

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 property¹, 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 11th 3D Geoinfo Conference².

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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¹ 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>)

² 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 Denmark

Questions	Responses
1. Please indicate the organizations responsible for valuation of properties for property taxation purposes through name in national language and English translation.	SKAT (Ministry of Taxation). In 2014, ICE - ImplementeringsCenter for Ejendomsvurderinger (Implementation Center for Property Valuations) was established
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.	The national recording of property data includes a coding into 41 property types. Detached houses, residential condominiums, owner-occupied flats, weekend cottages, in total 9 types are assessed unequal years. - Residential properties, including those owned by housing cooperatives, non-residential condominiums, business and industrial properties and warehouses, agricultural and forest properties, and building sites, a total of 32 types, are assessed equal years, according to BEK nr 814 af 26/06/2007 .
3. Please mention value type (e.g. market value, tax value, capital value) used by the responsible organization for property taxation?	For owner-occupied properties, sales comparison provides a basis, which may be further adjusted. – Commercial properties are mostly assessed according to the income approach, but the cost approach is applied, too. ICE
4. Please mention the public registry datasets (e.g. cadastre, land registry, building registry) which are used in valuation procedures, and their mutual functions?	In 1966 a computerized, national property register, EjendomsStamRegisteret , was established by the municipalities. According to a joint agreement, the eGovernment Strategy 2011-15 , the data these years are consolidated into a shared infrastructure for the property and buildings domain.
5. Which methods are applied for collecting market data needed for valuation?	Registration of titles to land, mortgages, etc. at the Land Registration Court, extending to all of Denmark, triggers sales statistic (ICE , Boks 2.2) The valuation authority, SKAT, may request information, e.g. from owners of rental properties (LBK nr 1067 af 30/08/2013 § 38)
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.	SKAT records sales statistics in the SVUR database, and publishes every six months a sales statistic. (SKAT)
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.	The Public Information Server, OIS, provides data on Danish properties. Owners have free access to own data, and

	companies may acquire property data. – Providing e.g. post address, you get details on last and previous appraisals, property type, parcel area, and specification of most recent property tax (www.ois.dk)
8. How frequently are general revaluations made?	In most of 20 th century every fourth year, 2002-2012 every second year, cf. 2 above. Presently halted, awaiting a new appraisal system expected to be operational 2018.
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.	Yes. Appeal may be lodged at either an administrative or a judicial body, LBK nr 1267 af 12/11/2015 §§ 6, 38

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 Denmark

Questions	Responses
1. Do you have a (computer aided) mass appraisal system in your country? If yes, please indicate also responsible authorities.	Yes. SKAT
2. Is there any other use of the mass appraisal system than property taxation?	The sales statistic is widely used, but also supplemented with an alternative, see C, 2.
3. Which CAD/GIS/CAMA (Computer-aided design / Geographic information system / Computer Assisted Mass Appraisal) software packages are used in mass appraisal?	In-house developed software is used
4. Which geographical or spatial datasets are used in mass appraisal? Please describe the source of these datasets.	The Cadaster (area); the Building and Dwelling Register (construction material, floor area, amenities, etc); the PlansystemDK (permitted land use) (EMS, LB)
5. Which geographic or spatial analysis methods (e.g. visibility analysis, proximity analysis) are applied in mass appraisal?	So far none. Likely to be applied by the system under development (ICE , Boks 2.2)
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.	Valuation objects include condominiums (6 types), cf. Section A, 2. Condominiums are described by floor plans, recorded at the Land Registration Court. Appraisal is based on data only, e.g. floor number and area.
7. Is there any relationship between the CAMA system and other public registers (e.g. cadastre, land registry, building registry, ...)?	Yes, a shared infrastructure for the property and buildings domain is being developed, cf. Section A, 4.
8. Please describe the statistical models (e.g. additive, multiplicative) applied in mass appraisal according to type or functions of properties?	-
9. Please indicate statistical analysis methods (e.g. multiple regression analysis, artificial neural network) applied in mass appraisal?	-
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.	PlansystemDK, established 2006, is maintained by the Danish Business Authority , based on reporting by the municipalities of their spatial planning.
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.	Likely to be applied by the system under development (ICE , Boks 2.2)
12. Which building or improvement characteristics (e.g. number of unit, construction type and material) are used as variables in mass appraisal models? Please	The Building and Dwelling Register, established about 1980 to support appraisal of properties, is updated by the

describe the source(s) of these characteristics.	municipalities while processing building permits. About 150 variables, incl. ownership, the use of building/unit, building material, installations, dates for building permits, etc (DST)
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.	Referring to K. Walsh, report from Office of the Revenue Commissioners, Ireland (2013), the ICE has assessed the accuracy of test appraisals in terms of the COD measure (ICE , p. 7)
14. Please indicate whether single property appraisal is applied for improving accuracy of mass appraisal estimations.	Individual appraisal is foreseen, esp. for commercial properties (ICE , p. 18)

Section C. Questions for single property valuation procedures in Denmark

Questions	Responses
<p>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).</p>	<p>The ambition of the mass appraisal officials, cf. Section A, 3, is to follow market practice. Therefore the same valuation object dependent valuation methods are applied. However, appraisal for mortgage is regulated to obtain a cautious result BEK nr 1760 af 27/12/2016</p>
<p>2. Which geographical or spatial datasets are used for single property appraisal? Please describe the source(s) of these datasets.</p>	<p>In addition to the sales statistic (A, 5) and property records (A, 4, 7; B, 4), the Association of Danish Mortgage Banks, The Danish Association of Chartered Estate Agents with others have established the House Price Statistics. It is based on transactions performed by professionals concerning detached and terraced houses, owner-occupied flats and holiday homes, and is issued four times a year.</p>
<p>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.</p>	<p>Data recorded at the Land Registration Court, cf. A, 5.</p>
<p>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.</p>	<p>Data in PlansystemDK (cf. B, 10), supplemented with local knowledge of possible changes in spatial planning</p>
<p>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.</p>	<p>Some environmental risks, e.g. contaminated site, are recorded in the Danish Natural Environmental Portal. Others, e.g. flood risk, are depicted on maps by Danish Agency for Water and Nature Management. Still, most characteristics seem to rely on local knowledge.</p>
<p>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.</p>	<p>Information from the Building and Dwelling Register, cf. B, 4, may be supplemented by a 'Tilstandsrapport' (Building Quality Status Report) prepared by certified engineers according to statutory rules, BEK nr 1426 af 30/11/2016. Such report and a specific insurance scheme reduces seller's liability (Danish Safety Technology Authority).</p>
<p>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.</p>	<p>Estate agents, often in links with mortgage banks, likely maintain in-house databases and analyses</p>

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)

Questions X..Y have been answered by	Respondent
1. Name	Erik Stubkjær
2. Affiliation / position	Aalborg University, Denmark Professor emeritus
3. Country	Denmark
4. E-mail	est@land.aau.dk
5. Comments	

Questions Z..A have been answered by	Respondent
1. Name	
2. Affiliation / position	
3. Country	
4. E-mail	
5. Comments	