARDS	QUAYS	SQUARES	PLAYGROUNDS	PARKS	GREEN ROOFS & FACADES
CS-KWARTIER	10,400	0	34,900	2,500	0	39,500
OUDE WESTEN	13,600	0	0	0	0	172,600
LIJNBANKWARTIER	7,700	0	21,300	4,500	2,300	119,300
LAURENSKWARTIER	35,900	48,900	42,700	4,500	5,100	155,200
HOBOKEN	6,500	11,900	6,000	0	0	113,200
COOL	8,300	0	4,600	4,500	7,000	41,200
WATERSTAD	30,000	26,300	0	0	25,800	122,900
NIEUWE WERK	11,300	59,100	0	2,500	0	59,900
KOP VAN ZUID	6,700	64,400	3,000	6,000	29,000	46,500
<b>TOTAL IN 2040</b>	<b>130,400</b>	<b>210,600</b>	<b>112,500</b>	<b>24,500</b>	<b>69,200</b>	<b>870,300</b>
<b>TOTAL POTENTIAL NEW GREEN</b>	<b>1,417,500 M² / 141,7 ha</b>					

OVERVIEW OF POTENTIAL NEW GREEN PER NEIGHBOURHOOD, 2040



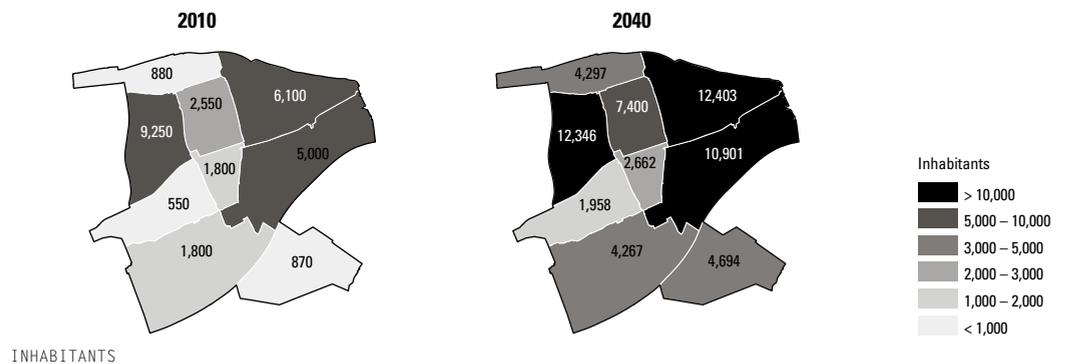
WESTBLAAK SKATEPARK, Co01, PHOTO Rotterdam Municipality

TOTAL DENSIFICATION AND GREEN POTENTIAL, 2040

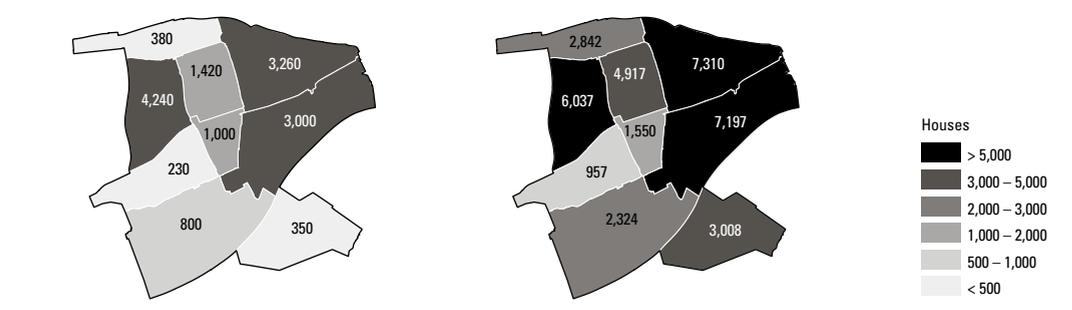


+ 20,000 DWELLINGS + 140 HA GREEN + 5,000 TREES

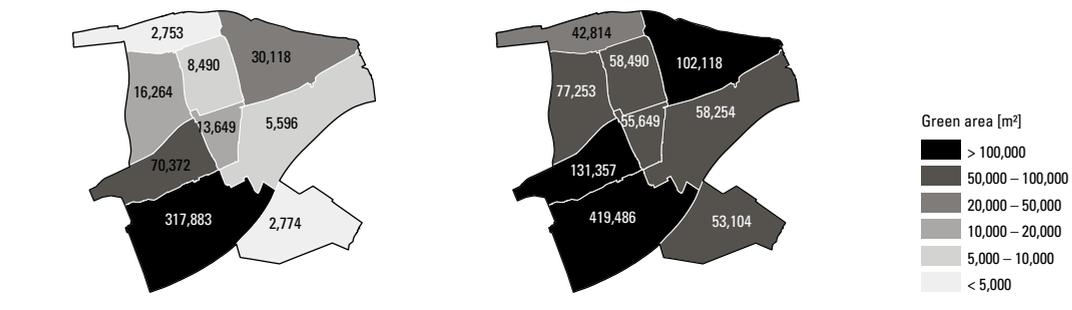
DENSIFICATION + GREENIFICATION IN NUMBERS



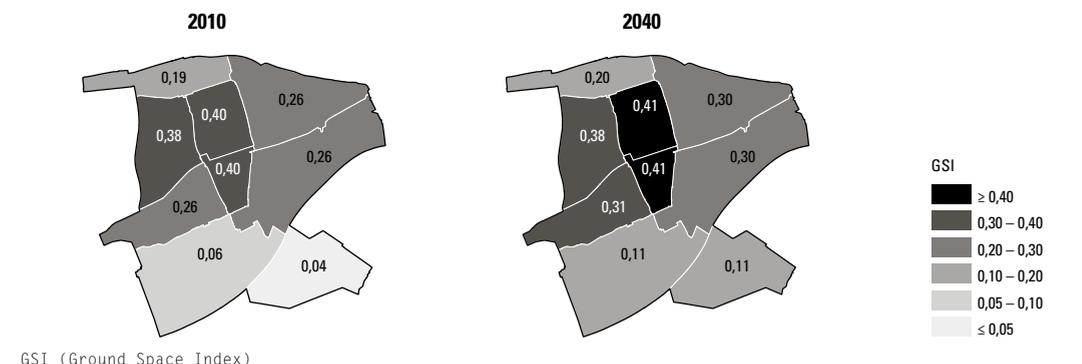
INHABITANTS



HOUSES



GREEN AREA



GSI (Ground Space Index)



FSI (Floor Space Index)



SHARE OF FAMILY HOUSEHOLDS

# SUSTAINABILITY PROFILE

## CHAPTER 3

*The concept of sustainability is often been criticized for it's lack of clarity and expressiveness. We demonstrated that sustainability can be explicit. Data, software tools and sound theoretical context are put to use, in order to present condensed analyses of the most important sustainability aspects that are related to densification. The results show that computation, as well as intuition, lead us to conclude that urban densification can improve sustainability. (TNO 2012a)*

### Urban sustainability

A number of recent publications have drawn attention to the impact on sustainability of urban dynamics, both within Europe and within the Netherlands. These dynamics in European cities were often characterised by urban expansion and restructuring; increasing mobility; more intensive use of urban space for leisure, shopping and other services; and higher consumption of resources, including energy and water. For many European cities, these dynamics result in persistent problems with air, noise and light pollution; insufficient supply of good quality water; aggravation of and vulnerability to the effects of climate change; qualitative and quantitative shortages in biodiversity and urban green per capita; and increasing social polarisation (EEA 2010).

For the Netherlands, the Netherlands Environmental Assessment Agency (PBL) concluded that the process of urbanisation over the last few decades has contributed to a relatively clean, green and quiet living and working environment for many inhabitants. Nevertheless,

urbanisation also has had its drawbacks, among them congestion, lack of environmental quality and liveability in cities, insufficient support for urban facilities, and deterioration of biodiversity, landscapes and cultural history values (PBL 2010). At the same time, the potential for greater sustainability in cities is enormous, due to advantages of scale for sustainable investments and their concentration of inhabitants, resulting in a solid basis for sustainable solutions in energy supply and urban transport.

### Policies and ambitions

After consultation with stakeholders, in 2011 the Municipality of Rotterdam outlined its sustainability ambitions in a comprehensive programme (Gemeente Rotterdam 2011), which incorporates earlier policy initiatives such as the Rotterdam Climate Initiative and the policy document *Rotterdam Climate Proof by 2025*.

The desire to become the most sustainable harbour city in Europe through ecologically sound measures (with additional social and economic co-benefits), leads in combination with

Rotterdam's vulnerability to flooding, sea-level rise and heavy precipitation, to a wide range of policy measures. These measures primarily aim at reducing risks related to climate change; reduced use of fossil-fuel derived energy; reduced CO<sub>2</sub> emissions; reduced noise and air pollution; more sustainable transport of persons and goods; more public green; better use of waste heat; increased use of renewable energy, higher energy and resource efficiency in buildings, industry and transport; and carbon capture and storage.

These ambitions are reflected in the Municipality's vision on further spatial development of the city, which is meant to contribute to improving the quality of life for its citizens. The choice for compact and mixed-use urban development offers many advantages, such as less car traffic and more support for urban facilities, although it does need to be accompanied by a better quality of the living environment in terms of public green, clean air, less noise pollution, and efficient use of energy (Gemeente Rotterdam 2007). The hypothesis underlying this book is, therefore, that a combination of feasible options for densification and development of public and private green can create this more sustainable, but nevertheless compact, city.

### Assessing urban sustainability

The concept of sustainability originally stems from ecology, where it referred to ecological and environmental boundaries that should be

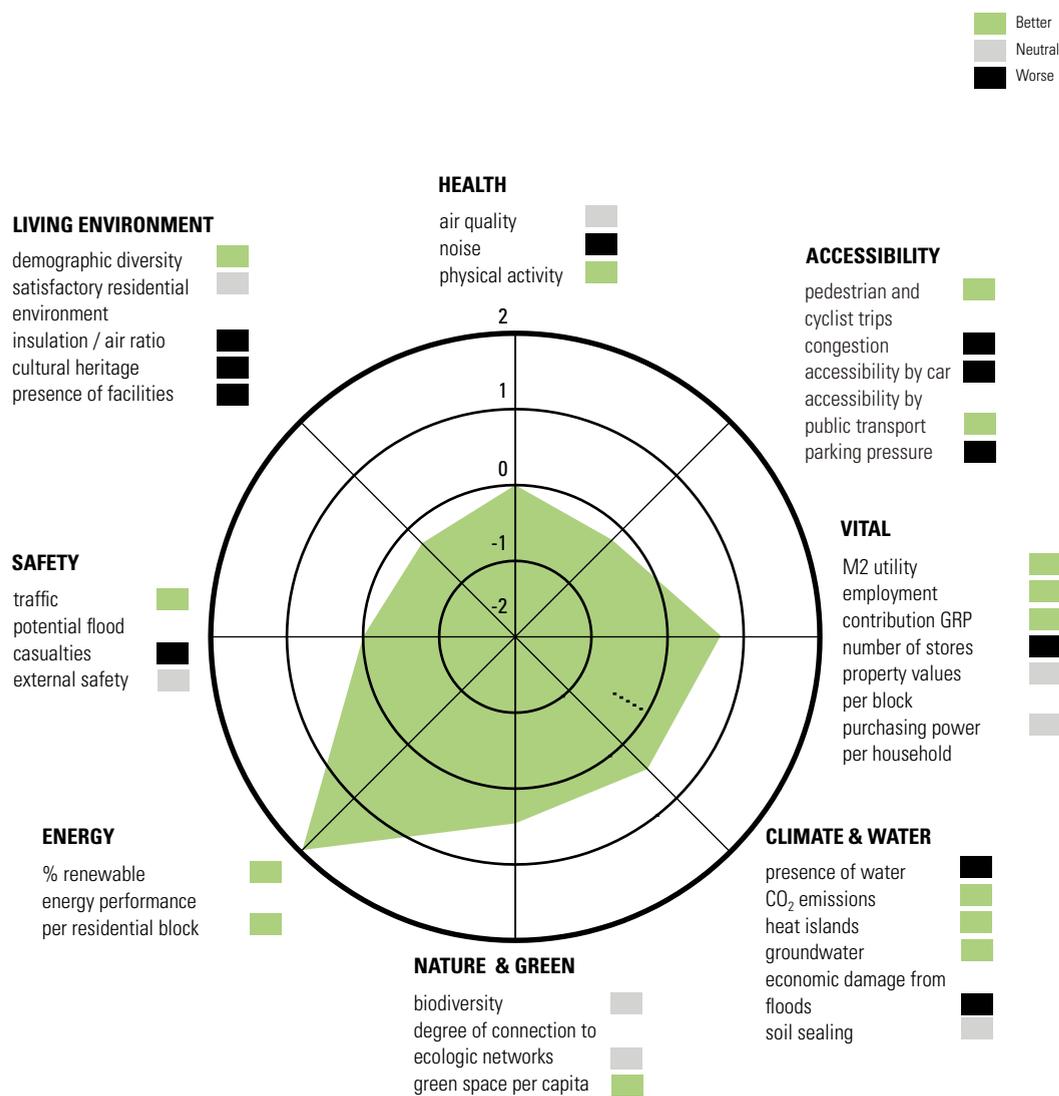
respected to ensure preservation of stocks such as fish and forests for future generations. In 1987 the Brundtland report, "Our Common Future" (WCED 1987), broadened the concept of sustainability to socio-economic aspects and the balanced development of People – Planet – Profit. In this vein, sustainability is seen here as the objective of ensuring a substantial level of environmental, social and economic quality in the future (elsewhere and later), while avoiding the negative consequences of current choices related to production and consumption, for the future and for other places on earth.

In the study described in this chapter, the impact on sustainability of densification in the inner city of Rotterdam has been investigated with the help of a newly developed sustainability profile. This was done using the model framework Urban Strategy (TNO 2012b) and its Energy Module to assess the impact of densification on eight sustainability themes. In addition, other models such as the economic model REGINA and the heat stress model SOLWEIG, as well as tools such as HIS (Flooding Information System) and sources of geodata have been used. The results have been analysed with Geographical Information Systems (GIS).

As a first step, a framework consisting of 35 indicators was designed for the eight themes, such as "water system and climate change" and

# SUSTAINABILITY PROFILE

SUSTAINABILITY PROFILE, 2040



## INDICATORS

<p><b>PEOPLE</b></p> <p><b>SAFETY</b></p> <ul style="list-style-type: none"> <li>traffic</li> <li>potential flood casualties</li> <li>external safety</li> </ul> <p><b>LIVING ENVIRONMENT</b></p> <ul style="list-style-type: none"> <li>demographic diversity</li> <li>satisfactory residential environment</li> <li>insulation / air ratio</li> <li>cultural heritage</li> <li>presence of facilities</li> </ul> <p><b>HEALTH</b></p> <ul style="list-style-type: none"> <li>air quality</li> <li>noise</li> <li>physical activity</li> </ul>	<p><b>PLANET</b></p> <p><b>CLIMATE &amp; WATER</b></p> <ul style="list-style-type: none"> <li>presence of water</li> <li>CO<sub>2</sub> emissions</li> <li>heat islands</li> <li>groundwater</li> <li>economic damage from floods</li> <li>soil sealing</li> </ul> <p><b>NATURE &amp; GREEN</b></p> <ul style="list-style-type: none"> <li>biodiversity</li> <li>degree of connection to ecologic networks</li> <li>green space per capita</li> </ul> <p><b>ENERGY</b></p> <ul style="list-style-type: none"> <li>% renewable</li> <li>energy performance per residential block</li> </ul>	<p><b>PROFIT</b></p> <p><b>ACCESSIBILITY</b></p> <ul style="list-style-type: none"> <li>pedestrian and cyclist trips</li> <li>congestion</li> <li>accessibility by car</li> <li>accessibility by public transport</li> <li>parking pressure</li> </ul> <p><b>VITAL</b></p> <ul style="list-style-type: none"> <li>M2 utility</li> <li>employment</li> <li>contribution GRP</li> <li>number of stores</li> <li>property values per block</li> <li>purchasing power per household</li> </ul>
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“accessibility”. The themes distinguished in the Rotterdam Resilience Profile cover the broad definition of sustainability, and thus include social and economic aspects as well as ecological and environmental ones (People, Planet, Profit). The subdivision into themes and indicators is roughly based on experiences of TNO with earlier sustainability assessments at the regional level, such as a benchmark of the Province of Utrecht for its new Spatial Structure Vision (Borsboom-van Beurden et.al. 2011a) and a visualisation of chances for more sustainability for the Province of Overijssel (Borsboom-van Beurden et.al. 2011b). The selection of indicators was based on their relation with urban densification and on the availability of data.

Subsequently, a “zero” measurement of the Rotterdam Resilience Profile was made for the themes in relation to the current inner city. Following this, the densification strategies were imported into the model Urban Strategy and the GIS; the values of the 35 indicators were calculated for 2040. To assess the impact of the proposed densification, the outcomes were interpreted: qualitatively by visual comparison, and quantitatively by summarising results and making additional calculations. After that, the values of the individual indicators were combined for all distinguished themes. The sustainability profile of the situation after densification is depicted in the spider diagram.

## Densification + Greenification + Low-carbon Transport = Sustainable City

The overall conclusion to be made from the sustainability profile is that densification strategies can contribute to a higher level of sustainability. In terms of safety, the results show that traffic safety improves due to relatively less car use, while safety from flooding remains the same: the risks do not increase, although the number of potential casualties is higher.

More demographic diversity due to the settlement of families contributes to greater satisfaction with the living environment. Persistent problems in terms of health, air and noise pollution remain, however. Although it is expected that air quality will improve, noise pollution will increase slightly due to more automobile traffic. As a consequence of densification, more people will be exposed to higher levels of air and noise pollution. At the same time, adults and children will have more possibilities for physical activity, which in combination with relatively less car use will lead to more years of healthy living, in spite of increased air and noise pollution.

For the theme “water system and climate change”, soil sealing and flooding risks remain at the same level. The extra heat island effect seems to be largely compensated for by an increase in shade cast by higher buildings and urban

## SUSTAINABILITY PROFILE

greening. Total CO<sub>2</sub> emissions from buildings and transport increase, but this effect is substantially compensated for by more energy efficient buildings and vehicles. However, economic damage as a result of flooding increases, not because flooding occurs more frequently, but because the total economic value of real estate is higher.

For the theme biodiversity and urban green it can be concluded that current initiatives to improve biodiversity will compensate for a more intensive use of the inner city area. The amount of urban green is expected to increase significantly. Nevertheless, it will be used by more people, so the area of urban green per inhabitant slightly decreases.

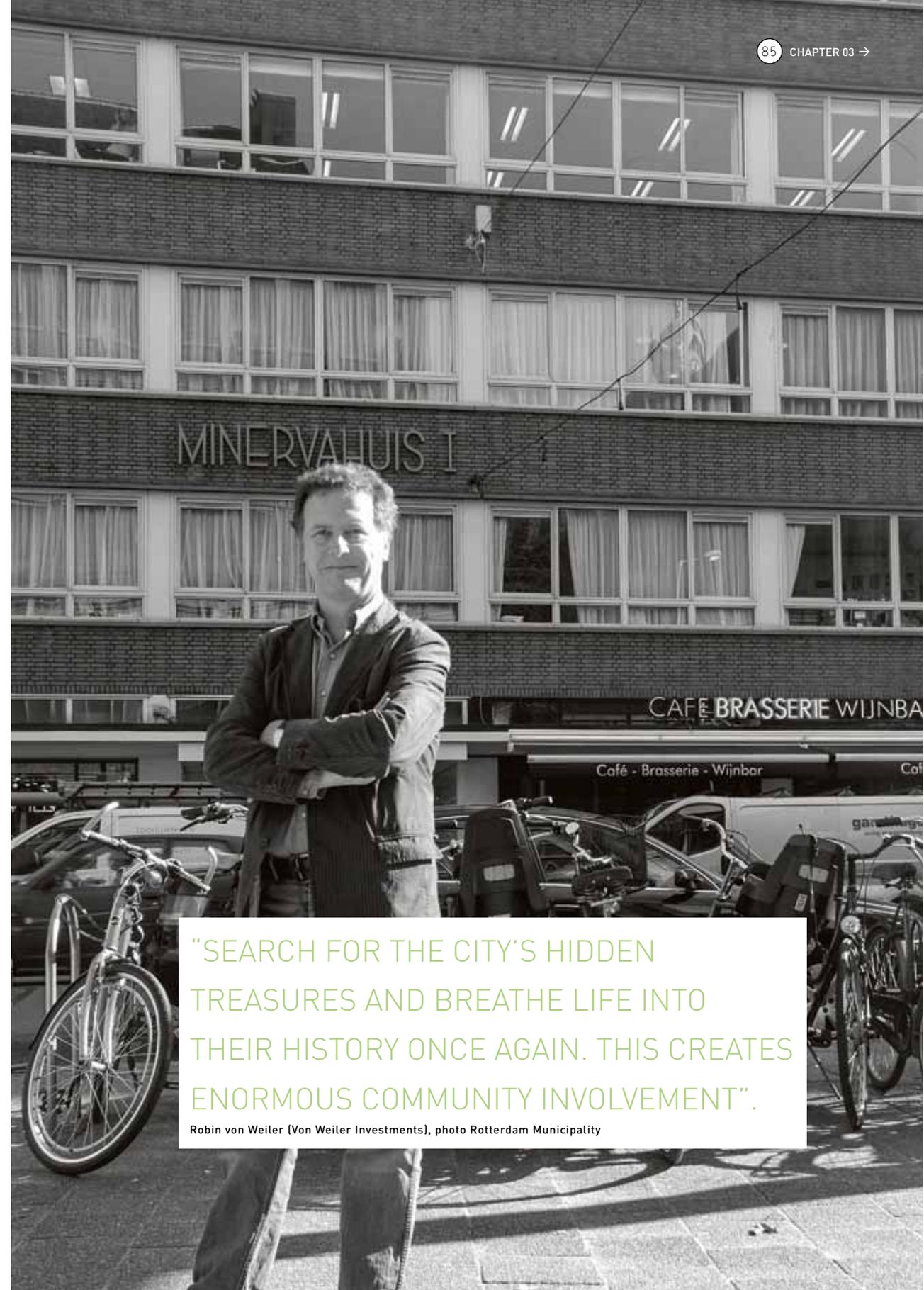
For the energy theme, it appears that consumption will increase for the entire inner-city area, but not as much as expected since new buildings will have to comply with stricter norms on energy performance as from 2020. This means that all new buildings will be nearly energy neutral. Also growth of renewable energy production within the city can be expected. Photovoltaic cells can be installed on flat roofs, in combination with green roofs. In urban transport, the combination of less car use and more frequent use of public transport, walking and cycling, in combination with more energy efficient vehicles, will largely compensate for the additional use of energy.

The theme accessibility in the inner-city area appears to be largely dominated by the voluminous traffic flows of commuters and visitors rather than the doubling of the number of its inhabitants, so the effect of densification is relatively small. Besides, for the inner city, the limited supply of parking places (0.48 parking place per dwelling) and frequent choice for other means of transport, such as public transport, walking and cycling, lead to reduced use of cars. Nevertheless, congestion will worsen on a number of roads as a result of higher traffic intensities.

Finally, for the theme competitiveness, the results show that densification at this scale leads to a significant increase in jobs, especially for services and businesses providing financial and administrative support to companies.

To conclude, densification and urban greening contribute to greater urban sustainability, but ambitious concepts and strategies for providing urban transport are needed as well, for instance electric cars and sustainable distribution of goods. These strategies have not been explored in the study. The hypothesis stated earlier is therefore only partly verified: low-carbon transport strategies are missing and still need to be articulated.

The most striking outcomes of the analysis of specific indicators are discussed in the remainder of this chapter.



“SEARCH FOR THE CITY’S HIDDEN TREASURES AND BREATHE LIFE INTO THEIR HISTORY ONCE AGAIN. THIS CREATES ENORMOUS COMMUNITY INVOLVEMENT”.

Robin von Weiler (Von Weiler Investments), photo Rotterdam Municipality

# 01

INDICATOR

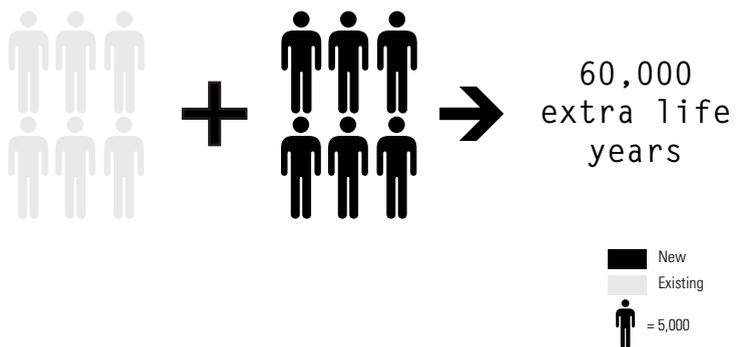
## PHYSICAL ACTIVITY

### Higher density stimulates walking and cycling

More inhabitants living in densely built-up areas means that walking and cycling can be promoted, particularly so because car use become less attractive as a result of a limited supply of parking places and an urban design attuned to cycling and walking. Ambitious urban green development induces physically active behaviour. More playgrounds will be created through strategies for urban greening and existing playgrounds will be used more intensively. The availability of areas that are agreeable for pedestrians, cyclists, etc., will depend on the urban design of the densification strategies. Examples of relevant elements in a urban design include lanes with separate walkways and cycle paths, the establishment of attractive green areas and the reduction of barriers by providing extra connections such as bridges for

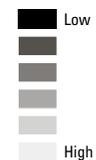
slow traffic. On the other hand, new blocks of buildings will limit the possibilities for physical activity around the city.

The maps show the degree of potential physical activity in Rotterdam per city block before and after densification. In general, improvement occurs when new green areas are developed, while decline takes place when blocks of buildings are added. It's clear that the new city structure includes some blocks for which it is less inviting to venture out on the streets by foot or car, because there is little urban green or barriers to walking and cycling are present. Additional analyses of the combined effect of physical activity, air pollution and traffic safety show that extending the possibilities for physical activity lead to extra years of healthy living.



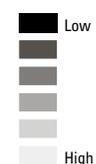
TOTAL INCREASE OF LIFE YEARS AFTER DENSIFICATION

ATTRACTIVITY OF THE SURROUNDINGS FOR PHYSICAL ACTIVITY, per city block



BEFORE DENSIFICATION

ATTRACTIVITY OF THE SURROUNDINGS FOR PHYSICAL ACTIVITY, per city block



AFTER DENSIFICATION

# 02

INDICATOR

## FACILITIES

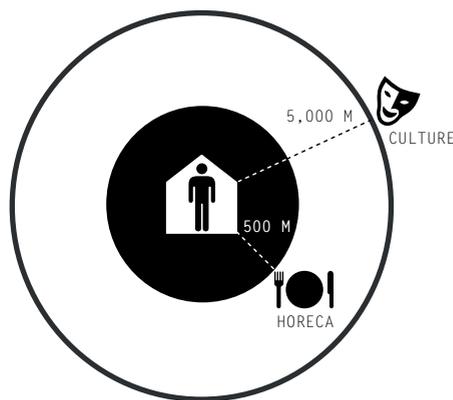
### More people means more leisure facilities

In the search for new housing locations, the number and quality of leisure facilities and services available often play a minor role as criteria. Nevertheless, in order to maintain an adequate service level, we need to identify places where leisure facilities and services should be added or expanded. All stakeholders should be aware of the needs of entrepreneurs and organisations at an early stage. Diversity and flexibility of space for leisure facilities and services should allow for easy adaptation to actual needs in future.

The maps show the location of bars, restaurants, hotels, theatres, galleries, museums and other cultural points of interest per city block. The bottom map shows the anticipated increase in the number of new facilities needed in relation to the location of new dwellings and new inhabitants after densification. Especially the areas around the Central Station and the *Kop van Zuid* district need a boost in the presence of these leisure facilities.

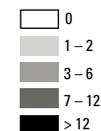
“LEISURE MEANS MORE THAN TAKING A STROLL ON SUNDAY. THE LEISURE SEEKER WANTS TO BE ENTERTAINED NOT ONLY IN THE WEEKEND, BUT ALSO AT NIGHT AND DURING WEEK-DAYS.”

Hans Leinfelder, 2008, plandag



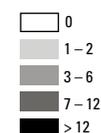
FUTURE DEMAND FOR PROXIMITY TO LEISURE FACILITIES

CURRENT NUMBER OF LEISURE FACILITIES, per city block



BEFORE DENSIFICATION

REQUIRED NUMBER OF NEW FACILITIES TO RETAIN CURRENT RATIO BETWEEN INHABITANTS AND FACILITIES



AFTER DENSIFICATION

“TO GENERATE EXUBERANT DIVERSITY IN A CITY’S STREETS AND DISTRICTS THERE MUST BE A SUFFICIENTLY DENSE CONCENTRATION OF PEOPLE, FOR WHATEVER PURPOSE THEY MAY BE THERE. THIS INCLUDES A DENSE CONCENTRATION OF PEOPLE WHO ARE THERE BECAUSE OF RESIDENCE.”

Jane Jacobs, *The Death and Life of Great American Cities*, 1961

# 03

INDICATOR  
**NOISE**

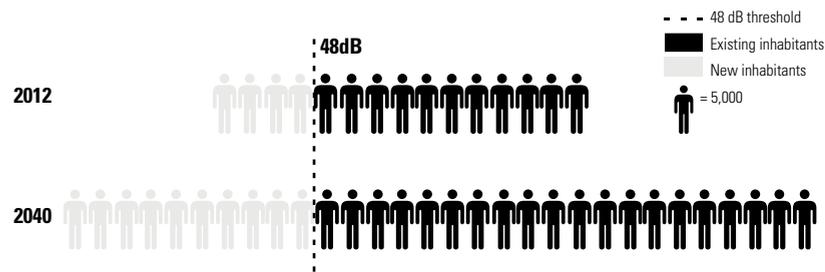
**The overall noise level in the inner city will hardly increase but more people will experience hindrance**

Effects of busier traffic are countered by buildings that act as acoustic screen. However, more than half of the new inhabitants will experience noise levels above the strict future norms.

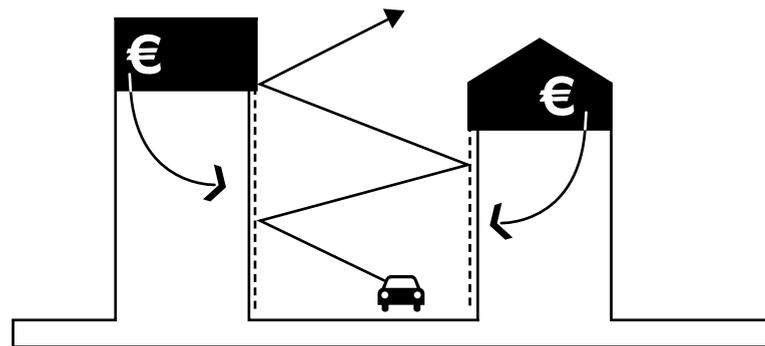
After the realisation of the densification strategies, about 18,000 of the new inhabitants will experience noise levels greater than 48 dB at the outer walls of their dwellings. This is primarily due to an increase in the number of cars.

The policy limit of 48 dB anticipates new, stricter policy norms in the future; 55 Db is the current norm. Very few houses are expected to experience noise levels above the current norm of 55 dB. Both now and after densification, noise levels above 50 dB are mainly confined to roads; noise levels at the facades of homes are mostly below 50 dB.

The map shows the difference in noise level in Rotterdam after the implementation of the densification strategies. As for congestion, few changes occur between the old and new situation.



INCREASE OF INHABITANTS ABOVE TRESHOLD OF 48 DB AFTER DENSIFICATION



POSSIBLE IMPROVEMENT OF NOISE SITUATION WITH DENSIFICATION

■ New buildings  
□ Existing buildings

CHANGE IN THE NOISE LEVEL AT THE FACADE OF DWELLINGS, measured in decibel

■ -15  
■ -14 - -10  
■ -9 - -5  
■ -4 - 0  
■ 1 - 5  
■ 5 - 10



AFTER DENSIFICATION

There are few places where an increase of more than 5db will take place. On the contrary, many places show a decrease of noise hindrance due to the assumed higher importance of public transport, walking and cycling as means of transport. Although densification will not as such substantially aggravate noise levels in the inner city as compared to current standards, action (e.g. reduction of car traffic or introduction of collective parking facilities) must be taken to comply with

“IF WE DON’T THINK ABOUT FUTURE GENERATIONS, THEY WILL NEVER FORGET US.” Henrik Tikkanen, Kulosaarentie, 1976

# 04

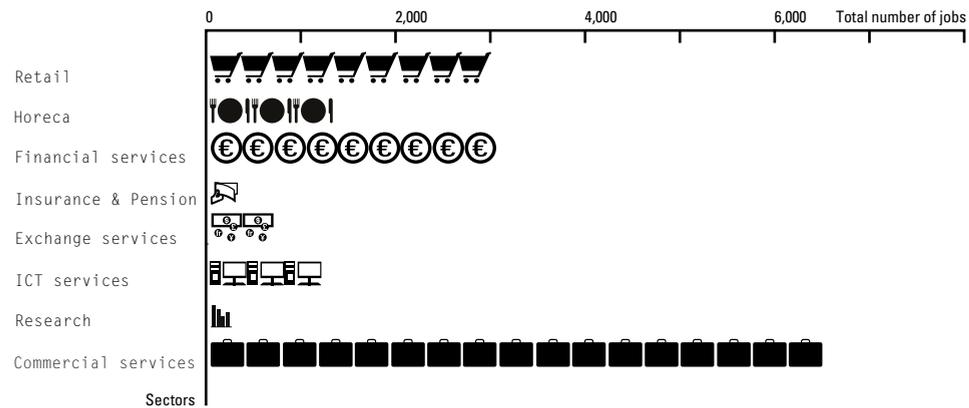
INDICATOR

## EMPLOYMENT

### Densification leads to a significant increase in employment in service activities

A denser inner city leads to a higher demand for services, such as shops, restaurants, hairdressers, and the financial and administrative services that in turn support these companies. Employment and added value per square metre will increase as a result of urban densification and the resulting increase in inner city inhabitants.

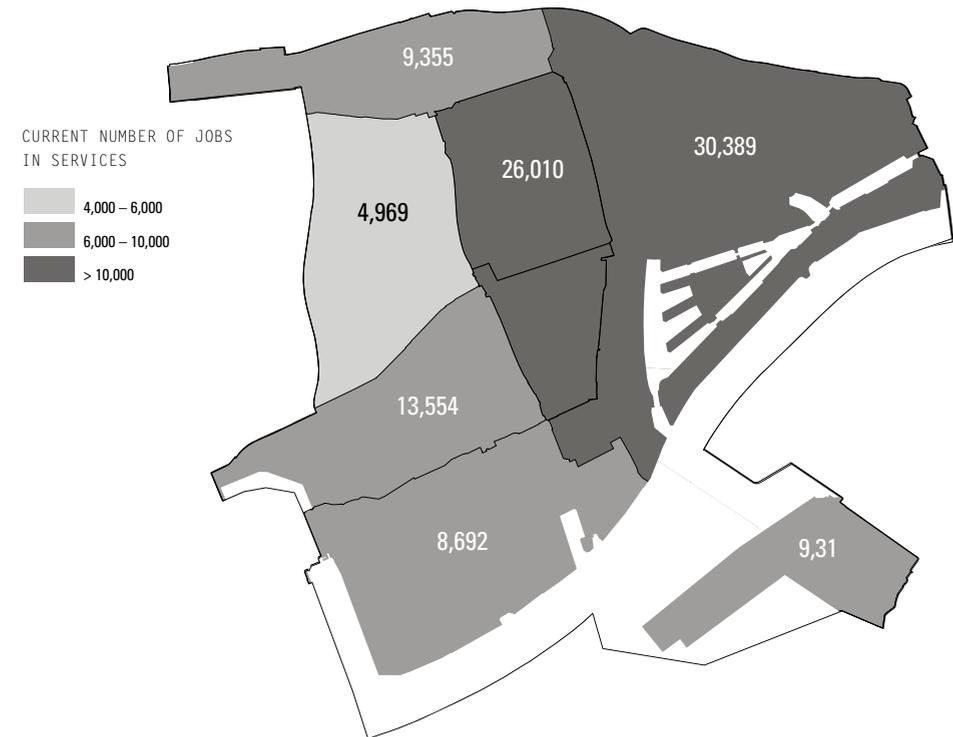
The maps indicate current employment in services generated in the inner city of Rotterdam per postal code, and the extra employment generated by implementation of the densification strategies. Since most of the new jobs are created in service sectors, productivity per employee will probably not increase significantly on an annual basis, given average levels. Some specific factors related to densification can increase production levels, but these are hard to incorporate in calculations beforehand.



TOTAL OF 30,000 JOBS IN SERVICES PER SECTOR AFTER DENSIFICATION

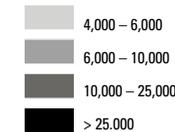


INCREASE OF 4,500 JOBS IN SERVICES AFTER DENSIFICATION



BEFORE DENSIFICATION

NUMBER OF JOBS IN SERVICES, corrected for any other factors



AFTER DENSIFICATION

# 05

INDICATOR

## CONGESTION

### Congestion increases only slightly

This is due to the fact that peak congestion during rush hours is strongly influenced by commuters and visitors from outside the inner city.

New inhabitants of the inner city bring with them demand for transportation by car. It is assumed that they make one round trip per day per person. Nevertheless, the resulting increase in the number of trips by car has little effect on the congestion. Congestion is expressed here as the ratio between the use of roads and the availability of roads for transport (Intensity/Capacity (I/C ratio)) during peak hours. When the use of roads is greater than the availability, intensity is greater than capacity, so the I/C ratio is greater than 1. Current transport policies aim at an I/C ratio of 0.6 during peak hours.

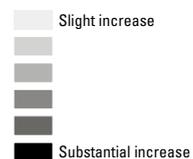
It appears that congestion does not change much with densification. The influence of intra-regional

traffic within the agglomeration of Rotterdam is much more significant than any increase in car use by inner-city inhabitants. Besides, more trips by the new inhabitants will be made by public transport, cycling and walking, because parking facilities will be limited and the level of quality of public transport in the inner city is good.

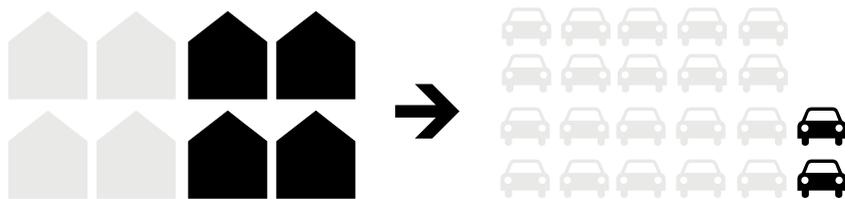
The map shows the change in congestion in Rotterdam per road segment after implementation of the densification strategies.

Besides the assumption of one round trip by car per day per person, it is expected in the analyses that every new inner-city household owns one car on average. At the same time, to restrain car use, the amount of parking spaces per household is set to 0.48.

CHANGE IN RATIO BETWEEN INTENSITY AND CAPACITY OF ROADS



AFTER DENSIFICATION



INCREASE OF 10,000 NUMBER OF CARS AFTER DENSIFICATION

“CONGESTION IS OUR FRIEND, IT’S THE ONLY WAY THE AUTOMOBILE IS GOING TO CONTINUE TO FUNCTION.”

Vancouver city councillor Gordon Price, 2010



VEERHAVEN, Nieuwe Werk, PHOTO Sander Lap

# 06

INDICATOR

## MARKET VALUE OF HOUSES

### First indication of value development based on the number of new houses per city block

Although the average current market value of houses per city block is known, it is difficult to accurately predict the future value of houses since there are many variables that influence their future price. We can nevertheless give a first indication of price developments based on observed correlations between the number of new homes and the development of housing prices. These correlations show that if up to ten houses are added to a residential area, house prices will increase with a few percent. This is because a small investment indicates a small scale of improvement of an urban area that has been already developed. If more than just a few houses are added, the data show that prices fall. All other things equal, this can be

explained by the simple mechanism of supply and demand: the more apartments or family homes in a certain building block, the less new owners are likely to pay for them.

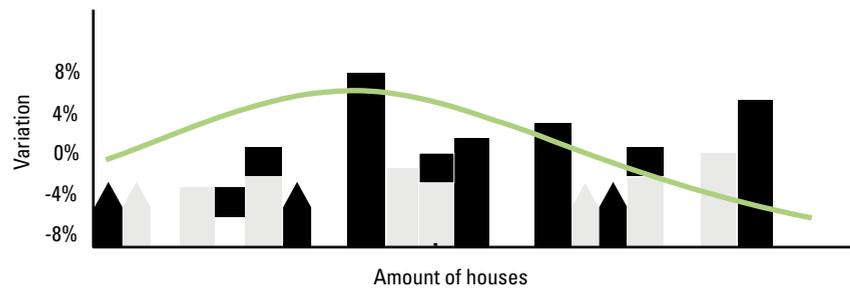
The map gives a rough indication of the relative change in house prices in Rotterdam per city block, as well as the current average values per block before and after densification. A strong reservation should be made about the outcome, since it is only based on the number of homes; other factors determining house prices, such as house type and number of rooms have not been researched. Differences can be seen between the northwestern and northeastern parts of the inner city. Unfortunately, data is missing for some city blocks.

INDICATIVE CHANGE IN HOUSE PRICES, based on number of new dwellings

Decrease  
Increase



AFTER DENSIFICATION



INDICATIVE CHANGE IN HOUSE PRICES BASED ON NUMBER OF NEW DWELLINGS

“PREDICTION IS DIFFICULT, ESPECIALLY ABOUT THE FUTURE.” Yogi Berra, baseballplayer, 1926

# 07

INDICATOR

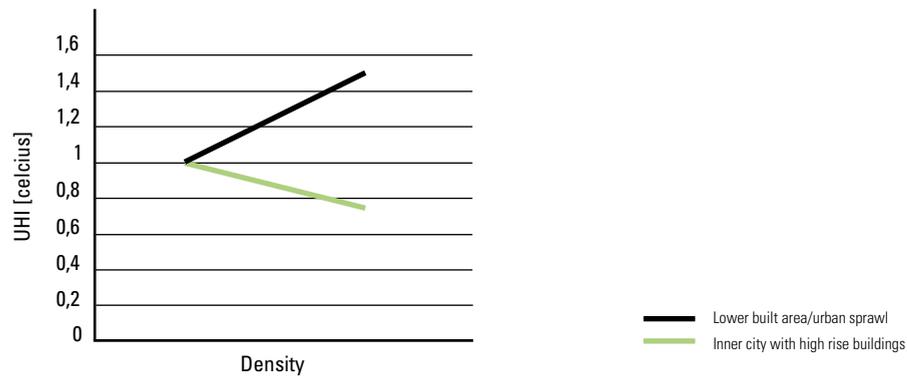
## HEAT ISLANDS

### Slight increase of heat islands effects

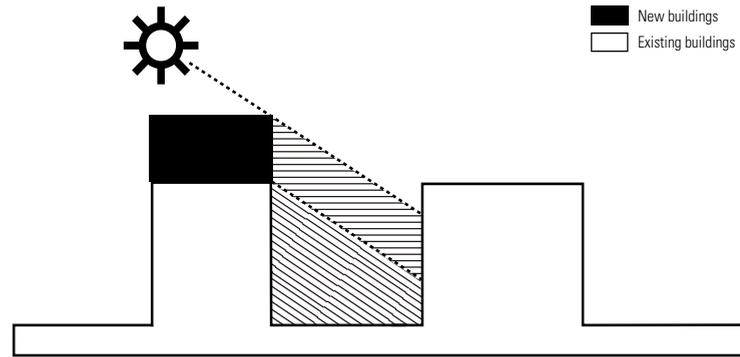
The increase in urban heat island effects by adding building mass to the inner city is compensated for by urban greening and shadow cast by high building blocks. The densification strategies as described in Chapter 1 are accompanied by ambitious urban greening strategies. Higher buildings lead to more prominent heat island effects. However, higher buildings also create more shade, which compensates for increased urban heat island effects. And development of more urban green

mitigates these heat island effects even further. As a result, heat stress does not increase significantly.

The maps show which parts of the city warm up during summer. The lighter the area, the smaller the chance that during a warm period the critical radiation heat will exceed 55°C. Note that radiation heat is not the same as air temperature; radiation heat is usually much higher than air temperature.



HEAT STRESS DIAGRAM



NEW VOLUMES DECREASE HEAT STRESS EFFECT BY CREATING SHADE

URBAN HEAT ISLAND SITUATION, Hours during summer where radiation temperature exceeds 55°C

- Areas that remain cool
- Areas prone to heating



BEFORE DENSIFICATION

URBAN HEAT ISLAND SITUATION, Hours during summer where radiation temperature exceeds 55°C

- Areas that remain cool
- Areas prone to heating



AFTER DENSIFICATION

# 08

INDICATOR

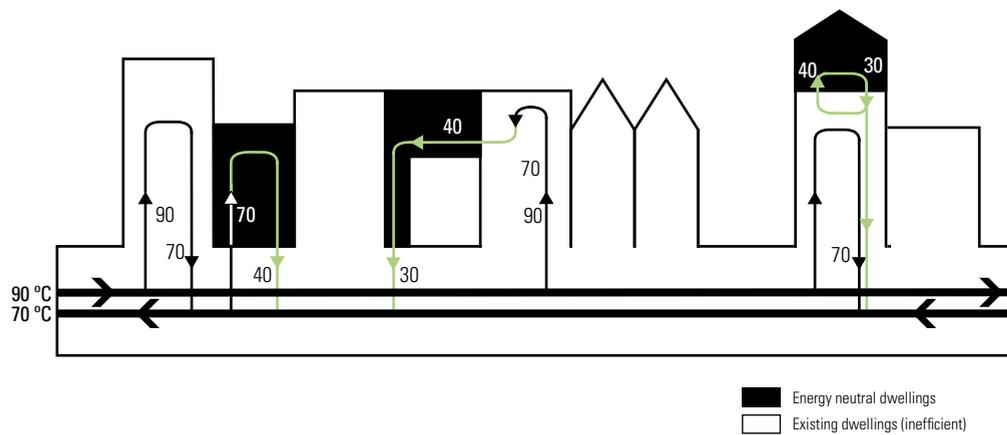
## ENERGY USE

### Doubling the number of dwellings will strongly help to decrease the average energy consumption per dwelling of the inner city area

Average use of energy per dwellings will decrease because new housing will have to meet stricter standards of energy efficiency. New houses will even have to be energy neutral after 2020. However, substantial efforts will be needed to upgrade the energy efficiency of existing housing stock. Ideally upgrading could be carried out while densification strategies are being realised. Densification has the added benefit of contributing to a more compact urban form: more clustering within the urban morphology leads to more energy efficiency as well. Further, existing district energy

networks will become more efficient and profitable because they will supply energy to a greater number of buildings and heat exchange between buildings will be possible (Tillie 2009). And lastly, a compact urban form also has a favourable effect on energy consumption by urban transport: means such as public transport, walking and cycling, use relatively less (fossil-based) energy.

The maps show the energy performance of buildings at present and after densification. Since all the new houses will comply new energy regulations, 44 tonnes of CO<sub>2</sub> emission will be avoided on a yearly basis, i.e. 18% of the current residential CO<sub>2</sub> emission of houses in Rotterdam.



CASCADING & HEAT EXCHANGE

ENERGY PERFORMANCE OF DWELLINGS



BEFORE DENSIFICATION

ENERGY PERFORMANCE OF DWELLINGS



AFTER DENSIFICATION



PARKLAAN, Hoboken, PHOTO Rotterdam Municipality

# INDICATOR 09

## URBAN GREEN

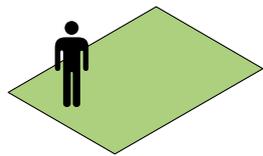
### Availability of urban green changes depending on location

An expansion of urban green will be realised, although the increase in numbers of inhabitants is relatively larger than the volume of urban green added. In this analysis urban green available for daily activities, (within a range of 250m of the dwelling), such as recreational walking and cycling has been distinguished from urban green available for weekend activities, (within 500m). It appears that the total amount of urban green per inhabitant decreases from 37 to 34,9 m<sup>2</sup> in spite of ambitious strategies for urban greening. However, the good news is that for many blocks of buildings their

proximity to urban green improves significantly, especially for many existing buildings.

Less urban green per inhabitant will lead to more intensive use of the urban green in place. This can result in “cosy crowdedness” and “more eyes on the street” (Jane Jacobs). The presence of people attracts other people. And the quality and characteristics of urban green do matter, since they influence how green areas are used. Green space of high quality can compensate for decreased quantity and thus contribute to a satisfying living environment.

2012



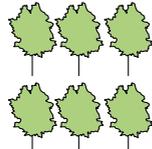
37 M<sup>2</sup>/PERSON

+



30,000 PEOPLE

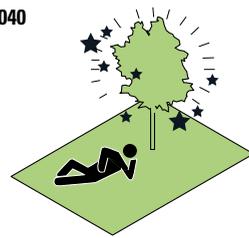
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141,7 HA GREEN

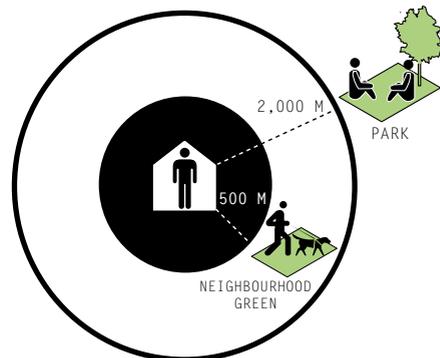
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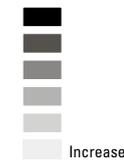
34,9 M<sup>2</sup>/PERSON

GREEN PER CAPITA AFTER DENSIFICATION



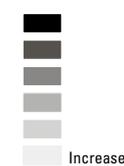
SUPPLY OF GREEN AREAS RELATIVE PER CAPITA

AMOUNT OF GREEN AREAS PER INHABITANT (M<sup>2</sup>)



BEFORE DENSIFICATION

AMOUNT OF GREEN AREAS PER INHABITANT (M<sup>2</sup>)

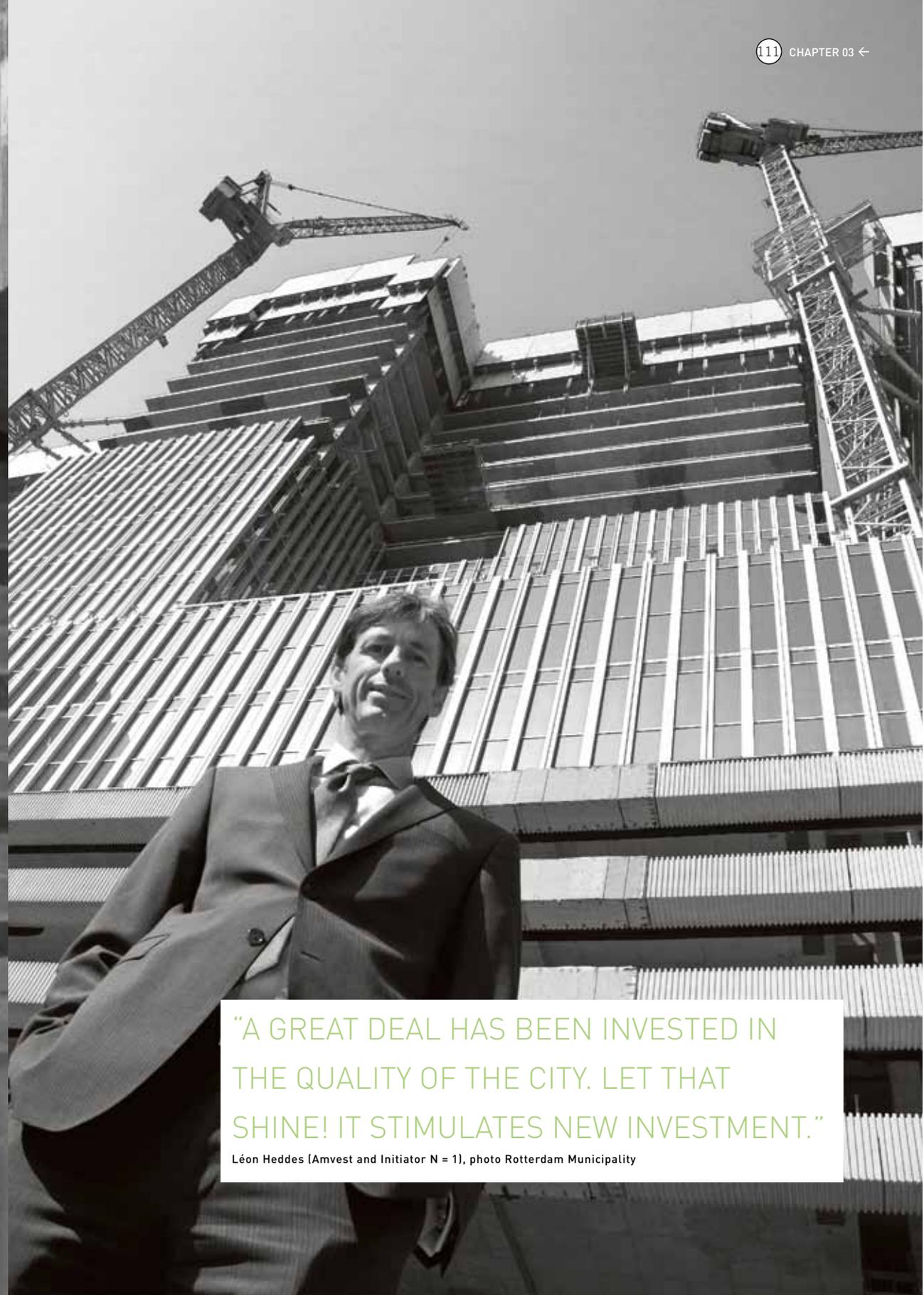


AFTER DENSIFICATION



“ROTTERDAM POSSESSES SOME MAGNIFICENT BEADS. NOW ALL WE NEED IS A BEAUTIFUL NECKLACE TO JOIN THEM TOGETHER. WE NEED TO IMPROVE ROTTERDAM’S SPATIAL LEGIBILITY!”

Bianca Seekles (ERA Contour and Initiator N = 1), photo Rotterdam Municipality



“A GREAT DEAL HAS BEEN INVESTED IN THE QUALITY OF THE CITY. LET THAT SHINE! IT STIMULATES NEW INVESTMENT.”

Léon Heddes (Amvest and Initiator N = 1), photo Rotterdam Municipality

# ENABLING ROTTERDAM TO EVOLVE

## CHAPTER 4

*In May 2007 the European ministers then responsible for urban policy adopted the Leipzig Charter: “In the development of sustainable cities, an integral approach to urban issues is of primary importance. Every dimension of sustainable development must be addressed simultaneously and with equal emphasis, i.e. economic prosperity, social balance and a healthy environment. Furthermore, attention for cultural and health aspects is required. In addition, European structural funds should be made available for local projects that embrace this integral approach.”*

One such local project is the European Interreg IVB project MUSIC, which focuses on transitions towards sustainable cities by bringing together knowledge, opportunities, and the energy and initiatives of stakeholders. To facilitate such transitions, this project follows a two-track approach:

1. Transition management to accelerate sustainable city development through stakeholder participation and by linking various initiatives;
2. Provision of knowledge and data to facilitate this transition through the availability of professional expertise, Geographic Information Systems (GIS) and a sustainability profile, i.e. a score card for each area or district (People, Planet, Profit) that indicates the opportunities, threats and initiatives that present themselves.

### Energetic cities

In the creation of sustainable cities, transitions at the district and neighbourhood scales are

crucial. These are the best scales for realising sustainability ambitions in a city: small enough to take quick action and large enough to make an impact. There has, however, been a shift in approach for urban-area development: a shift from a strong focus on top-down planning and master plans towards bottom-up approaches accompanied by room for initiatives. As Hajer (2012) says: “The question is how to combine the step towards a sustainable world with the exploitation of forces in an energetic city. This is not about top-heavy committees that launch proposals of the likes of the Delta Works, but about an administration that attempts to channel social energy in the right direction”.

Inhabitants create places for themselves that meet their own needs, and in doing so they become shareholders in the development of their city. They feel responsible for the co-creation of their own world and its safety through commitment to their places and each other. In this manner

FROM	TOWARDS
1. Non-connected places (loose beads)	1. Connected inner city (a necklace of beads)
2. Open festival area, gates and cleaning up (enjoy and leave the mess behind)	2. Everything is allowed provided it fits within a future-proof structure (create your own dream world)
3. Various communities going their own way in the city; little interaction or collaboration	3. Community feeling in which the public realm is the meeting place
4. Municipality / companies make the city	4. Rotterdam inhabitants make the city
5. Alienation from outdoor space	5. Feeling at home, outdoor space becomes a living room
6. Playing hide-and-seek	6. Making interests, places and existing energy visible

(Source: D. Loorbach (DRIFT), based on results of transition arena meetings)

sustainable cohesion will be established, because of the connection to an activity or the development of a place (Loorbach, 2012).

### Energy in Rotterdam

Various meetings were held to find out who as engaged inhabitants and entrepreneurs wished to participate in giving form to Rotterdam’s future inner city. The participants were all motivated inhabitants or entrepreneurs who took it for granted that they should be the ones who have the say over their lives. Trend-setters among this group, along with cultural leaders and trend-setters from the Municipality of Rotterdam, participated in meetings of focus groups – called transition arenas – under the direction of DRIFT. Ideas, initiatives, obstacles and problems were debated at these meetings with the aim of reaching consensus on a common vision.

Here it goes beyond the desire to create an attractive, sustainable inner city through densification and greenification, to include the realisation of inhabitants that they are also able to contribute to that goal.

During the third meeting, held on 23 February 2012, the trend-setters were already demonstrating how they were breathing life into various initiatives. Sometimes the Municipality of Rotterdam was the initiator, as in the case of some DIY houses. These houses previously belonged

to slumlords. As they had been generally poorly maintained, the Municipality was able to buy them cheaply and make them available for DIY renovation. Surveys among inhabitants and potential dwellers/buyers clearly indicate that this initiative is very much appreciated by enterprising inhabitants because they have an opportunity to satisfy their individual wishes and needs – as the market party Era Contour has already demonstrated with its “one city block”. For similar reasons, the housing corporation *Woonstad* will start selling houses destined to be DIY houses in the district of *Oude Westen*.

That entrepreneurship is key to such developments has been demonstrated by Joost Kühne, spokesman for a group of initiators who develop small new housing projects financed in advance by market parties and so contribute to the evolution of the city. And Henk Hartzema, in his study “*Klein en Fijn*”, showed how small interventions can have great impact on a neighbourhood. The Municipality of Rotterdam facilitates about 20 of these, for example by improving walking routes by providing zebra crossings. Bianca Seekles, from ERA Contour, has shown how she does not develop from a traditional plan, but rather uses the client’s wishes as a point of departure, as in the Le Medi project. This approach can also be applied in the inner city.

## ENABLING ROTTERDAM TO EVOLVE

Transformation of vacant office buildings and municipal real estate is also an issue high up on everyone's agenda. This is why the Municipality cordially invites creative entrepreneurs to come forward with plans to exploit the opportunities provided by vacant (municipal) real estate.

The seven green strategies discussed earlier in this publication show that a significant expansion of urban green space is possible. A number of plans are already being carried out, such as green quays together with, for example, glamorous green: *Leuvehoofd*, designed by Piet Oudolf. With green strategies it is important that, in addition to the municipality involved, private parties and developers can also contribute. Private initiatives such as the garden alongside the river Meuse come to mind. And green roofs, facade gardens and urban agriculture are also contributing to the city's face. All parties involved are enthusiastic and media coverage is positive. This also stems from the fact that we are expanding on proven, successful strategies.

All in all, the number of initiatives is no longer small. Extrapolation of the effect of densification and greening strategies indicates that there is sufficient space to extend these approaches on a larger scale and expand the involvement of inhabitants, thus reinforcing the sustainability and vitality of the city.



“STIMULATE COLLECTIVE INITIATORS. A SHARED PASSION STRENGTHENS BONDS.”

Bart Verhagen (Estrade Projects), photo Rotterdam Municipality

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## ROTTERDAM – PEOPLE MAKE THE INNER CITY

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