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Availability and Accessibility of Official Geospatial Reference Data in Germany

Peter Kreuzer

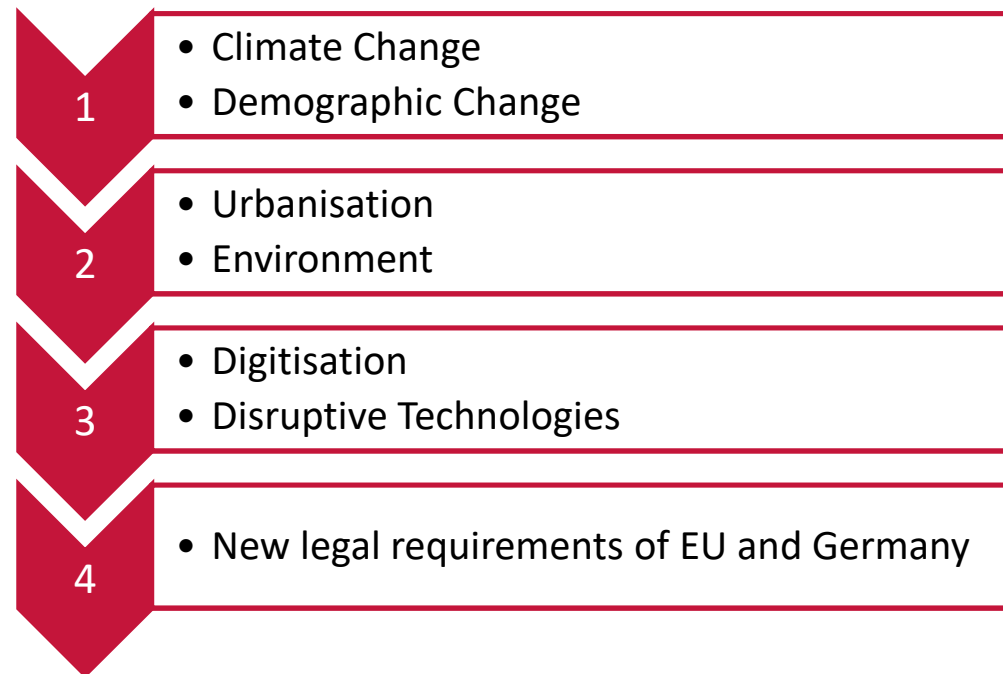


Niedersachsen

Content

- ◆ Introduction, background
- ◆ Customer expectations related to geospatial reference data
- ◆ Geoinformation at federal and state level in Germany
- ◆ Developments at federal level (BKG, AdV)
- ◆ Recent developments in Lower Saxony
- ◆ Conclusions

Drivers for Change



Customer Requirements

Basic and individual products and services

3D: High resolution Digital Terrain Model, digital surface model, buildings

Visualisation of topographical data including options for customising

Provision of time series

Performant web services

Meeting Customer Requirements

Open data, including easy access to data and data use free of charge

Up-to-date reference data, much shorter updating-cycles

Use of artificial intelligence algorithms and machine learning

Distribution of data and algorithms through portals and platforms

Easy use of geodata on mobile devices

Access and use of reference data through appropriate API's

Sound quality management

Integration within the framework for e-Government

Provision of market transparency.

SDI in Germany



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GDI-DE:

- Joint project of Federal Government, 16 states and local authorities
- Steering Committee
- Coordination office at BKG

AdV – Organisation and Tasks



Recommendations, guidelines and binding regulations for state survey and real estate cadastre in Germany

Co-ordination of state overlapping projects

Collaboration in research, development and application of technical methods and procedures

Representation of official surveying and mapping of the states of Germany and co-operation at international level

AdV – Smart Mapping

AdV Smart Mapping Map Editor Print Editor Applications Raster Documentation Open Data Google Translate **Beta**

Smart Mapping
Agile processes in the AdV

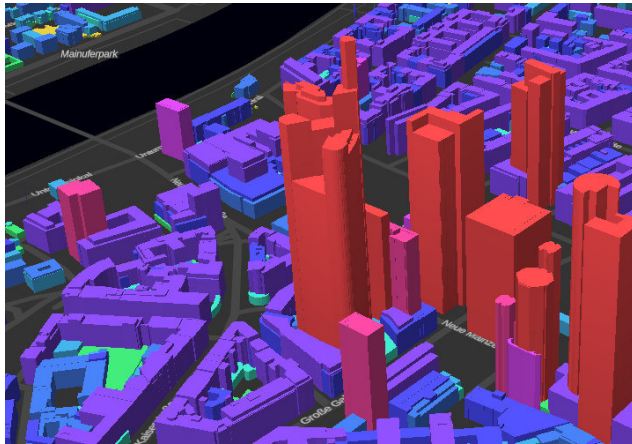
Map
Create vector map styles and applications with our beta version by customizing predefined basemaps. Try it out!
[Map Editor >](#)

Applications
Our application examples show possible use cases for custom vector maps in combination with other data sources.
[Application examples >](#)

Documentation
With our Vector Tiles API you can use official data and styles in your own map application. Take a look at the documentation for details.
[Documentation >](#)

Source: www.adv-smart.de

AdV – Smart Mapping II



Source: www.adv-smart.de

A government development collaboration at state and federal level

Combination of official German survey data with other open geospatial data sources

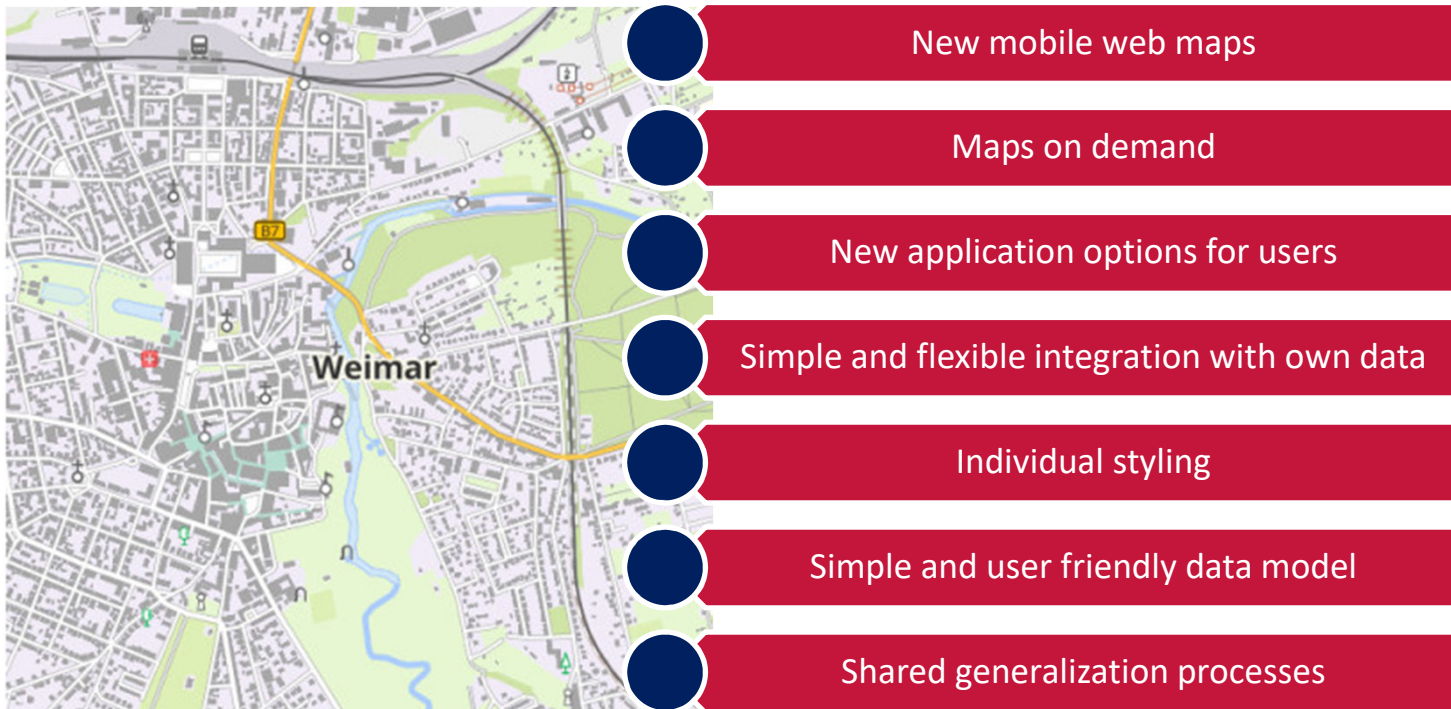
Technical platform for agile development, continuous integration, deployment and operation of SDI systems based on cloud technologies

Use of [Free and Open Source Software](#)

Simple user oriented data model for geospatial data

Creation of new AdV standard products. Phase 1: Vector Tile based Web Map API

AdV – Smart Mapping III



Source: www.adv-smart.de

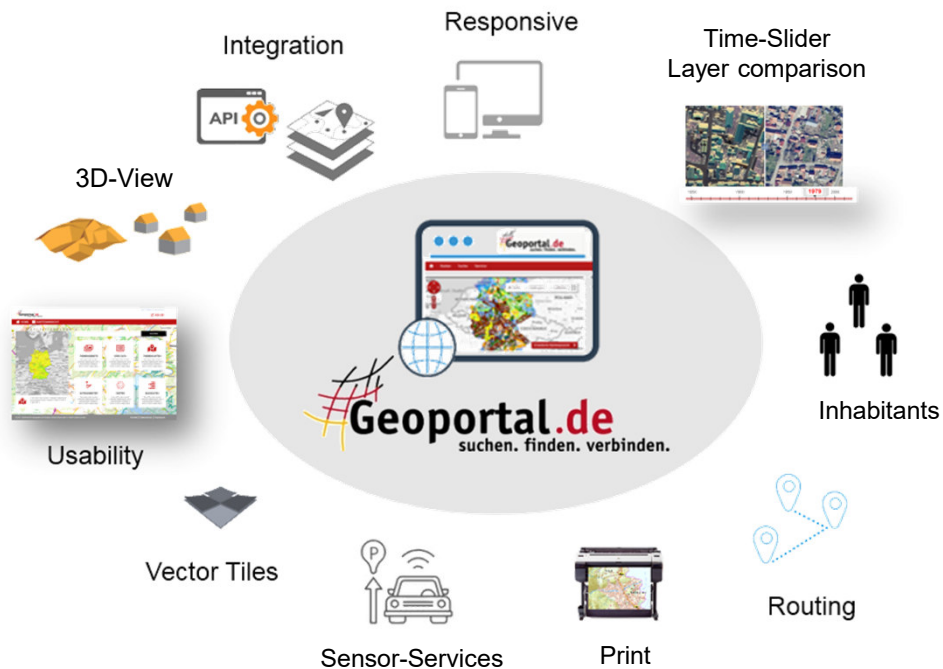
BKG at a Glance – Who We Are ...

- A technical agency under the Federal Ministry of the Interior and Community, with specialist departments in geodesy and geoinformation
- The central service provider of topographic data, cartography, and geodetic reference systems for the German federal government
- Operators of a service centre for geospatial information and geodesy
- Locations: 3 in Germany, 1 in Argentina (La Plata), 1 in Antarctica (O'Higgins)



www.bkg.bund.de

Central Geodata Broker of the Federal Government



The new Geoportal.de

- Published in April 2021 and hosted by BKG
- Central online platform of the GDI-DE for finding and displaying public geodata
- Clear and simple presentation of geodata
- Presentation of Best Practice examples (e.g. flood, heavy rain map)

→ Future integration of sensor services

Geoportal  YouTube
www.geoportal.de

GDI-DE = Spatial Data Infrastructure Germany

Data and Services of BKG (mostly open data)

- Digital Landscape Models (e.g. DLM 250)
- Digital Terrain Models (e.g. DGM 200)
- Digital Topographic Maps (e.g. DTK200)
- Other digital products (e.g. POI, administrative units, geographical names)
- Interactive atlases (e.g. Floods)
- Interactive map applications (e.g. Landscape change service)
- Web applications (e.g. historical place names , coordinate transformation, quasigeoid heights calculation, gravity value calculation)
- Online services (e.g. WMS, WFS)



Lower Saxony



Landesamt für Geoinformation und Landesvermessung

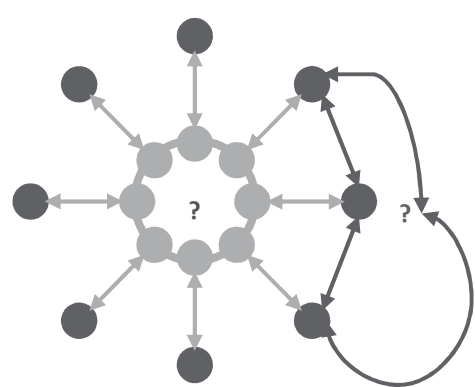
Modern ways for delivery of geodata

Cloudnative Geo

Source: LGLN

Shifting to a Platform Approach

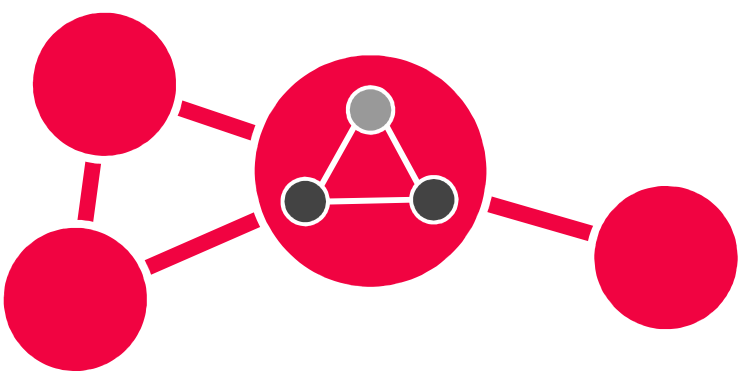
Classical data distribution



Service Customer

Service Provider

Platform Economy



Service Customer

Platform

Service Provider

Registers on platform
Obtains services

Administers customers
Lists services
Monitors usage
Accounting

Provides services

Success Factors

Network

A sovereign and open Platform-Infrastructure enables access to our data and services and media break-free integration at any time .

Standards & Sustainability

Reliable access, better analyses and sustainable further development

Accessibility and Use

Digital, online and close to citizens.

Agility

Customer focus: better standards and continuous development

Data driven organisational setup

Automatic, AI-supported evaluation of datasets allows analysis of service relations and improvement of services.

Openness

The platform approach will create a digital ecosystem where data and services of other organisations can easily be retrieved.

Spatio Temporal Asset Catalog



Enabling online search and discovery of geospatial assets

- > Initiated by the Radiant Earth Foundation and founded in October 2017 by 14 organizations (incl. Google Earth, OpenStreetMap, Amazon, Microsoft, ...).
- > Common language for organizing metadata
- > Based on current technologies

STAC Catalogue:

- > Simple, flexible JSON document of links
- > Provides a structure to organise and browse

STAC Item

- > Metadata of geospatial dataset
- > Reference to the actual dataset, mostly in cloud native geospatial formats (COG, COPC)



Niedersachsen

Cloud-native Geospatial Data Formats

Read Oriented

- > Write Once, Read Many (WORM)
- > Performance
- > Convenience
- > Compatibility
- > Compression

HTTP Partial Content

- > HTTP interfaces (S3/GCS/AZ/COS)
- > Application control
(data traversal, parallelism, volume)

Open Specification

- > Enable collaboration

Examples



- > Enables the streaming of the right parts of a GeoTIFF as needed, instead of having to download the whole file



- > A COPC file is a LAZ 1.4 file
- > Stores point data organized in a clustered octree

geoService example #2

Building Detection-as-a-Service

AI-technology as easy-to-use service for other organisations.

No deep AI-expertise required on the customer side

Object-recognition on own ortho images

Integration into their own GIS



geoService example #1

Real Estate Valuation

Transparent data and
mathematical models

Real-time availability instead of
long update-cycles

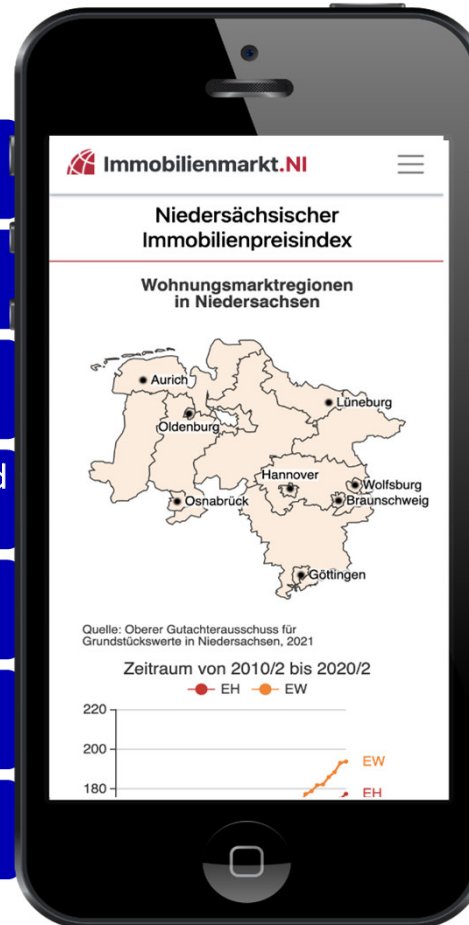
Easy to handle on mobile
devices

Participation in data capture and
model development

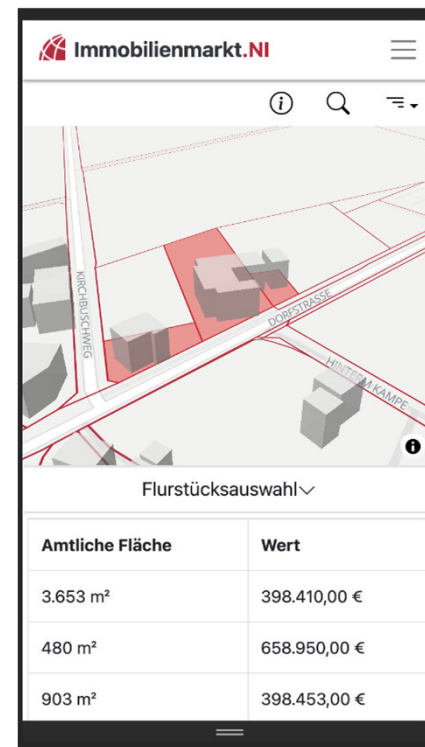
Agile development for spatial
and thematic sub-markets

Authoritative certification of
data sources and models

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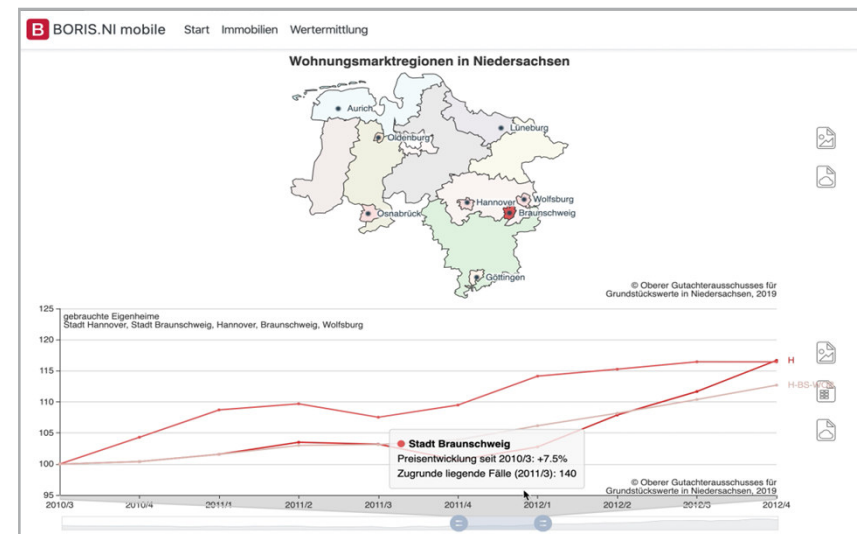
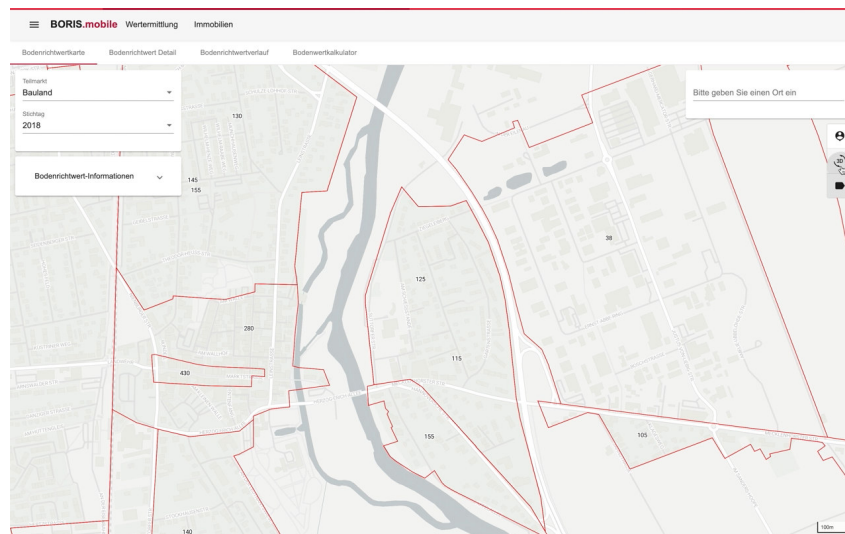


Valuation Map and Calculator



Source: LGLN

Zoning and Interactive Diagrams



Source: LGLN

Editor for Crowdsourcing

LGLN

Startseite Formular Editor

Niedersachsen

Toolbox

Mehrfachauswahl

Kommentarfeld

Bilderauswahl

Likert Skala

Einfachauswahl

Bewertung

A Eingabefeld

1

A Eingabefeld

Bilderauswahl

Likert Skala

Baujahr *

Gebäudeart *

Beispiel 1

Beispiel 2

Likert Skala

Zustand *

Sehr schlecht

Schlecht

Neutral

Gut

Sehr gut

Badezimmer

Vorschau schließen

Neues Formular

1. Baujahr *

2. Gebäudeart *

Beispiel 1

Beispiel 2

3. Zustand *

Sehr schlecht

Schlecht

Neutral

Gut

Sehr gut

Badezimmer

Complete

Source: LGLN

LGLN

23

Niedersachsen

3D



Source: LGLN

The Bottom Line

Digitisation as well as new legal and customer requirements for official geodata mean a paradigm shift for land administration data and services.

Mix of different professional profiles and skills is needed for future and sustainable development. Capacity building is a critical success factor.

Adjustment of business processes as well as an appropriate platform solution for data sharing and delivery are necessary to manage digitisation and customer needs.

Data quality must meet customer demands (fit for purpose).

Thank you for listening!