Strategic Innovation Programme – Smart Built Environment Call for Proposals

Digitalisation and industrialisation for a sustainable built environment

Smart Built Environment is part of a collaborative initiative in strategic innovation programmes by **Vinnova**, the **Swedish Energy Agency** and **Formas**. The programme is in its fourth year, and this is the second call in 2019 and the first of the annual calls we have now planned. The purpose of strategic innovation programmes is to foster international competitiveness and sustainable solutions for global societal challenges. Read more about the strategic innovation programmes on the Formas website.

For more information about this programme, visit the Smart Built Environment website.

SMART BUILT ENVIRONMENT

Revision history

Any changes to the call text are listed below.

Date	Change

1 The call in brief

Digital transformation and increasing industrialisation in the built environment sector are in full swing. Intensive efforts are underway to develop standards, tools and processes and to test solutions on small and large scales alike. Over 90 projects were launched within Smart Built Environment during the first programme period, and several of them have been completed.

The programme is now announcing grants for continued digitalisation and industrialised construction in the built environment. We would like the grant applications to clearly address the global sustainability challenges and contribute to innovations in processes, forms of cooperation, business models and technology. The purpose of the call is to accelerate digital transformation through activities that involve stakeholders throughout the value chain. Its goal is to increase knowledge in the sector by attracting new stakeholders from both within the sector and from other sectors. We welcome innovation-driven stakeholders and wish to see applications for testbeds, demonstrations, and implementation and training initiatives. We are keen to see a high degree of innovation that extends beyond incremental development.

The call covers the four Smart Built Environment themes (see 2.2), and the projects should help to achieve the impacts and objectives identified in the programme's impact logic (see Appendix 2). In your application, clearly describe which global sustainable development goals (SDGs) are addressed, and how the project's results can contribute to increased gender equality in spatial planning.

The call provides funding of approximately 30 million kronor and requires project co-funding of at least 50 percent of project costs. We welcome projects that request from 500,000 to 4 million kronor in project grants. The projects can be started immediately following a grant award and can run for 1–4 years.

Formas has developed its application process and associated system support for this call. Please read the instructions carefully, even if you have previously applied for a Smart Built Environment grant.

The following dates apply for this call:
Please note that all dates are preliminary. For the latest information, see the call's website.

Opening date	**12 November 2019**
Application deadline	**5 February 2020, 14:00 CET**
Date of decision	**27 May 2020**
Project start, at the earliest	**1 June 2020**

Questions about the call's background, purpose and desired impacts:
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Prisma IT support

2 Purpose of the call

2.1 Background

The Smart Built Environment strategic innovation programme has established a platform that brings together stakeholders across the entire built environment sector in order to achieve the overall objectives and impacts of the programme for a more resource-efficient built environment. Throughout society, a digital transformation is underway that is already affecting processes and stakeholders in the sector. For the built environment to become socio-economically effective and sustainable in line with the sustainable development goals (SDGs) and Sweden's environmental objectives, we need to develop how we plan, design, build and manage the built environment. In this development, both circular resource flows and the circular economy are major driving forces. With sustainability as a point of departure, digitalisation in various forms, together with the evolution of industrial processes and methods, can contribute to this necessary development.

Both within and outside the programme, digitalisation and industrialised construction are advancing at a rapid pace. The results of completed activities and projects as well as the ongoing programme activities, together with developments abroad, have brought about new technological solutions, methods, work approaches and new collaborative partnerships. Cooperation within the sector and with other sectors aligns resources and lays the foundation for developing sustainable business models through innovations that will be critical in achieving the SDGs. Various initiatives have been launched and are striving to achieve set climate goals, both globally and in Sweden. Examples are the roadmaps that several sectors have developed to become fossil-fuel independent. These roadmaps have identified several key areas to investigate, and there is great potential for collaboration around these activities.

With this call, Smart Built Environment aims to fund projects that strengthen efforts to achieve the SDGs through digitalisation and industrialisation in the built environment. We encourage applications for projects in which multiple stakeholders collaborate and develop solutions that have commercial potential, as well as create the conditions for new forms of procurement, business models and/or application areas for new digital approaches. We would like to see projects that can achieve real change for the sector's stakeholders, both at the individual and the organisational level. An important consideration is the project's potential to help achieve greater gender equality or other diversity and integration through the project's expected results.

Examples of topics to address are:

- Changed or improved procurement methods that provide incentives to implement digital work methods as well as processes and technology as incentives for reduced climate impact and the construction of safe, gender-equal environments

- Prerequisites for new operational models, business models and value chains that can help achieve the necessary system change in the built environment
- How to enable network connections for both the managed environment and temporary workplaces during construction
- Increased knowledge of, and application of, digital and industrial approaches to working
- Increased knowledge of how digitalisation can contribute to circular resource flows and circular business models
- Applications of new solutions that address the needs of the built environment sector and that use automation and self-learning technologies (machine learning, AI, robotisation)

The programme wishes to encourage international cooperation, stimulate the innovative capacity of more stakeholders, and create unexpected solutions that contribute to the overall vision and impact targets of the programme.

2.2 Thematic areas

Innovations and new applications
Through this call, we aim to stimulate ideas and initiatives that can develop into innovations and new applications of products, services or processes within the built environment. Within this theme, focus is placed on breaking ingrained patterns and work methods and discovering new solutions. We gladly accept applications that challenge these patterns and contain disruptive elements. Examples in this theme include projects that test previously identified standards in combinations with a view to create continuous digital information flows.

Value chains and business models
Value chains, incentives, and business and operational models are interrelated and must be studied and developed in order to harness the power of digitalisation and industrialised construction. This theme also addresses questions about stakeholder roles, skills, work methods and the organisation of projects and processes. It also relates to questions of public procurement and contract law within the "Information infrastructure" theme. Here, we gladly accept applications that involve value chains with practical application in the built environment sector and that include stakeholders from the entire value chain. We would like to receive applications that identify and develop new competencies or new forms of collaboration.

Information infrastructure
This theme is about the common information infrastructure that the sector needs for digital and industrial development. It includes standardisation of the exchange and integration of information in smart built processes, including lifecycle information structures as well as issues of data accessibility and data ownership. The theme also includes legal issues related to property restructuring, detailed

zoning plans and building permits, as well as procurement and contract forms for the optimal use of digitalisation. Continued strategic investments will also be made in this area, and we welcome applications that, for example, involve the development of information infrastructure or the testing of identified standards in a real-world environment.

Knowledge and skills
Harnessing the power of digital transformation in both the private and the public sectors requires a knowledge leap. This theme should contribute to raising awareness and building knowledge at private companies and public organisations, both at the management level and in daily operations. The theme also relates to how we can create and make use of new knowledge. In this area, we welcome applications that involve literature reviews and syntheses that can provide input for further testing in business operations or contribute to educational efforts. We would like to see skills improvement initiatives in addition to purely educational efforts, such as support for small and medium-sized enterprises to digitalise their businesses.

3 Who can apply?

The call is targeted to consortia of organisations such as private companies, public-sector organisations, universities and research institutes. At least two parties must participate in the application. The project manager can come from a private company, the public sector, academia or an institute. At least one of the participating parties must come from a private company **or** a public-sector organisation.

We welcome all interested organisations and companies to apply, preferably in cooperation together with new partners. Consortia with start-ups that can help to develop new ways of working, business models, and new technology and needs owners, such as municipalities, are especially welcome.

Project participants from outside Sweden are welcome to contribute their time or other resources as a project co-funder. International project participants can also receive a limited part of the grant, according to the research funder's rules. However, participants outside Sweden may not be project managers.

Smart Built Environment and Formas strive for an equitable, gender-equal and inclusive built environment. This means that grant applicants should design the project so that its results can benefit a diverse group of people and build a project team that takes into account gender distribution and different backgrounds. You should consider not only the number of people, but the distribution of power and influence in the project.

4 What is funded?

4.1 Activities eligible for funding

In this call, we would like to see applications for the following types of projects:

- **Test beds and demonstrations**
  Examples include the creation of test bed environments – virtual or physical – and demonstrations of the results from research and development projects, such as results from previous projects within the programme.

- **Implementation and educational initiatives**
  Here, we would like to see new ideas about awareness-raising and knowledge-building, as well as activities that reach out to the many stakeholders and businesses in the built environment sector. The project should preferably complement traditional education.

It is also possible to apply for a grant for other work arrangements/tools – the following list provides additional examples of such tools. Applications may combine several different tools.

- **Research and development projects**
  Projects containing different levels of research and innovation, such as Ph.D. students or postdocs, or the development of research results for increased commercialisation.

- **Literature reviews and syntheses of completed projects**
  Activities that complement the overall syntheses that are part of Smart Built Environment's coordination efforts. This can include results and syntheses from two or more projects implemented in the programme or in other initiatives.

- **Other new forms of collaboration**

  The use of different forms of collaboration that increase the possibility to benefit from digitalisation in the sector. An example of this is innovative competitions that aim to achieve disruptive innovations and increase the appeal of the built environment sector. Implementation of hackathons and crowd learning events are some examples of such activities.

4.2 Project duration

The project must run for a minimum of 12 months and a maximum of 48 months. Projects can start on 1 June 2020 at the earliest and 1 December 2020 at the latest. Projects must be completed by 30 November 2024.

Project grants may be used up to three months after the scheduled project end date. In addition, the project duration can be extended if there are special circumstances that are approved by the project manager and administrating organisation, such as sickness or parental leave.

For projects that are 18 months or longer, a periodic financial report must be submitted each year. The form opens every year on 1 January, and the project manager then has three months to submit the report. The first report is due in 2022.

After the availability period for the grant is over, the project manager has an additional month to submit a financial and a scientific report. The manager must use a template provided by Formas to create this report.

5 How much can you apply for?

5.1 Funding amount under the call

Under this call, Smart Built Environment has allocated programme funding of approximately 30 million kronor. Applicants can apply for grants between 500,000 and 4 million kronor.

5.2 Funding types

There are four types of funding an applicant can specify in the application:

1. **Requested grant from Formas:** Indicates the amount requested from Formas within the framework of Smart Built Environment.
2. **Other aid (state):** Indicates any funding received from other state funders towards implementing the project.
3. **Other aid (private):** Indicates any funding received from other private funders towards implementing the project.
4. **Self-funding:** Indicates the project parties' own contributions in terms of time, money and other resources.

Requested grants from Formas may constitute a maximum of 50 percent of the total project budget. If other aid from state funders is included in the project budget, this aid together with the requested grant may constitute a maximum of 50 percent of the total project budget.

Self-funding and other aid from private funders together constitute the project's co-funding. This portion should amount to at least 50 percent of the total project budget. Project parties from the public sector who provide self-funding can be included in the co-funding. Contact Formas if you are unsure about what counts as co-funding (see the contact details in Chapter 1).

The project consortium may itself determine how to distribute the grants, costs and co-funding levels as long as the project as a whole is co-funded to at least

50 percent and complies with state aid regulations (see Section 5.3). A participating project party can thus (1) only apply for grants from Formas, (2) only contribute self-funding, or (3) apply for a grant *and* provide self-funding.

Funding for other aid (public or private) and self-funding must be secured when the application is submitted under this call.

See Section 9.3 for budget instructions.

5.3 State aid

Private companies and other organisations engaged in economic activity that want to apply for grants from Formas must follow specific regulations on state aid. The regulations are based on the principle of EU law, which states that aid to private enterprises normally distorts competition but that certain exemptions are allowed.

The aid intensity that Formas can offer depends on the size of the organisation and the type of activities in the project. The organisation's size is assessed using the EU definition of small and medium-sized enterprises. Activities will be primarily assessed on the basis of industrial research, experimental development or aid for process innovation or organisational innovation.

In addition, de minimis aid can also be a possible basis for granting aid. For projects in which this might be the case, Formas will ask the applicant to fill in a special form after the project is awarded funding.

The Formas website contains more information about state aid. Questions about state aid should be sent to Formas (see the contact details in Chapter 1).

6 Eligibility criteria for application assessment

In order to be eligible for assessment according to the criteria in Section 7.1, the following requirements must be met. Failure to meet any of these requirements is grounds for an early rejection of the application, and it might not continue to the assessment phase.

- The application must be written in Swedish or English.
- The project description should be written using the template provided on the call's website.
- The project description must not exceed 10 A4 pages and must be written in a 12-point text size.
- The project parties must be legal persons.
- At least two organisations must participate as project parties in the project, of which at least one must come from a private business or the public sector.

7 Assessing applications that meet the procedural requirements

7.1 What do we assess?

The projects that are awarded grants should help to achieve Smart Built Environment's impact targets (see Appendix 2). Applicants should address the relevant impact targets and at least one of the four themes. The application must indicate the impact targets and the theme addressed, and clarify how the project will achieve them.

Assessment criteria for "Digitalisation and industrialisation for a sustainable built environment":

Relevance

- How well does the grant application relate to any of the four themes? (see Section 2.2)
- How do the selected activities (see Section 4.1) help to address the impact targets? (see Appendix 2)
- How well is the project as a whole linked to Smart Built Environment's overall impact targets? (see Appendix 2)

Potential

- Are the project's expected results innovative or significantly better than what is available on the market or than best industry practices in the built environment?
- Is there a need for a strategy to manage the project results, and how feasible is it?
- What is the potential of the project to contribute to the programme's impact targets (see Appendix 2)?
- What potential does the project have for contributing to greater gender equality or other diversity and integration in society in terms of issues like gender equality, social or cultural background, class, disability or age?

Implementation

- Is the project plan for implementation, completion and application feasible?
- Is the project's communication and knowledge dissemination plan credible?
- Are the timetable and budget reasonable in relation to the project's design and expected results?

Organisation and stakeholders

- Does the proposed organisation have the skills, resources and experience needed?

- Is there any need for international anchoring and, if so, how will this take place?
- How does the composition of the team (key people) reflect the distribution of genders, skills, experience and different perspectives on the built environment and digitalisation?

7.2 How does the assessment process work?

Summary of the decision-making process:

1. Applications that meet the procedural requirements (see Chapters 5 and 6) will be assessed using assessment criteria by external independent reviewers. The applications will then be ranked and a recommendation for funding made.
2. Formas will take the decision on which projects are awarded funding.
3. The decision will be announced to the applicants and the managers of the Smart Built Environment strategic innovation programme (SIP) and published on the websites of Formas and Smart Built Environment.

8 Decisions and conditions

8.1 Formas' decision

The grant decision states the amount that each party in the project is awarded. Funding will be granted under the EU Commission block exemption Regulation GBER (EU no. 651/2014 and/or de minimis regulation (EU no. 1407/201). The basis for the aid is stated in the decision and also governs which costs are eligible to be covered.

Formas' decision to award or reject an application cannot be appealed.

8.2 Terms and conditions for awarded grants

For awarded grants, Formas' general terms and conditions for grants apply. The terms and conditions include rules regarding payouts, follow-up, reporting and usefulness of results.

Since the call takes place within the framework of the Smart Built Environment SIP, there are additional special conditions and instructions that regulate reporting, follow-up, communication, etc. for the programme. See http://www.smartbuilt.se/verktyg (in Swedish only).

If any project party is subject to the state aid regulations, Formas' special terms and conditions for state aid will also apply.

Additional special terms and conditions may be determined for individual projects.

Any party that does not comply with Formas' terms and conditions might be held liable to return funds. This also applies if the party has been granted an incorrect or excessive amount.

Open access to publications and research data
Results from research funded by Formas must be published with open access. Read more about our requirements for open access to research results and data.

Funded projects must develop a data management plan for the data produced in the project. By signing our grant terms and conditions, you certify that a data management plan will be available before the research begins and that it will be maintained.

Reporting during the project
Smart Built Environment projects that are longer than 12 months must submit at least one financial report during the course of the project. Instructions on what applies to your project are provided by Formas. Your financial report should be submitted in the Prisma application system. Prisma automatically sends an email with a link to the project's administrating organisation in good time before you must submit your report. The financial reports also contain co-funding information as stated in a predefined template.

9 How to apply

Formas has developed its application process and associated system support for this call. Please read the instructions carefully, even if you have previously applied for a Smart Built Environment grant.

9.1 Procedural requirements

In the Smart Built Environment programme, organisations apply for funding to implement projects together in collaboration. Applying organisations must have a company registration number and be legal entities. Sole proprietors are therefore not eligible to receive funding.

At least two and a maximum of six organisations must be included as project parties on an application. One of the applying organisations must be the principal applicant and is called a coordinating project party. Other organisations that participate in the project's design contribute to the implementation and share the associated risks and results. They should be specified as project parties. Organisations that have a small role in the project, such as participation in

workshops or reference groups, are not specified as project parties but are instead described in the project description.

The coordinating project party will become the administrating organisation when the grant is awarded. Being an administrating organisation means that Formas approves the organisation as the recipient of funds for research, development or innovation, and that this organisation is responsible for allocating funds to other applying organisations in the project.

Formas distinguishes between generally approved administrating organisations (mainly universities, colleges and research institutes) that can apply under all calls, and administrating organisations that are approved under an individual call. Formas welcomes organisations that are not generally approved administrating organisations to apply as coordinating project parties in Smart Built Environment. Decisions on approving new administrating organisations will be taken soon after decisions on the call to ensure that the decisions are based on recent data. Prior to taking a decision, Formas performs checks on the project parties that apply for funding and engage in economic activity in order to assess their financial stability and ability to complete the project.

9.2 The Prisma application system

To apply for a grant from Formas, the project manager should submit an application online in the Prisma application system.

9.2.1 Apply for an organisation account

The organisation that is the coordinating project party needs to have an organisation account in Prisma. If the coordinating project party already has an organisation account in Prisma, then that existing account can be used. If the organisation has a user account but is not a generally approved administrating organisation with Formas, it must notify Formas and request to be added to the list of possible administrating organisations in Prisma (see the contact details in Chapter 1).

If the organisation does not already have a user account in Prisma, an appropriate representative should request an organisation account on the Prisma website in good time before the application is submitted. Specify in the reason for applying for an organisation account that you want to apply under Smart Built Environment. Other project parties do not need to create any user accounts in Prisma.

The application should be initiated through the organisation account. The person who is responsible for the organisation account then automatically becomes the project manager, but the manager can change this by inviting another person to become a project manager. If another person should be the project manager, that person must have a personal account in Prisma. If the manager of

the organisation account should be the project manager, then no personal account needs to be connected to the application.

9.2.2 Create a structure to describe your organisation

When the applicant (the project manager) fills in the application form in Prisma, he or she must state the administrating organisation and domicile. This is done in the drop-down menus for **Administrating organisation** and **Project domicile**. The domiciles that the applicant can select are retrieved from the organisational structure based on the organisation account settings defined by the person in charge of the organisation account. The organisation must have at least one domicile because this information is mandatory when the applicant submits the application. Domicile refers to the department, institute or unit within the organisation applying for funding.

9.2.3 Find the call in Prisma

The call is located on the **Organisation account** tab in Prisma. Click that tab, and then go to the link for organisation calls.

9.2.4 Fill in the form with the application content

The application must be written in Swedish or English.

The following information is requested in the application. All sections are mandatory except for the reference list and justification of budget.

- **Basic information:**
  - *Number of months applied for:* The number must not be less than 12 months or exceed 48 months.
  - *Start month:* The start date is 2020-06-01 for all projects.
  - *Estimated project duration:* The project duration is calculated automatically in Prisma, based on the start date and the number of months filled in.
  - *Project title in Swedish and English:* Maximum 200 characters per project title, including spaces.
  - *Abstract in Swedish and English:* A maximum of 2,000 characters per abstract, including spaces. The abstracts may be freely disseminated and published and so should not contain confidential or sensitive information.

- **Project description:** Maximum 10 pages. A project description template is available for download on the call's website. The project description should be uploaded as a file with a maximum size of 4 MB. Please do **not** include any budget in the project description.

- **List of references:** Maximum 2 pages. This part of the application is optional and can be used to list references that substantiate the project

description. The list of references should be uploaded as a file with a maximum size of 4 MB.

- **Thematic areas within Smart Built Environment:** Identify the themes within Smart Built Environment that the project will primarily contribute to. At least one theme should be specified. Read more about these themes on the Smart Built Environment website.

- **Budget for coordinating party and project parties:** The budget itemises the costs and funds for the entire project (not just funding requested from Formas). Applicants should fill in the information and budget for **the coordinating project party and each project party**. Prisma automatically totals these costs and funds for the project as a whole.

  The following budget information is requested in Prisma:
  Basic information *about the coordinating party and project parties.*

  Costs
  - *Staff expenses:* Eligible staff expenses for project parties not affiliated with a university, college or research institute may be allowed at a maximum of 800 kronor per hour.
  - *Equipment, land and buildings*
  - *Consultancy and licensing costs, etc.*
  - *Other direct costs including travel*
  - *Indirect costs:* Overhead costs. Universities, colleges and research institutes may charge a markup for indirect costs according to the applicable full-cost pricing method. Other project parties may charge a markup for indirect costs of up to 30 percent of their eligible staff expenses.

  Funding
  See Section 5.2 for a description of the four types of funding: (1) Requested grant from Formas, (2) Other aid (state), (3) Other aid (private) and (4) Self-funding.

  Justify the project budget
  Here, you should specify the average hourly rate for budgeted staff expenses. Staff expenses refers to salaries, including social security contributions. Other costs that require explanation can also be entered here. This is a free-text field that can contain a maximum of 4,000 characters, including spaces.

  A justification for the budget is also requested for each project party. Here, you should specify the average hourly rate for budgeted staff expenses. Staff expenses refers to salaries, including social security contributions.

Prisma automatically calculates the aid intensity and co-funding level for each project party and for the project as a whole. The calculated aid intensity is preliminary and can be adjusted prior to Formas' award decision.

The total cost for each project party, as well as for the project as a whole, must be the same as the total funding.

- **Classifications**
  Subject area: Select at least one and a maximum of three appropriate subject areas/keywords from a preset list.

  Global sustainable development goals: Choose one or a maximum of three sustainable development goals.

- **Appendices: CVs of project participants**
  A CV, maximum 2 pages per person, for at least one and maximum of six key individuals. The project manager's CV is mandatory.

9.2.5 Register and sign your application

After the application is completed, it must be registered and signed. It should be signed by the person responsible for the organisation account. Signing can be done in two ways:

- If someone other than the project manager is responsible for the organisation account, then that person must sign the application before the call closes.
- If the project manager is responsible for the organisation account, then the application is signed automatically after the application is submitted and registered.

For more information, visit the Prisma support page at https://prismasupport.research.se/user-manual/organisation-account.html

NOTE: After the application period expires, the application can only be supplemented in special cases on request by Formas.

10 Who can read the application?

Applications submitted to Formas become publicly available documents after a decision is announced. However, Formas does not disclose information about an individual's business relationships or operating conditions, inventions or research results if the disclosure would be assumed to cause the individual suffering. If applications are requested, Formas conducts a confidentiality assessment.

When a grant is awarded, a simpler project description aimed at the general public that does not contain any confidential information will be submitted to Smart Built Environment's programme office. The office will provide a template for this purpose. This project description is used to communicate externally about the project.

Appendix 1: Smart Built Environment in brief

The Smart Built Environment strategic innovation programme (SIP) supports digitalisation and the opportunities it brings to the built environment sector. It has identified industrialised construction, common information infrastructure, business-driven applications and process integration as fundamental areas of interest. The programme's overarching objective is to foster the continuous flow of information using business-driven applications within BIM (building information modeling), geodata and industrial processes related to construction and including built environment processes.

Smart Built Environment's impact targets that the programme parties should achieve by 2030 are:

- 40 percent reduced environmental impact in a lifecycle perspective for new construction and renovation of buildings and infrastructure.
- 33 percent reduction in total time from planning to completion for new construction and renovation.
- 33 percent reduction in total construction costs.
- More new value chains and business models based on lifecycle perspectives, research platforms and new constellations of stakeholders

The call "Digitalisation and industrialisation for a sustainable built environment" covers all themes within the programme. The programme's impact logic describes the expected impacts in the short and long term (see Appendix 2).

For more information about Smart Built Environment, visit the Smart Built Environment website.

Current information about the call and a link to the grant application function are available on the Formas website.

Appendix 2: Smart Built Environment impact logic

Smart Built Environment applies a so-called impact logic. This means that the project activities should help to achieve identified short-term impacts, which in turn help to achieve four overall long-term impact targets. The overall impact targets and each theme's impacts are described below. As set out in Section 7.1, the grant application should address a theme and describe the relevant impacts that the application is expected to help achieve. Note that the same impacts are found in different themes.

The programme's overall impact targets

- 40 percent reduced environmental impact in a lifecycle perspective for new construction and renovation of buildings and infrastructure.
- 33 percent reduction in total time from planning to completion for new construction and renovation.
- 33 percent reduction in total construction costs.
- More new value chains and business models based on lifecycle perspectives, research platforms and new constellations of stakeholders

Impacts for each thematic area

The impact of each thematic area is divided into a total of five groups that are present to varying extents in the different areas. ***Examples*** of concrete impacts are described below under each group.

- Improved information flow
- Streamlining
- Lifecycle perspectives
- Knowledge development and innovation
- Digital transformation

Innovations and new applications

- Streamlining
    - Reduced time in parts of or the entire process
    - Reduced costs in parts of or the entire process
    - Reduced resource consumption and process waste
    - More efficient government processes
- Lifecycle perspectives
    - Innovations leading to reduced greenhouse gas emissions and lower energy consumption
    - Changes leading to increased incentives to optimise resources and impacts from a lifecycle perspective
- Knowledge development and innovation
    - New services, products, processes or work methods are applied in stakeholder organisations
- Digital transformation

    - Changed work methods, processes and organisation within and between the sector's stakeholders
    - Learning organisations

Value chains and business models

- Digital transformation
    - Incentives, business models and operating models that contribute to higher value and benefit for end customers and users
    - Changed work methods, processes and organisation within and between the sector's stakeholders
    - Learning organisations
- Streamlining
    - Reduced time in parts of or the entire process
    - Reduced costs in parts of or the entire process
    - Reduced resource consumption and process waste
    - More efficient government processes
- Lifecycle perspectives
    - Changes leading to increased incentives to optimise resources and impacts from a lifecycle perspective

Information infrastructure

- Improved information flow
    - Open data available for planning, construction, management and use
    - Applications and platforms for information standards
    - Solutions for accountability, ownership and use of digital information
    - Increased integration of BIM and geodata
- Lifecycle perspectives
    - Robust environmental and building product declarations, available and usable in a digital format
- Streamlining
    - Reduced time in parts of or the entire process
    - Reduced costs in parts of or the entire process
    - Reduced resource consumption and process waste
    - More efficient government processes

Knowledge and skills

- Knowledge development and innovation
    - Increased knowledge and expertise among the sector's stakeholders on how digitalisation and industrialisation can drive change
    - Research-based knowledge is disseminated and used by sector stakeholders