

# **FOTdanmark - a Danish Cooperation Project Involving National and Municipal Government (version 2)**

**Bente NEERUP, Denmark**

**Key words:** common public cooperation, basic of spatial infrastructure, business model

## **SUMMARY**

By establishing a common nationwide mapping, the project 'FOTdanmark' is setting the scene for future cooperation between national and municipal government in Denmark. This future cooperation will invoke the use of common data specifications, a shared data-handling system and continuous updating. The project aims to build a basic spatial infrastructure for e-government in Denmark and to make this infrastructure cost-effective.

It is a precondition that FOTdanmark is established and developed through an equal and mutually binding cooperation. Thus, FOTdanmark is an example of public authorities using consensus rather than legislation to realize some basic elements of a common spatial information infrastructure.

This paper describes the framework and the coalition policy behind FOTdanmark. It highlights a number of business principles, a proposed business model for FOTdanmark's operation, an operational structure and plans for funding. This issue is of immediate importance, as the business model proposal is about to be completed and will be submitted in September 2006. The business model is expected to be endorsed in the end of 2006.

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## **1. INTRODUCTION**

Over the past few decades, responsibility for mapping in Denmark has been shared by the National Survey and Cadastre (KMS), municipal governments and large utility companies. KMS has historically been responsible for the nationwide topographical mapping, while municipal governments have taken on more detailed and technical mapping of their respective jurisdictions. At the municipal level, most focus has been paid to urban areas, as administrative tasks for which mapping is required have been concentrated in these areas. A few of Denmark's utility companies have also initiated detailed and technical mapping of the country's more rural areas. Today, all mapping is digital.

KMS, municipal governments and large utility companies all claim intellectual property rights to their digital maps, which they sell to each other and to third parties. KMS' principal customers are the state-level authorities and KMS sells to the municipal governments, too. The municipal governments' principal customers are the utility companies.

With a total area of 43.000 square kilometres, Denmark is a relatively small country. The country is currently divided into 271 municipalities in 14 counties. With effect from January 1, 2007, an administrative reform will restructure the country into 98 municipalities in 5 regions.

The combination of a relatively small land area with a number of producers of digital maps has made digital mapping in Denmark a dynamic and innovative sector. However, a lack of coordination among these competing map producers has led to double mapping in many cases, which is neither efficient nor cost-effective. Double mapping has also caused problems for the users in public sector administration.

Worldwide, growing e-government initiatives are placing increasing focus on the needs for a common, unambiguous and updated basic spatial infrastructure. These needs are intensified in Denmark, where a well developed and integrated system of digital nationwide registers of spatial information can be geo-coded to the digital map.

With Denmark's structural reform just around the corner, this issue is becoming increasingly urgent. Responsibility for public administration will be redistributed, with municipal governments gaining increased oversight of rural-scale activities. Access to digital land information will be essential for managing these new responsibilities.

FOTdanmark ([www.fotlandanmark.dk](http://www.fotlandanmark.dk)) seeks to establish common object types that will serve as the foundation for a common data and a data-handling system. FOT is an acronym for common object types, or Fælles ObjektTyper in Danish. FOTdanmark has approached this challenge from a combined business model and technical approach. This paper focuses on the business model, while the technical perspectives will be dealt with in Jørgen Grum's paper *FOTdanmark: Changing the Scope from Map Datasets to a National Geographical Administrative Dataset (0826)*.

This paper is mainly based on papers from the FOTdanmark working group that has addressed business model development and operating structure (see section 2.3).

## **2. THE PROJECT OF FOTdanmark**

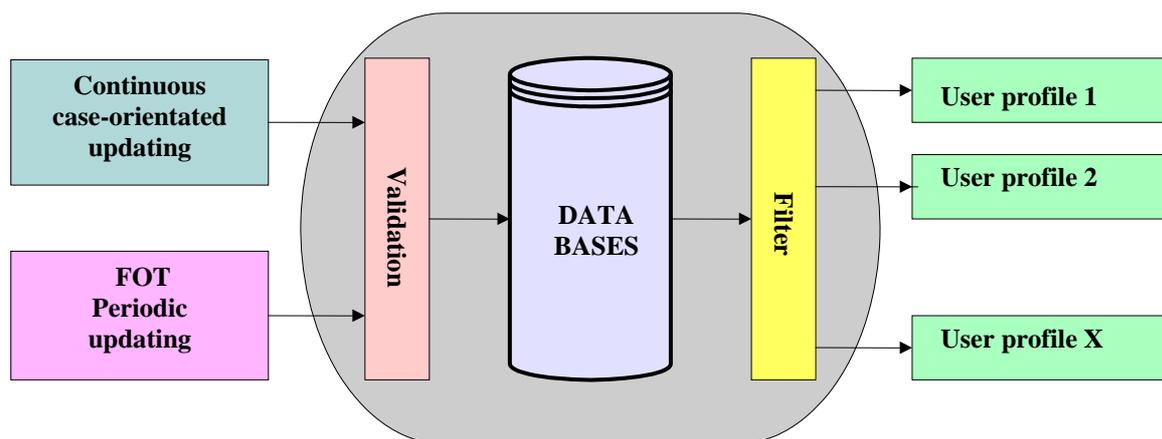
### **2.1 The aims and the guiding ideas**

The overall objective of FOTdanmark is to develop a common spatial infrastructure for e-government. This common infrastructure will foster common geographical understanding among public authorities at all levels. Thus, 'locality' can be used as a basis for digital public administration.

In the aggregate, FOTdanmark will:

- establish a common, standardised and updated spatial infrastructure for e-government which can be used by all public authorities across levels and sectors. It will, on the whole, be a frame of reference for handle of spatial data. This requires a homogeneous and seamless data collection. The establishment will be started from the existing mappings, which are worked up into common spatial data according to the specification for FOT data.
- through joint management, ensure that development and updating of data is efficient and cost-effective. A combination of periodic photogrammetric updating and continuous case-oriented updating will be introduced in the long term.
- ensure efficient access to the infrastructure by establishing a common and up-to-date system for storing of FOT data. This system will follow the requirements of the European INSPIRE initiative.
- ensure that the specifications for FOT data are current and meet to international standards.

FOTdanmark is based on the fundamental principles of e-government, in which data must be 'born' and updated at their source, without any needless double registration. This will be ensured by a publicly administered, service oriented IT-architecture.



**Figure 1:** An abstract sketch for the FOT concept

The project is also expected to bear financial savings through more efficient common standardised mapping and data processing. Further potential savings reside in future effectiveness of public administration through the use of spatial infrastructure. These savings are anticipated at all levels of Danish government. The introduction of continuous, case-oriented updating will be an important element in these future developments.

In autumn 2005, FOTdanmark produced a financial analysis that revealed the project's expected long term financial savings. These totalled 35 per cent annually, or approximately 5.5 millions Euros per year, excluding utilisation and other spin-off benefits. However, this sum must be offset by the total cost of establishment, which is currently estimated at 11 millions Euro. The report is available at [www.fotlandmark.dk](http://www.fotlandmark.dk).

## 2.2 Fundamental principles for the cooperation

### 2.2.1 Common-public cooperation

In Denmark, FOTdanmark functions as a common public cooperation, meaning that cooperation and participation are limited to public authorities. Private parties are expected to be engaged in the project primarily as users and distributors of data and services.

Additional common public projects are also under development, especially as Denmark implements the new structural reforms. Denmark's Environmental Portal (Danmarks Miljøportal, at <http://www.arf.dk/RegionalUdvikling/Miljoe/Miljoeportal/Miljoeportalen.htm>.) is one example. It is characteristic of a common public project that it promotes consensus and mutually binding cooperative agreements rather than new legislation. The cooperative agreement behind such a project is the result of lengthy negotiations and preliminary work executed by broadly composed working groups. The project's communications strategy includes constant updating to all interested parties through websites and meetings throughout Denmark. This is hoped to ensure wide support for the project and reinforce the effects and successes of its implementation.

When the development of a business model for FOTdanmark was placed on the project agenda, it was clear that the project team would have to start from scratch. Application of existing business models for other projects proved inappropriate.

At the base of the FOTdanmark business model is the principle that cooperation between the involved parties has to be equal. The model is intended to be coherent and well balanced with regards to decision-making, structuring of the project establishment, distribution of tasks, membership and funding.

### 2.2.2 A nationwide project based on voluntary participation

The parties involved in FOTdanmark have a common ambition to establish nationwide cooperation as soon as possible and thereby maximise use benefits across the country. However the project's voluntary nature challenges the achievement of 100% participation at the municipal level. Additionally, these authorities are only first required to standardise their activities under FOTdanmark guidelines once they have entered the mutual binding cooperation.

In order to achieve the maximal benefits of a nationwide standardised spatial infrastructure, it is imperative that the municipal-level governments participate. In the first instance, participation must be seen as attractive.

FOTdanmark has established the following goals for the project's 'nationwide' implementation:

- By the end of 2008, at least 50% of Denmark's land area is represented by municipal-cooperation in FOTdanmark. By the end of 2009, this number has risen to at least 75%.
- By 2010, the municipal governments that have joined FOTdanmark cover 98% of Denmark's total land area.

If the project does not reach these goals, then a decision must be made about either how to fund the mapping of the remaining areas or, in the worst case, to close down the initiative.

### 2.2.3 The contents in the FOT data collection

The FOT specifications should be regarded as the minimum requirements for data standards. Each participant may supplement on its own account, both with regard to contents and frequency for updating, so long as it does not raise production costs of the common minimum dataset. The participants may not store supplementary data in the common system if it results in increased expenses.

### 2.2.4 Common intellectual property rights of data

All FOTdanmark data will come under the project's common intellectual property rights, according to the FOT specification. The project's participants will collaboratively establish specifications for the use, processing and resale of FOT data.

### 2.2.5 Financial circumstances

It is a basic precondition that parties engaged in FOTdanmark do not increase their mapping expenses over current levels. Moreover, the financial savings must be of common benefit. FOTdanmark must pay for itself and not accumulate working capital.

## 2.3 The structure of the project

FOTdanmark was established in August 2005 by the Spatial Data Service Community (<http://www.xyz-geodata.dk/>) which is a governmental body established by the Project e-government. However, the “FOT” concept had already been introduced to Denmark by an earlier initiative that was based on a more narrow and traditional mapping-perspective.

FOTdanmark is led by a steering group comprised of representatives of state and municipal government. In addition to a project management team, which was appointed by the steering group, three working groups have also been identified. These are described below and illustrated in figure 2.

- A working group to define FOT data specifications (1)
- A working group to develop a FOTdanmark business model and organizational structure for project implementation and administration (2)
- A working group to develop the common basic FOT system (3)

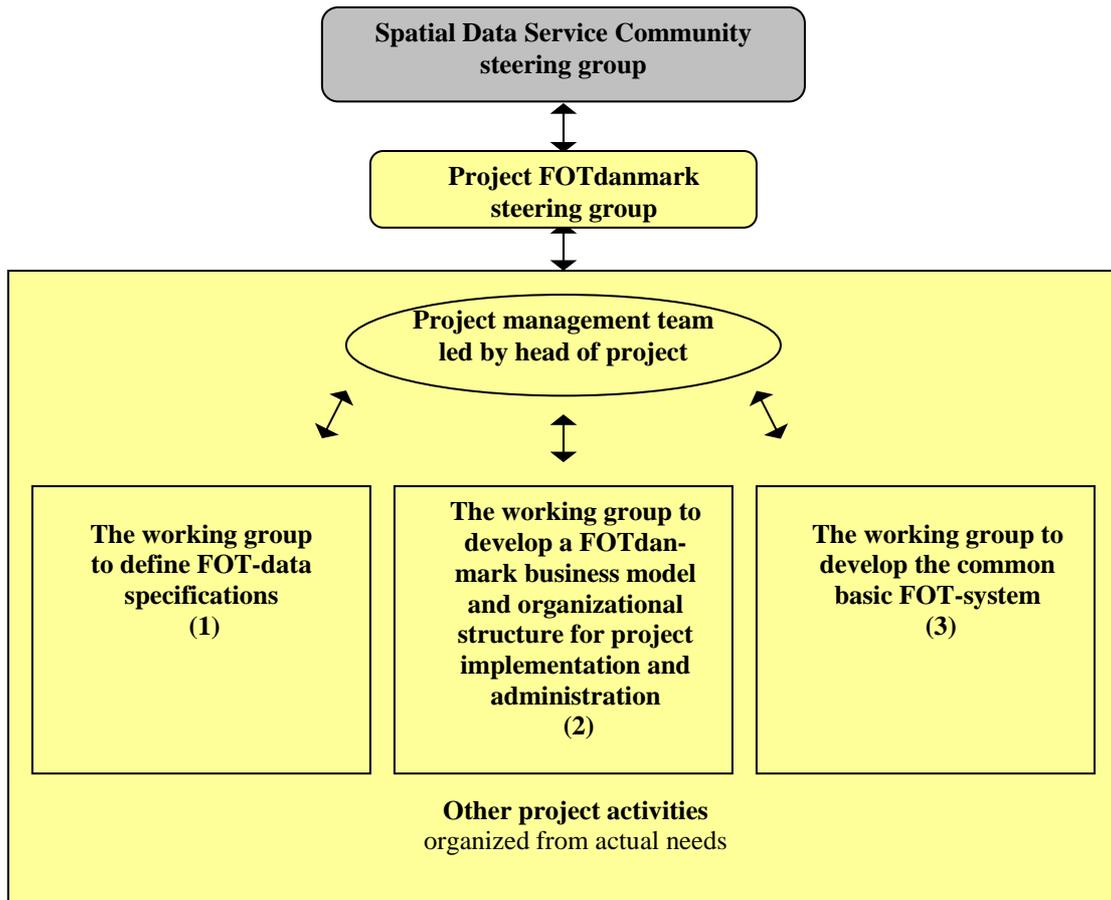
A range of specialists represent the project’s participants in these working groups. In addition, consultants have been attached to some of the working processes.

The working groups’ progress to date is roughly as follows:

(1) Production of FOT specification version 3. The specification was submitted to the project participants and endorsed in spring 2006. This working group is now closed down and replaced with a working group to implement and further develop the FOT specification.

(2) Production of a financial analysis of the FOT concept in autumn 2005. The group’s work extended into the first quarter of 2006, as it prepared an architecture for the business model and basic FOT system in conjunction with working group 3. Together, the groups identified an overarching infrastructure for the FOT system and data contents, a number of principles for working processes, and definition of the activities and responsibilities that can be expected during future cooperation. Work with the business model and the operating organization has continued, and a proposal to the cooperative members is expected in August 2006.

(3) When an architecture for the basic FOT system was prepared, the work on the basic FOT system had been suspended. Instead, the establishment of a temporary interim solution for storing and distribution of FOT data at KMS has been in focus. This adjustment was deemed necessary for meeting the goals of system operation in 2007. This system is called FOT2007 and is supposed be operational in the next few years.



**Figure 2:** The organization of the project

### 3. THE PROPOSED BUSINESS MODEL

#### 3.1 Participants in FOTdanmark

All participants in FOTdanmark are public authorities at either state or municipal level. One of the challenges of generating a business model for the project has been the designation of tasks that should be centralized and those that should be managed at local level. Tasks at all levels must be managed in a formal and legally binding manner.

Municipalities are expected to participate in FOTdanmark as individual authorities. Traditional cooperative mapping activities at the municipal level are expected to be reviewed and integrated into FOT.

At the national level, the interest association Local Government Denmark, or KL, represents the country's municipal authorities and safeguards their interests,. However, KL cannot sign for the municipalities in a legally binding way without having reached specific agreements

with individual municipalities. More information about KL is available in Danish at [www.kl.dk](http://www.kl.dk).

At the state level, a number of authorities will use and contribute to FOTdanmark. The National Survey and Cadastre (KMS), which is a branch of Ministry of Environment, will represent state-level interests and commitments in FOTdanmark.

As the first step of the implementation of FOTdanmark, KL and KMS will sign an overall cooperative agreement based on the project's business model. A set of agreements will provide the guidelines for the project's implementation.

KL will represent municipal authorities on the FOTdanmark steering committee. In practise, KL will manage a network and backing groups among the employees at the municipal governments.

KMS will vouch for FOTdanmark agreements, financial commitments and steering committee decisions on the parts of individual states. KMS will also establish a FOT forum to ensure the active participation of state-level authorities in the project.

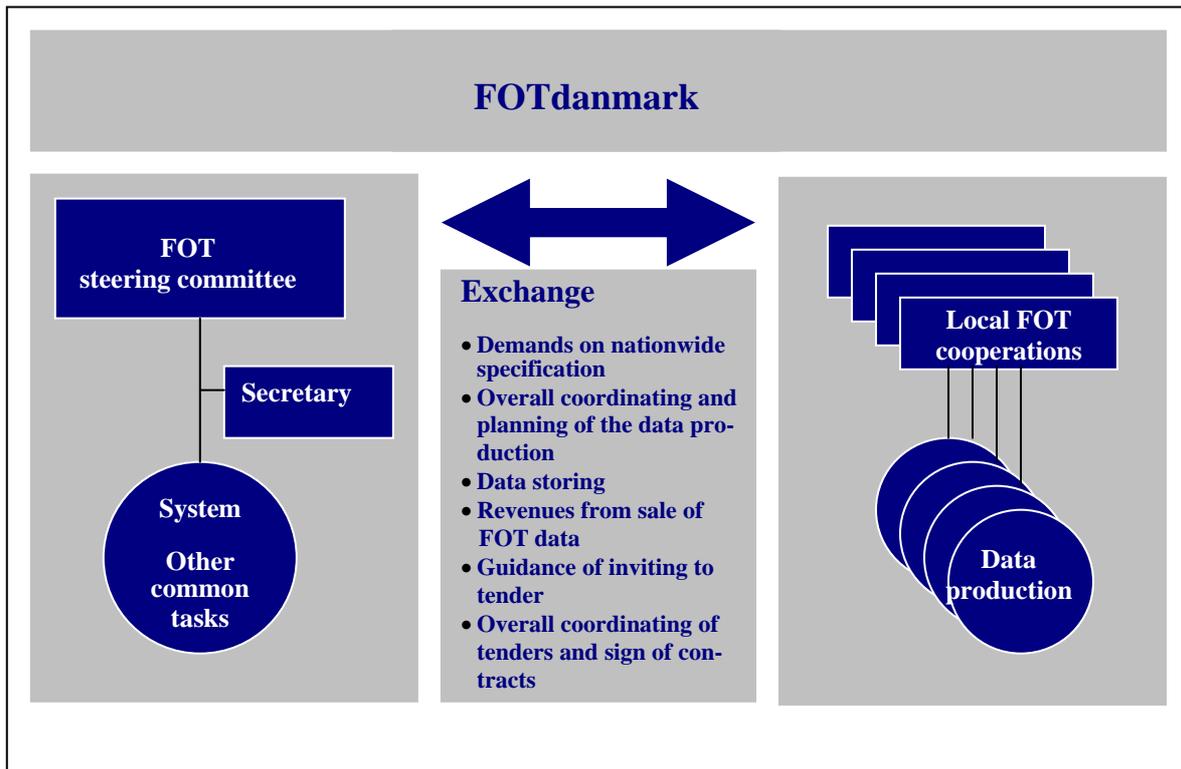
### **3.2 The organization and the distribution of tasks**

Figure 3 below illustrated the proposed operational organization for FOTdanmark. Integral in this structure should be the principles of equality, influence, transparency, qualifications, proximity, efficiency and requirements of resources.

#### **3.2.1 The steering committee**

FOTdanmark's steering committee has responsibility for the project's overall political development. This committee also has legal and financial responsibility for cross-cutting tasks such as the data-handling system. However, it has only coordinating responsibilities for data production activities.

The steering committee consists of six members, comprised of three representatives from KL and three representatives from KMS. The committee selects a chairperson from among its members, and the chairmanship alternates between the two parties. Each member has one vote and, in the case of a parity of votes, the chairman has a casting vote.



**Figure 3:** The organization of FOTdanmark

After Denmark's structural reforms have taken effect in January 2007, new regional governments will replace the existing county governments. These have an observation post in the steering committee because their future work will draw from FOTdanmark's spatial infrastructure, but only in a limited way.

Utility companies have a unique relationship to FOTdanmark due to their past and present role in digital mapping of Denmark. To ensure these companies' involvement in FOTdanmark, a liaison committee of utility company representatives will be established and will work in close cooperation with the project's steering committee.

### 3.2.2 The FOT secretariat

A FOT secretariat, independent of the FOT participants, will be established to serve the steering committee and to coordinate the project. With its limited resources, the secretariat will only manage cross-cutting and coordinating tasks. These will include preparing plans and budgets for common central activities, assisting local level participants with the preparation of invitations of tender and contracts, communication and dialogue with participants. The secretariat will not sell data, but will administrate the acquisition of licences to sell data - both for participants in FOTdanmark and for third parties.

Responsibility for the remaining common central tasks will be delegated to the project's participants, but they will remain under the jurisdiction of the steering committee and the FOT-danmark budget. This will require clear definitions and distinctions between the financial resources used for FOT tasks and those used to accomplish other activities.

The following tasks will be distributed to project participants in the establishment phase:

- The data-handling system: Until a system for nationwide data collection is established, the administration, operation, development of a common system and the common data specification will be the responsibility of KMS. Future distribution of these activities will be considered at a later date, when the nationwide participation has been achieved. At this time, considerations will be made to invite as many tasks as possible to tender.
- Nationwide specification and cross-cutting quality control: These tasks will also be the responsibility of KMS. The tasks will include developing FOT specifications and ensuring that data collection is homogeneous and seamless.
- Guidance to municipalities: KL will take responsibility for guiding individual municipalities in their FOTdanmark-related activities in addition to the distribution of projects costs and revenues among the municipalities.

### 3.2.3 The local FOT cooperations

To optimise the use of existing resources, responsibility for the production of specific geographical data has been delegated to local FOT cooperations. This includes collecting supplementary local claims to data production, inviting to tender for periodic photogrammetric updating and responsibility for data production.

In the first instance, these responsibilities are placed in the hands of municipal governments in specific geographic areas and KMS. However, the municipal authorities may appoint regional cooperative structures within their jurisdictions. The resulting local FOT groups must be able to administrate and sign formal legal contracts on behalf of the municipalities and KMS in the area of data production. They shall also clearly distinguish between those financial resources used for FOT tasks and those used to accomplish other activities. By establishing a flexible organizational frame for implementing FOT at the local level, with participation of representatives from the state level, too, the needs of both the project and the authorities are being respected.

### 3.2.4 The commitments within organizations

At the entry into FOT cooperation, each participant commits to carry through a number of necessary tasks, in particular, tasks that relate to object responsibility. All objects included in the FOT specification are connected to an unambiguous object-responsible authority. This is most often the authority which already has administrative responsibility for the particular object type. Object-responsibility involves data correcting duties and rights. These tasks may be delegated, but the responsibility for the object type remains with the relevant authority.

In the long term, a continuous, case-oriented updating system for all relevant object-types will be implemented and linked to administrative processes. However, it is expected that the participating authorities will uptake this implementation voluntarily, to match their existing needs for updated data.

### **3.3 Participation in FOTdanmark**

#### **3.3.1 The entry**

Upon entry to FOTdanmark, a new participant signs a contract with FOTdanmark and commits to fulfil the requirements of cooperation. Subsequently, the participant must enter into an agreement on data production. The local FOT cooperation will administrate this process.

New participants are also required to contribute a dataset to FOTdanmark. KMS is required to contribute national topographical data, while municipalities are expected to contribute detailed technical maps of their respective jurisdictions. These data must be updated to ensure their clean fit into the existing FOT database.

#### **3.3.2 The resignation**

If a participant chooses to resign from its FOT commitments, it is entitled to a copy of the data that are necessary for carrying out its administrative activities. Moreover, it may be authorised to sell and further distribute data based on standing legislation. The former participant relinquishes all rights to further updated FOT data.

#### **3.3.3 Suspension of FOT**

At closure, participants receive a copy of all the FOT data that refers to their jurisdictions. To a certain extent, they also acquire the right to use, further develop and sell the data which are the result of a further development and updating within FOTdanmark. KL and KMS jointly clarify how the rights to the common assets and liabilities, including both psychical assets and the common basic FOT system, should be distributed.

### **3.4 Funding**

The basic principle for FOTdanmark's budget is that "funding follows responsibility". This means that local FOT cooperation funds data production while participating authorities jointly fund common central tasks. Contributions from the participants will include both general administration and specific task-related activities. FOTdanmark must pay for itself and not accumulate working capital.

Funding of FOTdanmark's common central tasks will be determined by the steering committee in annual budgets. KL and KMS will ensure that the participants they represent contribute to funding FOTdanmark according to agreements.

The respective contributions from participants will be determined by distribution plans that will be adjusted every 2 or 3 years. Each of following tasks will be funded according to these distribution plans:

- The data-handling system: The funding of FOT2007 is determined in a separate agreement between FOTdanmark and KMS.
- The secretariat: The funding will be balanced between KL, representing the municipalities, and KMS, representing the state level.
- Data production: The costs of mapping Denmark in its entirety at the lowest FOT standard will be equally shared by state and municipal participants. However, the municipalities will cover most of the costs of mapping urban areas at more detailed standards.

In the establishment, some special questions about the funding will be raised because it is expected that FOTdanmark only will be gradually nationwide.

### 3.4.1 The revenues

FOTdanmark will not function as a sales-oriented organization. Sales of data will be handled as follows:

- The use of FOT data by participating authorities in their administrative activities will not be regarded as sale.
- FOT participants may apply to the FOT secretariat to establish sales rights for transactions with third parties. FOT data sold to third parties will invoke the payment of royalties to FOTdanmark.
- Private enterprises will have the ability to enter into agreements with the steering committee about distributing FOT data on payment of royalties to FOTdanmark.

According to a determined plan for distribution, the revenues borne of royalties from sales will equalize between the parties.

The amount of the royalties may be determined from the following parameters:

- The amount of data (per unit of area).
- The contents of data (how detailed, how many themes, etc).
- The character of the right for use (possibilities for use).

## **4. FURTHER DEVELOPMENTS**

Stocktaking for FOTdanmark in August 2006:

- The FOT specification version 3 was endorsed in spring 2006 and is now used for mapping in at least one part of the country.
- An agreement about the establishment of a temporary interim solution for storing and distributing FOT data to KMS will be concluded and the system should be running from the beginning of 2007 as planned. The system is called FOT2007 and is supposed be operational in the next few years.
- A business model for FOTdanmark will be proposed to participating parties in early September 2006. This is a little behind the schedule.

FOTdanmark now faces the challenge of attracting as many municipalities as possible to co-operation in the project's implementation and operation. Most municipal governments view FOTdanmark as a good idea but they are worried about increasing costs and reduced opportunities to influence future nationwide mapping in Denmark. Therefore, a number of meetings will be arranged around the country in late September and early October to inform various authorities about the business model and to discuss possible differences of opinion.

The business model for FOTdanmark is expected to be endorsed in the end of 2006.

## **REFERENCES**

The project "FOTdanmark", at [www.fotdanmark.dk](http://www.fotdanmark.dk).

Working papers from a working group to develop a FOTdanmark business model and organizational structure for project implementation and administration (not published).

## **BIOGRAPHICAL NOTES**

Head of GI-section in Hjoerring Kommune – a middle-sized municipality in Denmark.

Member of the working group to develop a FOTdanmark business model and organizational structure for project implementation and administration.

Boardmember of Geoforum Denmark – society of geographic information.

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