GENERATING INSPIRE PLU DATA ON BASE OF THE GERMAN NATIONAL STANDARD XPLANUNG

Dr. Joachim Benner
Dr. Kai-Uwe Krause

September
Introduction city state Hamburg

- Hamburg as a city state is both a municipality and a federal state of the Federal Republic of Germany
- The “Bürgerschaft” is Hamburg’s state parliament
- Ministerial duties in Hamburg are performed by the current 11 ministries, each headed by a Senator
- Hamburg breaks down into 7 administrative districts in charge of local government duties
- Each district is headed by a District Council Executive; an elected district council participates in the administration of the district
Challenges: Hamburg is Growing

- Approx. 100,000 new inhabitants predicted yearly until 2030
- High demand for new homes
- High demand for new work spaces
- Demand for leisure and recreation space
- Demand for renewed and adopted infrastructure
- High demand for a good quality of urban life for different lifestyles and income groups
Challenges: Hamburg is Growing

- Planning acts for **10,000 dwellings yearly**
- Planning process shall be finished within **18 month**
- Implementation **integrated digital planning and building process chains**:
  - from digital legal binding land use plan (**XPlanung**) to electronically assisted processing of building applications (**XBau**) to **BIM (IFC)**
Lossless data exchange between the actors involved in planning processes

XPlanung belongs to Germany’s national eGovernment strategy pursued by the federal government, federal-state governments and municipal administrations “Deutschland-Online” since 2004.
Goals of XPlanung

- a **semantic data model**, describing the geometrical and logical content of a spatial plan *independent from its graphical representation* and an object oriented data exchange format,
- standardised object model and data exchange format supporting horizontal (inter-municipal) and vertical (planner – municipality – county – federal state) coordination of planning processes,
- support of electronically assisted processing of building applications,
- standardised data format for e-participation platforms,
- semantic description of planning data as a basis for the *establishment of services* (query, monitoring, reporting) and visualisation in different software applications
Goals of XPlanung

- central storage of urban land-use plans / other plans of special urban planning legislation (e.g. formally designated redevelopment areas) in an uniform semantic structure as a data base for different software applications and information systems
- for source datasets according to XPlanung data model only one set of schema transformation rules to PLU INSPIRE data model has to be defined.
Object model XPlanung / data exchange format XPlanGML

XPlanGML

- object-oriented data model
- data exchange format

- XPlanGML formalises all **statutory designations** for regional planning, urban planning and landscape planning used in **legal planning documents**
- disjunction between semantic content and visualisation
- XPlanGML relies on the international standard **GML-3** (Geography Markup Language)
Implementation of XPlanGML export- / import interface in AutoCAD applications, e.g. WS-LANDCAD 2017

Lossless data exchange of digital binding spatial land use plans between different CAD / GIS software applications with XPlanung (AutoCAD / WS-LANDCAD)
Implementation of XPlanGML export- / import interface in AutoCAD applications, e.g. ESRI / GeoOffice

Lossless data exchange of digital binding spatial land use plans between different CAD / GIS software applications with XPlanung (ESRI / GeoOffice)
Spatial land use plan analysis and monitoring with XPlanung data

- All legal binding land use plans have been digitalised (about 2600 plans) within the last two years according to the XPlanung object model and are provided as WMS und WFS services by the deegree framework.
- XPlanung will be probably adopted (05.10.2017) as standardised digital data exchange standard for spatial plans by the IT Planning Council (central body responsible for national IT cooperation).
Formal public participation and statutory consultation with public authorities based on XPlanung data

Provision of a legal binding land use plan as WMS service in online participation

Detailed information about the future land use and planned regulations in legal binding land use plans - based on XPlanung
XPlanung legal binding land use plan for Elbphilharmonie (Hamburg-Altstadt36-HafenCity4)
XPlanung legal binding land use plan for Elbphilharmonie (Hamburg-Altstadt36-HafenCity4)
workflow converting XPlanGML => PLU
Converting Results

- Result of the *KIT XPlanung Toolbox* converting process is a valid GML Dataset against INSPIRE PLU Schema V 4.0
- Concepts / data type „*DimensioningIndicationValue*“ (e.g.: degree of building coverage can be determined by setting the plot ratio, floorspace index, cubing ratio, height of structures and number of full storeys) and „*OrdinanceValue*“ (e.g.: date specification explaining plan preparation procedure) are used
- *ZoningElement* land use classification is realised through one or more equivalent HILUCS-values (attribute hilucsLandUse), (voidable) concept HILUCSPresence is not used
- National Codelists for *ZoningElement* (attribute *specificLandUse*) and *SupplementaryRegulation* (attribute *specificSupplementaryRegulation*) are until now not in use, definition of these codelists is still in work
XPlanung BP_Plan (Spatial Plan) attributes
PLU Spatial Plan attributes

PLU WMS Service, layer Spatial Plan
### XPlanung BP_Baugebietsteilflaeche (Zoning Elements) attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XPlan Version</td>
<td>4.1</td>
</tr>
<tr>
<td>xpPlanType</td>
<td>BP_Plan</td>
</tr>
<tr>
<td>Rechtsstand</td>
<td>Geplant</td>
</tr>
<tr>
<td>Text Abschnitte KfZ</td>
<td>Im Kerngebiet sind maximal 35 vom Hbld. (v. H.) der Geschossfläche für Wohnnutzung zulässig. (Keine gesetzliche Grundlage)</td>
</tr>
<tr>
<td>Text Abschnitte GRZ</td>
<td>Im Kerngebiet ist das anfallende Niederschlagswasser direkt in die Elbe oder den Sandtorhafen abzuleiten. (Keine gesetzliche Grundlage)</td>
</tr>
<tr>
<td>Flächenschluß</td>
<td>Ja</td>
</tr>
<tr>
<td>GRZ</td>
<td>1</td>
</tr>
<tr>
<td>Allg. Art der baul. Nutzung</td>
<td>GemischteBaufläche</td>
</tr>
<tr>
<td>Vertikale Differenzierung</td>
<td>Nein</td>
</tr>
<tr>
<td>Rechtscharakter</td>
<td>Festsetzung</td>
</tr>
<tr>
<td>Besondere Art der baul. Nutzung</td>
<td>Kerngebiet</td>
</tr>
<tr>
<td>Weiterführende Informationen/Links:</td>
<td></td>
</tr>
</tbody>
</table>
PLU Zoning Element attributes
XPlanung supports the implementation of digital egovernment urban planning process chains as well as the implementation of the INSPIRE directive, especially for INSPIRE PLU
THANKS TO YOUR ATTENTION

Dr. Joachim Benner, joachim.benner@kit.edu
Dr. Kai-Uwe Krause, kai-uwe.krause@gv.hamburg.de