

## Questionnaire for the development of ISO 19152:2012 LADM Valuation Module

The ISO 19152:2012 Land Administration Domain Model (LADM) presents a conceptual schema for the specification of property units and their legal and geometric characteristics recorded at cadastre and land register, and relates these datasets with other property related datasets (e.g. addresses, utility networks, building (units), valuation, taxation, land use, land cover) recorded at external registrations.

A recently initiated collaborative research aims at developing a LADM based international information model for one of these external registrations, namely in terms of a Valuation Module for the ISO 19152:2012 LADM. The purpose of this research is to define the semantics of valuation information maintained by public authorities especially for recurrent taxes on immovable property<sup>1</sup>, and to extend the scope of LADM from a fiscal perspective to provide an information model that could be used to construct information systems for immovable property valuation. The preliminary results of this research were documented at the 11<sup>th</sup> 3D Geoinfo Conference<sup>2</sup>.

This questionnaire is prepared as a part of methodology applied for the above-mentioned research which is also supported by FIG Presidency and Chair of FIG Commission 9 Valuation and the Management of Real Estate. The purpose of the questionnaire is to create a world-wide inventory that reveals commonalities and differences among valuation systems used for recurrently levied immovable property taxes. The result of the questionnaire is expected to provide an understanding of the situation of valuation systems, and will be used as source data for the elaboration of the LADM Valuation Extension Module.

Please reply the following questions, and contact us if you have any comments and suggestions:

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<sup>1</sup> Recurrent taxes on immovable property covers taxes levied regularly in respect of the use or ownership of immovable property. These taxes are levied on land and buildings, in the form of a percentage of an assessed property value based on a national rental income, sales price, or capitalised yield; or in terms of other characteristics of real property (e.g., size or location) from which a presumed rent or capital value can be derived. They can be levied on proprietors, tenants, or both; they can also be paid by one level of government to another level of government in respect of property under the jurisdiction of the latter (The OECD classification and interpretative guide 2015, <http://www.oecd.org/tax/tax-policy/oecd-classification-taxes-interpretative-guide.pdf>)

<sup>2</sup> For more information, see: <http://www.isprs-ann-photogramm-remote-sens-spatial-inf-sci.net/IV-2-W1/145/2016/>

## Section A. General questions for property valuation systems in SLOVENIA

Questions	Responses
<p>1. Please indicate the organizations responsible for valuation of properties for property taxation purposes through name in national language and English translation.</p>	<p>Geodetska uprava Republike Slovenije</p> <p>Surveying and Mapping Authority of the Republic of Slovenia</p>
<p>2. What are the types of objects of valuation for property taxation (e.g. unimproved parcel, building)? Name and date of the ordinance to be listed.</p>	<p>Land and Buildings on the base of Mass Valuation Law</p>
<p>3. Please mention value type (e.g. market value, tax value, capital value) used by the responsible organization for property taxation?</p>	<p>Market Value</p>
<p>4. Please mention the public registry datasets (e.g. cadastre, land registry, building registry) which are used in valuation procedures, and their mutual functions?</p>	<p>Land Cadastre, Building Cadastre, Land Register, Address Register, Municipality land use plans are the main data sets for designing the Value Units in Valuation Database.</p>
<p>5. Which methods are applied for collecting market data needed for valuation?</p>	<p>Special Sales Price Register is established, where the sales and rent data are collecting and maintaining daily. Sales data are provided from Taxation Authority (property transfer tax) and from Companies (properties that are VAT related). Rent data are provided by Companies and by natural persons.</p>
<p>6. Is there any special valuation database for storing datasets <i>used in</i> (e.g. property characteristics) or <i>produced with</i> (e.g. sales statistics) valuation procedures? If yes, please give the name of database, indicate responsible authority, and describe its content.</p>	<p>Market data from the Sales Price register are analysed and used for valuation models design and calibration in special IT/IM system based on Open Source products (Linux, PostGres, PostGis, OpenJump, RStudio). Valuation Database is gathering the property data from the registers mentioned in 4. and calibrated valuation models from open source IT/IM System.</p> <p>For market data collection, analyses, valuation models designing and calibration, maintaining the valuation database and calculation of property values on the base of Mass Valuation Law, The Valuation office at Surveying and Mapping Authority of Republic of Slovenia is responsible.</p>

7. Is there a web-based dissemination of valuation information? If yes, please indicate which data (e.g. sales statistics) is open to the public.	Sales data, Property Market Reports, Property Data and Property Values of all 6,5 million properties are available on the web, free of charge.
8. How frequently are general revaluations made?	Every 4 years, and indexation if needed in between.
9. Is there a system of indexation affecting property value between regular revaluations?	Yes.
10. Do taxpayers have a right to appeal against the appraised values? If yes, please indicate how disputes are resolved.	Slovenia was trying to introduce the property tax based on market values from the Mass Appraisal System developed in 2014, but Constitutional Court abolished the Property Tax Law. Therefore new Mass Valuation Law and new Property Tax Law will be probably approved in May 2017 with the objective to collect the first property tax in 2019. Property owners will be notified with the property values in 2018 and will have right to appeal.

Please continue with Section B, if mass appraisal procedures are applied in your country for immovable property taxation. If single property appraisal methods are used -even if as complementary part of mass appraisal, please answer questions given in Section C.

## Section B - Questions for mass appraisal procedures in SLOVENIA

Questions	Responses
1. Do you have a (computer aided) mass appraisal system in your country? If yes, please indicate also responsible authorities.	Yes, Valuation Office at Surveying and Mapping Authority of Slovenia.
2. Is there any other use of the mass appraisal system than property taxation?	Yes, property values are used for census when applying for any social support or subsidies, courts and other state organizations for different legal issues, banks for mortgages, real estate agencies,..
3. Which CAD/GIS/CAMA (Computer-aided design / Geographic information system / Computer Assisted Mass Appraisal) software packages are used in mass appraisal?	Specially designed and so called "custome made" IT/IM system based on Open Source products (Linux, PostGres, PostGis, OpenJump, RStudio) was developed especially to support all Valuation issues in Mass Valuation System.
4. Which geographical or spatial datasets are used in mass appraisal? Please describe the source of these datasets.	Actual land use shapes (Ministry of agriculture), Future Land Use shapes (Municipalities), Flood Zones (Agency for Environment), Natura 2000 (Agency for Environment), Protected Forests Zones (Agency for Forestry).
5. Which geographic or spatial analysis methods (e.g. visibility analysis, proximity analysis) are applied in mass appraisal?	For different purposes we use different analyses, lately we use a lot GAMLSS (Generalized Additive Models for Location, Scale and Shape).
6. Is three-dimensional (3D) data used in mass appraisal? Please describe source of 3D data (e.g. floor plans). Does Valuation objects include condominium, strata title, freehold flats or other 3D units.	We do not have any 3D data available in the country. Otherwise apartments in condominiums are part of the Building Cadastre and are used in Mass Valuation System, but are not registered as 3D, but as "part of the building".
7. Is there any relationship between the CAMA system and other public registers (e.g. cadastre, land registry, building registry, ...)?	The whole Mass Valuation System and CAMA are based on Public Registers, see section A. point 4. as well.
8. Please describe the statistical models (e.g. additive, multiplicative) applied in mass appraisal according to type or functions of properties?	All 6,5 million properties are devided into 17 valuation models, all of them are based on hybrid statistical models
9. Please indicate statistical analysis methods (e.g. multiple regression analysis, artificial neural network) applied in mass appraisal?	We are using MRA and GAMLSS (Generalized Additive Models for

	Location, Scale and Shape), we are starting to develop artificial neural network as well.
10. Which land use characteristics (e.g. land use zones) are used as variables in mass appraisal models? Please describe the source(s) of these characteristics.	All the land – parcels in mass appraisal system and models are considered as future land use, where 36 different land use classes are defined and are generalized into 7 general future land use classes in valuation models system. Beside the future land use also the size, size class and other parcel data are used depending the future land use like, bonita points (agriculture land), growth coefficient and forest openness (forest land), ect.
11. Which environmental and locational characteristics (e.g. location nuisance, distance to points of interest / POIs, environmental risks) are used as variables in mass appraisal models? Please describe the source(s) of these characteristics.	Generally all the geographical data we are using in the system (see section B. point 4.) are part of the valuation models zoning and zoning calibration, nuisance that are related to one individual property are the appeals or special circumstances procedure applied by the property owner.
12. Which building or improvement characteristics (e.g. number of unit, construction type and material) are used as variables in mass appraisal models? Please describe the source(s) of these characteristics.	<p>Different kind of building characteristics for different kind of property groups (classes) are used in the models as variables depending on valuation method used (comparison, income, cost):</p> <p>Sales comparison models (apartments, houses): size (net, use), year of construction, year of renovation (roof, facade, installations, windows), number of floors, number of apartments in condominium, elevator, balcony, terrace, garage in the building,...</p> <p>Income: building type (offices, shop, shopping center,..) size, micro location,..</p> <p>Cost: building type (agriculture, industrial, public,..), size, industrial power,...</p> <p>All the characteristics are maintained in property registers, Land Cadastre and Building Cadastre.</p>
13. Does valuation legislation prescribe an investigation into the general quality or performance analysis (e.g. 'ratio study') of the mass appraisal system? If yes, please describe the indicators used in the performance analysis.	Yes, generally the legislation prescribes quite a lot quality criteria regarding using valuation methods, zoning and related value levels differences (10 – 15% in higher value levels – high values and 15 – 20% in lower value levels of value zones –

	low property values). Ratio Studies are related to mentioned quality criteria of value levels, so the ratio between the models values and time adjusted sales should be with in 20% (0,8 or 1,2)
14. Please indicate whether single property appraisal is applied for improving accuracy of mass appraisal estimations.	Partly yes.

### Section C. Questions for single property valuation procedures in XX country

Questions	Responses
1. Which valuation methods are used for single property appraisal for property taxation? Please relate valuation methods with the type of valuation objects (e.g. sales comparison approach for unimproved parcels).	
2. Which geographical or spatial datasets are used for single property appraisal? Please describe the source(s) of these datasets.	
3. Which legal property characteristics (e.g. property rights) are taken into account for single property appraisal? Please describe also the source of these characteristics.	
4. Which land use characteristics (e.g. land use zones) are taken into account for single property appraisal? Please describe also the source(s) of these characteristics.	
5. Which environmental and locational characteristics (e.g. location nuisance, distance to POIs, environmental risks) are taken into account for single property appraisal? Please describe the source(s) of these characteristics.	
6. Which building or improvement characteristics (e.g. number of unit, construction type and material) are taken into account for single property appraisal? Please describe the source(s) of these characteristics.	
7. If there is a special valuation database, please indicate which sales comparison method related data (e.g. comparable property identifiers, monetary adjustment for time, physical differences) are kept in this database.	
8. If there is a special valuation database, please indicate which cost method related data (e.g. type and source of cost price, chronological age, depreciations) are kept in this database.	
9. If there is a special valuation database, please indicate which income valuation method related (e.g. gross income, net income, capitalization rate, discount rate) are kept in this database.	

**Section D. Information concerning respondent(s)**

<b>Questions X..Y</b> have been answered by	<b>Respondent</b>
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2. Affiliation / position	Director of Valuation Office, Surveying and Mapping Authority of Republic of Slovenia
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5. Comments	

<b>Questions Z..A</b> have been answered by	<b>Respondent</b>
1. Name	
2. Affiliation / position	
3. Country	
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5. Comments	