

# Research for transformative and sustainable spatial planning

Strategic agenda for the national research programme for sustainable spatial planning



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# Foreword

We at Formas would like to thank everyone who has contributed in various ways to our efforts for carrying out the work of the national research programme for sustainable spatial planning. Since its inception in 2017 and through 2021, the programme has initiated more than fifteen calls, funded over 150 projects and contributed to a number of activities that promote the development and dissemination of knowledge for achieving sustainable spatial planning. For current programme information, please see [formas.se/samhallsbyggande](https://formas.se/samhallsbyggande). Thank you to everyone who has contributed!

We would also like to extend our thanks to everyone who has contributed wise input, draft texts and reflections while revising this strategic agenda for guiding efforts for working on the national research programme for sustainable spatial planning.

This includes participants from the research programme committee and working group: The National Board of Housing, Building and Planning, the Swedish Energy Agency, Forte, the Swedish Land Registration Authority (Lantmäteriet), Mistra – the Swedish Foundation for Strategic Research, the Swedish Civil Contingencies Agency (MSB), the Environmental Protection Agency, the Swedish National Heritage Board, the Swedish International Development Cooperation Agency (Sida), the Swedish Agency for Economic and Regional Growth, the Swedish Transport Administration, the Swedish Research Council and Vinnova.

Thanks also go out to the researchers and practitioners in the advisory groups of the Swedish Council for Sustainable Cities who participated in agenda revision discussions as well as to those who participated in the substantial efforts of laying the foundation of the first draft of the programme's strategic research agenda.

We extend our gratitude to the 2017–2021 Programme Committee Chair Ulrika Francke.

We look forward to our continued collaboration!

Stockholm, December 2021

Ingrid Petersson  
Director General, Formas

# Contents

Summary	6
1. Programme starting points and goals	8
1.1 Commission for a National Research Programme for Sustainable Spatial Planning	8
1.2 What does sustainable spatial planning mean?	9
1.3 Goals of the research programme	11
1.4 How the agenda has been developed	12
2. Perspectives and themes for the research programme	14
2.1 Perspectives for transformative and sustainable spatial planning	16
2.2 Themes for transformative and sustainable spatial planning	20
3. Research and Innovation Funding for Sustainable Spatial Planning	26
3.1 Chapter limitations	26
3.2 Funder responsibility and focus	27
3.3 Strategic innovation programme	34
3.4 European initiatives	37
4. Implementation of the programme	39
4.1 Organisation for collaboration	39
4.2 Programme activities	40
4.3 Follow-up and evaluation guide future choices	41
Annexes	45
Annex 1. The Formas commission	45
Annex 2. Global and national goals to be achieved by the programme	49
Annex 3. Agenda 2030 targets linked to programme themes	51

# Summary

The national research programme for sustainable spatial planning funds research and innovation that can contribute to a transformative, sustainable planning and built environment. The research programme stems from a government commission received by Formas and spans the period 2017–2026. The research programme for sustainable spatial planning is one of 13 national research programmes established to enable society to address key complex challenges.

Planning and building more sustainably societies require several structural shifts that will compel us to change our socio-technical and socio-ecological systems. Such shifts represent a transformation that encompasses technological innovation, changes in behaviour, culture and norms, and changes in our governing institutions. Working towards this transformation requires continuous, integrated processes for innovation, knowledge building and reflection. The task of the national research programme for sustainable spatial planning is to support a sustainable transformation by ensuring that new research and innovation are funded and that the knowledge generated can be translated into action.

The research programme aims to contribute to policy objectives, but another crucial task is to critically review, complement and think beyond today's policy objectives. The research programme thus covers a wide range of research approaches and initiatives.

In this strategic agenda, we present the objectives, thematic orientations and work approaches of the national research programme for sustainable spatial planning. This is a revised version of the original agenda, which was published in 2018 when the programme was created. The revision has been made in light of the lessons learned during the first years of the programme and the additional funding provided by the government starting in 2021. The revision was carried out in 2021.

The research programme and research agenda provide a platform for research and innovation, and create synergies between stakeholders that complement each other in terms of knowledge, expertise and projects. Therefore, a programme committee and a working group provide support for working on the programme. These groups are comprised of public research funders that are relevant for the area. The programme committee is headed by an external chair. This agenda shows the roles and specialisations of the various stakeholders. Thanks to our joint efforts on revising the research agenda, it can serve as a starting point for dialogue and coordination of future initiatives among the research funders.

In the agenda, we identify a number of key themes and perspectives that must be prioritised. More knowledge and new solutions are needed in these areas so that society can shift to transformative, sustainable spatial planning. We have identified the following themes:

- **Sustainable residential and public environments** focuses on sustainably designed and inclusive physical environments and a housing supply for everyone.
- **Sustainable mobility systems for all** focuses on integrated and coordinated transport planning, increased sustainable travel and transport, and sustainable mobility practices.

- **Human health and well-being** focuses on living environments that have a positive impact on public health and to reduce environmental pollution in buildings, air, soil and water.
- **Security and safety for people and societies** focuses on access to safe and secure public spaces, the safety and robustness of vital public functions, and reduced risks in the built environment.
- **Sustainable consumption and production** focuses on living environments for reduced and sustainable consumption as well as a lower carbon footprint and emissions in construction and building management.
- **Sustainable land and water use** focuses on spatial planning where long-term land use and land and water use are adapted to future climate change.

As a complement to these themes, we have identified five perspectives that intersect the themes:

- **Governance, policy and economics** addresses the need for transformative governance approaches, policy development and sustainable socio-economic models.
- **Organisation, collaboration and leadership** addresses on the complexity and variety of stakeholders involved in spatial planning and the need to coordinate processes in order to enable comprehensive solutions.
- **Accessibility, equity and gender equality** addresses the importance of considering the perspective of end users as well as their different needs and abilities early on in the planning process. This will help to achieve a holistic view of spatial planning and to include social issues to a greater extent.
- **Democracy and participation** addresses that openness, fairness, participation and transparency should form the essence of a well-functioning spatial planning process.
- **Digitalisation and artificial intelligence** addresses today's opportunities and challenges concerning new technology solutions for more interactive, integrated and sustainable planning and management.

The different themes and perspectives intersect and should not be treated as silos. They relate to all planning levels in society, and take as their starting point historical experiences, modern-day conditions and challenges, and future impacts and opportunities. The need for more knowledge and new solutions within each perspective affects all themes. In the research programme, we therefore support research and innovation that combines multiple themes and perspectives.

# 1. Programme starting points and goal

This introductory chapter describes the government commission to Formas' scientific council to establish a national research programme for sustainable spatial planning as well as the programme starting points and goal. The programme is guided and framed by this strategic research agenda. The following section describes how the agenda was developed as well as its contents.

## 1.1 Commission for a national research programme for sustainable spatial planning

As early as in 2017, the government commissioned Formas to develop a ten-year national research programme for sustainable spatial planning in collaboration with other funders (Appendix 1). The research policy bill that was established in 2020 also entailed increased funding for the national programme for sustainable spatial planning.

The government commission included developing a strategic research agenda to use as the basis for the programme's content and activities. The strategic agenda *Research for integrated and sustainable spatial planning* was developed in 2018 and this revised agenda, *Research for transformative and sustainable spatial planning* was developed in 2021.

A programme committee was instituted in 2017. The committee consists of representatives from the Swedish Energy Agency, Formas, Forte, Mistra, the Swedish Civil Contingencies Agency (MSB), the Swedish Environmental Protection Agency, the Swedish National Heritage Board, Sida, the Swedish Agency for Economic and Regional Growth, the Swedish Transport Administration, the Swedish Research Council and Vinnova. The programme committee is headed by an external chair and is also supported by

a working group. Participating in the working group are representatives of all funders in the programme committee as well as from the National Board of Housing, Building and Planning and the Swedish Land Registration Authority (Lantmäteriet), both of which are central authorities to the area of spatial planning.

As stated in the government's detailed description of the commission, the National Research Programme for Sustainable Spatial Planning should address the challenges facing cities and communities in our society. The programme should provide the knowledge needed for transformation to a fossil-free society accessible to all, to adapt to a changing climate, and to achieve global and national objectives that are central to sustainable spatial planning. According to the government commission, an overall goal of achieving sustainable spatial planning is to strengthen the conditions for Swedish cities and communities so that they can evolve into living, green, healthy and safe places for people to meet and thrive.

The global sustainable development goals of Agenda 2030 and the UN's New Urban Agenda of 2017 are key points of departure for the programme. The New Urban Agenda contributes mainly to global goal 11 (Sustainable Cities and Communities). In addition to goal 11, the majority of the 17 global sustainability goals relate in different ways to different aspects of the challenges of sustainable spatial planning. Sweden's environmental objectives are important national starting points for the programme. Among the most relevant objectives are:

Reduced Climate Impact, Clean Air, A Non-Toxic Environment, Good-Quality Groundwater, and Good Built Environment as well as the Generational Goal. Examples of other national strategies focusing on sustainable spatial planning relevant to the programme are the government's living cities strategy and designed human habitat policy. For more detailed information about the objectives and strategies, see Annex 2.

## 1.2 What does sustainable spatial planning mean?

The concept of spatial planning addresses equally the processes of planning, construction, use and management of buildings, infrastructure, cultural sites and natural environments, as well as the planning and promotion of inclusive, participatory and safe communities where people want to live. In light of all these factors, sustainable spatial planning means readjusting to a socially, culturally, environmentally and economically sustainable society. Sustainable spatial planning and built environment must take into account the links between all these dimensions, as well as explore tensions and conflicts of interest between them, for cities, hinterlands, urban areas, communities, and rural areas alike.

Cities and urban areas are linked together with the surrounding countryside and with each other in regional networks. Demographic shifts are taking place both from rural areas to cities and within different rural areas with a growing urban population. Changes in demographics pose social and economic challenges. A well-functioning interplay is needed between cities, urban areas and rural areas, especially in order to provide public services.

Another key concept is urban planning. In this agenda, urban planning is used as a collective term for several related concepts, such as spatial planning and urban planning, or simply planning. The purpose of urban planning is to meet society's basic needs; it relates to both urban and rural planning interacting together. It includes both long-term strategic planning and more detailed planning. Sustainable urban planning is grounded in a balanced holistic view and includes interaction with the environment as well as the use of economic and social resources.

The concept of spatial planning is used in some sectors to describe the entire chain of activities, from early planning through to implementation and management. The agenda mainly uses the concepts of urban planning and management. Management includes the operation, maintenance, adaptation and development of an existing built environment that takes into account the needs of future generations and interacts with planning for a new built environment.

### 1.2.1 Increased need for sustainable transformative change

Global warming and carbon emissions are continuing to increase globally and inequalities between the richest and poorest in the world, and Sweden, have not decreased. The 2019 Long-term Survey revealed that income inequality is

expected to continue to increase in Sweden<sup>1</sup>. The message relayed in the latest UN climate report is clear: the climate situation is serious, and humans are responsible. The IPCC states that we have reached unprecedented concentrations of carbon dioxide and that temperatures have increased, sea levels have risen and ice caps have melted at an incomparably rapid rate in the last few decades, only to escalate in recent years.<sup>2</sup> The poorest of the world are already the worst affected, a trend that is expected to continue even in the future, making climate change a major equality issue.<sup>3</sup>

Less than ten years remain until the Agenda 2030 goals are to be achieved. Now is the time to act, to translate knowledge into action and to ensure that research and innovation are put to good use in the transformation to a sustainable spatial planning and built environment that does not exceed the planet's limitations. At the same time, new challenges must be problematized, and time must be dedicated for discovering new problems and solutions that we cannot even conceive of today.

At the time of writing this revised agenda, it is the spring of 2021. Though only three years have passed since the first version of the strategic agenda was drafted in 2018, a number of changes have occurred in the world that impact the challenges and conditions for sustainable spatial planning. A significant change that has affected how we live and move in society is the COVID-19 pandemic that we are experiencing at the time of writing. It is difficult to forecast what the long-term consequences of the pandemic will be on spatial planning. Consulting company WSP Group was commissioned by the Swedish Council for Sustainable Cities with writing a report in the autumn of 2020. In the report, they discern a number of potential consequences of the pandemic that may challenge sustainable spatial planning<sup>4</sup>:

- The pandemic has made societal, organisational and system weaknesses and injustices apparent.
- The pandemic has accelerated ongoing change processes such as digitalisation, the changing role of city centres and segregation.
- The pandemic has opened up the opportunity for change, but real action is necessary to harness it.

To a degree, these consequences entail new challenges and needs for knowledge, but primarily they perhaps enhance already identified aspects of sustainable spatial planning.

Planning and building more sustainable societies require several structural shifts which compel us to change our socio-technical and socio-ecological systems. Such shifts imply a transformation that encompasses technological innovation, changes in behaviour, culture and norms, and changes in our governing institutions. Working towards this transformation requires continuous, integrated processes for innovation, knowledge building and reflection. The task of the National Research Programme for Sustainable Spatial Planning is to support a sustainable transformation by ensuring that new research and innovation are

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1. Long-term survey 2019, Main Statement, SOU 2019:6, Long-term survey 2019. Main Statement, SOU 2019:65 (regeringen.se), 2021-09-01

2. IPCC (2021) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Full\\_Report.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf); Vad säger den senaste IPCC-rapporten? – Naturskyddsforeningen (naturskyddsforeningen.se), 2021-09-02

3. <https://www.wwf.se/klimat/konsekvenser/>, 2021-09-01

4. Pandemins påverkan på hållbara städer och samhällen, WSP GROUP 2020

funded, and that the knowledge generated can be translated into action.

The research programme aims to contribute to policy objectives, but another crucial task is to critically review, complement and think beyond today's policy objectives. The research programme thus covers a wide range of research approaches and initiatives.

## 1.3 Goals of the research programme

The goals of the research programme have been allocated into two categories:

- research policy goals that were formulated in the government commission
- thematic goals that were developed in wide-ranging dialogues when working on the agenda

The thematic goals aim to more clearly define a direction for what the programme strives to achieve subject-wise in the area of sustainable spatial planning.

### 1.3.1 Research policy goals

With the national research programme, the government aims to promote research and innovation that support sustainable spatial planning. The programme aims to provide a platform for ongoing research and create synergies between different stakeholders that complement each other in terms of sustainable spatial planning knowledge, expertise and projects.

To solve the complex challenges facing society, the programme should be broad and multidisciplinary in nature and support cross-sectoral collaboration. A central ambition of the programme is to promote utilisation and communication of research results and contribute to research's impact on society

in the form of development, knowledge building, evidence-based politics and management. The programme can span the entire spectrum – from research, innovation and technology development to demonstration, market introduction and dissemination.

The research policy goals defined in the sustainable spatial planning programme remit are that the programme should

- serve as a platform for ongoing research within sustainable spatial planning
- create powerful synergies between sustainable spatial planning parties
- create the conditions for interdisciplinary, cross-sectoral collaboration
- provide a natural link to international research programmes and strengthen Swedish participation in the European research programmes
- contribute to a greater focus on research in higher education
- contribute to equality
- contribute to the impact research results have on society

### 1.3.2 Thematic goals

A number of thematic goals have been formulated for the programme to clarify the programme focus and what it aims to achieve in the area of sustainable spatial planning. These are a further development of the programme themes drafted

in the first version of the 2018 strategic research agenda. They aim to substantiate what the programme's efforts should contribute from a topical point of view.

These programme-specific thematic goals will be further developed in the next chapter, *Programme themes and perspectives*. Here, the six themes of the programme are described, as well as the five perspectives that permeate all themes. These together make up the programme framework. The thematic goals touch upon several perspectives and themes and share some similarities but, for clarity, they are described below under the six thematic areas. Knowledge and new solutions are needed in each of these thematic goals to achieve transformative change in spatial planning.

Theme: Sustainable Residential and Public Environments:

- sustainably designed and inclusive built environments
- provision of housing for all

Theme: Sustainable Mobility Systems for All:

- integrated and coordinated transportation planning
- increase in sustainable travel and transports
- sustainable mobility practices

Theme: Human Health and Well-Being:

- living environments that have a positive impact on public health
- less environmental pollution in buildings, air, ground and water

Theme: Security and Safety for People and Societies:

- access to safe, secure public spaces
- safe and robust vital societal functions
- fewer risks in built environments

Theme: Sustainable Consumption and Production:

- living environments that promote reduced, sustainable consumption
- reduced climate impact and emissions in building and management

Theme: Sustainable Land and Water Use:

- planning for long-term land and water use
- land and water use that is adapted to climate change

## 1.4 How the agenda has been developed

The strategic research agenda sets the framework for the research programme and is regularly updated during the programme period. In line with Government commission instructions, which dictate that the national research programmes

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should be run flexibly, the approach is continuously developed through ongoing learning.

The first research agenda draft was developed in 2018, to be followed up by this revised version in 2021. The research agenda is valid until 2026 and constitutes a strategic framework for the programme. It is also intended to act as a tool for conversations between research funders, researchers and other parties in society such as civil society organisations and the public and business sectors. Should it be necessary, the agenda may be revised again.

The process for developing the first draft included broad dialogue between parties in society and researchers. Participants of these dialogues were programme committee and working group members, a number of universities, research institutes, authorities, industry organisations, companies, municipalities, not-for-profit organisations and others. Participation took place in the form of workshops, stakeholder dialogues and contributions to a referral procedure.<sup>5</sup>

During the spring of 2021, the programme committee and working group were involved in revising the agenda. Digital workshops were conducted with the programme committee and working group on how to develop the themes and perspectives. The working group was also tasked with writing a short text on each included funder and organisation, what their respective roles are in spatial planning and what research they fund. A draft of the entire revised agenda was then discussed with the programme committee and working group. The perspectives and themes that are central to the programme were also discussed with consulting municipal, business, research and innovation groups from the Swedish Council for Sustainable Cities as well as with Swedish Universities of the Built Environment (SBU) and the academic network for designed human habitats.

### **1.3.1 Agenda contents**

The next chapter identifies the central perspectives and themes that address challenges, the need for knowledge and goals of sustainable spatial planning. These perspectives and themes govern the programme activities and identify which challenges and knowledge shortcomings the programme aims to help solve in order to achieve transformative sustainable spatial planning.

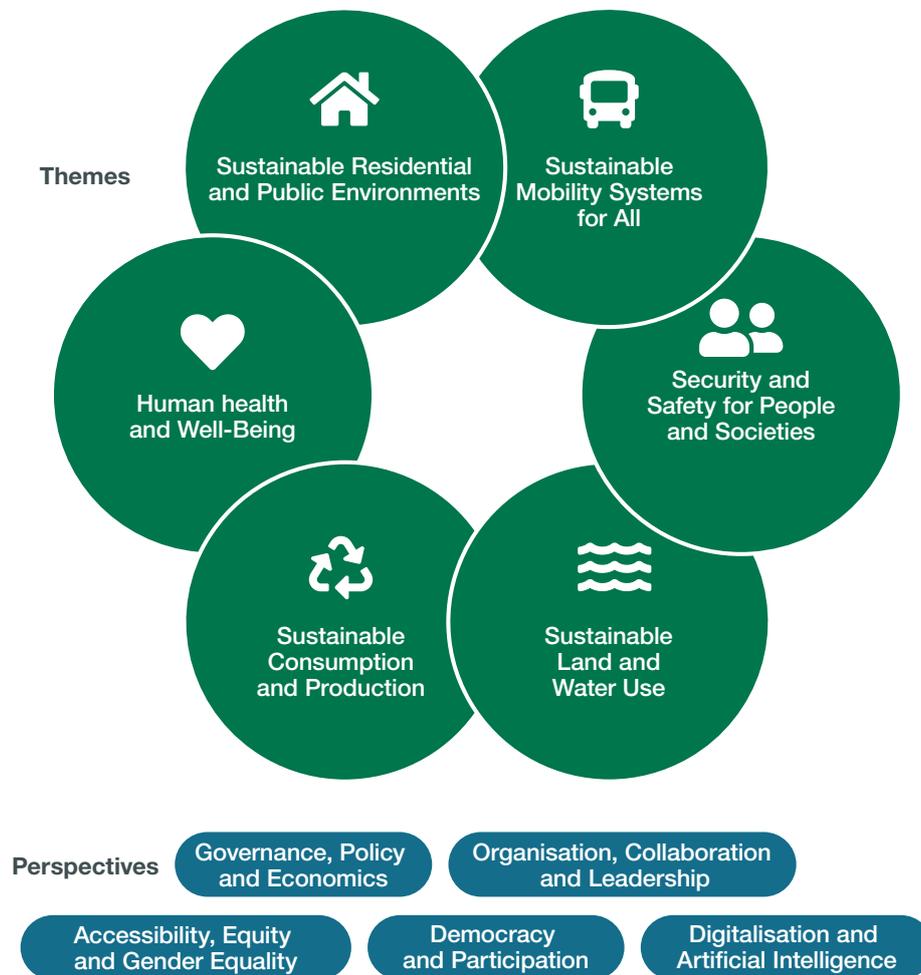
The next chapter provides an overview of how research and innovation in spatial planning are funded, nationally and in Europe. The chapter also contains brief descriptions of each organisation in the programme committee and working group as well as the roles each fills in the R&I funding system aimed at supporting the National Programme for Sustainable Spatial Planning.

The last chapter deals with how the programme is run and conducted, focusing on the programme organisation, activities and planned follow-up and evaluation.

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5. See Research Agenda 2018

## 2. Perspectives and themes for the research programme



**Figure 1.** Together, the programme perspectives and themes lay the groundwork for research and innovation toward transformative, sustainable spatial planning. From a spatial perspective, these perspectives and themes affect both local, regional, national and global contexts. They affect cities and rural areas of varying character as well as the connections and synergies between them. And from a time perspective, historical, contemporary and future considerations are important.

In working with the first draft of the agenda, five **perspectives** and six **themes** were identified for the research programme. These were developed based on the challenges and knowledge shortcomings that were pointed out in the Government commission, in workshops with stakeholders, in a survey of research funding in the area, in the work done by the programme committee and working group and by drawing conclusions from topical reports. During the review of the agenda in the spring of 2021, the perspectives and themes have been reworked in collaboration with consulting municipal, business, research and innovation groups from the Swedish Council for Sustainable Cities as well as with Swedish Universities of the Built Environment (SBU) and the academic network for designed human habitats. While reviewing the agenda, discussions have resulted in the perspectives and themes as they were formulated on the over-

view level of the 2018 agenda largely being kept intact, but with a few additions. However, the contents of the perspectives and themes have been rewritten to indicate a clearer direction in what needs to come about for sustainable spatial planning. Under each theme, two or three subheadings that indicate the thematic goals of the programme have been formulated.

In this section, the edited perspectives and themes that make up the framework for the National Research Programme for Sustainable Spatial Planning are described. The perspectives and themes address the challenges, need for knowledge and goals for a transformative, sustainable spatial planning and govern the research programme's activities. Together, the perspectives and themes lay the groundwork for research and innovation that contributes to knowledge-based, transformative sustainable spatial planning. From a spatial perspective, these themes and perspectives affect both local, regional, national and global contexts. They affect cities and rural areas of varying character as well as the connections and synergies between them. And from a time perspective, historical, contemporary and future considerations are important.

The themes describe areas in sustainable spatial planning whereas the perspectives describe basic aspects of spatial planning and management that are central for all themes. The themes are closely related and partially overlap. As such, the perspectives and themes of the agenda should not be treated as separate silos. Knowledge needs and solutions are often interlinked and involve several themes and perspectives. In practice this means that, for example, Governance, Policy and Economics is important for all themes and for correlations between the different themes. The five perspectives lay the groundwork for knowledge-building within and between these themes and thus contribute to transformative and sustainable spatial planning. Together, the perspectives and themes constitute the programme framework.

### **Perspectives**

- Governance, Policy and Economics
- Organisation, Collaboration and Leadership
- Accessibility, Equity and Gender Equality
- Democracy and Participation
- Digitalisation and Artificial Intelligence

### **Themes**

- Sustainable Residential and Public Environments
- Sustainable Mobility Systems for All
- Human Health and Well-Being
- Security and Safety for People and Societies
- Sustainable Consumption and Production
- Sustainable Land and Water Use

The upcoming section describes the challenges, knowledge needs and goals identified for each perspective and theme that need to be addressed by the Research Programme for Sustainable Spatial Planning. Working towards transformative change requires continuous, integrated processes for innovation, knowledge building and reflection. Each theme highlights a number of complex central areas that are in need of knowledge and innovative solutions for transformative sustainable spatial planning.

The knowledge needs described are by no means exhaustive. Researchers and various societal stakeholders continuously identify knowledge needs and issues to help solve societal challenges.

The perspectives and themes in question also relate to the different target areas of the programme. They clarify how future research investments and activities can be developed and monitored in relation to the global sustainability goals, the UN's New Urban Agenda and the national objectives of the commission.<sup>6</sup>

To emphasise the importance of applying the perspectives to all themes, the next section begins with a review of the perspectives, followed by a description of the themes in more detail. Together, perspectives and themes help provide the conditions for achieving complete solutions for sustainable spatial planning (see Figure 1).

## 2.1 Perspectives for transformative and sustainable spatial planning

The identified perspectives together constitute fundamental aspects of urban planning and management and build on the following arguments.

Spatial planning is done at several different levels of society: nationally, regionally, locally and the EU level. Therefore, collaboration between sectors and management on several levels simultaneously are required to lay the foundation for sustainable, transformative spatial planning. Forms of dialogue and collaboration between citizens, public parties, academia and businesses must also be developed.

Many solutions are available locally and can be implemented at local level. Municipalities need to be given the opportunity to increase the pace for sustainable transformation. National and regional planning must also be developed to address issues of regional importance. Swedish cities, urban areas and rural areas are affected by global challenges and also need to align with global goals, as well as international agreements and directives, during planning. Sweden must also leverage global knowledge and expertise to help solve our global challenges.

The different perspectives described in the following sections relate to all planning levels in society, and take as their starting point historical experiences, contemporary conditions and challenges, and future impacts and opportunities. The need for more knowledge and new solutions within each perspective affects all themes.

### 2.1.1 Perspective: Governance, Policy and Economics

Many issues within the framework of spatial planning are closely interrelated yet are addressed on various levels and in widely differing processes according to their respective laws. Governance takes place in many varying ways – through regulations, laws and policies, resource and funding allocation and financial incentives, as well as through norms and values. Procurement, requirements and socio-economic value models are important, powerful instruments of this governance. In addition, rapid technological developments and climate change require changes in legislation.

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6. The relationship between the global goals and the commitments in the UN's urban agenda is based on a survey conducted by Global Challenge 2016.

The Governance, Policy and Economics perspective indicates a need of more knowledge and new solutions for all themes on how different forms of governance, in and between varying levels (local, regional, national and international) impact spatial planning. Issues of power, influence and how conflicts of objectives and interest are currently governed and could be governed differently are central aspects for understanding as well as for how sustainability can be achieved in communities. In similarity to methods of evaluation, prioritisation and follow-up, it is relevant to know how e.g. co-creative and experimental activities can be used to test changed ways of governing.

Spatial planning projects are governed by a combination of financial and political driving forces. More knowledge is needed of how these forces influence the benefit of these investments to society and how to evaluate their long-term usefulness, for example, knowledge of alternative socio-economic value models. Governance needs to be directed toward values other than just financial ones. For this, new business models and socio-economic calculations are needed. How procurement and requirements can be used as a tool and how procurement instruments can be developed in relation to legislation are relevant in this context. Companies and private business have an important role and a great responsibility in this. There needs to be a focus on sustainability with regard to public and private capital in all spatial planning investments.

### **2.1.2 Perspective: Organisation, Collaboration and Leadership**

The organisation of urban planning is complex and consists of many different stakeholders – from Parliament, government, county administrative boards, municipalities and property owners, to developers and contractors, consultants and businesses. It also includes local residents as well as various special-interest and voluntary groups. Many issues within the context of spatial planning are closely related, with direct or indirect consequences in related areas. Despite this, planning and management take place in separate processes. There is therefore a great need to coordinate processes and legislation within spatial planning, both nationally and internationally, to create the foundation for a holistic perspective.

The Organisation, Collaboration and Leadership perspective addresses the need for more knowledge and new solutions for all themes pertaining to collaborative processes, roles and interaction between actors (public, business and civil) in the area of planning and management and how these can be developed. Knowledge of how different regulations (policies and governance) affect the potential for cooperation is also needed. It is also important to investigate on what level issues should reside, who has authority over what and who owns, or should own, a particular issue (e.g., public or private ownership).

Current organisational structures and leadership have limitations in how to deal with difficult problems and conflicts of objectives. Therefore, there is a need of more knowledge about and solutions for how new organisational forms, management models, and collaboration and leadership abilities for innovation and system change can be developed to enable changes in work arrangements and co-creation methods. The effects of leadership, and the relationship between political leadership and the role of officials as well as altered and new professional practices in planning and management are central aspects of this.

### **2.1.3 Perspective: Accessibility, Equity and Gender Equality**

Accessibility, equity and gender perspectives must be integrated early on in urban planning and be included throughout all stages of the planning process to take into account people's different needs and circumstances. This can be considered by asking questions like: Who are we building for and how do we do it? Do the decisions and plans have different consequences for different groups and individuals? Who is doing the planning and who the building? Where and when are things not built, or should not be built? In a citizen dialogue, these questions can involve who gets the chance to be involved, what type of meeting formats are used, what representation looks like in focus groups, and the choice of dialogue leader. Applying an accessibility, equity and gender perspective increases the likelihood of achieving a holistic view of spatial planning and including social issues to a greater extent.

The Accessibility, Equity and Gender Equality perspective addresses the need for more knowledge and new solutions to all themes on how equity, gender equality and accessibility can be integrated into spatial planning and management with a focus on under-represented and discriminated societal groups. Depending on the context, it is important to highlight the consequences and impact on e.g. the elderly, children, women and men respectively, girls and boys respectively, socio-economically vulnerable groups and individuals from other countries. There is also a great need to understand and address the importance of intersectionality, i.e., that different forms of inequality enhance other forms of inequality.

More knowledge and new solutions are needed for the design and adaptations of existing environments from the perspectives of gender equality, equity and accessibility. It is also about accessibility and inclusiveness in the physical environment, transport and facilities and access to goods, products and services. It is important to take the user's perspective into consideration in spatial planning, that is, to have those who will be using the function, service or area in the public or the private space and their needs as the starting point.

### **2.1.4 Perspective: Democracy and Participation**

In order for societies to transform and at the same time see to the needs of different people will lead to a great many conflict-laden decisions and processes. This can put democracy to the test and requires us to take a serious view on the tendency to mistrust democratic institutions. Well-functioning urban planning presupposes democracy and participation. There is a need for more knowledge and new solutions that bring into focus conflicts, accountability, legitimacy, justice, trust, consequences, and opportunities that come with democracy and participation.

The Democracy and Participation perspective addresses the need for more knowledge and new solutions for all themes on how participation-based, inclusive planning and management that takes everyone's social and socio-economic conditions into account can be developed and strengthened, how rights can be promoted, and obligations can be made clearer. Here, new forms of dialogue with citizens and dialogues in early stages of the planning process may be needed. Collaboration between the public sector, non-profit organisations and the business need to be developed and enhanced, as well as the role of civil society in change and transition processes. To a high degree, public spaces and natural and cultural environments should be designed and used in ways that foster participation, social inclusion and community.

In the field of spatial planning, different interests are weighed against each other and against individual interests in an open and democratic process, for example through consultation. Through citizen proposals, civic dialogues, advocacy activities, social media and mobilisation, civil society and various social groups can be given the opportunity to influence how our cities are designed and run. It is of great importance to investigate and develop how these processes are designed and given legitimacy. We need more knowledge of what threatens basic democratic freedoms and rights, what obstructs participation and how spatial planning processes can be developed to ensure that democratic freedoms and rights are taken into consideration.

### **2.1.5 Perspective: Digitalisation and Artificial Intelligence**

Digitalisation can enable planning, construction and management to become more efficient and to better leverage and develop the opportunities of big and open data. It offers a tool for transformative and sustainable urban planning and management. There is great room for development of technology for smart cities and communities. In this area, coordinated services around transport and logistics flows, energy, water and sewage can streamline management, operation and maintenance. But digitalisation can also help to cultivate democracy and participation through information and services that enable sharing and simplify people's everyday lives.

Artificial intelligence (AI) also shows great potential for sustainable spatial planning. It is already being used in the transport sector and is part of many applications and technical solutions. Digitalisation and AI also bring with them a risk of increased energy and resource consumption and that certain individuals and groups are excluded or lose their jobs. Understanding of the user's perspective and the societal consequences are central when it comes to digitalisation and AI in spatial planning.

The Digitalisation and Artificial Intelligence perspective addresses the need for more knowledge and new solutions for all themes in a number of issues. For example, how data can be collected, quality assured, made available and used for sustainable spatial planning. Knowledge is also needed of how uniform data series can be developed so that they can be reproduced at local, regional and national levels, of how data series should be interpreted considering insecurities or gaps in data, of how national key indicators can be developed for sustainable spatial planning and of how authorities can develop their evaluation methods. There is also a need of skills improvement initiatives and increased access to basic and updated information for existing properties.

It is also central to develop methods and tools to identify and eliminate vulnerabilities and risks related to data protection and cybersecurity, and how these can be integrated into urban planning and management. Legislation and the legal system also need to be developed to support digitalisation and AI that contribute to sustainable spatial planning. This perspective also has an impact on all forms of media, both traditional media and social media, which nowadays often have great impact and influence. Here, there is a need for more knowledge and new solutions for how social media and digital platforms are used and should be used in spatial planning to involve citizens and influence behaviours, norms and consumer preference.

## 2.2 Themes for transformative and sustainable spatial planning

As previously mentioned, when developing the first agenda, six themes were identified that work together with the perspectives to tackle challenges and knowledge needs for sustainable spatial planning. Together with the perspectives, the themes govern future activities in the research programme. During the 2021 revision of the agenda, thematic goals under each theme were formulated to more clearly indicate a number of complex, central areas that require more knowledge and new solutions to achieve transformative, sustainable spatial planning.

The following section describes these themes as well as the national and international objectives that the research programme activities can contribute to.

### 2.2.1 Theme: Sustainable Residential and Public Environments

Sustainable residential and public environments mean having access to adequate, safe and financially attainable living accommodations, basic services and green areas. Planning, construction and management also need to meet demographic changes such as an ageing population and take into consideration various age groups, e.g., including the perspective of the child. To achieve sustainable residential and public environments, there is a need for more knowledge and new solutions in a number of areas. Two thematic goals are indicated below.<sup>7</sup>

#### **Goal: Sustainably designed and inclusive built environment**

Sustainable built environments must be designed taking into consideration how architecture and design affect individuals, groups, community and inclusiveness. There is a need for inclusive public spaces, blue-green infrastructure and an understanding for how the design of spaces can e.g., impact civic influence, ecosystem services, gender equality and security. It is central to use natural and cultural environments as resources when designing inclusive public environments. It is also important that people with different needs and in different phases of life have access to services, cultural environments and nature and green areas. There is also a need for more knowledge and new solutions for e.g., various types of sharing and how several functions can cooperate and use the same spaces and properties.

#### **Goal: Provision of Housing for All**

Socially sustainable provision of housing for all entails that there are accommodations and good living environments available to social groups with fewer financial resources. There is a need for more knowledge and new solutions to how policies, laws, regulations, designs, management and innovations can contribute to social housing policies and good living environments for all.

More knowledge and new solutions are also needed to reduce housing segregation. It may entail how socio-economic issues interact with spatial planning, construction and design issues as well as how individual preferences and actions impact housing segregation. There is also a need for increased understanding of and new solutions for how social, financial and technical aspects of sustainable building and renovation intertwine.

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7. Investments and activities within the theme Sustainable Residential and Public Environments create opportunities to achieve some of the international and national goals: primarily goals 11 and 15, targets from the national objectives for construction, urban planning, architecture and more, and the Good Built Environment environmental objective. See Appendix 3 for related Agenda 2030 goals.

### **2.2.2 Theme: Sustainable Mobility Systems for All**

Sustainable mobility systems involve fossil-free, safe and accessible transport, travel and ways of moving about that are affordable and accessible to people with different needs and abilities. They also include sustainable logistics and sustainable freight transport. Sustainable transport systems in cities also include an aspiration to convert streets from carrying private vehicles to public transportation, cycling and pedestrians.

Transformative spatial planning must contribute to making it easier to choose sustainable transportation and travel behaviours and to minimise the need for travel and transport. To create sustainable mobility public environments for everyone, there is a need for more knowledge and solutions in a number of areas. Three thematic goals are indicated below.<sup>8</sup>

#### **Goal: Integrated and Coordinated Transportation Planning**

There is a need for increased coordination between transportation and urban planning locally, regionally and nationally. Sustainable mobility systems must be planned in relation to other functions in society (and vice versa), including housing and habitation, work, healthcare, transportation of hazardous goods and services. Issues such as how smart mobility and mobility services can be integrated with or add to different forms of transportation can be included. An important aspect is also infrastructure and mobility system ownership and the differences in consequences if they are owned by the state or privately, on a national, regional or local level.

#### **Goal: Increase in Sustainable Travel and Transports**

The proportion of sustainable travel and transports needs to increase while the total amount of travel and transports needs to decrease. This means that more knowledge and new solutions are required for creating sustainable transportation with sustainable forms of transport based on the different needs and circumstances of people. This requires a foundation for increasing public transportation and for making pedestrian and cycle traffic safer in built-up and rural areas. There is also a need to change logistics flows and make goods transportation more efficient and environmentally friendly based on regional conditions.

#### **Goal: Sustainable Mobility Practices**

There needs to be increased understanding for mobility practices and people's mobility strategies and on how more sustainable changes in travel and transport behaviours and practices can be achieved. This involves people's travel habits as well as values, choices, norms and beliefs concerning safety and health issues during travel. This also deals with how accessibility can be created in various parts of the country without the need for travel or transport. The mutual relationship between transport efficiency and social sustainability is viewed as an important area for bringing about sustainable mobility systems for everyone.

### **2.2.3 Theme: Human Health and Well-Being**

People's health and well-being are impacted by indoor and outdoor environments. To ensure good health and well-being, there must be a reduction in harmful

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8. Investments and activities within the theme Sustainable Mobility Systems for Everyone create opportunities to achieve some of the international and national goals: primarily SDGs 11 and 9 and targets from the national objectives for transport and infrastructure, spatial planning, architecture, gender equality and accessibility.

chemicals and pollution in the air, water and land. People's health and well-being are impacted by how living environments are designed and how habitations are sited and designed. Health and well-being are impacted by aesthetic, artistic and cultural historical values, access to daylight, noise levels, access to nature and recreational areas, conditions for active leisure time and socialising and participation and influence in society. To increase the health and well-being of people, there is a need for more knowledge and solutions in a number of areas. Two thematic goals are indicated below.<sup>9</sup>

### **Goal: Living Environments that Have a Positive Impact on Public Health**

It is important that our physical environments promote active mobility in everyday life, both on foot and bike. Physical environments must also provide areas for recreation, e.g., green environments that enhance physical and mental health, access to nature and cultural environments, recreation and play. Green environments also have a positive impact on biodiversity. A public health perspective needs to be integrated into urban planning and management to effect healthy environments. It is also important to integrate a perspective of justice as circumstances, overcrowding, areas for growing up and proximity to e.g., urban nature impact people's health.

### **Goal: Less Environmental Pollution in Buildings, Air, Ground and Water**

To improve human health and well-being, there must be a reduction in environmental pollutants in air, land and water and a reduction in chemical usage. It is important to create non-toxic environments and to phase out, handle or destroy substances in contaminated materials and waste. There is a need for knowledge on how physical environmental factors such as noise levels and access to daylight affect people's health and well-being. This knowledge must be integrated into planning, construction and management. This knowledge is also needed in order to assess risks to the environment and people's health and to reduce the consequences should the risks come to pass.

## **2.2.4 Theme: Security and safety for people and societies**

Vital societal functions that are of importance for the lives and health of the population, the functioning of society and basic values must not be impeded if the safety and security of people and communities is to remain. Vital societal functions must be protected from and adapted to climate change.

People and communities also need access to safe, secure, inclusive and accessible public spaces, residential environments as well as access to nature and green spaces. Individuals and groups experience safety and security differently. This theme therefore also deals with issues of perceived security and trust in society. To increase the safety and security of people and communities, there is a need for more knowledge and new solutions in a number of areas. Three thematic goals are indicated below.<sup>10</sup>

9. Investments and activities within the theme Public Safety create opportunities to achieve some of the international and national goals: primarily SDGs 5, 6, 7, 11, 12 and 15 and targets from the national objectives for transport and infrastructure, construction, urban planning, the environmental objectives Clean Air and A Non-Toxic Environment and public health goals and target areas.

10. Investments and activities within the theme Safety and Security Systems for Everyone create opportunities to achieve some of the international and national goals: primarily SDGs 9, 11, 13 and 16 and targets from the environmental objectives for public safety, construction and urban planning.

### **Goal: Access to Safe, Secure Public Spaces**

Safety and security in urban planning need to be addressed from a justice perspective and a social perspective as individuals perceive and are impacted by safety and security differently. There is a need to integrate security issues and crime prevention efforts into spatial planning and management. Collaboration between different stakeholders needs to be developed and efforts must be adapted to local conditions.

### **Goal: Safe and Robust Vital Societal Functions**

Our society and critical infrastructure must continue to function in all circumstances, even in the event of disruptions, crises, war and terrorism. In urban planning, it is important to secure the functionality and ability to prevent, manage and recover from serious disruptions to vital societal functions. Privatisation, technology development and increased internationalisation put new demands on how vital societal buildings and facilities that are part of critical infrastructure need to be designed to achieve the desired robustness, security and functionality. There is a need to develop and integrate risk and vulnerability analyses into urban planning and to integrate measures and solutions in both management and planning.

### **Goal: Fewer Risks in Built Environments**

Urban planning needs to be adapted to prevent negative consequences of climate-driven events, changed precipitation patterns, temperature changes and natural disasters. Built environments and climate and ecosystem services for existing buildings and infrastructure must be climate-adapted. It is also important that buildings are safe for people, including fire safety, that any safety and security risks are pre-empted and managed and that spatial planning does not cause or introduce new risks.

## **2.2.5 Theme: Sustainable Consumption and Production**

Responsible consumption and production entails efficient use of resources within the planet's limits. By integrating systems and services in order to use, reuse and recycle resources in planning, construction and management, the groundwork is laid for promoting a circular economy and efficient material and resource consumption in cities and communities and between cities and the countryside. Living environments need to be designed to encourage a reduction in resource use and consumption. There is a need for more knowledge and new solutions in a number of areas. Two thematic goals are indicated below.<sup>11</sup>

### **Goal: Living Environments that Promote Reduced, Sustainable Consumption**

There is a need for better understanding of the role that spatial design and the physical environment play in production and consumption patterns. In addition, new solutions are needed for resource management and circular economy and flows in and between cities and rural areas. This area also deals with how alternative economic and social models, policies and governance in spatial planning can influence consumption.

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11. Investments and activities within the theme Responsible Consumption and Production create opportunities to achieve some of the international and national goals: primarily SDGs 11, 12 and 15, targets from the environmental objectives for construction and urban planning, and the environmental objectives A Non-Toxic Environment, Good-Quality Groundwater, and Reduced Climate Impact.

It is important to integrate issues of design, consumption behaviours, circular economy, logistics flows, waste management and management of existing built environments as well as to understand how living environments can be designed to promote more sustainable consumption patterns and reduced consumption.

### **Goal: Reduced Climate Impact and Emissions in Building and Management**

It is of great importance to reduce the climate impact and emissions in new production, renovation and management of housing, buildings, production facilities and infrastructure. For this, knowledge and new solutions are needed of building and construction technology, building logistics and industrial building as well as of resource-efficient circular economy. Existing buildings should be utilised to a greater degree to reduce the need for new builds. A long-term life cycle perspective needs to be integrated into planning, construction, operation and maintenance with respect to cultural environments, construction and building materials, waste management, recycling and reuse.

## **2.2.6 Theme: Sustainable Land and Water Use**

Society needs to plan for sustainable land and water use. This means maintaining existing and future buildings and infrastructure to make them adaptable to changing conditions, to meet people's different needs and to promote biodiversity. Access to land and water is fundamental to all urban planning and often involves conflicts of interest and objectives. There is a need for more knowledge and solutions in a number of areas. Two thematic goals are indicated below.<sup>12</sup>

### **Goal: Planning for Long-term Land and Water Use**

Land is needed for various purposes such as for housing, infrastructure, green areas, ecosystem services, and food production. Therefore, interests are often in conflict with each other. Access to developable land is limited, especially in large urban areas. To achieve long-term sustainable land and water use, various interests and claims must be taken into consideration. A knowledge base, policy instruments and clear guidelines are needed to enable long-term trade-offs between societal objectives such as in the case of municipalities having to develop long-term plans, weighing various values against each other, for how to use land. For sustainable water use, the impact of drinking water supplies from other sectors, such as wastewater management, agriculture and road transport, as well as how groundwater is affected by pollutants and by excessive extraction, must be weighed. There is also a need to integrate a long-term life cycle perspective into planning, construction, operation and maintenance with respect to drinking water supplies, water and sewage issues, and stormwater management.

### **Goal: Land and Water Use that Is Adapted to Climate Change**

More knowledge is needed on the impacts of climate change on soil conditions and on existing and new geotechnical structures and infrastructure. With this knowledge as the starting point, land- and construction-related climate-adapting measures are needed. It is also important to integrate water and climate regulating ecosystem services into urban environments. Sustainable water use involves integrated management of water that considers the effects of climate change, uses measures to reduce stormwater runoff and reduces the risk of flooding and

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12. Investments and activities within the theme Sustainable Land and Water Use create opportunities to achieve some of the international and national goals: primarily SDGs 6, 9, 11, 12, 13 and 15, targets from the environmental objectives for construction and urban planning, and the environmental objectives A Non-Toxic Environment, Good-Quality Groundwater, and Reduced Climate Impact.

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pollutant emissions. It is important that stormwater runoff and sewage systems are considered early on in construction planning and implementation to meet changes in society and the climate and to increase understanding of human approaches to drinking water and water use. It is also important to take into consideration heat waves and other related consequences of climate change early in the planning and in adaptations to existing environments.

# 3. Research and Innovation Funding for Sustainable Spatial Planning

An objective of the research programme includes creating powerful synergies between different stakeholders who complement each other in terms of knowledge, skills and missions. The programme should also be characterised by active, strategic coordination of research funding and other activities. In part, this means that the programme should detail the initiatives and programmes carried out by the research funders who are members of the programme committee. This facilitates the assessment of synergies and the optimal use of research funding.

In this section, we describe the national and European research and innovation funding in the area of spatial planning. The purpose of this review is to get an overview of each funder's role and direction.

## 3.1 Chapter Limitations

Spatial planning encompasses many different stakeholders across multiple sectors and research areas. This review will only list state research funding institutions and organisations included in the programme committee and working group for the Research Programme for Sustainable Spatial Planning. The Swedish Energy Agency, Formas, Forte (Swedish land registration authority), Mistra – the Swedish Foundation for Strategic Research, the Swedish Civil Contingencies Agency (MSB), the Environmental Protection Agency, the Swedish National Heritage Board, the Swedish International Development Cooperation Agency (Sida), the Swedish Agency for Economic and Regional Growth, the Swedish Transport Administration, the Swedish Research Council, the National Board of Housing, Building and Planning and the Swedish Land Registration Authority (Lantmäteriet).

The section also includes the strategic innovation programmes in the area of sustainable spatial planning that are funded by Vinnova, the Swedish Energy Agency and Formas. At the end of the chapter, European spatial planning research and innovation initiatives will be described in brief.

There are also other spatial planning actors and initiatives that are not included in the presentation. Other examples not included are industry-funded research such as SBUF (the Swedish Construction Industry Development Fund), which provides grants for research and development in the Swedish construction industry, and SVU (the Swedish Water and Wastewater Association), which funds applied research and development of special interest for municipal water services. The Wallenberg Foundations, the Riksbank's Jubilee Fund and Länsförsäkringar's Research Fund also fund projects in the programme area. There are also other state actors, such as ArkDes Think Tank, the Delegation against Segregation and the Swedish National Art Council, that fund sustainable spatial planning research to some degree. About half of the funding obtained by universities are through

direct appropriations (also known as basic appropriations).<sup>13</sup> Such funding can be allocated over all research areas the universities are involved in. The portion of the basic appropriation for projects within sustainable spatial planning is not included in this presentation.

Below, a brief description will be given of the responsibility and focus of each state research funder included in the programme committee and working group for the National Research Programme for Sustainable Spatial Planning. This will be followed by short descriptions of the strategic innovation programmes that touch upon sustainable spatial planning. Lastly, European initiatives in this area will be described briefly.

## 3.2 Funder Responsibility and Focus

This section briefly describes the responsibility and focus of the research funders and authorities that are represented in the National Research Programme for Sustainable Spatial Planning. First, research funders will be listed in alphabetical order, followed by the National Board of Housing, Building and Planning and the Swedish Land Registration Authority (Lantmäteriet), which are central authorities in the area of spatial planning but are not tasked with funding. Refer to each organisation's website for more information on current programmes, calls and activities.

### Swedish Energy Agency

The mission and business idea of the Swedish Energy Agency is to lead societal transition to sustainable energy systems. The Swedish Energy Agency's role can be described as being governing, supportive and providing expertise. The authority supports research, innovation and business development, conveys facts, knowledge and analyses, develops statistics and forecasts, organises networks and participates in international climate initiatives.

The Swedish Energy Agency views energy system transition as an integral part of societal development, locally, regionally, nationally and internationally, and promotes transitioning all sectors.

The Swedish Energy Agency supports research and innovation initiatives with approximately SEK 1.5 billion annually in six main areas. The initiatives aim to make a contribution to the objectives of the Agreement on Swedish Energy Policy. These thematic areas are: Sustainable transports in an equal, accessible society; Resource-efficient, sustainable building; Competitive,

sustainable Swedish industry; Renewable electrical systems for sustainable climate transition; Sustainable bioenergy from societal residual currents; and People- and society-driven energy transition.

In addition to the six thematic research and innovation areas, the Swedish Energy Agency has identified seven critical initiative areas, or key solutions, where the opportunities for gearing up and the need for reinforcement for enabling the energy and climate goals are great: 1) digital transformation 2) electrification 3) energy storage 4) negative emissions 5) circular flows 6) sustainable societies 7) economic and social sustainability issues. The last two key solutions focus on how people make transition happen through behavioural and value changes.

For more information on current calls and activities, please see: [www.energimyndigheten.se](http://www.energimyndigheten.se)

### **Formas – a research council for sustainable development**

Formas is a government research council for sustainable development that funds research and innovation, develops strategies, makes analyses and evaluates and communicates research and research results. Formas' areas of activity are the environment, agricultural sciences and spatial planning. In 2021, Formas will allocate just over SEK 1.8 billion in support for research and innovation for sustainable development. In the area of spatial planning, Formas funds research and innovation in all themes and perspectives detailed in this agenda.

Since 2017, Formas is the host authority for the National Research Programme for Sustainable Spatial Planning. Within the programme framework, Formas pays out over SEK 125 million annually to research and investigation. Part of the programme remit is for Formas to coordinate the work in a programme committee and working group and communicate on ongoing and concluded research.

In addition to the initiatives made in the programme, Formas has an annual open call and a number of targeted calls for funding in the area of spatial planning. Formas also participates in many international contexts and initiatives in Horizon Europe, such as the Driving Urban Transitions partnership programme. Together with the Swedish Energy Agency and Vinnova, Formas also funds strategic innovation programmes.

For current programme information please see: [formas.se/samhallsbyggande](http://formas.se/samhallsbyggande)

### **Forte – Council for Health, Working Life and Welfare**

Forte is a state research council that funds scientific research in human health, work life and welfare that contribute to more equal and sustainable societies. Forte evaluates the effects of the research and how results can be put into practice. Forte also actively works with knowledge dissemination.

Forte's activities are to contribute to achieving Agenda 2030 and reaching the global sustainable development goals, especially with regard to the goals that have bearing on the social and economic dimensions of the agenda, e.g., goals 3 Health and well-being, 5 Gender equality, 8 Decent work and economic growth and 10 Reduced inequalities.

Each year, Forte directs over SEK 700 million to basic and needs-driven research. It is about everything from individual project grants to investments in building world-class research environments. Forte also allocates funds with the purpose of stimulating transboundary research collaborations, in the EU and the rest of the world.

Forte makes both a direct and an indirect contribution to the area of spatial planning. Their direct funding has in part been in the form of thematic investments with Nordforsk and in part as funding of research projects that highlight issues directly connected to SDG 11.

Forte's contribution amounts to about SEK 50 million annually. Indirectly, Forte develops the area by supporting research projects that highlight relevant issues despite the support not specifically being part of the national research programme's goals or focus areas in SDG 11. The research that Forte funds includes

issues of ageing, accessibility, healthy lifestyles, the labour market, including work life organisation and governance and welfare for various age and social groups. Public health is one of Forte's main areas.

For more information on current calls and activities, please see: [www.forte.se](http://www.forte.se)

### **Mistra – the Swedish Foundation for Strategic Research**

Mistra is an independent research foundation that annually invests about SEK 200 million in various research initiatives. The goal of Mistra's investments is to contribute to solutions to important environmental problems, create strong, high-class, international research environments and to strengthen Swedish competitiveness. Research results are required to be applicable and to contribute to sustainable development. Many environmental challenges are complex, and the goal is for research results to come into practical use through new products, services and methods of working. Therefore, the research investments are interdisciplinary and are conducted in collaborations between various scientific disciplines. Universities and research institutes are actively involved in the research, as are companies, authorities, non-profit organisations and other actors.

Mistra's research portfolio consists of approximately 20 research programmes and centres, most of which are for a period of eight years. The research portfolio varies with time and covers a range of areas from mobility solutions and leisure time to maintenance of municipal infrastructure and consumption.

Mistra started the Mistra Dialog initiative to enhance the connection between Mistra programme research and the surrounding community's need for qualified knowledge. Mistra Dialog links results and knowledge from Mistra's research initiatives and current topics on the environmental policy agenda in Sweden and the EU.

For more information on current calls and activities, please see: [www.mistra.se](http://www.mistra.se)

### **MSB – Swedish Civil Contingencies Agency**

MSB works toward securing a safer society in an ever-changing world. MSB is tasked with strengthening society's ability to prevent and manage accidents, crises and the consequences of war. MSB shall protect human life and health, societal functions and basic values such as democracy, the rule of law and human rights.

Changes in challenges, threats and opportunities require developed ability and new knowledge. Therefore, MSB funds research in the area of civil contingencies which includes everything from often recurring everyday accidents to large-scale events that occur rarely or can have system-threatening consequences for society.

MSB funds needs-driven research that can be applied in society. The research should stem from a need in society that could lead to new understanding, methods or products. External actors such as universities, colleges and research institutes receive funding. MSB invests SEK 110-120 million annually in research. About five to ten new projects are started each year, with running times of three to five years.

The research covers many different scientific disciplines. MSB encourages interdisciplinary research to enable MSB to better analyse and understand societal phenomena and to apply the results. The goal is to gain requested, needed and

utilised knowledge for strengthening the ability to manage current and future civil contingency challenges. MSB closely collaborates with actors and other research funders. From an international perspective, MSB prioritises Nordic collaborations in NordForsk, security research in the European Union Research Framework Programmes and the collaboration agreements Sweden has with the US and Canada.

For more information on current calls and activities, please see: [www.msb.se](http://www.msb.se)

### **Swedish Environmental Protection Agency**

The Swedish Environmental Protection Agency overviews the state of the environment and progress of environmental efforts. The Swedish Environmental Protection Agency has a vision of “a good living environment for man and everything living, now and in coming generations.” The authority

is responsible for the sixteen environmental goals and plays a role in developing sustainable physical planning and work with issues pertaining to sustainable urban development, physical planning, environmental assessments, climate adaptation and cross-boundary environmental impact. The Swedish Environmental Protection Agency counsels in areas such as climate adaptation, green planning, nature-based solutions, transport efficiency, leisure activities, city planning and urbanisation and sustainable use of plastic.

The Swedish Environmental Protection Agency funds needs-driven and fact-based research up to SEK 94 million annually. The research shall support the Swedish Environmental Protection Agency's and the Swedish Agency for Marine and Water Management's efforts on environmental quality targets, implementation of the climate policy framework, the Environmental Code as well as provide a basis for international negotiations. The research must be of high scientific quality with great practical environmental relevance. The calls are anchored in the needs for knowledge identified by the Swedish Environmental Protection Agency and the Agency for Marine and Water Management and encompass three main areas: nature, climate and sustainable society. The calls aim to promote basing environmental efforts on the best available knowledge.

For more information on current calls and activities, please see: [www.naturvardsverket.se](http://www.naturvardsverket.se)

### **Swedish National Heritage Board**

The Swedish National Heritage Board leads and supports efforts to preserve, utilise and develop the nation's cultural heritage. The authority's activities shall contribute to fulfilment of the national objectives for culture policy and state-funded efforts on the cultural environment. The Swedish National Heritage Board is primarily responsible for issues of cultural heritage landscapes, cultural sites, cultural values and museums.

The authority's remit includes leveraging cultural heritage in community development, promoting museum and cultural heritage efforts, developing and relaying information and knowledge of cultural heritage and allocating contributions and research funds in the area of cultural heritage. Annually, approximately SEK 280 million is allocated to initiatives for maintaining and making accessible valuable cultural environments as well as to the cultural heritage efforts of working life museums, local history museums and other non-profit organisations. Just over SEK 20 million is allocated to practical cultural heritage and cultural

environment research efforts. The purpose is to promote knowledge building, keep research living, and to clarify and enhance historical and humanistic perspectives in sustainable development of society efforts.

For more information on current calls and activities, please see: [www.raa.se](http://www.raa.se)

## **Sida**

Sida, the Swedish International Development Cooperation Agency, is Sweden's aid authority. By collaborating with civilians, authorities and companies, Sida works toward sustainable development and helps people living in poverty and oppression change their lives.

Research is one of humanity's greatest assets for solving problems and evolving. But low-income countries conduct very little research of their own. Sida therefore supports research that will eventually improve the lives of people living in poverty. Sida's research and innovation efforts are aimed at strengthening the capacity of low-income countries to conduct their own research by expanding national research systems and support for national research and innovation and by supporting research that is relevant to low-income countries.

Research support is Sweden's most long-term form of aid with research collaborations often lasting several decades. The results, reduced poverty and more sustainable communities, generally come after a great number of years. In return, the effects are often substantial and long-lasting. In 2019, Sida supported research and innovation with SEK 920 million.

For more information on current calls and activities, please see: [www.sida.se](http://www.sida.se)

## **Swedish Agency for Economic and Regional Growth**

The Swedish Agency for Economic and Regional Growth is a state-owned authority under the Ministry of Enterprise and Innovation. They are commissioned with promoting sustainable business development and regional growth and managing and allocating funds from the European Regional Development Fund (ERDF). The Swedish Agency for Economic and Regional Growth plays a special role as the authority responsible for regional development policy, business policy and coordinated rural policy. The Swedish Agency for Economic and Regional Growth works to strengthen the connections between sustainable regional development and urban planning.

The main source of funding for the Swedish Agency for Economic and Regional Growth is the European Regional Development Fund through eight regional programmes throughout Sweden, a national regional fund programme and the cross-regional Öresund-Kattegatt-Skagerrak collaboration programme. One of the regional fund programmes the Swedish Agency for Economic and Regional Growth is responsible for has a particular focus on sustainable urban development. The Swedish Agency for Economic and Regional Growth also manages REACT-EU, which aims to strengthen businesses in restarting and transitioning after the Corona pandemic, and the Just Transition Fund, which focuses on industries and regions with the greatest carbon emissions.

The ERDF in Sweden aims to improve the capacity of research and innovation and promote the use of advanced technology. It can fund parts of the Swedish innovation system, which complements the initiatives of the national research programmes. The ERDF can complement other research and innovation

funding such as early in the value chain by developing and strengthening the capacity of R&I infrastructure throughout the country and by later by disseminating, applying, scaling up and commercialising the results.

For more information on current calls and activities, please see: [www.tillvaxtverket.se](http://www.tillvaxtverket.se)

### **Swedish Transport Administration**

In the Swedish Transport Administration's area of operation, there are a number of actors who support research and innovation, both domestically and internationally. The Swedish Transport Administration is not, for the most part, purely a funder, but initiates research and innovation motivated by the administration's tasks.

The Swedish Transport Administration contributes to the development of the transport system through the assignment given by the Government to the authority. This includes planning the transport system in the long term and building, operating and maintaining state roads and railways. According to the 2018–2029 National Plan for the Transport System, the Swedish Transport Administration will invest approximately SEK 8 billion in research and innovation during those years.

In its role as a community developer, the Swedish Transport Administration collaborates with others to create good conditions for active integration of the transport system with other societal development. Some important areas of social development are housing, sustainability, labour market, tourism and how these create the conditions for freight transport and supply, public transport, combined mobility and walking and cycling. Through research and innovation, demonstration projects and national and international collaboration projects, the Swedish Transport Administration will develop new knowledge to support sustainable urban development and smart cities in accordance with Agenda 2030.

Developments in automation, digitalisation and robotisation will have major consequences for the city and for the transport system. For example, an increased proportion of autonomous vehicles would affect the accessibility of different groups, the design of streets and land claims. The Swedish Transport Administration cooperates with Vinnova, the Swedish Energy Agency, Formas and several other knowledge centres and innovation platforms.

Together with the Swedish Municipalities and Regions Agency (SKR), the Swedish Transport Administration manages and develops knowledge bases, handbooks and tools to support the realisation of mutual value creation between infrastructure and urban and regional development and to manage traffic issues in the city.

For more information on current calls and activities, please see: [www.trafikverket.se](http://www.trafikverket.se)

### **Swedish Research Council**

The Swedish Research Council is Sweden's largest government research funder and provides support for research in all areas of science. The Swedish Research Council allocates a total of almost SEK 7 billion each year to research and research infrastructure at Swedish universities and colleges. The Council is also an advisor to the Government on research-related issues and actively participates

in the debate to create an understanding of the long-term benefits of research. The Swedish Research Council also provides infrastructure and digital services for Sweden's researchers.

The Swedish Research Council funds research relevant to the themes of the research agenda, both with funding within the free calls, as well as in the special initiatives and research programmes that the Council has a Government commission to manage.

The Swedish Research Council hosts the related national research programmes for segregation, migration and crime, and is also part of several international collaborations where research with significance for the programme's themes is funded.

For more information on current calls and activities, please see: [www.vr.se](http://www.vr.se)

### **Vinnova – Sweden's innovation agency**

Vinnova is a government agency under the Ministry of Enterprise and Innovation and national contact authority for the EU Framework Programme for Research and Innovation. Vinnova is also the Government's expert authority in the field of innovation policy. Vinnova's vision is for Sweden to be an innovative force in a sustainable world, and the agency's mission is to strengthen Sweden's innovation capacity to contribute to sustainable growth. Vinnova's starting point is the Sustainable Development Goals adopted by the UN in Agenda 2030.

Vinnova works in ten areas to create opportunities and driving forces for organisations to meet important societal challenges together. Some of the ten areas border on the national research agenda for sustainable spatial planning namely Sustainable Urban Development, Sustainable Mobility Systems and Transformative Public Sector and Civil Society.

In all ten areas, Vinnova stimulates collaborations in which knowledge and competence from different directions meet and in which organisations learn from each other. Vinnova's support gives companies and organisations the opportunity to experiment and test new ideas before they become profitable. Every year Vinnova invests approximately SEK 3 billion in research and innovation.

In the field of civil engineering, Vinnova works closely with several other authorities and funders of research and innovation. Together with Formas and the Swedish Energy Agency, Vinnova funds several strategic innovation programmes, as well as participates in international initiatives and upcoming partnerships within Horizon Europe.

For more information on current calls and activities, please see: [www.vinnova.se](http://www.vinnova.se)

### **Swedish National Board of Housing, Building and Planning**

The Swedish National Board of Housing, Building and Planning is an administrative authority with responsibility for issues related to urban planning, construction and housing. The Board's vision is "a sustainable society with good housing in viable environments". The effects of a changing climate and social sustainability issues linked to exclusion areas and integration are examples of societal challenges with a strong connection to the National Board of Housing, Building and Planning's operational area. Similarly, their work to promote a

good indoor environment and participation in the civil engineering process.

The Swedish National Board of Housing, Building and Planning is a competence support for municipalities, the industry and other authorities. Their work includes, e.g., producing guidance and reports, organising and participating in conferences and seminars, developing appropriate rules and other instruments, and distributing state aid and grants in the Board's area of operations. The Swedish National Board of Housing, Building and Planning has a coordinating responsibility for the environmental quality objective of a well-built environment and a sector responsibility for disability policy.

The Swedish National Board of Housing, Building and Planning also has overall responsibility for the policy area Designed living environments, and works to create conditions for all planners, builders and managers. Many are affected: politicians and officials in public administration, business, science, civil society and individual residents. Sweden's National Architect, found at the Swedish National Board of Housing, Building and Planning, leads and coordinates issues at the national level. Since 2018, the Swedish National Board of Housing, Building and Planning has a Government commission to strengthen efforts with architecture and designed living environments throughout the country. In 2021, the Swedish National Board of Housing, Building and Planning was commissioned to coordinate Sweden's participation in the European Commission's New European Bauhaus initiative.

### **The Swedish Land Registration Authority**

Lantmäteriet is the authority that maps reality, sets fixed property limits and keeps track of who owns the land. Lantmäteriet has a government commission in digitalising the civil engineering process that aims to achieve a common digital infrastructure for geodata and national basic data standards. As a national geodetic authority, Lantmäteriet participates in the implementation of UN Resolution 69/266 (26 February 2015) A Global Geodetic Reference Frame for Sustainable Development.

Being able to buy and sell land, houses and apartments is a prerequisite for a functioning economy. Lantmäteriet provides information and documentation about Sweden's geography and properties. In order for society to function now and in the future, we need data that can be trusted. For example, data on properties and buildings, roads, water and elevation levels. This information is a prerequisite for planning the societies of the future, even taking into account climate aspects.

Lantmäteriet sees research efforts as an integral part of the agency's continuous development work. For Lantmäteriet to invest in research, it has to pertain to one of the agency's areas of activity: geodata including geodesy, property formation or property registration. The research is conducted in-house, for example through self-funded doctoral students, or through employees participating in external research projects.

## **3.3 Strategic Innovation Programmes**

Strategic innovation programmes (SIP) are initiatives in which leading stakeholders from industry, academia and the public sector themselves identify and define areas where they see the need for strong Swedish leadership and

collaborative efforts. Through collaboration in areas that are strategic for Sweden, a foundation is being built for sustainable solutions to global challenges and increased global competitiveness. The strategic innovation programmes are twelve-year initiatives that are evaluated every three years. Vinnova, the Swedish Energy Agency and Formas fund together 17 strategic innovation programmes. In all programmes, several calls and other forms of targeted activities and support take place. The co-funding rate is always 50%. Of the seventeen strategic innovation programmes, six relate primarily to sustainable urban planning. These are presented briefly below.

In the Research and Innovation Bill for the years 2021-2024, the Government uses the terms "next generation strategic innovation programme 2.0" to describe the development of innovation programmes. According to the bill, the programmes will address "areas of broad societal relevance based on Agenda 2030 in order to bring about systemic changes and include a larger budget to further ensure their effect and impact."<sup>14</sup> According to the bill, the development should move towards fewer programs with larger budgets to achieve stronger systemic effects on areas that are strategically important to Sweden. The programmes shall also have a clearer focus on fossil-free and non-toxic circular economy, as well as broader societal impact and strengthened international collaboration both within the EU and globally.

### **Viable Cities**

Viable Cities is a strategic innovation programme focusing on climate-neutral and sustainable cities. The program's "mission" is to accelerate the transition to climate-neutral cities by 2030 where people live a good life within the planet's limits. The programme aims to be a catalyst for new forms of cooperation between cities, industry, academia, research institutes and civil society. This is for mobilising to change the way our cities operate in line with our national environmental and climate goals as well as the international commitments linked to the global Sustainability Development Goals of Agenda 2030 and the Paris Agreement. Viable Cities has a programme office at the Royal Institute of Technology.

For more information on current calls and activities, please see: [www.viablecities.se](http://www.viablecities.se)

### **Smart Built Environment**

Smart Built Environment is a strategic innovation programme for how the spatial planning sector can contribute to Sweden's journey towards becoming a global pioneer that realises the new opportunities that digitalisation brings. The programme aims to create an information infrastructure for the spatial planning sector and enable business applications that can be realised through digitalisation and industrialisation, as well as integrate all processes of spatial planning to interact and benefit both the sector's actors and society at large. The programme is aimed in particular at those companies and organisations that strive to take the lead, actors with a willingness to change and innovative solutions that can tackle tomorrow's problems and create tomorrow's competitiveness. Smart Built Environment has a programme office at IQ Samhällsbyggnad.

For more information on current calls and activities, please see: [www.smartbuilt.se](http://www.smartbuilt.se)

### **InfraSweden2030**

InfraSweden2030 works to ensure that by 2030, Sweden will have competitive transport infrastructure suppliers that contribute to climate-neutral transport that meets society's economic and social challenges. The programme supports innovations in the transport infrastructure sector such as new materials, technologies, working methods, contract processes and forms of collaboration. By making the sector more innovative and dynamic, the programme contributes to attracting highly skilled people. The innovations supported by the programme also contribute to reducing the environmental impact of transport infrastructure. InfraSweden2030 has a programme office at the Royal Institute of Technology.

For more information on current calls and activities, please see: [www.infrasweden2030.se](http://www.infrasweden2030.se)

### **Drive Sweden**

Drive Sweden focuses on creating the mobility system of the future that is sustainable, safe and accessible to all people and goods. Drive Sweden aims to create an ecosystem of actors from industry, society and academia who together develop, test and implement efficient, connected, shared and automated transport solutions. Drive Sweden's programme office is located at Lindholmen Science Park.

For more information on current calls and activities, please see: [www.drivesweden.se](http://www.drivesweden.se)

### **RE:Source**

RE:Source works collaboratively to ramp Sweden up to accelerate innovation and develop solutions for circular material-efficient flows. Their work is focused on developing knowledge and solutions focused on three themes: sustainable offerings, sustainable use and sustainable circulatory systems. The RE:Source programme office is led by RISE in collaboration with the Chalmers Industriteknik Group.

For more information on current calls and activities, please see: [www.resource-sip.se](http://www.resource-sip.se)

### **Internet of Things Sverige**

Internet of Things (IoT) Sverige is a programme that provides support and funds innovative IoT projects across the country. IoT is a collective term for things that are connected and can communicate and share important information with us humans. IoT simply pertains to the connection between our physical and digital worlds. The programme aims to fund projects in a variety of areas across the country. These projects should lead to new models and prototypes for services, products and public services, all with the aim of providing increased quality, sustainability and efficiency for Sweden's residents with the help of IoT. The programme office is located at Uppsala University.

For more information on current calls and activities, please see: [www.iotsverige.se](http://www.iotsverige.se)

## 3.4 European initiatives

There are many international, European and Nordic initiatives under way with research and innovation funding that is relevant for sustainable spatial planning. The following briefly describes the upcoming initiatives under the EU's Horizon Europe framework programme, with relevant investments in new partnership programmes, 'missions' and The New European Bauhaus. Finally, the Nordic cooperation NordForsk is also described, which several Swedish government funders contribute to.

### **Horisont Europa, JPI Urban Europe and Driving Urban Transitions to a Sustainable Future (DUT)**

The EU organises European research and innovation cooperation in the form of framework programmes. The current Horizon Europe framework programme runs from 2021 to 2027. Horizon Europe will contribute to fulfilling visions of a prosperous, just and sustainable society as well as to green growth and competitiveness. Horizon Europe has clear global goals of combating climate change and promoting sustainable development.

The JPI (Joint Programming Initiative) Urban Europe programme has been running since 2010. Through JPI Urban Europe, European research funders jointly finance collaborative projects in urban development. The Swedish research funders participating in JPI Urban Europe are Formas, Vinnova and the Swedish Energy Agency. It has been an important initiative aimed at creating European solutions for sustainable urban development. Its objective is to help create attractive urban areas that are capable of transitioning to become resource-efficient, economically viable and sustainable.

With ten years of experience and research results, the programme now intends to increase efforts and activities to transform research and innovation into action. A new European partnership programme called Driving Urban Transitions to a Sustainable Future (DUT) is being developed for this purpose. Calls and other activities are planned for the partnership in the coming years.

For more information, please see:

[https://ec.europa.eu/info/horizon-europe\\_en](https://ec.europa.eu/info/horizon-europe_en) and Driving Urban Transitions to a Sustainable Future | JPI Urban Europe ([jpi-urbaneurope.eu](http://jpi-urbaneurope.eu))

### **Mission: Climate Neutral and Smart Cities**

As an integral part of Horizon Europe, five thematic "missions" have been identified. The main objectives of this "mission" are to support, promote and showcase 100 European cities in their systemic transformation towards climate neutrality by 2030. These cities will lead the European Green Deal to make Europe the first climate-neutral continent by 2050, while keeping citizens' needs in focus. This "mission" introduces an innovative approach through a new governance model focusing on a systemic, location-based, long-term climate strategy through "climate contracts" that will include local, national and European authorities and offer a new role for citizens to co-create and participate in implementing solutions. The overall objectives are to support Climate Neutral and Smart Cities in line with the European Green Deal Strategy, to achieve the 2030 Agenda and, more specifically, to contribute to the following

effects: systemic transition to climate neutrality in cities, climate neutrality and modernisation of transport and mobility systems, energy and resource-efficient renovations of buildings, and renovation of urban spaces combining sustainability, inclusion and aesthetics in a human-centric way.

For more information, please see:

[https://ec.europa.eu/info/horizon-europe/missions-horizon-europe/climate-neutral-and-smart-cities\\_en](https://ec.europa.eu/info/horizon-europe/missions-horizon-europe/climate-neutral-and-smart-cities_en)

### **New European Bauhaus**

New European Bauhaus (NEB) is a cross-disciplinary initiative that will create a meeting place where future ways of life will be designed at the intersection of art, culture, social inclusion, science and technology. The initiative aims to improve how we live together in the built environment by promoting innovative solutions that touch on the three complementary dimensions of sustainability, aesthetics and inclusion. Horizon Europe initiatives aim to solve major environmental and societal challenges through ambitious, creative, inclusive and interdisciplinary solutions that bring the European Green Deal closer to citizens. The initiatives within Horizon Europe and the EU mission Climate Neutral and Smart Cities share many goals with the NEB initiative. The goal of NEB is to create a movement around design and spatial planning with the keywords sustainability, aesthetics and inclusion. In 2021, the Swedish National Board of Housing, Building and Planning was commissioned to coordinate Sweden's participation in the European Commission's New European Bauhaus initiative.

For more information, please see:

[https://europa.eu/new-european-bauhaus/index\\_sv](https://europa.eu/new-european-bauhaus/index_sv)

### **NordForsk**

NordForsk is an organisation that operates under the Nordic Council of Ministers and funds and promotes Nordic cooperation in research and research infrastructure. The cooperation includes Denmark, Finland, Iceland, Norway and Sweden, as well as the three autonomous areas of the Faroe Islands, Greenland and Åland. NordForsk funds research in a variety of areas, including green growth, migration, integration and urban development. A research programme that runs from 2018 to 2024 is focused on sustainable urban development and smart cities. The overall goal of the research programme is to address the challenges faced by urban and regional life in cities of different sizes through the analysis and use of important knowledge for the successful implementation of solutions.

For more information, please see:

<https://www.nordforsk.org>

## 4. Implementation of the programme

This chapter describes how the programme is organised, managed, implemented, monitored and evaluated. We describe how collaboration is organised, how the programme's activities are developed and implemented, and conclusions of completed evaluations and plans for upcoming follow-ups.

The national research programmes are ten-year initiatives and the strategic research agenda is regularly updated during the programme period. In line with the commission instructions, which dictate that the national research programmes should be run flexibly, the approach is continuously developed through ongoing learning. The programme is conducted in collaboration between research funding bodies, research providers and other societal actors.

### 4.1 Organisation for collaboration

Formas has been commissioned to establish the National Research Programme for Sustainable Spatial Planning. A programme committee was instituted in 2017. The committee includes research funding bodies relevant to the programme's area. The composition of the committee may be amended as necessary. The committee has an advisory function and assists Formas in the long-term planning of the programme, proposes and recommends calls, provides access to expertise in the field and contributes to the visibility of the programme. The committee is chaired by an external chairperson, appointed by Formas' Director General. Up-to-date information on the members and chair of the committee can be found at [formas.se/samhallsbyggande](https://formas.se/samhallsbyggande).

A working group has also been created for the programme. Participating in the working group are representatives of all funders in the programme committee as well as from the National Board of Housing, Building and Planning and the Swedish Land Registration Authority (Lantmäteriet), both of which are central authorities to the area of spatial planning. The working group supports the ongoing work of the programme.

The working group discusses, e.g., upcoming initiatives, calls and ongoing research of relevance to the area for better coordination of operations, related government assignments or different parts of the programme's remit.

National coordination through the programme committee and working group facilitates an assessment of possible synergies and the effective use of funds. The work of the committee and working group contributes to coordinating the efforts of Swedish research funding bodies in the field of spatial planning, through common priorities and goals.

In addition to the work of the programme committee and the working group, there is also a regularly occurring dialogue between the funders who have been given government commissions to set up national research programmes: Formas, Forte and the Swedish Research Council. The dialogue takes place at both strategic and operational levels. The National Programme for Sustainable Spatial Planning works closely with the Swedish Council for Sustainable Cities

and the authorities and organisations involved there.

The programme utilises the Swedish Council for Sustainable Cities' (Rådet för hållbara städer) consulting municipal, business, research and innovation groups on various issues. Collaboration also takes place between the strategic innovation programmes, through work on climate contracts, cooperation within the European Regional Development Fund, and through IQ Centre for Innovation and Quality in the Built Environment's municipal network.

Activities are also carried out within the programme to link the programmes to international research and innovation funding. Chapter 3 provides a comprehensive survey of relevant international initiatives for the programme area. The programme collaborates with other European research funding bodies, for example through ENUTC (Urban Transformation Capacities) and DUT (Driving Urban Transitions) under the new Horizon Europe 2021-2027 framework programme and the Nordic research funding network NordForsk. The programme also provides a national coordinated bridge to the EU mission Climate Neutral and Smart Cities as well as the New European Bauhaus initiative.

In addition to these formalised forms of collaboration, needs-driven dialogue with research providers and other societal actors also takes place to support the programme's development work and efforts, such as calls. Social relevance is always included as a requirement in calls carried out within the programme and the programme has also initiated special calls that, for example, stimulate mobility between academia and internships and the use of research.

The programme works particularly closely with the other national research programmes for which Formas is responsible (climate, food, and sea and water programmes). Through regular dialogue and a coherent development process, the programme has enabled joint learning and method development of our efforts and calls. The programme also carries out joint calls with other national research programmes and other research funding bodies, not only members of the programme committee and the working group, but also other funders.

## 4.2 Programme activities

The programme's funds are distributed primarily through calls. The calls can be implemented within the programme or in collaboration with other Swedish or international actors. We offer different forms of grants to finance research, innovation and collaboration. The programme committee is involved in developing the focus of the calls conducted within the programme. The focus, structure and content are then discussed in the programme's working group. Before new calls, various collaboration activities and meetings with relevant actors are carried out to formulate knowledge and solution needs within the call's thematics. For larger initiatives, the programme can order feasibility studies in order to best design the call. It is Formas' Research Council that decides to open calls and on the allocation of funds. The [formas.se](https://formas.se) website provides information about calls within the programme.

The programme regularly invites funded projects to conferences and other events to contribute to new knowledge and to quickly reach out to society with results from conducted and ongoing research. For instance, this can be through a kick-off at the beginning of the project period, seminars during ongoing project time or for

completed projects, or theme days. In 2020, the programme initiated the Goal 11 Week, which was a week of digital seminars on the sustainable transition of cities and communities. This conference will return in 2022 with the Swedish Council for Sustainable Cities as its coordinating organiser. In 2021, the programme has launched a digital seminar series, Spatial Planning Research – a Digital Seminar Series on Sustainable Spatial Planning, with a focus on making ongoing research available on key themes in sustainable urban planning. The programme also compiles knowledge overviews to highlight where knowledge stands and what is still needed in important areas.

Within the framework of the programme and national coordination in the field of spatial planning, Formas also coordinates joint sending of newsletters with summaries of calls in sustainable spatial planning from all national research funding bodies including the strategic innovation programmes. The [hallbarstad.se](http://hallbarstad.se) website is also used as a single external channel to inform about calls and other activities.

## 4.3 Follow-up and evaluation guide future choices

In accordance with the assignment, Formas follows up the program annually and reports it to the Government Offices. We also continuously monitor efforts and activities carried out in the programme, such as calls, projects and communication activities. Projects that have been granted funding from the programme are part of a project portfolio that serves as a basis for analysing what research has been funded and what priorities need to be made in future initiatives. Funded projects are categorised according to the themes and perspectives of the agenda. In order to achieve the objectives of the programme a roadmap is used. The roadmap is a description of how the programme intends to achieve its goals and is based on an analysis of the expected outcomes and effects to be pursued to achieve the objectives.

Because the programme is long term, several evaluations are also conducted during the programme period. An initial evaluation of Formas' three national research programmes that started in 2017 was carried out in 2020. The aim was to provide a basis for streamlining and developing the programmes. The evaluation was carried out by Ramboll and the assignment consisted of investigating how effective and on point the organisation and governance of Formas' three national research programmes have been since their inception. The evaluation shows, among other things, that the programmes.<sup>15</sup>

- are well on their way to being established as nationally unifying platforms in each research area
- have identified relevant research needs in collaboration
- have contributed to better research coordination and relevant calls.

In order to develop and strengthen the continued work, Ramboll recommends that Formas

- clarify roles, responsibilities and key processes in the programmes for all cooperating parties in the programmes
- embrace and benefit from the different roles of research funding

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15. Evaluation of Formas' national research programmes, Ramboll 2020.

bodies in the research and innovation system and create a learning experience on how this type of collaboration can be conducted

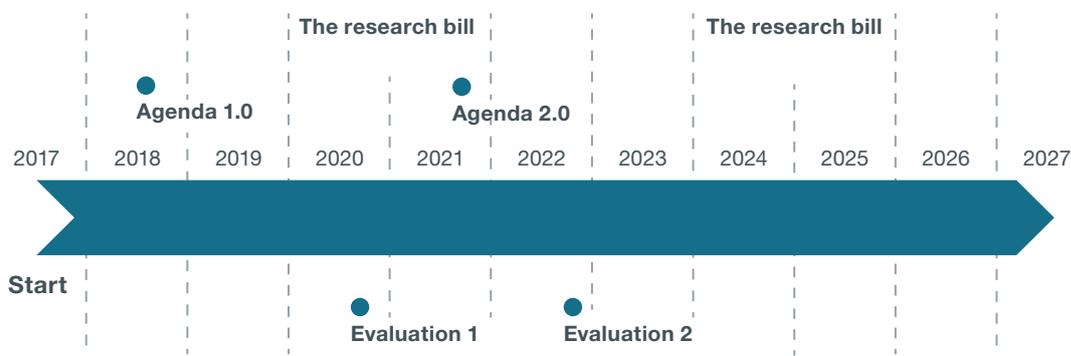
- find clearer forms for ongoing involvement of different actors and needs owners.

The Swedish Research Council, Forte and Formas have started to carry out a mid-term evaluation of seven national research programmes in 2021–2022.

The evaluation shall assess the potential of the programmes to achieve expected objectives, as set out in each programme's mission and strategic research agenda. This includes assessing how well the design and actions of the programmes correspond to the mission and to the objectives of each programme. The evaluation is also expected to make recommendations for the development of the programmes.

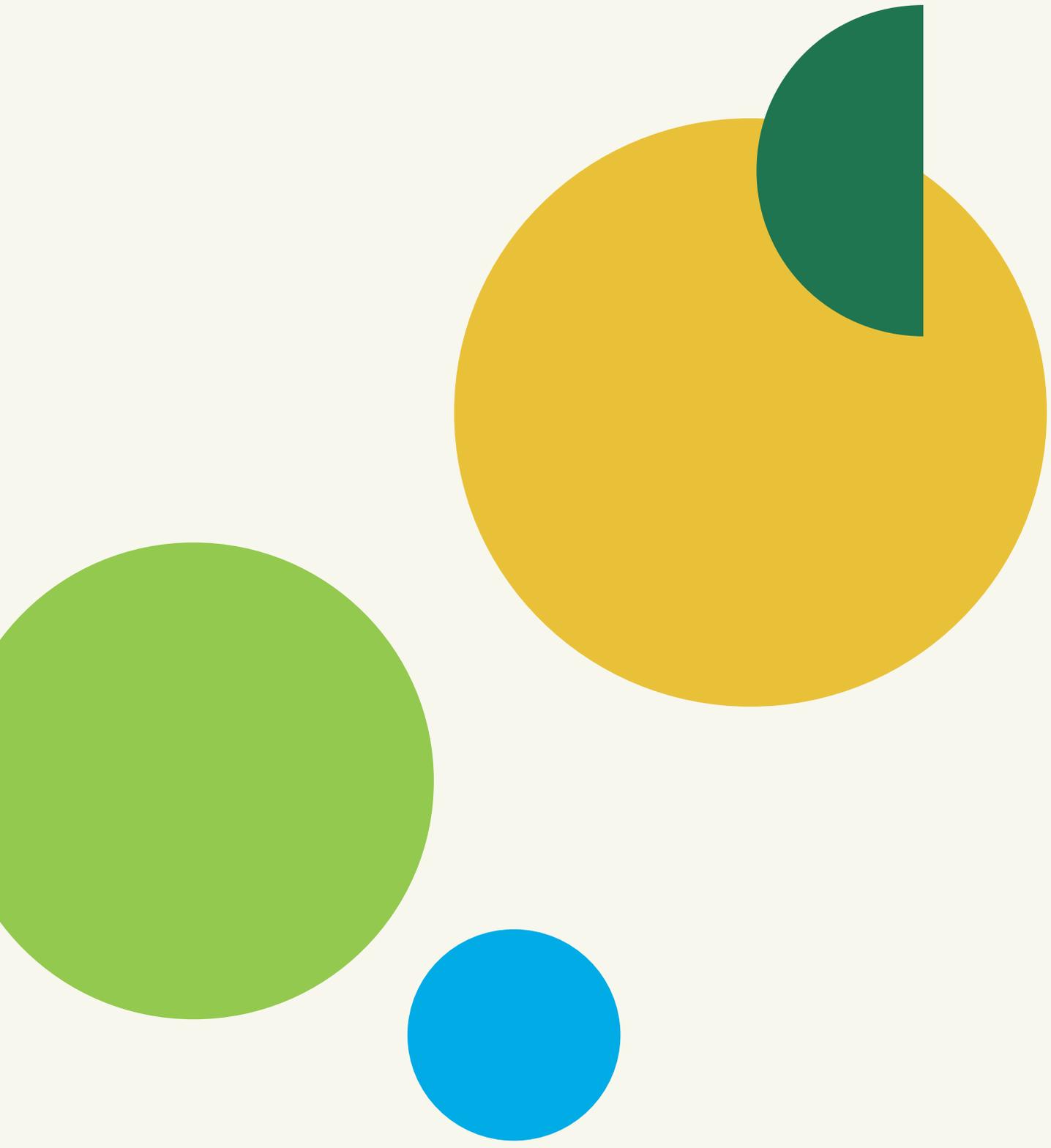
In the long term, a final evaluation is planned with a focus on the effects the programme has had on society's ability to meet the challenges and on the research system.

Evaluations, research policy proposals or major changes in the programme's environment, nationally or internationally, may lead to a reassessing programme priorities and revising the strategic research agenda. The revised agenda should be anchored with the programme committee, research providers and stakeholders. Formas' Scientific Council will approve the revised agenda after consulting the programme committee.



**Figure 2.** Overall timetable for evaluation and revision of the research agenda.





## Annex 1. The Formas commission

Government commission to establish national research programmes – general commission and extracts from decisions on sustainable spatial planning.

### Commission to establish national research programmes

*Extract from: Government decision III:7, 2017-05-18, Ministry of Education and Research.*

#### **The government's decision**

The government has tasked the Swedish Research Council, Swedish Research Council for Health, Working Life and Welfare, and Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning with establishing ten-year national research programmes that can help to meet different societal challenges. For each national research programme, a programme committee should be formed that includes the relevant funders. The work of each programme also includes the design of a coordinated strategic research agenda, which will be developed for each programme jointly by the responsible funders.

The government agencies responsible for the national research programmes will conduct follow-ups of the programmes and present them in a uniform manner. The commissions are to be reported on annually by 1 March to the Government Offices (Ministry of Education and Research with a copy to the Ministry of the Environment and Energy, Ministry of Health and Social Affairs, Ministry of Enterprise and Innovation, and Ministry of Employment).

#### **Background**

In their joint report for the research policy bill, the government research funders have proposed to establish national research programmes (U2015/05147/F). In its research policy bill “Collaborating for knowledge – for society’s challenges and strengthened competitiveness” (Bill 2016/17:50), the government announced its intention to launch the national research programmes proposed by the research funders. National research programmes are expected to create synergies between stakeholders that complement each other in terms of knowledge, expertise and projects. The research programmes are also expected to create the conditions for interdisciplinary, cross-sectoral collaboration. They can also serve as a platform for ongoing research within a field. The national research programmes will also provide a natural link to international research programmes and strengthen Swedish participation in the European research programmes relevant to sustainable spatial planning.

The national research programmes, together with existing strategic research areas and strategic innovation areas as well as the newly created collaboration programmes, will be complementary components of a powerful research and innovation system for increased Swedish competitiveness and the management of major societal challenges.

## More about the commission

FöTo enable the foundation for long-term planning, the national research programmes will cover a ten-year period. Each programme should have a programme committee that, under the leadership of the responsible agencies, can assist the funders in the design, implementation and regular updating of the strategic research agenda. The programme committee should consist of the funders concerned. Funders other than government funders should also be able to sit on the programme committees. Advisory groups with a broad skill set can be associated with the committees to assess society's knowledge needs within each challenge and national research programme.

The programmes are to be run according to a strategic research agenda developed for each programme by the responsible funder in consultation with the other relevant funders. The strategic research agenda should recognise research funders' shared and existing initiatives and programmes, and can, where appropriate, include development and innovation.

The programmes can initiate research to address identified, prioritised knowledge gaps. The programmes should be tailored to the conditions of the various research areas and be conducted in a flexible way. The funders base their work within the programmes on current supporting documentation and analyses within each agency's area of activity where appropriate. The national research programmes should encourage a greater focus on research in higher education, as well as gender equality and a greater impact of the research results on society in terms of development, knowledge-building, evidence-based policy and management.

The programmes are expected to provide a natural link to international research programmes, for example through so-called joint programming initiatives (JPIs).

The programmes should be regularly evaluated and continuously monitored. The government therefore intends to initiate future evaluations while follow-ups should be conducted by the agencies in accordance with this mandate.

## Commission to establish national research programmes on climate and sustainable spatial planning

*Extract from: Government decision I:12, 2017-05-18, Ministry of the Environment and Energy.*

### The government's decision

The government tasks the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) to establish national research programmes for climate and sustainable spatial planning, in accordance with the government decision of 18 May 2017 (ref. no. U2017/02404/F). The commission runs for ten years, through 2026. Formas shall also announce calls for special three-year grants to support research on social housing policy. Formas must annually report on the implementation of the national research programme commission to the Government Offices (Ministry of the Environment and Energy) when it issues its annual report

## Background

National Research Programme for Sustainable Spatial Planning, 2017–2026.

A sustainable society means, among other things, that citizens should have the right to clean air free of toxins, clean water and noise levels that are not harmful to health. Meeting our societal challenges requires research and development on topics such as the planning process, construction, mobile solutions, a safe and secure drinking water supply, sustainable waste management and chemical use, risk assessments for environment and health, life cycle analyses and policy instruments. Both in Sweden and globally, sustainable spatial planning also concerns people's living conditions and rights, habitats, social conditions and safety, and economic and social inclusion, as well as better public health opportunities including a more active outdoor life. The government wishes to strengthen the foundation for cities to be able to evolve into living, green, healthy and safe places where people engage and develop, and where innovations take place. Increased construction offers opportunities for sustainable urban development across all three dimensions – environmental, economic and social. More knowledge is needed about choices, attitudes and behaviour patterns among consumers and individual households.

The user perspective represents an important point of departure. Research on collaboration, conflict of objectives and the use of policy instruments in the planning process is also needed, as is research on citizen participation in urban planning and the shifting roles between society and citizens. Key research areas in the planning and building processes also include requirements definitions, procurement practices and leveraging the opportunities of digitalisation. Many solutions are available locally, and the government intends to make it easier for municipalities to change the pace of the transformation to sustainability.

People's access to housing, work, services, nature, cultural and play environments, and other leisure activities is central to a good quality of life, growth and development. Transport brings accessibility to citizens as well as businesses, but can adversely affect health, the environment and the climate. Accessibility without mobility might offer a solution, but the transport system still needs to evolve

into a greener, smarter and safer system. This requires an overarching approach to different modes of transport. A sustainable transport system is built using integrated solutions for public transport and pedestrian and bicycle traffic, and better use of existing transport systems. New knowledge will be needed to understand how to develop policy instruments, technologies and innovations in the transport sector, including life cycle analyses. Research is also needed about people's choices and attitudes concerning mobility and transport.

A sustainable society is grounded in safety and security, one that helps to protect society and the individual against different internal and external threats. Safety and security issues must become a natural part of the building process and spatial planning.

Achieving this requires national research capabilities for crime prevention, security and civil contingencies, science and technology as well as capacity to address the challenges of climate change, including drought and flooding, forest fires and extreme weather events.

## More about the commission

### National Research Programme for Sustainable Spatial Planning, 2017–2026

Formas shall establish and launch a ten-year national research programme for sustainable spatial planning. This programme should be based on the various societal challenges facing cities. Examples are the transformation to a fossil-free welfare society and adaptation to a changing climate, the sustainability goals of Agenda 2030, the UN's New Urban Agenda, and the relevant environmental objectives. Also of interest are the national objectives for cultural environments and the goals for architecture and design, as well as the government's objectives for housing, construction, transport policy, infrastructure, urban planning and public safety, crime prevention work, social objectives and gender equality. The programme shall also promote universal design. There is fierce competition for land in our cities, yet we need to find out how multiple functions can coexist in the same spaces. This requires effective solutions for land access and compensation. We also need more knowledge about how to manage such complex contexts and processes.

The national programme should have a broad, interdisciplinary character, a strong connection to the users of research results and an international perspective. Furthermore, the programme should relate to the government's collaboration programme. The research should include components of collaboration, communication and promotion of the usefulness of research results. The programme can span the entire spectrum – from research, innovation and technological development to demonstration, market introduction and dissemination.

## Annex 2. Global and national goals to be achieved by the programme

### Agenda 2030 – Global Sustainable Development Goals

The national research programme for sustainable spatial planning is linked to the goals and targets of Agenda 2030. Read more about these goals and targets at [sustainabledevelopment.un.org](http://sustainabledevelopment.un.org).

### Sweden's environmental objectives

See [www.sverigesmiljomal.se](http://www.sverigesmiljomal.se).



#### The generational goal

The overall goal of environmental policy is to hand over to the next generation a society in which the major environmental problems are solved, without causing increased environmental and health problems outside Sweden's borders. The generational goal is a target for environmental policy. The goal provides guidance on the values to be protected and the transition needed to achieve the desired environmental quality. The generational goal aims to guide environmental action at all levels of society.



#### Good built environment

Cities, urban areas and the wider built environment should provide a good, healthy living environment and contribute to positive regional and global environments. Natural and cultural values must be taken into account and developed. Buildings and facilities should be sited and designed in an environmentally sound manner to achieve long-term environmental stewardship of land, water and other resources.



#### Clean air

The air must be so clean in order to avoid damage to human health, animals, plants and cultural values. Breathing in polluted air negatively affects health. For many people, pollutants in the air can also shorten life expectancy. The most harmful air pollutants to health are inhalable particles, ground-level ozone and certain hydrocarbons.



#### Reduced climate impact

In accordance with the UN Framework Convention on Climate Change, the concentration of greenhouse gases in the atmosphere should be stabilised at a level in which human impact does not endanger the climate system. This objective must be achieved in a way that preserves biodiversity, ensures food production and does not jeopardise other sustainable development objectives.



#### Good-quality groundwater

Groundwater must provide a safe, sustainable supply of drinking water and contribute to a good living environment for plants and animals in lakes and watercourses.



#### A non-toxic environment

The presence of man-made or extracted substances in the environment should not endanger human health or biodiversity. Concentrations of non-naturally occurring substances should be close to zero, and their impact on human health and ecosystems negligible. Concentrations of naturally occurring substances should be close to background levels.

### **Strategy and designed human habitat policy – for sustainable urban development**

The strategy includes overall sustainable cities goals and new milestones in the environmental objectives system, together with priorities and new initiatives with an emphasis on environmentally sustainable urban development. The government wishes to strengthen the municipalities' foundation for being able to develop green, healthy and safe cities where people engage, and where innovations take place. Cities need to be developed so that all dimensions of sustainable development – environmental, economic and social – are harnessed. In cities, there are opportunities to meet many of the climate and environmental challenges, and the work for sustainable urban development is important for achieving the environmental goals.

See also: <https://www.regeringen.se/rattsliga-dokument/skrivelse/2018/04/skr.-201718230/>

### **Designed living environments policy**

The government has presented a new architecture and design policy for sustainably designed living environments. Architecture and design are to contribute to a sustainable, equal and less segregated society with carefully designed living environments, where all people are empowered to influence the development of their shared environment.

See also: <https://www.regeringen.se/rattsliga-dokument/proposition/2018/02/prop.-201718110/>

## Annex 3. Agenda 2030 targets linked to programme themes

Through initiatives and activities within the theme **Sustainable Residential and Public Environments**, the conditions are created to achieve several international and national goals in relation to the Agenda 2030 targets, in particular the milestones below:

- 11.1 Safe and affordable housing
- 11.3 Inclusive and sustainable urbanisation
- 11.4 Reducing the environmental impact of cities
- 11.7 Creating safe and inclusive green spaces
- 15.5 Protecting biodiversity and natural habitats

Through initiatives and activities within the theme **Sustainable Mobility Systems for All**, the conditions are created to achieve several international and national goals in relation to the Agenda 2030 targets, in particular the milestones below:

- 11.2 Sustainable transport systems for everyone
- 11.3 Inclusive and sustainable urbanisation
- 9.1 Creating sustainable, resilient and inclusive infrastructures

Through initiatives and activities within the theme **Human Health and Well-Being**, the conditions are created to achieve several national and international goals in relation to the Agenda 2030 targets, in particular the milestones below:

- 3.9 Reducing the number of deaths from harmful chemicals and pollutants
- 11.4 Reducing the environmental impact of cities
- 11.7 Creating safe and inclusive green spaces
- 6.3 Improving water quality and wastewater treatment and increasing reuse
- 12.4 Responsible management of chemicals and waste
- 12.8 Increasing public awareness of sustainable lifestyles
- 15.5 Protecting biodiversity and natural habitats
- 15.9 Integrating ecosystems and biodiversity into national and local government

Through initiatives and activities within the theme **Security and Safety for People and Society**, the conditions are created to achieve several international and national goals in relation to the Agenda 2030 targets, in particular the milestones below:

- 11.1 Safe and affordable housing
- 11.3 Inclusive and sustainable urbanisation
- 9.1 Creating sustainable, resilient and inclusive infrastructures
- 13.1 Strengthening resilience and adaptability to climate-related disasters

- 16.1 Reducing violence in the world
- 16.6 Building efficient, reliable and transparent institutions

Through initiatives and activities within the theme **Sustainable Consumption and Production**, the conditions are created to achieve several international and national goals in relation to the Agenda 2030 targets, in particular the milestones below:

- 11.3 Inclusive and sustainable urbanisation
- 12.2 Sustainable management and use of natural resources
- 12.4 Responsible management of chemicals and waste
- 12.5 Significantly reducing the amount of waste
- 15.5 Protecting biodiversity and natural habitats

Through initiatives and activities within the theme **Sustainable Land and Water Use**, the conditions are created to achieve several international and national goals in relation to the Agenda 2030 targets, in particular the milestones below:

- 6.1 Safe drinking water for all
- 6.3 Improving water quality and wastewater treatment and increasing reuse
- 6.4 Streamlining water use and safe water supply
- 6.5 Integrated management of water resources
- 6.6 Protecting and restoring water-related ecosystems
- 9.1 Creating sustainable, resilient and inclusive infrastructures
- 11.3 Inclusive and sustainable urbanisation
- 11.4 Reducing the environmental impact of cities
- 13.1 Strengthening resilience and adaptability to climate-related disasters
- 12.2 Sustainable management and use of natural resources
- 12.4 Responsible management of chemicals and waste
- 15.1 Preserving, restoring and ensuring the sustainable use of ecosystems on land and in freshwater
- 15.5 Protecting biodiversity and natural habitats
- 15.9 Integrating ecosystems and biodiversity into national and local government





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