

# **GEOVEKST – A Norwegian Program for Cost Sharing in Production, Updating and Administration of Geographic Data**

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**Key words:** Mapping in large scale, formal co-operation, cost sharing, standardised documents, quality controls.

## **ABSTRACT**

Geovekst is a nation-wide program for co-operation on establishing digital geographic data in Norway. The basic concept is pooling of money for jointly executed projects for establishing, improving and maintaining large scale digital geographic data. A general agreement on the Geovekst program includes the State Road Department, the Board of Electricity Companies, the Norwegian Association of Local Authorities, Norwegian Mapping Authority, the Telecommunication Department and the Ministry of Agriculture. Other services may participate in the program in specific regions. The Norwegian Mapping Authority undertakes the co-ordinating role both on national and regional level. The practical execution is organised as individual projects through which digital data is established and administrated in specific, limited geographic areas. The projects are based on an agreed set of standard rules and manuals, which facilitate the exchange and sharing of data across administrative boundaries.

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# **GEOVEKST – A Norwegian Program for Cost Sharing in Production, Updating and Administration of Geographic Data**

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Geovekst is a nation-wide program for co-operation on establishing of large scale digital geographic data. The co-operation started in the early 90-ties and has gone through a continuous development. The program involves different state agencies and level of government as well as private sector. The general agreement on Geovekst was signed in June 1992 by the State Road Department, the Board of Electricity Companies, the Norwegian Association of Local Authorities, the Norwegian Mapping Authority and Telecommunication Department. Ministry of Agriculture joined the co-operation half a year later. Other services may participate in the program in specific regions, if they have an interest. The Norwegian Mapping Authority has the co-ordinating role both on national and regional level. The practical execution is organised as individual projects through which digital data is established and administrated in specific, limited geographic areas. The projects are based on a set of common rules so that all projects are executed almost in the same way.

## **THE PARTICIPANTS IN GEOVEKST**

Translated into English, “Geovekst” means “Geo-growth”. In Norwegian Geovekst has a double meaning. The letters indicate the main participants in the program, which are;

- Norwegian Mapping Authority, working nation-wide. Most of the central functions are located in the main office. In addition there is one office situated in each of the 18 counties in Norway. The County Mapping Offices are traditionally, among a lot of other things, responsible for large scale topographic mapping, the so called Economic Map Series, in scales 1:5.000 and 1:10.000.
- The Road Department is also organised with one head office and one office in each county. Among other things they need digital data for planning and for making as-built maps when a road construction is completed.
- The electricity companies have different owners and ways of being organised throughout the country. Usually you find one electricity board in one specific region. But you can also find areas where one company is responsibility for the network, while another company distributes energy to the users. The electricity companies use digital data in their continuous operation, as well as for planning.
- The Local Authorities differs a lot in size and access of resources. In Norway there are about 434 Local Authorities (municipalities) at the moment. Their area differs from 6 to 9.700 km<sup>2</sup> and the number of inhabitants varies from 200 to more than 500.000. Their tasks vary widely, and so do the use of digital geographic data. Traditionally they cover urban areas by maps at the scales 1:500, 1:1000 and 1:2000.
- The national Telecommunication Department is divided into different units/companies which take care of distinct operations. The unit that is responsible for the network is the

- one that participate in Geovekst. The Telecommunication Department has designated one person in each region to take care of their local interests in Geovekst.
- The State Agriculture Administration is a department under the Chief Administrative Officer of the county. As the name says, they are situated in each county.

## **THE NATIONAL AGREEMENT ON GEOVEKST**

The Geovekst program is based on a shared responsibility concerning mapping and cost sharing. The Nation Agreement commit each main participant to do their best to take part in all projects. The parties may however consider if they want and have the possibility to take part in the actual projects. Up to now all parties to the national agreement have taken part in almost all projects. The data production is generally out-sourced to private companies. There are made two contracts for every project, one for the participants in the co-operation and one between the co-operation and the private company. These contracts are based on standard contract formulas with the possibility for local adjustment.

## **THE GEOVEKST FORUM**

The Geovekst program is revised continuously. Geovekst Forum is a national forum with representatives from each of the participants. They meet regular to discuss questions and problems that come up during the practical work throughout the hole country. The forum works out guidelines for the entire co-operation. The Geovekst Forum appoints Working Groups on actual problems that have to be solved. These groups and the Forum work out different guidelines, documents, manuals and implements. The working together in the Forum and the Working Groups constiute an efficient support for the joint program, which is of vital importance for the execution of the Geovkest projects. Each county has a co-ordination group with representatives from the local participants. Their mandate is to help the County Mapping Office in co-ordinating and planning in the particular county.

## **STANDARD CONTRACTS, TECHNICAL MANUALS AND GUIDELINES**

The program has developed standard bidding procedures and standard contracts describing both legal and technical matters. These documents are available on Internet, which means that all parties have access to the latest versions. In addition newsletters from the Geovekst Forum are distributed regularly.

Key documentation developed and made available under the Geovekst program are;

- General agreement
- Guidelines for national and local co-operation
- Standard contracts
- Standard for regional geodata production and maintenance
- Standard model for cost sharing
- Manual for production of data in standardised form, including collection, structure, storage and exchange

- Software for data production
- Control procedures, including software, for checking data quality according to fixed specifications including content, accuracy, completeness and data homogeneity, data structure and data delivery

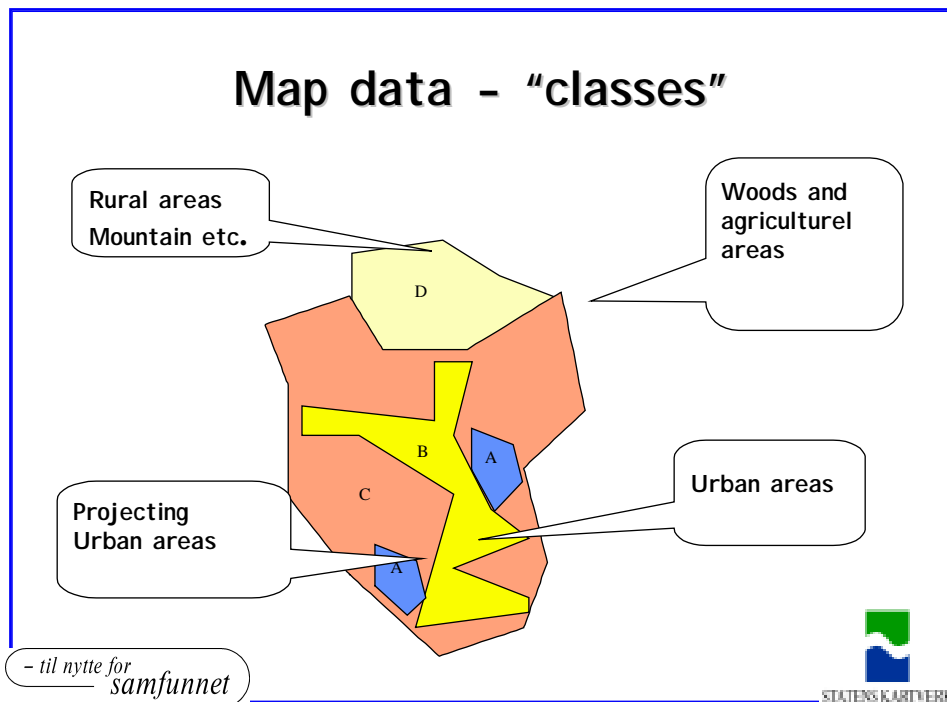
Developing of standard software for data production and quality control is worked out in close collaboration with Geovekst, however these activities belong mainly outside the joint program. Manuals to be used by contracted private companies are developed in close collaboration with the private sector.

The main objective for the joint program is mapping in the scales 1:500 to 1:5000. The digital data are however also used for maps in smaller scales.

Establishing of digital data follows a nation wide standard for content, structure and exchange called SOSI. This common standard is necessary to make it possible to combine data established in different areas. Particularly the parties with data needs across community borders require that data are in accordance with standard. The standard operates with different classes relevant to the different levels of mapping. Which class to apply for the individual project is negotiated by the parties to the single project.

A single project will normally extend to the whole or a part of the territory of one local authority (a municipality). The participants must agree on a dividing of the mapping area into the different mapping levels or classes. In Norwegian we call this FKB-standard. We have divided the standard into six classes. They are named FKB-A, FKB-B1, FKB-B2, FKB-C1, FKB-C2 and FKB-D. FKB-A is the most detailed, and only used in urban areas which require very detailed and accurate data. FKB-D is the less detailed level, covering some of the forest and mountain areas. FKB-D is however rarely used in Geovekst projects. The figure shows how a municipality can be divided into different classes.

The joint financing is based on cost – benefit estimations. Geovekst Forum is responsible for preparing cost-sharing principles. These are presented in different tables for urban and rural districts. A party which needs more detailed data pays more into the basket than a party that use only some of the information. But still all the participants get the same set of data. The participants are free to use data for internal purposes. The Geovekst Forum has agreed on regulations and pricing for access to data for parties outside the program.



## GEODATA PLANS

A basic component in the joint program is to prepare a general plan for the production and maintenance of geodata for each county, a Geodata Plan. The Geodata Plan must cover the whole area of every municipality. The content and structure of the Plan is based on a standard given in the Geovekst manual. The plan contains information on available digital data in the region, and on planned and on-going projects. In addition to the county plan, the municipalities and other parties are encouraged to make similar plan on local level.

## DIFFERENT KINDS OF PROJECTS

There are several types of projects organised under the joint program. The main types are related to establishing, updating, improving and maintaining of geographic data. Another task organised under Geovekst is the implementation of a new geodetic datum for Norway, the so called EUREF89.

So called "Establishing projects" are initiated in areas where there is no digital data available, or the data is in such a shape that it is most relevant to establish completely new data. If one of the participants in the project already have produced satisfactory digitale data, which can be used by the other parties as well, these data can be sold into the project.

"Updating projects" are initiated in areas where digital data exist, but there is a need to fill in new information. Typical examples are new houses and roads. Data establishing in these two types of projects are normally done by photogrammetric methods.

“Improving projects” are projects where the aim is to enhance the quality of existing digital data, collecting more detailed information, checking if the information is reflecting the reality, changing format due to new standards etc.

As participant in an “establishing project” the party also make a commitment to take part in the subsequent maintenance. Maintenance is also organised as projects. The main objective in “maintenance projects” are, by continuous updating, to keep the completeness of the digital data, however not always require geometric accuracy according to the standards. A new house can for example be added to the digital data based on inaccurate information. Later on, in an updating project, the geometric accuracy will be improved.

An establishing project include all steps from planning to final distribution. A project is divided into standard parts in accordance with the specification for the particular project. Relevant parts are the following;

- Leading of the project
- Establishing of ground control points
- Aerial photography
- Aerial triangulation
- Photogrammic construction
- Digitising of available analogue information
- Quality control (completeness, geometric accuracy, topology, structure, compared to other data etc.
- Attach to “old” digital data in the same area
- Production of plotting files
- Storing in general (nation) databases
- Distribution of data to all the participants

Most of the production are done by the private sector companies, however production may be done by the parties themselves, if they have the required capacity. The County Mapping Office (CMO), or sometimes by the Local Authority, will undertake project management. CMO normally also undertakes quality controls, but data control are also done by the Local Authority and the Road Department. Quality control is a very important part of the Geovekst projects, and is gaining more and more attention. An important element in the projects, is to compare with other digital data in the region, e.g. the cadastre. This gives synergistic effects also outside the Geovekst co-operation.

## **SOME EXPERIENCES**

During the ten years since the national agreement was signed, the parts in the Geovekst co-operative program have got to know each other much better. I think this is one important reason why we look upon the program as a success. In addition the program has made it possible to work out national standards and plans in a wide range of issue. Joint financing and co-ordination of data capture has been very cost effective for the Geovekst participants. Another benefit which can be observed, at least to some extent, is increased allocation of funds for mapping.

The Geovekst program is going through a continuous evolution. Geovekst Forum works on national guidelines all the time. Some problems has to be discussed over and over again. Among most difficult issues coming up are models for fair distribution of costs. Another critical issue is prising and rights to use the data, particularly in relation to making data available to users outside the parties directly involved in the program. The latter issue has become more difficult to handle because some of the parties are privatised, and do not belong to the public sector any longer.