



Ministerie van Infrastructuur en Milieu



Partners in Geo

Shared vision of government, private sector and scientific community on the future of the geo-information sector



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Introduction

Under the title “Partners in Geo”, government, private sector and the scientific community present a joint vision on the future of the location-based information sector. We believe it to be a bright future. There are innumerable opportunities to increase the range and amount of usage of location-based information. Government can create the right conditions by setting up a fundamental infrastructure with freely accessible location-based information. Private sector can focus on developing innovative products, while the scientific community continues to extend the boundaries of what is technically possible. Those involved can achieve the best results by working together and capitalising on each other’s strengths.

Collaboration should not be restricted to the sector itself. Location based-information is too valuable not to be shared with everyone. To realise this vision, we will continuously be seeking diverse combinations of participants, both inside and outside our sector. Together, we can make the whole more than simply the sum of the parts. This collective vision forms a first, and crucial, step on our way to a shared future.

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Target scenario 2020

By 2020, the possibilities for using location-based information in our daily lives, in the governmental services and in the businesses of the private sector will be changed immense. Due to sensor and mobile data there is a gigantic amount of real time location-based (linked) open data (big data). All these data will be applied in a pervasive way supporting our lives as modern citizens.

This means, for example, being able to read the amount of energy being consumed at any given moment, so that customers can adjust their usage accordingly. Traffic congestion has decreased, as routes are adjusted in response to both information on current traffic and weather conditions as to advanced forecasting traffic models. Actual supply and demand of voluntary and professional care is locally successfully adapted. The cost of failure in construction projects is reduced due to the availability of increased and improved location-based information. Our worldwide lead in knowledge on water management has advanced as we use new applications for location-based information.

In the period preceding 2020, this target scenario is made possible because all the governmental location-based key registers are made publicly available as open data. Government also encouraged and facilitated innovation. All sections of government in the public domain collaborate closely. Our education in the field of location-based information ranks among the best in Europe. Dutch scientific institutions have taken theoretical models out of the laboratories and put them into practice, by partaking in a continuous dialogue between government and private enterprise. The private sector's innovative attitude brought new products and services, unexpected insights and a strong international position. Government's role of obtaining and distributing data is now partly fulfilled by private sector and by citizens (crowdsourcing). Together, our sector has worked energetically and successfully to create the vision that you now read.



CONTEXT

Trends

Global level

The world around us is continually changing. On a global level, the world's population is expected to further increase in the near future. For the first time in history, more people live in cities than in rural areas. These cities depend on the supply of raw materials from other areas for their survival; so the interdependence of regions will grow. Many of these cities are located in low-lying areas and are thus particularly vulnerable to climate change. These developments are accompanied by global issues relating to the creation of a sustainable economy. How do we ensure there is enough energy? How do we share scarce raw materials? How do we simultaneously accommodate population increase and the ageing population? Finally, how do we safeguard our welfare and prosperity? All these issues converge in the midst of one of the greatest economic crises in modern history.

European level

The consequences of these global trends are also felt in Europe. The awareness that cross-border collaboration is necessary, if we are to tackle effectively the consequences of these developments, has led Brussels to play an increasingly important role in the field of location-based information. The European 'Galileo' satellite navigation system, the 'Copernicus' earth observation system and the INSPIRE spatial data infrastructure are striking developments. The European dimension plays a significant role in the way the Dutch policy on location-based information evolves.

National level

The trends mentioned are also important in the Dutch context. The ageing population is still increasing and so is the move of people to cities, thereby depopulating the rural areas. The Netherlands has an important mainport function for the Western part of Europe. The Dutch economy is well-known for its dependence on both import and export. Dealing with water issues is in our DNA, which is a good thing, because many of our most economically valuable, highly urbanised areas are also the ones most susceptible to flooding. In our densely populated country with limited space there is also the challenge of delivering sustainable prosperity and welfare to our population. Within the margins of our limited resources, we must respond to the economic crisis with ingenuity if we want to maintain the quality of life we have achieved. Instead of launching new, large-scale building projects, in the future we will see a focus on smart management, (re)use and transformation of our existing built environment.

Technological level

We are no longer surprised by a talking navigation system that adjusts itself when we drive the wrong way, or by seeing an updated map indicating the traffic jams when we watch the morning news. Despite these tools, which have become a normal part of our lives over the past decade, location-based information is still in its infancy with respect to the seemingly boundless possibilities it will be able to offer in the near future.

Soon, all kinds of public and private sensors will measure big volumes of data concerning the direct surroundings: the water quality in the ditch around the corner, local air quality, how busy it is in the swimming pool or the gym, the number of cars going to school and the (dangerously high) speed of the approaching delivery van. In short, we are on the threshold of a wealth of available data; data that are evolving steadily from linked data to a semantic web environment. One of our greatest challenges will be to effectively transform the enormous amount of structured and unstructured available sensor data into meaningful and primarily location-based information that can be used effectively on a real-time basis.

Social level

These developments have major consequences for the way we organise our society and our individual lives. Whilst the government steps back, citizens and private companies increasingly take their own initiatives. The volume and diversity of location-based information is growing. There are more and more examples of new initiatives on local and regional level, without government involvement. The growing amount of available data, the possibilities for anyone to collect data and the economically viable ICT options for processing data, enable citizens and private sector to develop their own solutions.

Consequences for location-based information policy

Location-based information makes (physical) developments and changes visible, is a powerful tool for context, integration and synopsis. This identifies underlying causes and enables society to respond. To be successful, the provision of information must be customised according to the trends above mentioned.

The Netherlands owns an enormous number of registrations containing location-based information. However valuable these might be, for the most part all they describe is a snapshot of reality. In our complex and highly dynamic society this increasingly falls short of what we need. To make the most appropriate choices in a given situation, it is increasingly necessary to be immediately acquainted with the current facts, to understand the nature of the dynamics and to predict their future effects. This information should be scalable to various levels because many issues have a different impact at different levels.

The collection of public location-based information generally stops at the front door. However, we spend most of our time indoors. This also means that public space is shifting from outside to inside the built environment. This coincides with the shift from creating new buildings to managing existing buildings.

The role of private companies and citizens in the production of information is greatly increasing. Slowly but surely, the government monopoly is dissolving. Particularly in the field of dynamic data, the millions of observations from smartphones and other sensors will be a welcome addition to the measurements from the dozens of public data gathering networks. Although it is not easy to accomplish, a clear interpretation of all this sensor data would allow it to be applied both within specific areas, such as water and air, as well as across other domains. To make the best use of the information available to our society while showing respect for privacy, agreements must be reached between government bodies, private companies, the scientific community and citizens, on how to organise our future information supply. Creating new information monopolies is undesirable.



HEALTH CARE and location-based information

Most important developments

- Costs of health care are increasing
- Population is ageing
- The quality of care requirements is higher
- Pro-active attitude of the citizens
- Living in one's own home for as long as possible is desired
- Quality, flexibility and adaptability is expected of the direct environment
- Care institutions need to be within reach: location and density issues
- Demand and supply for care need aligning (including location parameters)
- Health care responsibility is being decentralised (from national to local level)
- Government is providing less care, encouraging more market forces to act (both profit and non-profit)

Challenges – opportunities

- Spatial fine-tuning and better coordination of supply and demand (local – regional); providing more economical, better and quicker health care
- Providing open data in health care with respect for privacy (if necessary, aggregating or generalising location-based information)
- Adding location history to Electronic Patient Registers (geographically depicting location-related health risks)
- Relating health care to the direct environment and management of public space (removing physical obstacles)
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Box 1: Challenges in the theme of Health Care



SPATIAL PLANNING, TRANSPORT and location-based information

Most important developments

- Space is scarce: a fascinating mix of growth and decline is emerging
- Decentralisation dominates the practice of spatial planning
- Accessibility is becoming more assured – abolishing serious traffic congestion and bottlenecks
- Area development is consciously integrating diverse policy fields – guaranteeing the quality of the living environment
- The New Environment and Planning Act is being established, with a supportive spatial infrastructure of data (Avenue of the Living Environment)

Challenges – opportunities

- Providing a high quality location-based information foundation to improve land use and transport
- Using INSPIRE as a vehicle and leading principle for the information infrastructure, standardisation and governance of the new Environment and Planning Act
- Achieving cost savings and shorter formal procedures due to optimal use of location-based information
- Establishing location-based information as a foundation for the management of public space and (the total lifecycle within) asset management
- Developing 3D + dynamic information; innovative and dynamic visualisation
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Box 2: Challenges in the themes of Spatial Planning and Transport



AMBITION AND PURPOSE

In 2020, the Netherlands has reliable, accessible, up-to-date and multi-scale location-based information services. This infrastructure answers three basic questions related to individual, social and physical situations:

1. What is the current situation?
2. What are the dynamic influences at work?
3. How will the future develop?

In those cases where location-based information is a necessary condition for implementing legally-required government tasks, the government takes the lead to guarantee statutory compliance. Where location-based information plays a more service providing role, partners in the triple helix cooperate to find ways to promote innovation, improve quality and reduce costs.

The Netherlands is, in many respects, an ideal test bed and “living lab” for new concepts based on location-based information, such as for smart cities. These concepts can then be marketed abroad. Apart from the national interest in achieving qualitative location-based information services, creating export opportunities for our knowledge, products and services is a significant purpose in this vision.



ENERGY and location-based information

Most important developments

- Focus is on sustainability with regard to climate and environment
- Prices of raw materials are increasing and stimulating the transition to a circular economy
- Inclusive policy is taking shape, energy choices interact with other policy areas
- There is limited space for (sustainable) energy in a densely-populated country
- Society is developing, forming networks from the bottom up

Challenges – opportunities

- Providing a high quality foundation of location-based information for the energy sector / a minimum level of information is required regarding energy developments
- Designating appropriate land use for energy purposes, considered with and against other policies
- Visualising energy developments for use in (public) participation and support activities
- Mapping and communicating best options per location (X Y coordinate)
- Fine-tuning the production processes for the best possible (re)use of waste heat and other residual products
- Facilitating open data of (all) infrastructure information for efficient asset management and coordinated maintenance (e.g., between national, provincial and local levels)
- Creating an overview of information for decentralised generation of energy and redelivery to the network (encouraging use of privately collected energy)
- Encouraging an open infrastructure for overview of decentralised energy generation, for example from private or corporate solar panels
- Establishing city, district and neighbourhood competitions for sustainability via (open) location-based information
- Providing insight into energy consumption of food transport and production chains
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Box 3: Challenges in the theme of Energy



FOCAL POINTS

A reliable basis

A reliable geo-information basis starts with the proper management and further development of the elementary infrastructure. The first focus is our national geodetic infrastructure, which provides a framework for linking location-based information. This infrastructure includes the location-based key registers and the mandatory INSPIRE-registered data sets and services. The (predictive) models required for the proper functioning of the primary government processes are also vital here. Attention to standardisation and harmonisation remains indispensable for the proper functioning of the elementary infrastructure.

Obviously the underlying principles for this infrastructure will be expanded in the years ahead to include sector-specific datasets and services which are essential for the challenges those sectors face. The development of the new Environment and Planning Act offers a great opportunity to combine earlier developments into one integrated location-based information infrastructure. Examples of earlier developments are the set of key registers and INSPIRE. The agreements, governance and infrastructure of INSPIRE are exemplary of the sectorial data needed for this Environment and Planning Act.

Technological and social developments mean we need to keep the existing information services up-to-date. Big data, linked data, the increasing need for integrated, validated, current and dynamic data all impose additional demands on the current organisation. Of vital importance are the issues of: identifying and, where possible, coming to agreements on, the differences in the conceptual framework; using open standards and eliminating legal and organisational barriers; embedding geo-information services within the overall public information services. Particularly with regard to the latter, we aim to be reaching out to the aspirations of the Digital Government 2017-programme.

Knowledge infrastructure

Having sufficient highly skilled staff is a precondition for the sustainability of our sector. We need structural and significant investment in training people to use location-based information in the Netherlands. In addition, we need to invest in exchanging, coordinating and embedding knowledge within the triple helix if we are to fulfil this vision and market our common knowledge internationally. The constantly innovative nature of location-based information services means that current staff continually needs to take refresher courses, and there needs to be a healthy labour market for our professionals. Therefore, government and the private sector are exploring options for increasing the number of internships for students. Educational institutions will seek contact with government and private enterprises to ensure that course programmes reflect the practice.



Open data

Easy access to fundamental public information and other public location-based information is a necessary precondition for the best possible use or reuse of the data and models financed by the public sector. This vision confirms endorsement of this open data policy. When making data available, the most promising datasets will be given priority.

Besides making data available, government, private companies and the science community will actively promote the reuse of this location-based data. Innovation networks will be set up for a number of themes inspired by the National Satellite Data Portal. The government will create the right conditions, the market will anticipate the (latent) requests and science will play its guiding role.

Innovation

A reliable and open public information facility is crucial if application-oriented innovations within the sector are to succeed. We need to conduct more fundamental research to be able to find solutions to future location-based issues. With the identified trends in mind, the following priorities apply to scientific research for our sector:

- Transition from static to dynamic data
- Multi-scale approach
- Linking location-based information inside and outside our buildings and the built environment

Innovation is not limited to discovering new applications and techniques within the sector. The greatest benefit could perhaps be achieved by transforming these innovations for, and linking them to, other (top) sectors and new markets. The current economic situation also requires innovation in the development of new financing methods and business models.

The triple helix strives to realise a clearly recognisable research programme in which the private sector, government and the scientific community will invest. Together they will also explore the possibilities of joining major European research programmes such as Horizon 2020.

Better usage

It is in the interest of our sector that location-based information is used as broadly as possible. Existing solutions can be further improved or new applications can be developed using existing, and creating new, products and services. Not only does this apply to traditional sectors such as Agro and Food and Legal Security, it also applies to other sectors where, at best, marginal use is being made of location-based information. In this vision, we have chosen to focus on five sectors: Health Care, Energy, Water, Spatial Planning and Transport and Construction, see Boxes 1 to 5. This choice is based on criteria such as social relevance, the link with top sectors, marketing opportunities and the scope for innovation.

To contribute with the most appropriate products and services to these sectors, it is important to know precisely what they need. It is the demand for, rather than the supply of, location-based knowledge that should be at the forefront when further exploring options within these sectors. The Dutch location-based information sector will focus actively on this approach, with one of the activities being starting a dialogue with the relevant ministries and the associated private companies and umbrella organisations in these fields.

Marketing and communication

Although many citizens, the private sector and government bodies may be unaware of it, location-based information plays an important role in their daily activities and is often crucial in business processes. The triple helix makes the strength of innovation in this sector more visible with a joint marketing plan.

All triple helix partners collaborate to bring the location-based information sector into the spotlight of Dutch society: new products, scientific breakthroughs and innovative government services are publically acclaimed and specifically brought to the attention of relevant parties. Deliberate attention is being actively given to emphasize the added value of location-based information to the Dutch society.

The sector is organising an annual 'innovation award', which will promote the inventive and innovative image of our sector.

International

Information does not stop at a country's borders. A pro-active, agenda setting role of the Netherlands is important as the European policy has a particularly influential role in Dutch location-based information services. INSPIRE, HORIZON 2020 and the Digital Agenda for Europe may be the most obvious examples, but one should also consider SEIS, Galileo/Egnos, Copernicus, the Water and Marine Framework Directives, CORINE Land Cover, Natura2000 and the Common Agricultural Policy. Major commercial players, such as, Google, Microsoft, Apple and Oracle, are also creating important international developments in this market. At the global level, the standards of the Open Geo-spatial Consortium and ISO are promoting the interoperability of location-based information. Anticipating international developments in a timely manner and influencing them, combined with active participation in international knowledge networks, will help to safeguard Dutch interests and offers opportunities for marketing Dutch solutions abroad.

Collaboration in the triple helix

As previously indicated, government, private enterprise and the scientific community can achieve the best results by using each other's strengths. This means that designing a stable and long-term method of collaboration and partnership is a vital task, with clear agreements on roles, responsibilities and activities. Apart from striving to achieve the efficient execution of activities and business within the sector, the focusing on the citizen and/or consumer is important.



CONSTRUCTION and location-based information

Most important developments

- The economic crisis has led to shrinking order portfolios, low levels of investments and falling housing prices
- Demands and requirements in terms of sustainability and energy efficiency are higher
- More chain collaboration with parties from outside the sector
- Housing requirements are evolving, following demographical developments

Challenges – opportunities

- Within the triple helix, defining and agreeing to minimum location-based information requirements for spatial modifications
- Coordinating further development of the Building Information Model (BIM) with standards for location-based information
- Reducing the costs of failure and minimising risk by better use of information
- Storing data about the total lifecycle of buildings, right from the start of the construction process
- Creating a more effective and efficient design for construction logistics
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Box 4: Challenges in the theme of Construction

GOVERNANCE

Government, the private sector and the scientific community contribute jointly, each acting from their own positions to provide reliable, accessible, up-to-date and multi-scale location-based information.

Government

The government is responsible for the fundamental facility of the national geo-information infrastructure, her primary responsibility being the creation and maintenance of the appropriate standards, laws and regulations. The political coalition agreement includes devoting considerable attention to guaranteeing the privacy of citizens. The government will, however, soon reach the limits of its sphere of influence in this respect; effective agreements must be reached at an international level and in close collaboration with the private sector.

The government also has an important role to play in making public data accessible and promoting its reuse. Innovation plays an important role in collaboration in the triple helix. The government enables this collaboration: delegating the leading role of innovation to the private sector while also promoting research and science and encouraging the academic and private sectors to work closely together. The government focuses on identifying and the clear formulation of new and/or changing needs in society and the market and on shaping the role of “launching customers”, those early purchasers of new products.

In the near future, attention will be specifically devoted to the relationship between the market and government. Both parties benefit if the executive organisations fulfil their public tasks in a more clear and uniform manner. Reducing uncertainty encourages private investment. It also creates clarity about which services can and cannot be delivered by the government. When the government gives a commission to the private sector, it will do so as a professional and transparent client.

The Private Sector

This vision requires a market where the private sector is pro-active and takes initiative. The private sector will focus on innovating products and conquering new (international) markets. To this end, companies collaborate more closely and seek partnerships with other sectors. Their dependence on government contracts will be reduced.

Next to the services they provide to other businesses in the private sector, private companies now work towards a better provision of services to the consumer market, not least by finding more creative uses for public open data. The private sector helps the government to organise the fundamental infrastructure more efficiently, to set priorities within the open data policy, and to devise and continually renew the innovation agenda.



The Scientific Community

The scientific community plays a guiding role in our sector. Universities and knowledge institutions are particularly suited to identify future issues, to conduct research and to facilitate communication within the triple helix. The private sector and the scientific community work together on enhancing the value of research results. Models are now being developed and validated, which can interpret sensor data clearly and integrate it correctly, so that this information can be used both within specific domains and across domains.

The scientific community can also help the government to determine whether its location-based information policy is successful, and to make any necessary adjustments. The scientific community is also primarily responsible for the relationship between the supply of proper education fitting the needs of the market and government.

Governance

The government, the private sector and the scientific community, each in their own field, determine the focal points of this vision, concentrating on the priority sectors where possible, see Boxes 1 to 5.

To prevent the plans from diverging from one another as they further develop, the partners in the triple helix have created a strategic “top team” comprising the chairs of the GI council, of GeoBusiness Nederland and of the Netherlands Centre for Geodesy and Geo-informatics. This strategic group meets every six months to coordinate activities and actively seeks opportunities for collaboration.

WATER and location-based information

Most important developments

- Water remains a very dominant factor in the Netherlands’ spatial development, partly as a result of climate change,
- Water management provides guiding, long-term decisions for the Netherlands’ future
- Safety is a crucial factor
- Optimal provision of fresh water becomes more complex
- The water cycles within urban areas gain importance
- Spatial planning extends out into the sea; maritime spatial planning

Uitdagingen – kansen voor geo

- Recording data on the entire water cycle and making the data interoperable
- Considering water within spatial parameters, in conjunction with other sectors
- Integrating dynamic data from the sensors
- Making open data available to promote innovation and export products
- Making 3D information more accessible and applicable
- Creating opportunities for modelling in time and with different scales
- Promoting collaboration with other parties to improve public information
- Providing a platform for collaboration in the triple helix for parties from diverse sectors
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Box 5: Challenges in the theme of Water



Ministerie van Infrastructuur en Milieu



Partners in Geo is the shared vision of the government, private and scientific community about the future of the geo-information sector.

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More information: www.geosamen.nl