
# Invitation to tender

# Spatial data on the web – Research topic #1 revisited:

# Evaluation of lessons learned

Geonovum

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# Table of contents

# Chapter 1 - Introduction

**This chapter gives general information about this invitation to tender.**

## Invitation to tender

This document gives information about the invitation to tender regarding the following research topic:

- Research topic #1: **Modern ways of spatial data publication**

For this research topic a budget of € 25.000 excluding 21% VAT is available (see chapter 4).

## Background

This invitation to tender is part of Geonovum's testbed Spatial Data on the Web. Its general background, goal, scope, outcome etc. are explained in the previous invitation to tender[1]. In the first phase of the testbed three topics were researched. The results of this phase are published in GitHub[2].

The testbed results were consolidated in a set of lessons learned. We want to validate these and make them more mature by publishing more data according to these lessons and by using this data to create demo applications in an experimental setting.

Two research topics are left in the testbed: research topics #1 and #5. First, research topic #1 will be carried out. It is the subject of this request for tender. Work on research topic #1 will be carried out in the period of May - July. For detailed planning see chapter 4.

After summer, research topic #5 will be carried out. The emphasis will then be much more on community building. Using published data from the earlier testbed topics, a hackathon or other event(s) around spatial data on the web, targeted at data users (such as web strategists, web developers, data journalists, etc), but also involving data publishers, will be organized.

## Sponsors

The initiator of this testbed is Geonovum. The budget for this testbed is provided by Geonovum as well as several 'sponsors': Dutch programs and projects that are concerned with the publication of spatial data. These are the Ministry of Infrastructure and Environment (Key Register Large Scale Topography and the INSPIRE program), the ministry of Economic Affairs (project 'Open geodata als grondstof voor groei en innovatie'), and the Dutch geoportal PDOK (Publieke Dienstverlening op de Kaart).

Two sponsors are not only donating budget for this testbed but also play an active role in providing data. These are PDOK and the Ministry of Economic Affairs (EZ).

PDOK has invested in the testbed because of their interest in innovative data publication methods but also their interest in user interaction with data. For this reason they play an active role in this testbed phase which focuses on data publication, but also in the next phase which concentrates more on data users and stimulation of a spatial data on the web community.

The Ministry of Economic Affairs has invested in the testbed in the context of their project on open spatial data, "Open geodata als grondstof voor groei en innovatie". The Cultural Heritage Agency (Rijksdienst voor Cultureel Erfgoed, RCE) is active in this project. In the context of this project, EZ and RCE are providing cultural heritage data to the testbed and RCE will be actively involved in the research. The data is

[1] http://www.geonovum.nl/sites/default/files/Invitationtotender-SDWtestbed_0.pdf
[2] http://www.github.com/geo4web-testbed/general

described in Chapter 3. The results of testbed research topic #1 will be presented at the Open geodata event in June.

## This document

After this introduction, chapter 2 explains the tender procedure. Chapter 3 describes the research topic in detail. Chapter 4 explains the organization of the testbed in more detail.

This document is a final draft. Based on questions and comments during and after the tender period, the text can be changed in a 'living version' of this document in order to clarify issues or to remove errors. This final draft will remain available in unchanged form, as well.

# Chapter 2 - How to tender

**This chapter gives the information about the procedure of tender response.**

## Rules and procedure

The submission period for the tender starts on April 18, 2016 with the publication of the Invitation to Tender on Geonovum's website, www.geonovum.nl.

The tender is open to private and public parties, and to combinations of parties (consortia). In the case of a consortium, there is one party who acts as the contact point and contractor on behalf of the consortium for the tender with Geonovum.

Questions about the tender can only be asked by sending an e-mail to info@geonovum.nl, addressed to Linda van den Brink, Marcel Reuvers and Arnoud de Boer. These questions and our answers are collected in the testbed's GitHub repository[3].

Your tender must be submitted by sending an e-mail to info@geonovum.nl, addressed to Rob van de Velde, director of Geonovum.

The tender must be written in English and must at least contain:

- Specification for which task within the research topic you are applying;
- Motivation for applying for the research topic;
- Plan of approach (maximum of four pages);
- References (including e.g. publications, projects, blogs, code on GitHub) and curriculum vitae for performers of the research, showing enough relevant knowledge and experience;
- An indication of the in-kind investment;
- Statement of agreement with the publication of the research results and deliverables under a CC/by license.

All outcome will be available under http://creativecommons.org/licenses/by/4.0/. Deliverables of the research topics, in the form of, published data, vocabularies, demonstrators, prototypes and the like, must remain available for at least six months after completion of the testbed. The resulting reports must be made available to Geonovum indefinitely.

The deadline for submitting a tender is May 9, 2016, at noon.

Geonovum will judge the received tenders between May 9 and May 13.

Geonovum will announce which party is selected for which research topic on May 13 at the latest. All parties who have submitted a tender will be informed about this via e-mail.

Note that reviewers of this document, Geonovum staff, and sponsors are exempt from bidding.

[3] https://www.github.com/geo4web-testbed/general

# Chapter 3 - Research topic #1 revisited: Modern ways of spatial data publication

**When a governmental organisation wants to publish its open data, there are many publication methods available to choose from - and new ways are evolving as we speak. Based on its Spatial data on the web testbed research topics #2, #3 and #4, Geonovum has now formulated a set of lessons learned describing what we think are the best publication methods for spatial data on the web.**

## 3.1 Goal

Our goal is to validate and improve the results of our testbed:

- From the perspective of the data publisher
- From the perspective of the data user

At the same time, we want to stimulate the growth of a community around spatial data on the web.

## 3.2 Description

The results from testbed topics #2, #3 and #4 were presented on March 17, 2016[4]. Geonovum has published these results as a consolidated 'lessons learned' for publishing spatial data on the web. These can be found at the following URL:

- https://github.com/geo4web-testbed/lessons-learned/wiki

These lessons learned will be input for the next phase of the testbed. They are a work in progress; however, between the publication of this request for tender and the end of this testbed phase in July, only small corrections will be made. If more substantial errors are found, these will be recorded as issues in GitHub but not corrected in the text until after this testbed phase.

Research topic #1 is about answering this question:

**How do these lessons learned meet the constraints (e.g. budgets) and capabilities (e.g. in-house know-how) of governmental organisations on the one hand, and of data users on the other?**

This question is answered in the testbed from two perspectives: data publishers and data users.

*The perspective of the data publisher*
This target group is from the geo-information domain. A domain that currently uses OGC standards such as WMS, WFS, and WMTS for data and ISO 19115 and Catalogue service for metadata. This target group is homogeneous and well-organized. They aim their publications at the geo-information professional, because of the OGC/ISO standards they use. This group is not aware enough of the need to make data available in other ways in order to reach a wider audience besides the geo-information professionals.

*The perspective of the user*
'The user' is used in a special sense here; what is meant is data users like digital design companies and web developers. In fact it is everyone who wants to use digital information on the world wide web for websites, apps and so on. So this includes the geo-information professional too. But not end users: people who visit web sites where spatial data is used.

[4] For resulting reports, presentations, data and code see https://www.github.com/geo4web-testbed/general

The approach is aimed at validating and improving the testbed results. To this end a community of data users is built. Geonovum sees this as a communication activity: getting data publishers and data users together and active within a community. This will not be a totally new community, but will be in some form combined with communities that already exist, e.g. the PDOK community around spatial data, and Platform Linked Data Nederland.

The communication approach has already started before publication of the this request for tender. The work on research topic #1 has an important role in speeding up the growth of the community.

The scenario will be to enact the new Environmental law in a small setting.

## 3.3 Already done: input data for the testbed

As input to this task, several datasets are available at the start of the work on research topic #1, published in compliance to the lessons learned.

Topography

PDOK are providing a dataset containing topographic objects from the Key Register Topography (Basisregistratie Topografie) in the test area of Valkenswaard. This data is published as spatial data on the web using the data platform Kadaster is developing at the moment. Possibly, another dataset will be published in this manner by them for use in the testbed. This is decided in consultation between the testbed organization and PDOK.

Large scale topography

A similar dataset, but containing more detailed topographic objects, from the Key Register Large Scale topography, is also provided. It is the same test area of Valkenswaard. This data is published as a WFS service with an LD Proxy on top of it, as described in the lessons learned (lesson 4) and the report of research topic 4.

Land use data
A dataset containing Dutch spatial plans, published as part of research topic 3, is also part of the input data. This data is published according to the methods described in lesson 2 and lesson 3.

The data is available through an API: https://swaggerhub.com/api/apiwise/landcover/1.0

Enrichment with terms, information model and documentation

The data of the large scale topography is enriched with semantics: terms, information model and documentation.

Terms
Terms give names to the abstraction of things in reality. These abstractions are expressed as features in the geo-domain.
Regarding the large scale topography these are physical things like road, building, light mast, etc.
See: http://definities.geostandaarden.nl/concepten/imgeo/
In addition some formal terms (by government) will be added with terms that are used by 'normal' citizen.

Information model
The information model describes the structure of the dataset. For example classes, relations, properties, etc.
Traditionally in the geo-information domain this is done in UML class diagrams. For this testbed this will be done in W3C standards.

Documentation
The current official documentation of the large scale topography is available in pdf documents, but a lot of the information is also available online at http://imgeo.geostandaarden.nl. This is information that helps users to understand the data better.
The selected documentation that will be added to the information model includes:

- Capturing rules BGT (mandatory part of the large scale topography), for example see: http://imgeo.geostandaarden.nl/node/2340
- Capturing rules IMGeo (optional part of the large scale topography), for example see: http://imgeo.geostandaarden.nl/def/imgeo-object/waterdeel/inwinningsregel-imgeo

- Example of demarcation of the things (features), one or more pictures, for example see: http://imgeo.geostandaarden.nl/def/imgeo-object/waterdeel/zee

| Groups of information | Elements | Standards |
|---|---|---|
| 1. Terms | Sources (laws and regulations) | Juriconnect, ELI, ECLI |
| | Terms | SKOS |
| 2. Information models | Information models | SHCL or OWL (to be defined) |
| | Code lists | SKOS |
| 3. Documentation | Current documentation split by referred (linked) item | HTML |

## 3.4 Tender information data publication (Task 1)

One party will be selected to work as data publisher on task 1. They will get a contribution of € 10.000,- excluding VAT.

Besides the data that is published in advance, several other datasets are provided as well. It is part of this task to publish this data in compliance with the lessons learned.

Cultural heritage

Cultural heritage data, including:
- Built monuments
- Archeological monuments, possibly also archeological sites or archeological findings
- Image collection (beeldbank) containing photographs of monuments and old cadastral maps
- Art collections (digital museale collectie Nederland)
- Thesauri, describing the semantics of the data
- Historical geocoder, an API that gives the location of old Dutch place names

The Cultural Heritage data is provided through an API from which the data can be downloaded, and in addition possibly as XML.

The data created within this task will be used in a later phase of the testbed for research topic #5, which will include a hackathon or a similar event, where the data will be put to use in apps.

Publish this data in compliance with the the lessons learned, specifically:
- Lesson 1 D
- Lesson 2 A, B, C and D
- Lesson 3 A and B

The task is to validate and improve the lessons learned. The components of this task are:
1. Evaluate the usability of the lessons learned. How useful is the lessons learned as documentation? Are the contents understandable, the examples workable and the form of the documentation useful?
    a. Report any errors found in the lessons learned.
    b. Identify any gaps in the lessons learned, i.e. aspects of spatial data publishing on the web about which guidance is needed, but missing in the lessons learned.
    c. Identify any bad advice in the lessons learned. Are any parts of the lessons learned arguably not good practice at all?
    d. Give suggestions, preferably as text proposals, for the improvement of the lessons learned in areas mentioned in items 1-4 above.
2. Evaluate the ease of publishing and maintenance
    a. Which technical knowledge and experience is needed to implement and maintain the publication methods?
    b. Give suggestions on how to educate data publishers.
    c. What are the costs, time involved etc when implementing this publication method for the first time in an organization?
3. Evaluate the value of having the semantics with the data i.e. the terms, information model and documentation.
    a. Is it easy to use e.g. for finding definitions, finding related concepts, getting definitions and integrating them in a website?

b. Can the semantics be used to make decisions or in other smart ways?

### Deliverables task 1

- Published data as defined in this section (i.e. cultural heritage data and semantics)
- Report describing what was done and containing the findings and answers to above questions in this task description.
- Links to the hosted datasets, published in compliance with the publication methods described in the lessons learned.

## 3.5 Tender information spatial application builders (Task 2)

In addition to the data publishers two parties will be awarded a contribution of € 7.500, excl. VAT each, to represent the data user side in this phase of the testbed. They will implement a use case in a web application, using the data described in paragraph 3.3 and 3.4. In addition they are free to use other data that is published on the web.

The use case they implement must be based (at least partly) on the data as mentioned above and must enact a part of the environmental law use case. In this way they simulate the new environmental act in a small setting.

The task is:

- Create a working application, using the data as described in paragraph 3.3 and 3.4. Describe this application in your proposal.
- Report on your findings: are the data findable, usable and programmable?
- Does the information in the lessons learned help you work with the data?

For the lessons learned, the data user participants answer the same questions as the data publisher participants:

1. Evaluate the usability of the lessons learned. How useful is the lessons learned as documentation? Are the contents understandable, the examples workable and the form of the documentation useful?
2. Report any errors found in the lessons learned.
3. Identify any gaps in the lessons learned, i.e. aspects of spatial data publishing on the web about which guidance is needed, but missing in the lessons learned.
4. Identify any bad advice in the lessons learned. Are any parts of the lessons learned arguably not good practice at all?
5. Give suggestions, preferably as text proposals, for the improvement of the lessons learned in areas mentioned in items 1-4 above.

### Deliverables task 2

- Working application published on the WWW.
- Report describing what was done and containing the findings and answers to above questions in this task description.

# Chapter 4 - Testbed organization

**This chapter describes the organization, conditions, finances and planning of the testbed.**

## Coordination

The coordinator on Geonovum side is Linda van den Brink (Geonovum), with support roles for:

- Arnoud de Boer (Geonovum)
- Marcel Reuvers (Geonovum)

For every research topic there is a bi-weekly meeting between Geonovum and each contractor, either at the Geonovum office in Amersfoort or by phone, depending on the nature of the subjects under discussion. The agenda items of these meetings are the progress and any issues or technical questions concerning the details of the research topic.

## Testbed sessions

During the work on research topic #1, Geonovum wants the participants from the data publication side and data user side to inform each other as much as possible. Geonovum will organize at least one face to face session (max. 1/2 day each) with all the contractors, in order to get them interacting with each other. This is already a small step in forming a community: spatial data owners/publishers will work together with data users from the web world.

In addition to these meetings, Geonovum will organize a public session after completion of the testbed, in which the contractors have the opportunity to present their final results.

## Planning

Geonovum will announce which party is selected for which research topic on May 13 at the latest (see chapter 2). The testbed starts immediately afterwards.

The parties working on task 1, spatial data publication, will start on May 16. They should have a usable data publication finished by June 3. After June 3 they can continue perfecting the data publication, but the parties working on task 2 must be able to use the data from that date.

On/around June 3, the spatial data use parties working on task 2 will get to work on their applications. The people working on spatial data publication and spatial data use will have a joint meeting around this time.

The final deadline for carrying out the work on research topic #1 tasks 1 and 2 is the 15th of July.

## Finance

A total of three contractors will be granted a sum to work on this testbed topic. One for task 1, and two for task 2. The budget available is:

- € 10.000 excluding 21% VAT for one contractor working on task 1, spatial data publication.
- € 7.500 excluding 21% VAT for contractor A working on task 2, spatial data use.
- € 7.500 excluding 21% VAT for contractor B working on task 2, spatial data use.

The budget is not supposed to cover the entire research activities of the contractors; an in-kind contribution of the contractors is expected.