National Geodata Strategy for Sweden 2016-2020 - Developed co-operation for Open and Usable Geodata Via Services

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SUMMARY

In consultation with the Swedish Geodata Council, Lantmäteriet last year drew up a new Swedish geodata strategy for the years 2016-2020. The new strategy is based on five future challenges for the Swedish society where geodata is expected to contribute to solutions: Innovation and business growth, the digitization of public administration, the streamlining of the urban planning process, the climate adaptation and environmental threats and the Swedish defense and civil contingencies.

Common to all mentioned societal challenges is that the solutions will benefit from open geodata. In Sweden the user financing of public sector geodata is still substantial. This negatively effects data-driven innovation and business growth. It also negatively effects the digitization of public sector administration and the society's ability to act efficiently in businesses where it is important to share an updated and reliable model of the real world.

All challenges will also benefit from having a further developed national harmonization of geodata between national, regional and local level public sector entities. Sweden still deals with a situation where different geodata standards are used in the 290 municipalities. Further to this, both the social planning process and the civil contingencies – including emergency response activities – will benefit from having more unified basic geodata supporting the coordination of the activities involved.

All challenges would finally benefit from reliable and well known API services with clearly stated service level commitments. Lantmäteriet expects that developments will take a leap step forward when such APIs with high quality authoritative geodata becomes generally available for use in public and private sector applications.

To make this happen and fully support the Swedish society in solving its societal challenges, the public sector geodata entities in Sweden needs to further develop its ability to cooperate.

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1. INTRODUCTION

Since 2006 Lantmäteriet has a coordination role in the development of the Swedish national infrastructure for geodata. In this mission Lantmäteriet is supported by a "National Geodata Council" with important geodata related organizations. A couple of national strategies has already been produced, but as innovation and development in e-government and private enterprise lately has been negatively affected by the extensive user financing of geodata in Sweden there was a great need for a new strategy targeting this and other relevant problems.

The work with a new national geodata strategy was initiated in Lantmäteriet's appropriation document for 2016, which included this assignment:

Lantmäteriet shall, together with the authorities and organizations represented in the National Geodata Council, establish a new national geodata strategy that contributes towards solving important future societal challenges, such as climate-related and environmental challenges, and develops innovation and competitiveness among Swedish businesses. The result of the assignment shall be reported latest on June 15, 2016.

Lantmäteriet developed the new geodata strategy in consultation with the organizations in the National Geodata Council: Linköping Municipality, the County Administrative Board of Värmland, the Swedish Civil Contingencies Agency (MSB), the Swedish Environmental Protection Agency, the Swedish Maritime Administration, Statistics Sweden (SCB), the Geological Survey of Sweden (SGU), the Swedish Association of Local Authorities and Regions (SKL), the Swedish University of Agricultural Sciences (SLU), the Swedish Meteorological and Hydrological Institute (SMHI) and the Swedish Transport Administration.

The work started with defining the future societal challenges Sweden are facing where geodata can contribute to the solutions. Five challenges were defined: 1) Innovation and growth, 2) Digitization of public sector administration, 3)Streamlining of the urban planning process, 4) Climate adaptation and environmental threats, 5) Defense and civil contingencies

Based on the societal challenges a vision was established for the development of the future national infrastructure for geodata:

Sweden has a national infrastructure for geodata that promotes innovation and growth in the business sector, allows digitizing and streamlining of processes within public sector and actively contributes in securing the citizens a good, safe and sustainable living.

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The geodata related problems involved in the societal challenges cooked down to four overall goals constituting the strategy: 1) Geodata is open, 2) Geodata is usable, 3) Geodata is accessible, 4) Cooperation is well-developed.

The vision and goals of the new geodata strategy provides a good basis for Lantmäteriet's coordination activities during the period 2016 2020. Lantmäteriet intends to establish annual action plans for implementing the strategy in cooperation between the organizations represented in the National Geodata Board.

The new geodata strategy contributes to the Swedish government initiative "Digital first" for accelerating the digitization of important public sector processes. This includes Lantmäteriet's assignment as development authority for an efficient digital urban planning process and the Swedish Environmental Protection Agency's assignment as development authority for smarter environmental information. The new strategy also promotes openness and data-driven innovation for the benefit of both citizens and businesses.

The implementation of strategy will require cooperation and commitment from both central, regional and local government. The conditions for such cooperation, and for cooperation with the private sector, is essentially based on voluntary participation and voluntary initiatives. The way in which the individual organizations deal with the strategy will therefore also be important for its implementation and for the overall impact within society.

2. SOCIETAL CHALLANGES

The starting point for the new Swedish National Geodata Strategy is five important future societal challenges where geodata can contribute to the solutions. When these challenges are described from a citizen perspective, the benefits and consequences of difference decisions, choices and prioritizations becomes clearer and easier to understand. This starting point for the strategy provides a solid foundation for a developed dialogue with the political decision makers regarding necessary changes and developments within the spatial data infrastructure. So what are these societal challenges where geodata can contribute to solutions?

2.1 Innovation and growth

The speed of the technological developments will continue to accelerate and the demand for up to date maps and other good quality geodata will grow in line with this. The development of smartphones and mobile Internet has made maps, positioning and location based services available to all. Geodata in 3D is taken for granted. By developing the Internet of Things, we can use geodata and sensors to create smart worlds within many different areas. Through big data and data-driven analysis, large quantities of unstructured data can be combined and visualized with the support of maps and other geodata. The development of artificial intelligence, nanotechnology and biotechnology will bring a number of new applications.

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Sweden is a leading IT nation, but not in the absolute frontline when it comes to data-driven innovation based on the re-use of public sector data. Several urgent measures are necessary:

– An overall national strategy and reform agenda for public sector data
– Concrete actions to encourage development and eliminate financial and legal barriers
– Standardization within organizationally fragmented public sector data management
– Improving knowledge among decision makers about the need for digitization.

Several of the problems need to be solved at the highest political level, but this also requires coordinated political decisions at regional and municipal level. In addition to raising awareness of overarching problems, there is also a lot that authorities, municipalities and other public sector organizations can and must do themselves.

In order to encourage data-driven innovation, easy access to standardized data is needed around the clock via appropriate, reliable and up-to-date services. These should also be compatible with open service platforms to promote broad use of geodata. In areas where national data provision is fragmented by different municipal and state data management, the public sector data owners must also cooperate when it comes to standardization and combined national service solutions to overcome the organizational fragmentation.

Access to open data is of great significance in order to encourage innovation among small and medium-sized enterprise. When data is open and available without fees and restrictions on its use, most financial and administrative barriers that limits the use, creative processing and dissemination of data are eliminated. Open data accessible via open services creates good conditions for innovation in connection with e.g. products, visualizations, analyses, data journalism and crowdsourcing. Not to forget the new applications and uses we cannot yet imagine, which will come as the conditions for creative development improves.

Geographic information is essential for describing, understanding and communicating other information with a spatial component. The openness of the geographic information are therefore hugely significant for the development in the field of data-driven innovation.

There also is a great potential for development within agriculture, forestry, hunting, fishing, reindeer herding and nature tourism. In agriculture efficiency improvements are often dependent on geodata. Geodata management based on good quality, up-to-date open data for the whole of Sweden is therefore an important foundation on which to create competitiveness and growth within land-based industries.

2.2 Digitization of public sector administration

The development of the Internet and web-based services is largely driven by social media. This increasingly involves interactivity and cooperation in which users contributes with various kinds of

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content. The trend of increased interactivity should also serve as a model for the development of public sector processes and services.

To improve interactivity and transparency the government interaction with citizens and businesses must be digitized. Digitization is also essential to improve efficiency within public administration and to help citizens fulfil their obligations and exercise their rights.

The Swedish Government's motto "Digital first" has a clear focus on the development of digital public sector processes within society, taking the needs of businesses and citizens as its starting point. This development also improves the opportunities for private sector players to contribute towards social development through attractive services that can interact with the processes within public administration. Everything is done in the best interests of citizens.

The technology for digitizing public sector processes already exists, but the pace in which the practical developments proceeds is rather slow. The problem is partly linked to deficiencies in the provision of information within these processes, but there are also financial, legal, semantic, organizational and cultural barriers to development.

In this societal development of great importance for citizens, businesses and authorities, it is absolutely essential with an efficient geodata supply. Up-to-date core geodata must be easily available via simple, reliable around the clock services. Effective machine interfaces with geodata are crucial to establish digital, automated processes. Thanks to API:s, the geodata supply can be easily integrated into the business systems, bringing great rationalization benefits since the users' can reduce their investments in parallel databases with geodata and manual updating procedures. When developing effective digital flows and processes, concepts such as manual handling and manual processing must be phased out wherever possible.

Access to open and easy-to-use geodata via machine readable services is also important for the exchange of data between local authorities and central government and for the public sector processes to be able to provide benefits for customers, i.e. businesses, associations and citizens. Developments within e-government are largely about democracy, transparency and citizen influence, and about being able to share various kinds of information freely with businesses, associations and citizens. If the core maps and core geodata used in the digitized social processes are not open due to financial or outdated legal restrictions, there is a great risk that the solutions will be limited or will become unnecessarily complicated.

2.3 Streamlining of the urban planning process

Statistics Sweden's forecast from May 2015 suggested that the population of Sweden will grow by just over 1.1 million during the ten years up until 2025. The Swedish National Board of Housing, Building and Planning indicates that more than 75,000 homes need to be built annually between 2015 and 2020. Housing construction will not reach the levels needed to satisfy population growth within the foreseeable future. Despite this and the fact that housing construction in Sweden rose by

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almost 70% in the last five years, there will still be a shortage of housing for the foreseeable future in many of Sweden's larger Centre's of population.

One of the biggest problems is that some of the information in the process still are analogue. Digitizing the urban planning process within state and municipalities will lead to more effective interaction between authorities, citizens and businesses. The need for up-to-date, easy-to-use geodata in 2D and 3D will then become critical in order to make interaction with authorities, project planners/builders and citizens more effective.

There also are some fundamental problems associated with a split-up process in which everyone doesn't have the same information and where some information is also lost. Moreover, the process is applied differently in different municipalities, and there is no uniform information and geodata supply for all involved, from citizens, project planners, builders and administrators to municipalities and authorities. All in all, this results in quality deficiencies, costly administration and lengthy process times. The planning and construction process – which includes overview and detailed planning, road and railway planning, project management, property registration, land registration and dealing with planning permission – therefore needs to be developed in several different areas.

Both the Lantmäteriet state assignment "Digital first - for establishing an efficient urban planning process", and the state innovation program "Smart Built Environment" assume that there is a huge potential in a more efficient urban planning process. Although the assignment includes many different issues to develop in cooperation, Lantmäteriet expects that an improved geodata supply may be one of the key success factors for a more efficient process.

As a large number of different players are involved in the process, there is a need for securing that all involved are provided with uniform maps and geodata throughout the entire process. It is also important that maps and other geodata are easily accessible via API services.

Since some geodata and decisions in connection with plans and restrictions relating to land use are still analogue, investments are needed in digitization and standardization so that the services can be provided with all the information needed for a highly effective process.

The need for transparency in the planning and construction process also requires good opportunities for accessing and disseminating various geodata within society. It is therefore important that the user financing is discontinued and replaced with other funding so that core geodata from e.g. Lantmäteriet and the municipalities becomes open data, available free of charge and without restrictions on its use.

2.4 Climate adaptation and environmental threats

The challenges of climate and environment are large and cross border. The Swedish environmental quality objectives (http://www.miljomal.se/sv/Environmental-Objectives-Portal/) and several of the sustainable development goals included in the UN's Agenda 2030 focus on the climate and the

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environment. These establish a high level of ambition for environment work, in which open, easily accessible geographic information, but also real property information, is an important prerequisite for both implementation and monitoring.

Despite the climate policy targets set up at the 2015 UN Climate Change Conference in Paris, changes will continue in terms of temperature, precipitation and extreme events such as storms, torrential rain and fires. This will have long-term effects on natural conditions, on land-based industries and on urban planning, infrastructure and emergency response, in which climate and environmental factors must be factored in. In the near future, taking a changed climate into account will be a natural part of planning and construction processes. The rising sea levels along our coastline are already an important factor in today's planning work.

Since most of the effects of climate change and environmental threats have a geographic component, core geodata is of central importance. Geodata is needed to demonstrate and explain complex courses of events based on often large and complex quantities of data produced by research. Geodata is also needed for analysis, impact assessments and planning measures for climate adaptation, and as basis for the presentation and communication of different types of climate and environmental information. Within the latter, open data, maps and internationally harmonized geodata for land and sea areas are also highly significant.

Access to geodata is essential for the rational use of the tools currently being drawn up for the planning of green infrastructure and the significance of these structures for maintaining central ecosystem services.
Environment-related geodata also increases the opportunities for citizens to obtain information and get an overview of the environmental conditions in different areas, and to participate in the social debate on environmental issues. One important such source is the Swedish Environmental Protection Agency's Environmental Data Portal, which makes a large quantity of environment-related geodata about nature and the environment available such as environmental monitoring, land conservation and the results of inventorying and geographical analyses. It also contains links to services for displaying and downloading this data.

Green structures in larger centers of population are investigated every five years by Statistics Sweden. Additional analyses are also being carried out in connection with this, for example how many people have access to green areas within a particular distance from their homes. By combining information from many different sources, we can not only capture what is important in terms of ecosystems, but also ascertain which green spaces are actually available for outdoor activities – in contrast to e.g. gardens.

2.5 Defense and civil contingencies

The security policy situation in Northern Europe has gradually deteriorated in recent years. The threats to our security are cross-border and cross-sectoral in nature, and are more changeable than before. The boundaries between preparations for war and actual conflict are also increasingly being

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erased through hybrid warfare. The development of ICT challenges many traditional ideas about the scope, players and logic involved in security policy.

Defense and civil contingencies involves protection against war, accidents and disasters, and aims to defend important social values. Ultimately, this is about Sweden's integrity and sovereignty. Following many years of easing tensions and efforts in crisis areas elsewhere in the world, the ability and capacity of Sweden's national defense now needs to be reviewed.

As external threats against Sweden grow and have become increasingly complex, we have also gained a better insight in recent years into the need to strengthen our ability to protect life and property in the event of major civil crises. This includes all levels of society, and involves different players within both the private and the public sectors. Operations of societal importance for which public sector players were previously responsible for have largely been transferred to the private sector.

Good quality, up-to-date, uniform maps and geodata are an important and necessary requirement for military defense and civil contingencies, both in order to prevent accidents and crises and in order to deal with events and actions.

Here, we face a number of challenges during the coming years. The supply of maps and other geodata vary significantly between different players, from state authorities, emergency response actors to private players. There are financial, legal and knowledge-related obstacles affecting the ability to make effective use of good quality geodata. For budget reasons, some players choose lower quality geodata, or avoids updating it or using geodata at all.

Data sharing is prevented by restrictions in license agreements and collaboration hindered by lack of uniformity of maps and geodata. Open geodata would represent a significant step towards making high quality geodata available to a wide range of players within civil contingencies and emergency response.

In order to create the best possible conditions for saving lives and property in the event of accidents and emergencies, all players should have access to uniform maps and positioning data, in order to ensure a shared overview before, during and after an event. Just as in the urban planning process, there are many players involved and there is a real need for measures to ensure that all those involved have access to the same updated information.

3. VISION

Sweden has a well-functioning national infrastructure for geodata. This means that it is easy to search for and find geodata and services. Geodata from different sources can be accessed via services, and can easily be combined. State authorities, municipalities and other geodata producers have worked together to make geodata simple to use. This infrastructure is an important national asset for development, and its geodata is freely available to the whole of society. Geodata is created,

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administered and made available by the public and private sectors within shared frameworks, thus contributing towards openness, availability and compatibility.

An overall national strategy and reform agenda makes it clear how geodata can contribute towards process efficiency, towards the environmental work and the 17 sustainable development goals in Agenda 2030, and towards innovation, growth and competitiveness in both the digital economy and the physical economy.

Knowledge about the opportunities offered by digitization and the benefits of open data is well established among politicians and decision-makers. Significant economic and legal barriers are removed through regulations and reforms. The fragmentation of public sector data sources has been reduced through a combination of standardization work and the establishing of national services for the dissemination of data from national, regional and local level.

Core geodata is national, open, up to date, standardized, of the required quality, easily accessible and efficiently used. National and local government have clearly stated infrastructure assignments that give the public sector processes and the business community access to the best possible data.

In this vision of Sweden, the public sector processes are characterized by transparency, interactivity and good cooperation between authorities, businesses and citizens. The collaboration around the national infrastructure for geodata.
- promotes innovation and growth within industry
- enables public sector processes to be digitized and streamlined
- contributes to a good, secure and sustainable living environment

The key to success is a long-term approach to the assignment and financing, as well as a continuous, highly effective, cross-sectoral national and regional/local cooperation between public sector geodata producers and key public and private users.

The public sector undertaking for the national geodata supply is long-term, but need to be reviewed regularly to secure that the most requested geodata are made available in society.

Services for access to geodata are known, easily accessible, usable and stable over time, so that users can make long-term investments in their use.

4. GOALS FOR THE PERIOD 2016-2020

In order to encourage development, innovation and entrepreneurship and to achieve increased use of, dissemination of and social benefit from core geodata, new financing models must be introduced for national and local government geodata producers that enables core geodata to be made available as open data.

In order to provide full benefit in society, public sector geodata must be easy to use and easily accessible. Through long term stable machine interfaces, access to geodata can be integrated into

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different business systems. Through open machine interfaces and appropriate e-services, innovation and enterprise will be made easier.

One important success factor for the continued development within this field is that the strategic cooperation between the state, municipalities and businesses takes place across social sectors and comprises both central, regional and local levels.

Lantmäteriet, with support of its Geodata council, therefore has defines four important overall goals during the period 2016-20 in order to make sure that geodata can contribute towards the solutions of the defined societal challenges. These overall goals are: 1) Geodata is open, 2) Geodata is usable, 3) Geodata is accessible, 4) Cooperation is well-developed.

4.1 Geodata is open

In order to achieve the maximum benefit to society from public geodata, user financing must be replaced by other forms of funding that facilitates the broad use and dissemination of this data within society. It is not easy to define the total amount of user financed public sector geodata in Sweden. The Lantmäteriet user financing totals to about SEK 360 million per year (60 %). If we add an estimate of approximately SEK 250 million per year for municipalities and significant amounts for bodies such as the Swedish Maritime Administration and Statistics Sweden, the total user financing of gathering, updating, administering and distributing core state and municipal geodata should be close to SEK 700 million per year.

To be able to open up wholly or partly user financed public sector geodata free of charge for broad use in dissemination, innovation and development, alternative financing models for geodata needs to be introduced in central and local government. The scale of the financial problem in Sweden suggests a long-term change process, but for core geodata the need for alternative financing models is time-critical. Examples of such core geodata are basic geographic information like maps, aerial imagery, elevation data, place names, addresses, property boundaries, core statistics, transport information, etc. This data is often fundamental when communicating about other location-specific information and about locational relationships between different phenomena.

When developing Swedish society, great value is attached to democracy, transparency, citizen influence and the simplification and streamlining of authority processes, for the benefit of citizens, associations and businesses alike. In future Sweden, other important geodata, e.g. in connection with social planning and society development, will therefore also need to be open for everyone to use free of charge and without restrictions on the use and the dissemination. Examples of how Sweden's public geodata producers can contribute towards this goal is:

- Promoting a collective financing of the Swedish national infrastructure for geodata, including the municipalities' contribution to this.

- Clarifying, and publicizing on www.geodata.se, if there is core geodata which in view of integrity protection, national and personal security, environmental protection or national environmental monitoring should not be made available as open data.

- Clarifying whether there are other, non-relevant, barriers to opening up geodata and proposing actions to remove these barriers.

- Promoting the public sector organizations to secure full rights of disposal over their procured geodata to be able to make the data available to the whole of society in the form of open data.

- Working towards a modernized registry legislation and, where possible, develop the application of existing legislation in order to eliminate outdated restrictions applied on the further use of data and the possibilities of opening up geodata.

- Following and publicizing via www.geodata.se the development of open geodata within Sweden's public sector using a suitable "openness index" for geodata. In addition to access to open geodata from state and municipal authorities, the use of open data licenses and access to open services should also be monitored.

4.2 Geodata is usable

In order to be effectively usable, geodata should be easy to use, up to date, complete and of a known quality. With a total of 290 municipalities and many governmental agencies that produce geodata, standardization, harmonization and composability are important. We shall ensure that data can be obtained in the forms requested, that there is possibilities to choose between open national and international standards, and that there will not be different versions of basic public geodata.

In situations where more than one party continuously needs to cooperate around maps and location-based information, it is important that all parties involved have access to the same up-to-date information in order to ensure a shared overview. This applies in particular to important functions in society such as emergency response and urban planning. There is currently no common and uniform geodata supply within these areas, and special measures are required to ensure that uniform geodata is made available to all. Examples of how Sweden's public geodata producers can contribute towards this goal is:

- Ensuring that public geodata can be made available in accordance with open national and international standards and reference systems, and working towards private geodata also being made available in accordance with open standards.

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– Contributing to the national harmonization of geodata so that all municipalities and relevant governmental agencies during the period have implemented;

    1) the national reference systems in 2D and 3D.

    2) the common national geodata specifications that were drawn up in cooperation between Lantmäteriet, the Swedish Association of Local Authorities and Regions, the Swedish Transport Administration and other authorities within the harmonization project "Swedish Geoprocess".

    3) service-based data exchange for the updating of national datasets with geodata from municipal operations.

– Prioritizing the work with a more efficient urban planning process for the central and local government involved by;

    1) defining which uniform geodata, decisions and standards are required for an efficient and seamless process.

    2) making important analogue geodata and decisions, such as plans and restrictions on land use, digitally accessible in a standardized and rational manner.

    3) developing a national framework for geodata in 3D that clarifies how we shall link together national and municipal geodata about buildings and other physical infrastructure with building information modelling (BIM).

– Ensuring that geodata is effectively managed by:

    1) cooperating with the National Archives of Sweden in drawing up joint management specifications for geodata in order to prepare geodata for e-archiving.

    2) inventorying the quality of core geodata and, if necessary, drawing up action plans for rectifying quality deficiencies and issuing quality declarations for data.

    3) cooperating to eliminate versions of public geodata that are created through multiple registrations of geodata and decisions in various public registers, e.g. the Real Property Register, the Environmental Protection Register and the Cultural Heritage Information System. By having decisions registered only in one register, treated as the original, working processes can be made more efficient, deficiencies in terms of quality and up-

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to-dateness can be minimized, and use can be more effective.

‒ Ensuring that civil contingencies and emergency response are supplied with uniform geodata to ensure that all actors working with preventing and handling accidents and emergencies have the best possible conditions to increase the precision and effectiveness in both collaborative situations and in individual actions.

4.3 Geodata is accessible

In order to make geodata widely used they must be known and easily available. The transition from human-read data to machine-read data will require completely new ways of working and new workflows within the production, distribution and use of geodata. The workflows of the future will use structured semantic data, i.e. machine-readable data. This is an enormous change that requires a focus on system architecture and reference model architecture.

By supplying basic geodata services with machine interfaces (APIs) and professional service undertakings, professional users can integrate these services into their own business systems and simplify the digitization of their processes. E-services with user interfaces facilitate both the dialogue between government and citizens and the sharing of geodata with them. Service development must be user driven, and the services known, clearly described, user-friendly, up to date and available around the clock, with clear service undertakings. Examples of how Sweden's public geodata producers can contribute towards this goal is:

‒ Following the guidance set up by "Swedish e-delegation" for the re-use of public information and, if necessary, drawing up supplementary common guidelines for the provision of geodata that encourages broad use, dissemination and re-use.

‒ Describing the services in the existing service catalogues at www.geodata.se and www.opppnadata.se so that they are easy to understand for broad user groups needing information about the technical, financial and legal conditions for using the services.

‒ Providing APIs for geodata that meets professional user's demands so they can be a functional alternative to handling copies of the geodata in separate GIS systems. The basic geodata services in the national infrastructure must be sustainable in the long term and established with clear administrative and service undertakings.

‒ Ensuring that all governmental agencies producing geodata can offer redundant and secure access to geodata via the Swedish Government Secure Internet, the "SGSI network", e.g. for civil contingencies and emergency response in a strained situation, so that all authorities involved always have a secure access to core geodata.

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– Providing geodata also as raw data to facilitate re-use for new applications and for commercial re-use.

– Providing a common national map service linked to www.geodata.se that gives combined access to the open public geodata produced by central or local government. In the long run, this service should also be able to visualize geodata in both 3D and 4D, and support a coordinated development towards combinable data.

– Providing simple e-services for citizens that simplifies their access to various geodata and supports their dialogue with central or local government.

– Analyzing whether the requirements for metadata should be further developed from a user perspective.

– Benchmarking and making joint analyses of service descriptions, user interfaces, user-friendliness, service undertakings and support solutions in order to develop the user-friendliness and broaden the competence in geodata service development.

4.4 Cooperation is well-developed

The national geodata strategy 2016-2020 is an important tool for Lantmäteriet in the work with coordinating the Swedish developments in the field of geodata. The strategy forms the foundation for broad national cooperation between different public sector producers and users of geodata. It is important that this cooperation develops in a way that encourages knowledge building, dialogue and practical coordination. Since the production and use of geodata takes place throughout the country, it is important that both sectoral and regional/local driving forces are dealt with in the best way.

Examples of how public sector organizations can develop dialogue and cooperation:

– Analyzing which different legal, financial and other instruments and mandates are required in different fields to ensure that the proposed goals and actions are taken, and making recommendations to the Swedish Government for necessary actions.

– Clarifying and regularly updating the need for coordination of activities with other national strategies and coordination initiatives with touchpoint to the geodata strategy.

– Deepening the national strategy with sectorial analyzes to clarify important sector-specific needs concerning the collection, management, dissemination and use of geodata. This enables strategic cooperation around the supply and use of geodata for players in different political. This also provides a solid foundation for future updates to the national geodata strategy. Sectorial analyzes are done in cooperation between geodata producers, authorities

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with sector responsibility and users within government and businesses that use data. Important areas for sectorial analyzes are:

    a. Basic municipal surveying and mapping
    b. Basic national surveying and mapping
    c. The urban planning process
    d. Climate and the environment
    e. Civil contingences and emergency response
    f. Agriculture and forestry
    g. Innovation and commercial re-use of geodata
    h. Data for research, education and cultural activities (including citizen science)
    i. Life-cycle management of geodata

− Drawing up joint annual action plans for cooperation between relevant authorities based upon national geodata strategy. These action plans should clarify the responsibility for the various activities carried out in cooperation, who participates in these and how the result is monitored.

− Creating a platform for an overall development plan showing the various central initiatives of significance in developing the national infrastructure for geodata, thus reducing the risk of duplicated work. The content should not be limited to the development carried out within joint action plans. It should also include other development of central significance that is carried out nationally and regionally by single authorities, municipalities and other players within the field of geodata.

− Prioritizing service-based data exchange as a method for public sector cooperation in data collection and data management in order to carry out the standardization needed to achieve integrated geodata supply for consumers.

− Drawing up a joint communication plan in order to:

    1) communicate the benefits and opportunities offered by geodata, particularly open geodata, for industry and for politicians and decision-makers within municipalities, the Swedish Government and the Swedish Parliament.

    2) provide information about and market services within the national infrastructure for geodata to existing and potential user groups.

− Encouraging decision makers on regional and local level to engage in the national geodata strategy and its implementation. This can be achieved by supporting analyzes of specific regional and/or local needs of geodata. This can also be achieved by contributing towards

the formation of "Regional Geodata Councils" with decision makers to act as referral bodies and to support the work involved with the national infrastructure at regional and local level. Here, the National Geodata Council's regional organization representatives and the regional geodata coordinators in Lantmäteriet can play an important role.

– Working together with higher education institutions, research councils and other relevant authorities for adequate long-term skills provision within the field of geodata. Initially, this will be done by mapping existing education and research funding within the field.

– Drawing up a common list of terms used in the area and information models for geodata and services that facilitate cooperation and are stable over time.

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M. Sc in Land Surveying, Royal Institute of Technology, Stockholm, 1979-83
Research engineer, Royal Institute of Technology, Inst. for Real Estate Economics, 1983-84
Business manager, Real property maps, Lantmäteriet, Map division, 1984-85
Business manager, Real property evaluation, Lantmäteriet, Real Property division, 1985-86
Section manager, Real property Maps, Lantmäteriet, Map division, 1986-88
Head of production, Real Property Maps, Lantmäteriet, Map division, 1988-91
Head of Planning (6 month temporary post), Lantmäteriet, Director General Staff, 1992
Head of Geodata coordination, Lantmäteriet, Director General Staff, 1992-94
Head of Geodata coordination, Lantmäteriet, Division Geodata, 1994-97
Member of Board, Miljödatacentrum AB, 1997-2000
Head of Map Publishing & Map services, Lantmäteriet, Division Metria, 1997-2007
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