METROPOLITAN REGION AMSTERDAM

URBANISATION CONCEPT 2050

METROPOLIS OF OUTSTANDING QUALITY WITH HUMAN SCALE

3 November 2021
A collective strategy for developing the Metropolitan Region Amsterdam

metropool regioamsterdam
Rijksoverheid

Foreword

You are about to read the Urbanisation Concept for the Metropolitan Region Amsterdam (MRA). This is our collective response to the major challenges we face in terms of the MRA's future development. Never before have we worked together so closely from day one – as government authorities at local, regional and national level, and with the water boards – to create a story for this region. Until now. We urgently need to pool resources in order to effectively tackle the future tasks facing our society and communities. None of us can do this alone. So we have decided to join forces in order to develop the MRA.

The Metropolitan Region faces a huge housing challenge. But we cannot consider that urgent need for housing in isolation from all the other facilities that our residents, business owners and visitors need. It is not just a question of building homes; our job is to create complete and sustainable towns and communities. The Urbanisation Concept introduces new priorities: more than ever in the past, the entire metropolitan region will be involved in building a multi-core metropolis that ensures balanced economic growth for our towns. We are building a region that offers opportunities for everyone and for each individual geographical part. A metropolitan region where people can live in good health, with adequate housing, amenities and employment opportunities. With convenient connections to get from A to B. With adequate space and opportunity for business activities. We are developing a region that will be ready for all the unavoidable changes heading our way, such as climate change, measures supporting our commitment to preserving the landscape and biodiversity, and the technologies and locations for generating our energy. We are looking at the development path in context, with due consideration for the consequences of the proposed choices.

This urbanisation concept determines the direction our future development will take and at the same time allows adequate freedom for responding to uncertainties such as the corona pandemic or action to make our economy more sustainable. But we are not there yet. We must also make some difficult choices in the coming years. For example, in the North Sea Canal area, where there are a number of major spatial tasks, or in the South Flank, where the quality of life around Schiphol Airport is a major task. These choices must be made based on mutual trust and consensus.

If we are to live up to our stated goals, we must also act jointly to ensure subsequent realisation. This story sets out the basic framework for making reciprocal commitments in 2022, in order to progress towards implementation of the plans to build complete towns and communities.

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Minister of the Interior and Kingdom Relations,

Marieke van Doorninck
Chair of the Steering Committee
and Alderman of the City of Amsterdam

National and Regional Government Steering Committee – MRA Urbanisation Strategy

Marieke van Doorninck (chair) – City of Amsterdam
Jan De Reus – Provincial Authority of Flevoland
Maaike Veeningen – Municipality of Almere
Marja Ruigrok – Municipality of Haarlemmermeer
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Vincent van der Werff – Ministry of the Interior and Kingdom Relations
Harry Boschloo – Ministry of Infrastructure and Water Management
Jurgen Geelhoed – Ministry of Economic Affairs and Climate Policy/Ministry of Agriculture, Nature and Food Quality

The MRA Urbanisation Concept in detail

National government and the Metropolitan Region Amsterdam (MRA) want to make jointly supported agreements regarding the development of the MRA in the medium and long term. To achieve this, both parties are working on an integrated urbanisation strategy for the MRA.

The Urbanisation Concept, including a rough indication of the phasing, is the substantive basis for this Urbanisation Strategy. Further elaboration of the phases and the investment strategy will give concrete direction to the implementation of this concept. The Urbanisation Strategy is complemented by the Urbanisation Agreement, which sets out the final and mutually binding agreements between national government and the regional authorities for the coming years.

The Urbanisation Strategy for the MRA is the detail plan for the area in line with the National Strategy on Spatial Planning and the Environment (Nationale Omgevingsvisie - NOVI). The Urbanisation Strategy will be included in the Spatial Planning and Environment Agenda for Northwest Netherlands (Omgevingsagenda Noordwest Nederland), thus forming the joint policy framework and implementation agenda for the collaboration between national government and the regional authorities. This Urbanisation Concept (including the rough phasing) forms the substantive basis for the MRA's Urbanisation Strategy and for future local and regional policy.

So the Urbanisation Strategy defines a jointly agreed course and is also an implementation tool at the same time.

Drafting process

The Urbanisation Concept has been drawn up in a joint production process involving national government and the regional authorities. The Urbanisation Concept takes existing policy at national, provincial and municipal levels as its point of departure, including the National Strategy on Spatial Planning and the Environment (NOVI), the spatial planning and environmental visions that have been drawn up for provinces and municipalities and the national Delta Programme. It also incorporates the agreements that national government and the regional authorities have made in the recent past, including the agreements on multi-core development up to 2030, as set out in the intergovernmental consultation on the multi-year infrastructure, spatial planning and transport programme (BO MIRT 2020) and the living environment (BO Leefomgeving 2020).

Additional research has been conducted in respect of current societal tasks that have not yet been adequately addressed by the existing policy. This is the case, for example, with regard to the perspective for action at societal and community level (equal opportunities, good commuting balance and health), the economic development prospects, the development and sustainabilisation of the North Sea Canal area and the long-term development of the energy system.

In addition, coordination has taken place with relevant policy programmes that are being developed in parallel, such as Building Together for Accessibility

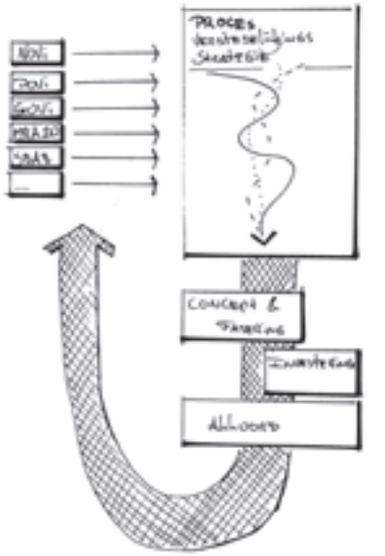


figure 1
Urbanisation Strategy Process

(Samen Bouwen aan Bereikbaarheid/SBaB) - the joint national and regional government programme for improving accessibility - and programmes for specific areas such as the Action Guidelines for the East Flank (Handelingsperspectief Oostflank) and the North Sea Canal area programme as defined in the National Strategy on Spatial Planning and the Environment (NOVI). The Urbanisation Concept brings coherence and focus to all these components.

Administrative Process

The final Urbanisation Strategy - depending on the progress made in forming the current cabinet - will be presented for adoption during the Intergovernmental Consultation on the Living Environment (Bestuurlijk Overleg Leefomgeving) in the spring of 2022, together with the Urbanisation Agreement, which is a set of agreements made between national government and the regional authorities. Prior to this, the municipal and provincial councils will be asked to endorse the substantive direction chosen for the Urbanisation Strategy - i.e. the Urbanisation Concept - and thereby express their intention to take this collective strategic concept for the region as the basis for their own future policy instruments.

Two versions preceded the present version of the Urbanisation Concept. Each version was discussed by the National and Regional Government Steering Committee, after prior administrative consultation within the MRA Spatial Planning Platform for the purpose of coordination within the MRA. The members of the municipal and regional councils were given the opportunity of attending an information session about version 1 and raising points requiring further attention in April 2021. In the spring of 2021, the members of the municipal and regional councils were invited to express their wishes and opinions, based

Summary

The summary is a highly abbreviated synopsis of the Urbanisation Concept. The actual text of the complete Urbanisation Concept is leading.

The Urbanisation Strategy in detail

The Urbanisation Strategy of the Metropolitan Region Amsterdam (MRA) is the elaboration of the National Strategy on Spatial Planning and the Environment (NOVI) for this area and will be included in the Environment Agenda for Northwest Netherlands (Omgevingsagenda Noordwest Nederland). The Environment Agenda sets out the joint policy framework and implementation agenda for the collaboration between national government and the regional authorities

This Urbanisation Concept (including the rough phasing) forms the substantive basis for the MRA's Urbanisation Strategy and for future local and regional policy. The Urbanisation Concept has been drawn up jointly by national government and the regional authorities. The Urbanisation Strategy is complemented by the Urbanisation Agreement, which sets out the final and mutually binding agreements between national government and the regional authorities for the coming years.

The Urbanisation Concept takes existing policy at national, provincial and municipal level as its point of departure. In addition, the concept has been drawn up in conjunction with (policy) programmes that are also under development at present and that have an impact on the living environment. Furthermore, we have conducted additional research in a number of areas. The Urbanisation Concept brings coherence and focus to all these elements.

Municipal councils, provincial councils, the transport region and the water boards all commented on a previous version of the Urbanisation Concept. Their wishes and views have been incorporated in this version. The Urbanisation Strategy Steering Committee approved the Urbanisation Concept, including its phases, on 3 November 2021. After approval by the steering committee, the municipal and provincial councils were requested to endorse the Urbanisation Concept and express their intention to use it as the basis for their own future policy instruments. We will lay down the final agreements in an Urbanisation Agreement, which will be adopted during the 2022 Intergovernmental Consultation on the Living Environment (2022 Bestuurlijk Overleg Leefomgeving) between national government and the regional authorities.

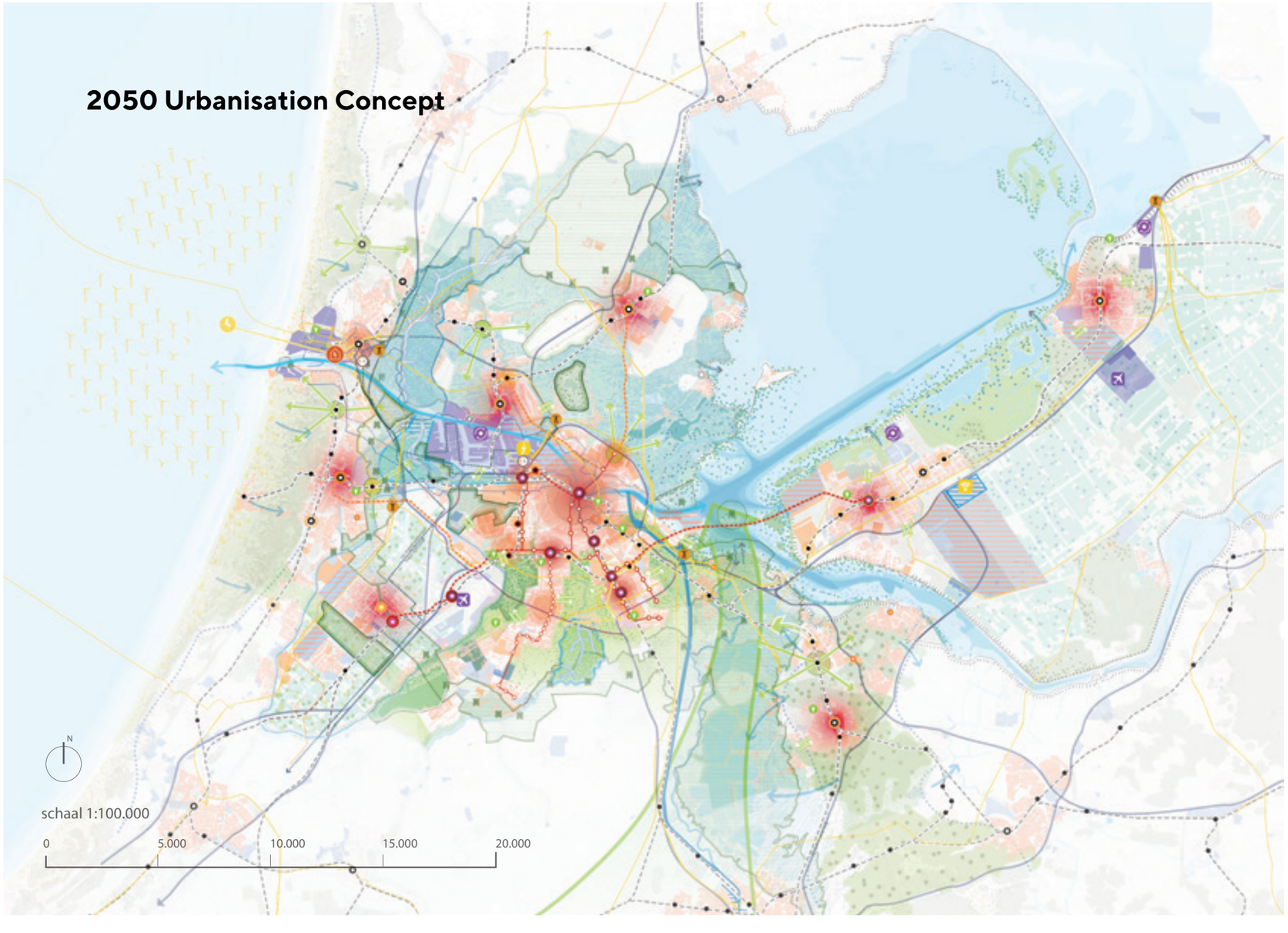
1. Introduction

In the years to come, the Metropolitan Region Amsterdam will face major challenges. National government and the region must imperatively build many new homes while simultaneously transitioning to sustainable energy and heating. We must adapt to climate change and ensure a strong economy in a healthy living environment where people, plants and animals thrive. And achieve all this despite intense time pressure, severe space constraints and a degree of divergence in terms of stakeholder's wishes.

Only if we act in unison and address the tasks coherently will we succeed in overcoming these issues. In the light of the above, national government and the MRA have decided to jointly set out a course for the medium term (2030) and the long term (2050) in the form of the Urbanisation Strategy. The strategy brings together all the choices we have to make. Ranging from our desire to make our way of life, housing, jobs and transport systems more sustainable to deciding what approach to adopt in respect of the landscape, our energy supply, water management, nature and the circular economy. So the Urbanisation Strategy is not about building houses; it is a roadmap for building entire towns and communities. The strategy defines the ultimate goal we all want to achieve: shaping a balanced metropolitan region with a healthy and safe living environment. Attractive and internationally oriented. Of outstanding quality, but with a focus on the human scale.

This is not to say that we already know all the details. The Urbanisation Concept contains unanswered questions and uncertainties such as the effects of climate change, the impact of technological developments, and the long-term effects of the COVID pandemic. What is certain though is that we have to make choices, because not everything can be done everywhere and at the same time. We need to work out these choices coherently in a manner that matches the scale of the MRA. Something else that is certain is that we need to invest. But this

2050 Urbanisation Concept



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Legenda

- 380 kV-onderstation
- Conversie van waterstof naar elektriciteit
- EnergieHUB
- Windturbines op zee
- Ruimte voor Energietransitie
- Data
- Circulaire economie (grondstoffen)
- Vliegveld
- Woningbouw
- Kantoren / bedrijventerrein
- Zoekgebied 4e connectiviteitshub
- Waterrobuust en klimaatbestendig ontwikkelen
- Multimodal knooppunt
- Kennis & Innovatieclusters
- Energie Infrastructuur
- Bestaande snelwegen
- Bestaande spoorwegen
- Ringen draaiend houden
- Bestaande HOV metrolijnen
- Nieuwe HOV lijnen
- Nieuwe HOV metrolijnen
- Metrohalte
- Sprinter stations
- Intercity stations
- Stadshart
- Ecologische verbinding
- Waterbuffer
- Kustzone IJmeer
- Verdiepen open water
- Vasthouden en kwelwater benutten
- Zoekgebied tijdelijke waterbuffer
- Spons
- Extra afvoer
- Transitie beplanting
- Dijken versterken
- Zoetwater reservoir en piekwater berging
- Transformatie van agrarische functie
- Regionale kering
- Unesco heritage
- Recreatie gebied
- Scheggen (Diemerscheg, Westeinderscheg, Amstelscheg)
- Veenweiden Laag Holland
- Gooi en Vechtplassen
- Recreatieve landschapscorridors
- Buitenpoort
- Ecologische verbindingen
- Verbindingen
- NZKG landschap
- Stelling van Amsterdam

is also not possible everywhere and all at once. So the Urbanisation Strategy consists of three parts: an Urbanisation Concept including the phases over time, an investment strategy and an Urbanisation Agreement, with which national government and the regional authorities make agreements for the coming years regarding their commitment to developing the MRA.

2. Growth and the transition in the MRA: ambitions

National government and the regional authorities want to achieve the 10 ambitions listed below with the Urbanisation Concept.

- The entire metropolitan region benefits from the resulting growth.
- There are enough high-quality residential and work environments.
- We strengthen diversity and connectedness in the economy.
- We create a better balance between living and working.
- The MRA becomes more accessible and with better connections for travel.
- The region offers a healthy living environment.
- We reduce our emissions of greenhouse gases.
- We strengthen the resilience of our diverse landscape.
- We structure the region to cope effectively with the impact of climate change.
- We increase biodiversity.

3. Urbanisation concept: metropolis of outstanding quality with a focus on the human scale.

3.1 Multi-core development with a focus on the human scale

We are fulfilling our objective of balanced growth through multi-core development.

Development of residential and work locations

National government and the regional authorities have agreed to build 175,000 homes by 2030. Because the demand for housing is so high, we are looking at increasing the number of homes to be built to 220,000 by 2030. To build complete towns and ensure their economic development, we must have enough space for businesses, including the industrial activities that we want to relocate from the transformation areas, and provide good connections for employees travelling to their work. To achieve this, we are developing a regional business park strategy. If new residential and work environments are actually to contribute to a healthy, safe and attractive living environment, they must meet a number of conditions relating to accessibility, climate adaptation, biodiversity, water management and energy.

The following development and urban renewal sites have been prioritised for collaboration between national government and the regional authorities:

- Hubs in and around Amsterdam.
- The major town centre areas of Almere, Haarlem, Hilversum, Hoofddorp, Lelystad, Purmerend and Zaanstad.
- Possible acceleration of the projects at large development locations in Almere Pampus, West Flank Haarlemmermeer and Hoofddorp, Zaanstad Achtersluispolder and Amsterdam (Zuidoost and Havenstad)
- Large urban renewal areas in Amsterdam, Lelystad and Zaanstad.
- Maintaining sufficient (environmental) space for business parks in the North Sea Canal area.

In particular, the development of core areas outside Amsterdam (the major town centres and regional centres such as Beverwijk and Amstelveen) plays an important role in successfully distributing economic growth evenly across the region and improving the commuting balance in the individual areas. In the period up to 2030, we expect to be able to influence the growth in jobs to some extent, channelling roughly 10% towards public transport hubs, in addition to the job growth already coming from the sub-region itself.

Diverse housing offer throughout the region

Rising purchase prices and rents are making the housing market in large parts of the MRA increasingly less affordable and accessible for low-income or middle-income earners. To develop the MRA in the desired manner both socially and economically, we must ensure a diverse housing offer in all areas of the region that meets people's needs in terms of price, size, type and residential environment.

Spatial and economic strategy

Multi-core development requires a spatial and economic strategy to strengthen the economic profiles of the sub-regions and distribute employment more evenly across the MRA. This strategy focuses on expanding the core economic area, strengthening specialised clusters, and increasing the benefits of societal and economic diversity. The economic core area will be extended to include the Noord, Nieuw-West and Zuidoost district centres in Amsterdam, and Zaanstad. In Hoofddorp, we will promote economic diversity. Almere and Haarlem will become fully-fledged urban centres that are connected to the core area. In Hilversum, we will focus on scaling up powerful and promising sectors. A development corridor will potentially boost the development of these centres.

Good connections with other parts of the metropolis are an important prerequisite for this. In the development of Amstelveen, Beverwijk, Lelystad and Purmerend, mixing functions and diversification of the existing economic structure are the obvious choices.

Greater equality of opportunity
We want residents in our region to benefit from equal opportunities, regardless of where they live. Where possible, we contribute to this within the Urbanisation Strategy, for example through measures that prevent segregation and promote proximity to work and amenities. Continuous and diverse area-focused interventions in the housing market will be required to also bind low-income and middle-income earners to all the sub-regions of the MRA.

Urban renewal and management
Our goal is to ensure that existing residents benefit, on balance, from our house building initiatives and densification activities. In the period up to 2030, some of the new housing will be built in urban renewal areas as part of a coherent, area-based approach that improves liveability and strengthens the socio-economic position of current residents. In former growth centres (Lelystad, Almere, Purmerend and Haarlemmermeer), new forms of management are needed to identify and address specific problems in the districts at an early stage.

Quality of life around Schiphol in relation to urbanisation in the MRA
In a large part of the MRA, in particular in the Amstelland-Meerlanden region, Schiphol has an impact on urbanisation possibilities in terms of the feasibility of multi-core development in a healthy, safe and attractive living environment. Schiphol is an economic growth engine, but aviation also has an impact on quality of life and contributes to the relatively unhealthy living environment in nearby communities. The airport also uses a significant amount of space and impacts development options, including opportunities to address the chaotic patchwork of greenhouses in the area. The region faces major challenges in the areas of housing, the economy, mobility, climate, the energy transition and green zones. This calls for an integral approach that weighs up all the interests, based on the principle of reciprocity between 'the air' and 'the ground': i.e. aviation takes the use of space on the ground into consideration and vice versa.

3.2 Green and blue network in and around the city

The varied and cohesive landscape is a unique, distinctive quality of the metropolitan region. The starting point for developing the green and blue network is that functional interventions in the landscape also enhance how it is experienced, and that interventions designed to enhance our enjoyment of the landscape also serve other purposes. We elaborate this in practice in the following lines of approach.

Landscapes that offer special value: quality enhancement
A number of areas within the MRA that are special because of their nature-related value, their heritage or recreational aspects require a quality boost. For example, much effort will be needed in the coming years to complete the Dutch National Ecological Network (Natuurnetwerk Nederland), including Natura 2000, and, once this milestone has been reached, to then manage and improve the network. Good agricultural land also remains a necessity, so preserving that resource must always be considered when evaluating claims for space.

Landscape enhancement
Our landscapes contribute to health, recreation, sustainability and climate adaptation. So we want to enhance the landscapes and make sure that everyone can access and enjoy them.

Green zones: landscape connections
The landscapes in the MRA are not only diverse; they also flow into each other. Mixing functions is a starting point here, so that the landscape connections - the 'green zones' - can help us realise different ambitions. Many connections - including ecological ones - need to be improved to function effectively.

Landscape-inclusive and nature-inclusive urbanisation
When constructing roads, housing estates and business parks, for example, we adopt designs that helps strengthen the landscape, rather than having an adverse effect on it. That is why we use a 'landscape-inclusive development' approach in our work.

MRA-wide recreational structure
We want to develop a recreational structure throughout the MRA that allows people to 'experience' the landscape, from their front door to the rural area. To this end, we are working to achieve radical upscaling by strengthening and further developing the existing recreational structure, taking into account population growth and recreational needs.

3.3 Systems for the future

Implementing multi-core development of housing, employment and amenities and developing the green and

blue network in and around the city requires interaction with the systems for mobility, ecology, water and energy.

Water
Climate change and continued urbanisation are having a major impact on our water system. This calls for fundamental changes to the entire water system, in conjunction with a rethink of our approach to structuring our living environment. A water-resilient system emphasises retaining water, supplying adequate drinking water and improving water quality, and designing the environment in a way that minimises the consequences of heavy rainfall and flooding, both now and after 2050. National government and the regional authorities will develop a coherent and systematic approach for making the region water-resilient and climate-proof, which indicates where and how spatial planning must allow for measures to mitigate the impact of climate change in terms of choice of location and area design, including designating candidate areas for temporary peak water buffering.

Ecology
A future-proof ecological system not only contributes to achieving our ambition of increasing biodiversity, it is also conducive to a healthy, safe and attractive living environment, in and outside the city. Up to 2027, we will focus our attention on completing the Netherlands Nature Network. At the same time, we will work on green zones with landscape and ecological connections and encourage development of a 'nature-inclusive society', with a greater focus on biodiversity.

Mobility
A mobility transition is needed to keep the MRA accessible and the towns liveable. With a coherent approach to urbanisation and the mobility system, we will contribute not only to accessibility and quality of life, but also to sustainability, health and inclusiveness. A 2040 Multimodal Future Vision for MRA (Multimodaal Toekomstbeeld 2040 MRA/MTB 2040) is under development to provide guidance for the choices we need to make in this respect. Because urbanisation and mobility are directly connected, we will make coherent decisions about investments for developing new residential and work locations and the mobility system.

A mix of measures is needed to improve sustainability, quality of life and the functional performance of the networks. For example, tempering the growth of vehicle traffic through behavioural measures. And smart urbanisation, through multi-core development and mixed-use residential/work environments on primarily inner-city development sites near key public transport locations.

In addition, investments are needed in bicycle, public transport and car networks and hubs:

- Expansion of the bicycle network, including safe, fast and comfortable transit routes.
- Phased scaling up of regional public transport: regional metro network(see paragraph 3.3, systems for the future, under mobility), rapid-transit (HOV) bus transport and possibly tram/light rail transit, and separating regional and national railway services to create greater capacity on the national railway network.
- Continued policy of directing vehicle traffic to the ring roads and distributing that traffic throughout the network. Depending on the outcome of traffic reduction measures, larger-scale investments in the road network will be required.
- For regional and urban accessibility: rings of regional hubs along the corridors towards Amsterdam, car-free inner-city areas and cores, accessible and affordable travel for practically trained workers and middle-skilled workers and action to stimulate efficient bundling of goods flows.

Energy
We are working towards an integrated, hybrid energy system. The choices made for this have spatial consequences. We wish to anticipate these developments as effectively as possible in our urbanisation choices for the MRA. Up to 2030, the 'base path', which includes projects arising from the Regional Energy Strategies (RES), the investment plans of TenneT, Gasunie and Liander and the Cluster Energy Strategy of the North Sea Canal Area, will determine our work in relation to the energy transition.

The energy supply system will change dramatically in the period from 2030 to 2050, but exactly how is still unclear. As a minimum, the following 'no regret' measures will be needed in the MRA:

- Construct new substations.
- Install local (district) storage for electricity to relieve pressure on the grid.
- Develop the regional hydrogen backbone, connect to the national hydrogen backbone, and create links between the hydrogen network and electricity grid at the strategic locations of Velsen and Hemweg.
- Reserve space for landing, importing, storing and converting energy, bearing in mind that the North Sea Canal area will play an important role here, as it does now.
- Draw up integral implementation plans, for both the

subsurface and above ground.
- Develop heating networks in the urban area.

4. Areas requiring integral development

What do the choices described above mean for the existing landscapes, towns, and economic centres in the MRA? How can we best exploit and strengthen the power of diversity and identity? This is elaborated for seven sub-areas in the Urbanisation Concept.

North Sea Canal Area (NZKG)

The North Sea Canal area (Noordzeekanaalgebied/NZKG) is a coastal cluster of progressive industrial economic activity with high employment, and a knowledge and energy hotspot. It is the nautical gateway to the MRA and a proving ground for applied innovation in the field of sustainability and the circular economy.
In 2013, national government and the regional authorities set out their choices for the development of this area in the 2040 North Sea Canal Area Vision (Visie Noordzeekanaalgebied 2040). Alongside that development plan, we now have several new key tasks: making the port complex sustainable, the energy transition, moving to a circular economy, housing and urban renewal, ensuring a healthy living environment, optimising the water system and adapting to climate change. The spatial claims associated with these tasks are not a seamless fit with each other. To respond to these complex tasks, the North Sea Canal area has been assigned a high priority (designated NOVI area) within the National Strategy on Spatial Planning and the Environment. Issues that cannot be solved in the NOVI area programme, or that have a broader scope, are considered at the level of scale of the MRA and beyond.

In respect of eight points, national government and the regional authorities have already made a choice that clarifies the course to be followed:
- Sustainabilisation (including Tata Steel)
- Connection to the hydrogen backbone and other elements decided in the CES project
- Development of transformation areas in line with the conditions set out in the 2040 North Sea Canal Area Vision
- Not using the Wijkermeerpolder for 'dry' (non-waterfront) business parks, including acceptance of the consequence that space for expansion will have to be sought at other locations. Possible locations: Boekelermeer in Alkmaar, Baanstee Noord in Purmerend, De Vaart in Almere and Flevokust in Lelystad
- Improving health and quality of life as a prerequisite for future developments
- Preserving and developing nature areas and recreational areas
- Identifying a candidate area for temporary peak water storage
- Retention of Unesco World Heritage site status for the Defence Line of Amsterdam (Stelling van Amsterdam) as a prerequisite for future developments

Six points have been placed on the agenda for further elaboration in the NOVI area approach for the North Sea Canal Area:
- Transition from a port to a hub for sustainable fuels and goods flows
- Space for circular economy initiatives
- Space for business parks
- Further detailing regarding the strategic reservation of the Houtrakpolder
- Improving health and quality of life, particularly in the IJmond region
- Choice of location, size and design of the temporary peak water storage facility in/near the Oer-IJ area

IJmond, Noord-Kennemerland and Zuid-Kennemerland

This area is suitable for the construction of some 40,000 homes. The focus of the multi-core development here is the town centre development in Haarlem and the intensive urbanisation around Beverwijk station. The sub-area has a diverse economic profile with employment opportunities for practically trained workers and knowledge workers. The IJmond port area is developing as a nautical gateway, as a 'green electricity hub' and as a TechPort. Development areas around public transport hubs offer opportunities for strengthening Haarlem's economic profile. The railway zone in Beverwijk offers a platform for further urbanisation and economic development to the north of the North Sea Canal. The 'Amsterdam Beach' initiative strengthens the tourist character of the coastal towns. Choices need to be made regarding regional accessibility, connecting National Park Zuid-Kennemerland with Spaarnwoude and PARK21, and the continuity of the landscape structure on both sides of the North Sea Canal.

Zaanstreek, Waterland, Amsterdam-Hoorn Corridor

The urban areas north of the IJ will continue to grow to over 500,000 residents in the coming decades. We will use this growth to strengthen the economy and social fabric of the area, for example through integrated plans for the town centres of Zaanstad and Purmerend. Further relevant developments in Zaanstad are the possible accelerated development of Achtersluispolder, urban renewal in Zaandam Oost and the construction of the

ZaanIJ rapid-transit (HOV) connection. We will make the peatlands, the polders and the banks of the Zaan more accessible in order to strengthen the recreational function. Together with all the stakeholders, we are looking at the best approach for dealing with land subsidence in peatland areas. Other issues requiring attention: possible capacity upgrades to the main electricity grid to the north of the Netherlands and the A8-A9 motorway connection. Development of the Amsterdam-Hoorn corridor is important for the entire region.

East Flank and Markermeer/IJmeer

The East Flank makes a major contribution to the MRA in terms of homes, jobs and recreation. We are capitalising on this potential by accelerating housing construction in the major town centres, via the major Pampus area development plan and via the foresight study on accelerated housing construction in Lelystad Zuid/ Warande in conjunction with (re)development of the existing town and urban renewal.
In doing so, we are working towards shaping complete towns and improving the commuting balance. The economic character of this new territory is still developing dynamically. The economic profile of Almere is developing further thanks to initiatives to strength the circular economy, ICT tech and energy transition cluster. The expansion of higher (technical) education is an important prerequisite for this. Lelystad is increasingly profiling itself as a multimodal logistics hub, largely due to economic developments in relation to Lelystad Airport, the port, its position in the energy network and its strong agrifood sector. The area also offers opportunities to further develop the leisure economy. The tasks in this area include: multimodal accessibility, nature and landscape development in and around Markermeer and IJmeer, and the possible construction of a hyperconnectivity hub.

Gooi and Vechtstreek region

The Gooi and Vechtstreek region connects the densely populated urban regions of Amsterdam, Almere, Amersfoort and Utrecht. In this sub-area, the media industry is a recognisable cluster within the economic profile. The Gooi and Vechtstreek region is positively characterised by its richly differentiated cultural and historical heritage and the diversity of its landscape and nature. The town centre development in Hilversum, the developments around Hilversum Station, Hilversum Sportpark and Hilversum Mediapark contribute to further strengthening of the region's economic profile. Points requiring attention in this area: groundwater depletion in the Heuvelrug and the effect on the Vechtplassen artificial lakes. To protect nature values, achieve water quality targets and ensure a climate-proof built area, an integrated approach to the water system is needed in relation to the use and layout of the Gooi and Vechtstreek region. In addition, attention is needed for the functional relationship between the A1 and A27 motorways and (rapid-transit) public transport connections and initiatives to preserve practically oriented employment in the region.

South Flank

The Amstelland-Meerlanden region and the neighbouring south side of Amsterdam bustles with economic activity and is a strong magnet for domestic and foreign business activity. In addition to general bottlenecks, the presence of Schiphol Airport creates an additional challenge for housing construction in various places. It also affects the potential for urbanisation and remediation of about 800 acres of land currently dominated by an untidy patchwork of greenhouses. National government and the regional authorities must therefore make choices regarding the quality of life around Schiphol in relation to urbanisation and the future of the airport. This calls for an integral and area-wide approach in the South Flank. Other points requiring attention in this area: integral development of the town centre of Hoofddorp in combination with the works to extend the North/South line, the west flank of Haarlemmermeer and the developments around Duivendrecht station in accordance with the airport layout decree (LIB), accelerated construction of recreational areas and making the landscape between the villages and towns accessible. There are also developments along the renewed Amstelveen Line and in the centre of Amstelveen.

Amsterdam

Amsterdam is the core city of the metropolitan region, with a very diverse population, a varied economic structure, and magnetic appeal. Growth of the population and of the economy must go hand in hand with improvements to the living environment and ensuring equal opportunities for all residents. The tasks here are the construction of 150,000 homes with accompanying amenities and workplaces within the existing city boundaries in the period up to 2050, promoting the construction of social housing and medium-rent housing and boosting construction output between now and 2030 in Haven-Stad and Amsterdam Zuidoost. The points requiring attention include: keeping the housing market accessible for low-income and middle-income earners, the transition to a car-free city, scaling up in relation to high-quality public transport and the preservation and strengthening of the green interconnecting areas and landscapes. Work is also taking place to create multiple cores within the city, strengthening the centres in Noord, Nieuw-West and Zuidoost and by further developing the Zuidas.

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1. Introduction

Introduction

The Metropolitan Region Amsterdam is home to 2.5 million residents, spread across a large number of towns and villages. Thanks to the wide variety of residential and work environments, there is room for all lifestyles at every stage of life. And while most residents feel primarily connected to the place where they live, they also venture outside those places as they live their lives. Social contacts, work, going out, exercise: within the area in which they can travel conveniently, people choose the most suitable or attractive places for these activities, regardless of municipal boundaries. The multi-core structure of towns and villages in a contiguous landscape automatically leads to great diversity in urban environments and landscapes, and ensures that the human scale is preserved.

At the same time, the MRA is one of the most important economic growth engines in the Netherlands, with 300,000 companies and 1.5 million jobs. The international orientation and accessibility, combined with the high quality of life, means that the MRA is among the top international areas in the world. Thanks to its high quality of life and favourable economic position, the MRA exerts enormous appeal, both domestically and abroad. In the period up to 2050, the MRA is expected to grow strongly in terms of both residents and jobs: + 700,000 and + 270,000 respectively. This growth will be strongest during the next decade.

That magnet function simultaneously puts pressure on the quality of life in certain areas. In recent years, growth in the MRA was mainly concentrated in and around Amsterdam. This has resulted in increasing crowding and rising property prices. And if the distribution of growth remains as it is now, the socio-economic disparities in the region will increase, which in turn will have a negative impact on equality of opportunity within the MRA. We must avoid a situation where some residents are forced to leave due to the MRA's international appeal – a phenomenon that we currently see in many other metropolitan areas around the world. The question is how do we accommodate growth in a way that strengthens the region's quality of life and economic strength.

On top of that challenge, we must implement the transitions that are needed to keep the region habitable and liveable into the distant future. The MRA is largely below the Amsterdam Ordnance Datum (NAP) and will be severely affected by the effects of climate change, which are already being felt. National and international agreements are in place to combat further climate change and strengthen biodiversity. These agreements must be implemented in detail at regional level.

The scale of the Metropolitan Region Amsterdam is significant in this respect. The region is functionally a single entity: the MRA spans the area within which the majority of commuting, recreational travel, and home relocations occur. Developments in one part of the region are also significant for residents elsewhere in the MRA. And developments in one place affect the functions of other places in the MRA. This 'daily urban system' is expanding. There is an increasingly strong connection with cities and regions in all directions. At international scale, the metropolitan region is also well connected to other urban regions in Northwest Europe.

In order to bring the urgent, complex and extensive tasks to a successful conclusion, national government and the MRA have jointly set out the course for development in the medium and long term in the Urbanisation Strategy. The strategy brings together choices in the areas of quality of life, housing construction, work locations, mobility, landscape, energy, water, the circular economy and ecology. The strategy outlines where we want to go together with the region. How we are continuing to build a metropolitan region of outstanding quality with a focus on the human scale. And how we are working together to create a healthy, safe and attractive living environment, now and also in the long term.

2. Growth and transition in the MRA

The Metropolitan Region Amsterdam offers high quality of life. This is due to the diversity, connectedness and human scale inherent in this metropolis.

The first half of the 21st century will be a period of growth and transition. Everyone will be affected. Residents, entrepreneurs, visitors. We want to shape that development in a way that increases quality of life. A healthy and safe living environment, attractive and internationally oriented. A metropolis of outstanding quality with a focus on the human scale. This is not only beneficial for those who live, work or reside in the MRA, but also for the prosperity and well-being of the Netherlands.

2.1 The strength of the MRA

The MRA is a metropolis of outstanding quality with a focus on the human scale. The aim of further urbanisation of the metropolitan region is to strengthen the identity and qualities of the MRA. Combined with the urgent, complex and extensive tasks we face, this means that we have committed to a multi-core development approach in a living environment that is healthy, safe and attractive in all respects.

The richness of diversity

Diversity determines the strength of the Metropolitan Region Amsterdam. From the centuries-old centres of Amsterdam, Haarlem and Weesp to the green districts of Hoofddorp and Almere; from metropolitan to suburban and village settings; from the beaches of Zandvoort and Wijk aan Zee to the moors of Hilversum and Bussum.

Few metropolises in the world can offer so much diversity in such a relatively small area as the Metropolitan Region Amsterdam. And it extends far beyond the region's landscapes and townscapes. Within the MRA, the population gives each city, town and village its own local colour. The origins of the region's residents - there are about 180 different nationalities in the MRA - also reflect diversity. A wide range of companies and institutions make everyday services and products permanently available. Others have become global trendsetters with their innovations and products. The Metropolitan Region Amsterdam aims to be the most inventive region in Europe with the best-educated population.

The different parts of the region all have their own specific economic profiles, and these profiles add up to a complete economic spectrum that educates and attracts talent and operates successfully at global level in a number of fields. At present however, the contiguous urban area of Amsterdam and the South Flank benefit to the greatest extent from the economies of scale that a metropolitan region brings. Other parts of the MRA have their own specialisations, but those specialisations are not yet adequately interconnected.

Strong regional and international links

The Metropolitan Region Amsterdam is a highly connected region. The urban region functions as one large city - as a cohesive daily urban system - with 2.5 million residents, 300,000 businesses and 1.5 million jobs. Many people work outside the towns where they live. Residents have their own favourite places where they shop, go out, play sports or get a breath of fresh air. Those places may also be distributed throughout the region, although large sectors of the population rely on jobs and services in a more limited area.

The metropolitan region spans the area within which most commuting takes place. At the same time, the metropolitan region is also strongly connected to the regions on its borders. People who work in the MRA live in those regions, businesses are located there that provide products and services to the residents and businesses in the MRA, and there is a significant flow between them for leisure activities. So the area that functions as a daily system (Daily Urban System) is larger than the MRA collaboration area. In a functional sense, the metropolis has an increasingly strong influence in all directions:

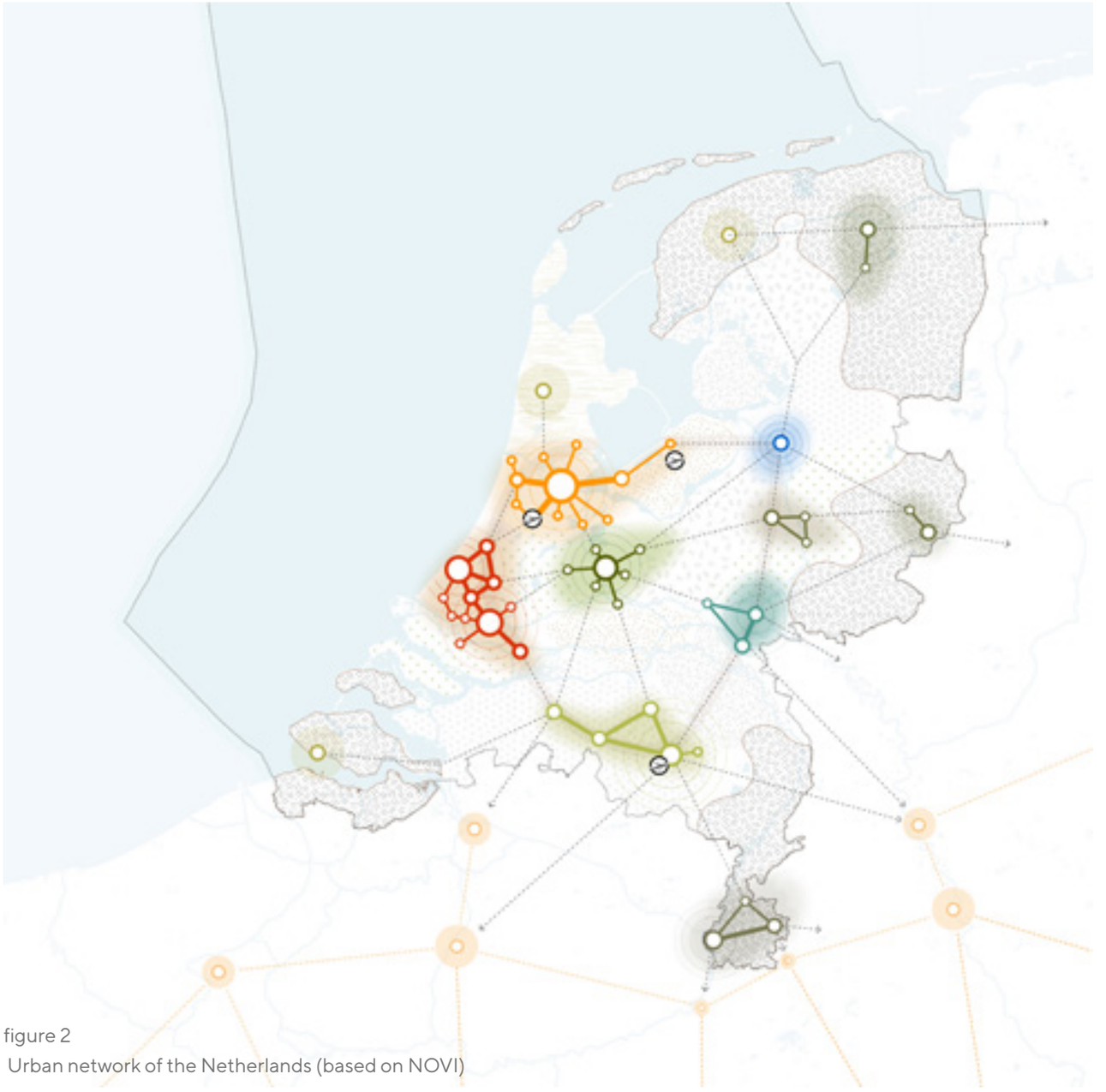


figure 2
Urban network of the Netherlands (based on NOVI)

towards Noord-Holland Noord with Alkmaar and Hoorn, towards the Leiden region, towards Rotterdam-The Hague, and further afield towards Utrecht, Amersfoort and Zwolle.

As one of the most important engines for economic growth and the most important social and digital hub of the Netherlands, the metropolitan region competes in the highest international echelons and is also strongly connected internationally. Via Schiphol Airport, the port and international train services, via the AMS-IX digital hub and via its residents' social networks. An important aspect here is the connection with other urban regions in Northwest Europe, such as the Ruhr area, Frankfurt, Hamburg, Berlin, Brussels, Paris and London.

Multi-core structure in an attractive landscape

The metropolitan region has an international orientation, and successfully combines it with a focus on the human scale and high quality of life. This is due in no small measure to the multi-core structure of the metropolis, with Amsterdam as the core city and a number of new and historic towns and characteristic villages a short distance away. In between, there is an attractive and extremely varied landscape with plenty of open water. It harbours a multitude of values and opportunities and is essential for high quality of life, but is coming under pressure in some places. In all its versatility, the landscape forms a contiguous area. Thanks to that structure, the individual towns remain recognisable and the landscape forms an extensive recreational area that is close by for everyone in the region, although not always easily accessible at the moment.

Relative to other metropolitan areas in the world, the MRA is characterised by relatively high socio-economic

equality. Even so, there is increasing inequality in the distribution of income groups across the region, as well as area-specific health deficits. Across the board, quality of life is high, but not everyone benefits equally.

Seven sub-regions with their own unique qualities

The Metropolitan Region Amsterdam is divided into seven sub-regions, each of which has its own unique qualities and together they determine the strength of the MRA.

Zuid-Kennemerland

The Zuid-Kennemerland sub-region offers the MRA a unique and attractive business establishment climate with ample opportunities for recreation and a high-quality residential and living environment, thanks to its location on the coast and the presence of the historic town of Haarlem. The population is relatively highly educated, with a growing number of expatriates among them. The seaside resorts and the nature areas on the coastline (National Park Zuid-Kennemerland, the country estates and stately homes in the inner dune fringe and the Spaarnwoude recreational area) are attractions for a growing number of visitors.

The economy is characterised by a high proportion of self-employed workers and SMEs in business services, retail, and the creative and digital sectors. In addition, Zuid-Kennemerland is home to a high proportion of (semi) government organisations (provincial authority, district court, educational and healthcare institutions). The sub-region's distinctive features include cultural facilities such as a number of large museums, a widespread hospitality offering and the town of Haarlem as one of the best shopping venues in the Netherlands. In recent times, we have seen a dynamic wave of start-ups and scale-ups in the field of the circular economy, health and applied innovation in the Haarlem region. Bouwlab, a nationally recognised field lab and innovation hub for new construction technologies, chose the Haarlem Business Park in Waarderpolder as the site for its facilities.

IJmond

The IJmond region is characterised by high landscape diversity. From explicitly urban to village life, from affordable to pricey. The residential area is surrounded by valuable landscapes: the coast, the rugged nature of the dunes, the country estates, the Defence Line of Amsterdam (Stelling van Amsterdam) and the Oer-IJ.

IJmond is the MRA's nautical gateway. Thanks to its location on the North Sea Canal, it is a bustling centre of production, development and innovation. The sub-region is also the home of a training and education network for manufacturing; the 'techport' of the MRA. IJmond's ambition is to make Techport a household name nationally, following in the footsteps of Brainport Eindhoven. IJmond has a key position in manufacturing and maintenance for the offshore wind energy sector, so it is the 'green electricity hub' of the MRA. In addition, the sub-region has a strong logistics sector, a regionally oriented healthcare sector, innovative horticulture and an extensive range of services. The Bazaar in Beverwijk, the coastal towns, the Zuid-Kennemerland National Park and the Spaarnwoude recreational area have high value in terms of tourism and recreation.

Zaanstreek-Waterland

Zaanstreek-Waterland is characterised by spacious living areas in the midst of an authentic landscape. Homes in

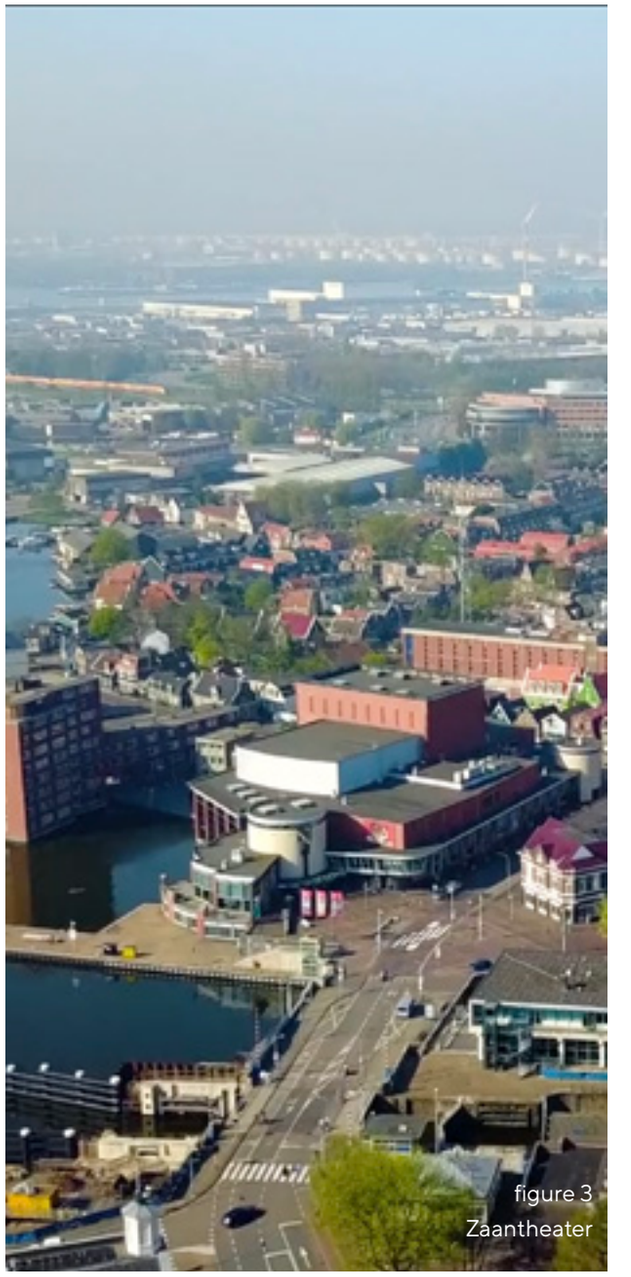


figure 3
Zaantheater

figure 4
Heathland and forest in the landscape of the Gooi

the city or in the countryside, with schools and amenities nearby, always near water, greenery and recreational opportunities, and easily accessible by public transport or car. The energetic regional business community focuses on food, (timber-based) construction, manufacturing, the circular economy and the energy transition and there is an ambitious technology and ICT cluster. There is intensive collaboration between education, entrepreneurs and government in order to mutually enhance quality across the board.
In addition to quality, an unmistakeable identity distinguishes Zaanstreek-Waterland; it is explicitly and proudly Dutch. As a result, the sub-region has great significance in terms of tourism and recreation. Beautiful peatland areas with centuries-old dikes and windmills, grassy meadows surrounding historic linear villages. The region has a history of economic and urban development. In the 19th and 20th centuries, business activity in the region modernised, but the region has retained its characteristic strong entrepreneurship, hands-on mentality and powers of innovation.

Almere-Lelystad
The towns in this area of reclaimed land are known for their unique urban design. The landscape and the towns were designed simultaneously and in conjunction. The communities here have been powerfully connected to the other parts of the region since the beginning, in terms of work and urban amenities, and in terms of home relocations. The development of nature along the coastline has led to a very special recreational and residential landscape, which enriches the palette of environments in the MRA.

The economic profile is still developing dynamically. The economic structure is increasingly characterised by logistics, ICT, engineering, the circular economy, the energy transition, food, tourism and recreation. Important clusters in the circular economy have now emerged in De Steiger and De Vaart business parks in Almere, and Lelystad boasts special laboratory facilities in the fields of aviation, food and animal health.

Gooi and Vechtstreek region
The Gooi and Vechtstreek is the green and blue connecting zone between the densely populated urban regions of Amsterdam, Almere, Amersfoort and Utrecht. With its high-quality amenities, this sub-region is a pleasant place to live, work and recreate. The residential environment has grown organically. This has led to high variety in the urban cores, which each have their own unique identity and residential environments. The media hub of the Netherlands lies in the heart of the Gooi and Vechtstreek region. Sectors such as ICT, artificial intelligence, creative industries, healthcare and recreation are also important elements of the economy.

The landscape is special and highly diverse. There are forests, heathlands and open pastures. There are historic stately homes and estates and extensive stretches of water, such as Naardermeer lake, the artificial lakes area, the IJmeer and the Gooimeer. Several areas have been awarded protected status at national and even international level. The variety of landscape types and their quality, in a relatively small area in the urbanised Randstad, make the Gooi and Vechtstreek region unique.

Amstelland-Meerlanden
This sub-region has a solid economic position within the MRA, thanks in part to Schiphol Airport and Greenport Aalsmeer. Transport and warehousing, wholesale, retail

and other business services are the main economic sectors. Because of this strong concentration of (international) economic activity, Amstelland-Meerlanden is an employment hub that attracts workers from all over the Netherlands. The number of jobs is greater than the size of the region's workforce. This has an impact on housing needs. The planned capacity is large. In addition to generic housing bottlenecks, the presence of Schiphol is an additional challenge that complicates the task of constructing the desired number of new homes.

The sub-region offers several highly valued residential environments. From urban apartments to historic cores and village and rural residential environments, complemented by high-quality cultural facilities, and all situated in a richly varied landscape. From country estates along the river Amstel, recreational facilities at Westeinderplassen, Ouderkerkerplas, Diemerscheg and in the Amsterdamse Bos, natural beauty in the Amstelscheg with its Ronde Hoep route, the seemingly infinite spaciousness of the Bovenkerkerpolder to new landscapes and landscapes under development such as PARK21 and the Westeinderscheg.

Amsterdam

Amsterdam has traditionally been a centre of international trade. Voluminous flows of people, goods, information and money converge here. Today, its appeal remains undiminished, thanks in part to the cultural and historical richness of the inner city with its canal ring and its international, liberal ambience. As a result, Amsterdam not only attracts droves of tourists, this mercantile city has also become a centre of knowledge, research and innovation. The universities, schools and knowledge-intensive businesses attract talented people: the human capital that drives the city's growing knowledge economy. Start-ups and the tech sector play an important role in this.

In the area inside and on the borders of the ring road/ A10 in particular, Amsterdam has all the characteristics of a highly urban living and work environment, with a high

figure 5
Amsterdam

2.2

Urgent need for an integrated approach

The combination of the high quality of life, the focus on human scale and the international orientation is a powerful plus, but it requires considerable effort to maintain it for everyone in the MRA. Especially in light of the demographic and economic growth that is expected.

In recent years, especially before the coronavirus pandemic, the MRA reaped the economic benefits of its magnetic attraction on the international stage. But that economic growth does not take place at the same pace everywhere, and not everyone benefits to the same extent. The housing market is under high stress and labour market shortages continue to mount up. The socio-economic disparities within the region are increasing. This is undesirable - because where you live should not affect the opportunities open to you, but also because practically trained and middle-skilled workers are indispensable for a smoothly functioning metropolitan region.

At the same time, we face a rapidly changing climate and biodiversity that has declined enormously in just a few decades. The health of the residential environment is under pressure in many places. These are processes that require urgent action.

That urgency applies across the full breadth of the urbanisation activities. We see each development as an opportunity to keep or make the living environment healthy, safe and attractive. Big or small, inside or outside the city or town. These opportunities are not optional: the level of urgency is high, and every opportunity must be seized.

This does not mean that the solution paths for the various tasks all point in one direction. Choices, both spatial and temporal, are and will continue to be necessary. These choices must however be made from a coherent, integral and MRA-wide perspective. To ensure that we combine tasks as much as possible in integrated projects and area developments. Examples that perfectly illustrate this are the quality of life around Schiphol Airport (paragraphs 3.1 and 4.6), the development of and sustainabilisation in the North Sea Canal area (paragraph 4.1) and the strong relationship between urban development (living, working, amenities) and the development of the mobility system. Choices made in these contexts have an effect in other parts of the MRA and beyond, and also have an impact on the quality of the living environment. So the developments will be worked out with the scale of the MRA in mind.
To meet all the urgent needs, substantial investments are needed, both public but definitely also private. Many of these investments must be made on short time lines in the near future, before 2030. This will only be possible if (international) investors, and residents too, are confident that the MRA will continue to provide a safe, healthy and attractive living environment for everyone in the long term. The choices in this Urbanisation Concept are based on this principle. When making short-term choices, we always keep the long term in mind. We are looking some 30 years ahead, or even further into the future where the effects of climate change are involved. This approach obviates the need to implement new measures before the end of those periods, which would result in even higher costs.

2.3 Our ambitions

Urbanisation is more than just building homes and business parks. Out task is to build complete towns with a high quality of life. This means that construction locations, especially the larger ones, may also involve investments in infrastructure, amenities, public space and the energy supply. Conversely, the green and blue network and systems for mobility, water and energy set the conditions for the development of residential and work areas.

In all urban developments, we want to seize the opportunity to make the region more climate-adaptive, nature-inclusive and water-resilient, to strengthen the specific profile of the environment and to improve the societal balances in the MRA.

The built area and the landscape are closely related. The contiguous, varied and water-rich landscape is a major asset of the metropolitan region and is indispensable for a healthy, safe and attractive living environment. Landscape structures continue into the built area, sometimes inconspicuously and sometimes as a distinct feature. Different functions of the landscape (such as nature, recreation, water) already have capillaries running into the residential areas. So the ambitions for the built area and the landscape are closely linked.

Ambitions

- Ensure that the entire metropolitan region benefits from the growth
- Meet the qualitative and quantitative need for living and work environments
- Strengthen diversity and connectedness in the economy
- Create a better balance in terms of living and working
- Ensure a healthy living environment
- Improve accessibility and travel connections in the MRA
- Reduce greenhouse gas emissions
- Further develop the metropolitan landscape
- Make the region climate-adaptive
- Increase biodiversity

Ensure that the entire metropolitan region benefits from the growth

The MRA's population and economy continue to grow. We want to use that growth potential to further strengthen the distinctive qualities: the combination of quality of life, the human scale and international orientation, and the characteristic diversity. To achieve this, we are further strengthening the multi-core structure of strong towns and villages in a strong landscape.

This commitment to multi-core development combines several ambitions. It allows us to reduce the pressure on the residential and work locations in the Amsterdam metropolitan area and limits the growth of rush-hour commuting to Amsterdam. We can utilise the qualities of all the towns and villages in the MRA and meet housing needs in each sub-region. We can maintain the human scale and we preserve the open landscapes between the urban areas to the greatest extent possible. As a result, we can simultaneously create favourable spatial conditions for the major sustainability tasks of our time: the mobility transition, climate adaptivity, water resilience, biodiversity and clean energy.

In doing so, our objective is to also contribute, through urbanisation choices, to an improvement in districts where a combination of spatial conditions and the socio-economic characteristics of the population result in reduced opportunities for a number of key aspects of life: prosperity, health and well-being. Our strategy for this includes mixing and improving districts through home construction and transformation, improving societal opportunities, social cohesion and liveability in vulnerable areas via amenities planning, among other things, and improving socio-economic opportunities in vulnerable areas through better access to jobs.

Meet the qualitative and quantitative need for living and work environments

National government and the regional authorities have agreed to build 175,000 homes in the period up to 2030 and are exploring the possibility of building another 45,000 homes during that period. After 2030, the need for new housing appears to decline, but the projections are subject to substantial margins. For now, it is assumed that 75,000 homes will be built between 2030 and 2040 and another 75,000 homes between 2040 and 2050.

The projected economic growth in terms of employment is about 250,000 jobs (more than 12 hours a week) in the period to 2040. Whereas it was previously expected that ageing would cause growth to level off, we now expect employment to continue to grow at the same rate between 2040 and 2050. We need to accommodate this in a manner appropriate to the nature of the business activities.

The residential and work environments that are to be developed must match the qualitative demand. The trend in that respect is increasingly towards mixed (highly) urban living/working environments. The demand for new homes comes mainly from first-time buyers in the housing market and households that want to progress up the housing ladder by moving to a higher quality home. This includes senior citizens seeking suitable housing: when they have found their new accommodation, they leave behind a single-family home. The MRA, particularly Amsterdam, also attracts many young people from other parts of the Netherlands and abroad. The demand for new construction after 2030 seems to focus on (highly) urban environments, with a large number of homes for single-person and two-person households who want to live close

to amenities, their work and public transport. In the period up to 2030, a relatively large number of single-family homes in residential areas will be needed, in addition to apartments.

Housing affordability is an increasingly important concern in this regard. Due to rising house prices, affordable housing is increasingly found on the fringes of the MRA. To ensure balanced (social and economic) development, sufficient affordable housing of adequate quality and size needs to be available throughout the region. This applies especially to inner-city locations near public transport hubs, town centres and major development sites. A sufficient supply of affordable homes can be achieved through new construction, and also by keeping the existing homes affordable.

The knowledge economy thrives in mixed environments because they promote interaction and knowledge exchange. But we also want to bring production companies into the towns, in 'productive districts'. The transformation of business parks with large-scale residential development increases the socio-economic task of maintaining sufficient space at the location or in the vicinity for locally focused businesses and local employment, particularly for practically trained workers. This is a prerequisite for ensuring that the commute between home and the workplace for practically trained workers does not become too lengthy and/or too costly. Business spaces for small-scale manufacturing and companies that provide locally oriented products and services are dependent on affordable leases (like social housing) and will not therefore be automatically provided by market parties. This also requires attention in the realm of regulations.

Not every business lends itself to a mixed-use environment alongside residential development.

figure 6 - The MRA offers a rich array of complementary work and living environments (source: 'Mensen Werk, Hoe geven we ruimte aan de toekomst van werk?' (2018), Spontaneous City)

Sufficient non-mixed-use business parks will continue to be needed for these companies, which are important for employment in the MRA. New plans for residential development that result in the transformation and loss of business parks are possible if sufficient space is available for business activities.

Strengthen diversity and connectedness in the economy

'Diversity' and 'connection' are the guiding principles for multi-core economic development. Regional economic profiles contribute to the diversity that characterises the MRA. Economies of scale in towns and cities are generated by the mutual proximity of economic activities, with a natural split between larger towns that have a diverse economic structure and more specialised, smaller towns. Amsterdam and the surrounding municipalities form the economically dominant core area in this multi-core structure. Economies of scale at the level of the metropolitan region come from strong connectedness: physical, social and economic.

A large proportion of mixed-use residential and work areas will continue to be concentrated in and around Amsterdam in the future. In order for the entire metropolitan region to benefit from job growth, we are strengthening the attraction of environments elsewhere in the region as a place for establishing businesses. We will do this by focusing on mixed residential and work environments with their own distinctive profile that offer an inviting development perspective, building on already existing economic characteristics.

With this ambition in mind, we will also develop the innovation ecosystem in the MRA, in which the business community, knowledge institutions, educational

institutions and government authorities each have their own role. The economy is moving towards circularity and digitalisation. Flows and circular systems increasingly determine the structure of the regional economy. Residual materials from one company can be utilised by another company, or by private individuals. For example, raw materials, residual heat, CO2, waste water. We take into account the possibility that facilities for the circular economy and the traditional economy will coexist for some time, resulting in a temporary additional space requirement.

The region's powers of innovation are sorely needed in the transition to a circular economy. The same applies to digitalisation. Knowledge development and knowledge application are already closely linked in current practice. Stimulation measures that focus on aligning education with the labour market are especially desirable. New generations of workers need skills appropriate to a circular and digitalised economy.

After all, the commitment to diversity and connectedness will automatically strengthen the MRA's international position. Through further development of the port, aviation, international railway traffic and the AMS-IX digital hub. In these developments, we are committed to increasing sustainability and improving health and liveability in the surrounding areas.

Create a better balance in terms of living and working

A balanced development of the metropolitan region is the goal of explicitly opting for multi-core development. At the moment, there is an imbalance in spatial distribution between the locations where people work and live in the metropolitan region. This is one result of an imbalance between a multi-core spatial distribution of housing and a spatial concentration of jobs.

For a variety of reasons, practically trained workers and middle-skilled workers in particular are less able and willing to travel a considerable distance, for long periods of time and at high cost in order to get to work. They typically earn less, own fewer cars and receive a lower commuting allowance from their employers. As a result, the commuting distance in terms of time, money and complication weighs relatively more heavily on them than on more highly educated people. However, due to processes in the housing market, these groups are more likely to live outside the core agglomeration than people with an academic education. As there are relatively few suitable jobs locally, they have to travel to that core agglomeration - which is less accessible to them in pure travel time and broad connectivity - in order to get to work. Moreover, within the core agglomeration, where there are actually more jobs than there are workers, jobs for practically trained and middle-skilled people are more often found in locations that are not so easy to reach with public transport.

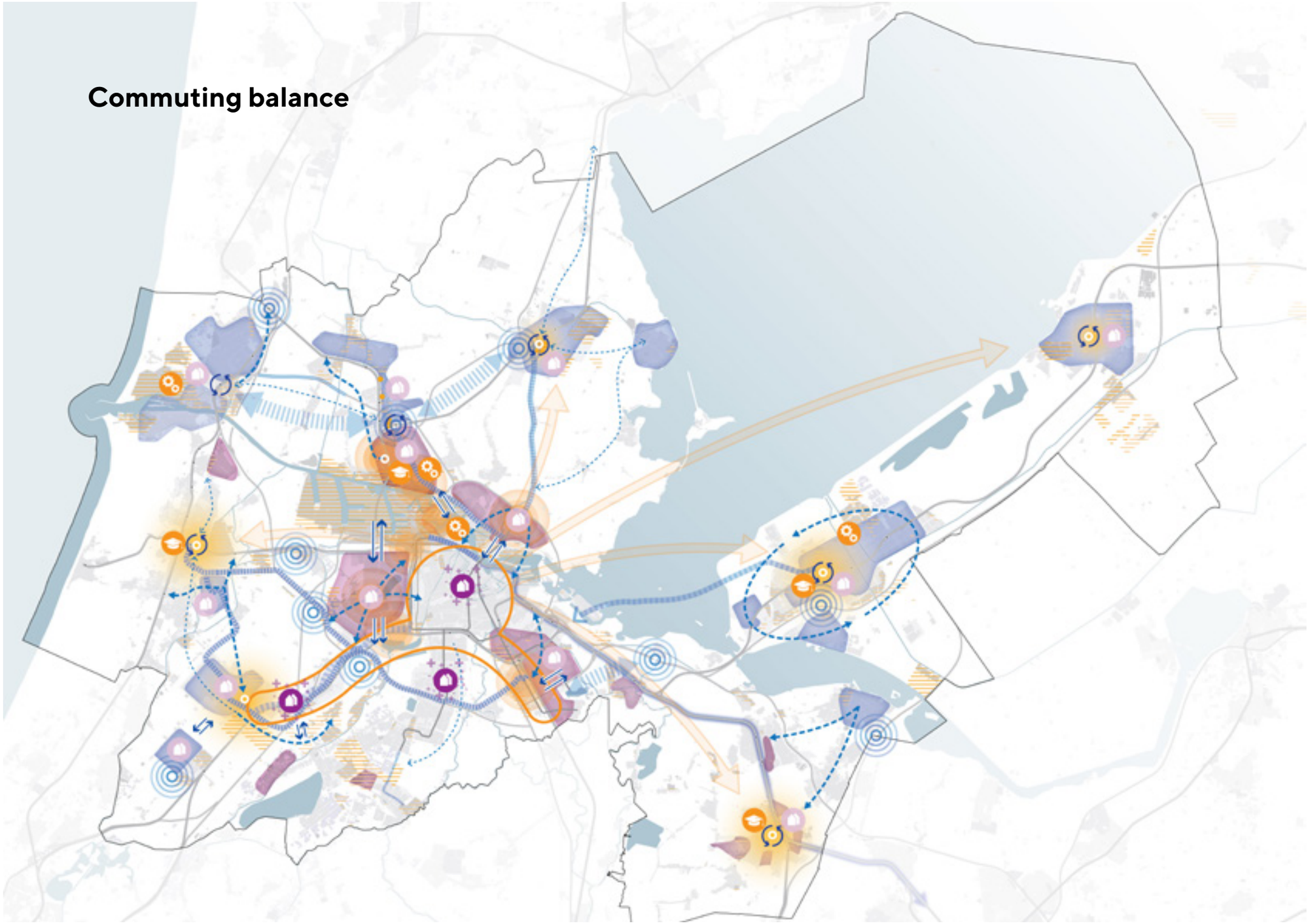
This spatial imbalance in the metropolitan region leads to a sizeable commute that reinforces transport inequality between practically trained and middle-skilled workers

Port economy

The industrial maritime cluster in the port is an employment engine, which generates profit internationally and has a significant multiplier effect on the local economy. The port functions as a transit hub for high-value products, a location for high-end industry and companies, a testing ground for new business activity and an ecosystem in which companies, knowledge institutions and public organisation interact. Recent investments have been made to refurbish the sea lock in order to protect that role.
In order to maintain its strong position on the international stage and its pivotal role in the national economy, the port area no longer depends solely on high volumes, but also on the sustainability of its operations and the innovations that go with them. The port has an important role to play in the energy transition due to the presence of large energy users and its traditional but declining transit function for raw materials such as coal. The port area also has an important role to play in the transition from a fossil-based, linear economy to a circular economy. The port's innovative capacity can drive transitions in the broader regional economy.

We want the port complex to maintain its strong, internationally competitive position and contribute to sustainable economic development. Sustainabilisation is required for this, and to improve health and quality of life in the MRA. We also attach special value to the specific employment opportunities provided by the port: practical jobs, within the geographical reach of many residents.

Commuting balance



Legenda

Interventies wonen

- Concentraties praktisch en middelbaar geschoolden nabij werkconcentraties (fijnmazig lokaal verbinden)
- Op peil houden betaalbare woonvoorraad

Interventies economie en onderwijs

- Economisch kerngebied
- Uitbreiding economisch kerngebied
- Versterken economische subcentra
- Versterken onderwijsstructuur
- Versterken maakindustrie, organiseren specialisatie
- Verleiden van bedrijven, versterken economisch profiel
- Ontwikkelen bedrijvigheid, sociaal economisch binden werkgelegenheid

Interventies bereikbaarheid banen

- Praktisch en middelbaar geschoolden op afstand van werkconcentraties (regionaal verbinden wonen en werken)
- Fijnmazig verbinden met economisch kerngebied
- Fijnmazig lokaal verbinden
- Verbinden economische centra met HOV
- Verbinden economische centra met fiets
- Zoeklocatie regiohub

Overige

- Stadsharten MRA Verstedelijkingsstrategie
- BBG
- Bedrijven en industrieterrein
- Treinspoor
- Snelweg

with lower incomes on the one hand, and academically educated people with higher average incomes on the other.[1] This imbalance also makes it more difficult, even impossible, for employers and practically trained and middle-skilled workers to find each other in the core agglomeration.

Our goal is to reduce this imbalance and inequality wherever possible. The challenge is to promote a better balance between living and work in all sub-regions, in terms of the ratio of the number of jobs to the working population, through smart coordination of location choices for living and work and their mutual accessibility.

The contribution of the Urbanisation Strategy consists, on the one hand, of measures to be implemented in decentralised locations with a high concentration of practically trained and middle-skilled workers (the blue areas on the map) in order to:

- Preserve the existing jobs and integrate them within the spatial transformation areas
- Improve the conditions for employment growth by strengthening decentralised economic profiles, thereby enhancing specialisation and competitiveness and encouraging companies to open establishments
- Mix living and work at transformation sites where possible in productive neighbourhoods or districts, and reserve planning space for business parks near places where large numbers of work areas are being transformed
- Improve proximity and accessibility for commuting between home and work locations with car-sharing schemes, car/bicycle and car/public transport combinations for car-dependent commuters and favour affordable and readily available alternatives such as walking, (electric) bicycles and public transport to achieve door-to-door network density

On the other hand, the Urbanisation Strategy can reduce potential labour shortages in crucial occupations and competitive sectors in the core agglomeration (the orange area on the map) with more housing options in the cities and core agglomeration for practically trained and middle-skilled workers on low or middle incomes. This means that the affordable housing stock must be maintained and, where possible, enlarged. In addition, the purple areas on the map call for targeted measures that help improve affordable and safe door-to-door connections between home and work locations.

This approach calls for customisation per area and for an MRA-wide integral elaboration in terms of the overlap between housing, the economy and accessibility. This integral elaboration includes:

1. Mapping out – in respect of various levels of education, social groups and business sectors – the current ratio of jobs to the working population, the functions mix of living and work facilities and the accessibility profile from the perspective of the sub-areas and the overall system
2. Determining the ambitions of sub-regions and town centre hubs for the further development of this functions mix and the accessibility profile, also in relation to changes in the accessibility system in the latter case
3. Determining a typology for the 'optimal' functions mix of the various living and work environments in relation to the (future) accessibility profile and business establishment climate, with guidelines for area development and accessibility interventions
4. Fleshing out and, where necessary, precisely defining the ambitions of sub-regions and town centre hubs based on the typology for the 'optimal' functions mix, and the living, business establishment and accessibility climate

Promoting connectivity in the MRA: accessible and affordable

The growth of the metropolitan region will also increase mobility within, from and to the MRA. This increasing mobility must be appropriately accommodated in the plans for a healthy, safe and attractive living environment. Economic centres must remain accessible, and at the same time the travel distance between the home and the workplace on the one hand, and to amenities on the

1 Transport inequality means that the cost of travelling between home and work in terms of time, money and complication is higher for practically trained and middle-skilled residents of the MRA – both within the MRA as a whole, and within the various sub-regions – than it is for academically educated residents in the MRA, to the extent that it may even create a barrier to labour participation in many cases.

other hand, should be kept at a reasonable level. We want this daily mobility to remain accessible and affordable for everyone. Convenient and affordable travel is a concern, particularly among practically trained workers.

The Urbanisation Strategy and the development of the mobility system, will result in a mobility transition through their mutual interaction. The objective is sustainable, healthy and smart mobility, which makes it easy for people to organise their travel from door to door, in an affordable way and with only limited dependence on a personal car. And we also want freight transport to be less dependent on trucks, especially in urban distribution. This sector can support other ambitions by making logistics and freight transport smarter and more sustainable, through increased use of the waterways for example.
Air travel plays an important role in terms of international connections. We want to reduce short-haul air travel by creating more capacity for international trains on the railway network. As a result, Schiphol can continue to grow as an international hub for railway traffic. To create that capacity on the railway network, Hoofddorp and Schiphol must be connected to Amsterdam's metro network. As a possible consequence, more international railway traffic may lead to increased environmental impacts and greater use of land for the railway network. Negative impacts on domestic and regional rail traffic also need to be avoided. In addition, these initiatives will not automatically reduce aviation's environmental impact and spatial requirements. After all, the resulting available aviation capacity could be used for long-haul flights. A balance needs to be struck here.

To promote the development of a safe, healthy and sustainable metropolitan mobility system, our approach considers it as a single coherent system of different modes of passenger and freight transport: railways, public transport, roads, waterways, bicycle paths and pedestrian access routes. The development of inner-city housing in mixed-use environments emphatically supports this ambition.

Ensure a healthy living environment

The local health situation differs widely across the MRA. For example, there are differences between areas where the living environment is relatively healthy or unhealthy, and between areas where there are relatively many or few people who are vulnerable to physical and mental health risks. This is the outcome of an analysis conducted by the National Institute of Public Health and Environment Protection (RIVM) for the Urbanisation Concept.

figure 7
Mobility system as a single coherent system
Bijlmer-Arena station

RIVM analysis of the living environment and health

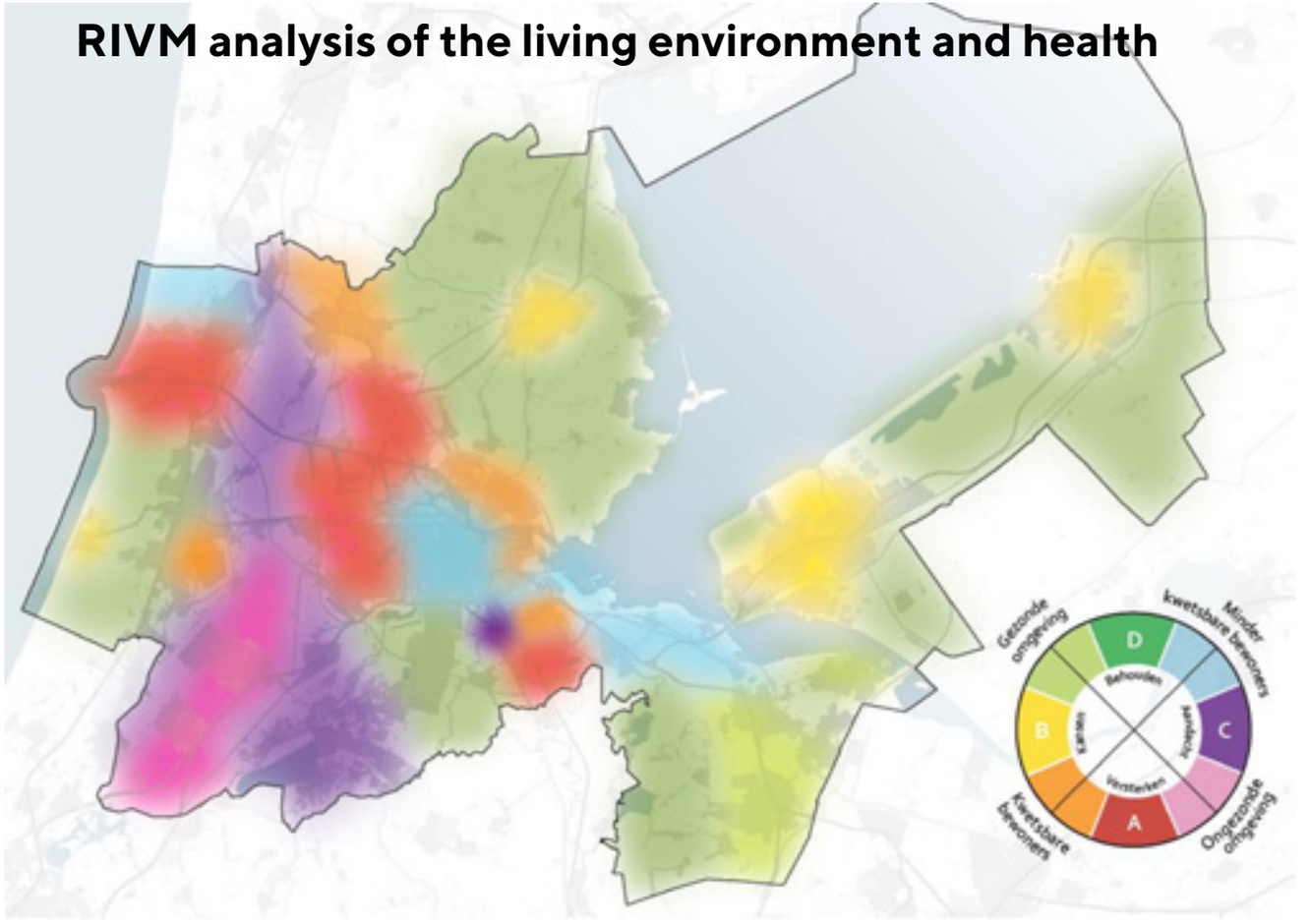


figure 8
Protecting and promoting health

Our ambition is to offer everyone in the MRA a healthy living environment by investing in developments that protect residents from environmental pressures and promote mental and physical health. Achieving this ambition is challenging when making choices in areas where unhealthy environmental factors aggravate an over-representation of people with fragile health, or where development applications with a negative impact on health compete for space with interventions to promote health.

The primary areas of concern are the red-orange-pink areas on the map. A relatively large number of people who are vulnerable to physical and mental health risks live here in a relatively unhealthy environment. In order to strengthen the healthy living environment, a combination of spatial measures to protect and promote health is appropriate here, especially if significant new construction is planned.

In the purple areas where an unhealthy environment is the main problem but the population is relatively small, health protection is the primary challenge. In the yellow areas, there is a relatively high population of vulnerable people but the environment is relatively healthy. Health promotion and reducing this group's vulnerability are important here. In the green areas where relatively healthy people live in a healthy environment, the challenge entails maintaining this healthy environment despite urbanisation pressures.

Protecting health primarily means taking action against noise and air pollution in the residential and living environment. For example measures to reduce, make more sustainable, or relocate sources of noise and

particulate matter such as industry and airport operations, and reducing the speed limit on roads in the vicinity of current and future residential locations. Furthermore, measures to prevent flooding and heat stress are also important in protecting health, as is road safety. There is a relationship with the energy transition and the circular economy, which are necessary on the one hand for a structurally cleaner and healthier environment, but whose infrastructure can also lead to locally adverse effects (in terms of environmental and safety contours). Finally, there is a strong relationship between health and poor housing quality (mould, foundation rot), which can also lead to energy poverty. In view of this, targeted actions to make homes more sustainable in certain districts are important, not only to further the energy transition, but also to achieve health benefits.

A spatial layout that invites exercise, relaxation and meeting people and active forms of mobility (walking and cycling) promotes health. The key points here are the mix of functions (the proximity of daily amenities, work and education and facilities for relaxation) and the proximity and quality of plants and gardens; both in the immediate vicinity of homes and attractive and accessible recreational and nature areas. This requires careful consideration, especially in the red, pink and purple areas where spatial claims associated with promoting health compete with other spatial claims.

In a general sense, the development of (rapid-transit) bicycle paths and public transport is also conducive to health. Furthermore, social participation can promote health. Proximity to work and education is relevant in this respect, as is social contact and social cohesion. A point to consider here is that segregation and gentrification in districts can be the cause of reduced social cohesion and contact, and have a negative impact on mental health. Finally, spatial planning will often not be a sufficiently effective solution. Effective behavioural change and health promotion require a combination of spatial policy and social measures.

Reduce greenhouse gas emissions

We are working towards a clean MRA that is circular and fossil fuel-free. The Urbanisation Strategy can significantly contribute to reducing the emissions of CO2 and other greenhouse gases. This is necessary to counteract further climate change and the resulting effects on the safety and health of the living environment. The energy system will be fundamentally re-engineered in the years to come. Sustainable energy sources such as wind, solar, geothermal energy and aquathermal energy will replace fossil fuels. This calls for an integrated hybrid energy system; one that uses different sustainable sources, integrates small-scale energy generation down to the neighbourhood level, and guarantees a stable energy supply. This will guide urbanisation choices to a greater extent than in the past. The energy transition is affecting industry, which will also operate more circularly in terms of its energy supply, and the mobility transition.

In construction, we want to promote the use of materials that produce little or no CO2 emissions, or even store CO2, such as wood. Planting forests helps store CO2. And reducing land subsidence also reduces greenhouse gas emissions.

Further develop the metropolitan landscape

Thanks to the MRA's multi-core urban structure, the landscape is never far away. Our ambition is to ensure that an attractive and accessible landscape can be reached from every home within a fifteen-minute bicycle ride. Close accessibility of the landscape makes an important contribution to the quality of life and the focus on the human scale. Whether one wants to quietly enjoy nature or go to a festival, play some form of sports or spend a day on the water. As towns become busier, the need for recreation in a landscape setting grows correspondingly. So attention for enjoyment, the recreational function, accessibility and town-to-countryside connectedness (the green wedges and green zones on the edge of built areas) is appropriate in spatial interventions that affect the landscape.

The landscape contributes to the identity of the area, embodies cultural and historical values, offers recreation and is productive as agricultural land. A contiguous landscape is essential for restoring biodiversity. A strong landscape also functions as a provider of a number of green and blue services that are each individually important for a healthy, safe and attractive living environment, such as clean air, water extraction for drinking water production, water buffering, cooling, energy and the mental health benefits associated with a green environment.

The landscape values and green and blue services all require attention and maintenance if they are to be preserved and enhanced in the long term. Retaining the contiguous landscape structure, developing the landscape units that are part of it and a landscape-inclusive urbanisation approach play a crucial role in ensuring good quality of life for everyone in this growing metropolitan region.

Make the region climate-adaptive

The climate is changing rapidly. This means an increased

Reduce land subsidence

The land subsidence in peatland areas (Waterland, Amstelscheg, Vechtstreek) is caused by oxidation of the peat. Greenhouse gases such as CO2 are released in this process. Land subsidence in areas of reclaimed land occurs due to a combination of clay soil compaction and peat oxidation. Land subsidence can also affect land use, infrastructure management, and the quality of timber foundations.

The rate at which peat oxidises is related to the groundwater level required for current agricultural land use. The wetter the soil, the slower the rate of subsidence. Current water level management practice in many agricultural peatlands, which involves pumping away ditch water to keep the soil sufficiently dry for agricultural production, contributes to the rate of land subsidence. Structurally raising the groundwater level is one option for combatting land subsidence in peatland areas. However this has immediate implications for land use. Adjustments would have to be made, either in the form of modified agricultural management, or through a choice in favour of nature or recreation, or a combination of the three. Technical solutions (such as pressure drainage or underwater drainage) are also possible approaches and are currently being investigated to evaluate their potential effectiveness and impact.

The solution that is most appropriate for each specific peatland area, such as Laag Holland and the Groene Hart, will be identified in integral area processes that involve all the relevant parties. These integrated area processes seek to find solutions that combat subsidence and can count on public support. In the Amstelscheg, parties representing the area are also working together on an integral Area Perspective, which includes this topic.

The main cause of land subsidence in Flevoland is compaction of the clay. This is a natural process that will eventually come to a halt. In addition, there are localised peat deposits close to the surface. Oxidation of these peat layers results in subsidence (in addition to compaction). Certain forms of intensive arable farming may no longer be feasible in some places over time. In these case, a different form of land use must be sought.

inflow of water via rivers, rising sea levels, extremely intense showers, and periods of heat and extreme drought. The spatial developments we set in motion today will face a substantially different climate before the end of their useful lives. Climate change is likely to accelerate in the second half of this century. That expectation makes the urgency of climate-adaptive design all the greater. The time available for making choices, preparing developments and implementing measures is shrinking at an increasing rate. Postponing climate adaptation measures simply means that we will have to reconfigure the spatial layout and water system in many rural and urban areas in the foreseeable future if we want to keep the metropolitan region liveable and limit possible damage.

In areas of high economic value, where many people live and work, this is both complicated and costly. If we put off initiatives a few years, or only calculate based on possible scenarios up to 2050, additional investments in the spatial planning of urban areas, and in the water system in particular, are almost certainly unavoidable. In other words, the sooner we start adapting, the lower the final total cost.

In spatial plans and projects, we must consider the entire life span now and look to the distant horizon of 2100. This means that short-term spatial developments must also be assessed against all long-term scenarios. That involves uncertainty. We do not know exactly how fast climate change will unfold, or how severe the effects will be. A climate-adaptive region must be capable of dealing with these uncertainties. This flexibility avoids interventions that will lead to major additional risks or costs in the long run, and keeps different development paths open as

options.

So each development must support the goal of creating a climate-adaptive region[2] . That is a region where:

- There is a limited risk of flooding
- Sufficient space is available for holding and storing water, even during periods of heavy rainfall or when high volumes of water flow into the country
- People have adequate access to drinking water and fresh water, even in a prolonged period of drought
- Urban areas have adequate cooling options for responding to extreme heat events

Increase biodiversity

The MRA is different from most other metropolitan areas in that it has a contiguous landscape structure, which means that easily accessible and valuable landscapes can always be found near the urban areas. The sea, beaches, dunes, forest, heathland, peatland, marshes, polders and the extensive lakes - they all have their unique and important natural values. Together, they are a habitat for thousands of plants and animal species. This variety in terms of landscape and ecology does not alter the fact that biodiversity has declined dramatically during the course of the twentieth century. That decline has slowed in recent years, but restoring biodiversity is still a major task.

In the long term, the ecological system must be resilient and robust enough to allow nature to withstand adversity without immediately losing value. Such a robust ecological dryland and wetland structure is a prerequisite for restoring biodiversity and for sustainable urban and spatial and economic development.

We are working towards a situation where care for plants and animals is rooted as a matter of course in everyone's living environment and in the activities for planning, designing, developing and managing towns, villages and landscapes. This ensures uninterrupted nature, from back gardens in towns and villages to the nature areas throughout the MRA. As a result, nature strongly permeates all the capillaries of society and residents can benefit from the positive health effects of a green and biodiverse environment.

Reduce heat stress

Heat is increasingly a health risk, especially in urban areas. Because of climate change, heat waves are becoming more frequent. During a heat wave, the temperature difference between urban and rural areas can rise to as much as eight degrees. Reducing heat stress is now part of the design profile for new and existing urban areas, particularly in urban densification projects Examples of cooling measures include creating more shade in the built environment and more space for green areas and moving water, both in the public domain (parks, public gardens, green wedges) and in the private domain (encouraging residents and businesses to convert roofs, façades or paved gardens to green solutions). At a larger scale, urban design choices can help cool breezes from the outskirts of the built area to penetrate deeply into the town.

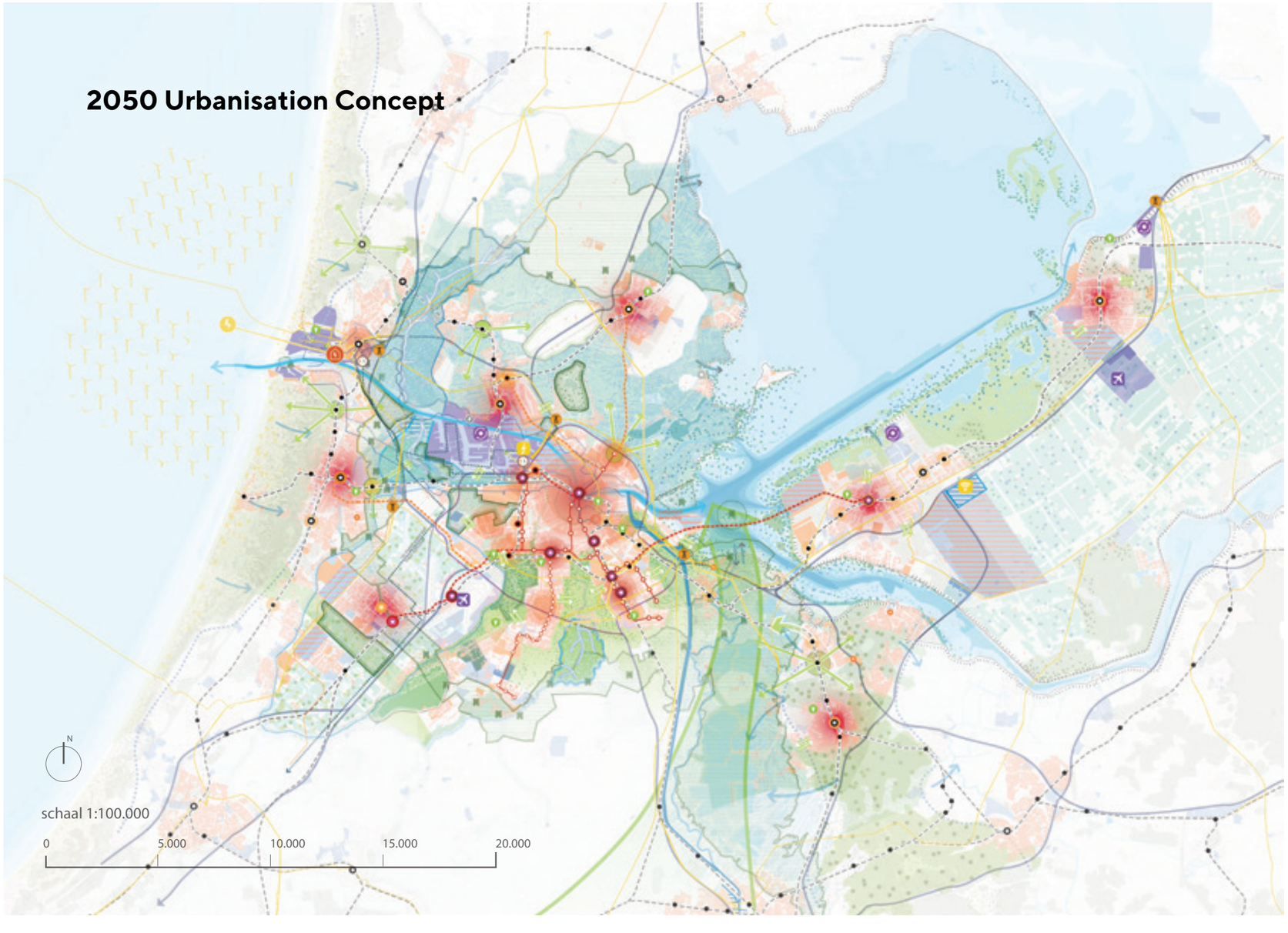
2 *The process results of the Spatial Adaptation and Fresh Water Delta Programmes can be used in the transition to a climate-adaptive region.*

3. Urbanisation concept

Ambitions are made concrete in the Urbanisation Concept. It shows how we intend to shape multi-core development within a healthy, safe and attractive living environment. Not everything can be done everywhere. We make every effort to preserve existing values and qualities of the living environment. The overlap between urban development and the water, energy and mobility systems gives rise to conditions. Measures support several ambitions at once, but incompatibilities that require choices also arise.

Many aspects converge in urbanisation. This chapter outlines the Urbanisation Concept base on its three main aspects:

2050 Urbanisation Concept



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Legenda

- 380 kV-onderstation
- Conversie van waterstof naar elektriciteit
- EnergieHUB
- Windturbines op zee
- Ruimte voor Energietransitie
- Data
- Circulaire economie (grondstoffen)
- Vliegveld
- Woningbouw
- Kantoren / bedrijventerrein
- Zoekgebied 4e connectiviteitshub
- Waterrobuust en klimaatbestendig ontwikkelen
- Multimodal knooppunt
- Kennis & Innovatieclusters
- Energie Infrastructuur
- Bestaande snelwegen
- Bestaande spoorwegen
- Ringen draaiend houden
- Bestaande HOV metrolijnen
- Nieuwe HOV lijnen
- Nieuwe HOV metrolijnen
- Metrohalte
- Sprinter stations
- Intercity stations
- Stadshart
- Ecologische verbinding
- Waterbuffer
- Kustzone IJmeer
- Verdiepen open water
- Vasthouden en kwelwater benutten
- Zoekgebied tijdelijke waterbuffer
- Spons
- Extra afvoer
- Transitie beplanting
- Dijken versterken
- Zoetwater reservoir en piekwater berging
- Transformatie van agrarische functie
- Regionale kering
- Unesco heritage
- Recreatie gebied
- Scheggen (Diemerscheg, Westeinderscheg, Amstelscheg)
- Veenweiden Laag Holland
- Gooi en Vechtplassen
- Recreatieve landschapscorridors
- Buitenpoort
- Ecologische verbindingen
- Verbindingen
- NZKG landschap
- Stelling van Amsterdam

3.1 Multi-core development with a focus on the human scale

Multi-core development is the key principle of the Urbanisation Concept. This elaboration reflects our ambitions of achieving balanced growth in the housing market, employment and the level of amenities while at the same time meeting qualitative and quantitative demand: our goal is to develop complete towns and communities.

Even so, a large part of the need for housing and jobs will come from the Amsterdam agglomeration and will be met there. But a substantial part will gravitate elsewhere, in addition to the demand arising from the sub-regions themselves. A coherent distribution of housing, jobs and facilities strengthens the individual parts of the metropolitan region in our concept.

The first paragraph of this chapter describes which residential and work locations will be developed and subject to what conditions, with an emphasis on those locations that require collaboration between national government and the regional authorities. The subsequent paragraphs outline how, among other things, we intend to strengthen society with these residential and work locations: via a diverse housing supply throughout the region, via strategic lines of economic development and a commitment to greater equality of opportunity. We then establish the relationship to the existing neighbourhoods in the 'Urban renewal and management' paragraph. The chapter on multi-core development concludes with a paragraph on the development of Schiphol in relation to urbanisation.

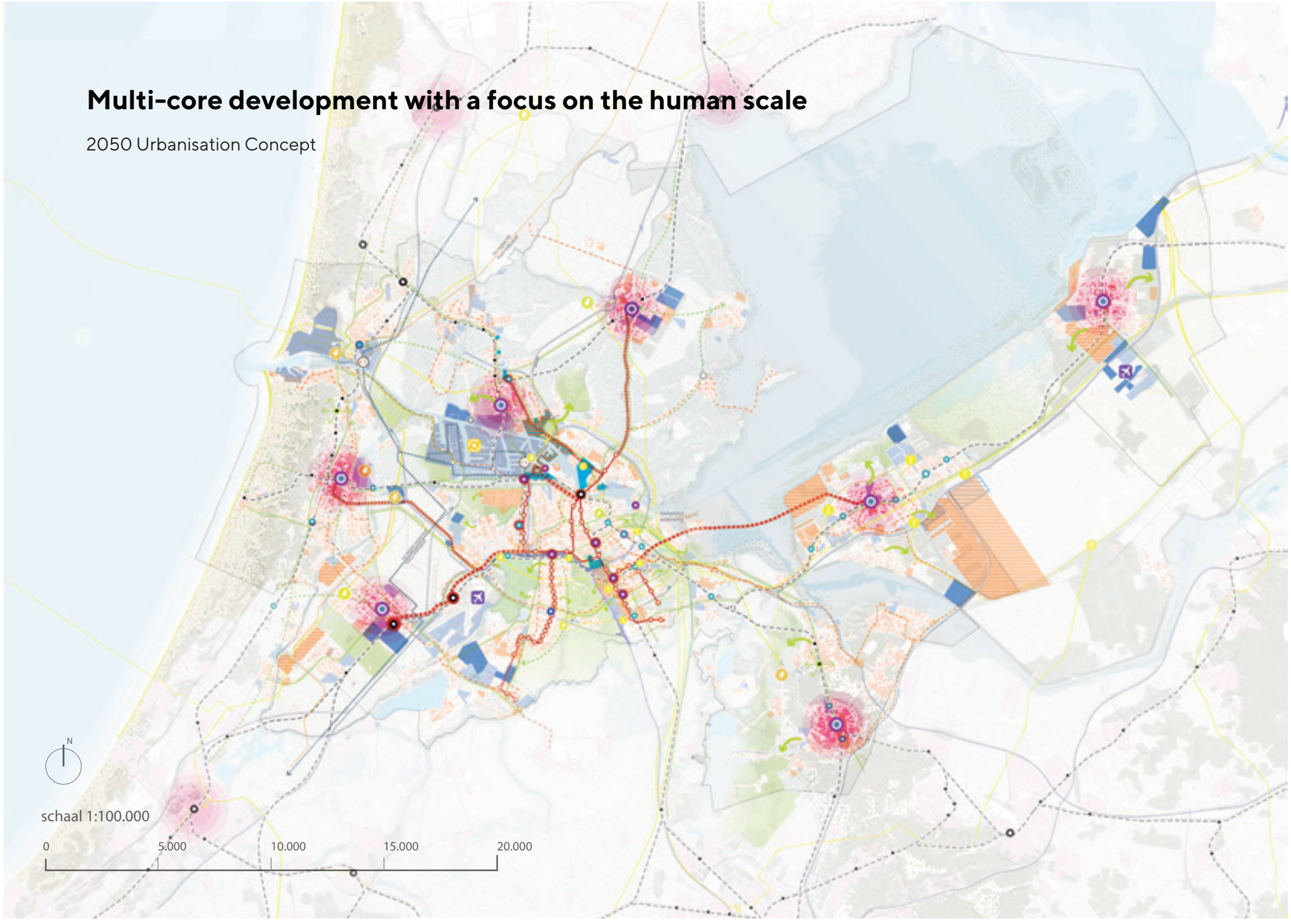
The development of housing, jobs and facilities takes place in interaction with the systems for mobility, ecology, water and, increasingly, energy. These systems set conditions that apply to urban development and, vice versa, large construction projects in particular also depend on investments in these systems. By developing the living and work environments in a climate-adaptive and nature-inclusive way, they also contribute to achieving the objective of a healthy, safe and attractive living environment.

Development of residential and work locations

The pressure on the housing market in particular is reflected by our agreement to build 175,000 homes by 2030 and 325,000 by 2050, in line with the qualitative housing need. We will also explore opportunities to accelerate housing construction by a maximum of a further 45,000 homes by 2030. This joint ambition of building 220,000 homes means that construction must progress quickly.

Multi-core development with a focus on the human scale

2050 Urbanisation Concept



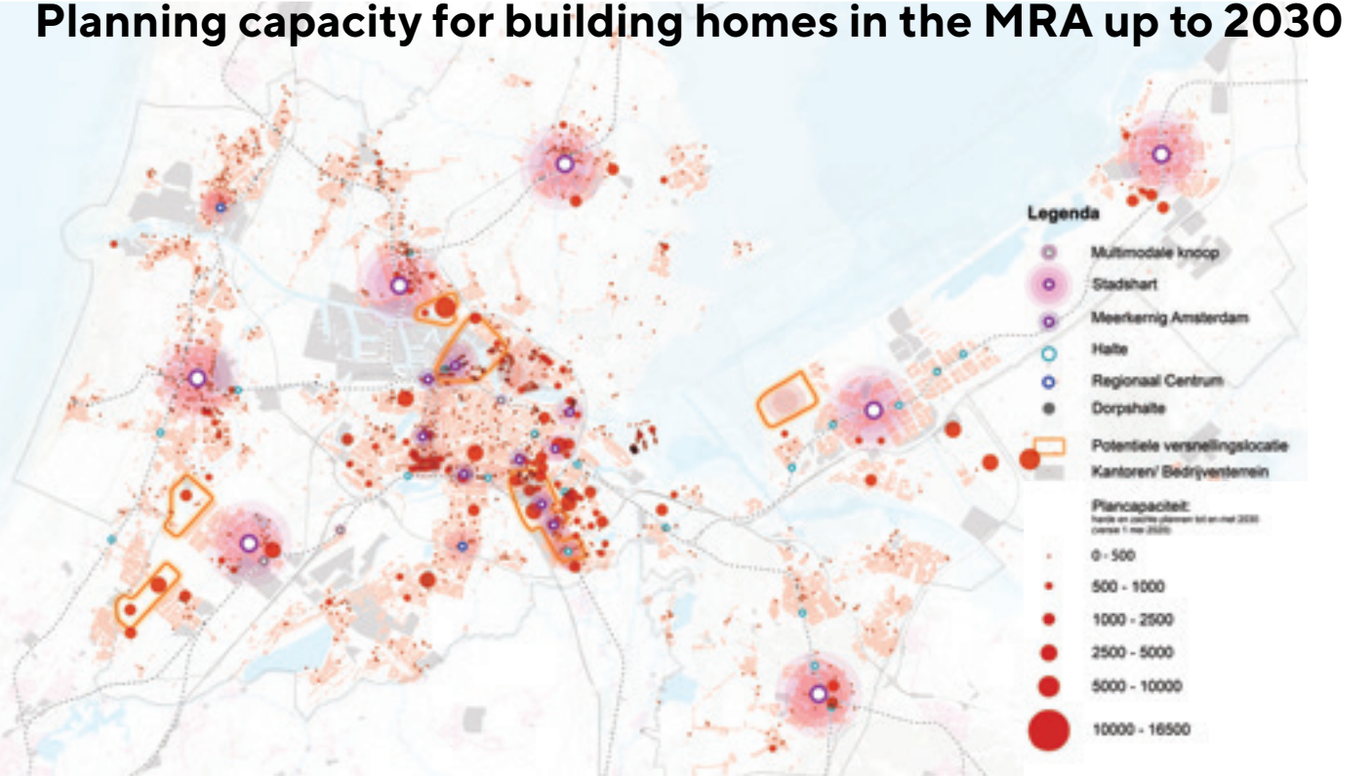
Legenda

- 380 kv onderstation
- Energie infrastructuur
- Ruimte voor energietransitie
- Circulaire economie (grondstoffen)
- EnergieHUB
- Woningbouw
- Kantoren / bedrijventerrein
- Zoekgebied 4e connectiviteitshub
- Waterrobuust en klimaatbestendig ontwikke
- Vliegveld
- Bestaande snelwegen
- Bestaande wegen
- Bestaande spoorwegen
- Bestaande HOV metrolijnen
- Bestaande snelle fietsnetwerk
- HUB (mobiliteitstransitie)
- HOV busstation
- Metrostation
- Sprinter stations
- Intercity stations
- Verbeteren HOV lijnen
- Potentiele nieuwe HOV metrolijnen
- Nieuwe fietsverbinding
- Potentiele nieuwe verbinding A8-A9
- Stadshart
- Scheggen (Diemerscheg, Westeinderscheg, Amstelscheg)
- Veenweiden Laag Holland
- Gooi en Vechtplassen
- Recreatieve landschapscorridors
- Buitenpoort
- Verbindingen

Within the scope of our ambitions, there is also an emphasis on developing mixed-use environments near public transport hubs and stopping points. This includes, for example, the development of station areas, business parks that are earmarked for transformation and new construction areas that have long been planned as part of Haarlemmermeer, Almere and Lelystad and that contribute to the continued growth of these new towns and their transformation into complete urban centres. A small portion of housing production will take place in expansion districts. Residential development near small cores and complementary to the existing structures in linear villages remains possible within the applicable regimes in order to maintain the quality of life in these cores and villages: to keep shopping facilities open and preserve public transport connections and/or other amenities. Finally, part of the construction production for business accommodation will take place in non-mixed-use business parks.

Many development locations can be realised under the responsibility of municipalities, without the need for collaboration between national government and the regional authorities. But this is not true of all development locations. The following are priorities in the collaboration between national government and the regional authorities:

- Development in the vicinity of hubs in and around Amsterdam
- Development in seven major town centre areas (Almere, Haarlem, Hilversum, Hoofddorp, Lelystad, Purmerend and Zaanstad)
- A number of large development locations in Almere, Haarlemmermeer, Zaanstad and Amsterdam



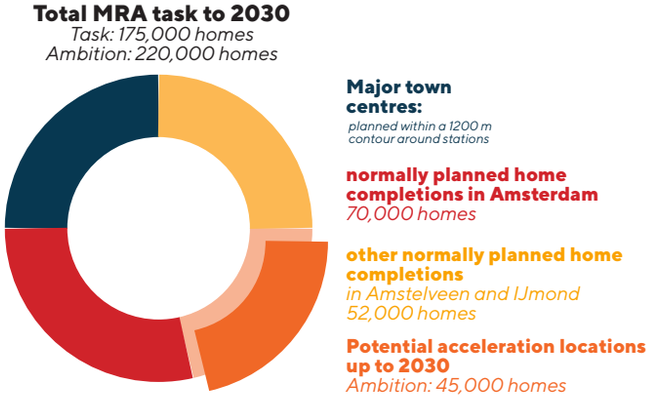


figure 9 - Breakdown of the MRA housing development task

where the potential for faster completion is being investigated
- The large urban renewal areas in Amsterdam, Lelystad and Zaanstad
- Preserving sufficient space for business parks in the North Sea Canal area

Public transport locations

The development opportunities at public transport hubs and train stations and bus stops also depend on their position in the mobility system. We distinguish between:

1. Multimodal hubs: (highly) urban mixed-use residential and work environments that are directly accessible by bus, train and the metro, with an existing strong economic structure or the potential for a strong economic programme
2. Major town centres: (highly) urban mixed-use residential and work environments with a broad range of urban amenities that are directly accessible by bus, train or the metro and that have the potential for a strong economic growth programme
3. Regional centres: urban mixed-use residential and work environments with urban amenities that are directly accessible by bus and train or the metro and that have the potential for a moderate economic programme
4. Train stations and bus stops: urban residential environment directly accessible by train or metro with potential for a moderate commercial programme. The density may vary. As the distance to the train station or bus stop increases, the density will sometimes decrease, resulting in suburban residential environments within the sphere of influence of 'train stations and bus stops'

In particular, housing development in the major town centres and regional centres in the MRA is important in respect of the ambition to balance economic growth across the region. The expectation is that spatial and economic policy will influence about 10% of the growth in jobs and succeed in channelling that growth component towards public transport locations. The intention is to use this potential for influence to strengthen these centre areas, in addition to the job growth coming from the sub-region itself. This requires attractive highly urban living and work environments at a short distance (no more than 15 minutes on foot) from an intercity station or another high-grade public transport hub, which match the economic profile of the area. The acceleration of housing construction in the major city centres and regional centres during the period up to 2030 is an important prerequisite for an attractive business establishment environment, in addition to a clear economic profile (see also the 'Spatial and Economic Strategy' paragraph).

Integral area plans have been drawn up for seven major town centres, based on a coherent approach and implementation strategy for both the projected new buildings and the existing housing stock and public space. This applies to Almere, Haarlem, Hilversum, Hoofddorp, Lelystad, Purmerend and Zaanstad. These integral plans entail:

- Continued investment in liveability, the social contact function and the area's appeal
- Substantial housing production at an accelerated pace
- A much needed boost to the economic profile, a strengthened economic structure and additional jobs
- Making the metropolitan region climate-proof
- Utilising and optimising public transport accessibility and slow traffic routes
- Ensuring access to green areas in and around these residential locations

In the Urbanisation Agreement, commitments are made regarding the part played by national government and the regional authorities in these area plans.

Accelerate construction at major development locations

In view of the large number of homes required, opportunities are being sought in order to increase building production to 220,000 in the period up to 2030 by accelerating construction at a number of large locations.[3] National government and the regional authorities are exploring the possibility of building a maximum of 45,000 homes in the MRA before 2030, spread across five development locations:

- Haven-Stad in Amsterdam
- Achtersluispolder in Zaanstad
- Almere Pampus
- Amsterdam Zuidoost/Duivendrecht
- Hoofddorp centre and the west flank of Haarlemmermeer

Prerequisites must be met in order to accelerate development in these five locations. This calls for acceleration in other areas as well as housing construction; i.e. other measures and projects that are linked to the residential development on a one-to-one basis, such as

3 *Agreements were made on this in the BO MIRT of the autumn of 2020.*

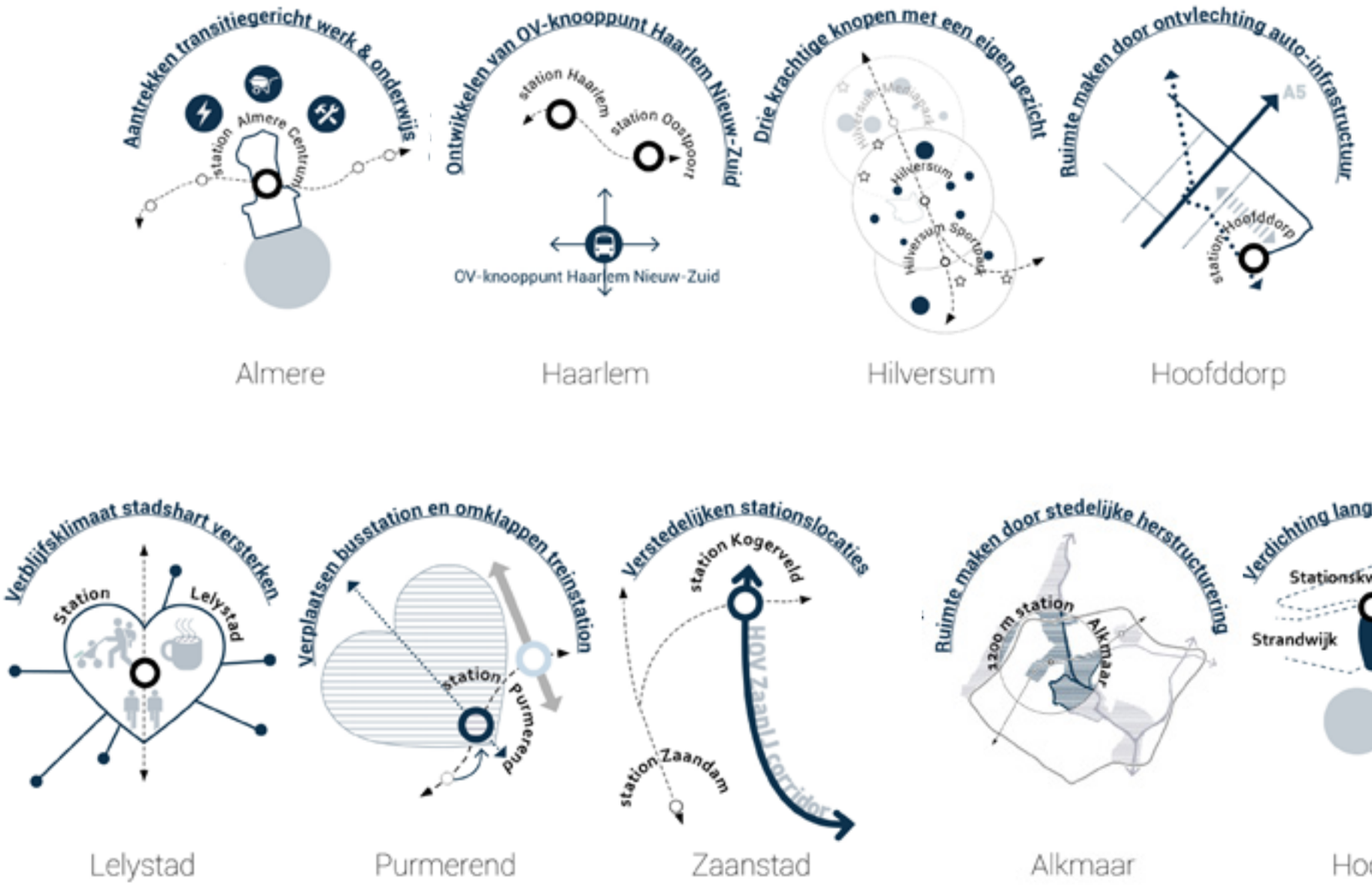


figure 10
Major town centre areas (from the Accessible Towns Programme, which also includes the town centre areas in Noord-Holland Noord)

mobility, the energy supply, climate adaptation or health. In the transformation areas, relocating businesses requires thorough preparation. Costs will be associated with this.

Accessibility also requires substantial investment. Because of the long completion time of major infrastructure projects such as new metro lines, they will not be effective in relieving the pressure on the mobility network until the mid-2030s at the earliest. Depending on the ultimate rate of urbanisation, this could potentially lead to bottlenecks in a specific period. Alignment in terms of the timing of housing and infrastructure is required to avoid accessibility problems. One possibility might be to adopt growth-linked strategies for mobility.

The type of living and work environments that will be realised in these locations is determined by the qualitative need, the qualities of the location and the position in the mobility system. The two development locations in the North Sea Canal area (Achtersluispolder and Haven-Stad) lend themselves well to the realisation of productive districts in which housing is mixed with existing industry, local service companies and employment, particularly for practically trained workers.

Non-mixed-use business parks

Not every business lends itself to a mixed-use environment alongside residential development in 'productive districts'. Non-mixed-use and zoned business parks will continue to be needed for these companies, which are important for employment in the MRA.

The large-scale transformation of business parks makes alternative business establishment locations necessary. Up to 2040, the MRA needs all the available hard and soft planning capacity to meet the requirement for business parks, both for new companies and companies coming from sites that are to be transformed. That hard and soft planning capacity is mainly available in the municipalities of Lelystad and Almere, north of the IJ and in Purmerend/Edam-Volendam, and in the South Flank. In the South Flank, accommodating the level of business establishment is difficult, particularly in respect of new companies. The existing space and plan capacity must be used economically to ensure that new and relocating businesses can find a place in the metropolitan region.

The port industrial complex is also under spatial pressure due to the housing development task in combination with increasing demand for space for activities related to the circular economy and the energy transition. This may result in the need to relocate businesses, for which a new location must then be found. It is important to distinguish between quayside and port-related companies, which are more difficult to relocate, and 'dry' companies. Intensification is always preferred in this regard, but will not always be feasible.

All of this requires a regional business park strategy. In addition, we see a further task - that of making these business parks easily accessible to workers from the region.

Conditions for development

If new residential and work environments are actually to contribute to a healthy, safe and attractive living environment, they must meet a number of conditions relating to accessibility, climate, biodiversity, water management and energy.

Good accessibility

By choosing to focus on inner-city development locations

Strategy for data centres

The digital infrastructure is growing and all the indications are that this growth will continue. In accordance with the National Strategy on Spatial Planning and the Environment (NOVI), hyperscale data centres (i.e. those owned by large tech companies and used only by them) should preferably be located at sites on the periphery of the Netherlands, but there are opportunities for other data centres in the MRA. Currently, three locations in the MRA offer business establishment opportunities for data centres that want to take advantage of hyperconnectivity in order to offer additional digital speed. These 'hyperconnectivity hubs' are located in Haarlemmermeer (Schiphol) and Amsterdam (Science Park and Zuidoost). The policy targets selective, clustered growth of these hubs, and at the same time there seems to be a need in the market for a fourth hub. The MRA intends to provide space for this development. In Flevoland, the provincial authority and municipalities are investigating a possible development in relation to this fourth hyperconnectivity hub.

The MRA is currently preparing a Data Centre Strategy that will set guidelines for achieving selective, clustered growth of data centre capacity with hyperconnectivity in the MRA. This strategy will also include the conditions for development. These conditions apply to site selection, design quality, a sustainable energy supply, the provision of heating, water safety and the usage of drinking, ground and surface water.

and development around public transport hubs, we limit the number of resulting travel movements generated and the distance travelled, and make the best use of existing infrastructure. This does not alter the fact that these development locations themselves will require investments in accessibility, sometimes substantial in scale; in smart and affordable mobility, good urban accessibility and the regional and national multimodal network. Capacity expansion of the urban bicycle network and the public transport and road system, and strengthening the interfaces between them, will require major investments. The development locations are also transfer points where travellers continuing on to their destinations need to be able to find their connections quickly and smoothly, park their bicycles or rent a shared bicycle, scooter or car for the last mile. Mobility facilities must fit appropriately in a public space that is also attractive as a residential environment.

Large development sites also need good connections to regional public transport. Agreements have been made between national government and the regional authorities regarding the expansion of the metro network and other rapid-transit (HOV) public transport in the 2019 and 2020 BO MIRT intergovernmental consultations on the multi-year infrastructure, spatial planning and transport programme (see the paragraph on the mobility system for the future).

Climate-adaptive and nature-inclusive development
The ambition is to ensure that the MRA is developed in a way that has no adverse effects (trade-offs) for the water system and climate resilience. Our aim (at all scales, from individual buildings and infrastructure to the region as a whole) is to develop in a manner that does not lead to additional burdening of the water system (quantitative or qualitative, such as the risk of salinisation due to vertical drainage) or to a higher level of risk in the event of flooding, and that allows for quick and adequate intervention if flooding or water scarcity are imminent, in order to limit the impact of emergencies of this nature. If that is not possible, we will seek a water system solution where the consequences (cost, schedule, space) are explicitly considered in the business case for urbanisation. The parties in the MRA intend to sign a letter of intent on 'climate-proof new construction' soon, which will include a basic safety level that new buildings must meet as a minimum.

Solutions for climate-adaptive and water-resilient development often go hand in hand with nature-inclusive development and a public space design that invites exercise and reduces the risk of heat stress, thereby both promoting and protecting the health of residents. All these ambitions call for sufficient greenery and water in the surrounding area: in the residential neighbourhood itself, but also in the outdoor area in the immediate vicinity. The development of a number of large sites also involves investments in the accessibility and attractiveness of urban fringe areas and green interconnections.

Solve bottlenecks in the energy system
The starting point for urban developments is a commitment to energy neutrality or energy-producing construction. Energy supply security is a concern, particularly in relation to developments involving high energy demand. We already face bottlenecks in the energy infrastructure in the short term (up to 2030). In the national grid, there are known bottlenecks in the network of 380 kV high-voltage cables. Work has already started on capacity expansion for the connection through Flevoland. The extent to which a second 380 kV cable between the North Sea Canal area and the northern part of the Netherlands is desirable or necessary is currently being investigated.

In the Noord-Holland part of the MRA, urbanisation up to 2030 requires capacity increases in almost all substations. Bottlenecks will arise at some substations - e.g. Haarlemmermeer - before 2025. A task force has been set up by the provincial authority of Noord-Holland and the network operators to advise on approaches to solve these bottlenecks, in collaboration with local parties. In the context of the Urbanisation Strategy, that task force was asked to state what would be needed to facilitate the projected programme in the period up to 2030 (including sustainable energy generation), without being forced to prioritise by energy system considerations, and whether any adjustments to the programmes might be required.

In Flevoland, preparations have begun for new substations to support urban growth and the increase in renewable energy generation. A new substation of sufficient capacity near Almere could also facilitate the establishment of a fourth hyperconnectivity hub for data centres in the MRA.

Diverse housing offer throughout the region

Pursuing diversity in the housing offer (price, size, type, residential environment) that matches the housing need in all parts of the MRA is essential to achieving the desired social and economic development of the MRA. This is a shared task, which involves different concrete responses depending on the character of the sub-regions. This does not mean the same mix everywhere, but one that offers all income groups in all sub-regions opportunities for living at an acceptable distance from their work in a home that suits their needs and (financial) possibilities. From the perspective of the economy, diversity in the housing offer is important for retaining an adequate practically trained and middle-skilled workforce, and to create opportunities

for the young first-time buyers whom we need to remain an innovative and vibrant region. From a societal perspective, a diverse housing offer is an important aspect of giving all the households in this region opportunities for support, healthcare, integration and participation in society/work. Proximity to work in the residential area is often decisive in ensuring a high level of employment among practically trained workers.

Rising purchase prices and rents are making the housing market in large parts of the MRA increasingly less affordable and accessible for low-income or middle-income earners. The waiting lists for social housing are long. Fewer and fewer affordable private-sector homes are available for low-income and middle-income households, especially in the core economic area. The rents in the private sector are often high and difficult for these groups to afford. Without additional measures, accessibility is under pressure for them in large parts of the region.

National government and the regional authorities can work together to create the prerequisites needed for diversity in the housing offer. Municipalities work on concrete area developments and housing programmes and can make agreements in this respect with housing corporations and market parties. National government can expand the instruments used by municipalities to guarantee the affordability of the existing housing stock and act to create sufficient investment capacity for housing corporations in order to ensure their ability to construct new homes and upgrade existing homes (housing quality, sustainability, energy transition, affordability). Finally, the availability of sufficient qualified staff in municipalities is a major bottleneck standing in the way of timely construction output. National government and the regional authorities can play a role here by helping to create a flexible pool of experts, who can be deployed to complete the planned construction projects (at a faster pace).

Spatial and economic strategy: balanced development of employment

The multi-core development approach reflects the spatial and economic strategy of strengthening the sub-regions and thereby distributing employment more evenly across the MRA. Outside the core economic area, households and businesses enjoy the benefits of specialisation in competitive and promising industries and of concentration around defining infrastructure such as airports and sea ports, the auction facilities in Aalsmeer, AMS-IX, and at the Mediapark. In Amsterdam and surrounding municipalities, households and businesses benefit from the socio-economic diversity and complexity of the economic activities that take place there.

The spatial and economic strategy focuses on expanding specialised clusters and increasing the benefits of societal and economic diversity. Action to strengthen the existing economic profiles in the sub-regions will create interesting and complementary environments, which are attractive for businesses and households alike. This investment entices companies and offices to locations where they can operate optimally and simultaneously provides significant added value in terms of the further development of the sub-regions and their economic profiles. The result is a contribution to equitable distribution of prosperity and welfare at local and regional level and implementation of ‘the right function in the right place’. The complementary nature and pulling power of the economic profiles is supported by accelerated housing construction in major town centre areas and regional centres and high-quality public transport. High-quality public transport connects the centres, businesses, households and people physically and economically, and also at a societal and cultural level.

The spatial and economic strategy extends the economic core area to include the Noord, Nieuw-West and Zuidoost district centres in Amsterdam, and Zaanstad. In Hoofddorp, the main focus lies on promoting economic diversity. Almere and Haarlem will become fully-fledged urban centres that are connected to the core area. The focus there is on increasing the mix of functions, improving the connections to the core area and broadening economic diversity. In Hilversum, we will focus on scaling up powerful and promising sectors. A development corridor will potentially boost the development of these centres. Good connections with other parts of the metropolis are an important prerequisite for this. In the development of Amstelveen, Beverwijk and Purmerend, mixed land use and diversification of the existing economic structure are the obvious choices. The actions to structurally strengthen the major town centres in the period up to 2030 are crucial to achieving the outlined development. Further elaboration and concretisation are required if we are to achieve the objective of continued development of the multi-core structure after 2030.

4 These three themes correspond to the 2020-2024 MRA Agenda. Inclusion is about equality, justice, and balance. Innovation is about value, value creation and future-proofing. Interaction is about interaction possibilities, accessibility and function mixing for living/work/amenities.

Strategic guidelines for strengthening the economic profile per sub-region, according to the principles of inclusion, innovation and interaction

Sub-region and the focus of the economic profile	Inclusion	Innovation	Interaction
Almere-Lelystad *Logistics cluster, transition-related engineering and markets for sustainable urbanisation, with a Medium Tech & High Tech Campus*	Expansion of local intermediate vocational education, higher vocational education and (in the longer term) university education; by strengthening knowledge, expertise, craftsmanship and skills in strong sectors of industry, logistics and transitions; and making integral agreements on living and work facilities for this purpose.	Broaden related skills at the intersection of societal transitions, applied technology and (new) urbanisation; by broadening the knowledge base and human capital in applied and experimental technology; and for that purpose, set up an ecosystem and formulate inspiring missions focused on 'the future of cities'.	Strengthen the individuality of the urban profiles of central Almere and central Lelystad; by densifying and urbanising the town centres; and spatially plan and profile the living and work environments of these centres for that purpose.
Amstelland-Meerlanden *Diverse economic structure with wholesale, logistics, agriculture and industry as well as financial and specialised services*	Maintain the balance between living and work facilities; by, for example, compensating for the loss of square meters and hectares caused by transformations, adding space if the market demands it and integrally developing work locations to optimise accessibility; and, for that purpose, among other initiatives, transform outdated glasshouse horticulture and demolish/redevelop obsolete offices.	Ensure a sufficient and qualitatively adequate supply of future-proof work locations; by, for example, focusing on a complementary and diverse selection of work environments, positioning work locations and giving space to local and regional dynamics; and for this purpose, among other things, updating work location profiles, adding new development space for after 2030 and take concrete action to achieve the major contribution to economic scale.	Optimise the business climate by, for example, retaining an international profile, focusing on diversification and human capital and connecting local, regional, national and international activities; and for this purpose, among other things, retain and attract companies that contribute to structural strengthening (e.g. via AiB), strengthen mobility (e.g. by extending the North-South line and in the Zuidoostlob), and stimulate sustainability (via RDA)
Amsterdam *Diverse economic structure with advanced (business) services and metropolitan interaction environments*	Strengthen economic diversity and counteract segregation and de-mixing in neighbourhoods; by maintaining mixed neighbourhoods and a mix of living and work facilities, by creating space for business activity in transformation areas, business parks/ports and new areas, and for practically trained workers and marginal jobs (which the city needs to survive); and to this end, link transformation to maintaining sufficient space for suitable businesses in transformation areas and compensation elsewhere in the city and metropolis.	Strengthen the knowledge economy and related skills so that all education levels benefit and the educational offer matches the labour market; by stimulating key technologies and innovation for the city's transition such as IA, Life Sciences/Smart Health, TMT, the energy transition and the circular economy; and to this end strengthen spatial quality, the economic mix and the innovation network in innovation areas, strengthen the position of the Port in the field of the energy transition and the circular economy and build an ecosystem for hydrogen and Carbon Capture Storage Utilisation with the Port, the North Sea Canal Area and MRA, and broaden knowledge applicability for all education levels.	Expand and develop (highly) urban environments with a high economic mix and good accessibility; by realising 15-minute accessibility in relation to living/work/leisure facility interaction areas via slow traffic within Amsterdam and 30-minute accessibility of Amsterdam from city and regional train stations and bus stops; and for this purpose realise rapid-transit (HOV) infrastructure and further develop different urban environments: city centres, mixed neighbourhoods, productive districts, innovation districts and station districts.
Gooi and Vechtstreek region *Data-driven media industry with Media Campus and AI hub as drivers for innovative and cross-sectoral applications*	Improve the balance between living and working and strengthen support for the level of facilities; by giving priority to, and creating space for, more jobs and suitable work for the existing and future working population, those with practical training and those with higher secondary vocational education qualifications (MBO+), and improve accessibility to jobs; and to this end, increase business establishment opportunities to boost employment and improve alignment between education and the labour market.	Further develop the media sector with a focus on innovation and the application of disruptive technologies aimed at accelerating digital transformation and increase knowledge and innovation intensity; by broadening the existing ecosystem through cross-sectoral intertwining with ICT, CI and Tech such as AI, AR, VR and Gaming and applying knowledge and skills for societal challenges such as healthcare, education and media literacy; and for this purpose set up a campus for Digital Media and Content Technology and an AI hub at the Mediapark.	Strengthen the identity and unique business establishment climate: sufficient formal work locations and good attractive informal work environments, in easily accessible places, in the midst of valuable landscape; through inner-city development with the desired and required qualities and connect work environments with the priority sectors of healthcare, recreation and the leisure economy, and the creative industry; and for this purpose, increase the function mix around station locations and other public transport hubs, strengthen the amenities level and the identities of cores in the region, and improve multimodal accessibility to work locations.
IJmond *Brainport for the manufacturing and maintenance sector, with the MRA's energy transition cluster*	Further develop Techport as the Brainport for the manufacturing and maintenance sector and the MRA's smart workshop; by positioning IJmond as the place for the innovative and clean manufacturing and maintenance industry and ensuring the availability of sufficient and qualitatively well-trained workers; and to this end, realise the multi-year Techport agenda, profile the Brainport aspect together with the regional authorities and national government, further develop the triple helix into a quadruple helix, and add higher technical education in the region.	Strengthen the position in the technical manufacturing and maintenance sector and the energy cluster: IJmond as the 'green electricity hub' of the MRA; by making the economy more sustainable, strengthening the energy transition cluster, and making use of the nautical gateway to NL; and to this end, stimulate (product) innovation, implement JTF projects related to the energy transition, and make the manufacturing and maintenance industry in IJmond more sustainable (all with proper attention for the health effects).	Sufficient high-quality living environments in the regional centres designed to provide a diverse selection of living (and work) environments and a pleasant and high-quality living climate; by linking the necessary sustainability and energy transition to the desired improvement of aspects such as liveability, air quality and health and improving (public transport) accessibility and services, e.g. 30-minute accessibility to central Amsterdam, Schiphol and Zuidas; and for this purpose, transform major town centres into high-quality living (and work) environments and investigate 30-minute metropolitan access
Zaanstreek-Waterland *High-quality manufacturing and process industry and agrifood, with Tech & E-sports campus*	Prepare the labour market for the future to match supply to demand; by encouraging an agile and resilient workforce and lifelong learning for everyone on education paths where continuous learning is relevant such as intermediate preparatory vocational education, intermediate vocational education and higher vocational education through a strong focus on (process) technology and ICT; and to this end strengthen triple helix cooperation, link education, innovation, knowledge institutions and business, and develop tech campuses: Purmer Valley, H20 Esports Campus and Techlands.	Excel in innovation in the agricultural and food industry, circular building/timber construction, and manufacturing industry aimed at the major transitions, sustainabilisation and digitalisation; by stimulating innovation and digitalisation, collaboration in the manufacturing and process industry, and ICT/Tech; and to this end enter into partnerships with the business community to create location environments that strengthen entrepreneurship and innovation.	Guarantee sufficient space for economic activities, improve the living/work/amenities balance, including reducing backlogs, by linking facilities and amenities to housing growth; by creating space for employers and mixed, easily accessible living and work environments and sufficient leisure facilities in urban and rural areas; and to this end, intensify living and work areas, increase the mix and density of urban centres, and strengthen bicycle infrastructure, slow-moving traffic routes and parking facilities.

Strategic guidelines have been defined for each sub-region in order to shape this desired development. Those guidelines express how the sub-regions give substance to the three principles of economic development: inclusion, innovation and interaction.[4] The table summarises these strategic guidelines.
The strategic guidelines are complemented by concrete action perspectives. Four studies are to be conducted in the short term to validate those perspectives. Specifically, these studies will investigate the feasibility of strengthening research and innovation ecosystems, investigate the potential for smart specialisation within existing sectors and clusters, identify the living/working/amenities/accessibility balance, and analyse the socio-economic character of the sub-regions. Education and labour market themes play a role in all these investigative studies. A coherent implementation strategy can then be drawn up based on these outcomes.

Greater equality of opportunity

Promoting equality of opportunity is one of the reasons for balancing growth across the region. We hope to halt and reverse increasing segregation via this approach. Achieving this means that we must build affordable housing everywhere in the region, take action to mix functions and guarantee good proximity and affordable accessibility of daily amenities in vulnerable districts, ensure sufficient and appropriate employment, combat transport and energy poverty and promote the health of the living environment in vulnerable districts.
Under current market conditions, combating segregation and ensuring sufficient function mixing will not happen automatically. Continuous and far-reaching interventions in the housing market will be required to also bind low-income and middle-income earners to all the sub-regions of the MRA. Sufficient and affordable housing must be available in all areas for a variety of reasons:

- In the core agglomeration: to maintain sufficient affordable housing for newcomers and young first-time buyers, especially practically trained and middle-skilled workers (whose housing needs differ from those of highly educated first-time buyers).
- In the northern part of the MRA: to meet the demand for housing of an increasingly ageing population (to promote flow on the housing market), local first-time buyers and newcomers to the MRA with a limited budget; and to strengthen vulnerable districts. In addition, to make optimal use of the affordability of homes in the northern part of the MRA, for which keeping the number of jobs with convenient and affordable commuting connections above the IJ and in the North Sea Canal area at least at the same level as population growth is an important requirement.
- In Flevoland: to preserve affordable and spaciously laid out residential environments and ensure that the new construction activity does not worsen the situation in existing districts where social problems are present or lurking. In addition, to make optimal use of the affordability of homes in Flevoland, for which keeping the number of commuting jobs in Flevoland at least at the same level as population growth (i.e. increasing the number of jobs) is an important requirement.
- In the vicinity of Schiphol Airport: to offer affordable new housing for first-time buyers and house buyers coming in from the areas in question, including the elderly moving to more appropriate accommodation, and new target groups of first-time buyers and practically trained and middle-skilled workers.

Urban renewal and management

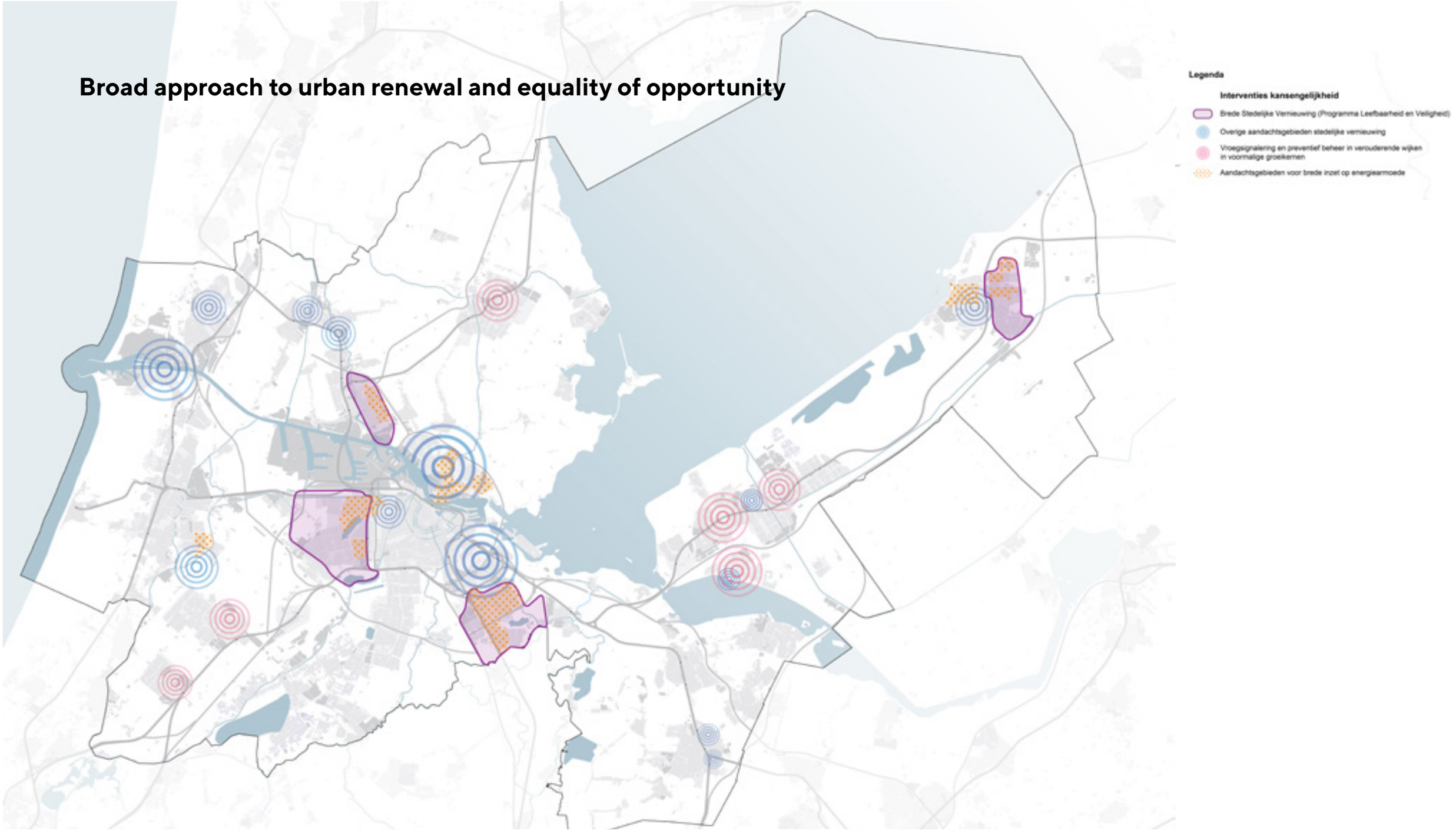
The goal is to ensure that existing residents benefit,

Control and management of tourism-related pressures

Spread the load, to distribute growth more evenly and protect quality of life; this also applies to tourism in the MRA. By continuing to work together and leveraging the great diversity in the MRA, we can spread the flow of visitors over a greater number of destinations. In doing so, we always seek a balance between the interests and needs of residents, visitors and businesses.

At the national level, forms of management and control are being sought that do justice to the pressure on major tourist destinations and their capacity to shoulder the load. The MRA, with its internationally known and attractive destinations, wishes to play an important role here and is working to develop an up-to-date, data-driven strategy for tourism and recreation. There are clear overlaps with the policy for mobility, sustainability and employment (the tourism sector provides many jobs, especially for practically trained people).

Broad approach to urban renewal and equality of opportunity



on balance, from our house building initiatives and densification activities. In the period up to 2030, the inner-city construction task partially focuses on urban renewal areas. Densification is used here as part of an integrated area-oriented approach that strengthens liveability in these districts and the socio-economic position of the current residents. This calls for homes in different housing segments, amenities and space for local entrepreneurship.

National government and the regional authorities are working together on urban renewal within the Liveability and Safety Programme (Programma Leefbaarheid en Veiligheid) in four areas: Amsterdam Zuidoost, Amsterdam Nieuw-West, Lelystad Oost and Zaandam Oost. For these areas, national government is working with decentralised government organisations and social partners (such as schools, businesses, the police and housing corporations) to develop a customised long-term approach for each area. The Liveability and Safety Programme can also contribute knowledge and expertise, and stimulate breakthroughs in other districts and neighbourhoods where there is a need for urban renewal.

The new construction task is also being deployed as a driver to focus the efforts of the joint parties on reducing energy poverty in parts of vulnerable districts where this is an issue. The intention is to reduce social costs due to health problems or other socio-economic issues resulting from the poor condition of the housing stock.

There is a specific task in the former growth cores, where large parts of the town are ageing simultaneously. Those cores are Lelystad, Almere, Purmerend and Haarlemmermeer. New, preventive forms of management are needed for these relatively young towns. The objective is to ensure that problems in the physical and social spheres, linked to the typical age split of the population and the specific character of these districts , are identified and addressed at an early stage.

Quality of life around Schiphol in relation to urbanisation in the MRA

In a large part of the MRA, in particular in Amstelland-Meerlanden, the development of Schiphol has a major impact on urbanisation possibilities for multi-core development in a healthy, safe and attractive living environment.

Schiphol is an economic engine for the Netherlands in general and for the region in particular. Schiphol airport accounts for 114,000 direct and indirect jobs. The added value of these jobs is €10.4 billion. At the same time, aviation affects the quality of life in the surrounding area and, in the municipalities in the Schiphol region, contributes significantly to the relatively unhealthy living environment around Schiphol (see the RIVM analysis on page 30). Furthermore, due to the high noise level and risk associated with aviation, the airport also adversely affects the use of space in the surrounding area and limits the development possibilities of other functions. Finally, the presence of Schiphol has an impact on options for transforming the chaotic patchwork of greenhouses in the area (about 800 hectares). Because of the restrictions on residential development and other noise-sensitive and vulnerable functions, it is difficult to formulate a sound business case for this. A never-ending bottleneck that is responsible for further impoverishment in the surrounding areas, with negative consequences for spatial quality and the quality of life.

The government has set out its plans for aviation development in the 2020-2050 Aviation Policy Memorandum entitled 'Verantwoord vliegen naar 2050'. This includes the provision that aviation can only grow if innovation and fleet renewal have demonstrably reduced the negative effects of aviation on the climate and the living environment. 'Unconditional growth can no longer be tolerated'. Creating a healthy and attractive living environment by reducing the negative effects of aviation on people and nature is an important goal of the Aviation Policy Memorandum. The memorandum also states that reducing the number of night flights at Schiphol partly depends on (the decision regarding) opening and the further development of Lelystad Airport and the use of trains as a substitute for air traffic.[5]

The region faces major challenges in the areas of housing, the economy, mobility, climate, the energy transition and green zones. In the first place, this requires a broad consideration of interests and a careful allocation of functions to the scarce space. The airport is of value to the Netherlands and to the region, just as building houses has value in terms of strengthening the business

5 *Letter to Parliament dated 26 June 2020: "The government has implemented the first step for achieving 29,000 night flights in the upcoming Airport Traffic Decree (Luchthavenverkeersbesluit/ LVB1). This involves a proportional contribution. The further steps for achieving a reduction to 27,000 and 25,000 night flights will be further elaborated and laid down in regulations. These last steps are partly dependent on conditions such as opening Lelystad Airport and substitution in the form of train services to destinations like Brussels and Düsseldorf."*

establishment climate and as a contribution to fulfilling the new construction task. Aviation is in flux, as are developments on the ground. The basis is the principle of reciprocity between 'the air' and 'the ground': i.e. aviation takes the use of space on the ground into consideration and vice versa.

The BRS has already adopted a position regarding the practice of keeping planning reservations, such as those for the parallel runway, open for a long period of time. [6] National government will take a decision on the continued space reservation for a parallel runway on the Kaagbaan approach in 2021/2022.

Air quality is also a major concern. This year, the results of research carried out by the National Institute of Public Health and Environment Protection (RIVM) on the health effects of ultra-fine particulate matter in this region will be published, and the Health Council will issue an advisory opinion on this. Decisions can then be made on how to incorporate the research findings in policy.

Investigations are ongoing to determine whether customisation and a careful balancing of interests can

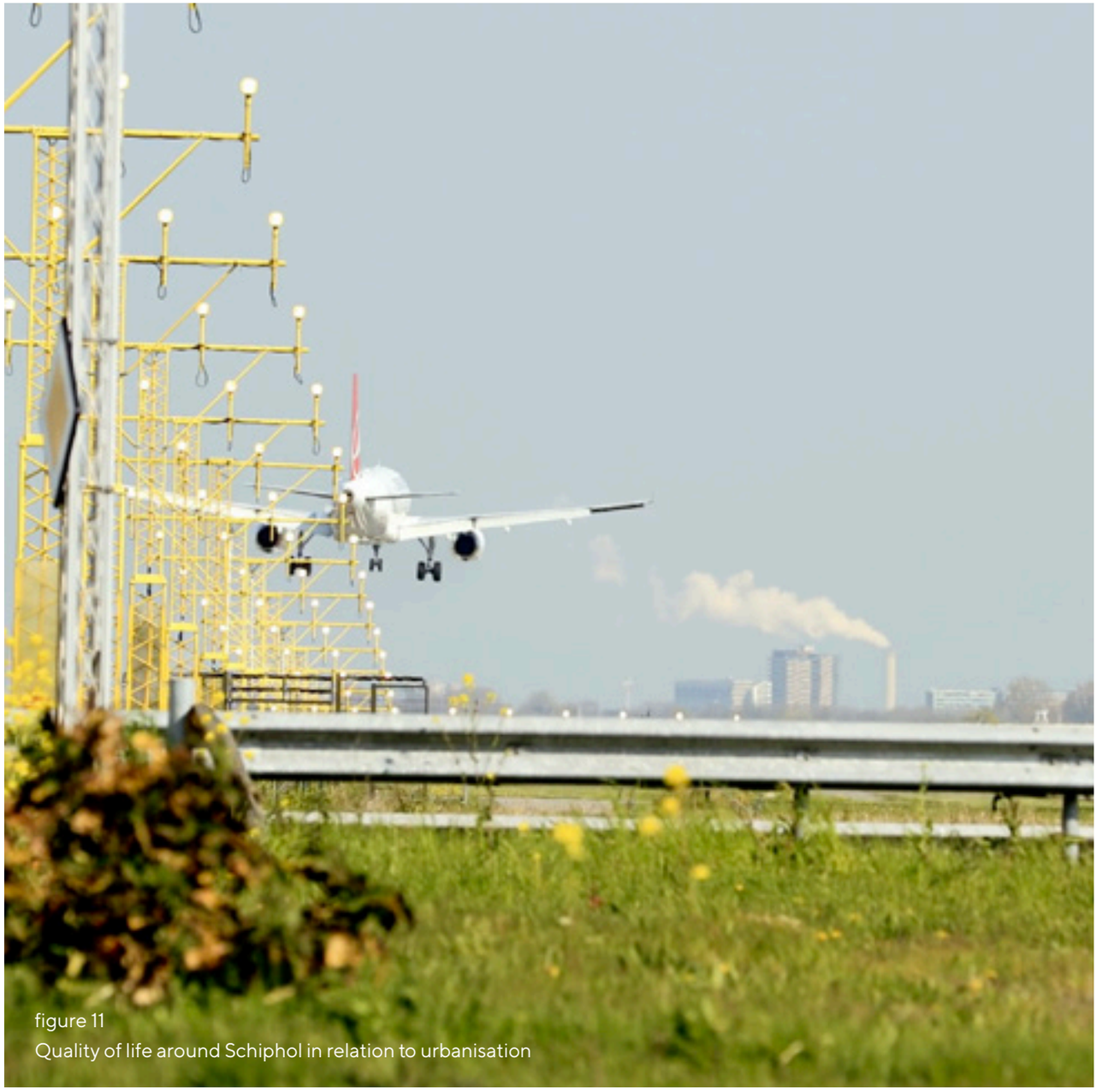


figure 11
Quality of life around Schiphol in relation to urbanisation

6 *In response to the draft Aviation Memorandum, the members of the Schiphol administrative steering group (Bestuurlijke Regie Schiphol/BRS) reacted to the proposed extension of the spatial reservation for the parallel Kaagbaan as follows: "There has been a spatial planning reservation for the Second Kaagbaan for years. A final decision on this issue has once again been postponed. This spatial reservation comes at the expense of developments on the ground, such as building a robust energy system which is urgently needed in the Schiphol region. Needlessly maintaining a spatial*

3.2 Green and blue network in and around the city

Valuable landscapes of a broadly varied nature support the MRA's interconnected green and blue network, which extends deep into the urban areas. A high-quality and future-proof green and blue network is an indispensable element of the healthy, safe and attractive living environment we are striving for.

Strong towns cannot exist without strong landscapes. A strong landscape contributes to the identity of the area, embodies cultural and historical values, offers recreation and is productive (as an agricultural area and as a provider of green-blue services such as clean air, drinking water, water buffering, cooling, energy and biodiversity). The variation in contiguous landscape units is a unique and distinctive quality. The metropolitan region boasts cultural and natural landscapes, old and new landscapes, and wetland areas in the form of the IJmeer-Markermeer and the North Sea coast. The quality and function of these landscapes is closely related to the landscape values and structures in the areas surrounding the MRA.

Although we often talk of the built area and countryside as two distinct entities, that boundary is not so hard. On the contrary: landscape structures continue into the built area, sometimes inconspicuously and sometimes as a distinct feature. This interconnection is reinforced by the need to structure the region in a climate-adaptive and nature-inclusive manner. Factors such as the soil type and quality, the elevation and the water supply guide choices for land use, both in urban and rural settings. There is a close relationship with the development of the water system.

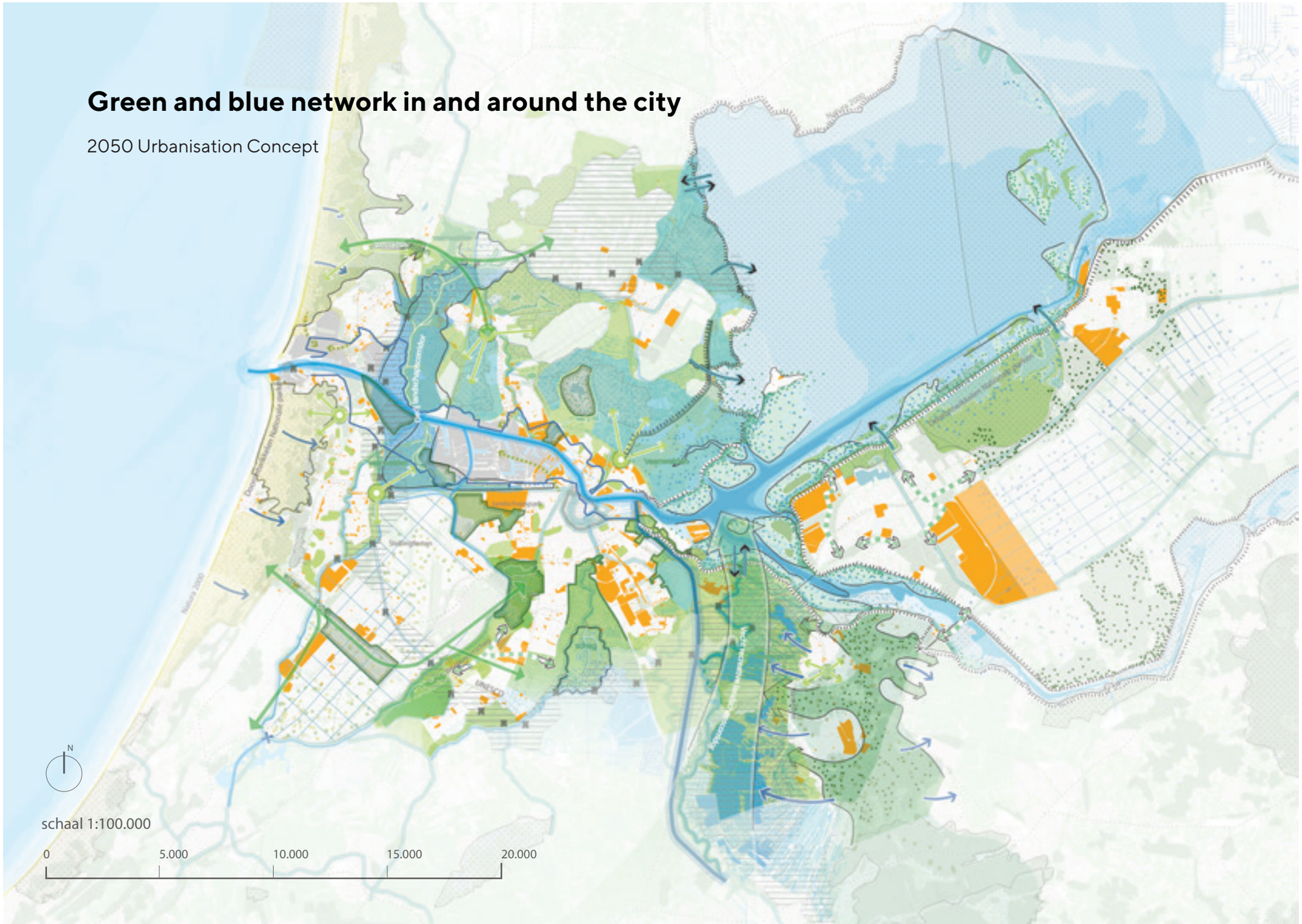
The starting point for developing the green and blue network is always that functional interventions in the landscape also enhance how it is experienced, and, vice versa, that interventions designed to enhance our enjoyment of the landscape also serve other purposes. We distinguish five focal themes here:

1. Nurture and enhance the quality of landscapes with special values (agricultural, cultural and historical, ecological),
2. Enhance and strengthen the landscape,
3. Create green zones,
4. Ensure landscape-inclusive and nature-inclusive urbanisation,
5. Create and expand an MRA-wide recreational structure.

Landscapes that offer special value: nurture them and enhance quality

Green and blue network in and around the city

2050 Urbanisation Concept



A number of areas within the MRA have special nature values or heritage values, or an important function as recreational areas. They are areas that we should nurture, but require a quality boost in some cases. The landscape values require attention and maintenance if they are to be preserved and enhanced in the long term.

The largest concentrations of natural values can be found in the areas assigned to the Dutch National Ecological Network, including the nature areas identified as part of the protected European Natura 2000 network. Much effort will be needed in the coming years to complete the National Ecological Network, and further effort will also have to be put into managing and improving this network subsequently. This applies in particular to the conservation obligation in Natura 2000 areas. For example, the agenda for the 'Future-Proof Ecological System' (Toekomstbestendig Ecologisch Systeem) in and around Markermeer and IJmeer extends far beyond 2027. In both National Parks in the MRA - Zuid-Kennemerland and Nieuw Land - the ambition is to realise an ecological and recreational buffer zone around the Natura 2000 areas, in line with the National Parks New Style programme (Nationale Parken Nieuwe Stijl) of the Ministry of Agriculture, Nature and Food Quality.

Heritage values are particularly strongly present in the three Unesco World Heritage Sites in the MRA. These are the Canal Ring Area of Amsterdam and two landscape-related sites: Beemster Polder and the Dutch Water Defence Lines. The latter is the result of a geographical modification made in the summer of 2021 when the Defence Line of Amsterdam was extended to include the New Dutch Waterline. Other landscapes with special cultural and historical values are the 'special provincial landscapes' in Noord-Holland.
The open and expansive agricultural areas are also an important part of the region's culture and history, but these are not always protected. These characteristic landscapes are dependent on agricultural land use. Good agricultural land remains necessary for the food supply and also for the transition to circular agriculture, the production of sustainable regional food and shortening the food chain. So retaining good agricultural land should always be a criterion when considering space claims in the landscape.[8]

Landscape enhancement

The landscape is dynamic and we are already seeing the first signs of changes in a number of areas. These are the areas we are working on or need to work on. That work involves more than just urbanisation in the most limited sense of the word: the creation and construction of urban and industrial functions and infrastructure. In many landscapes, development is driven by different factors. Such as the need to improve health, for example, in areas with a lack of green spaces in the residential environment or directly near the cores (such as Haarlemmermeer and Westeinderscheg). Around vulnerable natural areas, easing or regulating growing recreational pressure may also be a reason, and nature development also provides an opportunity for landscape enhancement. In the South Flank, the pressing need to clean up outdated greenhouse areas is a direct reason for development.

Retain agricultural land for circular agriculture

The term 'circular agriculture' covers forms of agriculture that involve sustainable soil management (which preserves the agricultural production function in the long term), minimisation of waste and emissions of harmful substances (such as nitrogen), and a use of raw materials and end products that targets as few losses as possible. Circular agriculture is also nature-inclusive and landscape-inclusive, and contributes to maintaining and increasing biodiversity in both the agricultural area itself and the nature areas in the vicinity. Agriculture within the MRA also offers solutions to store and retain CO2 by focusing more strongly on that aspect in soil management practices and when selecting crops.

The prerequisite for the transition to circular agriculture is the availability of sufficient good agricultural land, taking into account the fact that more land will be needed per unit of production.

Testing grounds for circular agriculture will be set up in the MRA - Laag Holland, the Amstelscheg and Flevoland are possible candidates. In Lelystad, the Farm of the Future (Boerderij van de Toekomst) has already been set up in collaboration with the Ministry of Agriculture, Nature and Food Quality. In addition, Flevoland is one of five experimental areas for circular agriculture in the Netherlands.

8 In September 2021, the Dutch Lower House passed a motion asking the government to investigate how to protect high-quality agricultural land in the Netherlands while taking into account the space claims for housing, energy and other initiatives (Boswijk et al. parliamentary document 33037-391),

Or development may target sustainability ambitions, such as limiting land subsidence or creating new forests. National government and the twelve provincial authorities have committed to planting 37,000 hectares of new forest. Capturing CO2 and enhancing biodiversity are among the considerations behind this national Forest Strategy, as are the recreational function, the contribution to climate adaptation and the production of timber as a sustainable and high-quality building material. Part of the 37,000 hectares can be accommodated well in the MRA, in landscape types that lend themselves to forestation and where forests can help address other tasks. In Flevoland, for example, 1,700 hectares of forest are being planted near new housing developments, and PARK21 and the Westeinderscheg may also offer opportunities.

The need to create a water-resilient, climate-adaptive spatial structure may also be a driver for landscape enhancement in areas that are experiencing desiccation (such as the Heuvelrug) or salinisation (such as the reclaimed land in the polders). The need for large-scale temporary peak water buffering to relieve the pressure on the main water system may also be a trigger. Candidate areas for this are in the Oer-IJ and near the Gooi and Vechtstreek region. Due to climate change, temporary peak water buffering in these areas is necessary to ensure water safety in the MRA as a whole. They complement the new emergency overflow area in the Ronde Hoep and the temporary water storage buffer in the southern tip of Haarlemmermeer, which have already been approved. Temporary peak water buffer locations, depending on their design, can be made to partly coincide with other functions in these areas such as agriculture, nature, recreation and energy.

More generally, more than one spatial planning tasks often apply in any single area. A further ambition associated with landscape enhancement is that functional interventions in the landscape always also enhance enjoyment of the area and contribute to accessibility, and vice versa, that interventions designed to increase our enjoyment of the landscape also serve other purposes.

Increase biodiversity, including in areas outside nature reserves

In the national Nature Programme the concept of 'basic quality of nature' is presented as a second area for action alongside the task of improving the ecological quality of the Dutch National Ecological Network (through measures inside and outside the network). Basic Quality of Nature is a tool for strengthening biodiversity outside nature areas. It focuses on nature-inclusive spatial planning in urbanisation, infrastructure, industry and the energy transition, i.e. across all areas of society. This may mean, for example, that measures to strengthen the ecological system are implemented at an early stage prior to investments in housing, economic projects or infrastructure, even if the task of maintaining ecological quality in Natura 2000 areas does not require this.

Green zones: landscape connections

The MRA is not just unique because of the diversity of its landscapes; the fact that they are contiguous is also highly unusual. The towns and villages are situated in the landscape - this is what sets the MRA apart from most other metropolitan areas in the world. Precisely because the landscapes are connected, they can contribute to the quality of life, respect for the human scale and biodiversity in the MRA. This makes the landscape connections important, in a sense that extends beyond the ecological connections included in the National Ecological Network.

To ensure that these 'green zones' contribute to multiple ambitions at the same time (e.g. health, climate adaptation, heritage and biodiversity), function mixing (such as nature, agriculture, water buffering, and recreation) is an appropriate basic principle. The relationship between these functions varies depending on the zone. The green connections run over land and over water and often along shorelines and dikes. When they follow historical lines or structures, such as the Oer-IJ or the Defence Line of Amsterdam, they also support the cultural and historical value of the landscape. Many connections need to be improved to function effectively. Their design and layout does not always match their connecting function, and barriers must be overcome, especially in the form of major infrastructure. The same applies to ecological connections within the National Ecological Network. Some still need to be created. Others are vulnerable, for example in places where they intersect with major infrastructure.

Landscape-inclusive and nature-inclusive urbanisation

The growth in the MRA also involves interventions that are difficult to combine with landscape enjoyment, which is an important aspect of a healthy living environment. This friction mainly arises when building new traffic infrastructure and expanding the energy network (pipes and energy generation) and in projects for business parks and new residential areas. The 'landscape-inclusive development' principle means that landscape quality must be considered and where possible integrated in the solution if an intervention of this type is chosen.

This extends beyond conscientious incorporation; it also means parallel or anticipatory investment in compensation for lost values, at or in the immediate vicinity of the location or route.

Spatial pressure caused by infrastructure and/or urban and economic functions can lead to having to make choices in the face of challenges that cannot (easily) be resolved with a landscape-inclusive development approach. At locations where infrastructure and/or urban and economic development is considered necessary, and landscape values cannot be integrated into that development without a net loss of quality, 'generous compensation' in an area further away comes into play as the development and design principle. This in no way diminishes the primary goal of achieving good integration within the landscape.

MRA-wide recreational structure

A recreational structure that will be extended across the entire MRA provides the basis for the landscape enjoyment experience. Ideally, this experience starts at the front door, runs through green zones in the built area to city parks and through attractive city-countryside connections into the rural environment. Cultural and historical structures such as rivers, watercourses and dikes play an important role here. Further aspects include landscape parks[7], good route structures and a good spread of the destinations. The recreational network must be scaled up significantly to create an MRA-wide recreational structure of good quality, which is also dimensioned in line with the expected population growth and projected increase in use within the metropolitan region. This requires a three-pronged approach:

1. *Strengthen the existing recreational structure* (where it has fallen into disrepair and/or lacks links) Responsibilities for recreational facilities not covered by a recreation board are fragmented among a large number of organisations and an adequate and clear financial framework is lacking. This situation leads to management backlogs and missing links in the network. Constructing new areas and connections reduces the recreational pressure on vulnerable nature areas. The task is not only to fix these bottlenecks in the current recreational structure, but also to set up a better system to pay for management.
2. *Continued development of the existing recreational structure*. This includes the ongoing development of landscape parks (such as PARK21 in Haarlemmermeer and the Noorder IJplas between Amsterdam and Zaandam), the further development of Spaarnwoude and the ongoing development of areas around the nature cores of the Zuid-Kennemerland and Nieuw Land National Parks, which are intended to allow people to access nature and enjoy the experience without harming the ecological value of the nature cores themselves. In further development projects, urban fringes and green connections in the built area require particular attention, especially where recreational pressure is high or where there are relatively many residents with fragile health, and where high-quality green space is scarce and recreational green space outside the built area is poorly accessible. Maintaining or possibly improving accessibility is also part of 'further development'. Some areas are characterised by high recreational pressure and people travelling to them cause congestion on peak days. The 'outer gates' concept is being further developed in order to improve accessibility using public transport. These are bus stops/train stations that provide direct access to recreational and natural areas. The first pilot has been completed (Santpoort-Noord) and four new potential 'outer gates' are being investigated (Bussum-Zuid, Wormerveer, Haarlem-Spaarnwoude and Castricum).
3. *Anticipate future growth and the recreational needs of residents*. The areas named above as candidates for 'landscape enhancement' and 'landscape connections' play an important role here. They offer the best opportunities for increasing the attractiveness and capacity for recreational visits, or for expanding the recreational network.

7 *We understand the term 'landscape park' to mean a part of the natural or cultural landscape, located directly within the urban sphere of influence, where specific provisions have been made for public outdoor recreation and a high level of recreational use. Landscape parks have considerable size and scale, they are larger than parks in the urban area and smaller than the original landscape units. Because of this size, they offer generous space for uniting recreational, productive, cultural and historical and ecological values. They are often richly varied areas (e.g. 't Twiske, the Amsterdamse Bos, the Tuinen van West, the Diemerbos and Spaarnwoude).*

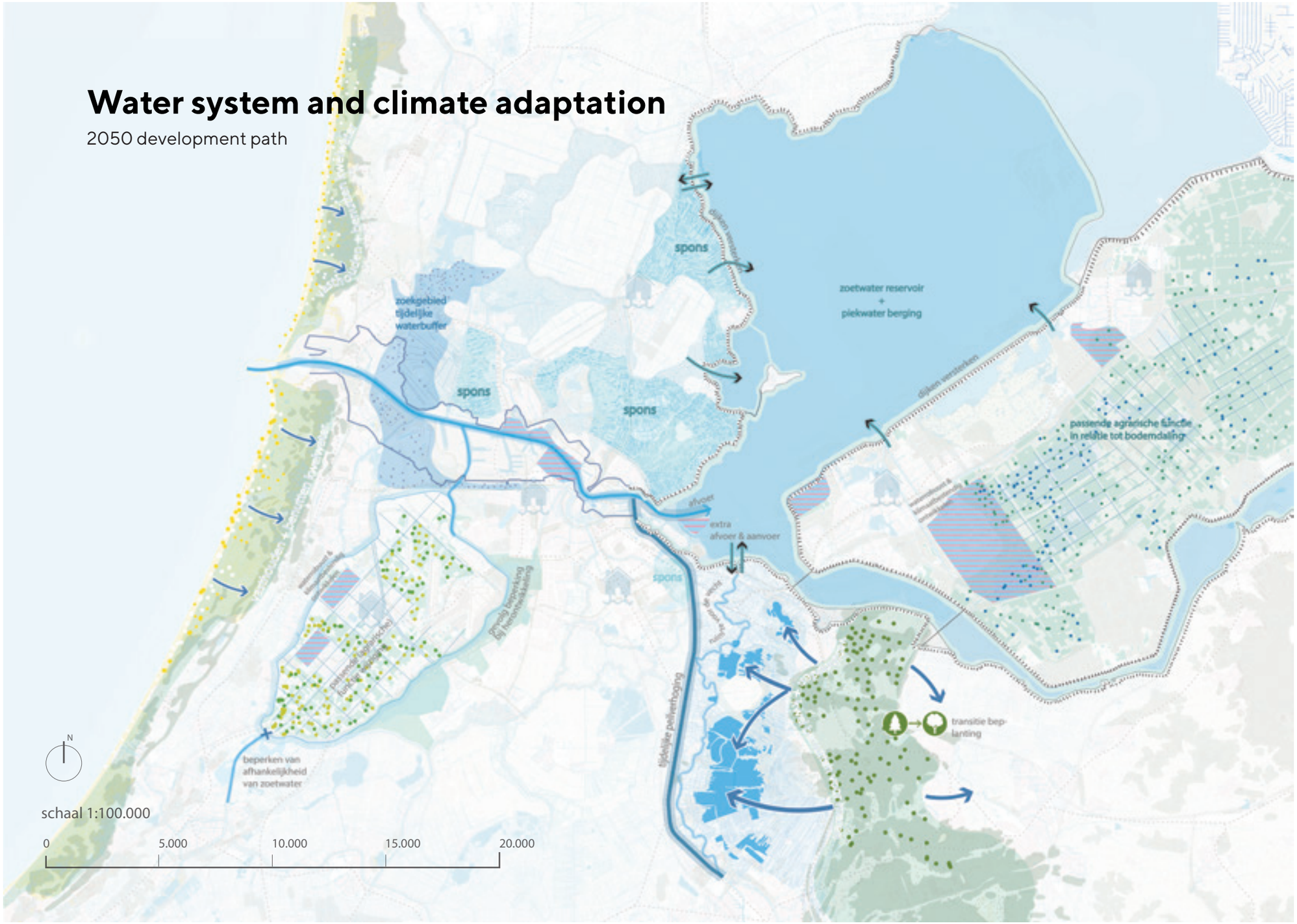
3.3 Systems for the future

Choices associated with multi-core development and the green and blue network are closely related to the development of the primary ‘systems’: those for water, ecology, mobility and energy. The systems impose conditions on spatial development and, vice versa, the systems will need to be adapted in some respects to accommodate spatial developments.

All four of these MRA systems are part of national and international systems. So choices made for the MRA cannot be separated from their larger national and international context. This makes collaboration between national government and the regional authorities an absolute precondition.

Water system and climate adaptation

2050 development path



Legenda

- Vasthouden en kwelwater benutten
- Zoekgebied tijdelijke waterbuffer
- Spons
- Waterrobuust en klimaatbestendig ontwikkelen - uitbreidings/transformatielocatie
- Verminderen doorspoelen met gebiedsvreemd water
- Extra afvoer
- Tijdelijke peilverhoging
- Transitie beplanting
- Dijken versterken
- Regionale kering
- Zoetwater reservoir en piekwater berging
- Transformatie van agrarische functie
- Waterrobuust en klimaatbestendig ontwikkelen - inbreidingslocatie

Water system

Water-resilient development

Until now, we have generally succeeded in applying technology to adapt the water system to the existing or desired land use to guarantee a supply of sufficient fresh water, and to prevent flooding and major flood damage. But the pressure on the water system is mounting. Climate change requires climate-adaptive and water-resilient spatial planning. In addition to climate change, spatial and economic developments are also increasing pressure on the water system. Urban and economic development results in an increasing demand for water, which cannot easily be met across the board. It also affects the load on the water system, for example, because additional hard surfacing leads to increased water run-off in conditions of heavy rainfall and because more waste products enter the water system. This in turn increases the effort that needs to be put in to combat flooding, water shortages and salinisation and to work towards a structurally better water quality. The pressure on water defences is also increasing, due to expansions in housing and business activity, climate change and choices relating to water availability (e.g. water level management policy).

Better interaction between land use and the water system

The water system is at its limit. More space is needed for natural water management, in addition to technical water management, at all levels of scale - from the streets to the national water system. This calls for better interaction between land use and the water system, to be achieved by:

1. Applying the traditional three-pronged water management approach of retention, storage and drainage more strictly. Subject specifically to the proviso that retention is the most important aspect now - much more so than in the past - and that water needs to be retained across the board; in the green zones, at all scales and in each individual area. On roofs and private plots of land, in streets and districts, locally in ditches and polders, in the regional water system and adjacent to and in the main water system.
2. Assigning greater importance to the availability of water as a decision-making criterion when considering the location of functions that depend on a generous supply of water and are vulnerable in periods of drought, such as companies that use a copious amount of cooling or process water, but also agricultural activities and nature. This also calls for the use of technologies that reduce the dependence on water where possible, such as alternative systems for cooling data centres. Fresh water is not infinitely available. In the case of severe shortages, available fresh surface water is distributed according to the national distribution priority sequence. Drinking water should not be used as an alternative for functions that do not necessarily require this water quality. Water that has been treated to make drinking water is scarce and is only used when necessary or when no alternative is available.
3. Designing new developments to minimise the impact of water damage caused by heavy rainfall, possible flooding and sea level rise. Vital and vulnerable functions should preferably not be developed in places where there is a high local risk, or they must be adequately robust and resilient in terms of their design and implementation. Developments in vulnerable areas give adequate consideration to disaster management, for example by taking into account evacuation routes and accessible safe places in the neighbourhood. In a new construction context,

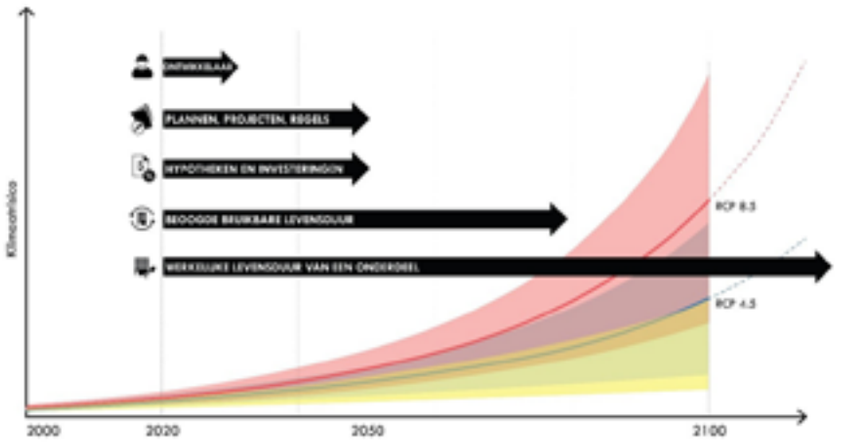


figure 12 - Climate risk, time horizon and life span (from Resilience by Design)

this is relatively easy. However, it is more challenging in existing residential and work areas Yet these areas must also be addressed. One solution is to address existing urban areas and new developments in conjunction with each other.

Particularly in rural areas, the effects of climate change may also make current land use unsustainable, for example in times of drought. This may lead to a change in land use and/or change of function.

In the coming years, we will work on an integral system elaboration for a robust and climate-proof region, which is intended to contribute to a better interaction between the water system and the spatial planning layout. This system elaboration will also consider the effects of sea level rise and climate change on location choices, look at how the various future scenarios (adaptation paths) can be kept open in spatial planning, and weigh up which usage functions can still be facilitated in the long term. In addition, this system elaboration will indicate how and where spatial planning should take into account space for water retention, storage and drainage to the sea.

Investments in the main water system

The need for climate-adaptive development will have an ever greater effect on the conditions for multi-core development and urban design, and development of the green and blue network. Further research is required in relation to a number of aspects of the main water system for water retention, storage, and drainage to the sea in order to determine investment choices.

For example, research is needed into the possibilities of using the current main water system for temporary water retention, as a possible necessary supplement to water retention in the built areas, polders and regional water systems, and temporary storage of water in peak water buffering areas adjacent to the main water system (for which candidate areas have been identified in the Oer-IJ and near the Vechtplassen). Other possibilities include utilising the Amsterdam-Rhine Canal and the North Sea Canal (by incidentally accepting higher water levels in the event of an impending emergency), and greater use than currently envisaged of the Markermeer and IJmeer for peak water storage and as a buffer for water availability (for fresh water and the drinking water supply, possibly also for the Gooi and Vechtstreek region). This requires a greater supply and discharge capacity towards the Markermeer, which would entail increasing the pumping station capacity near Muiden and the Amsterdam-Rhine canal. This action should also consider the spatial and economic consequences, knock-on effects and impacts on adjacent water systems and infrastructure (such as clearance heights for vessels). The potential for increased and efficient inflow and outflow capacity for the water system should also be investigated. In addition to the inflow and outflow capacity on the Markermeer, this concerns the inflow and outflow capacity to and from the river Lek and the possibilities for draining more water to the sea via the pumping stations at IJmuiden and Katwijk. This will be worked out in detail in the 'Future-proof Water System for the Amsterdam-Rhine Canal/North Sea Canal' programme (Toekomstbestendig Watersysteem Amsterdam-Rijnkanaal/Noordzeekanaal) and the Delta programme for the IJsselmeer region.

Improve the water quality

Good water quality is important for nature, but also for a liveable and healthy metropolitan region. Currently, the standards set in the Water Framework Directive (Kaderrichtlijn Water) are not met in many places. The sources of pollution include drug residues, plant protection products, fertilisers, sewer overflows, incorrect connections (sewerage to rainwater drains), and excessive organic matter caused by rotting leaves and plant waste. The latter factors play an important role in urban areas in particular. In addition, water quality is also determined by

Salinisation via the North Sea Canal

The water quality of the North Sea Canal is affected by salt water ingress through the sea locks. The greater frequency of periods of drought may further increase salinity. Some degree of salinisation is acceptable and even desirable for nature values along the banks. However, excessive salinisation is harmful to agriculture, nature and industry (which uses the water as a cooling medium and/or as process water), and it complicates drinking water production. To prevent excessive salt water ingress, a construction for 'selective extraction' is being built at the sea locks, allowing some of the salt water to flow back to the sea. Further development of the port economy may lead to increased shipping traffic, and therefore increased salt ingress. This salinisation can also affect the water quality of Markermeer-IJmeer via the Oranjesluizen locks, especially if an increase in inland navigation on that route leads to more lock cycles. The magnitude of this effect is unknown and should be investigated. This analysis will show whether it is a potential bottleneck and what can be done about it, and whether technology-based procedures such as selective extraction are an adequate solution.

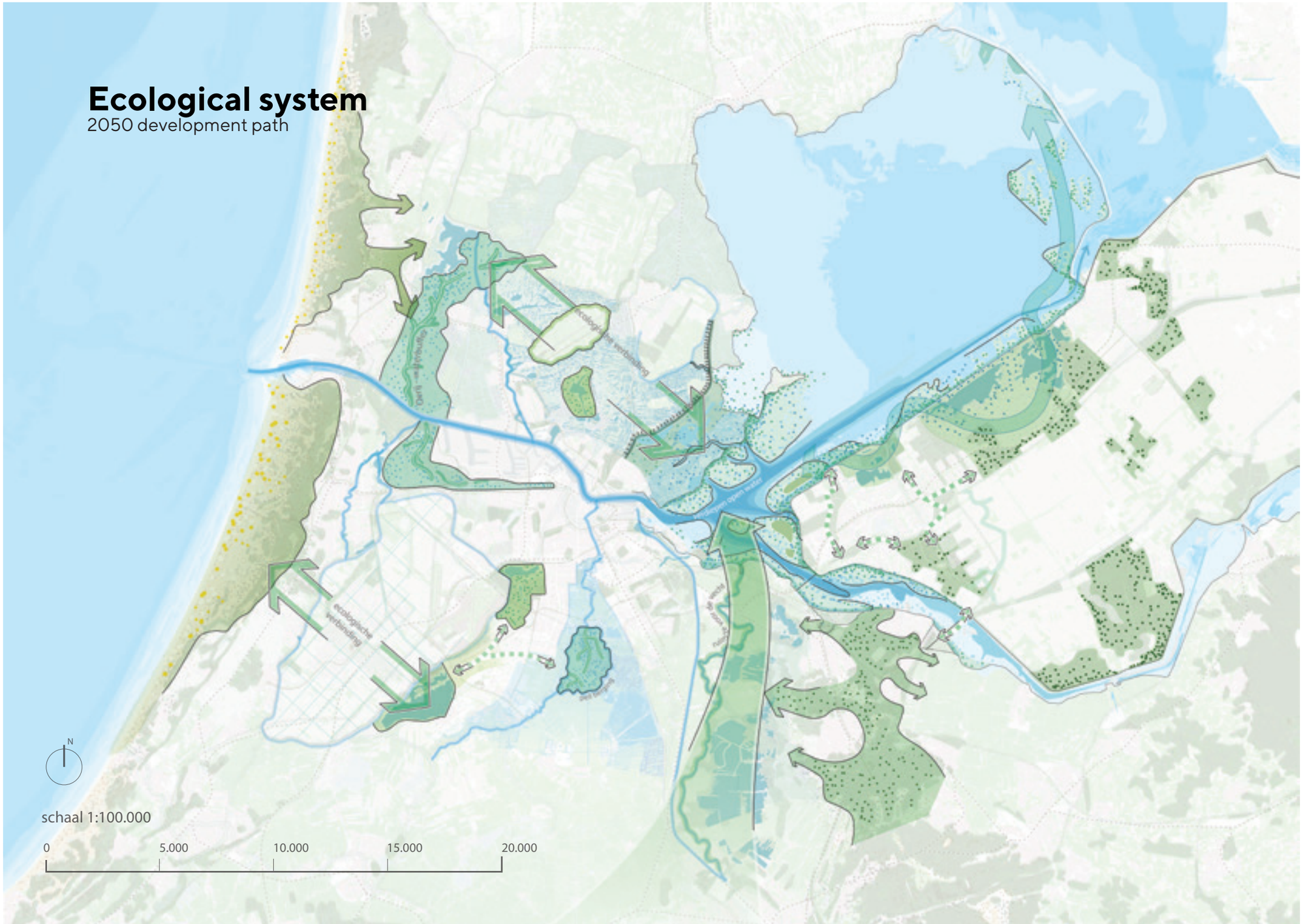
the spatial design of bodies of water and the surrounding area. Urbanisation and climate change (drought and salinisation) may lead to a further reduction in water quality. To avoid this and actually achieve an improvement, consideration of the preferred national sequence of action – 'maintain cleanliness, separate, treat' – is important.

The water quality need not be the same everywhere. The water system needs to recognise gradations from clean to less clean water and from saline water to fresh water, and these gradations must be linked to the existing and expected use of space. For example, the need for fresh water decreases if land use in saline areas is adapted to that level of salinity. A solution of this nature would require farmers to consider other crops or different land use. The layout of the urban area can contribute to the quality of ground and surface water by alternating places associated with high water usage in and next to the water (e.g. piers, sailing routes, floating objects) with quiet, nature-friendly places in and on the water. In clay and peat soils, excavating and preparing the land at construction sites without drainage also improves water quality.

figure 13
The water system and land use balance

Ecological system

2050 development path



Legenda

- Ecologische verbinding
- Waterbuffer
- Kustzone IJmeer
- Verdiepen open water
- Dijk versterken
- Ecologische verbindingen

Ecological system

A future-proof ecological system primarily contributes to our ambition to increase biodiversity, but there are also other reasons for investing in nature. Strong and vital natural surroundings contribute to a healthy, safe and attractive living environment, both within the built area and beyond. Strengthening the green and blue network, with its range of functions for recreation, heritage, clean air, water extraction for drinking water production, water buffering and cooling, depends in part on the quality of the natural surroundings.

Up to 2027, we will focus on completing the Dutch National Ecological Network (the network of interconnected nature areas, including Natura 2000 areas). That network is the foundation for the type of robust and resilient system we need. At the same time, in the short and long term, we are working on 'nature-inclusive development', with greater attention for biodiversity in the immediate vicinity, i.e. not only in the nature areas.

Dutch National Ecological Network

Much effort will be needed in the coming years to complete the National Ecological Network, and further effort will also have to be put into managing and improving this network subsequently. For example, the agenda for the 'Future-Proof Ecological System' (Toekomstbestendig Ecologisch Systeem) in and around Markermeer and IJmeer extends far beyond 2027. The objective of the Nieuw Land National Park (consisting of Markermeer, Trintelzand, Marker Wadden, Oostvaardersplassen and Lepelaarplassen) is to make this system so robust and resilient that it will be capable of easily withstanding the annual fluctuations inherent in any ecosystem. Even during periods of scarcity, regardless of the cause, Nieuw Land can host sizeable populations of migratory birds - a key measure of the quality of this particular area of nature in the MRA. In addition, planned connections elsewhere in the region have yet to be built, or are vulnerable, for example where they intersect with major infrastructure.

The problems of desiccation and the nitrogen crisis show unmistakably that the robustness and resilience of the National Ecological Network is strongly influenced by the use of space outside the Nature Network itself. A robust level of 'green content', reduced emissions and climate-proof water management outside nature areas are also important for the quality of the National Ecological Network. Nature can have a purifying effect on air and water, but it also suffers from air and water pollution. This impact can have numerous consequences if a major source of emissions is located near an existing or planned nature area. The ground and surface water quality and water levels also have an impact. The standards of the Water Framework Directive, which are geared to ensure a vital natural environment among other things, are still not met everywhere.

Improving ecological quality outside the National Ecological Network (including the Natura 2000 areas), but actually for the benefit of that Nature Network, is part of the national Nature Programme that national government and the provincial authorities are currently elaborating.

Green zones: ecological connections

Nature connections can take different forms depending on the ecological function. Within the Dutch National Ecological Network, which is to be completed in 2027, ecological connections have been identified that have a clear function within that network. After 2027, new 'green zones' on a regional scale that promotes nature will be integrated into the landscape connections (paragraph 3.2), and mixing with other functions (such as agriculture, water buffering, climate adaptation, health and recreation) will be applied as a guiding principle. Given its significant presence in and impact on the environment, agriculture can play an important role in this by adopting circular practices and switching to nature-inclusive farming. This is conditional to sufficient retention of farmland for agriculture, as explained in paragraph 3.2. Nature development is also a powerful tool for enhancing landscape enjoyment and thus strengthening the recreational quality. The green connections run over land and over water and often along shorelines and dikes.

The following green zones/ecological connections at regional scale are envisaged:

- Between the dunes and the Groene Hart (via PARK21 in Haarlemmermeer, the Westeinderplassen and the Amstelscheg)
- Between Spaarnwoude and the Zaanstreek (in combination with the candidate zone for temporary water buffering, via the Oer-IJ area)
- Between the Zaanstreek and IJmeer (via Waterland)
- The Oostvaardersoevers as a connection between the Oostvaardersplassen/Lepelaarplassen, IJmeer/Markermeer and the coastal zone of Lelystad (the coastal development on the Markermeer is an element of the Future-proof Ecological System (Toekomstbestendig Ecologisch Systeem) around Markermeer and IJmeer, and is also part of the Water Link (Natte As) between the alkaline fens of Noord-Holland, the Markermeer and Randmeren, and the alkaline fens in Overijssel)

- Green and blue veining of the agricultural area of Flevoland and Noord-Holland
- The connection between the wetland and dryland nature areas in the Gooi and Vechtstreek region with the wetland nature of Waterland and the wetland nature and forest areas of Flevoland

Nature-inclusive development

A logical natural structure provides the best basis for achieving a robust natural system that benefits both water management and biodiversity, and has a positive effect on health and liveability in the metropolitan region. The green and blue trelliswork of the MRA, the contiguous landscape structure, is the frame within which the other developments can take place. The landscapes that are to be strengthened, and the landscape connections outside the National Ecological Network that are part of those landscapes, play an important role in increasing biodiversity.

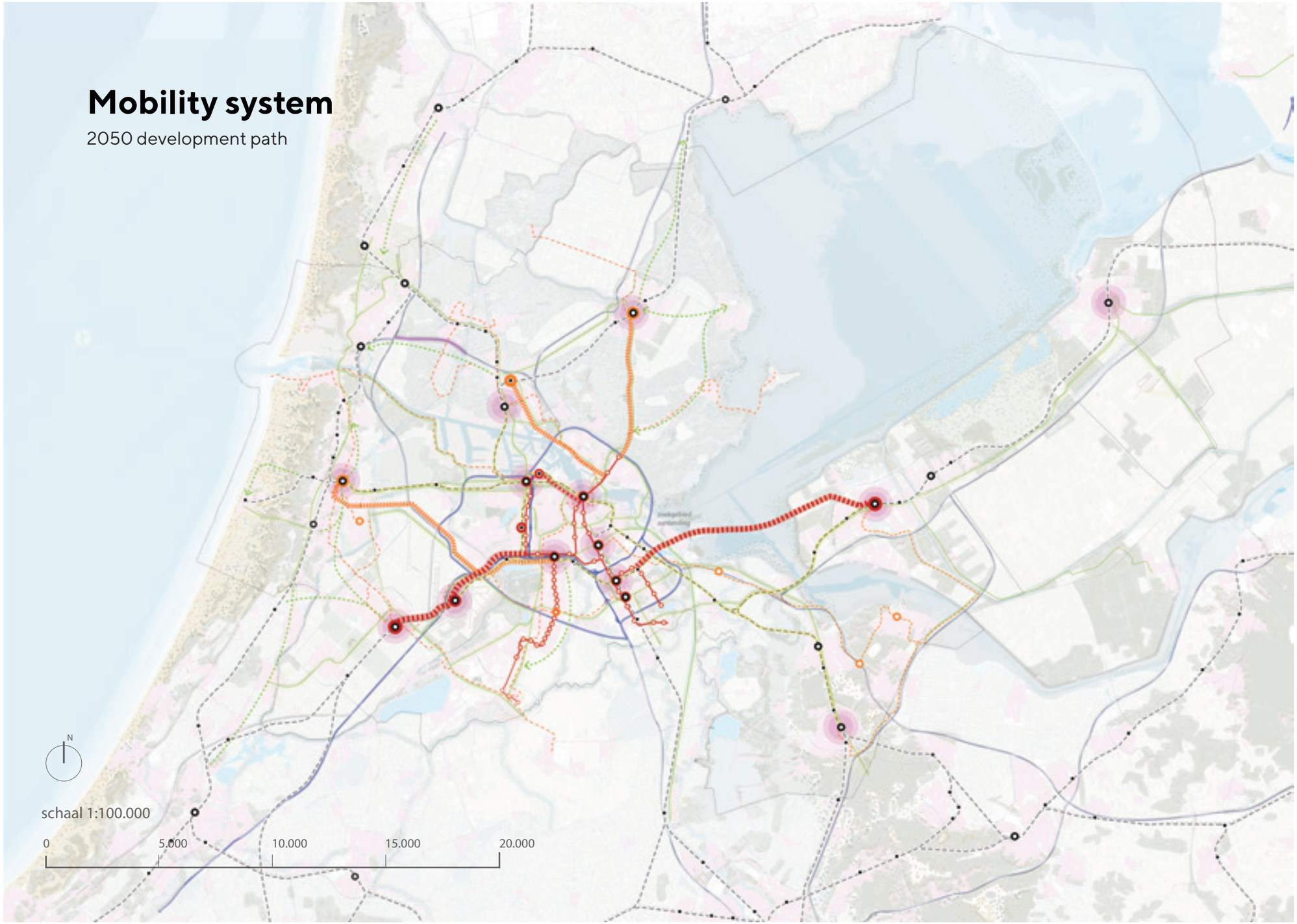
But nature-inclusive development is also desirable elsewhere: it helps create a vital countryside and a greener built environment in which biodiversity is naturally interwoven. Nature-inclusive spatial planning has a positive effect on urbanisation, infrastructure, industry and the energy transition, i.e. on the whole of society. The national Nature Programme uses the term 'basic quality of nature' to refer to this. Basic Quality of Nature is a tool for strengthening biodiversity outside nature areas.

Residents of the region should also be able to come into contact with nature in their own residential environment to a greater extent than is currently the case. The nature-inclusive development ambition also relates to urban areas. Green space in the city is an important theme in the 'Nature-inclusive Agenda', which is part of the Nature Programme. It serves many purposes alongside ecological quality: climate adaptation, water buffering, cooling, education and the food supply. Green space is essential for a healthy and liveable environment that helps prevent health inequalities and health-related problems. The mission of increasing biodiversity in the built area (for example, through green structures in towns, nature-inclusive construction and encouraging residents and businesses to green their gardens, balconies and roofs) contributes to a robust and resilient ecological system.

figure 14
Nature connection in Zuid Kennemerland

Mobility system

2050 development path



Legenda

- Bestaande snelwegen
- Bestaande wegen
- Bestaande spoorwegen
- Ontvlechting regionaal spoor
- Bestaande HOV metrolijnen
- Bestaande snelle fietsnetwerk

Onderzoek naar re-design wegen

- onderzoek naar aansluiten A8/A9
- ringen draaiende houden
- HUB (mobiliteitstransitie)
- HOV station
- Metrostation
- Sprinter stations
- Intercity stations

- Verbeteren HOV lijnen
- Potentiele nieuwe HOV metrolijnen
- Nieuwe fietsverbinding

*Het kaartbeeld ten aanzien van hubs en regionaal fietsnetwerk kan nog veranderen o.b.v. het multimodaal toekomstbeeld

Mobility system

To accommodate a growing population and economic growth, transport throughout the MRA must be developed to a higher level to create a smart, sustainable and space-efficient mobility system. Due to rapid urbanisation, the MRA increasingly functions as a single urban system. This calls for a closely matched and multimodal transport system for people and goods, and for an accelerated change to more sustainable travel behaviour on the part of visitors to the area and existing and new residents. A mobility transition is needed in the MRA to ensure accessibility to and from the MRA and maintain quality of life in the towns. We will achieve this with a mix of behavioural change and investments in the bicycle network, public transport and the road network, and through smart urbanisation.

If nothing is done to achieve additional densification with mixed living and work environments and to push forward the associated mobility transition, public transport and the roads are projected to become considerably busier in 2040 (up by 70% and 50% respectively). Assuming an urbanisation rate of +175,000 homes in the period up to 2030, about 75% of this growth will have already occurred by 2030. Despite the planned investments over the next 10 years, the networks will have already reached their limits in 2030, and will become saturated in many places and for all modes of transport. At MRA level, jobs and economic centres will become less accessible and (vehicle) mobility's growing claim on space will reduce liveability. In terms of the sustainability goals, the effect of simply switching to electric vehicles falls far short of what is needed. Transport poverty may also increase for the less educated in particular.

By adopting a coherent approach to urbanisation and the mobility system, we will contribute not only to accessibility and quality of life, but also to achieving goals in relation to sustainability, health and inclusiveness. This requires a mix of measures that reinforce each other. It is crucially important that we slow and spread the growth of mobility, accelerate the mobility transition that has already started and closely align urbanisation with proximity and good accessibility. The latter aspect is achieved through multi-core development and the creation of mixed living and work environments with the emphasis on inner-city development sites, especially at and around important public transport locations.

In order to gain a better understanding of the functional complexities of the transport system in the MRA, a 2040 MRA Multimodal Future Vision (Multimodaal Toekomstbeeld 2040 MRA/MTB 2040) is currently being prepared as a detailed supplement to MRA Network Strategy document (Netwerkstrategie MRA). This MTB 2040 provides guidance for the choices that need to be made at network level to best accommodate the growth of all the transport modes and the effects of urbanisation in the MRA up to 2040, while still maintaining or improving quality of life in the region. The Future Vision of National Public Transport (Landelijk OV Toekomstbeeld) and Future Vision of Regional Public Transport (Regionaal OV Toekomstbeeld) have been taken as the basis for this. The next step in the MTB drafting process involves analysing the investments needed and further clarification and detailing of the policy choices and the urbanisation concept (residential environments and business establishment climate). This information will then be used in the follow-up process for the Urbanisation Strategy.

Slow and spread mobility growth

To minimise the traffic pressures on the regional and national mobility system, we will focus first on slowing and spreading the growth of mobility. We do this by ensuring that many new (affordable) homes, workplaces and amenities in (highly) urban residential environments are easily accessible by public transport and bicycle and that they are within walking and cycling distance of a large number of existing homes, workplaces and amenities such as shops, schools and health centres. This reduces the need for vehicle-based mobility. It also contributes to creating a liveable, safe and healthy public spatial environment by reducing the amount of public space used for cars relative to the space for green zones and living areas. However, there will always be a need for other, less mixed and less densified residential environments in parts of the MRA and elsewhere. Furthermore, these areas do not always feature good access to the regional and national public transport system. The car will continue to play a significant role in these areas. We can, however, take action to restrict the distance travelled by car to one leg of a sequential multimodal journey, followed by a transfer to bicycle or public transport, and ensure an increase in the number of shared cars.

A single cohesive, multimodal system

Densification and the mobility transition will contribute to fewer and/or shorter journeys. They relieve the pressure on the mobility system and improve the accessibility and quality of life of economic centres and residential

locations. However, we cannot immediately solve all the (foreseeable) bottlenecks with this approach. In addition to a strong commitment to influencing behaviour, substantial investments are needed in all the networks and the associated hubs.

The mobility system operates as a single coherent system of different modes of passenger and freight transport: rail, public transport, roads, waterways, bicycles and walking. The MTB 2040 is still under development, but it is already clear that measures are needed in all parts/facets of this mobility system.

Need for a multimodal and integrated approach
A mix of measures is needed to meet sustainability and quality-of-life goals and improve the functional performance of the networks.

- Behavioural measures/policy
  The growth in vehicle traffic will be tempered by intensifying and expanding the use of integral behavioural measures such as financial incentives, car-free cities, multimodal area development and approaches that target education and employers. This will result in more space in the towns for using amenities, walking and cycling, as well as better access to the economic centres and other areas.

- Investments in the networks
  Despite the positive effects of behavioural measures, robust investments are inevitable. This entails investment in the urban, regional and national networks for bicycles, public transport, cars and hubs in order to improve accessibility, inclusiveness, quality of life, health and sustainability.

Investing in the **bicycle network** and bicycle use is crucial because the (electric) bicycle is the most space-efficient, healthy and sustainable form of regional mobility. An extra emphasis on the bicycle contributes substantially to achieving liveability and sustainability goals. The bicycle is not only ideal for the entire journey but also for the 'first & last mile' in multimodal journeys involving public transport or travel by car. In addition, high-quality walking and cycling routes to public transport hubs in the towns and providing sufficient safe parking capacity are also important. The e-bike and speed pedelec are a high-quality alternative for journeys of up to 20 kilometres and will lead to increased bicycle use on urban and regional bicycle routes. So investing in the regional and urban bicycle network is an important step. We will achieve this in part by developing rapid-transit bicycle routes. These are safe, comfortable and fast bicycle routes, with few stops and in attractive surroundings.

Urbanisation and measures that favour the mobility transition will lead to additional pressures on **public transport**. A step-by-step approach to scaling up regional public transport (metro, rapid-transit (HOV) transport) will free up space on the national and international railway network and strengthen the MRA's national and international competitiveness and urban agglomeration power, while at the same time improving the accessibility of existing towns and new urban development areas. The best way to create more capacity in public transport and improve reliability is to separate local/regional networks from the national and international network as far as possible. This involves investment in the regional metro network in the form of crucial network interventions or linked to large-scale residential locations (extending the North/South line between Amsterdam South and Hoofddorp, completing the Amsterdam metro ring between Isolatorweg and Amsterdam Central and constructing the IJmeer connection). It also entails expanding and strengthening fast, frequent and congestion-free bus transport and possibly tram/light rail transport (especially a rapid-transit (HOV) Haarlem-Schiphol-Amsterdam Zuid service and a rapid-transit (HOV) ZaanIJ service). On the main railway network, this involves separation of the regional train services (Intercity or Sprinter) and creating greater capacity on the national railway network.
The interchange capacity at the main hubs is reaching its limit. Spreading the number of transfers by making better use of smaller public transport hubs such as in the Haarlem-IJmond region and medium-sized public transport hubs in Amsterdam (e.g. Muiderpoort and Lelylaan) will be helpful in achieving the mobility and urbanisation goals.

In the underlying public transport system, service density, affordability and frequency remain of great importance for combatting transport inequality among specific target groups and for increasing the proximity and accessibility of facilities and work locations (24-hour economy).

Investments in the use of bicycles and in public transport - also in combination with behavioural measures - are insufficient to guarantee smooth traffic flow on Amsterdam's ring roads within the **car network**. It is important to ensure that we can continue to direct car traffic on the ring roads and distribute it throughout the network in the future. Possible measures might include maximising the use of the current space/roads in a smart and demand-driven way, by applying dynamic speed limits for example, and flexibly assigning lanes to target groups. There is no benefit to making a choice between either the outer ring road (A5, A9, A10 Noord and A10 Oost)

or the inner ring road (A10). Both ring roads are needed for handling incidents and to ensure system robustness. Depending on the extent to which measures that reduce demand are successful, larger-scale investments in the road network will be required. These investments should contribute to smooth traffic flow on the ring roads. There are tasks to be tackled on the A10 North and the Raasdorp - Holendrecht stretch of the A9, as well as at some interchanges such as Watergraafsmeer and Holendrecht.

In addition to these primary choices, there are also issues related to the roads and public transport in almost all the corridors to and from Amsterdam and on the Flevoland-Utrecht connection.

Regional and urban accessibility
The multimodal network includes rings of regional hubs along the corridors towards Amsterdam to divert car traffic to the main roads at an early stage and to allow travellers to switch to (electric) bicycles and rapid-transit (HOV) public transport for the next leg of the journey. The success of the hub strategy depends on flanking policy and the mobility transition throughout the network.

Car-free inner cities and cores, with less space for (especially private car) mobility, increase the attractiveness of towns, cities and villages and boost their quality of life. Expanding the residential zones (30 km/h speed limit) within the underlying urban network (50 km/h speed limit) improves road safety and contributes to the reduction of environmental and health risks. To achieve this, investments must be made in public spaces and the urban bicycle and public transport networks.

Prevent transport inequality
Convenient and affordable travel requires continuous attention, particularly in respect of practically trained and middle-skilled workers. In urban centre areas, work locations and amenities are readily accessible because public transport and bicycle use compete effectively with commuting by car. Outside those urban centre areas, public transport and bicycle use are less able to compete with commuting by car in terms of journey times and cost. Transport poverty is a further consideration that underlines the importance of the task of strengthening the affordability and quality of public transport, the quality of bicycle facilities and the spread of jobs in the region in order to combat transport inequality. This contributes to good access to their jobs for the increasingly scarce workers in crucial professions (education, healthcare and security) and helps improve the competitive position of businesses in the MRA.

Goods transport
Logistics flows are closely related to the mobility system for people. Internationally and nationally, we stimulate an efficient combination of goods flows by making smart use of the road network, railway network and waterways. In respect of the railway system, we are firmly committed to a step-by-step separation of passenger and freight transport within a future-proof and efficient Basic Network. This involves two related tasks identified in the future vision of public transport (Toekomstbeeld OV): a crucial separation of the 'dedicated' North-East Europe Freight Route within the entire railway system, and the port authority would like to see a direct access route to the Aziëhaven facility in the North Sea Canal area. This will free up space on the international and national railway networks and create better spatial planning conditions for urbanisation (space, safety, environmental benefits). The scope of urban logistics is growing due to the increases in online purchases, densification and construction logistics. We want to adopt a phased approach to organising these logistics aspects in a more sustainable, smarter and (where necessary) more compact and simpler manner, for example by building hubs for freight transport or construction logistics, transporting goods by water and providing space for technological developments such as the Cargoloop project and charging infrastructure.

Concurrent development of urbanisation and mobility
Given the scale of the urbanisation task and its effect on the mobility system, we are committed to an integrated approach to the development of new residential and work

Energy system

Base path and ‘no regret’ measures to 2050

400 ha
100 ha
0 1 2 3 4 5 km

Legenda

No-regret maatregelen 2030 - 2050

- Versterken van elektriciteitsnetwerk
- Uitbreiden en bijbouwen van onderstations (locatie indicatief)
- Het plaatsen van lokale (wijk) opslag voor elektriciteit (locatie indicatief)
- Energiehubs: Strategische locaties waar verschillende soorten energie-infrastructuur elkaar ontmoeten.
- Ruimte reserveren in NZKG voor aanlanding / import, opslag en conversie van energie
- Het maken van integrale uitvoeringsplannen, zowel ondergronds als bovengronds
- Uitbreiden van warmtenet in stedelijk gebied tussen IJmond en Almere

Basispad 2030

- Eén extra aanlanding wind op zee
- Waterstof productie (uit restgassen of electrolyse)
- Waterstof verwerking (tot synthetische brandstoffen)
- HyWay 27 (Nationale waterstofbackbone)
- Regional Integrated Backbone NZKG
- Lagedruk waterstofnetwerk (H2aven, locatie indicatief)
- Carbon Capture (afvang)
- CO_2 Verwerking (biokerosine en glastuinbouw)
- CO2-infrastructuursysteem (Athos)
- Stoomnetwerk
- E-Boiler (150MW)
- Tijdelijke windturbine (Almere Pampus)
- Zoekgebieden RES en wind op zee
- Verhogen capaciteit 380 kV / (ondergronds) 150 kV
- Nieuw netwerk 380 kV / (ondergronds) 150 kV
- Uitbreiden onderstation
- Nieuw onderstation

Overige

- Huidige windturbine
- Huidig Hoogspannings onderstation
- Huidig Middenspanning onderstation
- Huidig 380 kV netwerk
- Huidig 150 kV bovengronds netwerk
- Huidig 150 kV ondergronds netwerk
- Huidig middenspanningsnetwerk
- Plancapaciteit wonen
- Plancapaciteit industrieterreinen en kantoren
- Aanpak infrastructuur

Energy system

We are working towards an integrated, hybrid energy system. This is a system that uses various sustainable sources, integrates small-scale energy production down to neighbourhood level with large-scale energy projects such as bringing ashore energy from offshore sources or electrification, while ensuring a stable energy supply and healthy living environment. These changes are necessary to keep our energy supply reliable and to help functions such as transport and industry reduce emissions.

The conversion to this integrated, hybrid system of the future will be implemented in the coming years, in collaboration with all the stakeholders and in conjunction with choices made with the national scale in mind. For example, choices regarding the capacity of landing points for wind energy coming from the North Sea, or regarding the use of hydrogen and heat as energy carriers. The conversion of the energy system as a whole will take years and not all the details are known at present.

There are spatial consequences associated with choices for the energy system in the long term, not only because of the space requirements of the energy infrastructure itself, but also because the energy system is increasingly leading in the choice and design of urban and economic development locations. The current practice in which the energy system follows spatial developments cannot be sustained in the long term. We wish to anticipate these developments as effectively as possible in our urbanisation choices for the MRA.

The following design principles apply to the long-term development of the energy system:

- The capacity of the energy infrastructure (generation, transmission, conversion, storage) is considered when selecting and laying out urban development sites. In that process, allowance will be made for the expected shift to an 'integrated hybrid energy system' that utilises multiple sustainable energy sources and energy carriers (electricity, hydrogen, heat and CO2) and also links supply and demand at the district and neighbourhood level.
- Major energy consumers in particular, will be situated near locations where sustainable energy is produced and near the main connections in the energy network between the MRA area and the rest of the Netherlands (for electricity and possibly also for hydrogen, if the current natural gas pipe system is partly converted to carry hydrogen).
- Strategic spatial reservations can be made at places and in areas that play, or (after integral consideration) qualify for, a role in the future energy system. The environmental space present there will be maintained and, if necessary and acceptable, expanded. In any expansion project, the importance of a healthy living environment must be an integral part of the decision-making process.

The data centre strategy that is currently being prepared (chapter 2) is also closely related to the development of the energy system, due to the fact that data centres require a huge amount of energy.

Base path to 2030

The energy transition is unfolding at a rapid pace, and this process involves unavoidable uncertainties. Because these are usually large projects that take several years to complete, we can already state with reasonable certainty what will happen in the period up to 2030. After all, those projects are already being prepared and if that is not the case, the chances of completion before 2030 are very slim. We call this the base path. This path includes projects that are described in documents such as the Regional Energy Strategies (RES), the investment plans of TenneT, Gasunie and Liander and the Cluster Energy Strategy (Cluster Energiestrategie) of the North Sea Canal Area. Examples include:

- Bringing ashore 2.1 gigawatts of wind energy in the IJmond region as laid down in the land-use plans
- Candidate areas for wind and solar energy as identified in the RES of Noord-Holland Noord, Noord-Holland Zuid and Flevoland
- The national hydrogen backbone, HyWay27. And the Regional Integrated Backbone in the North Sea Canal area
- Construction of a green hydrogen production plant, storage and bunkering area near Lelystad as a first step in the development path for a multimodal energy hub
- Reinforcement of the electricity grid by extending 150/380 kV cables to Noord-Holland Noord or through Flevoland, and expanding and adding substations. A good integration (spatially, with the landscape and in terms of liveability/health) is important here

2050 development path

A tipping point in the energy system is expected around

2030, due in part to the closure of the Velsen Cluster power plants, the development of wind farms in the North Sea, and the implementation of the Regional Energy Strategies. The energy supply will change dramatically in the period from 2030 to 2050. This is inevitable if we are to achieve the climate goals that have been agreed. But how exactly is still unclear at this point. For example, we do not yet know:

- Where, how much and in what form energy from offshore wind will be brought ashore
- The degree to which the developments in the candidate areas identified in the Noord-Holland-Zuid RES and the Flevoland RES will be realised
- What role the strategic locations around the existing power plants in Velsen, Hemweg, Diemen and Lelystad will play in the future energy system - these locations in the direct vicinity of the main connections in the energy network seem to be suitable for the establishment of major energy consumers based on the principle of bringing energy supply and energy demand together
- How the plans to develop hydrogen and the associated network will progress

In order to gain a better picture of the period after 2030, the measures that can be implemented in any case have been examined based on the Foresight Study on Integral Infrastructure 2030-2050 (Integrale Infrastructuurverkenning 2030-2050). The 'no regret measures': these are measures that occur in all scenarios. The central question in this study is how much space (where and when) in the Metropolitan Region Amsterdam should be reserved for the future energy system and what the effects will be. The result shows different development paths, describing what a sustainable energy system might look like in 2050, assuming very different infrastructure needs. The 'no regret' measures are common to all the different development paths. These developments are additional to those projected for 2030 (the Base Path). The following 'no regret' measures are involved:

- Construct new substations. For both 2030 and 2050, increasing electricity demand and feed-in will require reinforcement of the grid. Which substations will need to be added and expanded after 2030 is not known at this time. That work depends on developments in the electricity grid. Developments near substations should make allowance for an increased substation space requirement in the future.
- Install local (district) storage for electricity to relieve pressure on the grid. Storing electricity locally in batteries (for a short period of time) can relieve pressure on the electricity grid.
- The development of the regional hydrogen backbone and the connection to the national hydrogen backbone (included in the base path) are crucial to meeting hydrogen demand in the region. In addition, links need to be created between the hydrogen network and electricity grid at the strategic locations of Velsen and Hemweg. Pressure on the electricity grid can be relieved and energy can be stored via these energy hubs. This entails both electrolysers that convert electricity to hydrogen and power plants that convert hydrogen to electricity. Importing hydrogen by ship can also help improve availability.
- Reserve space in the MRA for landing, importing, storing and converting energy. Regardless of the direction that future development of the energy system will take, the North Sea Canal area will continue to play an important part in the energy system. This requires space. If spatial reservations involve the expansion of environmental space, the importance of a healthy living environment must be given substantial and integral consideration in the decision-making process.
- Formulate integrated implementation plans for both the subsurface and surface domains to ensure smooth coordination when implementing the various works and simultaneous execution of activities in different work packages where necessary.
- Develop heating networks in the urban area. There are multiple sources of (residual) heat present in the MRA. The development of heating networks reduces the need for electric heating and can relieve some of the pressure on the future electricity grid.

Impact on health and quality of life in IJmond

The spatial layout of the MRA is such that the IJmond is a hub for industry (as a major energy consumer) and energy (supply and transport). This has an impact on health and quality of life in IJmond. In the health scan conducted by the National Institute of Public Health and Environment Protection (RIVM) for the Urbanisation Strategy (chapter 2; 'Ensuring a healthy living environment'), IJmond is identified as an area where the environment is unhealthy and where, moreover, a relatively large number of people live who are vulnerable to physical and mental health risks. Other recent RIVM reports also indicate that the capacity for coping with these pressures has already been exceeded in part of the IJmond area as a result of industry, mobility (over land, air and water) and energy infrastructure. Each addition to the energy supply infrastructure adds to these pressures, at all events in the form of the associated spatial impact and the consequences for health and quality of life. The exact effect depends on the development. On the other hand, measures aimed at making mobility and industry more sustainable also contribute to a better quality of life.[9]

Without access to a supply of green energy, industry cannot reduce its emissions. Climate change and health necessitate adjustments to the energy infrastructure.

In respect of new energy projects in the IJmond, the ability of the environment and residents to cope with the associated pressures is decisive and guiding. So the energy facilities in the IJmond area are geared to the level of local demand and the interests of the residents of the IJmond.

figure 15
IJmond as the nautical gateway to the MRA

9 https://www.rivm.nl/nieuws/gezamenlijk-overzicht-op-effecten-van-klimaatbeleid

4. Areas requiring integral development

All the ambitions in this Urbanisation Concept ultimately have an impact on the landscapes, towns and economic centres of the MRA. To clearly picture the opportunities, consequences and potential dilemmas, we have put seven related sub-areas under a magnifying glass.

Sub-areas have no hard boundaries. They differ from the sub-regions in the MRA in this respect. They are determined based on spatial coherence and they overlap. For example, almost every sub-area includes part of the territory for which the municipality of Amsterdam is responsible. The 'Amsterdam' sub-area referred to in this chapter is reserved for developments of regional significance within that municipality.

Integrated development of these sub-areas requires joint commitment from national government and the regional authorities in some areas, and regional commitment in others. In many cases, development action can be linked to current policy programmes. The National and Regional Urbanisation Agreement that is to be drawn up will identify these commitments in concrete terms.

4.1

North Sea Canal Area
Development and sustainabilisation

In 2013, national government and the regional authorities set out their choices for the development of this area in the 2040 North Sea Canal Area Vision (Visie Noordzeekanaalgebied 2040). This vision document looks integrally at spatial functions associated with the port and port logistics, industry, housing, accessibility, nature and recreation. In addition, there are now new major tasks regarding the energy transition, the circular economy, increased and accelerated housing construction and urban renewal, the health of the living environment, the water system and climate adaptivity. The spatial claims arising from these tasks are not a seamless fit with each other. In order to respond to these complex tasks and to guarantee the connection with the MRA and beyond at an appropriate level of scale, the North Sea Canal area has been designated as a NOVI area. The administrative platform for the area, Bestuursplatform NZKG, in which all the municipalities around the North Sea Canal area are represented, has joint administrative responsibility for this NOVI area approach as the contracting authority, together with national government. Issues that cannot be solved in the NOVI area, or that have a broader scope, are considered at the level of scale of the MRA and beyond.

A foresight study that researches the development direction of the North Sea Canal area has been carried out for the MRA Urbanisation Concept.[10] The results of this study were also considered when determining the basis of the collaboration in the NOVI area. In respect of seven points, national government and the regional authorities have already made a choice that clarifies the course to be followed. Furthermore, a concrete elaboration task for the NOVI area has been defined in respect of six other points.

Based on this foresight study and following on from and supplementing the 2040 North Sea Canal Area Vision, this Urbanisation Concept makes (or confirms) the following choices:

Regarding development of the port complex:

- Sustainabilisation, including sustainabilisation of Tata

10 Recommendations regarding the Development Path for the North Sea Canal Area, Breen Stedenbouw, 9 September 2021. The healthy living environment as a prerequisite and point to be worked out further is an addition to the recommendations.

North Sea Canal Area

Development and sustainabilisation

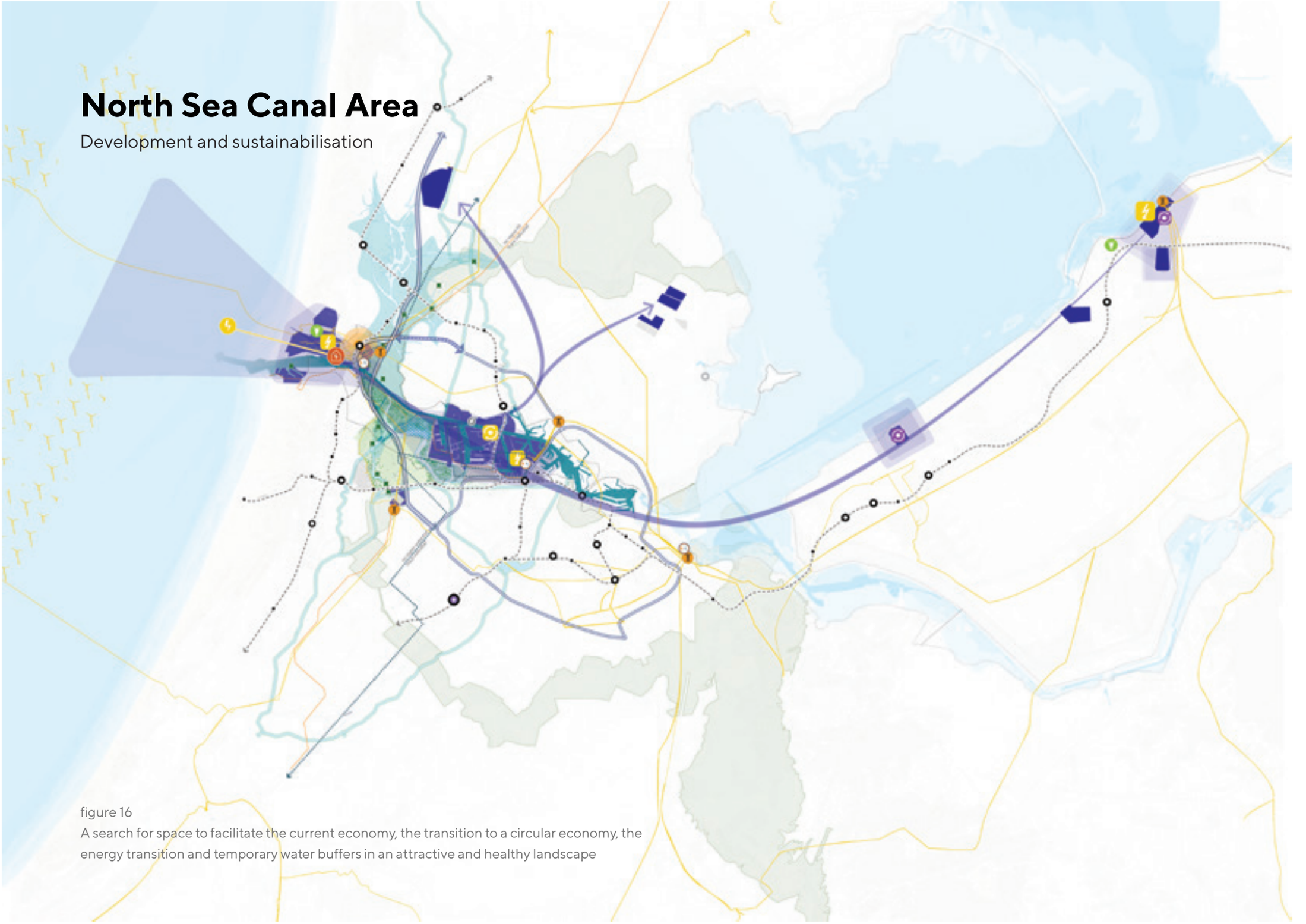


figure 16
A search for space to facilitate the current economy, the transition to a circular economy, the energy transition and temporary water buffers in an attractive and healthy landscape

Steel
- Connection to the hydrogen backbone and other elements decided in the CES project

Regarding development of the residential and living environment:
- Development of transformation areas in line with the conditions set out in the 2040 North Sea Canal Area Vision
- Not using the Wijkermeerpolder for 'dry' (non-waterfront) business parks, including acceptance of the consequence that space for expansion will have to be sought at other locations. Possible locations: Boekelermeer in Alkmaar, Baanstee Noord in Purmerend, De Vaart in Almere and Flevokust in Lelystad
- Improving health and quality of life as a prerequisite for future developments

Regarding development of the green and blue trelliswork:
- Preserving and developing nature areas and recreational areas
- Identifying a candidate area for temporary peak water storage in the Oer-IJ area
- Retention of Unesco World Heritage site status for the Defence Line of Amsterdam (Stelling van Amsterdam) as a prerequisite for future developments

A number of points are to be worked out in further detail before we can make choices. This further elaboration will be based on the framework set by the NOVI area approach for the North Sea Canal Area, in alignment with the MRA Urbanisation Strategy. As a result of the spatial foresight study, we have placed the following points for elaboration on the Urbanisation Concept agenda in respect of the NOVI area:

Regarding development of the port complex:
- Transition from a port to a hub for sustainable fuels and goods flows
- Space for circular economy initiatives
- Space for business parks
- Further detailing regarding the strategic reservation of the Houtrakpolder

Regarding development of the residential and living environment:
- Improve health and quality of life

Regarding development of the green and blue network:
- Choice of location, size and design of the temporary peak water buffering facility in the Oer-IJ area

The text below explains these choices and the points for elaboration, together with a number of related tasks, in the order of relevance for, firstly, the development of the port complex, secondly, the residential and living environment and, thirdly, the green and blue network.

Development of the port complex

The North Sea Canal area (Noordzeekanaalgebied/NZKG) is a coastal cluster of progressive industrial economic activity with high employment, and a knowledge and energy hotspot. It is the nautical gateway to the MRA and a proving ground for applied innovation in the field of sustainability and the circular economy. We want the port complex to maintain its strong, internationally competitive position and contribute to sustainable economic development. Sustainabilisation is required for this, and to improve health and quality of life in the MRA. This specifically concerns the energy infrastructure, the sustainabilisation of industry (including the transition to a circular economy) and the availability of suitable business parks.

Energy transition

In the 2020-2030 Port Memorandum (Havennota 2020-2030), national government sets out ambitions for a strong offshore wind port, for an international and national hydrogen hub, for using CO2 as a raw material, and for clean fuels with a strong focus on developing synthetic kerosene based on green hydrogen and green CO2 and (waste) heat. The extent and nature of space usage (including environmental zones) is highly dependent on choices related to the national energy system. Construction of a hydrogen pipeline with regional branches is indispensable. Conversion of electricity to hydrogen and vice versa can relieve pressure on the electricity grid and offer an alternative for processes that require high temperatures but cannot be electrified. We therefore opt for a connection to the national hydrogen backbone (starting in 2028).

The CES (the Cluster Energy Strategy for the North Sea Canal Area) identifies a number of other measures for the energy transition. In November, a final decision will be made regarding the projects that fall within the scope of the MIEK (the national Multi-Year Infrastructure and Climate Programme). With that caveat in mind, this will entail the following urgent energy infrastructure projects at national level:
- Reinforcement of the electricity grid
- A 'Regional Integrated Backbone' (RIB) for hydrogen

and at regional level:
- A steam network in the port
- A local hydrogen network in the port (H2avennet)
- A hydrogen network for Zaandam (ZaannetH2)

- Regional reinforcement of the electricity grid.

In addition, the CES refers to a CO2 capture and distribution system (Athos). This was largely planned for the purpose of reducing Tata Steel's CO2 emissions. However, Tata has adopted a different sustainabilisation approach (producing steel initially using natural gas, and subsequently switching to hydrogen). Although CO2 capture is still required, the scale is now so modest that Athos has been shelved. Consideration must now be given to alternative approaches for the remaining CO2 capture and storage requirement.

Landing additional offshore-generated wind power is not possible before 2030, because space must be freed up first. There are still choices to be made for the period after 2030. If additional landing capacity in the IJmond region is not chosen, extra 380 kV high-voltage power lines may prove necessary to channel electricity from the landing points to the North Sea Canal area. However, if additional landing capacity in the IJmond region is chosen, space will be needed.

Sustainabilisation and the circular economy

The decision to make Tata Steel and the rest of the North Sea Canal area more sustainable is closely linked to the energy transition. This is a prerequisite for improving health and quality of life in the IJmond region and for achieving the climate targets. Projects identified in the CES (the Cluster Energy Strategy for the North Sea Canal Area) are prerequisites for the desired transition of Tata Steel and other industry in the North Sea Canal area.

Other sustainability-related tasks are elaborated in the NOVI area approach for the North Sea Canal area. They concern transitioning the port to a hub for sustainable production and fuel and goods flows. These and the other transitions all require incorporation in terms of the physical space, environmental space, safety contours and space for underground infrastructure.

In the context of a switch to a circular economy, the transition as far as flows of goods are concerned is primarily about facilities for storing and processing materials to be reused and matching their environmental contours. Transitions like these do not follow a linear course, so it is not clear whether significant additional space will be required for them in the future. In the transition period to a circular economy, our plans take into account the possibility of a temporary need for and use of additional space for facilities that are needed for both the 'old' and the circular economy. In the NOVI area, questions arise about the spatial impact of the residual flows, the companies that must be accommodated in the North Sea Canal area and those that can be located elsewhere, what the best place in the North Sea Canal area is for these companies and whether this will have a negative impact on the space available for the port. Relocation to Lelystad or Almere, in connection with the 'circular economy activity line' that is emerging there, may be an option for companies that are not tied to short supply-chain relationships within the North Sea Canal area and are not deeply rooted in the North Sea Canal area.

Space for business parks

The transition to sustainable energy, the hub function for sustainable fuel and goods flows, and the shift to a circular economy are all associated with a need for space, during and possibly after the transition phase from the old to the new economy. In addition, the dynamics of the business activity in the port has its own space requirements and the transformation of business parks to mixed urban areas (in and outside the North Sea Canal area) leads to a need for space for businesses. Forced displacements can be reduced by measures and innovations that reduce environmental nuisance, at the source and/or on the side of the affected parties. However, not all plots of land are suitable for all businesses, especially in the higher environmental categories. Since the 2040 North Sea Canal Area Vision, the Wijkermeerpolder is no longer under consideration as a possible location for business activity.

The business parks in the North Sea Canal area play a major role as a source of employment for practically trained, middle-skilled and academically educated workers. Our preference is to have these jobs grow in parallel with the housing construction task in the North Sea Canal area. Four locations outside the North Sea Canal area are being investigated to assess whether they can meet part of the need for land-based and/or waterfront business parks: the Baanstee (Purmerend/Edam-Volendam), Flevokust Haven (Lelystad), De Vaart (Almere) and, outside the MRA, Boekelermeer (Alkmaar). This is an important part of the regional business park strategy that is being prepared for the context of the MRA in collaboration with the NOVI area team.

In respect of the Houtrakpolder, a strategic reservation has been made for port-related companies in the 2040 North Sea Canal Area Vision (Visie NZKG 2040). The Vision has been adopted by the municipal councils in the North Sea Canal area, the Provincial Council of Noord-Holland and national government, and included in the Provincial Strategy on Spatial Planning and the Environment, but is not endorsed by the municipality

of Haarlemmermeer in relation to this point. The Vision also includes procedural agreements on how to arrive at a decision on whether or not to use this strategic reservation. The conditions and procedural agreements set out in the 2040 North Sea Canal Area Vision for the use of this strategic reservation remain in force. One of those conditions is that the current port area has been sufficiently intensified.

The strategic reservation of the Houtrakpolder will be elaborated in the context of the NOVI area. This assessment will define the criteria for transforming the Houtrakpolder (international competitiveness, energy transition, circular economy), and whether the entire reserved area will be needed, or part of the reserved area. The Houtrakpolder is part of the National Ecological Network (Nationaal Natuurnetwerk/NNN). If (part of) the Houtrakpolder were to be used for port expansion, this would be at the expense of the National Ecological Network area. This should be accompanied by compensatory measures as described in the Provincial Environment Ordinance of Noord-Holland.[11]

Water safety

Our ambition is to ensure that every development in the MRA contributes to a climate-adaptive region (see the 'Ambitions' chapter). This also applies to development of the port complex.

Because of the concentration of vital and vulnerable infrastructure now and in the future, extra attention must be given to water safety and flood defences in the North Sea Canal area. Flooding from the sea would lead to major damage, risks to public health and disruption of an area much larger than the North Sea Canal area alone. Spatial measures and a good emergency strategy can greatly reduce the risks. Due to the relatively high elevation of the port area, effective measures can be implemented comparatively easily. In new area developments, the choice of ground level must take into account water safety.

Development of living and residential locations

Health and quality of life as prerequisites

The health of residents in the IJmond area is more fragile than average and they also live in an environment that is more unhealthy than average. This calls for prioritisation of investments and spatial choices that improve this situation in the North Sea Canal area. So the residents in the IJmond area need nationally and regionally driven investment in measures that protect health against negative environmental pressures, which are largely caused by industry (hence the sustainabilisation of Tata Steel), road traffic and air travel and transport. In addition, improving quality of life and creating a healthy living environment requires prioritisation of spatial reservations and investments in health-promoting measures (including accessible green space, recreation and healthy mobility) over other projects that require space, especially projects that have an additional negative impact on the healthy living environment. In some cases, sustainability transitions may mean that installations or facilities are required, which in themselves place a claim on the living environment, but subsequently allow replacement of installations and facilities that pollute the environment to a greater extent. The details of how we will realise the improvement in health and living conditions will be elaborated in the context of the NOVI area, in alignment with the MRA Urbanisation Strategy MRA.

Residential development and transformation to living and work environments

The transformation to living and work environments is underway at three locations: the Spoorzone in Beverwijk, Hembrugterrein/Achtersluispolder in Zaandam and Haven-Stad in Amsterdam. In the case of the

11 In accordance with the Draft Environment Ordinance of Noord-Holland 2022 (Ontwerp Omgevingsverordening NH2022), the applicable principle is that physical measures designed to compensate for the negative impact on the Dutch National Ecological Network Netherlands:

a. Are implemented outside the operational area of the National Ecological Network at a location that helps strengthen the cohesion of the network, or – if there are plausible reasons preventing physical measures outside the Dutch National Ecological Network – in parts of the Dutch National Ecological Network that have not yet been realised;

b. Are implemented in close proximity to the affected area unless it can be demonstrated that this is not possible;

c. Are implemented in an area at least equal to the footprint of the affected area;

d. Compensate for the impaired essential characteristics and values;

e. At the very least, provide for the layout of the area for developing the desired form of nature and also provide for development management of that nature area for a duration of at least 5 years, and in the case

Achtersluispolder and Haven-Stad developments, a study is currently being performed to assess the possibility of accelerating the home construction plans in the period up to 2030. Transformation can take place under the conditions set out in the 2040 North Sea Canal Area Vision and conditions arising from the Urbanisation Strategy: the connection to the energy system and to the infrastructure, sufficiently high ground level to prevent flooding, nature-inclusive development and customised solutions where housing and industry do not naturally mix. In addition to the business parks that are to be transformed, there is also a relationship between development in the North Sea Canal area and urban renewal in Zaandam-Oost and Amsterdam-Nieuw West in particular. This relates to the function of the port complex and mixed living and work areas as a source of employment for practically trained, middle-skilled and academically educated workers. A short and affordable commute is especially important for the practically trained, to avoid transport poverty. In the context of these groups, this means that sufficient appropriate housing must be built within affordable commuting distance of the workplaces in the North Sea Canal area. Issues of health and quality of life also need to be addressed here.

Development of the green and blue network

Nature and recreation

An inherent aspect of the multi-core development ambition is that built areas are not allowed to grow into each other. The North Sea Canal area is part of contiguous landscape connections between the peatlands in the Zaanstreek, the Oer-IJ area, Spaarnwoude and western part of Haarlemmermeer, and along the coast. The beaches, the dunes, the inner dune fringe, the Wijkermeerpolder, Spaarnwoude, the Houtrakpolder, the Brettenzone and the Noorder IJplas are important elements that help determine the liveability and attractiveness of the MRA. These areas have both recreational and ecological value and include good agricultural land. In the Urbanisation Strategy, we choose to secure and further develop these natural and recreational areas. The Houtrakpolder may be an exception subject to the conditions explained previously, including nature compensation.

Maintaining World Heritage status of the Defence Line of Amsterdam as a prerequisite

Some of the open landscape (roughly speaking the western part of the Oer-IJ area) is part of the Defence Line of Amsterdam. This military and historical landscape is a UNESCO World Heritage Site. This summer, that status was reaffirmed when UNESCO decided to expand this World Heritage Site to include the New Dutch Waterline, resulting in the Dutch Water Defence Lines as a World Heritage Site. This makes preservation of the Outstanding Universal Value (OUV) of the World Heritage Site a prerequisite for spatial planning. That OUV is operationalised in core qualities of the military and historical system, composed of the strategic landscape (including the inundation fields), the historical infrastructure for water management and the military fortifications with their fields of fire. For landscape developments (in combination with temporary peak water buffering), openness and connecting to the historical inundation system is important. Large-scale urban developments are in principle excluded within the Heritage Site boundaries. Smaller scale developments require careful incorporation. The addition of infrastructure (roads, railway lines, high-voltage connections) should preferably be avoided and, at a minimum, requires extremely careful incorporation.

Candidate area for temporary peak water buffering

The Oer-IJ is a candidate area for temporary peak water buffering to make the region climate-adaptive and water-resilient. The Urbanisation Strategy identifies the candidate area for temporary peak water buffering. Within the NOVI area plan, we will fill in the details for this task in conjunction with the 'Future-proof Water System for the Amsterdam-Rhine Canal/North Sea Canal' programme (Toekomstbestendig Watersysteem Amsterdam-Rijnkanaal/Noordzeekanaal): i.e. the exact location, the required size and possibilities for combinations with other functions. The impact on water quality in the area also still needs to be investigated. This buffer capacity is needed to prevent major flooding in periods when extreme precipitation cannot be drained off to the sea, the Markermeer-IJmeer or the river Lek, or only to a limited extent. In addition, a temporary level increase in the North Sea Canal (and in the Amsterdam-Rhine Canal) are being investigated. This will require the water level to be temporarily raised. Doing so has implications for the ground level datum for new construction and new ground level elevations along the canal, and means that a climate-adaptive design of the area must meet more demanding requirements. Additional drainage to the Markermeer, the river Lek and alternative drainage routes to the sea are also being investigated. The most likely outcome is that a combination of these measures will be needed. However, each of these solutions has its own drawbacks and obstacles.

Salinisation

Large investments of public money have been made in a new sea lock to allow further development of the port. A system for 'selective extraction' limits the inflow of salt water through this lock. This is an important measure for water extraction to produce drinking water, and for agriculture and nature. Further development of the port economy may lead to increased shipping traffic, and therefore increased salt ingress. Increasing desiccation

Agenda based on the Urbanisation Concept for the NOVI North Sea Canal Area

Transition from a port to a hub for sustainable fuels and goods flows

- These and the other transitions all require incorporation into physical space, environmental space, safety contours and space for underground infrastructure.

Space for circular economy initiatives

- Circularity specialists need to identify residual flows to allow estimation of the spatial impact.
- Which companies active in the circular economy should we accommodate in the North Sea Canal area and which companies can be accommodated elsewhere in MRA?
- What is the best place in the North Sea Canal area for these companies?
- Will this space need to be made available at the expense of the zone for the port?

Space for business parks

If it is not possible to realise sufficient space in the North Sea Canal area, what are the possibilities and advantages and disadvantages in Alkmaar, Purmerend, Almere and Lelystad (spatial planning, accessibility, environmental space, societal, etc.) - to be worked out in conjunction with the regional business park strategy.

Further detailing regarding the strategic reservation of the Houtrakpolder

- When will the need to transform the Houtrakpolder arise (in relation to the intensification possibilities of the business area and international competitiveness, the energy transition and the circular economy)?
- Will the entire reserved area be needed, or part of the reserved area?

Improve health and quality of life

Given the decision to improve health and quality of life in and around the North Sea Canal area, it is necessary to examine what this means for spatial reservations and prioritisation in the area.

Choice of location, size and design of the temporary peak water buffering facility in the Oer-IJ area

Given the decision to identify a candidate area for temporary water buffering in the Oer-IJ, the following points need to be investigated:

- What are the advantages and disadvantages of a facility to collect the expected amount of water in the designated candidate area (in terms of agriculture, cultural heritage, accessibility, land subsidence, nature development, recreation, etc.).
- What is the required volume for temporary peak water storage in conjunction with other possible measures such as temporary level increases in the North Sea Canal and Amsterdam-Rhine Canal, additional pumping stations and alternative drainage routes to the sea.
- What is/are the best place(s) within the candidate area for temporary water buffering and what is the water quality of the water to be buffered.

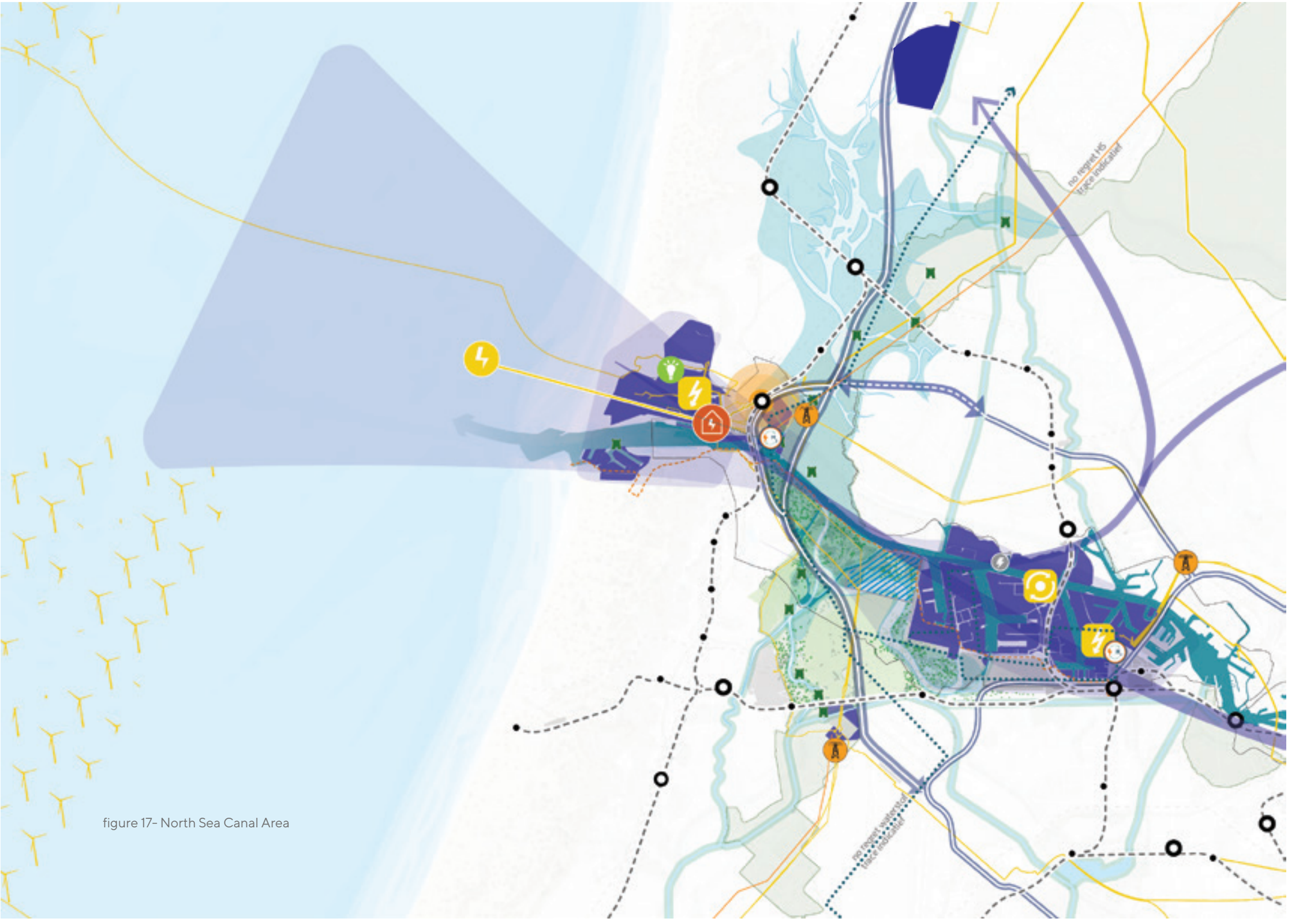


figure 17- North Sea Canal Area

4.2

IJmond, Noord-Kennemerland and Zuid-Kennemerland

Multi-core development with a focus on the human scale

In the coastal area of the metropolitan region, there is space for building some 40,000 homes and the multi-core development measures focus mainly on development of the town centre in Haarlem and intensive urbanisation around Beverwijk station.

The sub-area has a diverse economic profile across the board, with employment opportunities for practically trained workers and knowledge workers. The port area of IJmond is developing as a nautical gateway to the MRA, as a 'green electricity hub' for bringing wind power generated at sea to the mainland and as a 'Techport' for high-quality manufacturing and maintenance industry. The future development of this economic complex, in conjunction with other values and qualities, will be elaborated in the NOVI area plan for the North Sea Canal Area (see the paragraph entitled 'North Sea Canal Area'). Improving health and liveability are important prerequisites.

It is interesting to see that Haarlem, which is basically an urban economy, actually has a relatively large number of jobs for practically trained workers, and that many academically trained workers from Zuid-Kennemerland actually work outside that sub-region. The result is significant commuting to and from Haarlem. One of the goals of the ambition to balance economic growth across the MRA is to reduce that mismatch by increasing the number of jobs relative to the workforce. To achieve this ambition, Zuid-Kennemerland is committed to retaining existing employment and creating more functions that involve knowledge-intensive work. The opportunities for this lie in the town centre developments around the public transport hubs of Haarlem Centraal, Haarlem Station Spaarnwoude (Oostpoort) and Haarlem Nieuw-Zuid. An economic corridor is being developed on the line from Haarlem Centraal and Oostpoort, which includes De Koepel (the former prison complex) and the C-district circular economy network. De Koepel will be developed into an academic campus that focuses on business studies with the emphasis on entrepreneurship, the circular economy and digitalisation & robotisation, with an SME innovation hub, student housing, social housing for young people and various cultural and social functions. These developments open up opportunities for strengthening Haarlem's economic profile of digitalisation, health and circularity, especially in the field of applied innovations and testing ground functions/living labs.

The coastal towns have a strong tourist profile. This profile will be strengthened under the Amsterdam Beach plan. The largest coastal resort is Zandvoort. The focus here is on year-round tourism, 'working by the sea' and strengthening the recreation and sports cluster, in

IJmond, Noord-Kennemerland and Zuid-

Living, working and recreation near the coast and dunes

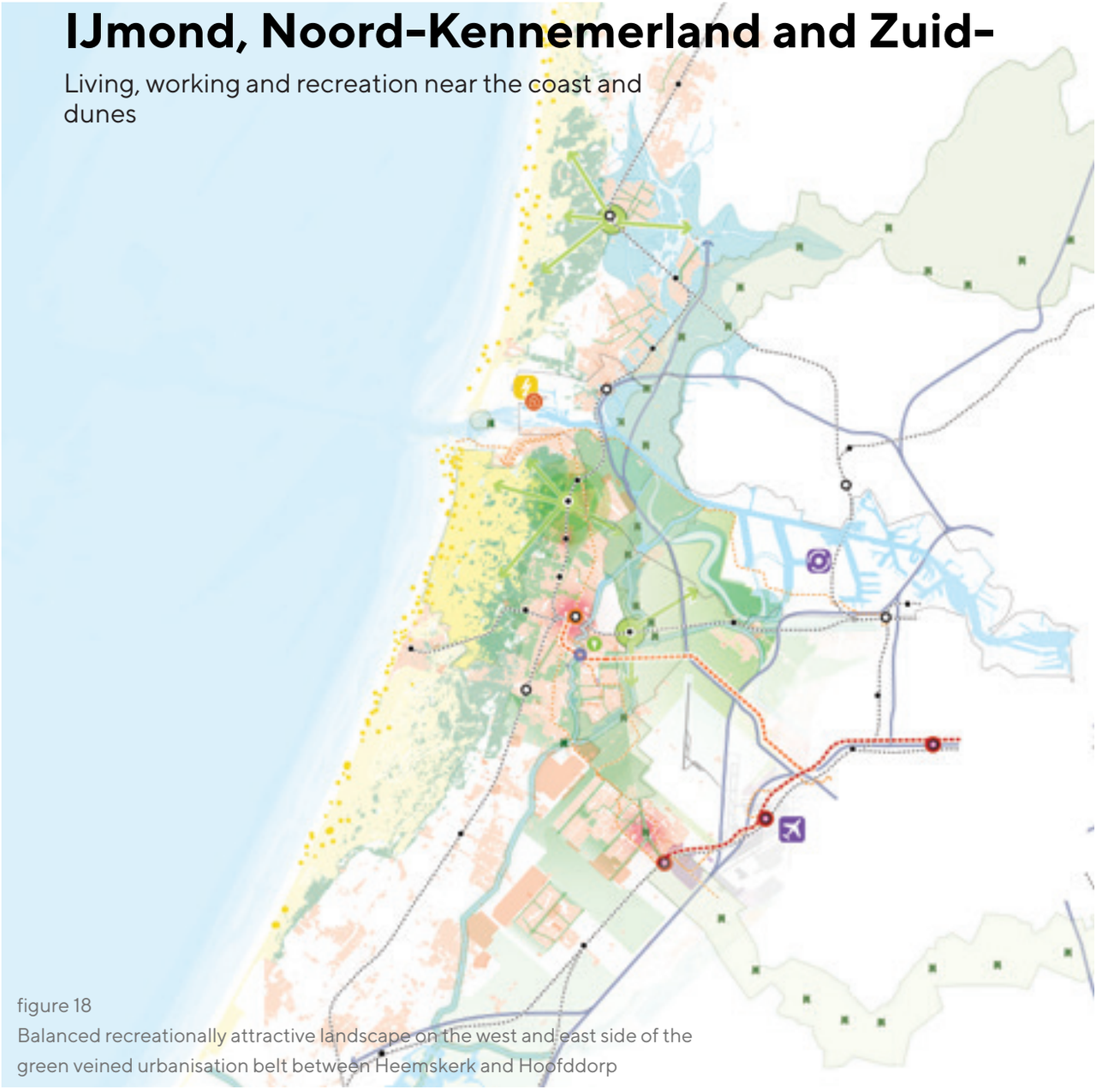


figure 18
Balanced recreationally attractive landscape on the west and east side of the green veined urbanisation belt between Heemskerk and Hoofddorp

conjunction with research into the water safety of the coastal region. Recreational year-round facilities are also being developed in IJmuiden aan Zee. Preserving the diversity of the coastal towns is an important part of the measures to boost quality. This is important for the quality of life in the region and the various target groups the North Sea coast serves.

Economic opportunities are strongly related to accessibility. One aspect of the road network study (for the '2040 Multimodal Future Vision') is the level of traffic pressure on the A9 and A22 motorways, and how it is affected by measures in the road network that are designed to improve traffic flow on the ring roads around Amsterdam.

Green and blue network in and around the city

With the coast, the dunes, and the inner dune fringe, this sub-area boasts a number of popular landscapes. The same applies to Spaarnwoude, the recreational area that is partly protected within the Dutch National Ecological Network and partly as part of the Defence Line of Amsterdam World Heritage Site. Even so, the landscape in this sub-area can still contribute more to quality of life in the MRA. The recreational pressure on National Park Zuid-Kennemerland is intense. "The ambition - in line with the National Parks New Style approach - is to strengthen the connection of the National Park with the beach areas and the inner dune fringe, in combination with a transition to nature-inclusive agriculture and a climate-adaptive spatial layout. Recreational visitors can then be spread more widely. Nature-inclusive development in the immediate vicinity of the nature core in the National Park will also better exploit the ecological potential

of the seepage water in the park. Collaboration with Spaarnwoude will relieve the recreational pressure. For the further development of this recreational and nature area, agreements aimed at receiving a larger number of visitors and other aspects have been made in the 2040 Spaarnwoude Park Vision.
More is needed to properly connect the landscape of beaches, dunes and the inner dune fringe with the hinterland and embed it in a region-wide recreational structure. It is important to strengthen the connections with the polder landscape on both sides of the North Sea Canal, both for nature and for recreation. Major lines of infrastructure, urban areas, and the current layout of agricultural areas make those landscape connections inadequate in the current situation. The landscape of the Oer-IJ can also play a role in this, in the context of the choices to be made for the North Sea Canal area as a whole. The choice of a candidate area for temporary peak water buffering fits well with this.

The landscape in Kennemerland is intersected by the North Sea Canal. In order to strengthen the continuity of the landscape structure and reduce the barrier effect of the North Sea Canal, efforts will be made to increase the perceived value of the canal and to make the landscape of the Oer-IJ recognisable on both sides of the canal.

Topics for area-based agreements

The most urgent area-focused tasks and issues that require joint commitment from national government and the regional authorities:

- Elaboration of the development and sustainabilisation measures for the North Sea Canal area (see paragraph 4.1) that are closely linked to this sub-area of IJmond, Noord-Kennemerland and South-Kennemerland
- Measures in the road network, with specific attention for the traffic pressure load on the A9 and A22 motorways among other aspects (part of the 2040 Multimodal Future Vision and SBaB)
- The integral development of Haarlem town centre with three public transport hubs

Initiatives that call for commitment from the regional authorities:

- Economic development of IJmond and Zuid-Kennemerland based on the economic profile and in line with the workforce present in the sub-regions (with a view to correcting the lopsided commuting balance and preventing transport poverty)
- The development of Haarlem as a creative city and Zuid-Kennemerland as a region of applied innovation in the field of the circular economy, sustainability, health and the creative and digital sectors as connecting sectors
- The development of De Koepel in Haarlem as an anchor institution for university education in combination with an SME innovation hub
- Strengthening the regional attractiveness of Haarlem's inner city in terms of retail, hospitality and culture
- Landscape development and recreational accessibility of the Oer-IJ, in conjunction with the water task
- Connecting National Park South-Kennemerland with Spaarnwoude and PARK21 and relieving the recreational pressure on National Park Zuid-Kennemerland, in line with the National Parks New Style programme
- Improving the recreational profile of Spaarnwoude based on the approved area vision
- Quality Impulse for the North Sea Coast ('Amsterdam Beach'): a quality boost for Zandvoort and IJmuiden aan Zee, development of year-round facilities, working by the sea and coastal accessibility, in conjunction with research into the long-term water safety of the coastal region in the face of accelerated sea level rise
- In the dunes and the inner dune fringe, seeking space to retain clean seepage water in the area and make better use of it, possibly resulting in restrictions on or adjustments to agricultural functions, in conjunction with the development of the Dutch National Ecological Network and the provincial authority's approach to nitrogen
- Landscape connections between the coast and the hinterland, including a strengthened bicycle network.

4.3

Zaanstreek, Waterland, Amsterdam-Hoorn Corridor

Inclusive towns in a contemporary Dutch landscape

Multi-core development with a focus on the human scale

The urban areas north of the IJ will continue to grow to between 500,000 and 600,000 residents in the coming decades. We use that growth to add economic and social value in order to create a better balance in the metropolitan region. This means that the extensive home construction programme (approximately 30,000 homes up to 2030 including Amsterdam-Noord) must be accompanied by investments in employment, amenities and accessibility. The commuter flows from this sub-area are disproportionately large and one-sidedly focused on Amsterdam. Zaanstad and Amsterdam-North have relatively many socio-economically weak districts with space for new economic development.
There are programmes for developing the town centres in Zaanstad and Purmerend. The Buikslotermeerplein area in Amsterdam-Noord functions as a third regional centre. A rapid-transit (HOV) connection will create a second backbone in the ZaanIJ corridor between Amsterdam and the Zaanstreek region. The area around Station Kogerveld can be developed as part of that corridor. In Purmerend, there is a relationship with economic development in the north of the town, including Baanstee business park, and the H20 e-sports campus as a showcase for Purmerend's IT and e-sports cluster. Baanstee-Noord can benefit accordingly from the need for a business park that cannot be accommodated in the North Sea Canal area.

The development of living and work environments in the ZaanIJ corridor (Hembrugterrein, Achtersluispolder) and the development of the Noorder IJplas as a landscape park contribute to strengthening this sub-area in terms of its social quality. The latter developments are related to the choices made in the North Sea Canal area. In the case of the Achtersluispolder, the possibilities for accelerated development are currently being investigated.

Attention is also needed for existing cores, districts and business parks. Residential development near small cores and linear villages may be desirable to maintain liveability in those cores and villages. This is possible within the constraints of the valid regimes. Quality improvements are needed in districts with socio-economic problems. In the ZaanIJ Region Deal, national government and the regional authorities are working together to create more jobs, improve the standard of education and create a green and safe living environment, particularly in Amsterdam Molenwijk, Tuindorp Oostzaan, Zaandam Peldersveld and Poelenburg, and the latter is also part of the intergovernmental Programme for Liveability and Safety. Existing business parks have a role as potential re-establishment sites for businesses from other parks that

Zaanstreek, Waterland, Amsterdam-Hoorn corridor

Inclusive towns in a contemporary Dutch landscape

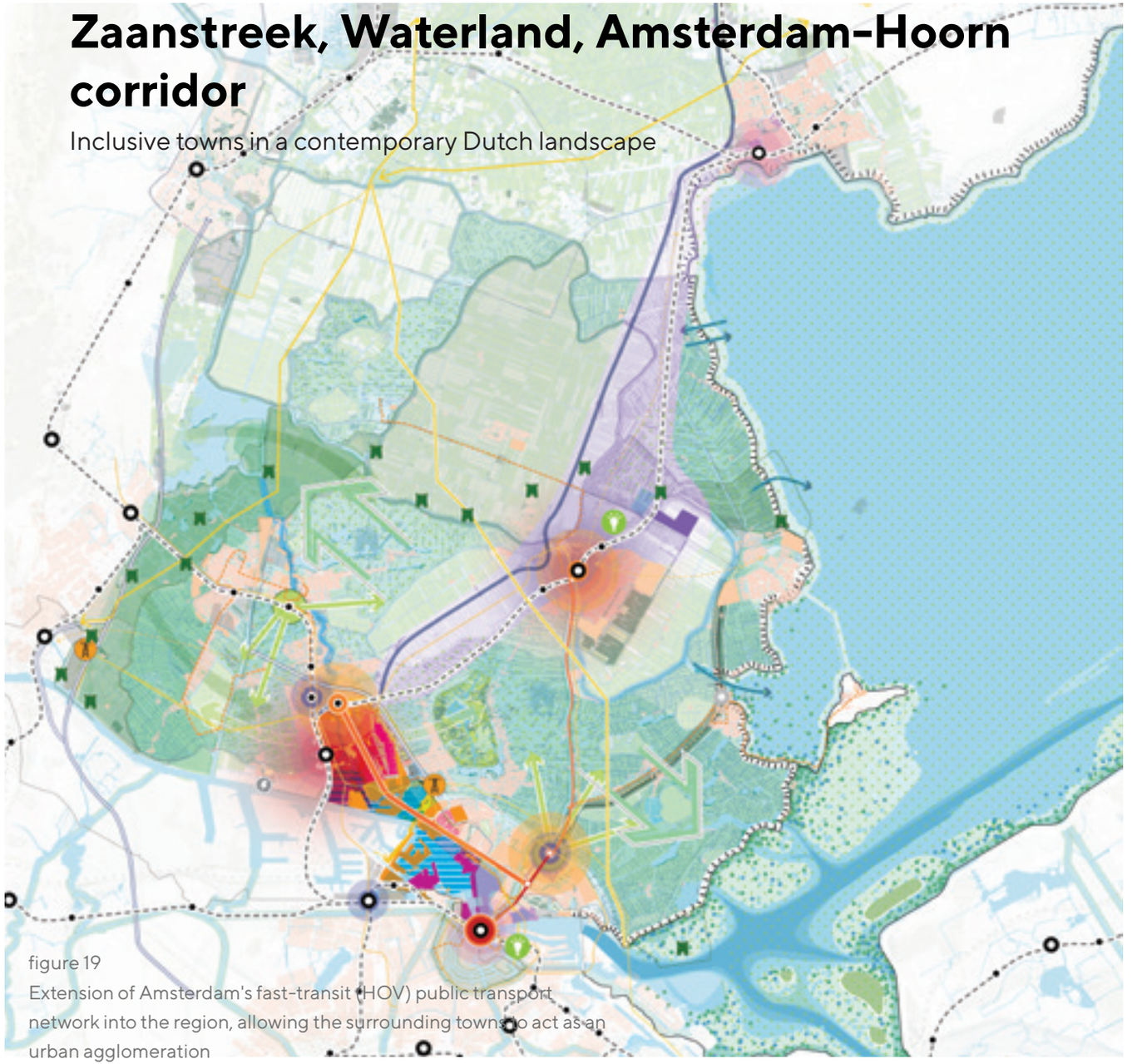


figure 19
Extension of Amsterdam's fast-transit (HOV) public transport network into the region, allowing the surrounding towns to act as an urban agglomeration

require transformation. Smart and careful use of space is a prerequisite for new business parks (Baanstee-Noord and HoogTij are now being developed)

Action to tackle congestion supports addressing these tasks. Improvement to the main infrastructure mainly focuses on the connection between the A8 and A9 motorways, and the Amsterdam-Hoorn corridor. That corridor is a line for clustered economic development, including areas outside the MRA in locations such as the Poort van Hoorn.

Green and blue network in and around the city

The landscape in this sub-area is highly valued because of its typical Dutch character and its innate heritage values. The peatlands, the polders and the banks of the river Zaan are valuable landscapes. The Beemster, as an agricultural polder, has been awarded Unesco World Heritage Site status. These landscapes are of high recreational significance. This recreational function can still be developed further; by improving the accessibility of these landscapes among other measures.

This landscape is under pressure. The main cause is subsidence of the peaty soil. This is related to the low groundwater level required for current agricultural use. Raising the groundwater level, however, is challenging for agriculture, especially in combination with reducing nitrogen emissions. It requires agriculture to reorientate, to look for new crops or new markets about which little is currently known. At the same time, it can bring other

ambitions within reach; for example, increasing the ecological value of the landscape or making it more accessible for recreational visitors. The connecting function of Zaanstreek and Waterland in the landscape (for both recreation and nature) can be strengthened.

The approach to the peatland problem is highly area-specific. The situation differs from one area to another, and so do the possible options and solution paths. So a bottom-up procedure and dialogue with all the parties involved are important for formulating the approach, based on mutual recognition of the social urgency and the interests of the agricultural entrepreneurs. The goal of this dialogue is to grow towards each other on the path to a new future, and also discuss the time lines and instruments. A transition like this takes several years.

An area process that looks at a new future of the peatlands in Zaanstreek and Waterland can draw ideas from many sources. Research carried out elsewhere in the country, such as at the Veenweide Innovatie Centrum and ongoing pilot projects in Laag-Holland can be used for guidance and developed further. In Noord-Holland, a Regional Peatland Strategy for the entire province is being developed, and the steering committee responsible for Laag-Holland (Regiegroep Laag-Holland) is working with the provincial authority, municipalities, the water board and nature and agricultural organisations to draw up an integrated area programme for the landscape of Laag-Holland.

Topics for area-based agreements

The most urgent area-focused tasks and issues that require joint commitment from national government and the regional authorities:

- Integral area process for the future of the peatland areas, managed from the bottom up, in the context of the intergovernmental Peatland programme (Programma Veenweide) and the area process in Laag-Holland (with a strong focus on the subsidence and nitrogen problems, the transition of and innovation in agriculture, nature development and recreational development)
- Integral development of the major town centres of Zaanstad and Purmerend
- If there is a demonstrable requirement for reinforcing the electricity grid to the northern Netherlands: investigate an alternative route for the 380 kV high-voltage cable via Noord-Holland North
- Tasks related to the development and sustainabilisation of the North Sea Canal area (NOVI area), in particular the development of ZaanIJ/ Achtersluispolder (living and work environment) and space for businesses relocating from business parks that are to be transformed
- Accelerated development of Achtersluispolder in conjunction with the necessary prerequisites

Initiatives to which national government and the regional authorities have already committed under existing agreements:

- Urban renewal task in Zaandam Oost (part of the Liveability and Safety programme)
- Regional Deal ZaanIJ
- Accessibility to the Amsterdam-Hoorn corridor (railway and A7 motorway) in accordance with the approved intergovernmental agreement

Initiatives that call for commitment from the regional authorities:

- The ZaanIJ rapid-transit (HOV) connection, linked to the construction of homes in the Achtersluispolder and Amsterdam-Noord, and urban renewal in Zaandam-Oost
- Work to further develop the recreational structure (including the accessibility of the most important green zones such as 't Twiske, Purmerbos and walking and cycling routes in peatland areas, in conjunction with the integral area development activities to secure the future of the peatland areas)
- The A8-A9 motorway connection and its integration into the landscape of the Defence Line of Amsterdam Unesco World Heritage site (landscape study in progress)
- Preservation and development of the Defence Line of Amsterdam and Beemster Polder Unesco World Heritage Sites (in conjunction with the integral area development activities to secure the future of the peatland areas)
- Development of the Noorder-IJplas landscape park
- Action to strengthen the economic profile (for example, in the form of complementary development of regional centres and smart use of space at the Baanstee-Noord/Noordoost business park in Purmerend/Edam-Volendam)

4.4

East Flank and Markermeer/IJmeer

Development of complete waterfront towns

Multi-core development with a focus on the human scale

The East Flank has significant space available for the region's growth task. The East Flank offers a healthy living environment, the housing market is relatively affordable, over 100,000 homes can be added in this part of the MRA, and there is plenty of room for business activity. Ensuring that growth in Almere and Lelystad contributes to the development of complete towns, and that the currently lopsided commuting balance improves, are important considerations. Town centre development and strengthening the economic profile of Almere and Lelystad are key prerequisites for the ambition relating to complete towns and a balanced, multi-core development of the MRA.

The economic profile of Almere continues to develop. As the youngest town in the region, Almere offers many opportunities for housing and spatial and economic development, but the economic activity is diverse and needs a boost to better keep pace with population growth. Logistics is a strong cluster in Almere that is still growing at present and provides relatively many jobs. With the social tasks and urbanisation issues in mind, effort has been devoted to building a circular economy cluster during the past decade. This cluster is emerging in business parks such as De Vaart and De Steiger and can grow even further, possibly boosted by companies from the North Sea Canal area if they require a new location. There is also a strong focus on the ICT technology and Energy Transition clusters, with opportunities for Medium Tech and High Tech industries. The urbanisation task in Almere will focus, among other things, on further expansion of the profiles of these clusters and strengthening the associated knowledge infrastructure. The development of higher (technical) education is an important aspect of this. This is a prerequisite for fully-fledged economic clustering and supports resilience in the community. The priority for living and working in a mixed environment near the town centre creates an appropriate urban context for this development.

The combination with the construction task offers opportunities to make a firm commitment to a circular construction economy and circular area development. In combination with companies working in the energy transition that are also located in Almere, an economic profile at the overlap between high-grade technology and the transitions (energy and circular economy) seems very appropriate here.

Lelystad is growing towards an economic profile as a multimodal accessible hub, thanks in part to Lelystad Airport, the port, the wind and solar energy in the polder, the strong agrifood sector and its location on a backbone for electricity and gas in the energy network. This is reinforced by targeted initiatives to strengthen education with courses that match the economic profile. A cluster

East Flank and Markermeer/IJmeer

Development of complete waterfront towns

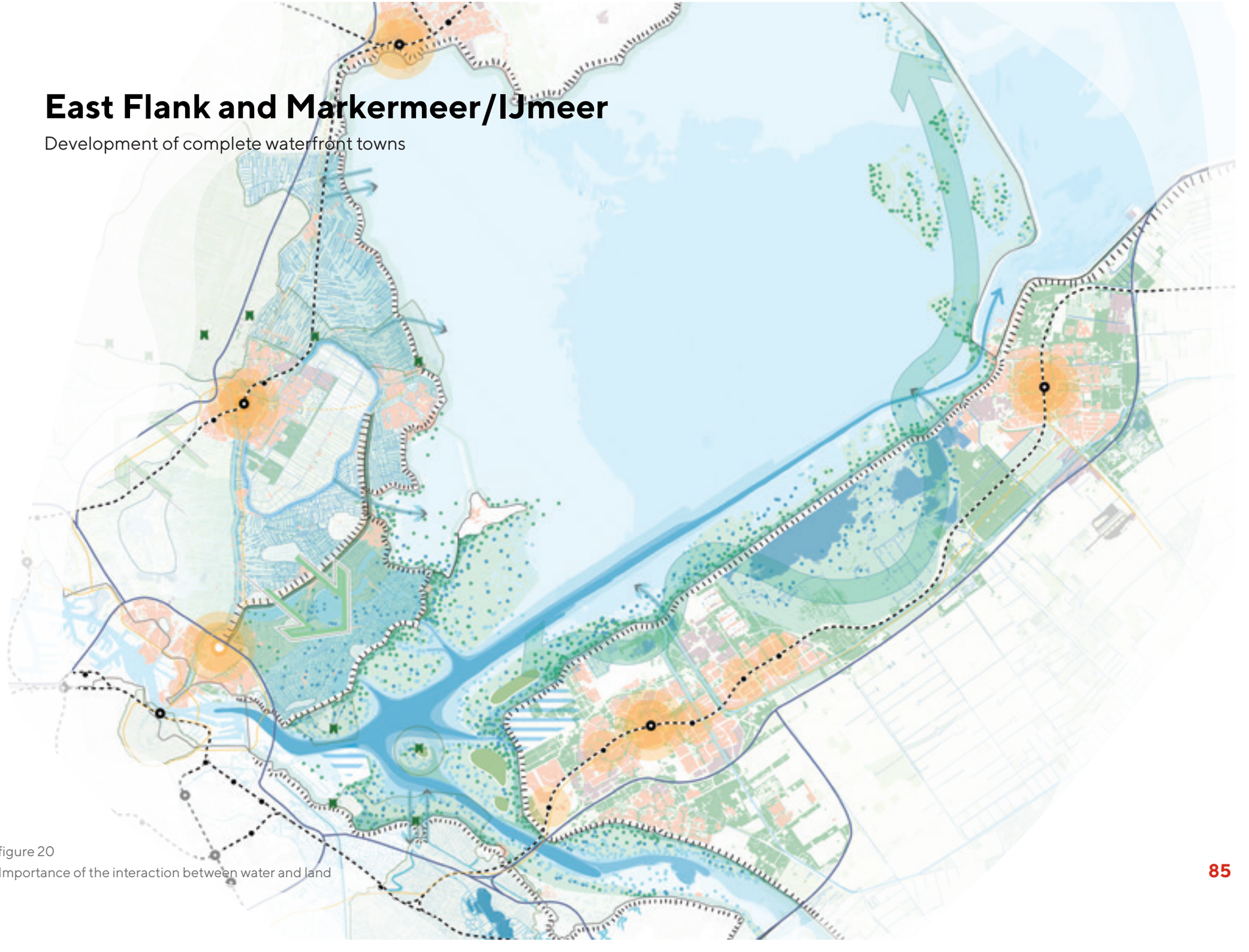


figure 20
Importance of the interaction between water and land

is being created here that will lead to a growing number of secondary jobs over time. The circular economy can grow within this profile, in conjunction with developments in the North Sea Canal area. Depending on the direction of development that will be chosen, relocation of water-related businesses and businesses active in the circular economy to the port of Lelystad may be an option. The port, Flevokust Haven, has plenty of space for circular economy activities. This line of development would lead to the creation of a 'circular economy activity line' between IJmuiden, Almere and Lelystad.

Development of the economy with growth in the circular business activity sector and Lelystad Airport has an undeniably positive effect on employment and the economic climate for establishing a business. Lelystad Airport can also contribute to reducing the number of night flights at Schiphol (see also paragraph 3.1, Quality of life around Schiphol). At the same time, developments of this type also have a (local) impact on the living environment. The healthy living environment of the East Flank is a valuable asset. In the further development of the East Flank, the balance between the healthy living environment and economic interests must be carefully monitored.

Continued growth to form complete towns also means that desirable growth is needed in terms of cultural amenities, healthcare facilities and social infrastructure. The geographical location in the nature-rich environment of National Park Nieuw Land and the green character of the urban area give direction and identity to the urban development of Almere and Lelystad, with Lelystad profiling itself as the new nature capital. It also represents an opportunity to further develop the leisure economy of Lelystad and Almere.

Study to determine the feasibility of a fourth hyperconnectivity hub

With the development of data infrastructure in the region in mind, a study has been conducted to determine a possible location for a fourth hyperconnectivity hub. This research focused on spatial possibilities, the connection to the power grid and the opportunities for using waste heat. The outcome points to Oosterwold, near Almere, as a candidate area for the preferred location for this development. Data centres are major energy consumers and this area is ideal as the data centre's power supply can be provided by a new substation that will also be used to facilitate the growth of Almere and feed wind energy from the surrounding area into the grid. The results of this study will be incorporated in the provincial authority's data centre policy, which is under preparation.

As a first step, research is now being carried out to investigate the integration possibilities. This new study also looks at issues other than the available space and the energy supply; for example, it will also analyse the economic effects (including employment) and the possibilities of climate-adaptive development (firstly, risk mitigation in the event of flooding or excess water, and secondly, the cooling method and possible discharges - if cooling requires the use of drinking or surface water, its availability is also a criterion, especially in periods of drought).

Based on the location policy that is under preparation, and this study, the provincial authority and relevant municipalities will decide whether to designate a location in the candidate area. If the aforementioned parties decide negatively, the issue of the possibility and desirability of a fourth hyperconnectivity hub will come back to the MRA.

Green and blue network in and around the city

In many ways, the Markermeer and IJmeer are among the high-value spatial assets of the MRA. It is no coincidence that Almere and Lelystad explicitly opt for cohesion with the expanses of open water in their urban planning programmes. Markermeer and IJmeer, together with their shorelines, are part of many ongoing programmes set up by national government and the regional authorities. These focus on improving the ecological system, the significance of the area for the regional water system and the connection with urban development in the East Flank. At the interface of urban development, in accordance with the agreements in the RRAAM programme, incorporation of a possible IJmeer connection will become a concrete task now that this development in the form of a light rail connection has been recognised as a promising solution in the studies to assess the living and work programmes for the Amsterdam Bay Area. If found necessary and useful, route variants can be worked out, including the possibility of underground sections.

Developments and tasks elsewhere in the MRA can affect the IJmeer-Markermeer area and its shorelines in a number of ways. These developments and tasks are mostly concentrated on the south shore of the IJmeer. This area is a link in the open landscape structure with water-rich nature that runs between the Vechtstreek region, via the IJmeer, to the Waterland part of the Defence Line of Amsterdam. To the west, the south bank merges with

the Diemerscheg, one of the green wedges around Amsterdam. In the light of further urbanisation on the edges of the Diemerscheg, maintaining a green Diemerscheg is becoming increasingly important. The parties involved are committed to improving the quality of the Diemerscheg: its landscape, ecology, cultural and historical value and in terms of recreational facilities. In order to make it future-proof, consideration is being given to the development of climate forests, with a higher groundwater level, water collection possibilities and less CO2 emissions. Space also needs to be available for the energy transition, provided it is properly landscaped. A possible IJmeer connection, if approved, must also be built in a nature-inclusive manner. In other words, landscape quality is considered during the assessment process and integrated into the solution if possible (see paragraph 3.2).

Several major infrastructure lines cross this zone. This results in a landscape reinforcement task. The urgency of this task may intensify as new infrastructure emerges, for example when the IJmeer connection on the east side of Amsterdam reaches the shoreline. There is also a possibility that the energy infrastructure will need to be reinforced, with a 380 kV high-voltage line for example, partly due to the presence of the power station complex in Diemen (Diemercentrale). Incorporation and/or compensation issues are associated with that possible development. Preservation of the World Heritage status of the Dutch Defence Lines is a prerequisite.

Adjustments to the water system in the MRA can have an impact on water quality, water quantity and the supply of water from and drainage of water into the Markermeer and IJmeer. Whether that will be the case and, if so, how substantial those effects are, is not yet clear. This may involve further work to strengthen the already important 'water butt' function of the Markermeer and IJmeer: a buffer to ensure water availability and peak water storage. The port of Lelystad can be used in part as a fall-back option for relocating water-related companies and companies active in the circular economy from the North Sea Canal area. This would require more lock movements at the Oranjesluizen locks and allow more brackish water to enter the IJmeer-Markermeer. The effects of a strengthened water butt function, in terms of the fluctuation in the water level, for example, and the load on the flood defences, is a theme identified for further research in the Urbanisation Strategy agenda. The effect of salinisation through the Oranjesluizen should be investigated as soon as a development of this type becomes a concrete option.

The objective of the Nieuw Land National Park (consisting of Markermeer, Trintelzand, Marker Wadden, Oostvaardersplassen and Lepelaarplassen) is to make this system so robust and resilient that it will be capable of easily withstanding the annual fluctuations inherent in any ecosystem. Even during periods of scarcity, regardless of the cause, Nieuw Land can host sizeable populations of migratory birds - a key measure of the quality of this particular area of nature in the MRA. An ecological and recreational

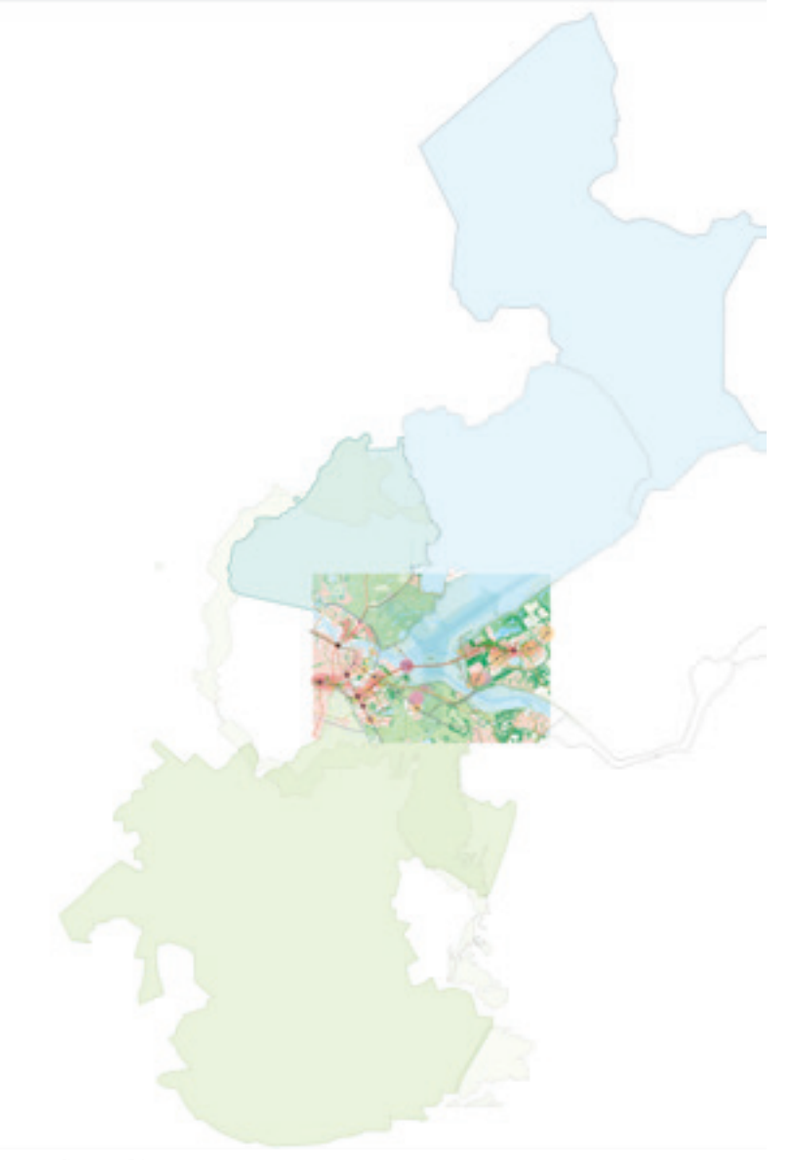


figure 21
IJmeer in the context of the major landscapes; Groene Hart, Waterland and IJsselmeer

'skin' is being developed around the nature cores in the National Park, with gateway areas in Lelystad and Almere. Nature-inclusive development in the immediate vicinity of the nature cores increases not only the accessibility but also the robustness of the National Park.

Topics for area-based agreements

The most urgent area-focused tasks and issues that require joint commitment from national government and the regional authorities:

- Nature and landscape development linked to the creation of a Future-Proof Markermeer-IJmeer Ecological System (Toekomstbestendig Ecologisch Systeem Markermeer-IJmeer) and the Action Guidelines for the East Flank (Handelingsperspectief Oostflank), based on the development principles of the Panorama Markermeer-IJmeer plan and in the context of Amsterdam Bay Area, National Park Nieuw Land and the Lelystad Coastal Zone.
- Strengthen the economic profile of Almere by expanding the education offer and amenities, etc.
- Integral development of urban cores in Almere (linked to the development of the economic profile) and Lelystad
- Acceleration of housing construction in Almere Pampus in relation to the IJmeer connection and the development of the green and blue network around Almere Pampus to ensure a climate-proof development
- Foresight study to assess accelerated housing construction in Lelystad Zuid/Warande in connection with the (re)development of the existing town (use of state-owned land, solutions for nitrogen restrictions, in conjunction with Lelystad Next Level)
- Multimodal accessibility, including elaboration based on the conclusions of the multi-year infrastructure, spatial planning and transport programme study for Amsterdam Bay Area
- Economic developments in relation to Lelystad Airport
- Possible construction of a hyperconnectivity hub in Flevoland
- If follow-up actions with regard to the water system give cause to do so: research into the influence of interventions elsewhere on water management of the Markermeer and IJmeer (this may involve research into a greater buffering capacity and/or storage function, or into a risk of salinisation due to more shipping movements through the Oranjesluizen locks)
- Preservation and development of ecological and recreational values on the shores of the Gooimeer

Initiatives to which national government and the regional authorities have already committed under existing agreements:

- National and regional government programme for Amsterdam-Almere-Markermeer (RRAAM/ Almere 2.0), including the Action Guidelines for the MRA East Flank procedure (Handelingsperspectief Oostflank MRA)
- The Lelystad Next Level programme
- Urban renewal task in Lelystad-Oost (part of the Liveability and Safety programme)
- Programme Approach to Large Surface Waters (Programmatische Aanpak Grote Wateren)
- Experimental area for circular agriculture
- National testing ground for precision agriculture

Initiatives that call for commitment from the regional authorities:

- Development of the Amsterdam-Almere-Lelystad corridor (economic profile, knowledge profile, living and work environments) combined with accessibility investments
- Development of Lelystad as a multimodal access hub and regional multimodal energy hub, by leveraging its location on energy networks, wind farms, the Maxima power plant, Flevokust Haven, the airport and agrifood
- New district-oriented approaches for the existing city, such as track 2 of the Liveability and Safety Programme (Programma Leefbaarheid en Veiligheid)
- Further development of the leisure economy
- Appropriate agricultural function in areas of severe land subsidence
- Preservation and further green and recreational development of the Diemerscheg and investigation to assess options for contributing to climate adaptation and the energy transition in a landscape-appropriate manner (the latter may require national government involvement)

figure 22
IJmeer - urbanisation in a continuous landscape

4.5

Gooi and Vechtstreek region
Climate-proof, recreational and culturally valuable landscape

Multi-core development with a focus on the human scale

The Gooi and Vechtstreek region connects the Metropolitan Region Amsterdam to the Utrecht region and contributes to the multi-core metropolis with developments concentrated along the Gooi corridor and rapid-transit (HOV) public transport lines. The ambition behind those developments is to ensure the construction of 11,500 homes in the period up to 2040, in accordance with the Regional Housing Vision (Regionale Woonvisie) and within the existing planning capacity. Homes that are largely accessible to low-income and middle-income earners to ensure a sufficient number of practically trained workers in this part of the metropolitan region. The town centre development in Hilversum, the developments around Hilversum Station, Hilversum Sportpark and Hilversum Mediapark also contribute to further development of the region's economic profile.

In this sub-area, the media industry is a recognisable cluster within the economic profile. In Hilversum there are opportunities for phased growth to become a Media Campus and Artificial Intelligence (AI) hub with innovative and cross-sectoral applications within and outside the data-driven media industry. A development of this type can be encouraged through a densification programme, a mixed-use environment and, if possible, increased public transport frequency. There are also opportunities elsewhere in the region for inner-city development to provide housing and generate jobs. Strengthening other public transport locations along the Gooi corridor, including educational facilities, helps to further build the economic profile. In addition to the media industry, there are opportunities for economic growth in the creative industries, healthcare, and recreation and tourism.

One consequence of the geographical location between Amsterdam, Almere, Amersfoort and Utrecht is that many commuter flows cross the area. The commuting balance is already quite skewed and deteriorating. The ambition is to improve this situation. This calls for an increase in (space for) work locations. There is also a qualitative mismatch. As a result, there is a significant outbound commuting flow and also a commuting flow into the area. Commuting relationships between the Gooi and Vechtstreek area and Flevoland are growing slowly. A better distribution in the commuting pattern can be created by developing and strengthening the economic profile in both areas in a distinctive way, without competing with each other, and by investing in mutual accessibility.

The 2040 Multimodal Future Vision (SBaB) assesses whether the corridors to Amsterdam's ring road need to be modified to function optimally. Those corridors include the A1 and A27 motorways, which may have a role in establishing a less lopsided commuting balance. An increase in passenger train service frequency (the Gooilijn) depends on the future of the freight traffic that

Gooi and Vechtstreek region

Climate-proof, recreational and culturally valuable landscape

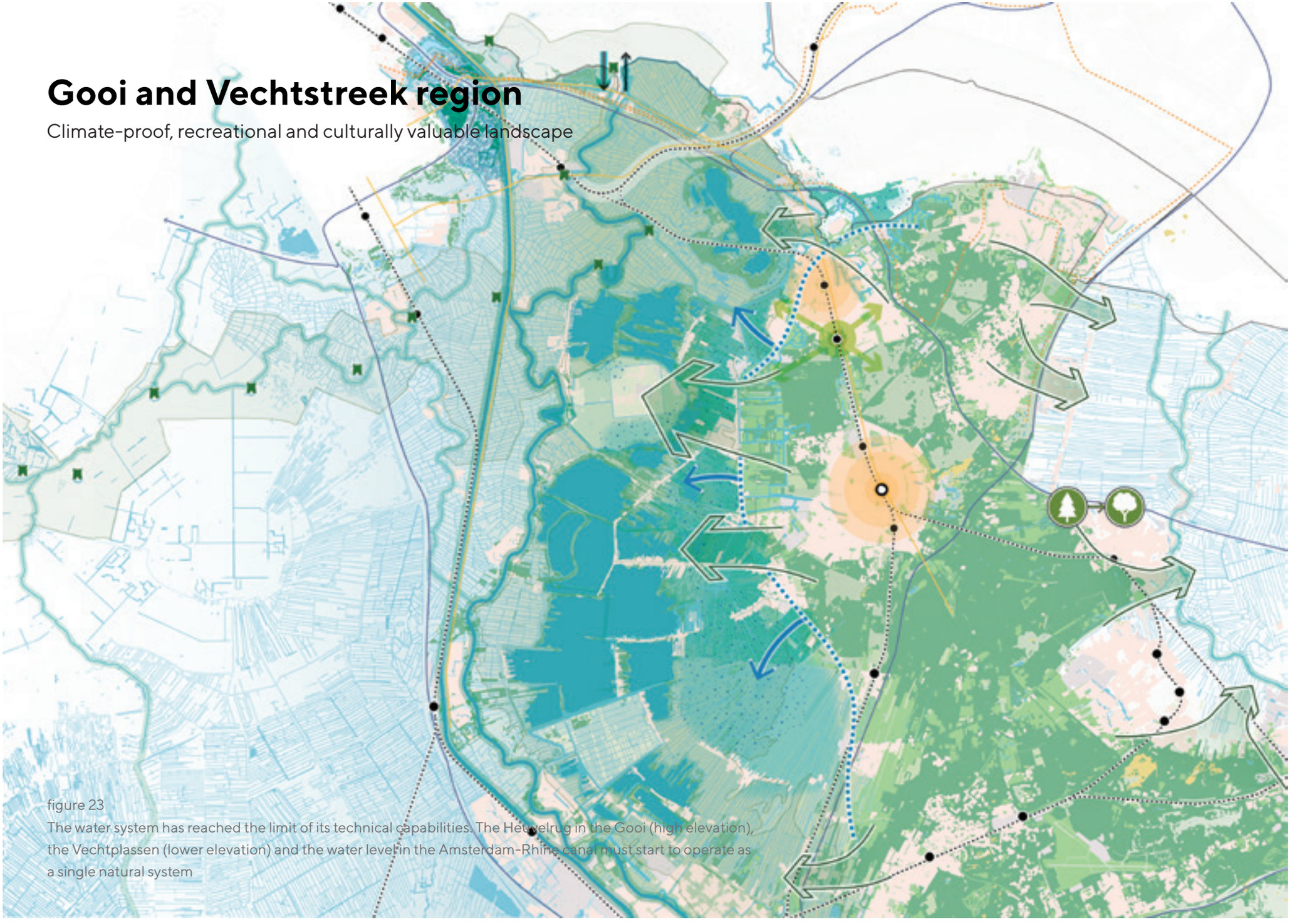


figure 23
The water system has reached the limit of its technical capabilities. The Heuvelrug in the Gooi (high elevation), the Vechtplassen (lower elevation) and the water level in the Amsterdam-Rhine canal must start to operate as a single natural system

is currently transported on that line. This issue lies outside the scope of SBaB, but is part of the 2040 Future Vision of National Public Transport.

Green and blue network in and around the city

The Gooi and Vechtstreek region is positively characterised by its richly differentiated cultural and historical heritage and the diversity of its landscape and nature. This is a prerequisite for the special living, work and recreational environment. Nature and the landscape in both the high and low parts of the Gooi and Vechtstreek region are under pressure due to desiccation in the Heuvelrug. Groundwater flows from the higher sandy soils of the Gooi to the west and east. The nature values of the Vechtplassen and Naardermeer, both Natura 2000 areas, depend on this seepage.

Water extraction for drinking water production, reduced infiltration into the push moraine and drainage of the polder are putting pressure on this system. In the Vechtstreek region, water from outside the region (from the Markermeer) must be brought in to drain off brackish (seepage) water from polders and to supplement the water from Naardermeer and Vechtplassen.

This makes it difficult to meet the nature and water quality goals. This is not a sustainable situation, both from the perspective of the ecological system and from that of the water system. It also affects the built environment, because the water cannot run off during extreme showers. This leads to flooding and damage. Climate change (especially increasing desiccation) and the growing demand for drinking water will put increasing pressure on this system. The sandy soils should retain water as long as possible and seepage water can be better utilised.
The challenge is to identify the point when a solution other than major (technical) investments must be chosen as a matter of principle. This type of solution needs to focus on a climate-adaptive and water-resilient design of rural and urban areas, and specify a time line for implementation. Within the Urbanisation Strategy, national government and the regional authorities will work out an integrated approach to the water system in relation to functions and the spatial layout in the Gooi and Vechtstreek region, with attention for Natura 2000 areas, agriculture, the layout of nature and residential areas on the Heuvelrug, water extraction for drinking water, management of the water level in the Vechtplassen, utilisation and retention of seepage water, possible peak water storage locations and additional pumping capacity at Muiden. Pumping up brackish groundwater from the Horstermeer polder before it reaches the surface as brackish seepage is one example of a possible measure that is already being piloted. The water extracted in this way is then treated and added to the drinking water supply.

The exact details will be worked out in the context of the valuable cultural landscapes in this sub-area: the Defence Line of Amsterdam and New Dutch Waterline, the Heuvelrug and the Groene Hart area which includes Natura 2000 sites such as the Naardermeer and the Vechtplassen. The Groene Hart has been designated a NOVI area in the National Strategy on Spatial Planning and the Environment. The task in this NOVI area as a whole focuses on limiting subsidence, CO2 emissions and adapting water management, space for agriculture, improving the urban-rural relationship, and coordinating new construction, heritage and accessibility.

In the Gooi and Vechtstreek area, there is a strong focus on a number of landscape connections, which are important to maintaining the character of the MRA as a network of towns and villages in a contiguous landscape, and for a robust and resilient ecological system. There are two major structures: the ‘wetlands nature’ of the Vechtstreek region that continues into the Diemerscheg,

and the ‘drylands nature’ of the Heuvelrug. These structures need to be connected to the wetlands of Waterland and the wetlands and forest areas of Flevoland. In particular, the connections between Naardermeer and its surroundings on the one hand, and the north-western part of the Gooi on the other, are very vulnerable. The mouth of the river IJ is also a major barrier.

Topics for area-based agreements

The most urgent area-focused tasks and issues that require joint commitment from national government and the regional authorities:

- Elaboration of an integrated approach to the water system in relation to functions and the spatial layout in the Gooi and Vechtstreek region, with attention for Natura 2000 areas, agriculture, the layout of nature and residential areas on the Heuvelrug, drinking water extraction in the area, management of the water level in the Vechtplassen, utilisation and retention of seepage water, possible temporary water storage locations and additional pumping capacity at Muiden
- Consideration for the functionality of the A1 and A27 motorways, as part of the 2040 Multimodal Future Vision
- The integral development of Hilversum town centre

In the Groene Hart NOVI area, national government and the regional authorities are working together on:

- A future-proof and ecologically resilient Groene Hart area where it is pleasant to live, work and relax, that is relevant in terms of the preservation and development of the historical cultural landscapes in this sub-area (part of which has ‘national significance’ as an element of the Dutch Water Defence Lines World Heritage site)

Initiatives that call for commitment from the regional authorities:

- Further strengthen the economic profile of the Gooi and Vechtstreek region in relation to the media industry (Mediapark), health (in Arenapark and elsewhere in the sub-area) and the leisure economy
- Strengthen the (international) competitiveness and earning power of the media industry in the Netherlands by focusing on innovation and talent development, making use of the opportunities offered by AI, via a strong future-proof Media Campus in Hilversum
- Focus adequately on maintaining jobs for practically trained workers in the Gooi and Vechtstreek region, as a condition for liveability and inclusiveness
- The commuting relationship with Utrecht, Amersfoort, Amsterdam and Flevoland, with additional attention to rapid-transit (HOV) public transport and bicycle connections to the workplaces

figure 24
Vechtplassen

4.6

South Flank of the MRA
Liveable international gateway to the Netherlands

Multi-core development with a focus on the human scale

The South Flank of the MRA is the contiguous area of Amstelland-Meerlanden and the south side of Amsterdam, which connects to the southern Randstad. The multi-core development ambition manifests itself here in the town centre development in Hoofddorp and other extensive area developments in the Haarlemmermeer, the developments around the public transport hubs of Diemen-Zuid and Duivendrecht and developments along the renewed Amstelveenlijn and in the centre of Amstelveen. In total, excluding Amsterdam, there is room here for some 60,000 homes in mixed living and work environments that should also largely accommodate the expected growth in jobs (some 60,000 in the period up to 2040). The high level of demand for space for business activity means that space to expand existing businesses is in short supply.

Thanks to internationalisation, high-quality logistics and the green port/floriculture function, the South Flank is a magnet for economic growth, especially in the urban belt comprising Hoofddorp, Schiphol, the Zuidas, Amsterdam-Zuidoost/Duivendrecht and Diemen. This growth is reflected in the high pressure on infrastructure. The ZWASH corridor (Zuidwestkant Amsterdam-Schiphol-Hoofddorp) has been given priority within SBaB - the joint national and regional government programme for improving accessibility. This includes the development of a living and work environment in the town centre of Hoofddorp, related to the extension of the North/South line to Schiphol and Hoofddorp. In particular, the growth of business activity in Haarlemmermeer will lead to an acute need to increase the capacity of the energy network.

A number of specific mobility issues are relevant in this context and they have been addressed in the SBaB programme. In the case of road traffic, this mainly involves research for the 2040 Multimodal Future Vision Study in respect of the ring roads around Amsterdam, including the A9 and A5 motorways, and measures in the main road network. In the case of public transport, the task is to maintain and strengthen accessibility around area developments at hubs (such as Diemen-Zuid for the development of Holland Park and Duivendrecht for the De Nieuwe Kern, Werkstad Over-Amstel and Entrada developments), at all scales: national, regional and last-mile. Furthermore, a new approach and junction to access the A2 motorway - the A2 Entree project - is being investigated, in the context of the areas to be developed in Duivendrecht (as part of the Amsterdam Zuidoost/Duivendrecht development location) and the Zuidasdok. This involves streamlining the first part of the A2 (from the Utrechtsebrug to the Amstel/A10 interchange). And partly in combination with public transport, an increasingly important role is reserved for the bicycle (electric or otherwise). This is especially relevant in the South Flank

figure 25
Schiphol Airport Zoning Decree (LIB) contour

where living and work are situated close together by MRA standards. These elements are also considered in the '2040 Multimodal Future Vision' under the SBaB programme

In the South Flank, the presence of Schiphol strongly influences the potential for urbanisation and remediation of about 800 acres of land currently dominated by an untidy patchwork of greenhouses. As stated in paragraph 3.1, investigations are ongoing to determine whether customisation and a careful balancing of interests can make more development space available than the present amount, within the prerequisites of health and safety. Solution paths that have particular significance for the South Flank are:

- Investigate the applicability of innovations, such as noise-adapted building design. The aim is to increase the flexibility of the regulations to allow small-scale housing development in order to maintain quality of life locally and to prevent degeneration, for example in the form of outdated and dilapidated greenhouses. The possibilities for noise-adapted buildings can also be applied in areas where construction works have already been approved in a high-noise environment. The results of the test site that the municipality of Haarlemmermeer has set up in collaboration with Schiphol, the provincial authority and national government (field lab for noise-adapted building design) will be used for this purpose. National government and the regional authorities are jointly exploring the possibilities for more spatial developments around civilian airports to maintain quality of life. This is being carried out in accordance with the prerequisites of safety and health and in line with the Dutch Environment and Planning Act (Omgevingswet). The implementation agenda accompanying the Aviation Policy Memorandum (Luchtvaartnota) includes a foresight study to assess methods for expanding opportunities for spatial developments and pilot projects around Schiphol. The Statement of No Objection under Section 8.9 of the Aviation Act currently allows customisation in specific situations. Whether and how this procedure can be improved for future policy will be explored in the process of revising the Airport Zoning Decree (Luchthavenindelingbesluit/LIB) and in consultation with all the stakeholders.
- One option for ensuring that zones where no construction can take place to contribute to quality of life in the region is to invest in landscape developments with functions that relate to the proximity of Schiphol Airport. These developments involve attractive and vital landscapes, which contribute to the health and climate adaptiveness of the environment and represent a certain cultural and historical value. They can be linked, for example, to the water task and the recreational network.

Integral area approach to living environment quality

National government and the regional authorities must make choices regarding the quality of life around Schiphol in relation to urbanisation and the future of the airport. This calls for an integral area approach in the South Flank (between initiatives under the Aviation Policy Memorandum and those under the MRA Urbanisation Strategy) to determine the right balance between space for housing, quality of the living environment, health and space for aviation, and the choices and measures (financial, compensation, insulation, etc.) that are needed to achieve the desired result.

In the short term (up to 2030), we must work out whether and how urban developments can be shaped in a broad consideration of interests in balance with aviation development, what the joint ambitions are in terms of quality of life for the South Flank, what solutions/ opportunities there are to improve quality of life and how any additional costs for the qualitative design or development of areas can be financed.

The basis is the principle of reciprocity between 'the air' and 'the ground': i.e. aviation takes the use of space on the ground into consideration and vice versa. We want to offer residents protection against noise and safety risks and create scope for innovations. In doing so, we will look for a system that is in line with the Environment and Planning Act.

In areas where no homes can be built, there are opportunities for strengthening the green zones and for recreation, water buffering, the energy transition and nature.

Among others, the following solutions will be considered during further elaboration of the integral area approach:

- Solutions arising from the spatial review of the Schiphol Airport Zoning Decree (Luchthavenindelingbesluit/LIB) process, for example with regard to the possibilities for customisation and making an integral assessment
- Optimisation of flight paths and where possible also assessing whether, for example, modification/ repositioning of radar systems is an option (with due regard for flight operations and safety)
- Appropriate application of the knowledge that the physical environment influences the actual noise level
- Offer scope for innovations in the field of soundscapes and noise-adapted construction that aim to reduce and prevent noise pollution and annoyance from air traffic for residents
- Commit resources to scenic and recreational developments and connections

Green and blue network in and around the city

In the South Flank, the (intergovernmentally determined) development principle that the built area and the landscape should be developed coherently is clearly applicable. The South Flank touches a number of landscapes that have special policy status: the Groene Hart area, the dunes with the inner dune fringe and the Defence Line of Amsterdam. Together with the green wedges in the vicinity of Amsterdam such as the Amstelscheg, the Westeinderscheg and the Diemerscheg, these landscape structures ensure that an extensive walking area is within convenient reach of all MRA residents.

If these green structures are to function as fully-fledged recreational areas, especially in view of ongoing urbanisation, they must be sustainably designed. In the case of areas such as De Ronde Hoep and the Bovenkerkerpolder, and within the framework of the Development Guidelines for Amstelscheg (Ontwikkelperspectief Amstelscheg), area partners and the different authorities involved tackle this together in area processes.

Especially in the Westeinderscheg, where outdated or disused horticultural greenhouses and land are present in the Bovenlanden area, this calls for a joint effort by parties to create a future-proof green recreational landscape. Improving recreational accessibility also plays an important role in the design of this area. In the case of the Westeinderscheg, an area process was recently launched, which investigates defining the area as a contiguous landscape structure extending from the river IJ into the Groene Hart to a point well beyond Aalsmeer. The project will define the contours of the Westeinderscheg, put it on the map and also anchor it administratively. In the South Flank, the main focus lies on the part south of the Amsterdamse Bos (Bovenlanden and Westeinderplassen), which can be designed as a fully-fledged green and blue zone, in line with the recently published Amsterdamse Bos vision.

In a general sense, there is a need to connect the various landscapes in the South Flank, and to improve or maintain existing connections. Analyses carried out by PBL Netherlands Environmental Assessment Agency for the MRA show that the presence of green space and landscape in this sub-region falls short of the mark (particularly in the area between Hoofddorp/Nieuw-Vennep on the one hand and Aalsmeer/Uithoorn on the other). Due to many barriers (road infrastructure, Ringvaart Haarlemmermeer canal), recreational accessibility and ecological connections are very limited. In particular, there is a need for an ecological connection between the dunes and the Groene Hart (via PARK21 in Haarlemmermeer and the Westeinderplassen and Amstelscheg) and a recreational connection that largely

South Flank of the MRA

Liveable international gateway to the Netherlands

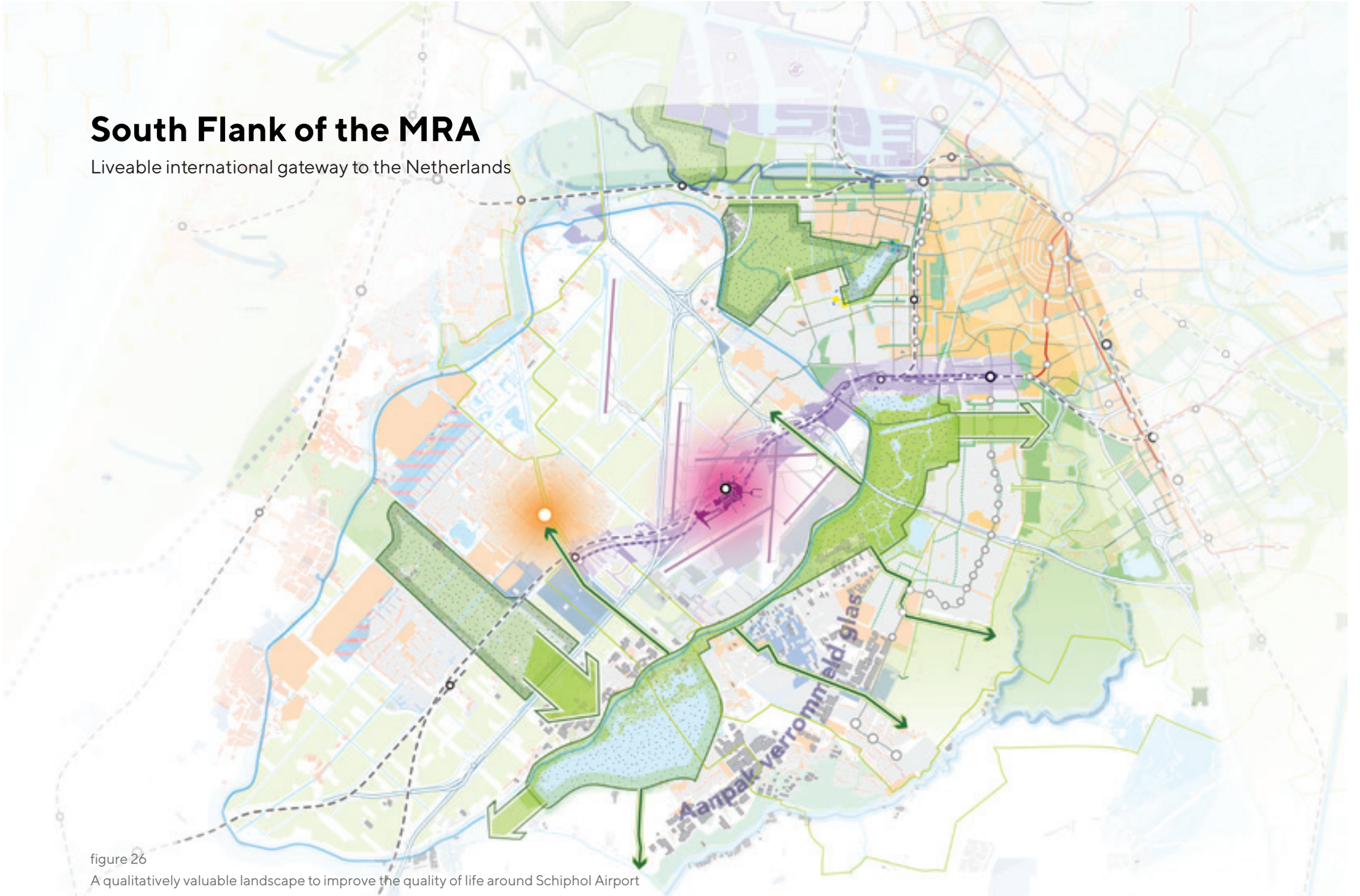


figure 26
A qualitatively valuable landscape to improve the quality of life around Schiphol Airport

overlaps it: from the Amsterdam Waterleidingduinen via PARK21, across the Ringvaart canal to the Westeinderscheg, Amsterdamse Bos and Amstelscheg. There are also opportunities here for strengthening the water system, for example water storage. Near Uithoorn, the possibility of a green recreational connection between the Westeinderplassen and the river Amstel is being considered, including via the Vuurlijn - part of the Defence Line of Amsterdam. In addition, there is a need for an 'Amsterdamse waterleidingduinen-Heemstede-Westflank-Haarlemmermeer/Liniepad (north of Hoofddorp)' recreational connection, and a recreational corridor through the Westeinderscheg.

Finally, from the perspective of the water system, there is a need to limit wasteful use of fresh water by irrigating crops in areas where the groundwater is brackish. This would require farmers to consider other crops and may create new opportunities for nature and recreation. In the long term, climate-adaptive development may require spatial interventions in relation to existing dikes, or new compartmentalisation dikes, if further development in Haarlemmermeer (which will lead to higher economic value) requires a higher level of protection. Due to the construction programmes and the geographical situation, climate adaptivity and certainly specific action to mitigate adverse consequences play an important role in area developments in Haarlemmermeer. In the case of the Westeinderscheg and the Amstelscheg, a balance must be found between urban pressure and landscape, between climate adaptation, energy, land subsidence, changes in agriculture, nature development and recreation.

We will use the landscape development needs to strengthen the green and blue structure at the regional level: a continuous green-blue network that interconnects green areas and contributes to other tasks (water, climate, heritage). Specifically, this means:

- Committing to the further development of PARK21 and in particular the connections to the surrounding landscape, with particular attention to the areas where those connections cross the A4 motorway and the railway line. This is where both the barrier effect of the infrastructure and alignment with economic development along the A4 motorway come into play. This is a vital link in a recreational and ecological structure that connects the dune landscape, PARK21, Westeinderscheg, Amstelscheg and the Groene Hart.
- Committing to further recreational and nature development of the Westeinderscheg, together with the Bovenlanden and Westeinderplassen, as a fully-fledged green and blue wedge that connects to the Amsterdamse Bos, PARK21 and the Groene Hart and contains functions that relate to the development of the green and blue zone. The recreational accessibility of the Westeinderscheg and connections to adjacent landscapes are important topics.

The contiguous line of green spaces consisting of the Groene Hart, Westeinderscheg and PARK21 (and further to the dunes) requires further elaboration at various points:

- The spatial planning elaboration: identifying what is needed for an effective ecological and recreational connection
- (Related to this) the level of ambition: focus on a green structure and investigation of the possibilities for inclusion in the national Forest Strategy in which national government and the twelve provincial authorities have committed to planting 37,000 hectares of new forest
- The transformation task to rezone land used for outdated (greenhouse) horticulture as nature and recreational areas in the Westeinderscheg
- The interaction with agricultural land use and the water-related tasks in Haarlemmermeer
- The design of the zone where the ecological and recreational connection crosses major infrastructure (the railway line and the A4 motorway)
- The intersection with the Ringdijk, where ecological and recreational development can go hand in hand with long-term water safety improvements in Haarlemmermeer
- The incorporation of economic functions within the above-mentioned prerequisites

Finally, achieving a good connection between all the areas is important. The Westeinderscheg and the connection to PARK21 meet at the level of the Westeinderplassen and Rijsenhout. Removal of the patchwork of old greenhouses in this area offers opportunities for new green and blue connections, which at the same time boost quality of life in Rijsenhout. The intention is that they will ultimately function as a single contiguous landscape structure.

Topics for area-based agreements

The most urgent area-focused tasks and issues that require joint commitment from national government and the regional authorities:

- Integral area approach to quality of life in the South Flank. This approach focuses on the elaboration of joint ambitions for quality of life, the solutions and opportunities for quality of life in conjunction with the spatial and economic developments around Schiphol. The integrated area approach can provide input for the spatial policy review with regard to Schiphol (Luchthavenindelingbesluit/LIB). Transforming the untidy patchwork of greenhouses, tackling outdated mono-functional office areas within LIB contours

and developing a landscape connection between the Westeinderscheg, the Amstelscheg and the Groene Hart are among the detail elements of this area approach.

- Integral development of the town centre of Hoofddorp
- Maintaining and strengthening public transport accessibility (national, regional and last-mile) for area developments near public transport hubs (such as Duivendrecht and Diemen-Zuid), part of the SBaB (joint national and regional government programme for improving accessibility)
- Further progress in the Growth Fund proposal relating to the North/South line, including funding from national government and the regional authorities
- Actions and agreements related to the ZWASH corridor programme, including the extension of the North/South line from Amsterdam to Hoofddorp
- Accelerated housing construction in Westflank Haarlemmermeer and Hoofddorp to meet the prerequisites
- Measures in the road network (with specific attention for good operation of the A9 motorway and the N201) and strengthening the bicycle network (both part of the 2040 Multimodal Future Vision and SBaB programme)
- Transformation of the Amstelscheg because of land subsidence, a different type of agriculture, nature development and recreation, in the context of the intergovernmental Peatland programme (Veenweide)

In the Groene Hart NOVI area, national government and the regional authorities are working together on:

- A future-proof and ecologically resilient Groene Hart area where it is pleasant to live, work and enjoy recreation, that is relevant in terms of the preservation and development of the historical cultural landscapes in this sub-area (part of which has 'national significance' as an element of the Defence Line of Amsterdam World Heritage site)

Initiatives that call for commitment from the regional authorities:

- Developing the PARK21/A4/Westeinderscheg area as a candidate area for ecological and recreational connections and functions in combination with economic developments (including investigation of eligibility for funding under the national forest strategy and seeking synergy with a climate-adaptive layout and the removal of old greenhouses)
- Developing the Westeinderscheg as a fully-fledged green and blue wedge with nature development, recreational functions and connections
- Developing the economic profile of
- Greenport Aalsmeer, reclustering and replacing the old greenhouses with other functions: home construction, landscape development/recreation, food (shorten the supply chain), solar energy

figure 27
Greenport Aalsmeer

4.7

Amsterdam

Green metropolis, creative mercantile city and cultural heart of the Netherlands

Multi-core development with a focus on the human scale

As a metropolitan area, Amsterdam faces the complex task of facilitating demographic and economic growth in a careful and balanced way that further enhances the quality of life in the city, does not further increase the negative impact on the environment, and reduces socio-spatial inequality. The city emphatically accepts its responsibilities for the above, as demonstrated by the fact that about half of the homes included in the MRA's total housing task will be built on land within Amsterdam's boundaries. The city is set to build at least 150,000 extra homes, for 250,000 residents, by 2050 - and will create 200,000 new jobs. In economic terms, Amsterdam has an important function for start-ups and the tech sector, and it is an attractive location for metropolitan amenities.

This task primarily involves extensive densification and transformation projects such as Haven-Stad and Amstelstad (including development locations in Amsterdam Zuidoost and Duivendrecht). For these to be realised, the associated prerequisites must be in place. Bottlenecks in the energy system and traffic infrastructure need to be eliminated, and there is a need for space in these locations to accommodate businesses that are not suitable for a mixed-use combination with residential development. In addition to the current focus on the ring road zone and the banks of the river IJ, Amsterdam is increasingly focusing on the flanks of the city. Independent cores with mixed, urban living and work areas, in a sustainable and green living environment, are emerging in the urban districts of Nieuw-West, Zuidoost and Noord. As a result, Amsterdam is becoming a multi-core city within the multi-core metropolis. The new living and work areas are closer to the region and often connect to developments in neighbouring municipalities. This calls for close coordination with the tasks at MRA level in the surrounding five sub-areas.

Amsterdam wants to be and remain an inclusive and diverse city. Fulfilling this desire is anything but self-evident. In a city that is becoming increasingly expensive, it requires constant and far-reaching interventions in the housing market to keep low-income and middle-income residents in the city as well. To counteract socio-spatial segregation, Amsterdam is striving for a more balanced distribution of work potential, jobs, education and amenities across the city and the metropolis. Achieving this requires action to reduce transport poverty in parts

Amsterdam

Green metropolis, creative mercantile city and cultural heart of the Netherlands

figure 28
Densification in the city requires a quality boost. Connecting high-quality green space in the city to the landscapes around it.

of the city and region and a commitment to retaining practically-oriented jobs and practically trained and middle-skilled workers in the city.

Green and blue network in and around the city

In the densifying city, scarce public space is becoming increasingly important. It should be of high quality and invite encounters and exercise. The public domain is being rigorously greened. Money is being invested in park development (including Oeverlanden, Gaasperdakpark and Zuidasdokpark), in green routes and ecological connections. Busy multimodal traffic routes, such as Gooiseweg and Lelylaan, are to be transformed into green urban avenues lined with new building developments. And money will also be invested in the landscape and green wedges, through nature development, the promotion of circular agriculture and the creation of more space for recreation, sports and exercise.

The surrounding landscape is also of great importance for quality of life in Amsterdam. This applies in particular to maintaining access to and strengthening the green wedges and metropolitan landscapes, partly in view of increasing recreational pressure. Investments in the landscape to stimulate climate adaptiveness, water resilience, (circular) agriculture, heritage management and biodiversity also contribute substantially to the health, safety and attractiveness of the living environment of Amsterdam's residents.

Topics for area-based agreements

The following ambitions, plans and projects will require (further) agreements with national government and/or the regional authorities within the foreseeable future:

1 - Construction of 150,000 homes with the associated amenities and workplaces within the existing city in the period up to 2050, achieved through densification and transformation.
National and regional government:

- Implement the agreements made in the Woondeal, i.e. promote construction of social housing and medium-rent housing; with further agreements on optimising the use of construction grants for the required infrastructure, and on the affordability of housing and the - complex and costly - transformation of areas (for example, buying out companies)
- Acceleration of construction output in Haven-Stad and Amsterdam Zuidoost/Duivendrecht in the period up to 2030

Regional government:

- Strengthen the coherence between densification and transformation projects on the city's flanks and neighbouring developments in surrounding sub-regions.

2 - Reduce socio-spatial inequalities in the city and region
National and regional government:

- Introduce national regulations to combat excesses in the housing market
- Act to reduce urban and regional transport poverty
- Reduce environmental health risks in specific parts of the city and metropolis

Regional government:

- A more balanced distribution of work potential, jobs, education and amenities across the city and metropolis

Agreements have been made with national government regarding the use of the Liveability and Safety Programme (Programma Leefbaarheid en Veiligheid) in the Nieuw West and Zuidoost city districts.

3 - Optimise and future-proof the national, regional and urban traffic and transport system
National and regional government:

- Further detailing of the Growth Fund proposal relating to the North/South line (SBaB programme), including funding from national government and the regional authorities
- Agreements on studies assessing closure of the Ringlijn in the Amsterdam metro network (SBaB programme)
- Construction of a number of new permanent riverbank connections across the river IJ in accordance with the final recommendations of Committee d'Hooghe and agreements that have already been made between national government and the regional authorities
- Action to promote a car-free city through, for example, innovative infrastructure such as hubs (people, goods), freight transfer points for goods, waterborne distribution (in alignment with SBaB)

4 - Future-proof integration of aviation/Schiphol into the growing and intensifying city and metropolis
National and regional government:

- The commitment on the part of national and regional government specified in paragraph 4.6: Integral approach to quality of life in the South Flank
- Actions and agreements linked to the ZWASH (Zuidwestkant Amsterdam-Schiphol-Hoofddorp) programme (see the paragraph on the South Flank)

5 - Achieve the metropolitan energy transition with the North Sea Canal area as the pivot point
National and regional government:

- Agreements and considerations arising from the elaborations for the North Sea Canal Area as a NOVI area (as set out in paragraph 4.1 North Sea Canal Area)

6 - Achieve a robust, resilient and climate-proof water system in the city and region
National and regional government:

- Strengthen the collaboration to solve the growing number of bottlenecks in the urban and regional water system and to design the city and region in a water-resilient and climate-adaptive way, according to the priorities described in paragraph 3.3 (water system)

7 - Maintain access to and strengthen the green wedges and metropolitan landscapes, partly in view of increasing recreational pressure
National and regional government:

- An area-oriented approach to land subsidence in peatland areas as described in the paragraph on Zaanstreek-Waterland - 'Integral area process for the future of peatland areas'
- The further development of the Westeinderscheg, the Amstelscheg, the Diemerscheg and Waterland as described in the paragraphs on the South Flank, East Flank, the Gooi and Vechtstreek area and Zaanstreek-Waterland

Regional government:

- Strengthen the recreational structure through a quality upgrade in the existing recreational areas, including addressing the backlog of maintenance in the areas managed by Staasbosbeheer, the state

5. Phasing

The Urbanisation Strategy for the Metropolitan Region Amsterdam outlines the development programme for the region in the period up to 2050. During this period, we will provide space for the construction of 325,000 homes and some 400,000 additional jobs, including the associated amenities, facilities and infrastructure for the major transitions. We take action to ensure nature and landscape development and create a living environment that is healthy and resilient to the effects of climate change. This chapter summarises the phasing of the Metropolitan Region Amsterdam urbanisation plans.

5.1 Phasing in outline

Desired development over time

This chapter presents the broad outlines of the ideal development path over time. The phasing concretises the choices made and lays the foundation for how national government and the regional authorities will work together to develop the Metropolitan Region. Actual realisation of the plans depends on many factors. Not everything can be done at once. The investment resources are finite and there are limits to what the market can cope with. Broad support across the community is also an important factor.

Phasing dependent on major investments in essential systems (prerequisites)

A sustainable multi-core metropolitan region that is socially and economically strong will require major investments and multiple radical system changes, which also affect phasing. In order to cope with the level of predicted growth and keep the region accessible, and ensure continued growth after 2030, significant investments will have to be made in the coming years in areas such as the urban mobility system and initiating upscaling in the regional mobility system. Decisions must be made in this respect in the years to come. The energy transition means that we must move to a different - integrated and hybrid - energy system. And climate adaptivity places high demands on spatial planning to prevent flooding, fresh water shortages or heat stress. There is a close and interactive relationship between these spatial planning requirements and the water system. The radical system changes need to be prepared and launched in the coming decade. They play a key role in determining the phasing of the Metropolitan Region's development beyond 2030. In the period up to 2030, the ability to achieve system upscaling will largely determine the pace of development in the coming years.

Uncertainties, monitoring of development and investment activity

The investments needed for the next decade and the longer term cannot all be arranged at the same time. In a few cases, studies are still ongoing to determine which investments are needed where and when to ensure that the essential prerequisites are in place And the time when these prerequisites must be realised depends on housing construction plans and the pace of development. Finally, the future is associated with uncertainties. The uncertainties that have an impact are the long-term effects of the coronavirus on, for example, mobility and housing preferences, population development and specifically immigration, the economic climate, the speed and impact of climate change, and developments related to aviation and businesses that have a major impact on the living environment. This means that the development of the region must be monitored annually, corrections must be made to the phasing where necessary and allocations linked to the investment resources. All the existing monitors, such as the Plancapaciteit Monitor (housing planning capacity monitor) and the Plabeka Monitor (offices and business park planning capacity monitor) will be used for this purpose, and we will assess what additional measures are required.

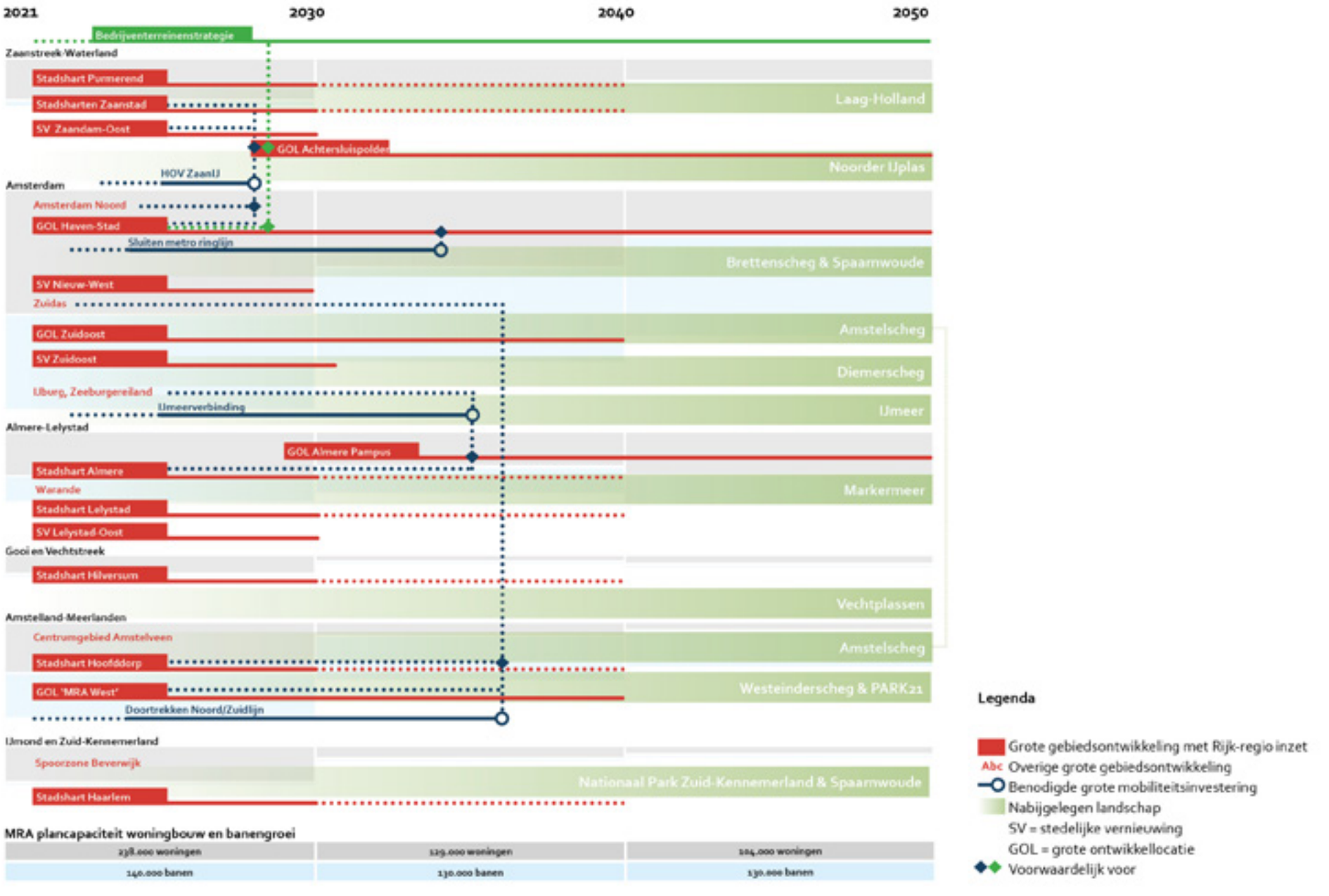
5.2 Phasing profile

The following is a rough phasing profile. It outlines the ideal phasing. Because it is a rough indication, it does not include all the measures mentioned in the previous paragraphs. It does, however, identify the most significant interventions and concrete examples are mentioned in several places. The phasing profile shows the phasing for developing the multi-core metropolis first, followed by the green and blue network (including the water system and ecological system) and the energy and mobility systems. This phasing profile will be worked out in greater detail in the elaboration of the urbanisation concept and updated annually.

Phasing for multi-core development

2021 to 2030: Reduce pressure on the housing market by focusing on development around public transport hubs and strengthen the town centres and economic profiles of the cores outside Amsterdam; prepare the prerequisites for accelerating housing construction and major developments after 2030.
During the coming decade, we will focus on relieving pressure in the housing market by constructing 175,000 to 220,000 homes up to 2030. All the planning capacity available in the region is devoted to this. Amsterdam claims the lion's share with locations such as the 2nd phase of IJburg, Noord and Zuidoost (the latter in collaboration with Ouder-Amstel). With regard to the seven town centres and five large development locations for which national government and the regional authorities are working together, we are investigating the possibility of further acceleration. We have chosen an integrated approach to the housing development task: not only will we build homes, we will also build towns and communities. As a result, we also address urban renewal, with national and regional government commitment to four areas in the MRA. Furthermore, the developments associated with the housing task will also accommodate employment growth amounting to about 140,000 jobs.

The urbanisation activities focus on strengthening the multi-core structure of the metropolitan region. The emphasis lies on the development of (highly) urban living and work environments around public transport hubs and in the major town centres in the MRA and strengthening the economic profile in the cores around Amsterdam and in the Nieuw-West, Noord and Zuidoost city districts within Amsterdam. With the ultimate goal of more balanced employment growth in the MRA. The space requirements for business activity will also be viewed from this perspective. In the North Sea Canal area, the energy transition and switch to a circular economy are leading to additional demand for space. Although this will mainly apply after 2030, a sophisticated business park strategy and the corresponding administrative agreements are needed in the near future (before 2023). Important areas in this regard are the existing port area of Amsterdam, which is to be further intensified, Baanstee in Purmerend/Edam-Volendam, Flevokust Haven and De Vaart in the East Flank, and - outside the MRA - the Boekelermeerpolder in Alkmaar. This


2021
2030
2040
2050
Bedrijventerreinenstrategie
Zaanstreek-Waterland
Stadshart Purmerend
Stadsharten Zaanstad
SV Zaandam-Oost
Laag-Holland
GOL Achtersluispolder
Noorder IJplas
HOV Zaanlijn
Amsterdam
Amsterdam Noord
GOL Haven-Stad
Sluiten metro ringlijn
Brettenscheg & Spaarnwoude
SV Nieuw-West
Zuidas
GOL Zuidoost
Amstelscheg
SV Zuidoost
Diemerscheg
IJburg, Zeeburgereiland
IJmeerverbinding
IJmeer
Almere-Lelystad
GOL Almere Pampus
Stadshart Almere
Markermeer
Waarde
Stadshart Lelystad
SV Lelystad-Oost
Gooi en Vechtstreek
Stadshart Hilversum
Vechtplassen
Amstelland-Meerlanden
Centrumgebied Amstelveen
Amstelscheg
Stadshart Hoofddorp
GOL 'MRA West'
Westeinderscheg & PARK21
Doortrekken Noord/Zuidlijn
IJmond en Zuid-Kennemerland
Spoorzone Beverwijk
Nationaal Park Zuid-Kennemerland & Spaarnwoude
Stadshart Haarlem
MRA plancapaciteit woningbouw en banengroei
238.000 woningen
129.000 woningen
104.000 woningen
140.000 banen
130.000 banen
130.000 banen
Legenda
Grote gebiedsontwikkeling met Rijk-regio inzet
Abc Overige grote gebiedsontwikkeling
Benodigde grote mobiliteitsinvestering
Nabijgelegen landschap
SV = stedelijke vernieuwing
GOL = grote ontwikkellocatie
Voorwaardelijk voor

strategy is also relevant for the development of the major transformation locations of Haven-Stad (Amsterdam) and Achtersluispolder (Zaanstad).

Structural strengthening of the economic profiles of the sub-regions is one element of the commitment to multi-core development. An implementation strategy must be drawn up for this in the short term.

We support this multi-core development with mobility measures and actions to address bottlenecks in the energy network. The main priorities are to develop the international Zuidwest Amsterdam-Schiphol-Hoofddorp corridor, including Amsterdam Zuidoost, to further develop the west side of Amsterdam, to develop Almere town centre to the east and, where possible, to implement additional steps in relation to Amsterdam Bay Area. To accelerate housing construction and ensure smooth development of the major development sites after 2030, a major upgrade to the public transport system must be prepared and initiated in this decade.

Climate adaptation, water resilience and nature inclusiveness are integral aspects of the developments.

In addition, we are investing in the landscape in the vicinity of large housing development locations, where recreational pressure is high or increasing and where quality of life is under pressure, for example around Schiphol Airport.

2031 to 2040: continue on the multi-core path, with more attention for large development locations; the transformations in the North Sea Canal area gain momentum
During this period, the construction of 75,000 homes is planned and employment is expected to grow by at least 130,000 additional jobs. The development activities around public transport hubs and initiatives to strengthen the living and work environments in the town centres will continue during this period. In addition, the large development sites will play an increasingly important role in urbanisation, assuming that the necessary prerequisites have been put in place. The metro projects are of great importance here: extending the North/South line to Hoofddorp, the closure of the metro ring in Amsterdam and the Amsterdam-Almere metro link. The ZaanIJ rapid-transit (HOV) public transport link is essential for further development north of the IJ.

The transitions for energy and the circular economy are going to demand more and more space in the North Sea Canal area during this period. Just like the new housing development in Haven-Stad and the Achtersluispolder. The strategy relating to businesses will need to help facilitate the transitions and the development of customised solutions for providing space for housing construction and business activities when implementing transformations.

Area developments during this period will obviously also be tackled integrally, in a manner that is climate-adaptive, water-resilient and nature-inclusive. In the context of the hybrid energy system, the area developments will also increasingly require new energy solutions such as a network of neighbourhood batteries. These tasks will also increasingly become apparent in existing districts.

2041 to 2050: in addition to the large development locations, there will be an increasing emphasis on transformations for water safety and transitions in existing urban areas
Based on current knowledge, construction of another 75,000 homes and growth in employment of some 130,000 jobs is also anticipated during this period. The development work that started in the previous period will continue. Even more than in the previous decade, the main focus will lie on the large development sites. During

this period, qualitative demand is expected to lead to housing development that focuses on supplementing the existing housing offer and that concentrates particularly on urban living environments and homes for small households.

The urban area will undergo further transformation during this period to ensure that the areas offer a healthy and (water) safe living environment and to concretely shape the energy transition and the mobility transition.

Green and blue network phasing

Landscape, nature, the soil and the water system are closely intertwined. Interventions in any one domain of the green and blue network in and around the city will almost certainly lead to opportunities to include tasks in the other domains. There is also a strong relationship with large-scale area developments. These areas must be developed integrally, i.e. in a manner that is also climate-adaptive, water-resilient and nature-inclusive, and as an attractive, healthy living environment with sufficient green space in the immediate vicinity. And the area developments lead to increased recreational needs in the surrounding landscapes.

2021 to 2030: complete the nature network, invest in landscapes near major developments, start to tackle major water system and landscape tasks
In this period the National Parks will be developed further along the lines of the National Parks New Style programme, the Forest Strategy will be worked out in detail and implemented and the Dutch National Ecological Network will be completed. The latter requires interventions in all parts of the MRA and is always linked to the other tasks.

Such as the major transitions in the green and blue network. This concerns the integrated approach to the peatland areas and work to restore the water system in the Gooi and Vechtstreek region, and the integrated system elaboration for a climate-proof and water-resilient region. Easily realisable measures identified in these approaches and visions can be implemented in the first decade. In the case of the water system, the first priority in this period will be to optimise the current water system, by reinforcing dikes and implementing other measures. Measures to improve water quality, including the Gooimeer, are already planned pursuant to the Water Framework Directive (Kaderrichtlijn Water). Landscape development can be included in these works.

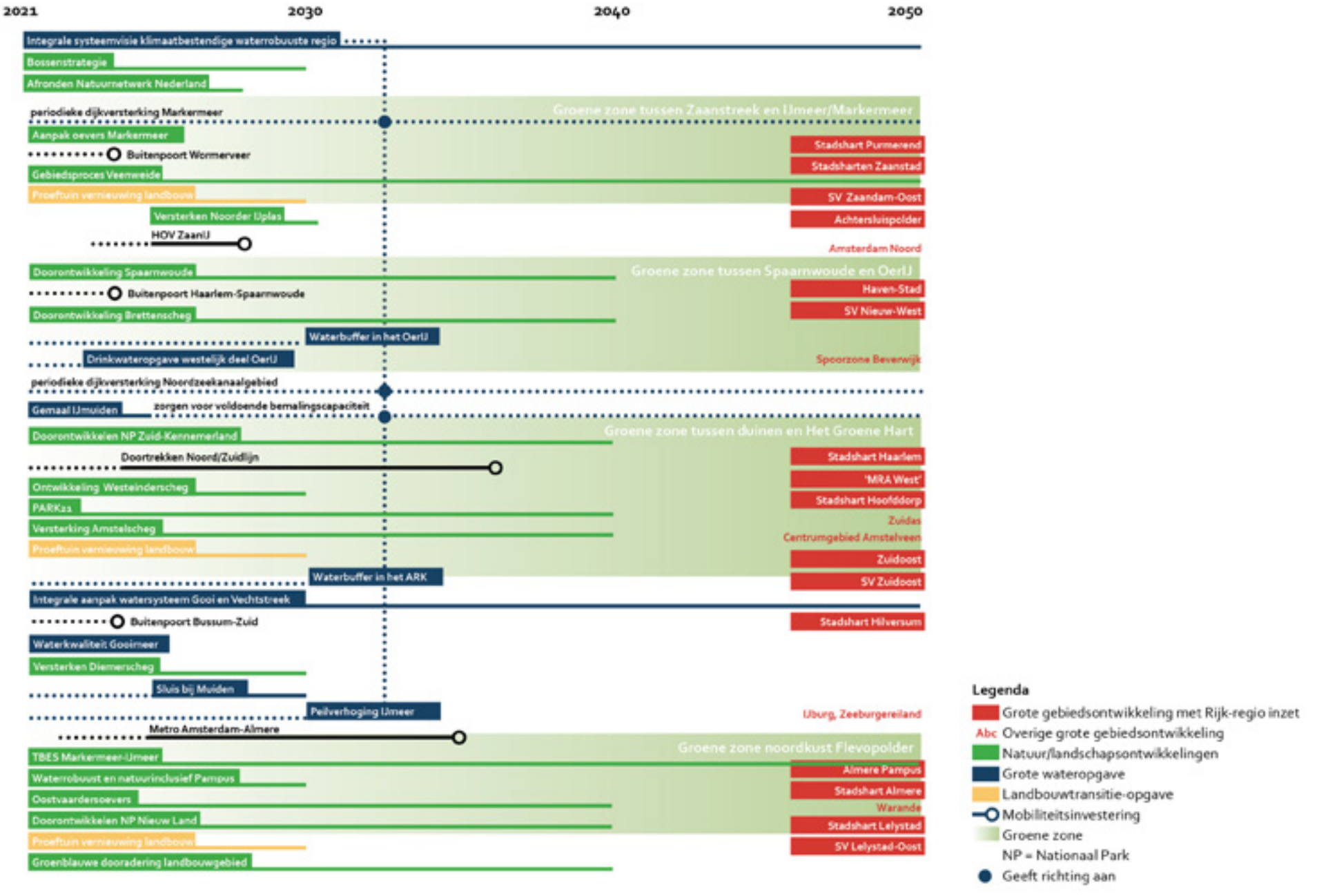
In view of the growing need for recreation, investments in nearby landscapes are made at the same time as major area developments. Priority is given to the Amstelscheg, the Westeinderscheg (linked to improving the quality of the environment around Schiphol and Greenport Aalsmeer), the Diemerscheg and the connections between National Park Zuid-Kennemerland and Spaarnwoude and PARK21, also in relation to Schiphol. In addition, work will be carried out for part of the tasks in/on the Markermeer-IJmeer (MIRT project Oostvaardersoevers, expansion of the island area of National Park Nieuw Land/Marker Wadden and advance investment required in relation to Pampus and the IJmeer connection). The recreational networks will be strengthened by further development of the Metropolitan Bicycle Network and the development of several train stations as 'outer gates'.

Finally, agriculture will also be remodelled during this period, including the transition to circular agriculture. In the region, there are three areas with testing grounds: Laag-Holland, Amstelscheg and Flevoland. The testing ground in Flevoland can also contribute to green and blue veining within the agricultural area.

2031 to 2040: start redesigning the water system, integrate developments in the energy and mobility systems into the landscape, and continue efforts to create a nature-inclusive society
This decade will also see the implementation of larger measures that follow from the integral approaches to the peatland areas, the water system in the Gooi and Vechtstreek region and the integral system elaboration for a climate-proof and water-resilient region. This involves setting up areas for temporary peak water buffering near the Amsterdam-Rhine Canal and North Sea Canal and switching to other land uses, such as agriculture. The latter development is closely associated with the commitment to making the transition to more sustainable forms of agriculture. Within the water system, work is carried out to reinforce dikes and to build additional pumping stations to increase drainage capacity.

The implementation of the landscape tasks continues during this period, once again largely based on prioritisation according to the recreational needs and pressures. But other developments may also play a role in prioritisation. For example, developments in the energy and mobility system have a major impact on landscape tasks during this decade; i.e. the expansion of the high-voltage grid and the construction of public transport links. The latter activity also offers opportunities for improving accessibility to the landscapes and the recreational network.

In the approach to nature development, the emphasis this decade shifts from completing nature networks to enhancing basic quality and realising a nature-inclusive society. The ultimate goal is a vital countryside and a greener built environment, in which biodiversity is


2021
2030
2040
2050
Integrale systeemvisie klimaatbestendige waterrobuuste regio
Bossenstrategie
Afronden Natuurnetwerk Nederland
periodieke dijkversterking Markermeer
Groene zone tussen Zaanstreek en IJmeer/Markermeer
Aanpak oevers Markermeer
Buitenpoort Wormerveer
Gebiedsproces Veenweide
Proeftuin vernieuwing landbouw
Versterken Noorder IJplas
HOV ZaanIJ
Stadshart Purmerend
Stadsharten Zaanstad
SV Zaandam-Oost
Achtersluispolder
Amsterdam Noord
Doorontwikkeling Spaarnwoude
Groene zone tussen Spaarnwoude en OerIJ
Buitenpoort Haarlem-Spaarnwoude
Doorontwikkeling Brettenscheg
Waterbuffer in het OerIJ
Drinkwateropgave westelijk deel OerIJ
Haven-Stad
SV Nieuw-West
Spoorzone Beverwijk
periodieke dijkversterking Noordzeekanaalgebied
Gemaal IJmuiden
zorgen voor voldoende bemalingscapaciteit
Doorontwikkelen NP Zuid-Kennemerland
Groene zone tussen duinen en Het Groene Hart
Doortrekken Noord/Zuidlijn
Stadshart Haarlem
'MRA West'
Ontwikkeling Westeinderscheg
PARK21
Versterking Amstelscheg
Proeftuin vernieuwing landbouw
Stadshart Hoofddorp
Zuidas
Centrumgebied Amstelveen
Zuidoost
SV Zuidoost
Waterbuffer in het ARK
Integrale aanpak watersysteem Gooi en Vechtstreek
Buitenpoort Bussum-Zuid
Stadshart Hilversum
Waterkwaliteit Gooimeer
Versterken Diemerscheg
Sluis bij Muiden
Peilverhoging IJmeer
Uburg, Zeeburgereiland
Metro Amsterdam-Almere
Groene zone noordkust Flevopolder
TBES Markermeer-IJmeer
Waterrobuust en natuurinclusief Pampus
Oostvaardersoevers
Doorontwikkelen NP Nieuw Land
Proeftuin vernieuwing landbouw
Groenblauwe dooradering landbouwgebied
Almere Pampus
Stadshart Almere
Warande
Stadshart Lelystad
SV Lelystad-Oost
Legenda
Grote gebiedsontwikkeling met Rijk-regio inzet
Abc Overige grote gebiedsontwikkeling
Natuur/landschapsontwikkelingen
Grote wateropgave
Landbouwtransitie-opgave
Mobiliteitsinvestering
Groene zone
NP = Nationaal Park
Geeft richting aan

naturally interwoven. Special attention is devoted to the green areas in this regard.

2041 to 2050: continued efforts to maintain the level of nature and water quality and manage the landscapes, the major development tasks continue
Maintaining nature and water quality and managing landscapes will also require continued attention during this decade. Developments in the green and blue network in this period will largely be a continuation of the measures identified in the major tasks such as the integrated approaches to peatland areas and the water system in the Gooi and Vechtstreek region, the system implementation details for a climate-proof and water-resilient region, the development of the Markermeer-IJmeer and also the transition to sustainable agriculture. It should be noted here that the trends in climate change have a significant influence on the interventions in the green and blue network in the longer term. Due to the high level of uncertainty in this respect, the major tasks mentioned previously will have to be updated in good time to reflect the current situation. The same applies to the Delta Programme and thus also to the question of whether investment in coastal reinforcement will also be necessary in the long term.

Phasing of systems for the future

The development phases of the water system and ecological system are integral to the phasing of the green and blue network. The phasing profiles for the mobility system and energy system are described below.

Mobility system phasing

Currently, within the joint Building Together for Accessibility national and regional government programme for improving accessibility (Programma Samen Bouwen aan Bereikbaarheid/SBaB), work is being done to develop the Multimodal Future Vision, which details the phasing of measures in the mobility system, based on the desired phasing of the urbanisation programme. The level of investment required for this is of such an order of magnitude that prioritisation will be necessary. In close collaboration with the Urbanisation Strategy process, this prioritisation will be elaborated in the Development Path (Ontwikkelpad), in which national government and the regional authorities will make agreements on investments in the MRA mobility system for the coming years. These agreements are expected to be finalised in the spring of 2022. The phasing profile below includes what is known to date about the mobility investments required for the desired phasing of the urbanisation developments.
2021 to 2030: implementation of existing national-regional agreements at government level, measures for urban accessibility to Amsterdam and its urban cores and completion of the metropolitan bicycle network; preparation for the scaled-up mobility network
We focus on implementing existing agreements during this decade. These include the A9 motorway near Amstelveen, the Duinpolderweg, the start of construction of Zuidasdok, sub-projects in the High-Frequency Rail Transport programme (Programma Hoogfrequent Spoorvervoer), the redesign of Amsterdam Lelylaan and of the Schiphol Multimodal Hub and public transport connections for Schiphol-Amsterdam-Almere-Lelystad.

In addition, to accelerate the development of the major town centres, various supporting mobility measures will be implemented, as elaborated in the SBaB programme for improving mobility. In Amsterdam, urban accessibility measures that are currently being worked out in various mobility plans will be implemented. We will also continue to strengthen the urban and metropolitan bicycle network and local public transport, and work to further strengthen the functionality of regional hubs and public transport hubs.

Finally, this decade will be devoted to preparing (and, where possible, starting work to implement) the scaled-up mobility network: detailed plans for expanding the metro network and strengthening the main road network to/from and around Amsterdam. In these plans, expansion of the metro network not only ensures regional accessibility in a broad sense, but is also a prerequisite for the further growth of large development locations such as Haven-Stad, Almere Pampus and Hoofddorp. The rapid-transit (HOV) ZaanIJ public transport connection also contributes to the scale upgrade and is a prerequisite for developments in Amsterdam Noord and Zaandam, where we expect to reach the tipping point at an early stage, before 2030.
2**031 to 2040:** work to scale up the mobility network and continue to invest in urban accessibility and the mobility transition
To continue to accommodate growth within the towns, we must continue to invest in quality of life and accessibility in the towns. In the regional network, bottlenecks around Schiphol station will have to be addressed early in this period to prevent the mobility network from becoming gridlocked: the preferred variant is to extend the North/South line to Schiphol and Hoofddorp. This paves the way for large-scale housing development and releases capacity on the national railway network that can be used to improve international and national connections. Realising two metro projects in this period - closing the metro ring and the IJmeer connection - is a prerequisite for the Haven-Stad and Almere major development locations. These measures will be further investigated in the MIRT projects for ZWASH (Zuidwestkant Amsterdam-

Schiphol-Hoofddorp corridor) and Amsterdam Bay Area. In respect of road traffic, additional measures will have to be implemented in the vehicle network (depending on the outcome of the '2040 Multimodal Future Vision' within the SBaB Building Together for Accessibility programme). In addition, there may be additional measures identified in the Multimodal Future Vision that need to be implemented during this period.

2041 to 2050: further use of mobility investments that have been completed and possible additional measures
The expansion-related investments in the metro system, for example, will create capacity for further growth in the system. As time passes, further development may lead to the need for additional measures in the urban and regional mobility system. In this context, various local environmental visions already envisage future accessibility measures in the more distant future, such as the construction of an East/West line in Amsterdam, for which there are no concrete plans as yet. Any additional measures that are required over time will need to be investigated when the Urbanisation Strategy is updated.

Energy system phasing

2021 to 2030: resolve short-term bottlenecks and work out the hybrid energy network of the future in further detail
The period from 2021 to 2030 is dedicated to solving bottlenecks in the current energy network. There are several bottlenecks in the Noord-Holland part of the MRA's energy network. Where these affect development sites, they are addressed as a priority. A new medium-voltage substation will be built in Haarlemmermeer, and near Almere/Zeewolde, a new substation will be added to facilitate further growth of the town and cope with the increase of sustainable energy generated in the area, and also to facilitate realisation of the fourth hyperconnectivity hub if this project is given the go-ahead. The decade is further devoted to working out the details of the integrated hybrid energy system of the future, which integrates the results of the Regional Energy Strategies (RES) and the Cluster Energy Strategies (CES). Three more scenarios are now envisaged for the hybrid power grid. The scenario that is ultimately chosen will be determined by the decision-making process on bringing offshore wind energy to land and the elaboration of the Main Energy Structure (Energiehoofdstructuur), which will also determine the role of the North Sea Canal area in the international and national energy network. Creating a governance structure for the energy transition in coordination with spatial and economic developments in the region is a further important task.

2031 to 2050: start construction of the hybrid energy network
The period from 2030 to 2050 is dominated by the construction of a hybrid energy network linked to spatial and economic developments in the MRA and to developments in the international and national energy system. The exact measures still need to be worked

figure 29
Energy network in Flevoland

Appendices

Appendix A – Tasks addressed by the 2050 Urbanisation Strategy

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Appendix

Tasks addressed by the 2050 Urbanisation strategy

This appendix lists the 'tasks' for which the Urbanisation Strategy identifies an answer or solution path. They were adopted by the Urbanisation Strategy Steering Committee on 13 May 2020.

In essence, the purpose of the Urbanisation Concept, as a first step towards a complete Urbanisation Strategy, is to facilitate urban developments (for housing, jobs, amenities and recreation) in conjunction with regional systems for mobility, energy, water and ecology.

This helps achieve the central goal of the Urbanisation Strategy as a whole: the development of a sustainable and socially and economically strong metropolitan region in the medium and long term, in line with the regional DNA.

The systems for mobility, energy, water and ecology each have their own tasks. This also applies to the components of the urbanisation task itself: housing, jobs, amenities and recreation. These tasks are allocated to separate policy pathways. Developments, choices, and investments in these four systems affect the possibilities for urbanisation and vice versa. They can reinforce each other, but they can also lead to friction or mutual dependencies that affect implementation. In the case of some tasks, the roadmap within the policy field in question has already been worked out at a relatively detailed level. Other tasks, however, are still shrouded in a mist of uncertainties, and several studies to research possible solutions are ongoing.

The Urbanisation Concept brings all these tasks together in a coherent development picture for the built area and the landscape. That development vision has then been worked out further in terms of phasing and investment strategies in order to create a complete Urbanisation Strategy.

This appendix identifies the tasks arising at the overlap between urbanisation and each of the four systems. These tasks largely determine the choices that have been and will be made in the Urbanisation Concept.

1. Urbanisation tasks

Short-term choices (up to 2030) characterise the approach for addressing the urbanisation task in terms of

housing, jobs and amenities. The way growth is shaped over the next decade has implications for liveability and equality of opportunity far into the future. The urbanisation concept must meet spatial needs in a way that:

- is diverse, liveable and socially inclusive,
- increases international competitiveness,
- strengthens the connections to, and the quality of, the surrounding landscape.

Construction of 325,000 homes in the period up to 2050

The quantitative housing development programme, based on the 2020 forecast, consists of 325,000 new homes (excluding replacement of homes that need to be demolished) in the following phases:

- 175,000 before 2030,
- 75,000 between 2030 and 2040,
- 75,000 between 2040 and 2050.

There is ample spatial planning capacity available to complete the housing development programme in the period up to 2030, even if delays in development or implementation arise in some of the locations, or if the forecast has to be adjusted upward (there is capacity for at least 130% of the requirement).

Provide space for employment growth

The Metropolitan Region Amsterdam is one of the economically strong regions in the Netherlands. This manifests itself in high employment growth. It is assumed that that growth will continue for the next twenty years. This assumption is substantiated and elaborated in the Department of Spatial Planning and Economic Affairs framework (in the appendices). This does not include the economic effects of the coronavirus pandemic. The possible effects will be investigated in the coming period.

The projected economic growth in terms of employment is about 230,000 jobs (more than 12 hours a week) in the period up to 2040. From about 2030, the rate of growth appears to level off, mainly due to the ageing population. The current estimate is that growth between 2040 and 2050 will be another 40,000 jobs. The task here is to accommodate this in a manner appropriate to the nature of the business activities. Development focuses as much as possible on mixed-use inner-city living and work environments, concentrated around public transport hubs.

Ensure good liveability

Ensuring good quality of life is a permanent task that applies across the entire metropolitan region. One aspect of that task is ensuring the same level of liveability for all residents in the region. This involves, for example, the quality of public spaces, an adequate level of amenities, a healthy environment, and the availability and robustness of sufficient green space, just a short distance away from the districts.

Socially inclusive construction

Equality of opportunity is a key feature of a balanced metropolitan region without major socio-economic disparities between areas. Equality of opportunity means socio-economic security for all residents. Processes of social and economic exclusion must be prevented and combated. To the extent that there are spatial causes for this, the urbanisation strategy should contribute to eliminating those causes. This means, for example, that constraints due to economic pressures, environmental nuisance or the impact of climate change should not fall primarily on specific groups.
This leads to the following tasks:

- counteract the growing inability of less affluent households to access an increasingly large portion of the regional housing market; for example, by ensuring sufficient affordable housing and a balanced distribution of those homes,
- prevent a decline in equality of opportunity in districts (e.g. due to a one-sided composition of the population or housing stock) and stop this trend where it is already occurring,
- promote a situation in which daily amenities and appropriate employment opportunities are either nearby for all residents, or can be accessed quickly and affordably (prevent and combat transport poverty).

A task that seems to be imminent in the near future is the prevention of energy poverty. This arises when less affluent sectors of the population cannot invest in, for example, heat pumps and solar panels, and the traditional energy supply (natural gas, electricity from the grid) becomes more expensive.

We are currently conducting an analysis of the social impacts of different forms of urbanisation. The results of that analysis will be included in the Urbanisation Strategy as soon as they become available.

Integral customisation in urban renewal

In the coming years, the urban renewal task for national

and regional government will focus on four areas where there is a combination and accumulation of tasks: Amsterdam Zuidoost, Amsterdam Nieuw-West, Lelystad Oost and Zaandam Oost. These tasks relate to education, work/poverty/inclusion, safety/undermining criminality, housing and health (in a different mix per area). The four areas are part of the intergovernmental Liveability and Safety. programme (Leefbaarheid en Veiligheid) National government works together with decentralised governments on a long-term customised approach per area within that programme. This approach will continue to take on concrete outlines in the coming years. Urban renewal in the Metropolitan Region is not limited to the four districts mentioned above Customised renewal will also take place in other neighbourhoods and districts, but outside the collaboration for the Liveability and Safety programme.

Reduce heat stress

Heat is increasingly a health risk, especially in the built area. During a heat wave, the temperature difference between urban and rural areas can rise to as much as eight degrees. This is because heat from the sun is retained in façades and hard surfacing at night, and there is relatively little green space, water and wind in the city to act as a counterbalance. So the city is becoming an urban heat island. Urban densification aggravates this problem if no action is taken to enhance cooling. Examples of these cooling measures include creating more shade in the built environment and more space for green areas and moving water, both in the public domain (parks, public gardens, green wedges) and in the private domain (encouraging residents and businesses to convert roofs or paved gardens to green solutions). At a larger scale, urban design choices can help cool breezes from the outskirts of the built area to penetrate deeply into the town.

Build districts on the outskirts of the city to accommodate expansion until roughly 2035

The preference for building in inner-city locations does not eliminate the need to also build outside existing urban areas. There are opportunities for this at agreed locations[12] on the suburban fringes, on the west flank of Haarlemmermeer and in Flevoland - in Almere and Lelystad, the landscape framework has already been geared to the future construction of new urban districts with various living and work environments. Among other things, these new districts offer space to meet the need for single-family homes, which need to be built in relatively large numbers in the period up to 2030. In the period thereafter, additional new construction demand will focus, even more than now, on single-person and two-person households who want to live near amenities, their work and public transport hubs.

Permanent availability of sufficient non mixed-use business parks

The transformation of business parks into new mixed-use living and work environments means, among other things, that existing and new business can be integrated into these new districts. However, business parks without residential development will continue to be needed. After all, not all types of businesses lend themselves to mixed-use zoning with housing - because of their size, for example, or because of their environmental impact, or the resulting traffic intensity, or their appearance, so not every business park lends itself to transformation. Mixed zoning with other functions (water, green space) is often possible and may increase quality. In the region, there is substantial space in four municipalities for developing new sites of this type (separately from the port-related and airport-related sites): Haarlemmermeer, Purmerend, Lelystad and Almere. In addition, the transition to a circular economy is expected to lead to a demand for space for companies that, for example, store materials and make them suitable for reuse. Companies like this can be accommodated both in the port area and in these business parks.

Preserve and create recreationally attractive landscapes

It is estimated that the recreational needs of residents will increase by more than 30% in the period up to 2050, due to population growth and population ageing. The growth in tourism and the desire to spread it out more will further increase crowding. This recreational and tourist pressure is not limited to the recreational areas that have been created; it is also apparent in agricultural areas, in nature areas, on the coast and on the water. It can lead to tension with other functions of the landscape (such as nature and agriculture) and to higher management costs.

This results in the task of preserving and creating recreationally attractive landscapes. This cannot be separated from the housing construction task. Residential development must be accompanied by coherent investments in more

12 *Shown on the MRA Housing to 2030 map*

and better recreational facilities in and around towns, including resources for management. Depending on the area, this may involve the construction of new recreational areas or amenities, or improving the quality, accessibility and usability of existing landscapes. Where possible, this task is combined with other tasks in the landscape, such as those relating to biodiversity and water storage. Offering farmers reasonable compensation for their support for the transition to extensification and circular agriculture, with a greater emphasis on green services, can be extremely helpful.

2. Urbanisation and the mobility system

The mobility task in relation to urbanisation is network-oriented: it involves building a mobility network that integrates the various transport modes and the various levels of scale, and that improves the accessibility, liveability and sustainability of the metropolitan region.

The relationship between the development of the mobility system and urbanisation is elaborated in the national and regional government SBaB programme (Building Together for Accessibility). The following tasks are linked to the SBaB programme:

- How do we ensure that investments in accessibility (for both the short and long term) maximise the competitiveness of the MRA? And how do we reduce the economic losses caused by disruption and delay?
- How do we keep the MRA's current and future top economic locations accessible in a way that suits the current and future functions and users of these locations?
- How do we accommodate the urgent housing construction task (for the large densification locations and other sites) in the MRA in a way that leads to an attractive, demand-oriented supply of housing in accessible and liveable locations?
- How do we provide a smoothly functioning, demand-oriented Daily Urban System in the MRA and its surroundings with attention for travel times, reliability and the overall experience?
- How do we use and strengthen the ambitions of national government, the MRA, businesses and civil society organisations in respect of innovation, smart mobility, (traffic) safety, climate, health, energy and sustainability when tackling the accessibility tasks?

In administrative terms, an unambiguous direction has been chosen in response to these challenges: polycentric urbanisation in the metropolitan region, comprising the densification and development of Amsterdam, the international corridor (Hoofddorp-Schiphol-Zuidas, to be extended towards Amstelstation and Amsterdam Zuidoost), large urbanisation locations (Haven-Stad and Amsterdam Bay Area) and urban hubs (Haarlem, Zaandam, Lelystad, Purmerend, Hilversum; in addition to the Hoofddorp and Almere hubs that are situated in the aforementioned areas).

This choice triggers growth in the use of all modes of transport, especially public transport. To facilitate this growth, the 'distribution loops' (the region's orbital roads and orbital railway structures for road traffic and public transport) must continue to function. To achieve this, the BO MIRT 2019 intergovernmental consultation on the multi-year infrastructure, spatial planning and transport programme identified the following system tasks:

- Strengthen both international and national rail transport and regional and urban public transport in and around Amsterdam.
- Improve the robustness and flow of the road network in the metropolitan region: the functionality of A10 motorway and expansion of the second ring road in conjunction with the strong urbanisation activity there.

This development path contributes to creating the greatest possible degree of proximity between homes, jobs and amenities in urban areas, at locations that are well connected by public transport. This limits the growth of commuting by car. Encouraging people to use bicycles is also an integral part of the development of the mobility system. The various modes must be made to connect to each other smoothly, by developing 'multimodal hubs' among other measures.

There is a connection between this network task and the task of building in a socially inclusive manner. Mobility is a prerequisite for participating in daily social life. If people are unable to do so adequately, for example because affordable housing is too far from amenities and work locations for practically trained workers, middle-skilled workers and people without a job, they end up being caught in a transport poverty trap. The network strategy can contribute to reducing the differences within the metropolitan region, so it is an important instrument in working to achieve a balanced and socially strong metropolis.

3. Urbanisation and the energy system

The energy system is becoming a significant factor in location choices for urban and economic development. Placing new businesses and facilities with large energy

demands near the main connections in the energy grid is already important. The task associated with the energy system boils down to building an integrated hybrid energy network (which makes use of various sustainable energy sources, integrates small-scale energy production down to neighbourhood level and guarantees a stable energy supply).

The transition to a sustainable energy supply requires smart and innovative solutions. Those solutions are currently the focus of intensive development. Their ultimate form depends on factors such as the development of technology, the international energy market, trade agreements and so on.

The energy system of the future not only utilises other sources, it also requires greater capacity on the electricity grid. Electric mobility, the Internet of Things (the 5G network) and other factors will drive up demand for electricity and increase the load on the electricity grid. The extent is uncertain; grid operators assume growth of 3% per year. In order to meet the power needs of new data centres, it is estimated that a capacity of 2,500 MVA (mega volt amps) will be required in 2030. This compares to the current annual usage of the municipality of Amsterdam of around 900 MVA. The current grid has virtually no room for that additional capacity.

At present, grid operators are required to connect new urban and economic functions to the energy network, regardless of their nature or location. Every development means that the network must be expanded or broadened. This leads to significant investments. This is especially true of large energy consumers like various forms of industry and data centres. The expectation is that these investments will no longer be possible in the future as a matter of course, and that the energy infrastructure will therefore play an important role in choices for urban and economic development (just like mobility and water).

Anticipate spatial needs for a main network for sustainable energy

The spatial task associated with the energy transition largely revolves around a space requirement for generation, storage, transport and conversion, and aligning urban and economic development locations with the energy network. This leads to the task of structuring, transforming and intensifying existing space use, and creating new space. The number of hectares involved and the requirements relating to that space will depend on choices that, to a large extent, cannot be made at this time, but which do need to be anticipated.

In part, this task involves creating new space for the energy system. The Regional Energy Strategy being formulated around this time will identify candidate areas, with 2030 as the target year and provide a longer-term outlook to 2050.

Large energy consumers will also need to be connected to the main connections in the national energy network via short lines. This main energy structure consists of the existing 380 kV high-voltage power lines, the extension of that grid with a line through Noord-Holland towards Groningen if this option is chosen, and the natural gas pipeline from Groningen that seems likely to be converted to a transport pipeline for hydrogen in the future. There is also a task relating to the construction and expansion of the CO2 network. This network is intended to capture and store CO2 and supply CO2 for use in horticulture and industry. At regional level, there is also a task relating to expansion of the regional heating network.

Strengthen and utilise the main structure in the energy network between the North Sea Canal area and Groningen

Wind energy generated offshore is fed into the international and national main energy network grid at the mouth of the North Sea Canal. From that point, this energy is distributed on throughout the region and beyond. In the light of this, one of the basic assumptions in intergovernmental plans is that the North Sea Canal area must become the primary hub for sustainable energy in the Metropolitan Region. This is in line with the National Strategy on Spatial Planning and the Environment. (NOVI), which states that space will be actively provided for (new) energy-intensive industry at the sites where offshore energy is brought ashore. This choice does not alter the fact that large amounts of wind energy are also generated in Flevoland and that there are also good opportunities there for energy-related functions and large energy consumers.
The wind farms in and around the region feed energy into the main electricity grid, however the region also depends on the main electricity grid to ensure a stable energy supply when wind farms and solar generation facilities temporarily deliver less energy. Both functions (feed-in and consumption) require strengthening of the transport capacity, with particular opportunities arising from the main connection for electricity between the North Sea Canal area and Groningen. Currently, transporting the offshore wind power that comes to land near the Eemshaven in Groningen via Flevoland is also being considered. The presence of a second main connection

between the Metropolitan Region Amsterdam and Groningen further strengthens that structure: the main natural gas pipeline, which looks set to be widely used for hydrogen from 2030 onwards.

This main structure results in a space requirement for energy facilities (including, for example, electricity storage and conversion) and location opportunities for large energy consumers. Existing facilities such as the Maxima power plant in Lelystad and initiatives launched by existing large energy consumers such as Tata Steel are important in this regard.

Moving toward an integrated hybrid system that combines different sustainable sources

The starting point for government plans is a commitment to energy-neutral or energy-producing development. In addition, the energy transition will affect the existing housing stock. At the level of scale of neighbourhoods, districts and larger agglomerations, the task is to create a 'hybrid energy system'. A hybrid system of this type integrates different sources, links supply and demand and provides storage within a single system. This must be an integrated system; the creation or continued existence of parallel systems (such as a gas grid and a heating network) is not desirable. In a hybrid energy system, short supply lines are established in the chain between suppliers and consumers of power and heat. The distinction between the two will blur.

The transition to an integrated hybrid energy system of this type still requires much thought and innovation. Research on this issue by TNO and others is due to start soon. As with the main network, it can have a determinative effect on spatial planning: leading to a need to create space, set up structures, intensify and transform.

Elements that play a role at district and neighbourhood level include:

- insulation and other energy-saving measures in existing homes.
- the use of low-temperature heat from sustainable sources for heating networks.
- innovations for generating heat (for example, under roads, or from surface water),
- small-scale energy generation and storage: as a result of European legislation, local energy cooperatives will become increasingly important. They will be supported by so-called independent aggregators. The latter parties establish the connection to the national network to make stable energy supply possible. This not only requires adaptation of the low-voltage grids, but also a market model that allows exchange.

In this transition to a sustainable energy system, care must be taken not to create energy poverty.

Construction of a fourth hyperconnectivity hub for data centres

The space requirement for data centres has been estimated at 250 hectares in the period up to 2030, assuming single building layer construction. This surface area corresponds to the required power capacity of 2,500 MVA. Of that total surface area of 250 hectares, a requirement for hyperconnectivity is expected to apply to 60%. Hyperconnectivity is currently available at three locations in the region: Schiphol Rijk, Amsterdam Zuidoost and Amsterdam Science Park. This is not adequate for future demand.

A fourth hyperconnectivity hub requires an additional load pocket (an extension to the electricity grid that can be used to power a data centre). The completion period for realising this load pocket is seven to ten years. In addition, the business community needs substantial investment in digital infrastructure. Studies point to a location near Almere-Zeewolde as the preferred solution, but an alternative in IJmond is also still in the picture.

4. Urbanisation and the water and soil system

Many tasks at the overlap between urbanisation and the water and soil system stem from the need to protect the region against the effects of climate change. They mainly target protection against flooding and inundation, and ensuring a permanent supply of sufficient fresh water, even in times of prolonged drought. Climate adaptivity and water resilience must become automatic components of the spatial choices for the city and countryside.

The soil type and soil quality are also becoming more determinative for land use than before. This is particularly relevant in areas where subsidence must be slowed or stopped and when making decisions regarding the future of land-based agriculture.

It is probably true to say that climate change manifests

itself most clearly in the water system in this region. The system in its current form is not designed to handle the increasingly severe climate extremes the region will face. Those climate extremes include both prolonged drought and very heavy rainfall. The water system must be made more resilient and robust.

As a result, climate adaptation and water are becoming increasingly important for choices in the spatial planning domain. In the regional context, this firstly requires adaptive development, which allows a rapid response to changing expectations or circumstances, and, secondly, water-resilient development, which ensures rapid and adequate intervention in situations of impending flooding or water scarcity and limits the consequences of such an emergency.

Because we do not yet know how long climate change will continue to develop and at what rate, spatial developments in the short term must also be assessed in terms of their suitability for all long-term scenarios. This flexibility avoids interventions that will lead to major additional risks or costs in the long run, and keeps different development paths open as options.

The need for climate-adaptive and water-resilient development permeates all development and design choices in the region. It is a prerequisite for a safe and liveable living and work environment.

Limiting the risks of flooding

Multi-layer safety is central to mitigating risks of flooding. Until now, the main focus has been on the construction of strong flood defences (layer 1). In the future, this must be combined with water-resistant spatial planning (layer 2) and adequate emergency management (layer 3). This means:

- Areas where there is a high risk of flooding should either not be urbanised, or should be built on in a manner that can withstand flooding (e.g. floating or elevated structures). This is especially true of areas that may experience flooding to a significant depth. If the risk of flooding to a shallow depth is relatively high, measures such as raising the ground level may also be implemented.
- Vulnerable functions and infrastructure should not be situated in areas associated with a high probability of flooding and flooding to a significant depth, and/or additional protection against flooding should be provided.
- Space needs to be reserved for strengthening (raising and/or widening) flood defences. Urbanisation may give rise to new reinforcement measures, over and above what has already been agreed, if the increase in the economic value of an area calls for a higher level of protection.

Reserving space for water storage

Space is needed in the main water system, the regional water system, the polders and in urban areas to accommodate water during periods of heavy rainfall or large inflows from other areas.

In the main water system, the Markermeer acts as a water buffer. Excess water can be channelled here, for example, if the water level is high and drainage to the sea is not or insufficiently possible. That function must remain intact. In addition, the Amsterdam-Rhine Canal and the North Sea Canal both need extra space to which water can be drained during periods of high water inflow. Several candidate areas have been identified for both canals, to the north or south of the North Sea Canal, and to the east or west of the Amsterdam-Rhine Canal (the location to the west lies outside the Metropolitan Region). Areas that qualify for this function will not be considered for urbanisation. However, recreational co-use is possible.

More storage capacity is also needed in the underlying water system. Local water retention in the capillaries of the regional water system or in polders is often the most effective approach. However, specific water storage areas scattered throughout the region may also need to be integrated in the regional system.

The task of creating more water storage capacity also applies to urban areas. Developments must be water-neutral. This means that new residential and work locations may not place an extra adverse load on the water system in terms of safety, water quantity and water quality. Rainwater that falls at residential and work locations is retained on-site and drained away at a controlled rate, so that excess water during peak periods is not diverted into the water system and does not cause damage to property and infrastructure.

Maintain water availability, even during periods of drought

The growing number of homes and businesses is leading to an increasing demand for drinking water. For example, the water utility companies estimate that they will need to extract around 30% more drinking water for the Utrechtse Heuvelrug (including 't Gooi) by 2040, even though water is already being extracted in areas where, from a nature and climate adaptation perspective (such as 't Gooi), this

is either not desirable, or not desirable in the quantities involved. An eventual transition to hydrogen in the energy system also requires a lot of water.
The location of functions that use high volumes of water, such as data centres and various forms of industry, must take into account the availability of water. This also applies to landscape measures such as channelling water back into peatland areas. In addition, the requirement for fresh water must be reduced in the future and existing reservoirs in and around the region (of which the Markermeer is the largest) must be left intact.

Climate change makes the task of keeping sufficient water available even more urgent. As a result of climate change, we are experiencing long periods of drought more frequently. This emphasises the need to keep sufficient water available and to structurally reduce the need for water.

Improve water quality
Good water quality is important for nature, but also for liveability and public health. Currently, the standards set in the Water Framework Directive (Kaderrichtlijn Water) are not met in many places. Urbanisation and climate change (drought and salinisation) may lead to a further reduction in water quality.
The water quality need not be the same everywhere. The water system needs to recognise gradations from clean to less clean water and from saline water to fresh water, and these gradations must be linked to the existing and expected use of space. For example, the need for fresh water decreases if land use in saline areas is adapted to that level of salinity. This applies particularly to peatland areas. In combination with the task of combating subsidence, this requires farmers to consider other crops. The layout of the urban area can contribute to water quality by alternating places associated with high water usage in and next to the water (e.g. piers, sailing routes, floating objects) with quiet, nature-friendly places in and on the water. In clay and peat soils, excavating and preparing the land at construction sites without drainage also improves water quality.

Counteract land subsidence
Land subsidence in peatland areas is a major contributor to CO2 emissions in the region and, if the current agricultural use remains unchanged, will require deeper and deeper drainage. So action is requires to mitigate land subsidence. However this has implications for the use of space. Urbanisation is not the most obvious choice on this soft soil type. A spatial design that retains the agricultural function, but then in a nature-inclusive manner based on circular farming practices, or nature development, are more obvious approaches. Combinations with recreation are perfectly feasible. In other areas prone to land subsidence, such as Flevoland, where the clay soil continues to settle, urbanisation can be an option. However, this would lead to a major maintenance and management task for the long term.

Circular agriculture
TBD, in relation to land subsidence, salinisation, green services, soil depletion, range from hyperlocal to hyperglobal. Food as an opportunity to connect the built area and the countryside with each other.

5. Urbanisation and the ecological system

Completing the National Ecological Network
The ecological system in the region focuses on biodiversity on land and in the water, inside and outside nature areas. The Metropolitan Region includes two National Parks (Zuid-Kennemerland and Nieuw Land) and a number of other Natura 2000 areas (located along the coast, in the Gooi and Vechtstreek region, Markermeer-IJmeer, Zaanstreek and Waterland). Together with other nature areas and connections, they form the National Ecological Network in the region. The stated objective is to complete this network by 2027. To achieve that objective, an acceleration of nature development is necessary.

Ensure ecological quality in Natura 2000 areas and other parts of the National Ecological Network
Nationally, and with regard to the Natura 2000 areas also internationally, it has been agreed that the habitat for designated animal and plant species may not be adversely affected in the National Ecological Network. This also places demands on spatial development in the surrounding area. Nitrogen deposition due to land use in the vicinity of Natura 2000 areas that are sensitive to nitrogen (in particular the peatlands and the dunes) must be reduced. Reducing nitrogen deposition is also a prerequisite for creating space for new economic development.

Increase biodiversity in urban and agricultural areas
The urban area also contributes to biodiversity in the region. This contribution can be increased by green structures in the city, but also by nature-inclusive construction and

Appendix

Development and spatial layout principles

This appendix lists the 'development and spatial layout principles' that were identified when preparing the Urbanisation Strategy. The development principles are part of the administrative base points established in the November 2019 BO MIRT intergovernmental consultation on the multi-year infrastructure, spatial planning and transport programme. All references to these BO MIRT principles are shown in italics in this appendix. The numbering is the same as that used for the administrative base points. For the sake of clarity, further information has been added in respect of some of these principles. These additions relate to previous agreements or ongoing policy processes, such as Building Together for Accessibility (SBaB) and Metropolitan Landscape (Metropolitaan Landschap) and were adopted by the Steering Committee during the meeting of 13 May 2020.

Principle 1.1
"A sustainable, socially and economically strong metropolitan region is the aim of both national government and MRA. The urbanisation concept for the medium term and the long term is intended to outline the common framework for the relevant deliberations and choices, based on good intergovernmental collaboration."

Principle 2
"The polycentric metropolitan region is the basis for further development of the urbanisation concept. We are working on further functional integration of the different characteristics and the mutually reinforcing cores, and on

the identity of the metropolitan region that operates as a single large city."

1 Ensure good liveability

Principle 1.2
"National government and MRA explicitly monitor the effects of the urbanisation strategy, which citizens experience in their personal lives, in existing neighbourhoods and districts in the towns and in the cores in rural areas, and which can make the immediate living environment more attractive, healthier and more sustainable."

To aid elaboration of this principle in the urbanisation concept, we have added the following interpretation here:

- health risks to which people are exposed (such as noise, heat stress and particulate matter) are reduced,
- the design of the public space contributes to a healthy living environment, social interaction and creating an attractive business establishment environment,
- local services and amenities are maintained at or brought up to an acceptable level, even in areas where this is under pressure (such as in smaller cores in rural areas),
- promote the availability and robustness of sufficient green space in the districts and at a short distance from the urban area.

2 Urban and landscape areas are developed in conjunction with each other

Principle 3
"The development of urban and landscape areas is a coherent and interconnected task. We are committed to landscape-inclusive development that strengthens the functions and qualities of the landscape. The landscape forms the contours of the urbanisation projects. The initial situation and the characteristics of the landscape in relation to urbanisation differ within the MRA.".

To aid elaboration of this principle in the urbanisation concept, we have added the following interpretation here:

- The values and opportunities represented by the landscape in terms of, for example, water, soil, heritage, nature, recreation and enjoyment are an intrinsic part of all development choices, and landscape management is also involved in a way that contributes to a healthy living environment and to creating an attractive establishment environment for businesses.
- In situations and at times when new construction locations (for functions such as housing, work, infrastructure, energy) have to be found outside urban areas, landscape qualities determine the locations and boundaries.
- If spatial developments cannot be implemented within existing urban areas, the regional parties will adopt an approach of generous compensation for the reduction of surface area and impairment of landscape, recreational and ecological qualities.[13]
- An attractive landscape is just a fifteen-minute bicycle ride away from every home.
- Urban developments are linked to investments in an attractive landscape.
- Spatial developments in the landscape always serve multiple purposes, for example, water management, climate, nitrogen deposition, circular agriculture, biodiversity, recreation, heritage or land subsidence.

3 New residential developments and environments are diverse, liveable and socially inclusive

Principle 4.3
"National government and MRA are acting to improve the housing market and quality of life to ensure that both current and future residents can find a suitable and attractive place to live. We are working to provide enough housing, based on a diverse and affordable housing offer in a variety of residential settings, in high-quality and safe living environments."

To aid elaboration of this principle in the urbanisation concept, we have added the following interpretation here:

- At development locations, homes will be built in a variety of price ranges, including sufficient affordable housing, and in a variety of designs in line with housing needs (unless the number of homes planned at the location is very limited).

13 adopted in the spatial planning intergovernmental meeting (BO Ruimte) of 4 December 2019

- In areas where one-sidedness in the housing stock or population composition threatens equality of opportunity in the region, we will remedy that situation by intelligently planning housing developments in or near clusters of this type to provide a range of housing types and amenities, and good access to those amenities.
- Residential environments encourage a healthy lifestyle by providing sufficient green space and good walking and cycling facilities.
- When choosing locations for housing developments, infrastructure and work locations, we seek area-specific solutions that are future-proof and always focus on measures to ensure that people can live healthily, safely and pleasantly.
- Where densification increases the pressure on green spaces, we act to increase the quantity, quality and accessibility of green spaces.

4 Urban developments and investments in mobility systems reinforce each other in a cohesive and balanced mobility network

Principle 4.1
"National government and MRA aim to develop residential locations, work locations and facilities within the urban area as much as possible. We achieve this through inner-city densification in mixed-use environments and by concentrating development around public transport hubs. Key areas have been defined as the focus for future inner-city development. They are candidate areas for large-scale development locations in the MRA as identified in the draft National Strategy on Spatial Planning and the Environment (NOVI)."

Principle 4.2
"National government and MRA will realise the planned and future outlying expansion locations, subject to timely provision of proper access, including by public transport."

Principle 5.1
"To facilitate inner-city densification and concentration around hubs, we focus primarily on regional public transport and bicycle network connections to better enable sequential multimodal travel."

Principle 5.2
"The development of new residential, work and recreational locations is implemented reciprocally with the regional public transport system and bicycle network, both in terms of the capacity of the local, regional and supra-regional networks and in terms of timing."

Principle 5.3
"We are committed to a mobility system that facilitates all modes of transport (bicycle, regional public transport, train, car), encourages smart mobility and reinforces the urbanisation concept. In respect of the major system tasks, we are working on a network strategy and smoothly functioning 'daily urban system'."

To aid elaboration of these principles in the urbanisation concept, we have added the following interpretation here:

- when allocating programmes for residential and workplace developments near public transport facilities, we distinguish between:
  - multimodal hubs: directly accessible by bus, train and metro, with (already or potentially present) a highly urban mixed-use environment and an extensive economic programme;
  - town centres: directly accessible by bus and by train or metro, with a highly urban mixed-use environment and growth opportunities for the economic programme;
  - stops: directly accessible by train or metro subway with an urban living environment or with potential for a light commercial programme.

  The Department of Spatial Planning and Economic Affairs framework, included in the appendices, contains a programme-focused and bandwidth-based interpretation of the residential and workplace programme.

To aid elaboration of the mobility network, we have added here the six principles that ensue from the Building Together for Accessibility (SBaB) programme. These will be presented for adoption at the next SBaB Programme Council meeting (14 May 2022).

1. we exploit the strengths of the modes of transport and facilitate mobility systems at different levels of scale, based on preferred modes:
   - walking, cycling and public transport as the basis in inner-city areas,
   - public transport primarily for connections between the major towns and on the economic core corridors,
   - the car as the basis for other connections;
2. we facilitate transformation into a smart and sustainable mobility system;

3. we focus on the needs of the traveller/shipper; with consideration for door-to-door mobility;
4. we create smooth transitions between the levels of scale and between transport modes;
5. we work on liveable (inner-city) urban areas with a focus on facilities for walking, cycling and public transport;
6. we make optimal use of existing infrastructure.

5 The development of economic centres and other work locations contributes to a resilient, clean and inclusive MRA economy

Principle 6.1
"New plans for residential development that result in the transformation and loss of business parks are possible if sufficient space is available for business activities".

Principle 6.2
"National government and MRA are taking into account additional space for business activity needed for the transformation period to a climate-adaptive, energy-neutral and circular economy, particularly in port and industrial areas."

Principle 6.3
"National government and MRA develop existing and new residential and work locations in a circular manner as far as possible, and with an emphasis on the use of high-quality materials".

To aid elaboration of these principles in the urbanisation concept, we have added the following interpretation here:

- The spatial and economic development contributes to the international competitiveness and innovative capabilities of the region and of the Netherlands as a whole.
- The jobs and the labour market in the region are closely aligned. The pressure on space may not lead to many practically trained workers no longer being able to quickly and affordably travel to suitable jobs.
- In the transition period to a circular economy, our plans take into account a temporary need for and use of additional space for facilities that are needed for both the 'old' and the circular economy. This may mean that strategic space reservations are made, and that the environmental space available at those locations remains necessary and may even be expanded.

6 Spatial developments contribute to the acceleration of the energy transition

Principle 7.1
"National government and MRA are committed to energy-neutral or energy-producing spatial development."

Principle 7.2
"National government and MRA balance demand (consumption of energy) and supply (generation of renewable energy) as closely as possible and in line with the characteristics and efficiency of the network. In doing so, we allow for the fact that the electricity grid must be strengthened and other energy networks (heating, hydrogen) must be set up and expanded because of the energy transition."

Principle 7.3
"National government and MRA will manage developments related to data centres in line with the availability of electricity, the presence of a heating network and minimising the distance to the point where offshore wind energy comes ashore, or to local (sustainable) power generation facilities."

Principle 7.4
"The North Sea Canal Area is the hub for renewable energy in the MRA".

To aid elaboration of these principles in the urbanisation concept, we have added the following interpretation here:

- The capacity of the energy infrastructure (generation, transmission, conversion, storage) is considered when selecting and laying out urban development sites. In that process, allowance will be made for the expected shift to an 'integrated hybrid energy system' that utilises multiple sustainable energy sources and energy carriers (electricity, hydrogen, heat and CO2) and also links supply and demand at the district and neighbourhood level.
- Major energy consumers, in particular, will be situated near locations where sustainable energy is produced and near the main connections in the energy network between the North Sea Canal Area and Groningen (for electricity and possibly also for hydrogen, if the

current natural gas pipe system is converted to carry hydrogen).
- Strategic spatial reservations can be made at places and in areas that play, or (after consideration in the Urbanisation Concept) qualify for, a role in the future energy system. The environmental space present there will be maintained and expanded if necessary.
- One site of up to 150 hectares is planned in the region for new data centres that use hyperconnectivity. The availability of sufficient cooling water is a prerequisite when choosing locations for these and other new data centres (unless an innovative, non-water-cooled solution is used).

7 Spatial developments contribute to a climate-proof metropolitan region

Principle 7.5
"National government and MRA urbanise in a climate-proof manner, by acting to reduce the impact of climate change (drought, heat, extreme rainfall and possible flooding)."

To aid elaboration of this principle in the urbanisation concept, we have added the following interpretation here:
- New locations and restructuring areas for living and work are developed in a climate-proof and water-neutral manner: rainwater is retained locally and allowed to drain away slowly, heat stress is counteracted and damage in the event of possible flooding is limited.
- New urban developments will only be implemented at locations where they can be combined with a robust and future-proof water and soil system. This means, among other things, not building in areas with a relatively high probability of flooding to a significant depth, unless the structures are built in a way that can withstand a flood of this nature. This applies particularly to vital functions such as data centres, hospitals and critical infrastructure.
- Where possible, developments will contribute to counteracting and slowing down land subsidence.
- Sufficient space will be created for temporary water storage in wet periods, both in polders and within the regional water system and the main water system.
- Sufficient water is retained or stored to ensure that sufficient fresh water remains available for nature, drinking water and agriculture at all times, including protracted periods of drought. New functions that require large volumes of water will be situated in a location where there is sufficient water in the vicinity.

Annex C

Agreed actions

Outcomes of the Living Environment intergovernmental meeting (BO Environment) of 8 June 2020

(source: letter from the Minister of the Interior and Kingdom Relations to the Lower House, 25 June 2020, reference, 2020-0000381130)

The Metropolitan Region Amsterdam (MRA) urbanisation strategy defines the course chosen by national and regional government to realise a sustainable and socially and economically strong MRA in 2050. A polycentric development of the MRA with mutually reinforcing cores is the basis for further development. To achieve this, national government and the regional authorities will jointly and comprehensively put prerequisites in place and make appropriate choices in the areas of housing, employment, accessibility, landscape, the energy transition, climate adaptation, the circular economy and quality of life. Agreements have been made on the polycentric and balanced development of housing and employment until 2030, in alignment with the expectations regarding accessibility and the energy transition up to 2050 in relation to urbanisation.
The MRA faces an urgent housing challenge. Due to increasing population growth, home completions for the MRA must increase to 175,000 homes by 2030 (2019 CBS forecast). For housing development up to 2030, national government and the regional authorities have agreed, in addition to earlier agreements, to focus on accelerating the implementation of adopted plans, plans that are under preparation and potential plans up to 2030, taking into account the consequences for accessibility in line with decisions made in the area-based Building Together for Accessibility (SBaB) programme.
In order to meet the increased demand for housing, I will cooperate fully with the regional partners in order to achieve completion of 17,500 homes and to jointly eliminate the bottlenecks, as identified in the Woondeal housing agreement. Quantity is not our sole objective. We will ensure a balanced distribution of the housing stock across the region and a new construction programme that meets demand by providing affordable housing for both low-income and middle-income residents. We will also address the excesses in the housing market. With regard to housing development until 2030, it has been agreed that priority will be given, in connection with accessibility, to development of the international Zuidwest Amsterdam-Schiphol-Hoofddorp corridor, including Amsterdam Zuidoost, and to further development of the west side of Amsterdam and, on the east side of Amsterdam, to focus on development of the centre of Almere until 2030 and, where possible, to take additional action with regard to the Amsterdam Bay Area.
Not only will we build homes, we will also build towns and communities. For a balanced development of the polycentric metropolitan region and in order to strengthen the quality of life in existing cores, national government and the regional authorities have agreed to jointly implement the policy intention of spreading 10% (indicative) of the employment growth in the period from

2020 to 2030 over the town centres of Almere, Haarlem, Hoofddorp, Hilversum, Zaanstad, Purmerend and Lelystad. This also contributes to making the best possible use of the accessibility system, including public transport hubs and (public transport) infrastructure, and to making jobs more accessible, particularly for practically trained and middle-skilled workers, in cores outside the main city area.

A sustainable MRA will require significant interventions and expansions in the energy infrastructure in the period up to 2030. At the time of writing (2020), there are already capacity problems in the high-voltage network (150/380 kV) and at a number of substations, which are needed for regional power distribution. This means that the energy network is not robust enough for realising all the ambitions relating to housing, work locations and the energy transition in the medium (up to 2030) and long term (2030 to 2050). With regard to the energy transition, national government and the regional authorities have agreed to include all aspects of the main structure for supplying energy in considerations relating to urbanisation and to link it to the locations for sustainable energy generation (RES) and spatial and economic developments in the MRA in the period from 2020 to 2050. For the medium term, national government and the regional authorities, acting in close collaboration with the network operators, are working out a selection of high-priority 'no regret' measures aimed at resolving capacity problems in the energy networks in the periods from 2020 to 2025 and from 2025 to 2030. The underlying aim here is to avoid, to the greatest possible extent, delays and/or prioritisation decisions during area development.

The remaining open issues for the urbanisation concept, i.e. the energy transition, the fourth hyperconnectivity hub, landscape, water and soil for the period 2030 to 2050, will be further elaborated in the coming months. The aim is to adopt the decisions on this and the urbanisation strategy in the intergovernmental consultation on the multi-year infrastructure, spatial planning and transport programme (BO MIRT) in the autumn of 2020. The decision on the phasing of large-scale housing development sites up to 2050 will be made in conjunction with the SBaB accessibility programme.

The tasks within the MRA for the medium and long term are, to a greater or lesser extent, related to tasks in the areas adjacent to the MRA (Noord-Holland Noord, other parts of Flevoland, Utrecht, Leiden region). Where relevant, the MRA Urbanisation Strategy will address these tasks or they will be elaborated in the Environment Agenda for the Northwest (Omgevingsagenda Noordwest).

To start up the Environment Agenda for the Northwest, it was decided to give priority this year to ongoing national-regional government projects, such as the MRA and MRU urbanisation strategies, in which a large number of area-based tasks are already being tackled. Similarly, the NOVI Noord-Holland alliance has my full backing in respect of drafting a Regional Investment Agenda for the area above the North Sea Canal. National government and the regional authorities agreed to start exploring additional area-based tasks in January 2021, which may potentially need to be included in the Environment Agenda. The intergovernmental consultation on the Living Environment (BO Leefomgeving) in the spring of 2021 will determine which additional area-specific tasks will be included in the Environment agenda. In principle, the Environment Agenda for the Northwest will then be adopted in the intergovernmental consultation on the multi-year infrastructure, spatial planning and transport programme (BO MIRT) in the autumn of 2021.

The urbanisation and accessibility tasks in the MRU and MRA are very significant and urgent. Insufficient financial resources are available at national and regional

level for realising these tasks. This calls for a realistic phasing of area developments for the medium and long term. In addition, national government and the regional authorities will need to consider the extent to which additional financial resources can be made available.

National-regional government agreements, BO MIRT 25 November 2020

Urbanisation Strategy for the Metropolitan Region Amsterdam

- National government and the regional authorities see a huge housing task in the MRA. This housing task cannot be realised unless joint measures are implemented by both national government and the regional authorities to create the required prerequisites relating to mobility, accessibility, economy, energy, climate adaptation, water, ecology, landscape and inclusiveness. These prerequisites are the cement that holds together the individual elements of the housing task. In addition, short-term measures are needed in relation to the nitrogen and PFAS issues, noise accumulation, and the coronavirus crisis, which has had the effect of greatly slowing down construction output.
- An acceleration of the housing task also means that these prerequisites must be accelerated.
- National government and the regional authorities note that the required tasks for living, working, accessibility, landscape, ecology, climate adaptation, energy, circular economy and inclusiveness require systemic leaps. In such a process, attention must continue to be given to the high quality of life in the MRA and the special qualities of a balanced polycentric metropolis (both in social and economic terms) located in a unique and culturally and historically valuable landscape.
- National government and the regional authorities are working together on these essential prerequisites in the urbanisation strategy, the housing deal (Woondeal) and the accessibility programme (SBaB). In addition, the boost in housing development offers opportunities to accelerate housing completions in the short term.
- National government and the regional authorities agree to continue the elaboration of the Urbanisation Strategy during the run-up to the intergovernmental consultations on the multi-year infrastructure, spatial planning and transport programme (BO MIRT 2021) and the living environment (BO Leefomgeving 2021).
- National government and the regional authorities confirm the choice of basic approach, which is to ensure balanced development of a polycentric metropolitan region and develop 175,000 homes in the period up to 2030, and their commitment to spreading the influenceable part (roughly 10%) of employment development over the major town centres in the MRA. A number of further agreements apply in this context, specifically:
- Acceleration of housing completions and the necessary prerequisites during the period up to 2030:
  - National government (interdepartmental, coordinated by the Ministry of the Interior and Kingdom Relations) and the regional authorities agree to elaborate concrete and integral area plans for the accelerated development of housing in the period from 2021 to 2030 in the town centres of Almere, Haarlem, Hoofddorp, Hilversum, Lelystad, Purmerend and Zaanstad, including putting in place the (financial) prerequisites for this integral development, such as accessibility, energy infrastructure and other aspects. This will take place in close collaboration with the Accessible Towns (Bereikbare Steden) sub-programme within the Building Together for Accessibility programme (SBaB). Decisions on the accessibility aspects are made within SBaB. These aspects will be included in the SBaB Implementation Agenda.
  - National government and the regional authorities will come up with a detailed proposal as to how, and subject to which prerequisites, housing construction in the large-scale locations of Achtersluispolder in Zaanstad, Almere Pampus, Hoofddorp station and west flank in Haarlemmermeer, Havenstad in Amsterdam and Zuidoostflank Amsterdam, which are currently planned after 2030, can be brought forward, in addition to the already agreed objective of 175,000 new homes in the period up to 2030, without frustrating this objective and taking into account the (MIRT) studies that are already ongoing for these locations as part of the Building Together for Accessibility (SBaB) programme.
  - The progress made in the decision-making process described above will be discussed during an extra BO Woningbouw intergovernmental consultation on home construction in February/March 2021, in anticipation of the complete decision-making process in the BO Leefomgeving intergovernmental consultation on the living environment in the spring of 2021, and decision-making in the BO MIRT intergovernmental consultation on the multi-year infrastructure, spatial planning and transport

programme in the autumn of 2021.

- Water/climate adaptation: this includes agreements between the regional authorities and national government (Ministry of Infrastructure and Water Management, Ministry of the Interior and Kingdom Relations, Ministry of Economic Affairs and Climate Policy, Ministry of Agriculture, Nature and Food Quality) to use their own powers to implement climate-adaptive measures in all area developments (nature, agriculture, housing, business, energy and infrastructure) to avoid disproportionate costs caused by future damage. In addition, national government and the regional authorities are jointly exploring what follow-up studies are needed in the area of water and climate adaptation; in alignment with existing programmes as far as possible.
- Landscape and ecology: this includes agreements between the regional authorities (MRA participants) and national government (Ministry of Agriculture, Nature and Food Quality), based on their own powers, to address common interests, such as land subsidence in peatland areas, improving and supplementing ecological connections, nitrogen-sensitive N2000 areas, the agricultural transition to circular agriculture and nature-inclusive agriculture, and strengthening biodiversity. In doing so, we will seek the closest possible alignment with existing structures and collaborative partnerships (Peatland Plan, Nature Programme, Forest Strategy, NOVI areas, Markermeer-IJmeer Steering Committee, etc.).
- Energy: National government and the regional authorities agree to continue the process of defining a set of high-priority 'no regret' measures aimed at solving current capacity problems in the energy networks in the period from 2020 to 2025 and from 2025 to 2030, in relation to the urbanisation locations proposed in that period, and to present the results in the BO Leefomgeving intergovernmental consultation on the living environment in the spring of 2021;
- Energy: National government and the regional authorities agree to include all aspects of the main energy structure in considerations relating to urbanisation of the MRA and to link it to the locations for sustainable energy generation (RES) and spatial and economic developments in the MRA in the period from 2020 to 2050. In that connection, at least the following considerations have been put on the agenda for further elaboration:
  - Linking living, working, accessibility to the availability of energy and energy networks via concrete proposals in the urbanisation concept;
  - Answering the question of whether and where space is available for conversion facilities;
  - Making decisions regarding necessary/desirable additions and/or modifications to the main energy networks;
- Economic Profile of Almere: National government and the regional authorities agree to explore in the coming months what joint effort is necessary to strengthen the knowledge profile in Almere regarding the growth of the town and specifically the growth of the local economy and employment. If necessary, this may lead to adjustment of the Covenant on Higher Education in Flevoland (Convenant Hoger Onderwijs Flevoland).

Building Together for Accessibility Programme (SBaB)

With regard to Network strategy
National government and the regional authorities note and conclude that:

- Urbanisation leads to substantial growth in mobility. The number of journeys by car and on public transport to, from and within the MRA will grow to 5.6 million per day by 2040, an increase of 56% relative to 2014. The growth affects different mobility systems: 1. within the highly urbanised area, where public transport (bus, tram, metro and train), walking and (electric) bicycle travel are popular choices; 2. between towns, where train travel is the popular choice and 3. other journeys with the place of departure and/or destination in the MRA, where the car is a popular choice.
- As a result of COVID-19, the development in mobility growth has flattened in the short term, however, due to the strong spatial and economic development of the MRA towards 2040, mobility growth is expected to increase significantly again.
- As a result of urbanisation and the location of the national infrastructure in the MRA and around Amsterdam in particular, it is increasingly used for journeys where Amsterdam is the point of departure/destination. This means that both local commuting traffic and through traffic use the limited capacity available on the roads and railway network. Without drastic choices and measures, the networks will grind to a halt and the accessibility of the towns and economic top locations (such as the Zuidas, Schiphol and the Port of Amsterdam) will deteriorate.
- In order to accommodate growth in the coming years, the current MIRT agreements must be implemented (including ZuidasDok, the Schiphol-Amsterdam-Almere-Lelystad/SAAL public transport project, A8-A9, Amsterdam Zuid, High-Frequency Train Transport/PHS) and the necessary urban accessibility investments (local bicycle network, expanding BTM)

must be implemented in the MRA.

- In order to provide a future-proof solution for international/national and regional/urban traffic, a Network Strategy for the period up to 2040 has been drawn up, which consists of the following main choices for a coherent multimodal network:
- Progressive increases in scale in the regional rapid-transit (HOV) system in the highly urbanised area of the MRA to create capacity on the international/national railway network and to access new development areas. This increase in scale is necessary because the current public transport system is unable to cope with the strong growth in mobility from, within and to the MRA (69% growth relative to 2014). The first steps have been investigated and elaborated in the Zuidwestkant Amsterdam-Schiphol-Hoofddorp and Amsterdam Bay Area MIRT studies.
- A progressive re-design of the road network involving relocation and strengthening of the distribution loop for through traffic around Amsterdam (A5, A9, A10-Noord). A re-design is needed because strong growth in vehicle mobility in the period up to 2040 from, within and to the MRA (52% growth compared to 2014) means that the A10 ring road cannot continue to accommodate both through traffic and local traffic travelling from and to places in Amsterdam. More in-depth research is needed to determine the optimal configuration of the package of measures (physical and behavioural).
- The bicycle is an important and promising mode of transport for keeping the MRA accessible and liveable in a sustainable and healthy manner. Three solution paths offer potential in this regard: 1) completing regional bicycle transit routes, 2) realising attractive routes (feeder routes) to public transport hubs to improve sequential multimodal travel and 3) developing high quality bicycle parking facilities at public transport hubs.
- Commit to high-quality urban and regional interchange facilities between mobility systems (hubs).
- In addition to the main choices that have an impact on through flow throughout the MRA, there are also tasks for specific corridors in the context of the roads and public transport, such as the A27 motorway from Almere to Utrecht and the Gooi corridor, which can be resolved with local measures.

National and regional government agree:

- To work integrally in the MRA on (1) progressively scaling up the regional rapid-transit (HOV) system in the highly urbanised area of the MRA in order to create capacity on the international and national railway network and for good access to new development areas, (2) a re-design of the road network and (3) utilisation of the growing potential of the (electric) bicycle. This is done incrementally in steps and in conjunction with (the phases in) the urbanisation strategy. This strategy is elaborated in an area-specific manner in the ZWASH and Amsterdam Bay Area studies for the MIRT programme.
- To initiate a study for re-designing the (main) road network, which involves relocating and strengthening the distribution loop for through traffic around Amsterdam (A5, A9, A10-Noord). This study will provide information about the optimal combination of road infrastructure measures and policy efforts to keep the road network (main roads, secondary roads and local roads) in the MRA flowing smoothly in preparation for the intergovernmental MIRT consultation in the autumn of 2021.
- Draw up a 2040 multimodal future vision for the MRA as an elaboration of the Network Strategy for the intergovernmental MIRT consultation in the autumn of 2021. With the aim of further detailing the coherence between the transport modalities, the area studies and the transition to a safe, smart and sustainable mobility system; in line with the urbanisation agreements. Within this future vision, we will work with social partners and knowledge institutions to:
  - set the regional building block parameters for the National Future Vision on Bicycle Use (Nationaal Toekomstbeeld Fiets);
  - work out the (further) details of the multimodal hubs at city and regional level;
  - establish the link with the follow-up studies for ZWASH and Amsterdam Bay Area (both MIRT studies will involve bicycle use);
  - establish the link with overlapping programmes such as the MRA Urbanisation Strategy, Future Vision of National Public Transport and projects/studies organised by national and regional government (A27, Hoorn line, IJ river bank connections, local measures in the context of car-free urban areas, etc.).

With regard to the ZWASH study under the MIRT programme
National government and the regional authorities note and conclude that:

- Extending the North/South (metro) line to Hoofddorp is a good solution for creating capacity for the further growth of train traffic on the international/national network.
- Extending the North/South line will allow further development of the core corridor between Amsterdam Zuidas and Hoofddorp as an attractive

business establishment environment for international companies and contribute to the development of this area as the International Gateway to the Netherlands.

- Extending the North/South line is important for future-proof access to Schiphol Airport and as a remedy for lightening the load on the busy train station.
- Extending the North/South line is important for several large-scale housing development projects both in the immediate vicinity of Hoofddorp station and throughout all of Haarlemmermeer, and is consistent with the 50,000 jobs expected in Haarlemmermeer within the sphere of influence of the core corridor (including Schiphol).
- Closing the Ringlijn is a precondition for the area development in HavenStad, involving 70,000 homes and 58,000 jobs, and contributes to separation of the traffic flows in the public transport system (particularly in the Schipholspoortunnel) and thus to improved national and regional accessibility.
- The airport sprinter service can play an important role in the public transport network, but offers fewer opportunities for residential development and separation in the network to free up capacity on the railway network in the long term.
- Without extensive investment in the underlying tram network, a 'HavenStad' airport sprinter station is not a future-proof option for the period after 2040.
- The public transport topics have been prepared in sufficient detail to initiate an foresight assessment, however the 75% available funding requirement is not met.
- In the context of the investigated road measures, expanding road capacity for a number of road sections leads to an improvement in traffic flow, and the packages of measures in the studies also lead to a reduction in capacity bottlenecks in the area, but are not yet sufficient for completely resolving the bottlenecks.
- Future investments will continue to be needed to resolve these road bottlenecks.
- Information is still missing and this calls for further exploration in a follow-up study of the road measures.

National and regional government agree to:

- Consider the Zuidwestkant-Amsterdam-Schiphol-Hoofddorp study under the MIRT programme as completed and to adopt the conclusions.
- There are currently no resources available to make a start-up decision on the preferred alternatives of extending the North/South line between Amsterdam Zuid and Hoofddorp and closing the Ringlijn between Isolatorweg and Amsterdam Centraal ring line, costed at a total amount of €4.7 billion.
- To avoid losing time, the parties will continue to carry out the substantive work in preparation for the start-up decision.
- Jointly continue with the further elaboration of an integral development strategy, in which the spatial and economic developments, including accelerated housing construction and the developments regarding aviation and international train traffic, match the accessibility measures in public transport and the road and bicycle networks.
- Conduct an in-depth study to assess the optimal combination of road infrastructure measures for the road-related tasks in the corridor, in close coordination with the study regarding policy deployment and measures at the system level within the MRA Network Strategy programme line.
- Bring together the work done in relation to the themes of urbanisation, public transport, bicycle use and the road network in preparation for the MIRT intergovernmental consultation in the autumn of 2021 to facilitate integrated decision-making.

With regard to the Amsterdam Bay Area study under the MIRT programme

National government and the regional authorities note and conclude that:

- There is a major need for housing in the MRA, amounting to 250,000 homes in the period up to 2040, and that the eastern side of the MRA contributes substantially to this housing task, as set out in the urbanisation strategy.
- The housing task up to 2030 primarily focuses on the realisation of a substantial number of homes in IJburg and Almere, in relation to which creating living and work environments in Almere's town centre, through densification around Almere Centrum station is the largest development task. The remaining task activities focus on adding residential environments around the existing stations in Almere and strengthening the existing neighbourhoods.
- After 2030, Almere Pampus represents the greatest urbanisation ambition. This development makes a major contribution to the MRA's significant need for housing after 2030, and opportunities for accelerating this urbanisation ambition are still being explored.
- The Amsterdam Bay Area study performed under MIRT includes an integral development strategy for this area. The RRAAM agreements of 2013 were the starting point for this strategy.
- Bicycle use and the underlying public transport network are an important part of the development strategy for the East Flank and contribute to a

mobility transition.

- Good accessibility using all modes of transport is an important factor for adding a (substantial) number of homes in the eastern side of the MRA. The study examined several public transport variants, including an IJmeer connection and improving the existing railway. The effects of the spatial development on the road infrastructure were investigated in the study and bottlenecks were identified. Road-related measures have not been investigated at this stage.
- The mini SCBA shows that, in the case of the programmes for living and work examined in this study, an IJmeer connection does have societal added value. The development strategy assumes the construction of about 100,000 homes and the creation of about 40,000 jobs in the area, of which 75,000 homes and 35,000 jobs are in Almere.
- Irrespective of all the spatial developments, measures are also needed to restore the ecological system of the IJmeer/Markermeer and to contribute to the creation of a Future-proof Ecological System (Toekomst Bestendig Ecologisch Systeem/ TBES). Funding is available from nature and ecology organisations, including the parties in the Markermeer and IJmeer Steering Committee (SMIJ). This is in line with previous agreements in the RRAAM intergovernmental agreement. National government is already investing in improving the ecological quality via projects such as Markerwadden, Oostvaardersoevers and NH Markermeer Coast, and will continue to do so in the future.*

National and regional government agree to:

- Adopt the report on developing a strategy for the Amsterdam Bay Area (Naar een ontwikkelstrategie voor Amsterdam Bay Area), which presents the (interim) results and conclusions of the MIRT study and thereby endorse:
  1. The integral ambitions relating to urbanisation, accessibility, nature and ecology in this area.
  2. The need and principles for densification in Almere, accelerating Almere Centrum and the realisation of Almere Pampus in order to contribute to resolving the substantial housing need in the MRA.
  3. The IJmeer connection in the form of a light rail link, associated with the housing and employment programmes investigated in the study (approximately 100,000 homes and 40,000 jobs), is a promising solution for contributing to the main tasks of the SBaB programme and to the urbanisation task in the East Flank of the MRA.
  4. The need for investment in nature and ecology in and around the IJmeer/Markermeer.
- To continue the MIRT study and to complete a phased and adaptive development strategy for the MIRT intergovernmental consultation in the autumn of 2021, and to produce an integral and robust assessment of the themes of living, working, ecology, nature, landscape, recreation and accessibility (e.g. the choice of public transport system), in relation to the main tasks of the SBaB programme and the

urbanisation strategy.

- That sufficient new employment is an essential condition for a good balance in the city and for balanced area development. This is a joint task for the regional authorities and national government.
- In the follow-up study, attention should, at all events, be given to the required bicycle, road and public transport measures in relation to (the phases of) the spatial developments in the area (urbanisation strategy).
- As part of the development strategy, produce a financial analysis, including a summary of the costs, benefits and (alternative) sources of finance in relation to the packages of measures.
- As a first step for improving traffic flow on the A27 motorway, the regional authorities will work on implementing the Quick Win A27, Eemnes junction. A reconstruction of the intersection at the bottom of the Eemnes exit contributes to better traffic flow on the A27. The cost of this measure has been estimated at €2.4 - 3 million (including VAT). The contribution from national government amounts to a maximum of €1.5 million (including VAT). Implementation is planned in 2022.
- As a second step, an MIRT foresight study will be started to assess capacity expansion of the A27 between Almere Haven and the Eemnes intersection as a solution for the NMCA bottleneck on this route and to contribute to better reliability of the rapid-transit (HOV) public transport service. The scope of the MIRT foresight study will be embedded integrally within the Building Together for Accessibility (SBaB) programme. National government and the regional authorities will make joint agreements on this in the start-up decision. The investment cost for widening the motorway is estimated at €29 million (including VAT). The region's contribution is 25%.

Outcomes of the Living Environment intergovernmental meeting (BO Environment) of 21 April 2021

(source: letter from the Minister of the Interior and Kingdom Relations to the Lower House, 7 June 2021, reference, 2021-0000281596)

National government and the regional authorities share a joint ambition to accelerate realisation of the major urbanisation task in the Metropolitan Region Amsterdam and Metropolitan Region Utrecht. This is a complex task, which is only feasible if a large number of prerequisites are met in terms of affordability, investment capacity of the corporations, the nitrogen approach, noise accumulation, liveability, accessibility including upscaling public transport, the energy transition, climate adaptation and landscape development. National government and the regional authorities appreciate that this requires both more resources and a transition from project-based funding to joint and adaptive, multi-year, programme-based funding. National government and the regional authorities have therefore agreed to work out an outline national-regional programme for the Amsterdam and Utrecht metropolitan regions as an integral part of the regional urbanisation strategies, on the basis of which the considerations and choices to be made can be discussed in the BO MIRT intergovernmental consultation on the multi-year infrastructure, spatial planning and transport programme in the autumn of 2021. The national-regional spatial planning process will consist of a multi-year overview of the most important national-regional investments, including their costs and potential coverage, and can be updated annually on the basis of the plans and information regarding phasing and prioritisation that are current at the time. After the summer recess, an intergovernmental consultation on housing and urbanisation strategies will be scheduled to discuss the progress of the urbanisation strategies, including the national-regional spatial planning process and the use of the existing instruments for housing construction.

Colophon

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