

Welcome to the
Dutch Demonstration
Delta in Zwolle

With great pleasure we
present to you a global
village for the GCECA.

COLOFON

Bidbook WDDDZ 'Welcome to our Dutch Demonstration Delta' is a joint production of the Municipality of Zwolle, the Regional Water Authority Drents Overijsselse Delta (WDO Delta), the Province of Overijssel and Dutch Rail (NS)

Published September 2017

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WELCOME
TO OUR

DUTCH



DEMONSTRATION

DELTA

Let's excel
in and
accelerate
climate
adaptation
now!



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39	Our demonstration delta The IJssel-Vecht delta, its heart beating in Zwolle's Spoorzone district, displays a 360-degree approach in climate adaptation projects. Clever concepts are implemented decisively to become best practices that appeal to the imagination.
61	Epilogue Any staff, partners or visitors entering the GCECA building will immediately experience the spirit of the Spoorzone district. The demonstration delta is an ever developing showcase of climate adaptation with an active community ready to welcome the GCECA and its staff and guests with open arms.

Preface

It is with great pleasure that we present to you our collaborative bid: a 'global village' for housing the GCECA, adjacent to the railway station entrance in the Spoorzone, an area that will showcase major urban development and climate adaptation in Zwolle in the heart of the IJssel-Vecht delta.

GCECA's 'global village' wants to be an inviting and hospitable icon of climate adaptation. It consists of newly-built, modular and distinctive houses, reflecting the human scale of our delta. Interconnected with the surrounding city and delta, the houses symbolize the connection between GCECA's global network and local communities. Together they scale up climate adaptation to a new way of living.

Our IJssel-Vecht delta has a centuries-long tradition of collaboration in living and building with the water everywhere around us. As local and regional authorities we work together, both on the delta and on city governance, building cities for people. Surrounded by a green-blue environment in an agricultural region, Zwolle has evolved into a healthy, liveable city with a strong economy. We are part of a broad range of networks and partnerships.

Is there a recipe for excelling in, and accelerating climate adaptation? In Zwolle we find success lies in collaboration, community involvement, and clever, down-to-earth solutions

(feasible and affordable) enabled by SMART. These may very well be characteristics of a mid-sized city that represents a worldwide majority which plays a key role in upscaling climate adaptation.

Maybe this is why we already have a hundred projects to demonstrate, widely varied in scale (from inflatable rubber dam to rain barrel), theme (city climate to agri-food) and participants (from citizens to government). Our delta can therefore be seen as a demonstration delta for scalable initiatives in climate adaptation.

We would like to share our ideas and practical results, not only to test them further. But also to help broaden and deepen the body of knowledge on climate adaptation. Expertise which is needed more than ever, now that the occurrence of weather extremes intensifies.

Yours sincerely,

Henk Jan Meijer
Mayor Municipality of Zwolle

Herman Dijk
Chairman regional water authority
Drents Overijsselse Delta

Ank Bijleveld-Schouten
King's Commissioner Province of Overijssel

Hans Broekman
Real Estate Manager
Dutch Rail





The DNA of our delta

Water is a cornerstone of our identity and mindset. Living with water, working together on water: it is traditionally in our genes.

We have had to battle together to keep our feet dry, but at the same time, water brought us wealth. It has unified our society and it is part of our DNA. This has made of Zwolle an economically flourishing city in the IJssel-Vecht delta. Its scale, dimensions and the solutions it has found make this delta the ideal demonstration delta.

Room for the River project Westenholte





Ramspol inflatable rubber dam, the only inflatable rubber dam in the world intended for use as a surge barrier. It rises 10 m above water in case of a storm.

A rich history surrounded by water

The first polders were constructed in the Middle Ages. Waterways were dug and diverted and flood dykes were built. The IJssel-Vecht delta is one of the areas in the Netherlands where the centuries of battling the water shaped the landscape: the flood dykes, the farms built on mounds, the pools resulting from dyke breaches, the creeks, the unique Hanseatic cities and geometric parcelling of the Mastenbroek land (one of the oldest Dutch polders), the vastness of the landscape and the floodplains of the IJssel, where history dates back to 1308.

We have worked, throughout centuries, to keep our delta liveable, and we still do. Just in the last 15 years, for example, we have implemented important projects such as the four Ruimte voor de Rivier (Room for the River) projects in our region. We also installed a giant inflatable rubber dam at Ramspol.

“The Climate Campus can help us achieve our goal of being well-prepared for climate change, for our residents and our housing: no heat stress, but dry feet!”

Erik van der Linden, Manager Real Estate Openbaar Belang, housing association Zwolle region



A valuable legacy

The municipalities of Zwolle, Kampen and Zwartewaterland all lie in the delta of the rivers IJssel and Vecht, in the northern part of the Dutch delta. People have been living with water here for centuries. It all started with building on the high dry ground, the the river dunes and river banks. In fact, that is where the name Zwolle comes from! A 'suolle' is an area of high ground that stays dry during flooding. This ridge of surface sand can still be seen in the varying heights in the city.

Climate Campus

Building on the DNA of our delta, 43 parties (government, vocational training institutes, businesses, research institutes and NGO's) recently declared their intention to develop a Climate Campus. They endorse the importance of developing climate resilient deltas. Excelling, accelerating and capitalising form the common threads in the development of the Climate Campus. It is about connecting the international professional world of knowledge and innovation with the local community in order to excel in climate adaptation.



Participants enjoying the Hanse Convention 'Water Connects' where the international Charter of Kampen was signed last June.

Flevogebouw Zwolle

The RIJP –the government department charged with overseeing the IJsselmeer polders- was stationed in the Flevogebouw in Zwolle from 1940 till 1974. The RIJP was responsible for implementing the construction of the Flevoland polder. Property developer BEMOG is the current owner of the Flevogebouw. BEMOG has recently renovated the premises to be sustainable and is a partner of Climate Campus.



The New Hanseatic League

Anyone reading up on the history of the IJssel-Vecht delta will see that Zwolle's evolution and economic growth have everything to do with water. Water brought trade and wealth. The water system was adapted several times in order to allow Zwolle to flourish.

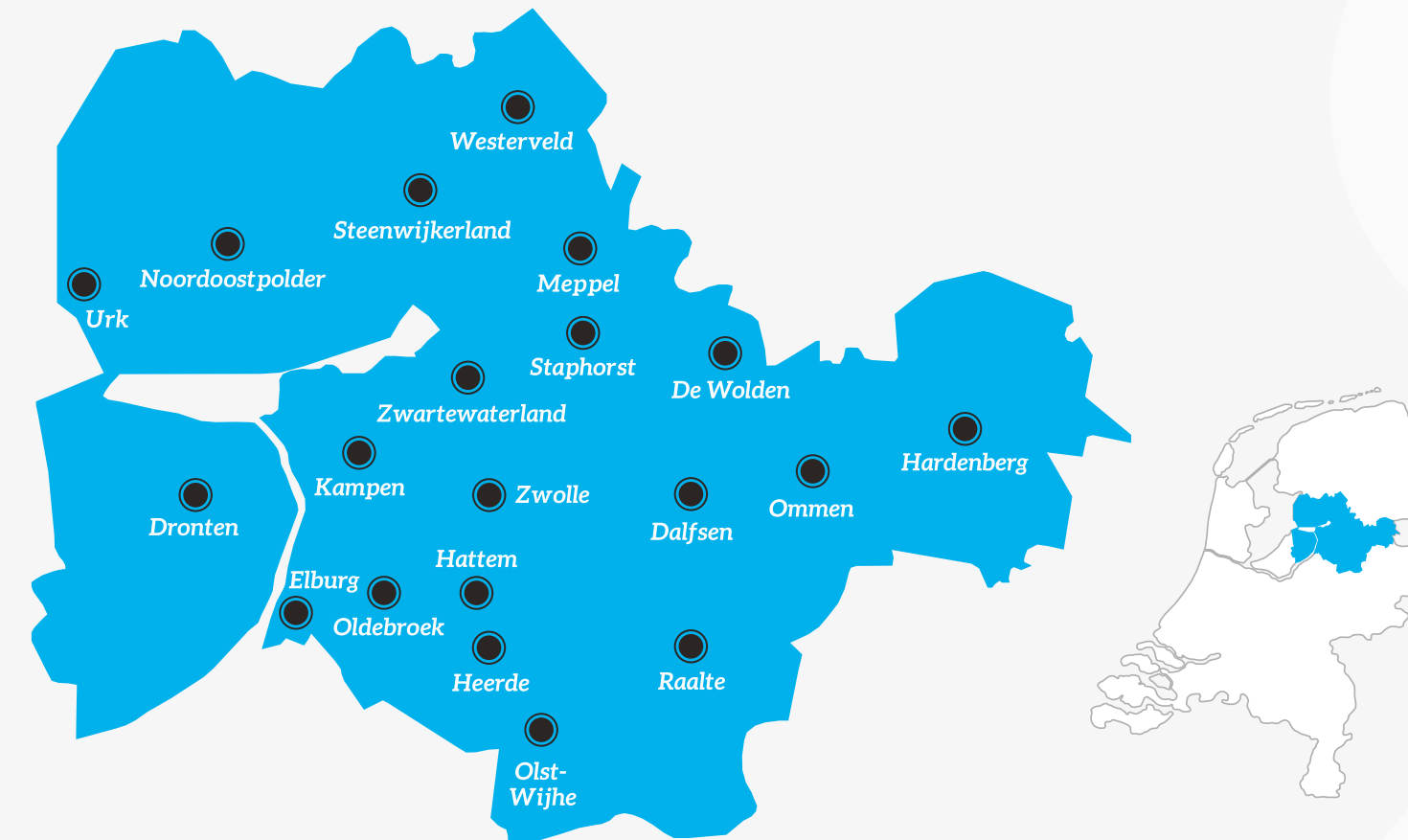
In the 15th century, Zwolle joined the Hanseatic League, a confederation of merchant guilds and their market towns. It was to be the start of Zwolle's own 'Golden Age'. In the 17th century, another Hanseatic city in our delta, Kampen, was actually nominated to be the capital city of the Netherlands

because of the wealth and huge number of trading activities. The New Hanze was founded in Zwolle in 1980, a cultural, social, economic and civic collaborative partnership of former member cities of the Hanseatic League.

The International Hanseatic Days 2017, an event full of festivities took place in June, in the city of Kampen. During the Hanse Convention, 'Water Connects', the Charter of Kampen was signed, with which International Hanse cities declare their intention to collaborate in the field of water safety and climate adaptation.

Flourishing economy

Our region is still performing well economically. Zwolle has been ranked in the top 3 successful economic locations for many years now. The economic successes are confirmed by a recent large-scale research (2016), 'The power of East Netherlands' (De Kracht van Oost-Nederland). The East Netherlands region plays a leading role in the applied knowledge economy, has a high level of productivity and more highly-trained people staying in the region than leaving it. The regional economy is specialised in top sectors, such as agri-food and high-tech and it is characterised by the large number of family businesses, stable growth and social identity.



Economic facts Zwolle region

3rd	economic hotspot in the Netherlands
677.839	inhabitants
318.500	jobs
growth	above national average
21,5 billion	added value for businesses
76%	family businesses



Climate Active City, a movement of 33 parties united to building a climate resilient IJssel-Vecht delta

A culture of solidarity and cooperation

Zwolle also has a rich history in the ecclesiastical, educational and administrative fields, where problems and malpractice were tackled and improvements were carried out. Proponents of the Devotio Moderna were very active here, while Zwolle resident Joan Cele made sweeping changes to education and Thorbecke founded our

current Dutch democracy. Our culture is characterised by solidarity. There has always been great mutual trust and a consideration for each other's interests. We are capable of putting important social matters first. The way in which we are used to cooperate was remarked as excellent in a recent study (Maak verschil) by the Ministry of Internal Affairs, in which Zwolle was a pilot. This is reflected in various projects and collaborative

partnerships, such as Climate Active City (Klimaat Actieve Stad), a movement in which 33 parties (government, education institutions, businesses, social organisation and neighbourhood initiatives) commit to building a climate resilient IJssel-Vecht delta.

One of the features of our delta is the triumvirate of province, water authority and municipality. Within the IJVD partnership (IJssel-Vecht delta)

There has always been great mutual trust and a consideration for each other's interests. We are capable of putting important social matters first.

Government priority

Climate adaptation is given top priority on our government agendas. The province of Overijssel is the initiator and main financing body of the IJssel-Vecht delta programme. Climate adaptation is a strategic spearhead for Zwolle Municipality, and extra funding has been made available.

The WDOdelta coalition agreement mentions the importance of a sustainable living and working environment: water shortages and flooding (and heat stress in the built-up area) to be resolved by the partners, while increasing awareness of water in the residents. There is funding available for initiatives.

there are six authorities collaborating on a future that is climate resilient and water safe. The province of Overijssel, the Drents Overijsselse Delta regional water authority (WDOdelta), the Veiligheidsregio IJsselland (regional safety organisation) and the municipalities of Zwolle, Kampen and Zwartewaterland see this as a joint task. Based on jointly-developed visions and policies, such as the Vision of the Subsurface (2005), Long-term Prospect

(2013), Strategic Water Agenda (2015) and Climate Adaptation Implementation and Sewer plans we work together on action programmes and a wide range of projects. We are presently working within the IJssel-Vecht delta on implementation such as the Regional and Zwolle Adaptation plans, together with various stakeholders.

Cooperative beyond borders

Furthermore collaboration does not stop at the borders of our own region. Due to the great diversity of climate adaptation challenges in our delta, we take part in a number of sub-programmes of the National Delta programme, covering a wide range of urban and agricultural climate adaptation issues. We are therefore one of the first to participate actively in the Delta Programmes: Spatial Adaptation, Water Safety, Rivers, Fresh Water Supply and IJsselmeer.

Zwolle Municipality is the initiator of the national City Deal Climate Adaptation, a collaborative partnership that works towards realising the national delta decision on spatial adaptation. In our region, we are working hard to implement the delta plan for agricultural water management, in projects such as 'future-proof farming in wetlands'. The WDOdelta water authority is extremely active on a global level, including in South Africa, Ukraine and Burkina Faso.



Capacity building in Sincobile Highschool (SA) on water sanitation

South Africa projects

A number of projects are running in South Africa. An important common thread is the collaboration between Dutch and South African water authorities and municipalities (capacity building). The Hydronet Water Control Room Project, by Climate Campus partner Hydrologic, recently won the 'Partners for Water' award. The demonstration project is a big success: there have already been 25 contracts signed in South Africa for the application of this type of water management.



Future-proof farming

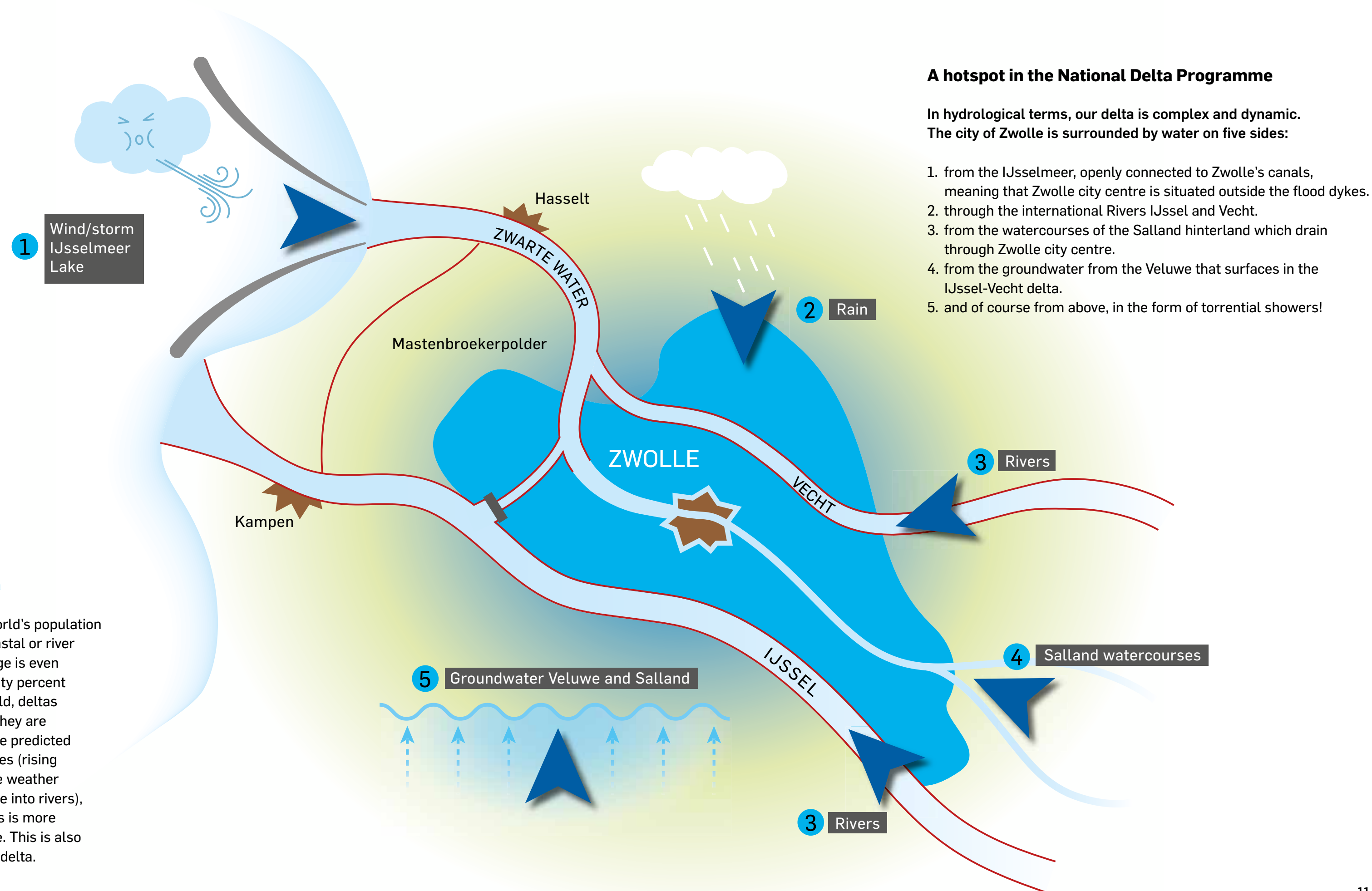
All agricultural entrepreneurs are familiar with subjects such as waterlogged ground, too little capacity, ground that is too dry, disruptive layers in the subsoil or poor drainage. In a joint project the cadastral authority (Kadaster) and the Vechtdal regional water authorities are involved. They support and advise agricultural entrepreneurs in taking measures to solve issues with soil and water to improve the absorption of water.

Farmers depend extremely on weather conditions. Yields are threatened by too much water or drought. Climate change demands a very adaptive attitude from farmers. They are looking for helpful measures to prevent waterlogged soils by improving organic matter, solving disruptive layers, creating better drainage and irrigation techniques and the application of new crops.

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A full-fledged delta on a manageable scale

At present, half of the world's population lives in deltas, and in coastal or river areas, and this percentage is even expected to rise to seventy percent in 2050. All over the world, deltas are economic hubs, but they are also vulnerable. Given the predicted continued climate changes (rising sea levels, more extreme weather conditions, more drainage into rivers), the vulnerability of deltas is more relevant than ever before. This is also true for the IJssel-Vecht delta.





Mid-sized cities

Although the definition may differ globally, mid-sized cities have one thing in common, they represent the majority.

They are cities that have fewer residents, a smaller surface area and a greater dependence on the surrounding region and regional partners. They generally have fewer resources at their disposal and often attract less money and knowledge than metropolises.

They respond by being inventive and efficient. Their answer is to come up with smaller-scale, clever projects with plenty of impact. More importantly, mid-sized cities need a reciprocal relationship with their social and physical surroundings in order to get things done. The impact of issues and solutions often reach beyond their city limits; they are less able to act autonomously, which makes them cooperative by nature.

High & dry, low & wet

The IJssel-Vecht delta is a cultural historic and vulnerable landscape, with unique delta nature. Another feature is the agricultural function of the outer areas. We have both low-lying wet polders and higher, dry catchment areas. Engelse Werk, the drinking water extraction plant, is close to Zwolle city centre. This combination makes the IJssel-Vecht delta special, also from a national perspective.

All-round delta city

The versatility of our delta leads to a great diversity of climate adaptation issues, including drinking water supply,

water safety and flooding, city climate and ensuring sustainability of the agricultural sector. Solutions are needed at every level, from rain barrels to inflatable rubber dams. Those solutions can all be found in our delta, and with them we are not only illustrating the many aspects of climate adaptation in deltas: while many researchers, politicians and policy makers concentrate their efforts on the large cities and metropolises, our city may well exemplify the majority of mid-sized cities worldwide.

Ingenious solutions

Mid-sized cities have a characteristic and interesting dynamic. In the case

of complex tasks such as climate adaptation, they are obliged to be creative, come up with ingenious solutions and form effective collaborations. And that is what happens in this region. The diversity of issues here has sparked skills and solutions that could well be utilised in other mid-sized cities. They are what has made Zwolle an all-round delta city, and the IJssel-Vecht delta a full-fledged demonstration delta.

The diversity of issues here has sparked skills and solutions that could well be utilised in other mid-sized cities.



The housing we are offering

We will welcome the GCECA in the Spoorzone district, the area around Zwolle Central Station.

The building takes its inspiration from the DNA of our delta and the urban development in the district. The architectural design reflects characteristics such as solidarity and humanity, the history and culture of living with water, the relationship between the city and the delta and the hands-on mindset. It perfectly suits the 'Spoorzone', a city development dedicated to climate adaption and housing multiple stakeholders.

The development of the Spoorzone district is in full swing



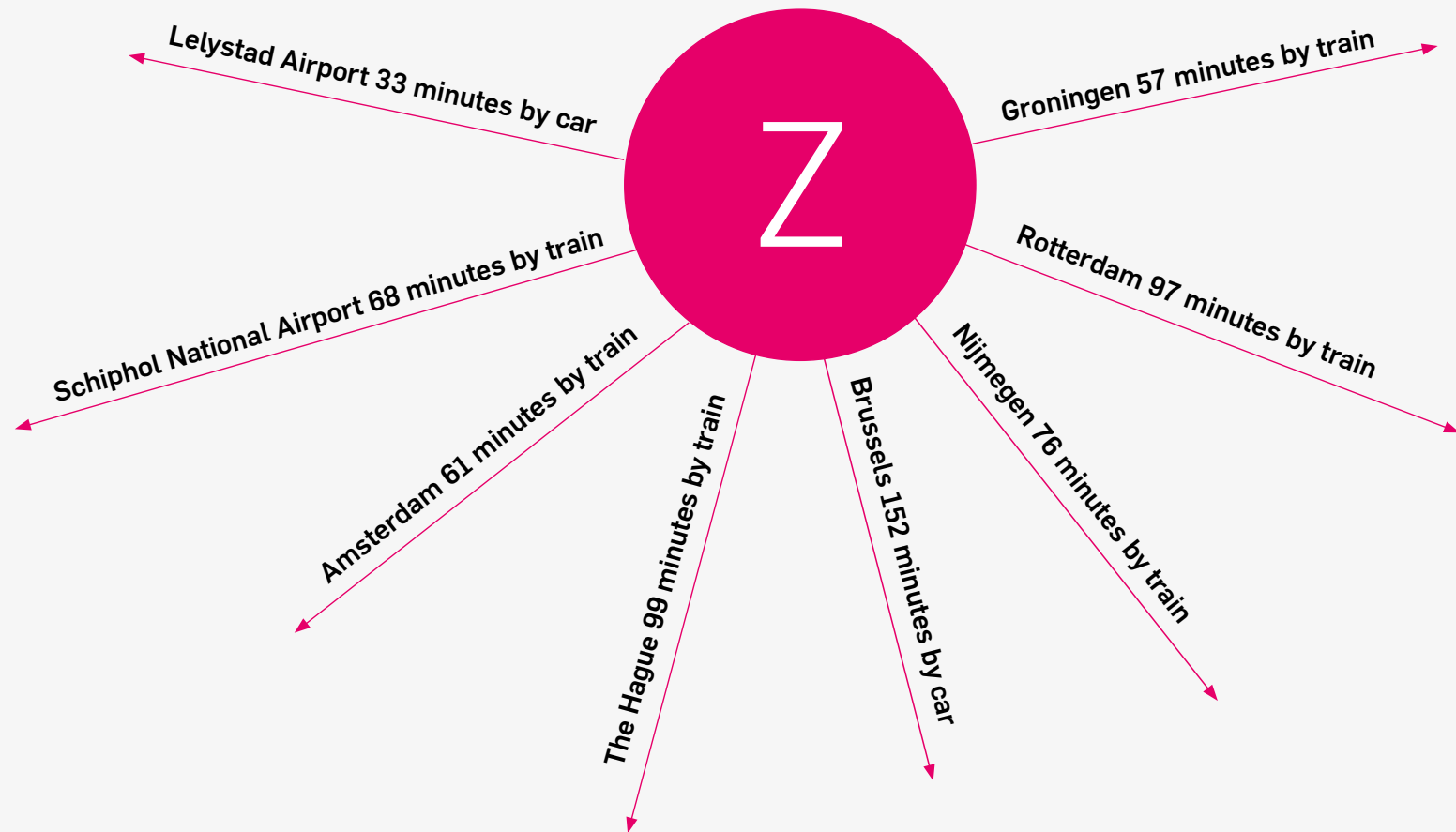


A district that connects

The Spoorzone district is an area of connections between infrastructure and functions, between people and knowledge. Zwolle is a road, rail and waterways hub, and as such has a central position in the national infrastructure. It is the second railway hub in the Netherlands. Passengers can choose from eight directions out of Zwolle: Amsterdam, The Hague,

Groningen, Nijmegen, Rotterdam and Schiphol national airport all directly accessible within a journey of an hour to an hour and a half. Lelystad airport is only half-an-hour away.

The Spoorzone district is also easily accessible by road. Within five minutes, you are on the A28 motorway towards Amsterdam and Groningen, or the A50 towards Arnhem and Eindhoven.





The spirit of the Spoorzone area

The GCECA will be accommodated in the heart of the demonstration delta, adjacent to the south-side entrance to Zwolle Central Station, right in the middle of the lively Spoorzone district. With 1,000 residents, 8,000 jobs, 20,000 students and growing rail passenger numbers (upwards of 60,000), it is a district with ambitions. Zwolle is increasingly being chosen as a business location and meeting place. The city is

keen to make better use of its strategic position as an outstandingly accessible connecting point between the area formed by Amsterdam, Rotterdam, The Hague and the north of Holland. The development of the Spoorzone district is in full swing, and we are improving the physical infrastructure for example, by redesigning the station forecourts. But the ambitions do not stop there. The Hanzeland district, to the south of the station, is being transformed from an office district into

a multi-functional sub-district, linked to the city centre.

The standards set for the Spoorzone district are high: become an icon of climate adaptation and energy transition, not only in terms of technical solutions, but particularly in the experience value for residents and users. It should be an alluring place where climate adaptation and energy transition are visible and tangible.

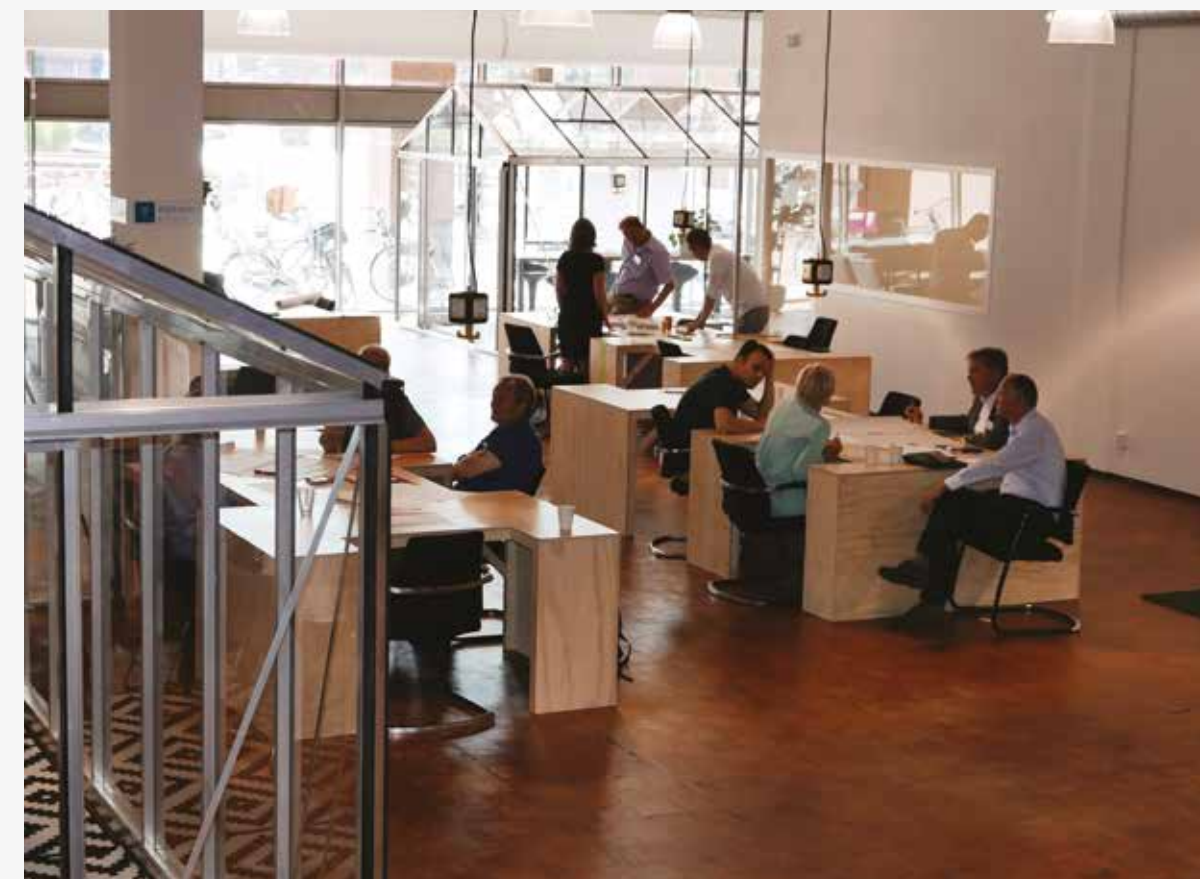
The 'Friends of Hanzeland' share ideas about the development of the Spoorzone district and offer practical help.

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"Green and blue support the climate resilient area development. Knowledge, experience and network come together in the Climate Campus. VHG Branch Association is happy to link the network of entrepreneurs in the green to this."

Egbert Roozen, director VHG branche association for entrepreneurs in the green



Brainstorming in BrainZ, one of the creative breeding grounds in Hanzeland for entrepreneurs, education, government and local residents. You will find Windesheim University students here on a daily basis, and Zwolle Municipality and Cadastral agency staff, for example. The Urban Data Centre Zwolle (a collaboration between Zwolle Municipality and Statistics Netherlands) is also housed in BrainZ. There is a Fr-I-day Innovation event every first and third Friday of the month.

Because of the strategic position of the Spoorzone culture, education, housing, offices and care are all within easy reach. Creative breeding grounds such as City Lab BrainZ are happy to settle here, as are the start-up entrepreneurs you will meet at HanZ and Citypost.

In addition to developments such as the construction of a bus bridge, seven metres tall, crossing 16 railway tracks,

there are also countless smaller-scale initiatives. Hanzeland, in particular, at the south side of the station, has an active community. The 'Friends of Hanzeland' is an association that not only shares its ideas about the development of the Spoorzone district, but also offers practical help. At present, plans are being made to make the Lubeckplein (city square) green and climate-proof.



Home base of the Climate Campus

The Spoorzone district is also the home base of the Climate Campus. Building on the DNA of our delta, 43 parties (government, education institutions, businesses, knowledge institutes and social organisations) recently declared their intention to develop a Climate

Campus. The parties endorse the importance of developing climate-proof deltas. Excelling, accelerating and capitalising from the common threads in the development of the Climate Campus. It is about connecting the international professional world of knowledge and innovation with the local community in order to excel in and accelerate climate adaptation.

In addition to the usual partners, such as government, consultancy firms, nature and environmental organisations and education institutions, also housing associations, the trade association of landscapers, parties from the agri-food sector, data and geodata parties and other internationally-operating parties have joined.

Various Climate Campus partners have been actively involved in the initiatives in our demonstration delta for some time now. On the 1st of December, the Climate Campus will launch its first action plan.



"Delinea contributes to Climate Change Adaptation through model and software development in projects in which African countries prepare themselves for drought, floods and tropical cyclones. Not just aid, but adaptation. That's the ticket!"

Frederik Rosman, CEO Delinea geo information technology and partner of Climate Campus





A 'Global Village'

A collection of distinctive houses form GCECA's 'Global Village', expressing the human dimensions and scale of our delta, in separate solid volumes. It symbolises the connection between GCECA's global network and local communities. Together they scale up climate adaptation to a new way of life, making the global village inviting and hospitable, unambiguous and climate adaptive.

Striking elements

A transparent walkway connects the collective spaces to the individual work stations. Materials and details create an ecosystem including small-scale applications of climate adaptation, as an inviting prospect for the public. It

provides easy access to a unique hub in which all stakeholders can engage in initiatives that will accelerate climate adaptation.

Choice of materials

The materials chosen are sustainable wood for construction, re-used sea containers, green roofs and façades, transparent PV cells and various public design elements. Climate adaptation has been applied on a small scale, with the aim of making new innovation visible within the next five years.

By constructing the building in separate volumes, it will be possible to place the individual elements in other locations in the Spoorzone district, to be used as gallery space, work stations or information kiosk.

GCECA staff will be treated daily to a view of peaceful, water-enriched surroundings that contrast starkly with the hustle and bustle of the station and the city.

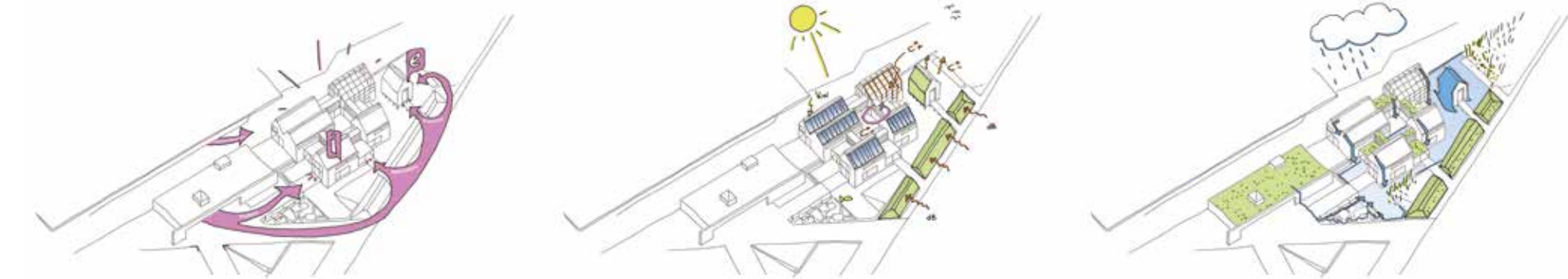


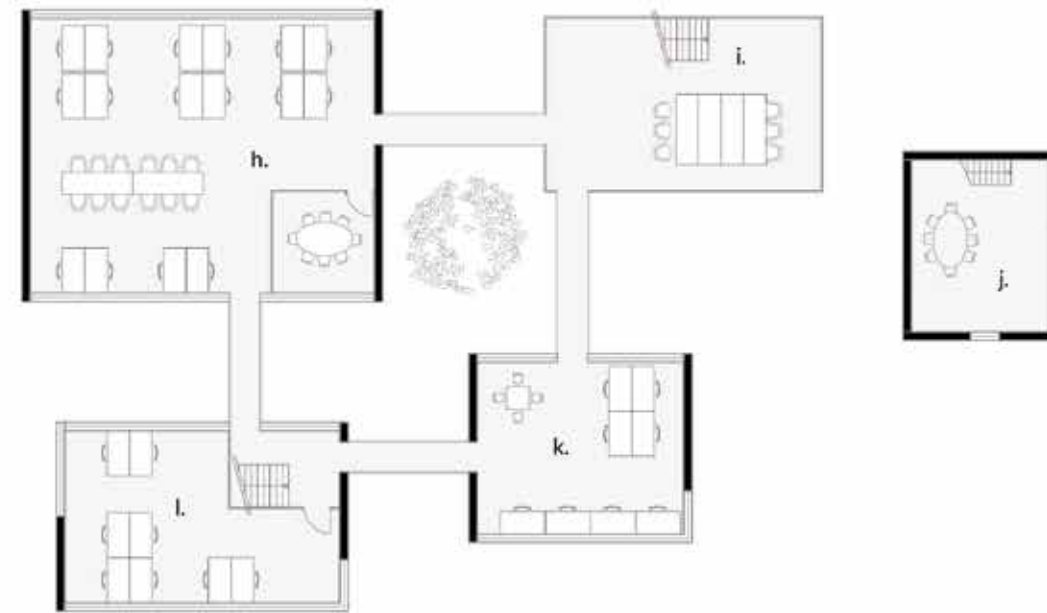
The water system of the IJssel Delta

Zwolle's topography and surrounding landscape exemplify the Dutch way of 'Living with Water', and the GCECA offices will be an excellent operational base for numerous model projects in our demonstration delta. Mutual inspiration between the GCECA and its guests will literally connect the global and local communities.

The entrance building and the GCECA are part of a water installation visualising the water system of the

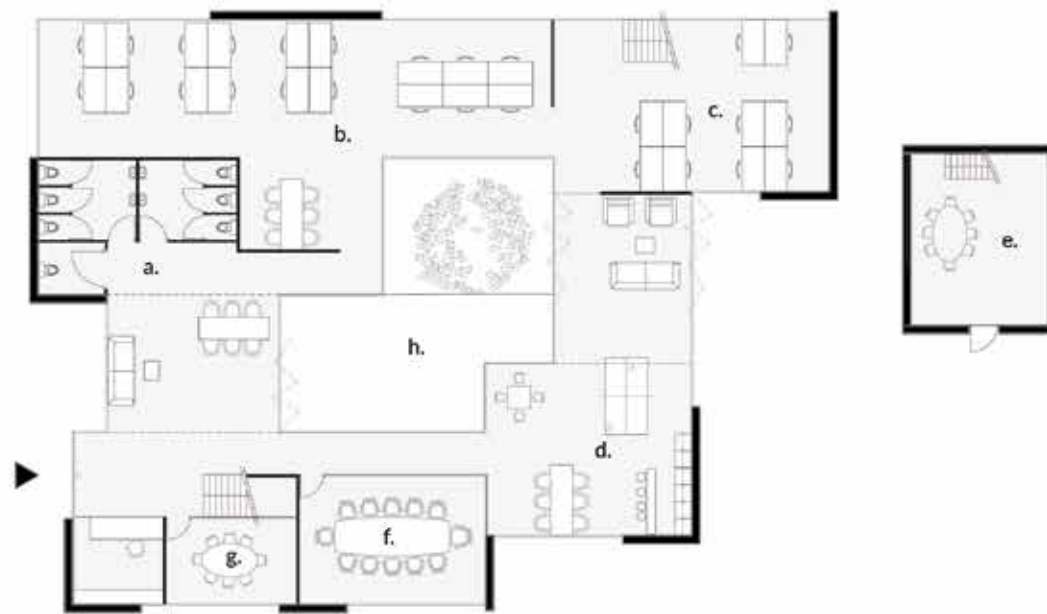
IJssel delta. At the bottom of the iconic tower there is a water tap with which the watercourse can be switched on. The water runs off from the tower, along the roof to a wall of water, adjacent to the entrance of the GCECA. There the water lands in a system of low lying 'polders' (with a pump). Behind the water wall a historic picture is visible showing how Zwolle's history is intertwined with water. The installation is a symbol of our vulnerable dependence on technology, therefore it is also an urgent appeal to adapt to the changing climate if we want to keep our IJssel delta livable and prosperous.





First floor

- h. workspace or presentation room 16 workspaces / 126 seats
- i. workshop area / multifunctional space
- j. small meeting room
- k. 8 workspaces
- l. 8 workspaces



Ground floor

- a. reception / entrance / toilets
- b. 18 workspaces
- c. 10 workspaces
- d. kitchen / recreational area
- e. exhibition space
- f. large meeting room
- g. small meeting room
- h. garden / water



Skills of the housing

Type of building:

A new self-contained, autonomous, climate adaptive modular, flexible and circular building, 750 m2.

Working space:

28 seats ground floor, 16 seats first floor, option of another 16 seats.

Meeting facilities:

4 meeting rooms (3x8 seats, 1x12 seats), option of 1 room with 126 seats. The layout is flexible.

Kitchen facilities:

The building will have a canteen with a kitchen and lounge area

Up-to-date internet infrastructure:

The modern office building has access to a state-of-the-art fibre optic internet infrastructure.

Easy access to catering facilities:

There are several catering facilities nearby, commercial and public.

Water, electricity and heating:

All utilities are included, provided by solar panels, a local water system and a helophyte filter.

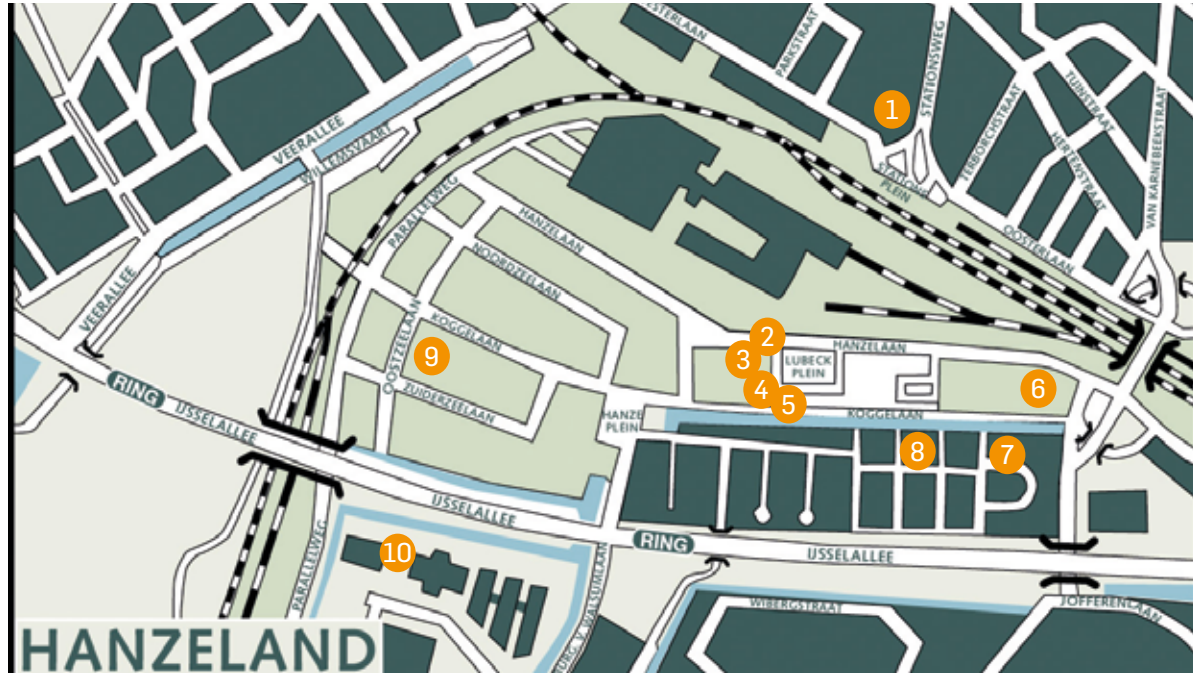
Insurance:

The building is property of Zwolle Municipality, covered by the municipality's insurance package.

Cleaning services:

Cleaning services are available through an external provider, funded by bidders.

Given the short construction time and length of use, this temporary office building (5-10 years) will be flexible and modular, with a circular character. It offers space for around thirty work stations, conference rooms and kitchen facilities.



- 1 Wavin Mexichem
- 2 CBS Urban Data Center
- 3 BrainZ
- 4 Nederlandse Spoorwegen
- 5 Royal HaskoningDHV
- 6 Arcadis
- 7 Kadaster
- 8 Esri Nederland
- 9 Groene Welle
- 10 Windesheim University of Applied Sciences

The Zwolle region has more to offer

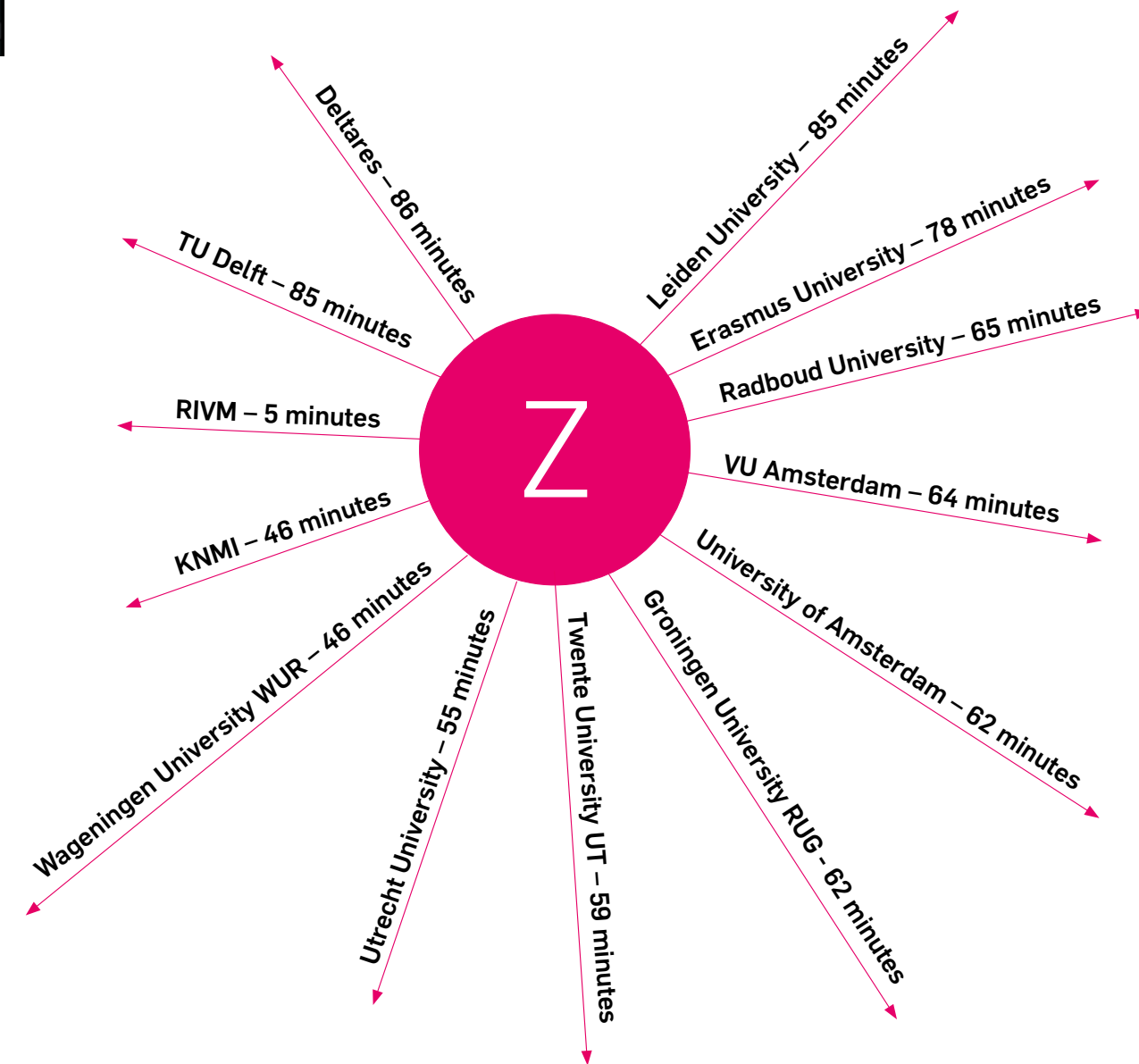
Proximity of partners

Zwolle is centrally situated in the Netherlands and easily accessible. The city is the middle point of services in Northeast Netherlands, and many businesses and organisations have an office or their headquarters in Zwolle.

You will find the offices of internationally-operating consulting firms such as Arcadis, Royal HaskoningDHV and Sweco in the Spoorzone district, along with internationally-operating companies such as Wavin-Mexichem, Scania and Abbott Laboratories.

A number of insurance companies, banks and property developers have offices in Zwolle: Univé, Zilveren Kruis Achmea, Rabobank and ABNAMRO. The head offices of the largest financial institutes are only forty-five minutes to an hour and a half away.

With the exception of the University of Maastricht, all Dutch universities can be reached within one hour and a half. And the same goes for research institutions such as KNMI, RIVM, CBS and Deltares. Organisations in our delta collaborate with universities and education institutions, in particular UTwente, TU Delft, WUR, Deltares, KNMI, CBS and Radboud University, some of whom are also partners of Climate Campus. They are often to be found in Zwolle.



The striking Waanders in de Broeren, a Gothic church dating from 1466 that has been transformed into a book shop.

Excellent amenities

The city that fulfils an important central function for a large region offers a rich choice of urban amenities such as shops, theatres, museums, pop venues, sports clubs and events.

Zwolle's historic city centre is within walking distance of the railway station. There are many historic buildings to be found here, including the striking Waanders in de Broeren, a Gothic church dating from 1466 that has

been transformed into a book shop with a brasserie, art gallery and culture. Waanders in de Broeren is, understandably, one of the most beautiful book shops in all of the Netherlands!



Zwolle's events and festival agenda has a lot to offer.



The striking architecture of Isala hospital



Every week there a several markets in Zwolle's city center.



The Librije, Zwolle's top restaurant, is close to the Spiegel Theatre.

There are hotels and Bed and Breakfasts in a variety of price ranges close to the station, and you will find a great selection of restaurants. Zwolle has been in the top ten culinary cities in the annual publication Atlas voor Gemeenten for years now. The best restaurant in the Netherlands, with three Michelin stars and ranked 34th in the world is 'De Librije' in Zwolle's inner city. It is ranked 34th in the list of the World's Best 50 Restaurants 2017.

Just half an hour away is International School Eerde, located on the premises of Eerde Castle. It offers English language education for secondary and vocational colleges. Isala (the old name for IJssel) is the largest non teaching hospital in the Netherlands, with high-end clinical specialties such as heart and neurosurgery, oncology, radiotherapy and dialysis. The region offers a broad selection of urban amenities, but for anyone wishing to make use of amenities in any of the large Dutch cities, Amsterdam, Utrecht, The Hague and Rotterdam are all less than an hour and a half away by car or train.

The 'Maagjesbolwerk', a former fortress houses several luxury apartments by the Zwarte Water.



International School Eerde



PEC Zwolle, the city's pride and joy.



The Fundatie (foundation) with a cloud on its rooftop is Zwolle's museum of Modern Art.





The green banks of the river IJssel offer all kinds of recreational activities, such as hiking, biking and boating.



A green children's playground with a water pump

By urban standards, Zwolle offers plenty of choice in affordable and available housing. Residential areas are built to be spacious and green. Cycling from the suburbs to the city centre takes between fifteen minutes and half an hour at the most, and many people in Zwolle, including children, travel everywhere by bike.



There is a lot of choice in housing for expats. From stately medieval housing in the inner city to roomy villas in residential areas around the centre.



Zwolle's ferry 't Kleine Veer on the river IJssel.



"When you live abroad for a couple of years with your children, an international school with a good reputation in a green, safe, healthy environment is quite an asset. Especially when they offer lots of sports and cultural facilities. Also the proximity of other English speaking expats is important. In Zwolle you can find all this and more."

Pimmy Huisman,
the wife of a UN expat.

Healthy and relaxed living
Anyone looking to enjoy a natural, blue-green environment can be in our countryside in a fifteen-minute cycle ride at most.

According to the Ministry of Security and Justice's 2016 Safety Monitor, Zwolle has an above-average score for safety in the list of the 50 largest municipalities (> 70,000 inhabitants) in the Netherlands. And Zwolle Municipality has one of

the lowest scores when it comes to neighbourhood nuisance and feeling unsafe. Criminality is below average too.

A blue-green region
There are no less than five National Parks in the Zwolle region (Weerribben-Wieden, Drents-Fries Wold, Dwingelderveld, Sallandse Heuvelrug, De Hoge Veluwe). Three water-related UNESCO World Heritage sites can be easily reached from Zwolle: the 'ir. D.F.

Woudagemaal' (the largest pumping station in the world still working), 'Schokland' (a former island in the sea, now surrounded by polders) and the 'Waddenzee' (a sea with great biodiversity, and a coastline influenced more by man than by nature). The Frisian lakes and the IJsselmeer lake, with its lovely beaches are also quickly and easily accessible from Zwolle.



Our demonstration delta

The IJssel-Vecht delta, its heart beating in Zwolle's Spoorzone district, displays a 360-degree approach in climate adaptation projects. Clever concepts are implemented decisively to become best practices that appeal to the imagination.

From green rooftops to a noise barrier that is a flood defense in one and from sensor projects to the high water brigade volunteers, professionals and members of the community get involved. Thus climate adaptation is scaled up in practice in a down-to-earth manner. Is there a recipe for excelling in and accelerating climate adaptation? Ours is collaborating on feasible and affordable solutions, a decades-long commitment to building a 'city for people', community involvement and the application of smart techniques and tactics to become the new standard.





Clever solutions that are feasible and affordable are needed for the new delta works. We have developed and applied a number of ideas in our delta in recent years.

You will find the new delta works in the city

Bearing in mind the changing climate, the traditional, large-scale approach of 'building flood dykes and pumping' alone offers insufficient protection against climate change in the long term. For example, how can we absorb torrential showers, limit the consequences of flooding, combat heat stress, make the water chain sustainable and many more such questions? The answer is to take a lot of small-scale measures, in addition to the large-scale approach in and around the city, in order to cleverly

structure the city and the surrounding countryside. This might involve diverting rainwater from the sewers, adding greenery or protecting vital amenities (drinking water abstraction, energy network, hospitals) for example.

In fact, you will find the new delta works in and around the city! It's a mix of measures at various levels: from urban facade gardens to surge barriers. By now, we have around a hundred projects in the field of climate adaptation. You can read about them at www.climate-campus.nl



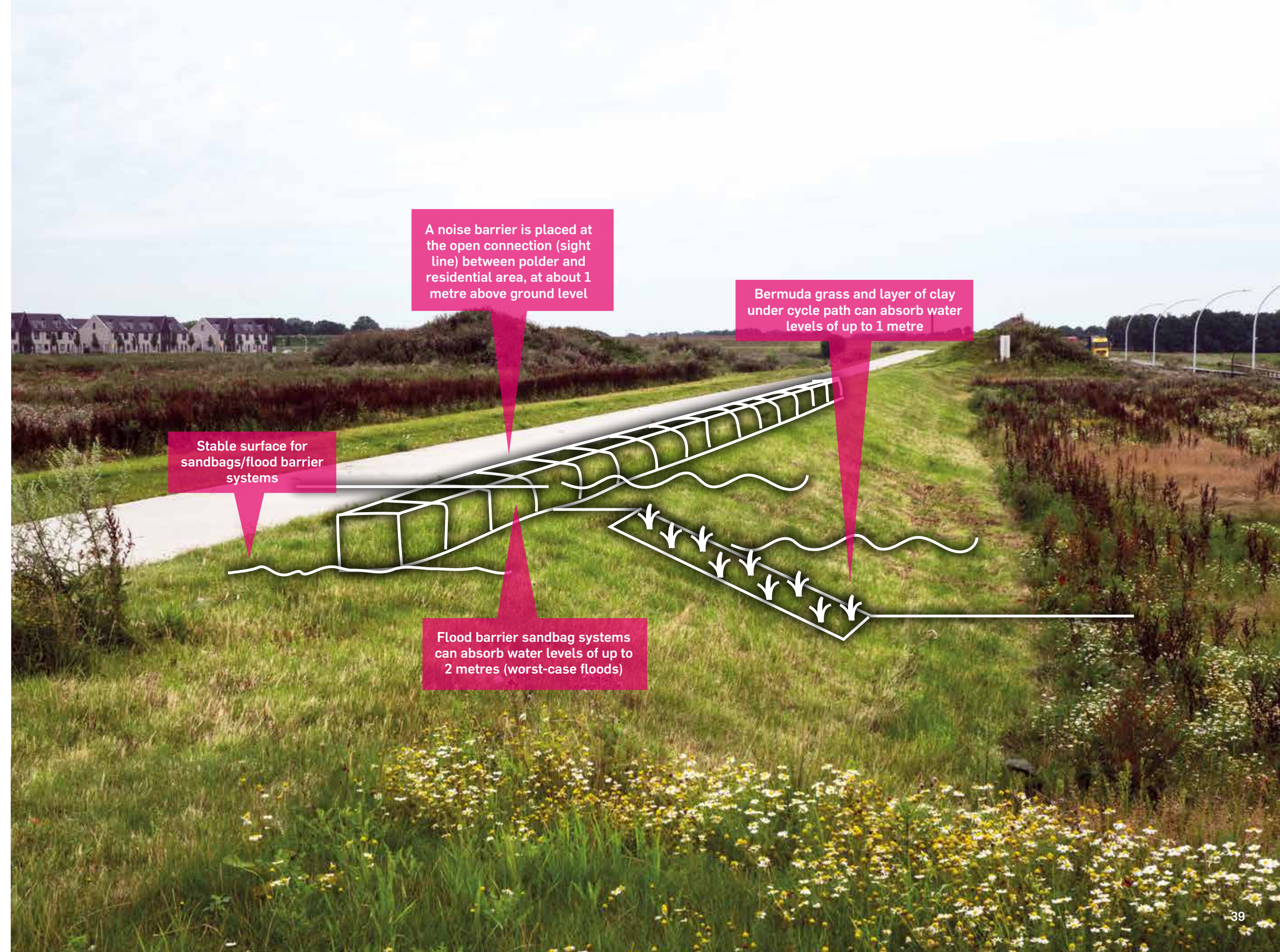
'Delta works in the city'



Stadshagen noise barrier

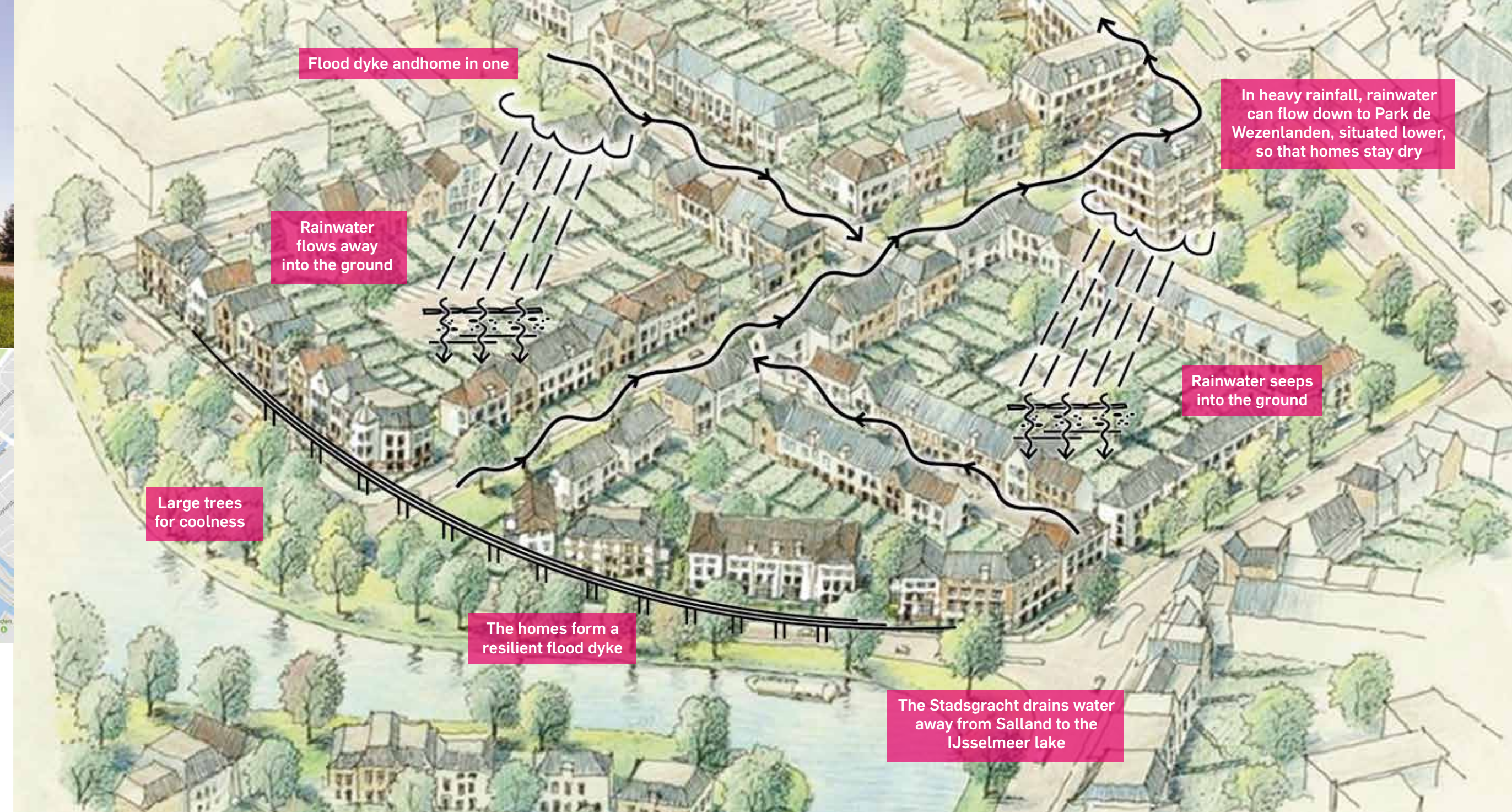
Only a few adjustments are needed to reinforce this noise barrier to make a compartment that offers extra protection against flooding.

The new delta works in and around the city are a mix of measures at various levels.





This historic city centre is located outside the flood dykes, like an island in Lake IJsselmeer. The measures taken on the flood dykes around the city centre are spatially difficult to apply, requiring clever solutions such as incorporating a flood dyke in the road profile (Pannekoekendijk) or even incorporating such dykes in newly-built housing (of Weezenlanden).



A 'flood dyke' has been fitted into the new-build housing project of Weezenlanden by way of a raised waterproof wall which is incorporated in houses on the quay.



Refurbishment of Weezenlanden

A 'flood dyke' has been fitted into the new-build housing project of Weezenlanden by way of a raised waterproof wall which is incorporated in houses on the quay. Another such dyke

has been incorporated in a basement bike park. Other climate adaptive measures include large trees to provide coolness and the redirecting of water from extreme rainfall to the nearby park where it will cause no damage.

Large trees for coolness during long periods of heat enhance the well-being of our inhabitants

Water cascade

By connecting the existing differences in height offered by the landscape, it can work as a 'trap' for excess water, which can then be led, as a cascade, to a place where it will do less damage. This concept has been implemented in the area to the south east of Zwolle. Initial calculations show that an average reduction in damages to the value of 439 million euros is possible!

Another innovative concept is that of 3D thinking with regard to water management. The concept has been laid out in the Visie op de Ondergrond Zwolle (2005). Groundwater flows from the Veluwe to our delta, where it surfaces. This flow of water is rather like a third river in our delta. This river is clean, flows slowly and is ideal for storing excess water and supplying the delta during dry spells. These concepts have been applied in the developing location of Breezicht. Breezicht is being designed to be as climate adaptive as possible as an example of 'the new normal'.

Breezicht

In the expansion neighbourhood Breezicht, groups of houses are being built on newly-constructed mounds. The

blue-green areas in between offer not only a high quality of public space to the area, but are also utilised in Breezicht's 3D water management. Rainwater is diverted from the sewers, and led from the houses to the blue-green areas. Excess water flows as a cascade by way of the terraced effect in the blue-green structures away from the area. The blue-green structures are also being constructed extra low, to connect with the aquifer. This ensures that fresh water is available during dry spells, and that profits people, plants and animals.

Vision of the Subsurface

This paper includes a description of the course being set out to protect drinking water abstraction at Engelse Werk, the use of the '3rd river' of groundwater to solve water supply issues, spatial planning of the substrate and groundwater and the use of energy from water and groundwater. The vision has won not only a national prize (the Columbus' Egg prize for collaboration within the project) but also an international one (the Brownie Award for dealing with pollution of groundwater).



3D water management the expansion neighbourhood Breezicht. Rainwater is diverted from the sewers, and led from the houses to the blue-green areas. Excess water flows as a cascade by way of the terraced effect in the blue-green structures away from the area.



Community involvement

Doing things together

In order to get climate adaptation implemented at all levels, we need a community that is involved, if only because half of the city is privately owned. We have various ways of achieving that. The common thread is doing things together. And we're happy to do things together, as the 'dyke army' and 'Kampen High Water Brigade' show.

Kampen High Water Brigade

is a team of volunteers who, in the event of extremely high water, will put together a flood barrier consisting of 84 components such as sheet piles, waterproof doors and valves in the road surface. Together, they keep Kampen Midden district safe and dry. The components are distributed among homes. For example, one is incorporated in the toilet of a resident who lives outside the flood dykes. The brigade holds annual exercises.



The volunteers of the High Water Brigade in Kampen building up a temporary dam in the city centre against the rising water.



"Aeres Hogeschool researches vertical farming, an innovative method of cultivation with low input and great circularity, involving the application of smart data, leading to food safety and a sustainable effect on the climate."

Rieke de Vlieger MCM,
director of Aeres Hogeschool

The involvement of youth

Students and schoolchildren are also involved. We are keen to make them aware of the importance of climate adaptation. And young people's fresh way of looking at things often points us in new directions in our search for solutions, which is why we collaborate with education institutions. More than 2200 schoolchildren and students

have been involved in the climate adaptation theme since 2014. By way of 30 projects, they have helped to set up and implement events, design climate adaptive gardens for residents and develop apps and publicity campaigns for the SDGs. For example, Artez Hogeschool voor de Kunsten developed the creative concept 'Zwolle aan de IJssel'.



Inspiration and awareness

Culture and the arts are carriers of our delta DNA.

There are regular performances, exhibitions and public events, such as in the past, the 4-Day Water Event and more recently, the summer exhibition on water in Museum de Fundatie, the IJssel biennial and the open-air 'Operatie IJssellinie' show. We organise more serious events too on a regular basis, such as inspiration sessions for Klimaat Actieve Stad, congresses and symposia. The TEDx Climate Active Cities took place in Zwolle in 2015.

We also achieve inspiration and awareness by introducing climate adaptation on time in developments where that is not yet regulated by law or by contract. Such interventions are not necessarily expensive. By getting involved on time, developments can be implemented climate adaptively with simple and affordable measures, as was the case with Wehkamp.



Solar panels and thermal energy storage in the ground as sources of sustainable energy

Wildlife garden



Green roof on bike park collects and retains clean rainwater

Servers and vital business facilities are located on the first floor so that in the event of flooding, the company can continue its international operations

Wildlife garden for bio-diversity

Wehkamp

This large online store has the biggest automated distribution centre in the world. That means that their servers are vital to the company. To limit risks and damage from flooding, the servers are located on the first floor.

"As a business, you have to take your surroundings into consideration. And if you're located in an environment that is at risk of flooding, you must take preventive measures. We placed the servers in our new premises on the first floor, for example."

Andries van Daalen, Former Programma Director Wehkamp, voorzitter ZwolleFonds.

Climate street Seringenstraat started with a soil remediation, for which part of the street had to be dug up. In that process, the gardens were made climate adaptive by disconnecting rainwater from the sewers, installing green roofs and constructing façade gardens. And a novel idea was introduced: the rainwater fence.



Adriaan Mosterman is interviewed by Dutch press on his "Climate street"

Lastly, we inspire by way of model projects for residents (climate street Seringenstraat), businesses (Hornbach), municipality and property developers (Breezicht), housing associations (Weezenland Noord) and many more.

Climate street Seringenstraat

A collaboration between residents, government, education and businesses resulted in a win-win situation. It started with a soil remediation, for which part

of the street had to be dug up. In that process, the gardens were made climate adaptive by disconnecting rainwater from the sewers, installing green roofs and constructing façade gardens. And a novel idea was introduced: the rainwater fence. Students at Groene Welle contributed to the design, a local landscape gardener helped the residents with the work and government (municipality, water authority) offered advice and helped with funding.

Increasing awareness remains necessary. We campaign to make entrepreneurs and residents aware of the need for water safety and climate adaptation and offer tools with which they can take their own smaller-scale measures to develop and build in a climate resilient way. And that, too, we do together with our community.



Green roof collects and retains rainwater and adds a pleasing, green appeal to the area

Crates placed below paving to collect rainwater from paving and roofs. Once in the crates, the water seeps slowly into the ground

Green gardens with permeable paving

A lot of capacity for the collection of rainwater, meaning less flooding and reduced risk of damage



Landstede Media Academy – Groeten van CRIZ

In the run-up to a campaign, students developed material for a climate-active city campaign called 'Greetings from CRIZ'. In a collaboration between government, volunteers and teachers, the whole of the second year was introduced to the theme of climate adaptation. Afterwards, students created a logo for a publicity campaign and they are now working on a website.

Connecting the professional world to the community

The most important key to the acceleration of climate adaptation is in connecting the professional world to the community. The professional world develops solutions, business cases, etc. The community has to work with them, is the end-user and expert by experience, and knows what's needed.

We are looking into smart ways of connecting the Climate Campus with the Hanzeland community, within the inter-regional CATCH project, for example. Can we unite these worlds, professional versus amateur, into being just the



GROETEN VAN
Climate Responsive Initiatives Zwolle
CRIZ

people they are? We believe we can. After all, professionals are also citizens, and vice versa. This is why we started the 'Water aware Stadshagen'.

Water aware Stadshagen

is an experiment involving the professional citizen. We see that citizens in general are more than willing to contribute to their living environment, but are reluctant to constantly take a leading role. We aim to close this gap by involving professionals in the neighbourhoods they live in.

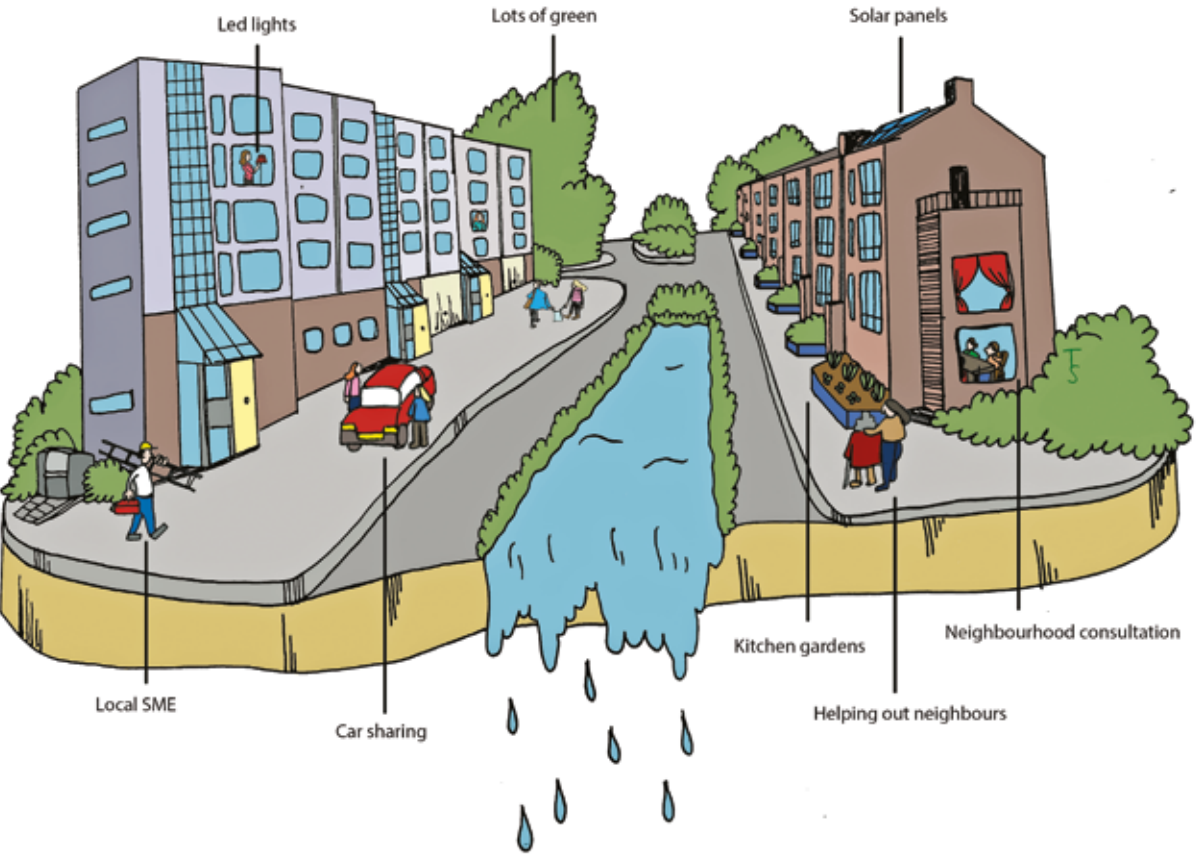
They work partly in their own time, as residents of the neighbourhood, and partly in their boss's time, as professionals. They might be municipal employees, water authority staff or people who work in education institutions. For consulting firms or SMEs, it can also be an addition to their CSR policy. It's a modern-day way of expanding neighbourhood initiatives while at the same time, giving employees the chance to further develop. It would be interesting to investigate whether this could be an effective new role for government.

To measure is to know

Development of the research agenda

It's important to continually develop and apply new knowledge. And on the other hand, to formulate research questions from practice. Our delta is known for its practical applications, but it also works closely with universities and research institutes. This might be for technical expertise, such as in the

international GreenBlueCities project carried out together with Delft University of Technology, and the collaboration with Wageningen University on urban climate, or it might be for data projects with the KNMI, or for the relationship between climate adaptation and the socio-economic development of neighbourhoods, as we do for Dieze-Oost with Deltares.



Windesheim University of Applied Sciences

A renowned university with many research programmes is located in Zwolle itself. Of course, the Climate Campus has an important role too. We prefer to develop new knowledge together with the community, as we did with Wijbedrijf in Dieze-Oost.

Dieze-Oost

The experiment carried out in Dieze-Oost had its roots in an underlying question about how climate adaptation and nature-based solutions can contribute to the socio-economic development of a neighbourhood. In the experiment,

residents associated in 'WijBedrijf Dieze', worked together with the municipality in structuring the neighbourhood's water system to be future-proof while meeting needs such as lower living expenses, job creation, a worthwhile living environment and a hand in organising that. This approach requires financial innovation, and the first draft versions are already on the table.

The experiment is being supervised and supported by ToekomstSterk and Deltares and is partially financed by the Topconsortium voor Kennis en Innovatie Watertechnologie.



SMART

To measure is to know. Therefore we need data and models. There is close collaboration with the 'SMART Zwolle' programme data and geodata parties such as Esri Nederland, Kadaster, CBS, RIVM and KNMI. The 'SMART Zwolle' programme recently won the award for

best vision at Smart City, and has an ISO 37120 certificate. Climate adaptation is a top priority within this programme.

The Urban Data Center Zwolle opened recently, and the Senshagen project is currently in development. Crowd sourcing is one of the ways in which we

validate our models. Following a recent torrential shower, we asked citizens and businesses to report any nuisance situations on an online geomap, and to upload accompanying visual materials. We are presently processing more than 70 responses.



SensHagen

Is a collaboration between Zwolle Municipality, renowned knowledge institutes such as RIVM and KNMI and residents of Stadshagen. We install an infrastructure of sensors to monitor the effects of climate change at parcel and local level over a period of several years. This gives residents the opportunity to develop climate adaptive awareness and actions, based on the collected measurement data, and to be able to influence their environment. The research data is collected, processed and subsequently made available to the residents and to science. The project

is part of European research project ERA4CSURCLIM. Measuring progress is important to the acceleration of climate adaptation. In the EU Interreg CATCH project, parties from the North Sea region are developing a dashboard with which to monitor climate adaptation.

EU Interreg CATCH project

The overall objective of CATCH is to demonstrate and accelerate the redesigning of urban water management in mid-sized cities in the North Sea Region, so that they may become climate resilient. It is based on the Water Sensitive Cities theory. One

interesting element is the development of a dashboard: a decision support tool for mid-sized cities that will help to formulate long-term climate adaptation strategies which will have maximum impact on climate resilience, and subsequently monitor the progress. UTwente contributes expertise in the field of governance assessment. The pilot in Zwolle's Spoorzone district also focuses on the smart connecting of the professional world (Climate Campus) with the 'Vrienden van Hazenland' community in order to make the Spoorzone district more climate adaptive.





Epilogue

Any staff, partners or visitors entering the GCECA building will immediately experience the spirit of the Spoorzone district. The demonstration delta is an ever developing showcase of climate-adaptation with an active community ready to welcome the GCECA and its staff and guests with open arms.

Obviously, the presence of the GCECA in general would be a trophy for the Zwolle region. That goes for any city. Moreover, the significance that the GCECA could have here is of exceptional value.





The presence here of the GCECA would undeniably underline the region's ambitions, raising climate adaptation in the Spoorzone district to a higher level, and making it tangible and visible, with the global village building as a breeding ground and meeting place. That will appeal to other mid-sized cities too.

The GECEA would be an important and international link, the cherry on our delta community cake, the cream in our Climate Campus coffee, and of course quite simply, help us to excel and accelerate.

Choosing a mid-sized city as the headquarters for the GCECA might sound daring. It could equally be a statement of belief in mid-sized cities which, in a global network, will ultimately make the difference, worldwide.

**THE NEW DELTA
WORKS ARE IN
OUR CITIES**