



Ministry of Infrastructure and the
Environment

I&M creates space

The Infrastructure and Environment Ministry's Strategic
Knowledge and Innovation Agenda for 2012-2016



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Foreword

‘I&M creates space’ is the title of this, the Ministry’s first Strategic Knowledge and Innovation Agenda or SKIA. Within our vision this involves space for growth and manoeuvre, now and looking ahead.

Policy at the I&M Ministry focuses on the sustainable deployment of space in this country. This means accessibility of economic hubs, liveability in urban and rural areas, and flood protection. All these tasks require consistent policy from government – which will stand the test of time – plus in-depth knowledge and robust powers of innovation.

‘I&M creates space’ also entails greater space for the public, corporates and governmentals to determine the quality of their own living environment with minimal encroachment by national or local authorities. The parties on the spot know best how to cope with local matters.

In the meantime the people at I&M are focusing on issues with a national impact, including main passenger and goods networks, flood protection and environmental standards.

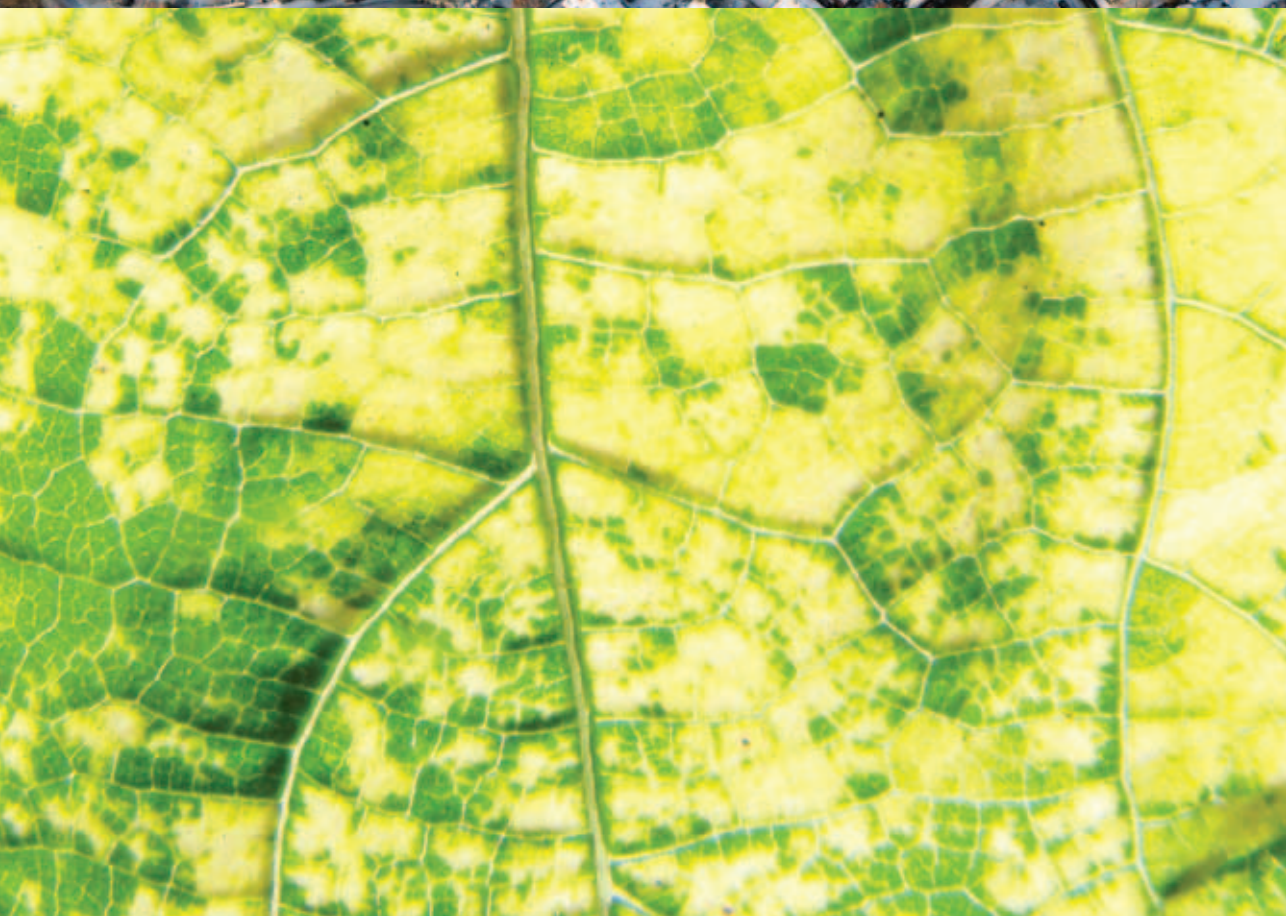
The Ministry’s first SKIA outlines seven target themes around research and innovation over the next four years. We will be acting jointly on this agenda with corporates, social organizations and governmentals. This will ensure that I&M stays firmly with both feet on the ground while working effectively towards keeping this country competitive and attractive.



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1 Introduction

A SKIA for the Infrastructure and Environment Ministry - why?

“In 2030 will the Dutch delta be an object lesson for other highly urbanized deltas elsewhere in the world - protected by smart dykes, with floating districts, and equipped to deal with climate change? Will we then be able to reach our destination, quietly, without emissions, via the optimal route, with the ideal means of transport? - be that in city centres or amidst greenery conducive to relaxation, or even - if possible - the water side? And in 2050 will we still earn our living by exporting this low-lying land’s centuries-old speciality, namely knowledge around water, great sea- and airports, logistics and living bunched up? All of this with smart, attractive cities with a mix of highly developed agriculture and 100 percent re-cycling of goods, and a more than ample supply of sustainable energy sources. Above all, would this involve the input and diverse creativity, skills and passions of the people of the Netherlands?”

The I&M Ministry’s knowledge and innovation agenda prompts almost limitless dreams and fantasies. Indeed, it’s easy to want too much too soon. A Strategic Innovation Agenda or SKIA helps I&M focus on key themes for the country’s future.

I&M’s various sections and policy departments have dedicated SKIAs targeting their particular policy areas. This SKIA for I&M was jointly formulated by the various sections and focuses both on umbrella themes and themes linking the policy areas of spatial development, water, the environment and accessibility. In so doing, it invites one to look beyond the borders of policy fields and contributes to the further integration of the newly formed I&M Ministry.

Together this Ministry’s SKIA and the dedicated section SKIAs form the basis for programming and prioritization of research within the department and the knowledge institutes associated with the Ministry, including the KiM¹, PBL, RIVM and KNMI. The agenda also provides research programming around organizations including TNO, the GTIs and NWO. The SKIA seeks to further advance relevant and promising innovations; in so doing it shows the thrust of I&M’s needs in knowledge and innovation. The agenda directs attention and the (limited) funding available for knowledge and innovation at seven themes.

¹ See glossary

The choice of themes results from an analysis of trends and developments offset against I&M’s ambitious aims. I&M seeks domestic and international alliances to further these aims.

This Innovation & Environment Ministry SKIA can be seen as the successor to the Strategic Knowledge agenda VROM and WWI (2008) and the V&W SKIA Mobility and Water (2008).

In preparing this SKIA lessons have been drawn from evaluation of the V&W SKIA which calls for increased focus on the direct effects and steering of the SKIA. The agenda also features topics, such as behaviour, from the 2008 agendas. At the same time - as is appropriate for a new Ministry and significant changes around the world since 2008 - many of the themes in this SKIA are new.

What is Infrastructure and Environment's SKIA?

I&M's SKIA comprises knowledge and innovation agendas. The knowledge agenda focuses on strategic knowledge issues which are relevant to I&M policy in the short, medium and long terms. The focus of the innovation agenda is on innovations in the start-up stage and innovations which I&M can upscale and implement within the space of one or two years.

Drafting I&M's SKIA forms part of the Knowledge policy for Infrastructure and the Environment's multi-year agenda dating from 2011 ². Action 13 on the multi-year agenda is "Updating and publication of strategic knowledge agendas both at section levels and across I&M".

I&M's multi-year Theme Programme for Knowledge Policy comprises a total of 19 actions (alongside action 13) in the area of knowledge infrastructure, linkage of knowledge supply and demand, and knowledge management within I&M. The overall aim of I&M's knowledge policy is to promote more effective and efficient deployment of knowledge around policy development and implementation.

² Knowledge policy for Infrastructure and the Environment.

The SKIA runs for four years during which time the Ministry may fine-tune the agenda. I&M will draft an implementation programme for the agenda after the summer of 2012; this will detail the steps required to achieve the desired effects and set out responsibilities per party. The Ministry will ensure that the implementation programme is positioned in programming at the knowledge institutes and planning agencies and will do the same at the knowledge roundtables with other Dutch and European governmentals. Innovation tasking will be covered by facilitating alliances with corporates, knowledge institutes and social organizations. Progress will be assessed in the 2013 Innovation Relay.



2 From aims and trends towards themes of knowledge and innovation

The shaping of I&M's Strategic Knowledge and Innovation agenda takes place via interfacing relevant social trends and developments with the Ministry's policy aims. This confrontation is the basis for inclusion of knowledge and innovation themes in the agenda. The following chapter outlines the process and the relevant input foreseen by I&M.

I&M's ambitious long-term aims linked to government policy

The Dutch government aims to make this country stronger, safer and more prosperous. Maintaining and enhancing a strong economic position and international competitive ranking demands space for entrepreneurship and targeted investment in education, innovation and infrastructure.

The government seeks to create the conditions for economic recovery and an enhanced competitive position; this includes getting the nation's finances in order and reducing bureaucracy. Over the next several years the financial and economic crisis will mean less public funding available to meet demands by society as a whole. Meanwhile, availability of private funding is uncertain. Government is enhancing the country's competitive status via policy which is generic, sector-dedicated (top sectors) and area-dedicated (economic core areas). Meanwhile, the national government seeks a more customized, integrated approach by devolving tasks to other governmental bodies.

The Infrastructure and Environment Ministry is tasked with promoting the quality of life, (physical) safety and accessibility in the Dutch delta. To this end, in line with national government policy, I&M has formulated the following ambitious aims for the period up to 2028:

1. Create space for the public, corporates and other governmentals;
2. Top marks (from the population) for urban and rural quality;
3. Intelligent preparation of the Dutch delta for flood hazards and periods of drought;
4. Uninterrupted access to core Dutch economic regions plus the ability to compete worldwide with other urban regions;
5. People and goods to be sustainably, safely transported by land, water and air, within a given time-frame;
6. Closure of energy, water and raw material chains.

The Ministry's challenge is to develop and implement policy for these aims – taking in promising and threatening trends and developments in this country, Europe and across the world.

Trends and developments

³ National Knowledge Agenda, phase 1: trends and developments.

Major change is underway across the globe and here in the Netherlands. The National Knowledge Agenda ³ points to 18 key trends. These include international developments, such as shifts in balances of power, the economic and financial crisis, globalization, technological developments, the burgeoning importance of knowledge and information, and tensions within the European Union. Also involved are Dutch domestic trends like altered demographics (population and households), shifts in information provisions (burgeoning role of computerization and media), on the part of the public, organizations and other governmentals. Taken together this enables new potential and challenges for national government – like changes in position, policy tools and financial resources.

And so, I&M needs to realize these ambitious aims for 2028 within global and Dutch scenes - both in rapid change-mode.

The following trends from the National Knowledge Agenda are particularly important for I&M:

- **The great rebalancing – shifts in global balances of power**
Emerging economies, political and military powers, shifting value systems and geopolitical shifts.

- **Competition for the earth's resources**
Rapidly emerging new economies mean burgeoning demand for raw materials, energy and water.

- **Climate shifts and pressure on biodiversity**
For this country the priorities are flood protection and sufficient, good quality freshwater, plus the impact on food production, transition to sustainable energy supplies and preservation of ecosystem functions and biodiversity.

- **Fragmentation, shedding of traditions and the ending of institutionalization**
Far-reaching individualization, more problematic representation, a greater role for social media, legitimacy of government under pressure, society increasingly pluriform.

- **A more compact world**
The ongoing interweaving of worldwide systems strongly increases the flows of people, goods and information.

- **The growing role of towns and mega-cities**
Ongoing global urbanization, burgeoning competition between a limited number of urban regions and demographic shrinkage in peripheral areas.

At the time the National Knowledge Agenda appeared the financial and economic crisis had yet to hit a low. Despite scoring reasonably well across a large number of international rankings, the Netherlands was not immune to a second recession. The impact included a decline in the construction sector, empty office premises, falling house prices, unemployment and pressure on government finances. Meanwhile, the future is uncertain for the EU and the Euro and there are major question marks around developments in countries outside Europe – with a major potential impact on the Netherlands. And, while we can do more, a fixable future appears further away than ever – thanks both to complex dynamics and the fact that outlooks on the future, interests and opinions are more divergent than ever.

These trends and developments mean that I&M's ambitious aims will demand a major focus on utilizing society's energy, the innovative power of the marketplace, adaptable policy – plus crafting of fresh action perspectives.

Trends and developments confronting the aims of I&M

I&M has detailed the six ambitious aims within concrete policy paths, i.e. visions, agendas, legislation and measures. Meshing with these policy paths I&M sections set out the knowledge and innovation tasks within their own SKIAs. Comparing these ambitious aims with relevant trends and developments for I&M yielded seven universal, supplementary knowledge and innovation themes at overall Ministry level. The figure below shows the aims and policy paths relating to the trends developments and links them with the seven themes.

The seven knowledge and innovation themes stand for the various ways of regard a future relevant to I&M. In broad terms there are two types of knowledge issues and innovation tasks:

- Ministry-wide knowledge issues and innovation tasks around the changing role of government/I&M in society in safeguarding public interests: **(figuratively) creating space for society!** See Chapter 3.

- Ministry-uniting knowledge issues and innovation tasks in future tasking for society around the structuring of space in the Netherlands: **(literally) creating space in the Delta!** See Chapter 4.

The three themes around the changing role of government differ in terms of perspective for exploration of potential system-wide changes for the steering function of local, regional and national government:

Theme **A. Energetic society, governance and decentralization** chiefly looks at government's steering potential in relation to societal forces and how these can contribute in maintaining and developing public values.

Theme **B. Financing, earning models and other market approaches** chiefly looks at the organization of public and private funding for the realization of public works and values.

Theme **C. Individualisation and behaviour** covers knowledge issues and innovation tasks aimed at enhancing insights into individual behaviour and its development, the objective being to formulate frameworks – whether or not experimental – and policy instruments for maximum deployment of this knowledge.

These three umbrella themes apply to several I&M sections (corporate themes) and are also identified in the area of the physical living environment by the ministries of Economic Affairs, Agriculture And Innovation (EL&I), and Interior & Kingdom Relations (BZK).

The four themes identified in regard to future societal tasks are based on differing concepts for development of the physical living environment.

Theme **D. Regional spatial development** takes as its starting point the layer approach from the National Spatial Strategy Summary: surface (safety!), occupation (quality of life!) and the networks (accessibility!).

Theme **E. Junctions and networks** views all I&M networks in mutual linkage. Travellers and transporters provide the main point of view here. What's the easiest way to get goods and people from A to B?!

Theme **F. Sustainable mobility** looks at traffic and transportation in terms of mega-tasking to drastically cut the burden on planet earth.

Theme **G. Closure of energy, raw material and water supply chains** looks past the layers to address current and future opportunities that enable closed-loop supply chains while maximizing use of (nationwide) regional water and sustainable energy sources.

Overview of the four concepts:



The layer approach



Regional supply chains for raw materials, water and energy



I&M's ambitious aim	Relevant policy processes	Trends and developments	Knowledge and innovation theme
1. Create space for the public, corporates and other governmentals	<ul style="list-style-type: none"> • Environment and Planning Act • SVIR • Green Deals • Administrative agreement • Sustainability Agenda • Climate Letter 	<ul style="list-style-type: none"> • Fragmentation • Financial crisis • More compact world 	<p>a. Energetic society, governance and decentralisation</p> <p>b. Financing, earning models and other market approaches</p>
2. The Dutch give top marks to the quality of urban and rural areas	<ul style="list-style-type: none"> • SVIR • Sustainability Agenda • Climate Letter 	<ul style="list-style-type: none"> • Fragmentation • Growing role of towns and very large cities 	c. Individualization and behaviour
3. Our delta is intelligently prepared to deal with rising water levels and periods of drought	<ul style="list-style-type: none"> • Delta Programme / MIRT • National Water Plan 	<ul style="list-style-type: none"> • Climate changes and pressure on biodiversity • Growing role of cities and metropolises 	d. Regional spatial development
4. Our core economic regions are permanently (internationally) accessible and competitive with other urban areas worldwide	<ul style="list-style-type: none"> • SVIR • MIRT • Beter Benutten • Aviation policy document 	<ul style="list-style-type: none"> • The great rebalancing • More compact world • Growing role of towns and very large cities 	
5. People and goods can move around sustainably, safely and within a pre-set time frame by land, water and air	<ul style="list-style-type: none"> • SVIR • MIRT • Beter Benutten • EU roadmap sustainable mobility 2040 • Aviation policy doc. 	<ul style="list-style-type: none"> • More compact global networks • Growing role of towns and very large cities • The conflict to claim our planet's resources 	<p>e. Junctions and networks</p> <p>f. Sustainable mobility</p>
6. Closure of energy, raw materials and water supply chains	<ul style="list-style-type: none"> • Sustainability Agenda • Waste Letter • Delta Programme • Climate Letter • EU roadmap on Resource Efficiency 	<ul style="list-style-type: none"> • Competition for our planet's resources • Climate changes and pressure on biodiversity 	g. Closure of energy, raw materials and water supply chains

Government's role – the I&M perspective

The I&M Ministry sets out – and directly contributes to - frameworks whereby other parties can ensure safety, accessibility and quality of life for this country. This means 'enabling and ensuring'. To this end I&M also deploys the findings of research and innovation projects. Knowledge development is a prime tool in helping I&M outline future policy. Innovation projects contribute to implementation of current policy. Think and act!

Government's role in knowledge development

I&M itself takes the initiative in responding to knowledge issues. In this context it differentiates between:

- knowledge required in-house to exercise its public tasking worldwide and in Dutch society – both of which are in transition, and
- knowledge available externally. I&M decides how it will cooperate here – nationally, at the European level, or internationally.

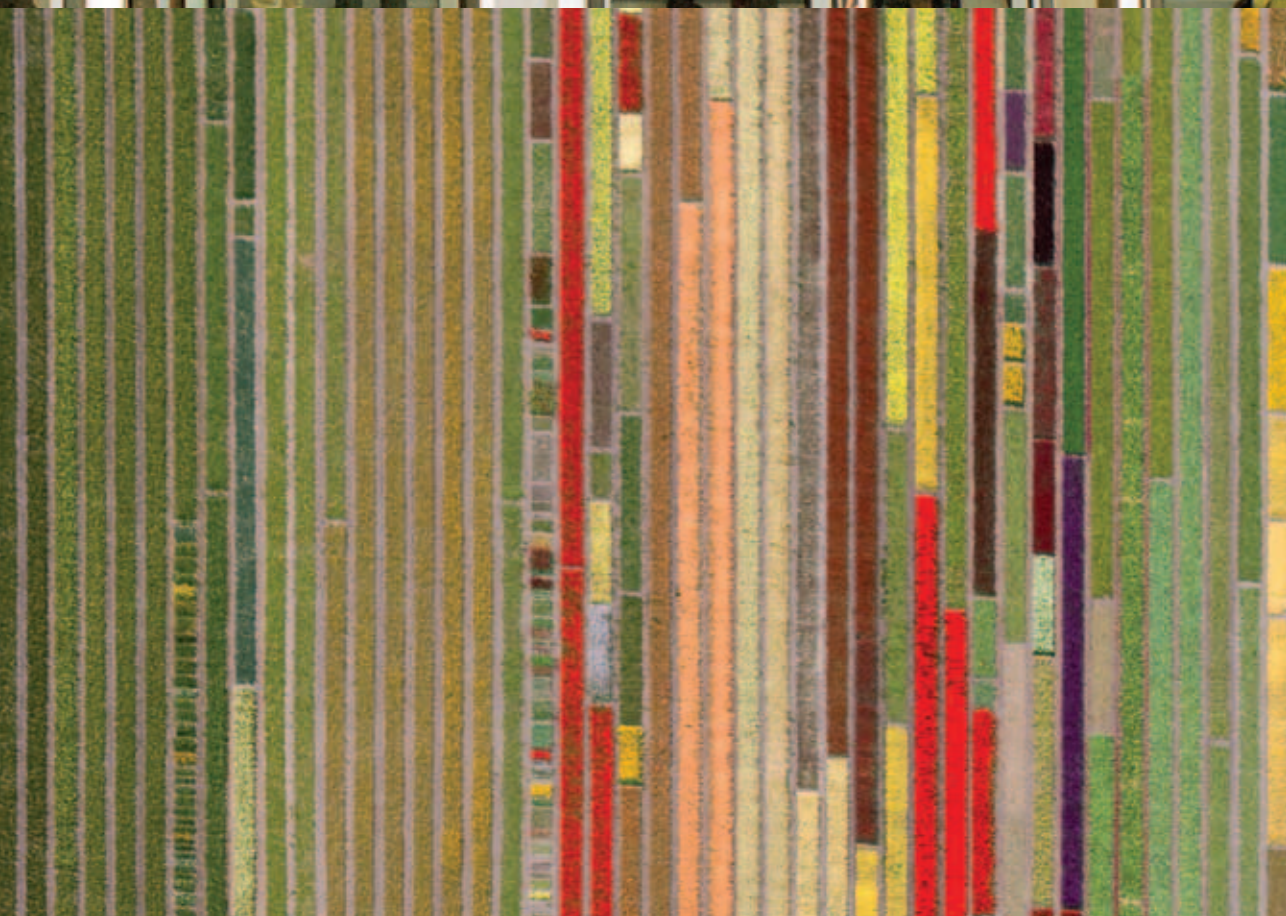
Government's role in innovation

When it comes to innovation tasks I&M is not always the initiator. Depending on the type of innovation involved (system, technical, public administration) and actual problem areas, the first question is which party needs to take the initiative - possibly government, but not necessarily. As time unfolds government may be asked to take on a variety of roles, the traditional one of subsidy provider may not always be the most suitable. For example, with innovative tendering Rijkswaterstaat plays an important role as promoter of innovation in management and development of the three networks (roads, waterways and water systems). I&M also seeks to play a role in the active sourcing of ideas, experiences and innovation in the marketplace, from knowledge institutes and its own workplace.

Given limited options and means I&M will need to weigh up the deployment of personnel vis-à-vis resources for knowledge and innovation and the expected payoff. In this context it is important to utilize the power inherent in society while securing the business community and knowledge institutes as partners for I&M's societal objectives, and vice versa.

Innovations in the top sectors Water and Logistics are priorities for involvement by I&M – both forming part of the government's Top Sector policy.

In short, I&M puts knowledge and innovation themes on the agenda and deploys limited public resources for key future social themes – while seeking coalitions and acting in network – controller mode.



3 Corporate knowledge and innovation themes

Chapter 2 sets out three key umbrella themes around knowledge and innovation across I&M. The themes are an Energetic society, governance and decentralization (a), Financing, earning models and other market approaches (b) and Individualization and behaviour (c).

A. Energetic society, governance and decentralization

In our picture of the future governments will deploy the creativity and unmatched rapid responses of an energetic society. In line with the ambitious goal of ‘space for the public, business community, provinces and municipal councils’ this demands a different government and governance. The focus here needs to be on formulating clear objectives and enabling space for stakeholders other than government – to help realize the objectives.

Extract from the National Knowledge Agenda on fragmentation and de-institutionalization: “The authority of institutions within society, like government and the scientific community, is no longer taken as read. This goes hand in hand with the democratization of knowledge. Knowledge circulates rapidly thanks to the arrival of new media - and is accessible to broad sections of the population.”

Knowledge issues

An I&M-wide question arises: “*Given the tasks confronting society, what is the potential for action to serve and utilize the energetic society?*” Although government no longer holds all the cards in this energetic society it is still a special player thanks to its unique resources and position (legislation, tax revenues, societal mandate, control of public resources). The National Policy Strategy for Infrastructure and Spatial Planning (SVIR) represented a major step in

decentralization of spatial policies and hence in ‘providing space’. At the same time this raises questions around I&M’s remaining role as the governmental stratum between Europe and the region. We want to learn from local residents who use the infrastructure and are familiar with problem areas, and from companies familiar with conflicting regulations. Partly based on and inspired by the SKIAs from the various sections of I&M we arrive at the following knowledge issues:

- How can government promote, enable and utilize the creativity of the public, business community and decentral governmentals in resolving stubborn problems around sustainability? In this context it makes sense to find out what’s stopping members of the public, business community and local government from thinking creatively towards solutions and potential for action – taking account of European and other international legislation and regulation.

- How can government avoid confining interaction to a limited but active section of the public and the business community – the front-runners? In this context it makes sense to learn from best practices among the front-runners at local, regional and international levels. It’s also important to consider how best to share and apply best practices on a wider scale – taking account of possible clashes with vested interests.

- Given divergent societal interests, in how far should government follow the lead from input by (an energetic) society? In this context government needs to consider in how far it can take the traditional two-way approach of scope for private initiative versus protection - for often undervalued collective values and long-term prospects.

- Given the aim of creating space for creativity and innovation in society, what’s the outlook for policy instruments as a dynamic system of standards , for financial tools directed at altering behaviour , and for stakeholder involvement , plus new alliance formulas? The answer here needs to take account of influences arising from access to knowledge and information as policy tools – and appropriate monitoring and feedback.

- What is the significance of decentralized policy for knowledge and information requirements for local and regional governmentals – and how can these requirements be met?

- In how far can the public and the business community be involved – or more involved – in more effective and efficient ways of enforcing legislation and regulation? There may be nothing new about compliance, but the environment in which it takes place does change and this offers new potential. The Human Environment and Transport Inspectorate (ILT) is currently agreeing covenants with the private sector. The question is –what will be the impact of this covenant approach and in how far can experience gained by the ILT be translated into effective policy, also in other areas?

Organisation and implementation

We will express these knowledge issues in more concrete terms in applying them to specific domains (energy, climate, mobility, spatial quality, water, quality of the living environment). I&M will integrate this into the SKIA's implementation programme. Linking up the knowledge issues of the various sections and departments will create added value and promote mutual learning. The energetic society concept originated at the Environmental Assessment Agency (PBL) – which will, indeed, coordinate content for an upcoming knowledge and innovation programme with the title 'Energetic society, governance and decentralization'. It is also quite possible that an umbrella programme of this type could require the formation of a cross-Ministry programme council; alongside I&M this would also involve colleagues from BZK and EL&I). Pilot schemes with secondments between policy units, knowledge institutes and planning agencies are realistic options here (learning by doing, co-creation approach). The aim here is to involve external front-runners and to examine a joint approach with the School of Business Administration's (NSOB) governance-programme. I&M will develop this in more detail in the implementation programme.

B. Financing, earning models and other market approaches

Looking ahead we see I&M as a smart user of newly-to-be-developed and current financing instruments, earning models and market approaches. In so doing we will be seeking to provide space for corporate creativity while finding new ways to optimally contribute to our ambitious aims – even in a constrained financial climate.

Extract from the National Knowledge agenda – Financing and earning models:
“In most cases, particularly in mature economies, financial crises are followed by a period of austerity with major cutbacks and debt restructuring on many fronts.”

Knowledge issues

The question arising right across I&M is “*Looking at I&M's policy areas, how will new forms of financing turn out?*” Answers are required to the following knowledge issues:

- Working in strategic alliances with market players, how will new contract and alliance formulas realize implementation activities at I&M?

- Which market alliances could lead to new earning models?

- Which new business concepts will substantiate the paradigm shift towards sustainability?

- Which sustainability indicators are appropriate bases for financial decisions?

- How do we make the transition from financing innovation via subsidies to payment from project funding for construction and maintenance?

Innovation projects

In the face of steadily decreasing funding Rijkswaterstaat is innovating to maintain broadly acceptable service levels in the three managed networks, i.e. roads, waterways and water systems. Innovation projects around financing, earning models and other market approaches are essential here.

‘Innovative tendering’ and ‘innovation-oriented procurement’ are contributory factors here. To this end Rijkswaterstaat’s Corporate Innovation Programme operates a policy framework for Procurement and Innovation. **Innovative tendering** involves use of other, newer contract formulas including Design-Build-Finance-Maintain-Operate (DBFMO) or competition-driven dialogue whereby government imposes fewer rules and conditions and the market has the space to deploy its own ideas. **Innovation oriented procurement** focuses on innovative solutions or gives the contractor space to provide an innovative solution. This approach to formulating questions and developing criteria challenges the market to come up with the smartest solutions; the two can be combined by obtaining an innovative product and innovative procurement process.

Innovative tendering and innovation-oriented procurement are designed to give the market space to come up with innovative solutions that contribute to societal objectives. As a governmental player Rijkswaterstaat also aims at innovation-oriented procurement by being first to use a given product that foresees boosted deployment of breakthrough technology.

Open data. Opening up access to data lowers the investment threshold for new, innovative products and services. The aim is, as far as possible, to provide free access to official government data, enabling its free utilization by the business community and general public, whereby government bodies are encouraged to take an ‘open access, unless’ approach. The project, led by DGRW, will run until 2015 and I&M is jointly involved with BZK, EL&I and ICTU. An Open Data core team has been formed to prepare, supervise and detail the inventory process into a roadmap. The BZK Ministry is further developing the Open Data Portal while encouraging other governmental bodies to provide access via this portal.

- Government data to be accessible for the business community.

- Government data easier to locate for the business community.

- Use of government data actively promoted.

Open data will also be involved in concrete projects at Rijkswaterstaat; this includes multiple utilization of satellite data and information for crisis management.

Organization and implementation

Rijkswaterstaat takes the lead for this theme and in developing the multi-year programme to be included in this SKIA's implementation programme. Given the urgency of the knowledge issues around land development policy counterparts at DGRW will provide support for Rijkswaterstaat (see theme D). The network of other interested parties and potential contractors for this knowledge programme includes the Bureau for Economic Policy Analysis (CPB), the Environmental Assessment Agency (PBL), and the finance and agriculture & innovation ministries. The implementation programme will examine potential for co-financing from the final year of the 7th European Framework Programme and Horizon 2020; we may also be able to join the ongoing NWO/Nicis knowledge programme.

C. Individualization and behaviour

Looking ahead we foresee government being respected and appreciated for taking account of preferences and behaviour on the part the public and the business community. On one hand government gives them the space and on the other it seeks to exert influence.

Extract from the National Knowledge agenda – Individualization and behaviour:
“Individualization chiefly involves shedding traditions: people have distanced themselves from ruling tradition and see themselves as designers and executors of their own lives.”

Knowledge questions

The core question confronting I&M is: *“How do the behaviour and preferences of individuals and the business community affect realization of societal goals set by I&M, and how should I&M deal with this?”* Hence, I&M's environmental policy has traditionally focused on producers rather than consumers – whereas persuading the latter to consume sustainably would be a promising approach. And in the area of mobility policy it makes sense to question in how far demand shifts apace with an ageing population and a younger generation with its own specific demands in this area. Meanwhile, flood protection raises the issues of effective means to communicate around risks and uncertainties in climate change and rising sea levels.

Alongside the core issue, a scan of SKIAs from the various sections of the Ministry yields a number of knowledge issues:

- How do the public and the business community view government's efforts around nationwide accessibility, quality of life, safety and sustainability? Where does this mesh with individual preferences, and where less so, and how does this affect future I&M policy?
- What new behaviours and preferences are to be expected, e.g. due to socio-demographic developments, ICT & flexible telecommuting – and how will these affect spatial use and

demand for space? Or how will be the shift of economic balance to Asia affect standards and values in our part of the world?

-
- What can government do to combat counterproductive effects of *the green paradox*?⁴
 - How can we adapt mobility policy for a better match with the preference pattern of mobile individuals? Moreover, how can government influence individual behaviour so that it meshes with mobility policy?
-

⁴ The 'green paradox' is the expected situation that given a possible future environmental levy on fuel, producers – with an eye to lower profitability in the future – will seek to maximize output and sales now. This would accelerate exhaustion of reserves.

Innovation projects

I&M's (*Beter Benutten*), programme on enhanced infrastructure aims at boosting accessibility in key regional economic hubs. To this end government is also active in influencing the behaviour of travellers and transporters (see theme 'F. Junctions and networks').

Organization and implementation

KIS (the Knowledge, Innovation and Strategy directorate) leads the 'Individualization and Behaviour' knowledge/innovation theme which is integral to I&M. KIS is supported here by the KiM mobility policy knowledge institute. KiM has been conducting research into behavioural aspects of mobility for some years – as has DGMI (Directorate general for the environment and international affairs), given the major importance of knowledge issues focusing on consumer behaviour around sustainability. The Social and Cultural Planning Agency (SCP) and the PBL are certainly part of the network of stakeholders and potential contractors around this knowledge programme. An initial idea here is to set up a Behavioural Insight Team deploying psychological and behavioural/economic principles. This theme also meshes with the fourth action plan in the multi-year Knowledge Policy agenda Infrastructure and the Environment which focuses on reinforcing knowledge infrastructure in social sciences.



4 Themes at the interface of spatial development, water, the environment, and accessibility

Chapter 2 contains four themes at the interface of I&M's policy areas, namely regional spatial development (d) at the interface of spatial development, water and accessibility - junctions - and networks (e) at the interface of accessibility and spatial developments - sustainable mobility (f) at the interface of the environment and accessibility - and chains (d) at the interface of water and the environment. This chapter details the themes listed.

D. Regional spatial development

Looking ahead we envision a country with identifiably unique values across all its regions. This means a liveable delta competing on the world stage - plus unique regions which, notwithstanding occasional population troughs, can build with the new driving forces for prosperity, based on their red (urban), green (nature) or blue (water) qualities, and which are well prepared for climate change.

Extract from the National Knowledge agenda – Growing role of the towns and very large cities, “Urbanization also continues apace in the Netherlands. These cities increasingly form part of national and international networks – enabling the upmarch of mega regions.”

Knowledge issues

The core question is: *“How can I&M – with a smart, safe and efficient organization of available space - contribute to a metropolitan business climate plus a smart combination of red, green and blue functions nationwide, while taking account of climate change”*. How do we combine an appropriate climate for the knowledge and business economy (red) taking in crucial requirements for quality of life and sustainability (green), plus smart advanced measures against rising water levels in the Dutch delta, and potential periods of water shortage due to climate change (blue). And how will the regions identify their unique selling points for a sustainable future in a competitive international arena? The underlying knowledge issues are as follows:

- How do we realize sustainable (urban) regional development which optimizes water, nature, agriculture, housing, work, recreation and mobility?

- How do we realize sustainable water management in rural areas (including the so-called Green Heart of the Netherlands) taking account of necessary climate-driven adaptation in line with water depletion, flooding, salinization and soil subsidence.

- How will we design (multi-layer) water management for both flood protection and supplies of freshwater?

- How can national government improve the spatial-economic structure of prioritized regions, and what would be the appropriate instruments?

- What spatial measures should be taken for optimization and maximization of agglomeration benefits?

- How do we address the differences in development power between the various regions and between growth and downturn areas? Is it feasible to lever the agglomeration advantages of urban regions while at the same time offering prospects to regions in downturn areas? In this context what could be the input from new challenges including energy transition, population decline and flood protection?

- With traditional earning models no longer viable due to the crisis situation and changed societal tasking how do we arrive at new financing arrangements for regional development? In this context how can investment by national government, the regions and private parties best be harmonized, and what should be the stance on adaptive, flexible use of land, here (link to theme B)?

Innovation projects

Top sector Water. Government has designated water as a top sector and has asked the sector for recommendations around boosting the leading Dutch role in the global water arena - in both short and long terms - with innovation as catalyst. Within the troika formed by government,

private sector and knowledge institutes, the water- and delta technology and maritime sub-sectors have commenced detailing the innovation issue with a view to enhancing the country's competitive position and boosting market share - see the report 'Water verdient het' (water deserves it). This took tangible form across a whole range of business cases and in an innovation contract 'Nederland waterland, onze bron voor welvaart en groei' (Netherlands, land of water, our source of prosperity and growth). The business cases, the innovation contract and creation of a major Dutch testing ground (*Proeftuin NL*) are at the heart of development of the Top Sector Water. Proeftuin NL comprises a number of business cases in the area of integral regional spatial development. With a view to enabling Proeftuin NL I&M provides access to its infrastructure for meaningful initiatives. This contributes to implementation of innovation - mainly by integrating these initiatives in existing major programmes such as 'Flood Protection' and 'Room for the River'. Making and maintaining international contacts and accompanying trade missions are also an important part of the enabling/facilitating task. *Building with Nature 2015* and *Flood Control 2100* are important business cases for I&M.

Urbanizing Deltas of the World

I&M will advocate expansion of the upcoming NWO knowledge programme *Urbanizing Deltas of the World*. This multi-year programme – under the umbrella of the NWO theme Connecting Sustainable Cities – has now been positioned with the Top Sector Water (Delta technology). This type of international programme could be relevant for a large number of top sectors - notably Logistics.

The expanded multi-year programme would need to focus on international comparisons between our and other densely populated deltas around the world – with an eye to I&M's various policy areas (climate and water, city and sustainable living environment , mobility and logistics) and linkage with all relevant top sectors. Within this type of programme I&M could act jointly with the EL&I, BZK/WBI and BuZa ministries. Ideally there would be separate calls – not merely for flood protection but also for sustainable ports and logistics, smart cities, urban development and creativity, and urban agriculture.

NWO funding has been reserved within that organization's current research programme *Urban Regions in the Delta*; this also falls under Connecting Sustainable Cities. The initiative is likely to be jointly financed by the foreign Ministry (BuZa).

Organization and implementation

The knowledge and innovation theme around regional spatial development and junctions is led by DGRW supported by the Mobility&Transport directorate (DGB). The challenge here lies in I&M's wish to build a bridge between the previously noted red, green and blue values. The network of other interested parties and potential contractors for this knowledge programme includes PBL, other governmentals and universities. Indeed, the aim here is also to have knowledge issues function as a starting point in steering research programmes under the NWO's Connecting Sustainable Cities (VerDuS) theme.

E. Junctions and networks

Looking to the future we see ongoing sustainability for leading regions in the Netherlands with main ports, brain ports and green ports, and reliable accessibility. In 2028 the smartest route from A to B will be known to all travellers and transporters – with multi-modal hubs helping to realize a sustainable spatial network.

Paraphrased from the National Knowledge Agenda – a more compact world: “Global compacting of the economy, population and information also involves the Netherlands where agglomeration and clustering of homes, ideas and sectors is ongoing. This impacts on the mobility - precisely where the burden is greatest already.”

Knowledge issues

The core issue is: *“How can Transit-oriented development and multi/synchromodality contribute to the accessibility of our core economic regions?”*

The underlying knowledge issues are as follows:

- What is the mutual impact of chains, and junctions and what are the chances and obstacles around accessibility and transit-oriented-development (TOD) in the Netherlands?

- What sustainable financing and governance structures are in place for development of multimodal junctions – even where these are separate from integral regional development? What are national government’s control instruments here?

- What impact will medium- to long term developments have on the junction position of our main ports and short-term location preference for multimodal junctions?

- What is the cost of a lack of reliability on society? – and how is reliability impacted by policy measures ? What is the level of friction between maximum utilization of networks’ capacity (road, rail, public transport, waterways and the water system) plus reliability in these contexts?

- What contribution can a multi- and synchro-modal transport network make to reliable mobility against the background of extreme external factors (such as major accidents, extreme weather conditions and terrorist threats)?

Innovation projects

Top Sector Logistics. The Top Sector Logistics makes a maximum contribution to reinforcing the Netherlands' competitive position internationally. Top Team Logistics' ambition is to gain a leading international position for the Netherlands, in 2020, as freight flow handler, and director of domestic and wider supply-chain activities. It also aims to provide an attractive climate in which freight-handling and logistics companies can innovate and locate. To this end there are a number of concrete innovation processes including the open ICT platform for the seamless supply of information in the logistics sector. Based on I&M's societal responsibility to ensure reliable, safe and sustainable mobility, the key knowledge and innovation issues are concentrated around:

- development of a core network on national and international logistic connections;
- development of combined junctions for passenger and freight transport;
- Transition from multi-modal to a synchro-modal mobility system.

These developments will contribute to an improved spread of flows along transport axes that are optimal both in terms of speed and costs – plus external safety, maintenance and sustainability - and with enhanced load factors to ensure more sustainable freight transport. The development of a good network of hubs and distribution centres will enable clustering of cargo flows and reduce transport resources needed to move a given volume.

Smart use of infrastructure. Up to and including 2014 the action plan for optimal use of infrastructure (*Beter Benutten*) will focus on passenger and freight transport by road, rail, cycle paths and waterways – and transfer and transshipment points en route.

The action plan embraces the following aspects:

1. Better spread of operations during the whole day, across the whole network;
2. Optimized and smarter linking of capacity across infrastructural networks.

This is done via a region-oriented approach. *Beter Benutten* requires a shared, dedicated approach by the national and regional governments and the private sector. This involves a sustainable form of joint approach set up or enhanced for every region. This type of initiative, albeit in various forms, is not new, good examples being the urban accessibility programmes *Verkeersonderneming Rotterdam*, *Maastricht Bereikbaar* and the *Netwerkaanpak Utrecht*. The direction of the programme is led by a troika comprising the minister, a regional administrator and a CEO from the regional business community. The approach focusses on customized solutions within regional portfolios while checking out the most effective regional measures and reviewing these in context (supply, demand and usage).

There are also nationwide, umbrella measures. These involve developing a smart infrastructure for roads, rail and waterways – plus smart methods of utilization. I&M ensures development and introduction new applications for mobility management and ITS applications.

Transit-Oriented Development (TOD) focuses on successful realization of top locations by means of a multifunctional spatial programme and optimal accessibility within a public transport network. Far-reaching consolidation and city centre creation should enhance utilization of public transport and mesh with use of private cars. Investment in public transport, roads and building nearby stations is closely linked.

I&M is setting up a roundtable for innovation (CoRP GO-Spoor) where stakeholders can gain insights into each other's positions, create windows for synergy and reach concrete agreements around pilot schemes, a programme, and an action schedule.

The aim here is to enable knowledge breakthroughs and innovations to confront the challenges. First and foremost this is about a meaningful exchange between research programmes and lessons and practical experience from the three urban regions (the North and South wings of the main Randstad urban agglomeration and the Arnhem-Nijmegen urban region). At the same time, lessons will be drawn from various approaches to comparable tasks and the roundtable will look for generic solutions. Secondly, this is about organizing meaningful interaction between the public and private parties involved in TOD's policy and practical implementation – both from transport and rail, and regional development.

Organization and implementation

DGB acts as theme leader here, supported by DGRW. The programme's challenge lies in I&M's wish to bridge-build between the various modalities (road, rail, water, air, passenger and freight transport, and individual and collective transport) and between infrastructure and spatial development. The network of interested parties and potential contractors for this knowledge programme includes other governmentals, the PBL Environmental Assessment agency, and universities. The aim of the theme is also to ensure that the findings of the NWO programme Sustainable Accessibility Randstad have a maximum impact in both policy and practice. The knowledge issues will also be deployed as starting points in directing the research programmes within the NWO's Connecting Sustainable Cities theme.

F. Sustainable mobility

Looking ahead to 2028, despite the ongoing scarcity of fossil fuels, we still foresee meaningful levels of freight transportation by road, water and air without this negatively impacting on the planet or quality of life. A sustainable mobility system will help make this country a good place to live, with a healthy economy.

Extract from the National Knowledge agenda – Competing for the earth's resources:
"Increasing demand for natural resources levers ecological pressure on the planet while the parameters for these resources shrink"

Knowledge issues

The core question is: *“How can we approach our future mobility and logistic needs so that this contributes optimally to prosperity while remaining within ecological parameters (climate, biodiversity), while helping enhance the quality of life (noise, safety, air quality)?”*

The underlying knowledge issues are:

- What steps need to be taken to realize the successful transition to sustainable mobility and logistics – and which parties should take these steps? Involved here are technical, organizational, financial and behavioural options, plus the impact of action taken, timing, costs, and financing involved.

- How can an adequate level of development be realized around supply and demand for renewable fuels (e.g. bio-mass) and energy carriers (e.g. electricity and hydrogen)?

- What will be the impact of new modes of transport (e.g. electric cars, scooters, bicycles, segways and high-speed buses) and new transport systems (e.g. linked and driverless vehicles) on road safety, energy consumption and emissions?

Innovation projects

Work on this theme will include projects around the launch of innovations in sustainable transport (efficient, quiet and clean transport systems and smart methods for moving around as efficiently as possible). This will include elimination of national and European regulatory barriers, introduction of innovative mobility concepts and alternative fuels and energy carriers - plus vehicles and infrastructure to match.

Organization and implementation

The *Sustainable Mobility programme* is led by DGMI supported by DGB. The network of interested parties and potential contractors for this knowledge programme includes other governmentals, the Institute for Transport Analysis (KiM), the Environmental Assessment Agency (PBL), TNO, universities and European and international partners. Green transport is among the challenges confronting the Horizon 2020 European knowledge and innovation programme.

NWO's *Sustainable Accessibility Randstad* programme.

G. Closing the energy, raw materials and water chains

Looking ahead we foresee a green economy with closed cycle and sustainable chains – and a fresh economic outlook: we will produce and consume sustainable functions supplied by our ecosystems (ecosystem services). In line with the EU 2020 strategy the aim is to get out of the crisis with green growth.

Extract from the National Knowledge agenda – Competing for the earth's resources: "All reserves will be scarce by 2025 - raw materials and fossil energy as well as space, water and fertile soil in particular. The idea of recycling materials is no longer confined to idealists but has become an economic necessity."

Knowledge issues

This is the core question: *"What are the options for promoting a green economy and who should do what and when?"* Factors here include reducing demand for energy, water and raw materials, changes in methods of production, while boosting efficient utilization, re-use and recycling.

The underlying knowledge issues are:

- How will scarcity and pricing of water and raw materials contribute to innovations in areas such as use and re-use of raw materials, water management and consumption, and energy management?
- How can the surface and deep underground layers be utilized in a multifunctional and sustainable manner – and how can this be integrated with topside functions?
- What are the options for utilizing interferences between chains (e.g. energy and food, energy and mobility, energy and raw materials) to make the economy green?
- How can logistic chains be optimized to help close the cycles?
- How can asset management - by Rijkswaterstaat and others – help create closed cycles? This could involve more active deployment, smarter management and use of smarter materials, like asphalt, which has a longer lifespan.

Innovation projects

Looking at the area of raw materials, in the short term we see most opportunities in government's ambition to make this country a "**raw materials chain agreement**" in Europe, with minimum loss of substances and materials. There is a strong link between the emphasis on recycling – where the Netherlands is already a leader – seeking economic value in waste, and a strong national role in transshipment and distribution.

The two pilot projects below have been selected for further development in the next several years:

- Pilot project around recycling rare **earth metals** from light bulbs (yttrium/europium). The mercury content puts these bulbs in the most highly polluted category of waste. An innovative company has developed a method to separate yttrium and europium - with an extremely high level purity - from other materials. This makes them ideal for re-use as raw materials in the production chain, whereby the company can minimize highly polluted waste. The company developed a healthy business case with a payback period of between two and three years. Finance providers, producers and waste collectors are interested in setting up a plant in the Netherlands and taking on European collection, processing, and distribution. The pilot project has the potential to yield substantial information around organization of knowledge on dealing with such minor – but important – flows of waste. At the same time it can demonstrate the impact on recycling of rare metal recycling via wider implementation of new waste separation technologies.
- Pilot project around **phosphate** recycling and processing into phosphate as a secondary raw material. The recently formed Nutrient Platform alliance between public and private sectors and the scientific community focuses on reclaiming phosphates from dredging, waste(water) and groundwater, and reintroducing this into circulation. Alongside environmental benefits this will open up opportunities for the private sector to secure a competitive advantage in and beyond of the EU. The Nutrient Platform includes Slibverwerking Noord-Brabant (sludge-processing), Thermphos, Moerdijk Biomass power plant, the Union of Regional Water Boards, Grontmij, Tauw, and the VU University Amsterdam. Rijkswaterstaat can play a sustainable procurement role here by exclusively using sludge for road building after useful nutrients have been extracted and re-used.

Organization and implementation

This programme is led by DGMI supported by DGRW. The network of interested parties and potential contractors for this knowledge programme includes – in the water section – all parties from Top Sector Water, the Environment and Safety Sector of the National Institute for Public Health and the Environment (RIVM), WETSUS, PBL, the Water Governance Center and NGOs; in the area of raw materials it comprises parties from the chemicals, manufacturing, agriculture and logistics sectors, as well as the waste and recycling/re-use sector. Where the thrust is specifically on energy the lead is taken by EL&I and parties involved in the Top Sector Energy. Energy's inclusion here reflects the mutual interfacing between the raw materials, energy and logistic chains.



5 Impact and outcome

Effect identified

Following on from this SKIA the Innovation & Environment Ministry (I&M) will finalize an implementation programme in autumn 2012. This chapter on impact sets out a number of components and can be seen as a forerunner to the programme. An important starting point is that the themes in this I&M-wide agenda will be approached jointly with the departments and agencies. To this end - working across departmental lines - we will be examining the already available knowledge and networks, together with best practices where lessons can be learned, and where additional input is needed to cover knowledge issues or facilitate knowledge issues. In concrete terms – as shown in the chart below - this means that two agencies have been designated for each SKIA . Each pair is made up of a 'leader' and a 'second'. They own the given theme and are responsible for internal and external coordination of the integral programming of knowledge issues and innovation tasks. Each pair is responsible for multi-year programming within the implementation programme.

Theme	Leader	Secondary	Contact person
Energetic society, governance and decentralisation	KIS (PBL*)	All, but ILT, DGB first	Hans Leeflang (Olav-Jan van Gerwen)
Financing, earning models and a different market approach	RWS	DGRW	Hans Jeekel
Individualization and behaviour	KIS (KiM*)	DGMI	Hans Leeflang (Arjen 't Hoen)
Regional development	DGRW	DGB	Henk Snoeken
Junctions and networks	DGB	DGRW	Emiel Reiding
Sustainable mobility	DGMI	DGB	Sebe Buitenkamp
Closing energy/raw materials/ water supply chain	DGMI	DGRW	Sebe Buitenkamp

*) PBL and KiM are responsible for coordinating theme content, as commissioned by KIS.

Knowledge issues phased effects within the programme

The phased system set out below was formulated in drafting the implementation programme. It is used by the paired agencies to ensure that knowledge issues generate effects within the programmes:

1. Check on formulation of the knowledge issue and on ownership safeguards

To some extent the knowledge issues as formulated already came about in dialogue with the knowledge institutes. Even so, following release of the SKIA there will further honing in consultation with senior advisers from Rijkswaterstaat and knowledge institutes associated with I&M. Hence, the owners will examine in how far the requested knowledge is already available and avoid the same items being procured in duplicate. The owners will then fill any remaining gaps in knowledge required. The aim of having an owner for each individual knowledge issue within the theme is to ensure that an I&M colleague takes on the role of dedicated contractor for the issue.

2. Assign the knowledge issue to a knowledge institute, planning agency or advisory council. Which organization(s) should address the issue?

This will also require a joint approach by departments and knowledge institutes. In general the answers will need to be generated by clustering knowledge components from various domains and institutes, whereby one needs to look beyond bodies associated with I&M. Issuing a call for tenders could be considered here; this is the EU approach when seeking an appropriate consortium to carry out a project. I&M considers reducing institutional financing in favour of increased project financing for knowledge institutes. This would represent a real promotion of partnerships with these bodies.

3. Incorporate the knowledge issue in the programme

There are two ways of covering knowledge issues: by providing a budget and by exerting influence on the programme via the network. Fund-based steering is mainly an option for knowledge institutes which are demand-oriented and work on contracts. The knowledge institutes nearest to I&M are the Netherlands Organization for Applied Scientific Research (TNO), Deltares, the National Space Laboratory (NLR), the Institute for Transport Policy Analysis (KiM) and the National Institute for Public Health and the Environment (RIVM). Network steering works particularly well with knowledge institutes and planning agencies which determine their programming independently. In particular the SKIA and the implementation programme are used, in consultation, to influence programming. At the same time this also involves influencing the use of unclaimed strategic space at demand-driven knowledge institutes.

Scheduling an implementation programme for autumn 2012 meshes well with programming at knowledge institutes and planning agencies in 2013. Moreover, given the SKIA's longer duration not all the knowledge issues will be covered in year t+1. It would also make good sense for programming to differentiate between short and medium to long-term knowledge issues.

Implementing bodies are also increasingly flexible in the way they programme - with an eye to maintaining sufficient capacity for new projects during the course of the year.

Innovation projects – impact in programming

The paired agencies use the approach set out below to ensure that the innovation projects impact in programming:

1. Determine the phase of innovation and conduct a diagnosis

The innovation projects listed in Chapters 3 and 4 are in different stages of development. Some are in the start-up stage while others are further advanced or are in the testing stage. This needs to be borne in mind when seeking to realize impact. Meanwhile, Cap Gemini's *Innovation that works* report describes a number of diagnostic issues which are useful in making innovation programmes more specific and tangible.

2. Determine how impact will be pursued

Hence, impact will be ensured in differing ways, depending on the stage reached by innovations. In the early stages innovations can be addressed via a roundtable, e.g.:

- The innovation roundtable on Transit Oriented Development
- The innovation roundtable on Construction

Innovations that have taken on more shape can be moved forward with agreements like the Green Deals for the raw materials, Dutch Phosphate value chain agreement, or innovation contracts in the top sector context. This applies to the innovation contract in the top sectors logistics and water. The Open Data innovation project is embedded in the Creative top sector.

- Innovations that have already reached the development and testing phase and are going through the final stages can (e.g.) be seen in Rijkswaterstaat's Corporate Innovation Programme (CIP). This multi-year programme includes innovations that meet the "3x 30 percent" criterion. This means 30 percent lower life-cycle costs, 30 percent greater functionality, and 30 percent more sustainable and safe. This involves a joint approach with the policy core team, as in the action plan for optimizing use of infrastructure (Beter Benutten).

3. Harvesting: towards the 2013 innovation relay

In order to enable presentation of concrete results in the 2013 innovation relay the leaders listed in the table are responsible for the various innovations and progress from development start-up to testing. Meanwhile the Knowledge, Innovation and Strategy directorate will give support on request to help harmonize and accelerate initiatives while involving the external network (e.g. the Club van Maarsse platform).

Linkage via Top Sector policy

The Top Sector Policy defines the joint efforts of the private sector, knowledge institutes and ministries involved in knowledge and innovation. I&M is the government's leader in the Top Sectors Water and Logistics. It is directly connected to the horizontal themes of sustainability and space – which are relevant to most top sectors.

In summer 2011 the top sectors issued an action agenda with a view to increasing competitive status internationally. These agendas have been developed in the form of innovation contracts setting out precisely how the relevant parties pursued innovation in 2012 and 2013. I&M is a partner in the contracts for water and logistics where it contributes via a financial contribution and steering societal demand at NWO, TNO and the GTIs. In this context I&M focuses on developing knowledge and innovation activities that help provide answers to societal issues around its own policy objectives (accessibility, quality of life and safety). At the same time it also acts to reinforce the top sectors' competitive status internationally.

This SKIA includes action to be taken under the innovation contracts Water and Logistics which deal with societal issues involving I&M. The SKIA's various knowledge and innovation themes also connect with the horizontal themes space and sustainability policy. Sustainability policy has strong links with the top sectors Energy, Chemicals and High Tech, while Space is connected to all sectors positioned in a main port, brain port, greenport or 'valley'. During the course of 2012 the top sectors will further detail their programmes for 2013 and 2015 - while I&M will also be linking-up with its SKIA priorities.

The effects of knowledge and innovation in policy – and towards implementation and inspection

The aim here is to ensure that knowledge generated and breakthrough innovations contribute to I&M's ambitious goals; this could be in policy, implementation and inspection by the Ministry, or directly.

Detailing this is the task of the owners. Often, the contact persons at the paired agencies are not the ones who get involved where policy development, implementation and inspection are involved. This is particularly the case for strategic anticipatory knowledge issues. I&M will further detail the additional tasking involved in the implementation programme. In line with the multi-year agenda on Knowledge Policy, Infrastructure and the Environment – the implementation programme will also need to focus on improving knowledge management in the organization. Competencies will need to be cultivated among both knowledge- and policy staffers to promote mutual understanding and cooperation.

Impact by influencing European research programming

Where possible it is important to ensure that programming of knowledge issues is included in European research programming. At best this is a way of gaining a large volume of new knowledge using limited resources. With basic or project financing Dutch knowledge institutes can join in consortiums involved in knowledge issues that are relevant to I&M – whereby their results would be at our disposal. At worst it would mean financing a consortium that is not open to influence and delivers unusable results too late. The contours of the 8th Framework Programme Horizon 2020 are currently being defined - with the close involvement of I&M. Other financing options are also open via Joint Programming, the ERA-nets, European Innovation Partnerships, the European Technology Platform, Flagship Resource Efficiency and the Flagship Innovation Union. I&M will make strategic use of the potential from these funding sources and networks to cover our knowledge issues and realize our innovation tasks. With the activities of the Knowledge Policy multi-year agenda as starting point the directorates of international affairs and KIS are working closely with other departments to ensure effective input. The various top sectors are linked to the themes of Horizon 2020. The European priorities 'smart, green and integrated transport' and 'climate action, resource efficiency, and raw materials' closely correspond with I&M's knowledge and innovation themes.

SKIA financing

Implementing the SKIA requires funding which is only available on a limited basis and will become more scarce apace with the financial crisis. This calls for a frugal and creative approach. The task here is to optimally deploy financial resources while seeking other sources of funding and openings for cooperation.

We will be further developing the implementation programme; in any event this will involve:

- prioritization of crucial knowledge issues and innovation themes. This means an extra check on the knowledge issues and innovation tasks set out in chapter 3 and 4;

- critical review of available knowledge before starting-up yourself;

- preferably gathering knowledge yourself, e.g. learning by doing rather than outsourcing;

- optimally adapt deployment of basic financing of knowledge institutes to match SKIA structure;

- utilize European financing potential.

Implementation programme, flexibility and progress reporting

The SKIA will run for some four years. The agenda will appear in print and on the internet. Topics may be added or removed during the course of the SKIA. I&M will also publish the implementation programme on its website. The Ministry will also monitor the progress of the knowledge issues and innovation breakthroughs and make them more widely available on the internet. I&M will specify how and when the process and content are evaluated.

The Ministry will monitor and share progress in knowledge issues and innovation breakthroughs.



Glossary

Beter Benutten	Action plan on optimizing infrastructure use
BuZa	Ministry of Foreign Affairs
BZK	Ministry of the Interior and Kingdom Relations
CIP	Corporate Innovation Programme (falls under RWS)
CPB	Netherlands Bureau for Economic Policy Analysis
DGB	Directorate-General for Mobility and Transport
DGMI	Directorate-General for the Environment and International Affairs
DGRW	Directorate-General for Spatial Development and Water Affairs
EL&I	Ministry of Economic Affairs, Agriculture and Innovation
GTIs	Large Technological Institutes (Deltares, ECN, MARIN and NLR)
ICTU	ICT (Information and communication technology) Unit for implementation
ITS	Intelligent Transport Systems, part of I&M
KiM	Netherlands Institute for Transport Policy Analysis
KIS	Knowledge, Innovation and Strategy Directorate
KNMI	Royal Netherlands Meteorological Institute
MIRT	Multiannual Programme for Infrastructure, Spatial Development and Transport
NGOs	Non-governmental organisations
NLR	National Aerospace Laboratory
NWO	Netherlands Organisation for Scientific Research
PBL	Netherlands Environmental Assessment Agency
RWS	Rijkswaterstaat (Directorate-general for Public Works and Water management)
RIVM	National Institute for Public Health and the Environment
RLI	Councils for the Environment and Infrastructure
SCP	Social and Cultural Planning Agency of the Netherlands
SKIA	Strategic knowledge and innovation agenda
SVIR	National Policy Strategy for Infrastructure and Spatial Planning
TNO	Netherlands Organization for Applied Scientific Research
TOD	Transit-Oriented Development
SVIR	Structural Vision on Infrastructure and Spatial Planning
VerDuS	Connecting Sustainable Cities
WBI	Directorate-General for Housing, Building and Integration (part of BZK)



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